360 environmental

Bibby Road, Cooljarloo

Spring Biological Assessment

Prepared for

Shawmac on behalf of Image Resources

May 2021

people planet professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4045AA_Rev0	Internal Draft	N. Whittington E. Webb B. Duncan	M. Stone		-	22/01/2021
4045AA_Rev1	Client Draft	N. Whittington E. Webb B. Duncan	M. Stone	L. Ioannidis	1x electronic copies	22/01/2021
4045AA_Rev2	Client Final	N. Whittington E. Webb B. Duncan	M. Stone	L.Ioannidis	1x electronic copies	10/05/2021

Disclaimer

Executive Summary

Shawmac commissioned 360 Environmental Pty Ltd on behalf of Image Resources to undertake a spring biological (flora, vegetation, vertebrate fauna, and black cockatoo) assessment of a predetermined section of Brand Highway near Cooljarloo, Western Australia.

The project includes two optional Brand Highway intersection upgrades, one at Wongonderrah Road and the other at Bibby Road. The purpose of the spring flora and fauna assessment is to assist in preparing a Native Vegetation Clearing Permit (NVCP) once the preferred option has been determined.

This report is for the detailed flora and vegetation survey, basic terrestrial vertebrate fauna survey and black cockatoo habitat assessment of the Bibby Road intersection option, approximately 10.1 km south of the Badgingarra townsite, in the Geraldton Sandplains bioregion (herein referred to as the Survey Area). The Survey Area comprised a linear corridor along Brand Highway, covering approximately 30.3 hectares (ha).

Flora and Vegetation

The desktop assessment identified 92 conservation significant flora species occurring within 60 km of the Survey Area. A likelihood of occurrence assessment was undertaken post survey and determined three species as having a high likelihood of occurrence, six species as having a medium likelihood and 75 species as having a low likelihood of occurrence.

The detailed flora and vegetation survey within the Bibby Road Survey Area recorded floristic composition and vegetation types from six quadrats and additional mapping notes. The survey recorded a total of 159 taxa from 93 genera across 33 families.

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

Nine DBCA listed Priority flora were recorded; *Hypocalymma serrulatum* (P2), *Arnocrinum gracillimum* (P3), *Babingtonia urbana* (P3*), Banksia nana* (P3)*, Beaufortia bicolor* (P3), *Synaphea endothrix* (P3), *Banksia chamaephyton* (P4), *Desmocladus elongatus* (P4) and *Grevillea rudis* (P4).

Two introduced species were recorded within the Survey Area, however, neither are listed as Declared Pests or are Weeds of National Significance.

Three vegetation types were mapped:

- AhXssp: Mid open shrubland
- BaBm: Low woodland
- Ne: Isolated mature non-endemic eucalypt trees.

The statistical analysis resulted in BaBm vegetation type being most affiliated with Floristic Community Type (FCT) Swan Coastal Plain (SCP)23b – Northern *Banksia attenuata – Banksia menziesii* woodlands. SCP23b has been listed as a sub-community under the EPBC Act listed *Banksia* woodlands *of the Swan Coastal Plain* Threatened Ecological Community (TEC). BaBm is

therefore likely to be considered for National protection under the Federally listed *Banksia woodlands of the Swan Coastal Plain*.

AhXssp. has been determined to have affiliation with FCT SCPS09 - *Banksia attenuata* woodlands over dense low shrublands. However, the absence of *Banksia* tree species in the vegetation type alludes that it is not representative of the *Banksia Woodlands of the Swan Coastal Plain* TEC and, therefore, is not likely to be considered suitable for national protection.

Vegetation condition within the Survey Area ranged from Excellent to Degraded. The majority of the vegetation in the Survey Area was in Excellent condition (61.4%). Disturbance to the vegetation was minimal with the main sources being roads, tracks, and driveways.

Vertebrate Fauna including Black Cockatoos

The basic vertebrate fauna and black cockatoo habitat assessment identified and mapped two fauna habitats, *Banksia* woodland/*Allocasuarina* shrubland and non-endemic trees.

One conservation significant fauna species was recorded during the field survey, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), which is listed as Endangered.

The desktop assessment identified a further two conservation significant fauna species as having a high likelihood of occurrence within the Survey Area, the Western Brush Wallaby (*Notamacropus irma*), which is listed as Priority 4, and Jewelled Sandplain Ctenotus (*Ctenotus gemmula*), which is listed as Priority 3, and one conservation significant fauna species as having a medium likelihood of occurrence within the Survey Area, the Black-striped Snake (*Neelaps calon*otos), which is listed as Priority 3.

Three introduced fauna species were recorded during the survey via secondary evidence, European Cattle (**Bos primigenius taurus*), the Red Fox (**Vulpes vulpes*) and the Rabbit (**Oryctolagus cuniculus*).

The black cockatoo habitat assessment identified 21.7 ha of very high quality foraging habitat and 0.1 ha potential roosting habitat for Carnaby's Black Cockatoo. No suitable breeding was identified.

Table of Abbreviations

Abbreviation	Description
BoM	Bureau of Meteorology
BC Act	WA Biodiversity Conservation Act 2016
EP Act	WA Environmental Protection Act 1986
BAM Act	Biosecurity and Agriculture Management Act 2007
EPA	Environmental Protection Authority
360 Environmental	360 Environmental Pty Ltd
ESA	Environmentally Sensitive Area
DBCA	Department of Biodiversity, Conservation and Attractions
DAWE	Department of Agriculture, Water, and the Environment
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
NVIS	National Vegetation Information System
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
DoE	Department of Environment
TPFL	Threatened and Priority Flora Database
WoNS	Weeds of National Significance
PMST	Protected Matters Search Tool
WAH	Western Australian Herbarium
WA	Western Australia
km	Kilometres
m	metres
SCP	Swan Coastal Plain
TEC	Threatened Ecological Community
PEC	Priority Ecological Community

Table of Contents

1 Introduction 1
1.1 The Project 1
1.2 Objectives and Scope 1
2 Background 3
2.1 Protection of Flora, Vegetation and Fauna 3
2.2 Existing Environment 4
3 Methods 11
3.1 Desktop Assessment 11
3.2 Flora and Vegetation 13
3.3 Vertebrate Fauna 15
3.4 Black Cockatoos 16
3.5 Limitations 19
4 Results 21
4.1 Literature Review 21
4.2 Flora and Vegetation 22
4.3 Vertebrate Fauna Results 35
4.4 Black Cockatoos 47
5 Discussion 48
5.1 Flora and Vegetation 48
5.2 Vertebrate Fauna 55
5.3 Black Cockatoos 56
6 Conclusion 58
7 References 60
8 Limitations of this Report 62

List of Figures

Figure 1: Survey Area 2
Figure 2: Long term and Monthly Total Rainfall for Nambung and Maximum and Minimum temperatures for Badgingarra Research Station (009037) (Bureau of Meteorology, 2018). 4
Figure 3: Soil Landscapes and Land Systems 8
Figure 4: Hydrology and Wetlands 9
Figure 5: Conservation and Environmentally Sensitive Areas 10
Figure 6: Survey Effort 18
Figure 7: DBCA Threatened and Priority Flora Locations 23
Figure 8: DBCA Threatened and Priority Ecological Communities 24
Figure 9: Vegetation Types within the Survey Area 32
Figure 10: Vegetation Condition within the Survey Area 33
Figure 11: Species Accumulation Curve 34
Figure 12: DBCA Threatened and Priority Fauna Locations 37
Figure 13: Fauna Habitat 46

List of Tables

Table 1: Land Sub Systems across the Survey Area 5
Table 2: Representation of the broad vegetation type on a State, regional and local scale (Government of Western Australia, 2019) 6
Table 3: Database Searches of the Survey Area 11
Table 4: Likelihood of Occurrence Criteria 12
Table 5: Limitations and Constraints Associate with the Survey 19
Table 6: Literature Review Summaries 21
Table 7: Flora of Conservation Significance with the Survey Area 25
Table 8: Introduced Flora Species within the Survey Area 26
Table 9: Vegetation Types Occurring within the Survey Area 27
Table 10: Vegetation Condition within the Survey Area 29
Table 11: Floristic Community Type Analysis of Quadrats 30
Table 12: Species Richness Indicators 34
Table 13: Conservation Significant Fauna Likelihood of Occurrence 36
Table 14: Fauna Habitats with the Survey Area 39
Table 15: Fauna Species Recorded During the Field Survey 42
Table 16: Conservation Significant Fauna Locations 44
Table 17: Summary of Black Cockatoo Foraging Habitat in the Survey Area 47

List of Plates

Plate 1: Male Carnaby's Black Cockatoo foraging within Survey Area 45
Plate 2: *Hypocalymma serrulatum* (P2) – (Source: 360 Environmental, 2020) 49
Plate 3: *Arnocrinum gracillimum* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020) 50
Plate 4: *Babingtonia urbana* (P3) – (Source: 360 Environmental, 2020) 50
Plate 5: *Banksia nana* (P3) – (Source: 360 Environmental, 2020) 51
Plate 6: *Beaufortia bicolor* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020) 51
Plate 7: *Synaphea endothrix* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020) 52
Plate 8: *Banksia chamaephyton* (P4) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020) 52
Plate 9: Desmocladus elongatus (P4) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020) 53
Plate 10: *Grevillea rudis* (P4) – (Source: 360 Environmental, 2020) 54

List of Appendices

Appendix A Database Searches
Appendix B Conservation Significant Flora Likelihood of Occurrence
Appendix C Flora Species List
Appendix D Flora Site Sheets
Appendix E Fauna Habitat Assessments

1 Introduction

1.1 The Project

Shawmac commissioned 360 Environmental Pty Ltd (360 Environmental) on behalf of Image Resources to undertake a spring biological (flora, vegetation, vertebrate fauna, and black cockatoo) assessment of a predetermined section of Brand Highway near Cooljarloo, Western Australia.

The project includes two optional Brand Highway intersection upgrades, one at Wongonderrah Road and the other at Bibby Road. The purpose of the spring flora and fauna assessment is to assist in preparing a Native Vegetation Clearing Permit (NVCP) once the preferred option has been determined.

This report is for the detailed flora and vegetation survey, basic terrestrial vertebrate fauna survey and Black Cockatoo habitat assessment of the Bibby Road intersection option, located approximately 10 km south of the Badgingarra townsite, in the Geraldton Sandplains bioregion (herein referred to as the Survey Area). The Survey Area comprised a linear corridor along Brand Highway, covering approximately 30.3 hectares (ha) (Figure 1).

1.2 Objectives and Scope

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

The scope of works includes:

- Undertake a desktop assessment of the Survey Area that includes Department of Biodiversity, Conservation and Attractions (DBCA) database searches and publicly available sources
- Carry out a spring field survey of the Survey Area to assess flora, vegetation, vertebrate fauna and black cockatoo values
- Prepare a technical flora, vegetation, fauna, and black cockatoo survey report and
- Provide all spatial/mapping data collected during the survey in Index of Biodiversity Surveys for Assessments (IBSA) form.

Legend

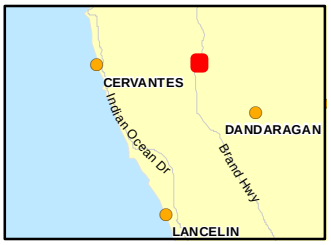
- Survey Area
- Lot Boundaries

0 160 320 480 Meters
1:15,000 @ A4

N

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

LOCALITY MAP



Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 1
Bibby Rd Survey Area

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F01 Bibby Rd Survey Area.mxd

2 Background

2.1 Protection of Flora, Vegetation and Fauna

Western Australian (WA) flora and fauna is protected formally and informally by legislative and non-legislative measures:

Legislative measures

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- WA *Biodiversity Conservation Act 2016* (BC Act)
- WA *Environmental Protection Act 1986* (EP Act)
- 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)
- Recognition of locally significant populations by DBCA.

These protection mechanisms are supported by guidance documents published by the Environmental Protection Authority (EPA) and Department of Agriculture Water and the Environment (DAWE; formerly Department of Environment, and Department of Sustainability Environment Water Population and Communities):

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016)
- Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment (Environmental Protection Authority, 2020)
- Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment, 2013)
- Survey Guidelines for Australia's threatened mammals (Department of Sustainability Environment Water Population and Communities, 2011a)
- Survey Guidelines for Australia's threatened reptiles (Department of Sustainability Environment Water Population and Communities, 2011b)
- Survey guidelines for Australia's threatened birds under the Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment Water Heritage and the Arts, 2010).

Conservation codes used throughout this report are in accordance with Conservation Codes for Western Australian Flora and Fauna (Department of Biodiversity Conservation and Attractions,

2020a) and Definitions, Categories and Criteria for Threatened and Priority Ecological Communities (Department of Environment and Conservation, 2013).

2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather stations with complete datasets are:

- Badgingarra Research Station (9037) for climate statistics. The station is located 37.7 km north east of the Survey Area
- Nambung Station (9276) for rainfall statistics. The station is located 17.1 km west of the Survey Area.

The long-term mean minimum temperature for Badgingarra ranges from 7.1˚C (August) to 17.8˚C (February) (1965 to 2020) and the long-term mean maximum temperature ranges from 17.6˚C (July) to 34.6˚C (January and February) (Figure 2) (Bureau of Meteorology, 2020).

The Nambung weather station recorded 272.2 mm of rainfall in the 11 months prior to the survey (September 2019 to July 2020), which is 265.4 mm below the long-term average of 537.6 mm(Bureau of Meteorology, 2020). In the three months prior to the survey (June 2020 to August 2020), 114.9 mm of rainfall was recorded, which is 168.4 mm below the long-term average of 283.3 mm for the same time period (Bureau of Meteorology, 2020).

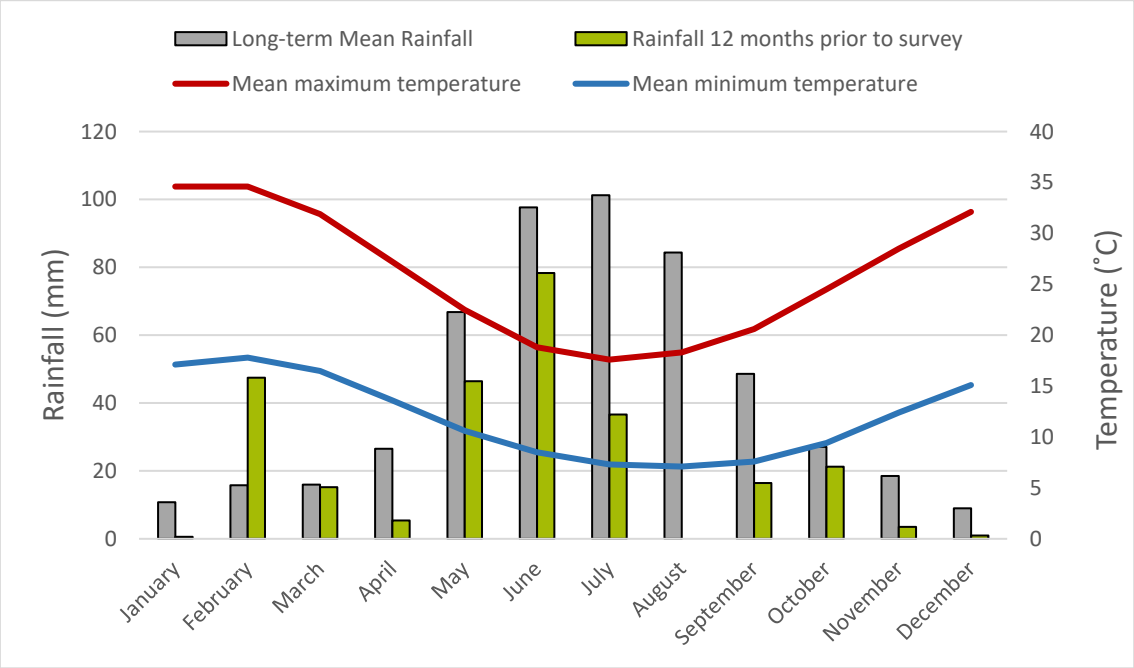


Figure 2: Long term and Monthly Total Rainfall for Nambung and Maximum and Minimum temperatures for Badgingarra Research Station (009037) (Bureau of Meteorology, 2018).

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 (Department of the Environment and Energy, 2016b).The Survey Area occurs within the Geraldton Sandplains bioregion (GES) and the Lesueur Sandplain (GES02) subregion.

The Lesueur Sandplain subregion comprises coastal Aeolian and limestones, Jurassic siltstones, and sandstones (often heavily lateritised) of central Perth Basin. Alluvials are associated with drainage systems. There are extensive yellow sandplains in south-eastern parts, especially where the subregions overlap the western edge of the Pilbara Craton. The subregion is represented by shrub-heaths rich in endemics that occur on a mosaic of lateritic mesas, sandplains, coastal sands and limestones (Desmond and Chant, 2001). Heath on lateritised sandplains along the subregions north-eastern margins (Desmond and Chant, 2001).

2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia described 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 occurs entirely across the Yerramullah System, which is described as subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. It is characterised by pale deep sand, sandy gravels, and yellow deep sand. The Yerramullah System is associated with Banksia woodlands on lower slopes/depressions, and heathlands elsewhere. The Survey Area occurs across three sub systems shown in Figure 3 and detailed in Table 1.

Table 1: Land Sub Systems across the Survey Area

Sub System Code	Description	Area and Proportion of the Survey Area*
224Ye_2	Plateau residuals, very gently to gently inclined hillcrest and hillslopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands	8.4 ha 27.8 %
224Ye_3	Colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths	21.8 ha 71.8 %
224Ye_3a	Colluvial slopes; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths	0.1 ha 0.5 %

*Rounded to one decimal place

2.2.4 Hydrology and Wetlands

The Survey Area does not intersect any major watercourses or water bodies (Department of Water and Environmental Regulation, 2016) (Figure 4). The Lancelin Defence Training Area (WA119) is located approximately 16 km south west of the Survey Area and is listed in the Directory of Important Wetlands (Department of Agriculture, Water and the Environment, 2005). The wetland area is approximately 2,000 ha and is included in the larger Lancelin Defence Training Area of 25,000 ha. The wetland is regionally significant and is recognised for its high conservation value. The site has large areas of lakes and seasonally inundated basins lying on Bassendean Dunes. There is also one geomorphic wetland 2.5 km south west of the Survey Area which is a dampland.

2.2.5 Broad Vegetation Associations

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 associations within Western Australia.

One broad vegetation type, Lesueur Sandplain 1031 occurs across the entire Survey Area. This vegetation association is described as scrub-heath/heath. Mosaic of shrublands, hakea scrub-heath/shrubland, dryandra heath. Table 2 details its representation at a local, regional and state level.

Table 2: Representation of the broad vegetation type on a State, regional and local scale (Government of Western Australia, 2019)

System and Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Proportion of Current Extent in DBCA Managed Lands (%)
Representation across Western Australia				
Lesueur Sandplain 1031	269,490.91	88,668.30	32.90	42.66
Representation across the Geraldton Sandplains Bioregion				
Lesueur Sandplain 1031	241,349.97	83,217.27	34.48	44.52
Representation across the Lesueur Sandplain Subregion				
Lesueur Sandplain 1031	241,349.97	83,217.27	34.48	44.52
Representation across the Shire of Dandaragan				
Lesueur Sandplain 1031	230,488.23	68,040.83	29.52	52.60

2.2.6 Environmentally Sensitive Areas

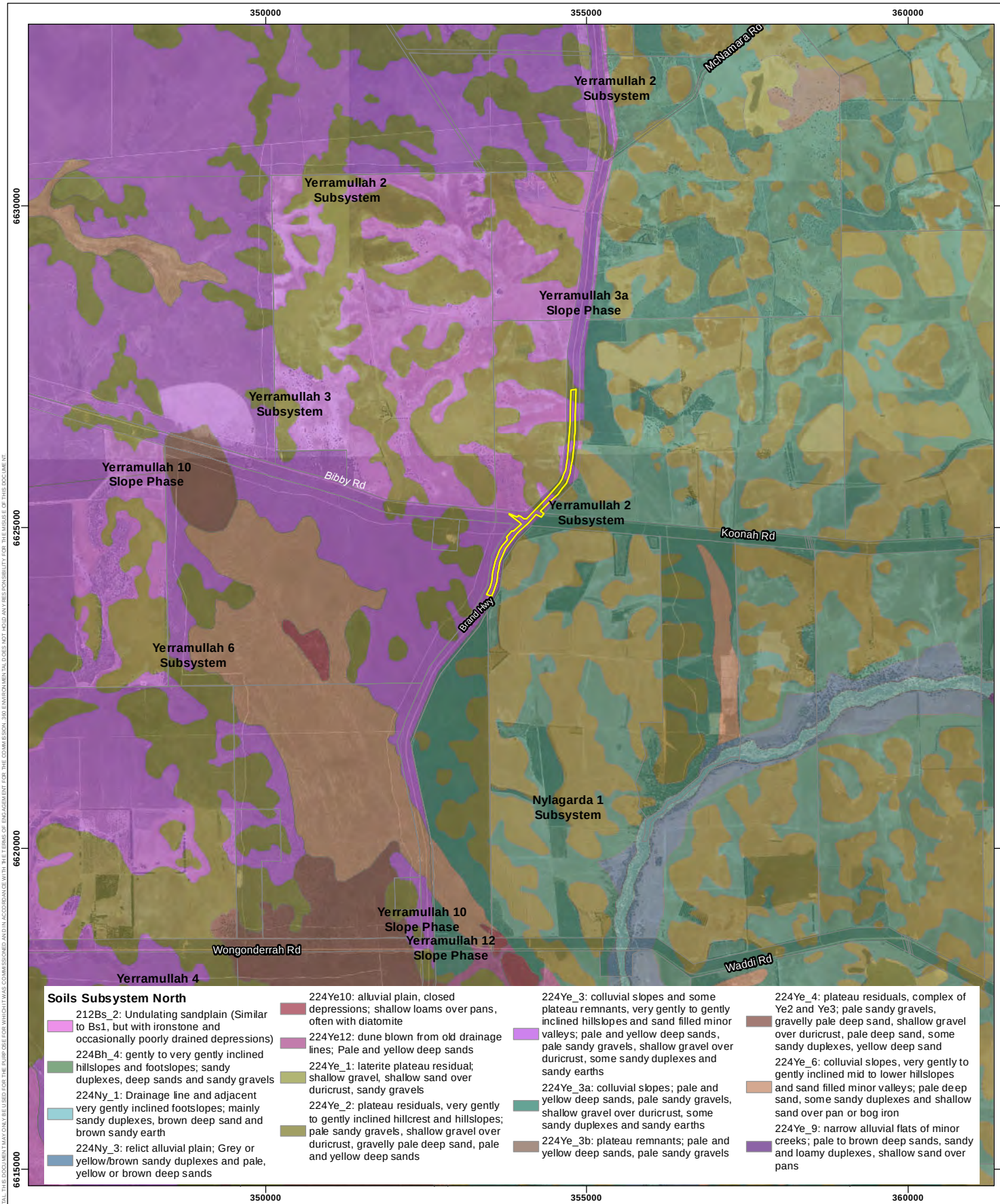
Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, TECs or significant wetlands. The following areas are declared to be ESAs as described by DWER (2014):

- A declared World Heritage property as defined in section 13 of the Environment and Biodiversity Conservation Act 1999 of the Commonwealth.
- An area that is included on the Register of the National Estate, because of its natural heritage value, under the Australian Heritage Council Act 2003.
- A defined wetland and the area within 50 metres of the wetland. Defined wetlands include Ramsar wetlands, conservation category wetlands and nationally important wetlands.
- The area covered by vegetation within 50 metres of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located.
- The area covered by a threatened ecological community.
- A Bush Forever site listed in “Bush Forever” Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission.
- The areas covered by the Environmental Protection (Gnangara Mound Crown Land) Policy 1992.
- The areas covered by the Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002.
- The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies.
- Protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998.

The Survey Area overlaps with a mapped ESA. This ESA comprises the Badgingarra National Park (R 31809) and an un-named Conservation Park (R 41986) (Department of Water and Environmental Regulation, 2020) (Figure 5).

2.2.7 Conservation Areas

The Survey Area is located directly adjacent the Badgingarra National Park (Reserve No. 31809), located approximately 130 m west of the Survey Area (Figure 5). An additional un-named Conservation Park (Reserve No. 41986) is located approximately 5.7 km south west of the Survey Area and is vested under the Conservation Commission of Western Australia.



Legend

- Survey Area
- Lot Boundaries

0 840 1,680 2,520 Meters
1:80,000 @ A4

N

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

LOCALITY MAP

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

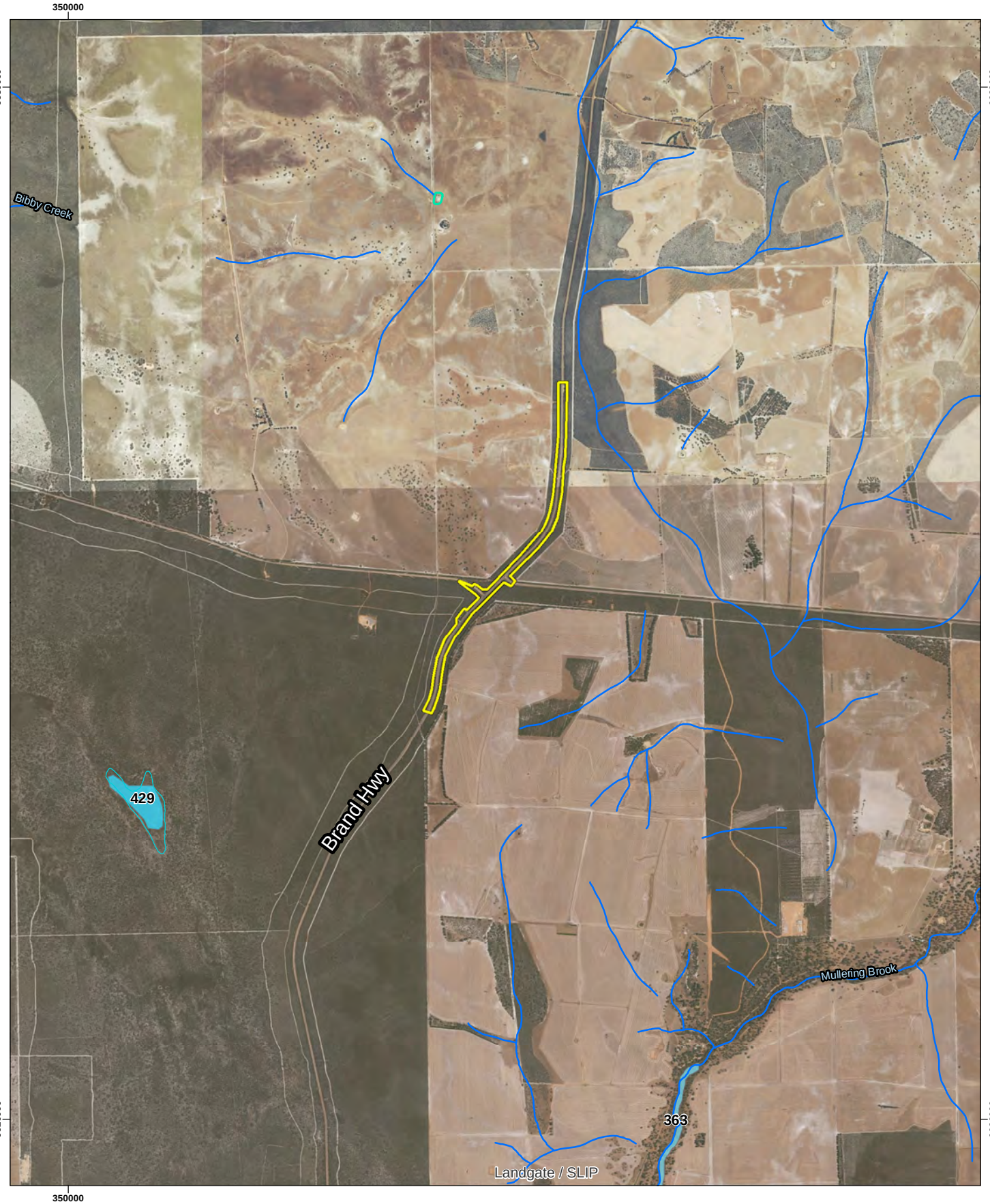
CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 3
Soil Landscapes and Land Systems

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F03 Bibby Rd Soil Landscapes and Land Systems.mxd



Legend

Geomorphic Wetlands
- Dampland
- River

Hydrography
- Watercourse - minor
- Lake
- Swamp

Powered By SLIP ENABLER

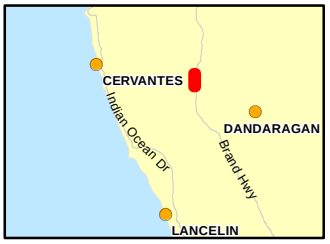
- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 520 1,040 1,560 Meters
1:50,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	18/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

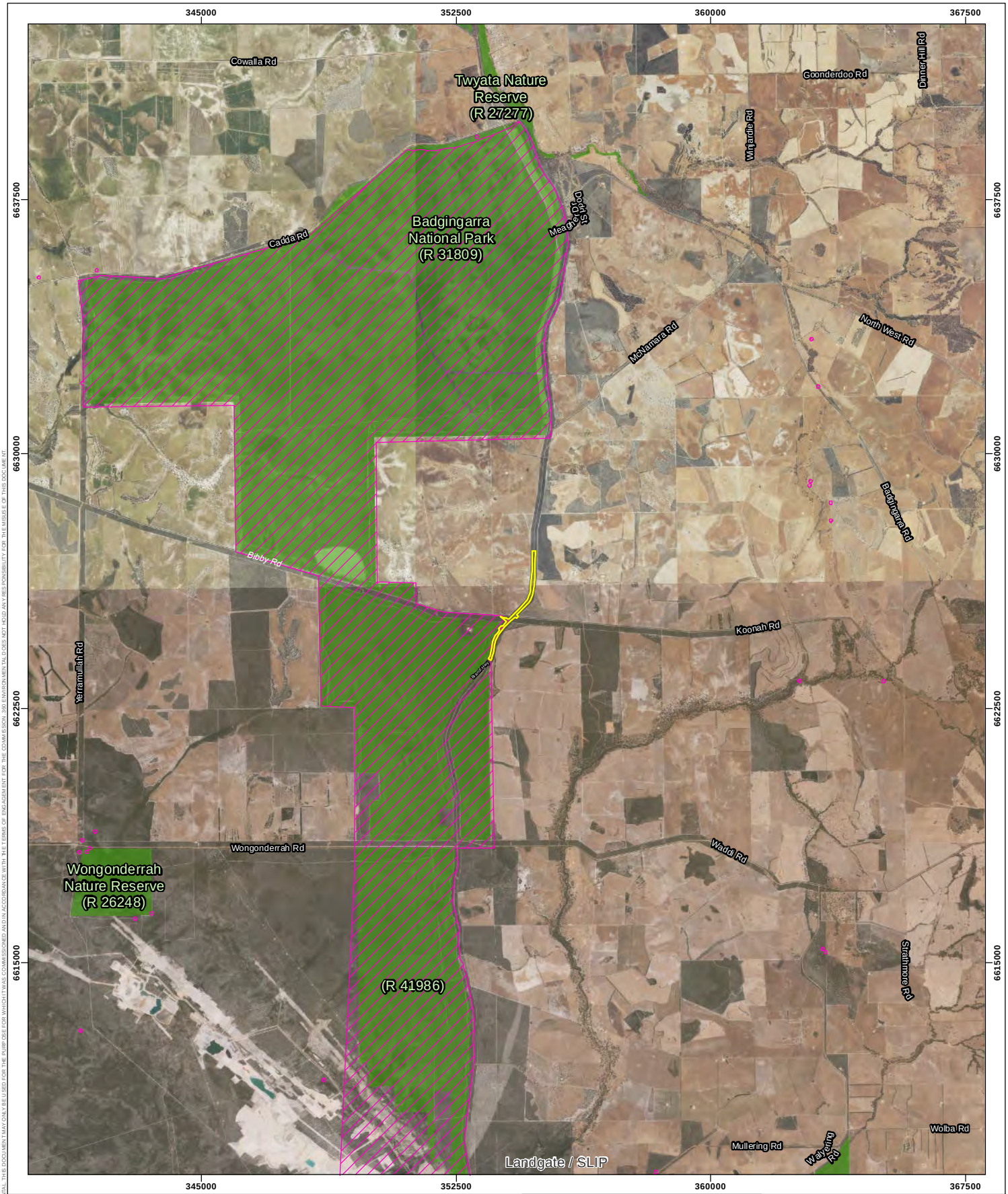
CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 4
Hydrology and Wetlands

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F04 Bibby Rd Hydrology and Wetlands.mxd



Legend

- Survey Area
- Environmentally Sensitive Areas
- DBCA Managed Land

0 1,500 3,000 4,500 Meters
1:150,000 @ A4

N

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

LOCALITY MAP

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 5

Conservation and Environmentally Sensitive Areas

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F05 Bibby Rd Conservation and Environmentally Sensitive Areas.mxd

3 Methods

The biological surveys documented by this report were undertaken in accordance with relevant EPA and DAWE guidelines (see Section 2.1).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds, was compiled prior to the field survey (see Section 2.2). Historical vegetation mapping (Beard, 1976; Shepherd, Beeston and Hopkins, 2002), land systems mapping (Department of Agriculture and Food WA, 2012), and the IBRA classification system (Mitchell, Williams and Desmond, 2002) were consulted to provide broad contextual knowledge of vegetation units likely to be encountered within the Survey Area.

The literature review also considered two publicly available biological reports undertaken in the vicinity of the Survey Area:

- Cooljarloo West Titanium Minerals Project: Flora and Vegetation Assessment (Woodman Environmental, 2014)
- Cooljarloo West titanium Minerals Project: Public Environmental Review, EPA Assessment No. 1974 (Tronox and Stratagen Environmental Consultants, 2017).

3.1.2 Database Searches

Database searches were undertaken to identify potential conservation significant flora and fauna taxa, ecological communities, and Matters of National Environmental Significance (MNES) within or surrounding the Survey Area (Table 3). The search area for each parameter was varied to reflect distances recommended by DBCA. The search areas are herein referred to collectively as the Study Area.

Table 3: Database Searches of the Survey Area

Database Name	Date Received	Search Target	Search Area
DBCA Threatened and Priority Ecological Communities custom database search (Department of Biodiversity Conservation and Attractions, 2020c)	16 September 2020	Listed TECs and PECs	15 km search buffer of the Survey Area
DBCA Threatened and Priority Flora Species List (TP list) custom database search (Department of Biodiversity Conservation and Attractions, 2020e)	2 September 2020	Threatened and Priority Flora	15 km search buffer of the Survey Area
Western Australian Herbarium flora custom database search (Department of Biodiversity Conservation and Attractions, 2020f)			

Database Name	Date Received	Search Target	Search Area
DBCA Threatened and Priority Fauna List plus Black Cockatoo specific custom database search (Department of Biodiversity Conservation and Attractions, 2020d)	2 September 2020	Threatened and Priority Fauna and Black Cockatoos	12 km search buffer of the Survey Area (fauna), 30 km buffer of the Survey Area (black cockatoos)
NatureMap area search (Department of Biodiversity Conservation and Attractions, 2020b)	26 August 2020	Threatened and Priority Flora and Fauna, and inventory of potential flora and fauna	10 km search buffer of the Survey Area
Protected Matters Search Tool area search (Department of Agriculture Water and the Environment, 2020a)	26 August 2020	Commonwealth listed Threatened flora and fauna, and TECs	10 km search buffer of the Survey Area

3.1.3 Likelihood of Occurrence

Conservation significant flora and fauna species identified from the desktop assessment were assessed to determine a likelihood of occurrence both prior to and post field survey. The assessment was completed based on the likelihood of occurrence criteria presented in Table 4. Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence are discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria are not discussed unless a justification for this classification is required.

For fauna, species listed as Marine under the EPBC Act were not included as conservation significant as the Marine listing only applies within Commonwealth marine areas.

Table 4: Likelihood of Occurrence Criteria

Likelihood	Flora	Fauna
Recorded	Flora and fauna species previously recorded within the Survey Area	
High	Previously recorded within Survey Area or within 5 km and suitable habitat potentially occurs in the Survey Area.	Preferred habitat is present within the Survey Area, the Survey Area is within the species' known distribution, and the species has been recorded within the database search area in the last 15 years. The Survey Area and surrounding habitat is expected to support individuals or populations of the species.
Medium	Previously recorded within 5 to 15 km of the Survey Area and/or suitable habitat potentially occurs in the Survey Area.	The high likelihood of occurrence criteria has not been met, however suitable (not necessarily preferred) habitat occurs within the Survey Area and the Survey Area is within or near the species' known distribution. The Survey Area and surrounding habitat may support individuals or populations of the species.

Likelihood	Flora	Fauna
Low	No suitable habitat appears to be present in the Survey Area and records are greater than 15 km.	No suitable habitat is present within the Survey Area, or the Survey Area is well outside the species' known distribution, or the species is considered locally or regionally extinct. The Survey Area and surrounding habitat are unlikely to support individuals or populations of the species, however individuals may rarely occur as transients or vagrants.

3.2 Flora and Vegetation

3.2.1 Field Survey

A detailed single season flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington (Flora Licence FB62000177, TFL 70-1920) and Graduate Ecologist Bridget Duncan (Flora Licence FB62000272) from the 16 – 17 September and 6 – 8 October 2020. The field survey was undertaken in conjunction with the Bibby Road intersection option and included an assessment of ten quadrats within Wongonderrah road intersection Survey Area and six quadrats within the Bibby Road Intersection Survey Area, mapping notes, vegetation condition notes, opportunistic flora collections, observations, and a targeted search for conservation significant flora. The survey effort and quadrat locations are shown in Figure 6.

A minimum of three quadrats of 10 x 10 m (100 m^2) were installed in each representative vegetation type, across the two Survey Area options, where possible. Each quadrat was accurately measured using measuring tapes, and the northwest corner was demarcated with a steel fence dropper.

At each quadrat, the following was recorded using a Fulcrum mobile data collection device:

- 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) recorded at 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.
- Inventory of vascular flora including the approximate height and percentage foliar cover for each taxon 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.

- Vegetation condition – assessed according to the South West vegetation condition scale (EPA, 2016).
- Photographs – a photograph from the north west corner looking toward the south east corner was taken.

3.2.2 Flora of Conservation Significance

Prior to the survey conservation significant flora with the likelihood or potential to occur within the Survey Area was compiled (see section 3.1). Field personnel familiarised themselves with photographs, reference samples and descriptions of these taxa before conducting the survey.

The Survey Area was traversed on foot and suitable habitats targeted. Where Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby. Specimens of any potential conservation significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.2.3 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 Taxonomists Frank Obbens and Udani Sirisena at the WAH.

The finalised species list was checked against FloraBase (Western Australian Herbarium, 2020) to determine the species' conservation status and known distribution. Introduced species were checked against the BAM Act Declared Plants list and the WoNS list to determine their status (Thorp and Lynch, 2000; Department of Agriculture Water and the Environment, 2020b; Department of Primary Industries and Regional Development, 2020).

3.2.4 Statistical Analyses

Quadrats were classified on the basis of similarity in species composition using Primer-E version 6.1.5. Species presence/absence quadrat data was pre-treated and transformed and then computed using Bray-Curtis similarity analysis.

A Bray-Curtis similarity analysis was undertaken on the floristic composition of the quadrats recorded during the survey with weed and native flora quadrat data compiled between 1990 - 1996 for the Southern Swan Coastal Plain (SCP) (Keighery *et al.*, 2012). The Keighery *et al.*, (2012) data set combines a total of 1098 sites from numerous studies on the SCP.

The SCP dataset provides the closest publicly available standardised regional vegetation dataset, however, that study area is located south of the current Survey Area. Despite this, an attempt has been made to correlate the vegetation in the Survey Area with the FCTs as presented in the SCP dataset as an aid in determining the conservation significance of the vegetation.

Species accumulation curves were plotted using Primer-E version 6.1.5. to determine the adequacy of the survey. The treatments comprised Sobs (Mao Tao), to reflect the number of species observed (based on a given total of species recorded), and richness estimators Chao 1, Chao 2, Jacknife 1, Bootstrap and Michaelis-Menton to predict the total number of flora taxa

that could potentially be recorded. Species accumulation curves for this survey were calculated using data collected from the flora sites within the Survey Area. All flora taxa, both annual and perennial, within each flora site were used in generating the species accumulation curve.

3.2.5 Vegetation Unit and Condition Mapping

Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:25,000. Broad vegetation units were refined based on taxonomic identification of flora collections, statistical analysis of data collected from the quadrats and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.3 Vertebrate Fauna

3.3.1 Field Survey

A basic vertebrate fauna survey was undertaken from the 16 to the 17 of September 2020 by Ecologist Evan Webb. The purpose of the field survey was to verify the accuracy of the desktop assessment and to further delineate and characterise the fauna assemblages and fauna habitat in the Survey Area. The field survey consisted primarily of fauna habitat assessments, systematic bird searches and opportunistic fauna observations. The Survey effort is shown in Figure 6.

3.3.2 Fauna Habitat Assessment

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat values. Habitat assessment locations are shown in Figure 6. The following information was collected at each site using Fulcrum, a mobile data collection app:

- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental.

3.3.3 Systematic Bird Survey

Unbounded bird surveys were undertaken at each habitat assessment location for a duration of 10 minutes.

3.3.4 Opportunistic Observation and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Active searches were undertaken in microhabitats likely to contain fauna. They primarily involved raking leaf litter, peeling bark, and splitting dead wood.

3.3.5 Taxonomy

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the WA Museum checklist 2020 (Western Australian Museum, 2020) where relevant.

3.4 Black Cockatoos

3.4.1 Field Survey

The Black Cockatoo habitat assessment was undertaken alongside the vertebrate fauna survey and involved traversing the Survey Area on foot to determine the presence of potential breeding, foraging and roosting habitat. The survey was conducted in accordance with the EPBC Act Referral Guidelines for three threatened Black Cockatoo Species (Department of Sustainability Environment Water Population and Communities, 2012) and with due regard for the revised draft referral guideline for three threatened black cockatoo species (Department of the Environment and Energy, 2017).

3.4.2 Foraging Habitat

Foraging habitat was assessed based on the presence of tree and shrub species known to be important dietary items, such as Marri and *Banksia* species, as outlined within the referral guidelines. It also included looking for:

- Evidence of feeding (chewed cones, seed and nut material)
- Opportunistic observations of black cockatoos foraging within or utilising the Survey Area.

Foraging habitat was mapped and classified as low, medium, high, or very high quality using criteria based on the Foraging Habitat Scoring Tool in the Draft Revised EPBC Referral Guidelines (Department of the Environment and Energy, 2017).

3.4.3 Breeding habitat

Any trees meeting the following criteria for potential breeding or future breeding, based on the criteria described in the referral and revised draft referral guidelines (Department of Sustainability Environment Water Population and Communities, 2012; Department of the Environment and Energy, 2017), were recorded using the Fulcrum mobile data-collection application:

- Tree species with the potential to form suitable hollows, particularly endemic eucalypt species (e.g. Jarrah, Tuart, Marri, Wandoo and Salmon Gum)

- Diameter at breast height (DBH) of greater than 500 mm (greater than 300 mm for Wandoo and Salmon Gum) regardless of the presence or absence of hollows (DBH is measured approximately 1.3 metres from the ground)
- Any trees containing hollows (observed from the ground), which were then categorised as:
    - Hollows that are unsuitable for black cockatoo breeding e.g. hollows with an estimated opening diameter of obviously less than 100 mm, downwards-facing hollows
    - Hollows that are potentially suitable for black cockatoo breeding e.g. upwards or sideways-facing hollows with an estimated opening diameter of greater than 100 mm (Saunders, Mawson and Dawson, 2014).

Trees with swellings or forking/branching at breast height were measured just above or below breast height to gain a more accurate measurement of diameter. In instances where trees had multiple stems, only the largest stem was measured.

3.4.4 Roosting Habitat

Areas suitable for black cockatoo roosting were identified and recorded. If observed, evidence of roosting such as scat at the base of trees was recorded (lack of roosting evidence does not rule out the possibility of black cockatoo roosting as dusk/dawn surveys were not undertaken).

Legend

- Survey Area
- Lot Boundaries
- GPS Tracks

Flora Sample Sites

- Quadrat

Fauna Sample Sites

- Habitat

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

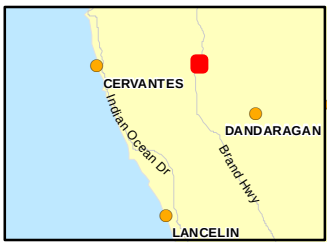
0 160 320 480 Meters

1:15,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, Intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 6
Survey Effort

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F06 Bibby Rd Survey Effort.mxd

3.5 Limitations

Limitations and constraints of the flora, vegetation and fauna survey are detailed below in Table 5.

Table 5: Limitations and Constraints Associate with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Availability of Data	Not a limitation	All data required to complete the scope of works including regional and local contextual information was available
Access and Survey Intensity	Not a limitation	The Survey Area was able to be accessed by vehicle and on foot. The survey effort is displayed in Figure 6.
Experience	Not a limitation	The flora and vegetation survey was undertaken by Principal Botanist Narelle Whittington and Graduate Ecologist Bridget Duncan. Narelle has 20 years' experience conducting surveys of similar scope throughout Western Australia and is a specialist in the south west region. Bridget provided assistance in the field as well as data collation and reporting. Identification of flora collections was completed by experienced taxonomist Udani Sirisena and Frank Obbens at the WAH. Relevant WAH specialists were consulted for difficult specimens, and any specimens with novel characteristics were submitted to the WAH for formal identification. The fauna survey was undertaken by Zoologist Evan Webb. Evan has four years of experience conducting surveys of similar scope throughout Western Australia and the south west region.
Timing, weather, season	Partial 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. In the three months prior to the survey (June 2020 to August 2020), 114.9 mm of rainfall was recorded, which is 168.4 mm below the long-term average of 283.3 mm for the same time period (Bureau of Meteorology, 2020). It is likely that additional annual and ephemeral taxa may have been recorded with higher rainfall volumes preceding the survey. Additionally, at the time of the survey there was no fruiting or flowering material available for many taxa, as a result many of the specimens collected were sterile and could not be confidently identified to species. Conservation significant flora species identified by the likelihood of occurrence assessment with a high or medium likelihood of occurrence that are annual, ephemeral, or short-lived perennial species could occur within the Survey Area but have been indetectable at the time of the survey. The timing of the survey was not a limitation for the basic vertebrate fauna survey or black cockatoo habitat assessment.

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Life forms sampled	No limitation	The Survey Area was traversed by vehicle and on foot and representative sites were sampled in all remnant vegetation types. All flora species encountered within the Survey Area were recorded. Of the 152 flora taxa collected, 11 (7.2 %) were unable to be identified to species level due to the absence of required identification features such as fruits and flowers. The basic fauna survey and black cockatoo assessment focussed on habitat assessments and opportunistic fauna records, therefore there were no constraints relating to fauna recorded associated with the survey.
Completeness	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. The survey was considered complete for a basic vertebrate fauna survey, including number of species recorded and habitat assessments.

4 Results

4.1 Literature Review

The key findings of the flora and vegetation reports reviewed are summarised in Table 6.

Table 6: Literature Review Summaries

Report	Survey Area	Survey Type	Survey Timing	Seasonal Conditions	Survey Effort	Number of Vegetation Types Recorded	TEC / PEC's Present	Total Taxa Recorded	Number of Con Sig species	Which Con Sig Species	Declared Pest or WoNS Recorded
Cooljarloo West Titanium Minerals Project: Flora and Vegetation	The Study Area occupied an area of approximately 34 424 hectares (ha), with dimensions of approximately 26 km from east to west and 24 km from north to south.	Detailed Flora and Vegetation	Spring 2012	Mean yearly rainfall at this station had not exceeded the mean in the years 2000 – 2012.	235 quadrats were established within the Study Area over six field trips totalling 25 days.	18 Vegetation Types	No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs).	1156	4 Threatened species and 2 Priority species.	Andersonia gracilis (T) Anigozanthos viridis subsp. terraspectans (T) Macarthuria keigheryi(T) Paracaleana dixonii (T) Diuris ?eburnea (P1) Stylidium aceratum (P2).	A total of 93 introduced taxa are known from the Study Area, of which two (Echium plantagineum (Paterson's Curse) and Moraea flaccida (One leaf Cape Tulip) are Declared Pests under the Biosecurity Management Act 2007 (BAM Act).
Cooljarloo West Titanium Minerals Project: Public Environmental Review	Up to 2000 ha within a 5082 ha Disturbance Envelope, the vegetation Study Area covered 34 401 ha.	Various	Surveys have been conducted over multiple years, and multiple seasons; mostly in spring but also during winter and summer.	370 quadrats were established and more than 45 6 km of linear transects	18 vegetation typ es	No TECs or PECs occur in the vicinity of the Development Envelope.	N/A	Four conservation significant flora ta xa listed under th e EPBC Act and 53 priority species ha ve been recorded in the Study area.	-		A total of 93 introduced taxa are known from the Study Area, of which two (Echium plantagineum (Paterson's Curse) and Moraea flaccida (One leaf Cape Tulip) are Declared Pests under the Biosecurity Management Act 2007 (BAM Act).

4.2 Flora and Vegetation

4.2.1 Desktop Assessment

The desktop assessment identified 92 conservation significant species occurring within 60 km of the Survey Area. This included:

- Twenty Threatened species
- Six Priority 1 species
- Thirteen Priority 2 species
- Thirty-eight Priority 3 species
- Fifteen Priority 4 species.

Locations of all conservation significant species identified in the desktop assessment are mapped in Figure 7.

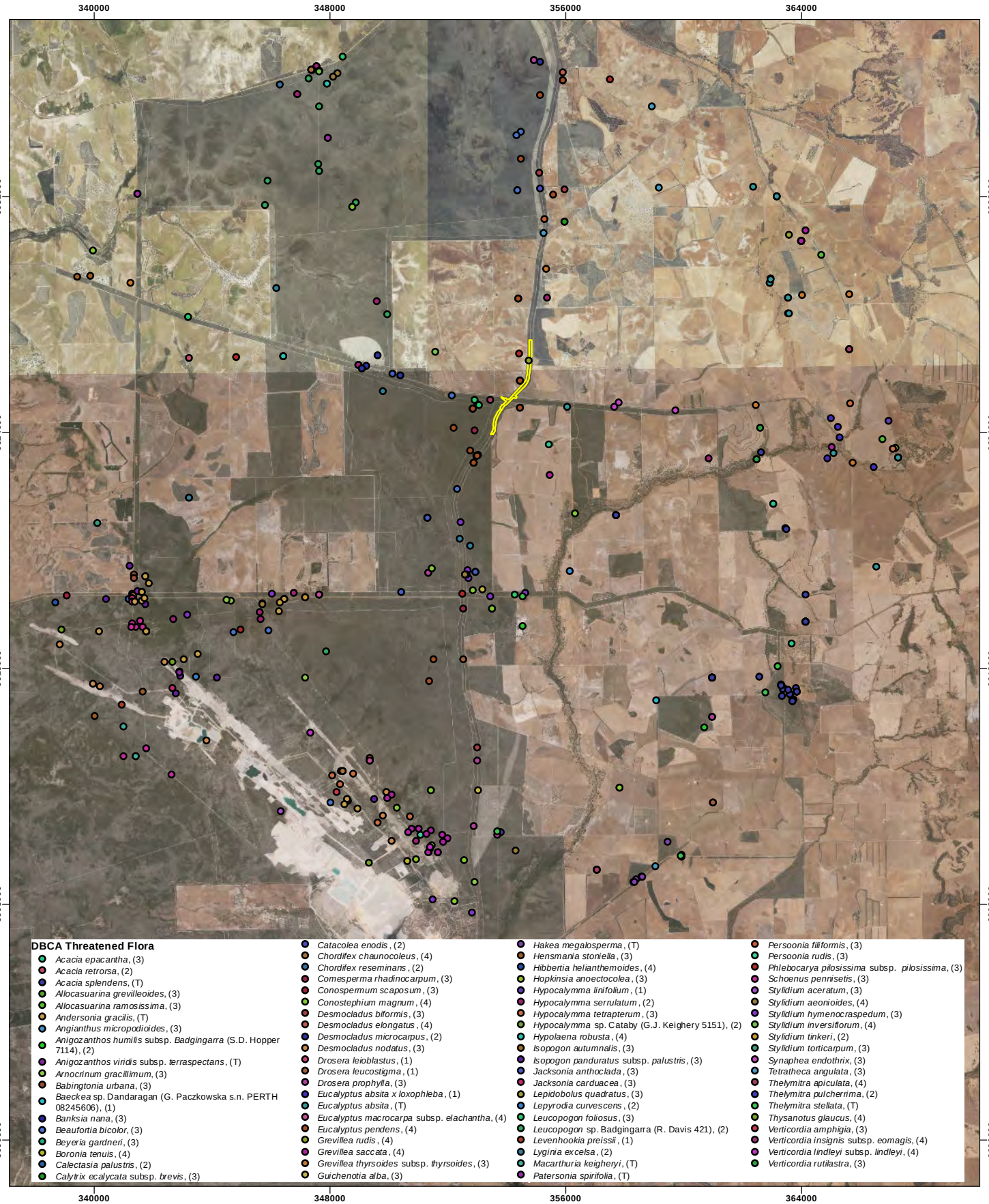
The desktop assessment identified one State listed PEC, which, is also listed as a TEC under the EBPC Act, occurring within 10.2 km of the Survey Area (Figure 8):

- *Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*.

4.2.2 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 4. This was done prior to the field work being undertaken and again following the completion of the field work. Prior to the field survey, of the 92 species identified in the desktop assessment, one species had previously been recorded within the Survey Area, 23 species were considered to have a high likelihood of occurrence, 23 species were considered to have a medium likelihood and 46 were considered to have a low likelihood of occurrence.

The post field survey likelihood assessment considered the habitat types observed, vegetation condition and survey effort, which, resulted in three species considered to have a high likelihood of occurrence, six species considered to have a medium likelihood and 75 considered to have a low likelihood of occurrence. Eight species identified from the database searches were found within the Survey Area. One conservation significant species, *Banksia chamaephyton* (P4) was found within the Survey Area, however, was not listed in the desktop assessment. The likelihood assessment is displayed in Appendix B.



DBCA Threatened Flora

- *Acacia epacantha*, (3)
- *Acacia retrorsa*, (2)
- *Acacia splendens*, (T)
- *Allocasuarina grevilleoides*, (3)
- *Allocasuarina ramosissima*, (3)
- *Andersonia gracilis*, (T)
- *Angianthus micropodioides*, (3)
- *Anigozanthos humilis* subsp. *Badgingarra* (S.D. Hopper 7114), (2)
- *Anigozanthos viridis* subsp. *terraspectans*, (T)
- *Arnocrinum gracillimum*, (3)
- *Babingtonia urbana*, (3)
- *Baeckea* sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606), (1)
- *Banksia nana*, (3)
- *Beaufortia bicolor*, (3)
- *Beyeria gardneri*, (3)
- *Boronia tenuis*, (4)
- *Calectasia palustris*, (2)
- *Calytrix ecalycata* subsp. *brevis*, (3)
- *Catacolea enodis*, (2)
- *Chordifex chaunocoleus*, (4)
- *Chordifex reseminans*, (2)
- *Comesperma rhadinocarpum*, (3)
- *Conospermum scaposum*, (3)
- *Conostephium magnum*, (4)
- *Desmocladus biformis*, (3)
- *Desmocladus elongatus*, (4)
- *Desmocladus microcarpus*, (2)
- *Desmocladus nodatus*, (3)
- *Drosera leioblastus*, (1)
- *Drosera leucostigma*, (1)
- *Drosera prophylla*, (3)
- *Eucalyptus absita x loxophleba*, (1)
- *Eucalyptus absita*, (T)
- *Eucalyptus macrocarpa* subsp. *elachantha*, (4)
- *Eucalyptus pendens*, (4)
- *Grevillea rudis*, (4)
- *Grevillea saccata*, (4)
- *Grevillea thyrsoides* subsp. *thyrsoides*, (3)
- *Guichenotia alba*, (3)
- *Hakea megalosperma*, (T)
- *Hensmania stoniella*, (3)
- *Hibbertia helianthemoides*, (4)
- *Hopkinsia anoectocolea*, (3)
- *Hypocalymma linifolium*, (1)
- *Hypocalymma serrulatum*, (2)
- *Hypocalymma tetrapterum*, (3)
- *Hypocalymma* sp. Cataby (G.J. Keighery 5151), (2)
- *Hypolaena robusta*, (4)
- *Isopogon autumnalis*, (3)
- *Isopogon panduratus* subsp. *palustris*, (3)
- *Jacksonia anthoclada*, (3)
- *Jacksonia carduacea*, (3)
- *Lepidobolus quadratus*, (3)
- *Lepyrodia curvescens*, (2)
- *Leucopogon foliosus*, (3)
- *Leucopogon* sp. Badgingarra (R. Davis 421), (2)
- *Levenhookia preissii*, (1)
- *Lyginia excelsa*, (2)
- *Macarthuria keigheryi*, (T)
- *Patersonia spirifolia*, (T)
- *Persoonia filiformis*, (3)
- *Persoonia rudis*, (3)
- *Phlebocarya pilosissima* subsp. *pilosissima*, (3)
- *Schoenus pennisetis*, (3)
- *Stylidium aceratum*, (3)
- *Stylidium aeonioides*, (4)
- *Stylidium hymenocraspedum*, (3)
- *Stylidium inversiflorum*, (4)
- *Stylidium tinkeri*, (2)
- *Stylidium torticarpum*, (3)
- *Synaphea endothrix*, (3)
- *Tetratheca angulata*, (3)
- *Thelymitra apiculata*, (4)
- *Thelymitra pulcherrima*, (2)
- *Thelymitra stellata*, (T)
- *Thysanotus glaucus*, (4)
- *Verticordia amphigia*, (3)
- *Verticordia insignis* subsp. *eomagis*, (4)
- *Verticordia lindleyi* subsp. *lindleyi*, (4)
- *Verticordia rutilastra*, (3)

Legend

Survey Area

0 1,800 3,600 5,400 Meters

1:175,000 @ A4

N

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

LOCALITY MAP

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

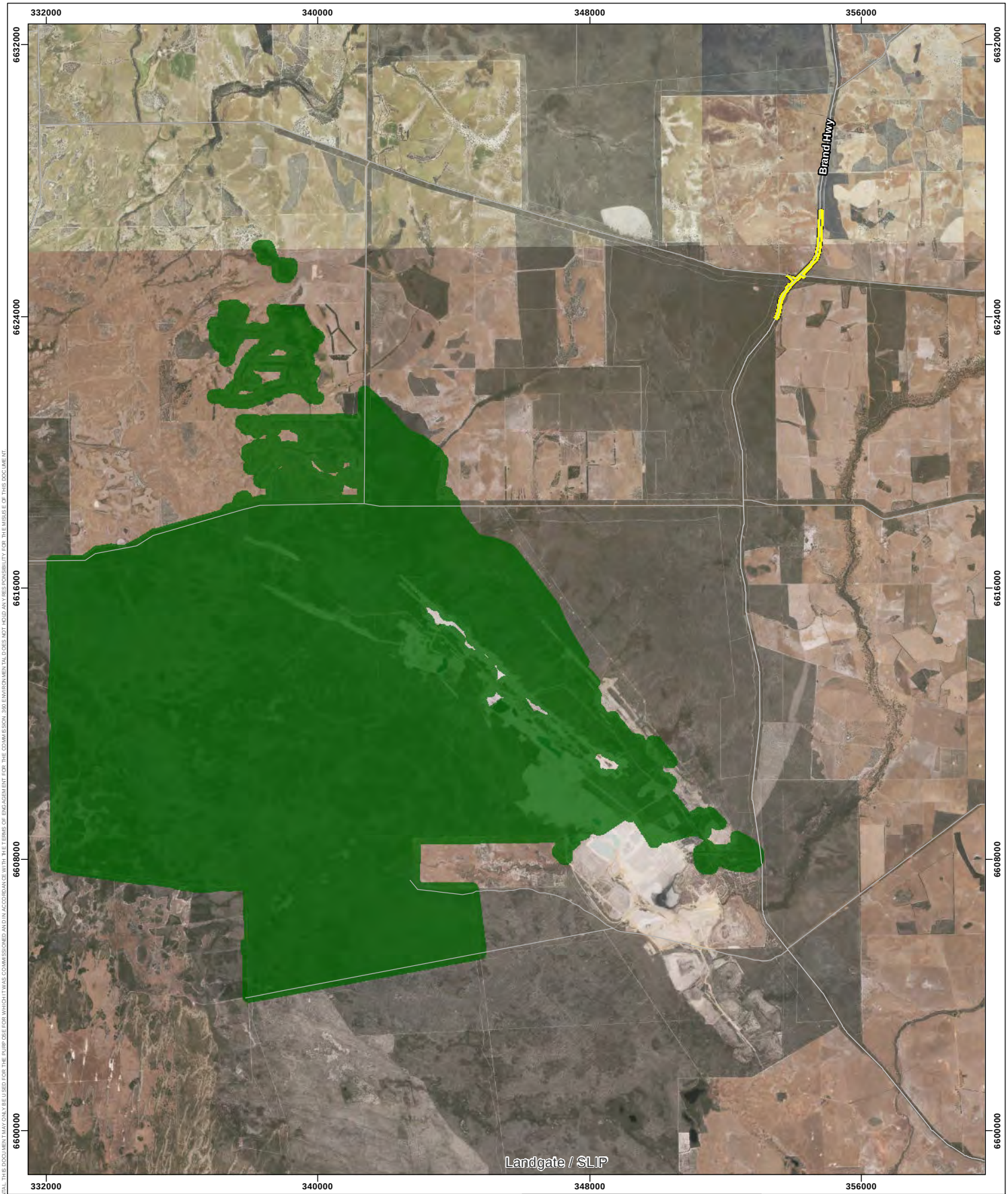
Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 7

DBCA Threatened and Priority Flora Locations

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F07 Bibby Rd DBCA Threatened and Priority Flora Locations.mxd



Legend

Survey Area

DBCA Threatened and Priority Ecological Communities Results

Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 1,500 3,000 4,500 Meters

1:150,000 @ A4

N

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

LOCALITY MAP

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 8

DBCA Threatened and Priority Ecological Communities

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F08 Bibby Rd DBCA Threatened and Priority Ecological Communities.mxd

4.2.3 Flora

The survey recorded a total of 159 taxa from 93 genera across 33 families. The most dominant families were Proteaceae (28 species) and Myrtaceae (23 species) and the most dominant genera was *Banksia* (eight species). A full species inventory is provided in Appendix C.

A specimen was collected for all species that could not be confidently identified in the field (155 specimens). Thirteen specimens (8.3%) 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. All but one of these, ?*Levenhookia pusilla*, have been assigned a confirmed genus with seven being tentatively identified to species level and six only identified to genus level.

Eleven of the 13 species are not considered to be analogous to any conservation significant species identified by the database searches. Two species that were not able to be confidently identified down to species level merit further consideration.

- *Drosera* sp. was sterile therefore could represent a conservation significant *Drosera* species.
- *Synaphea endothrix* (P3) has been found in the Survey Area, therefore, there is a probability that *Synaphea* sp. could represent the Priority three species.

4.2.4 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 (Appendix B). One conservation significant species, *Banksia chamaephyton* (P4) was found within the Survey Area, however, was not listed in the desktop assessment.

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

Nine DBCA listed Priority species were recorded in the Survey Area (Table 7; Figure 9).

Table 7: Flora of Conservation Significance with the Survey Area

Taxon (status)	Number of Individuals	Habitat within the Survey Area (Flora site)
Hypocalymma serrulatum (P2)	515	Recorded in grey sand during targeted Priority flora searches
Arnocrinum gracillimum (P3)	5	Recorded in grey sand during targeted Priority flora searches
Babingtonia urbana (P3)	4	Recorded in grey sand during targeted Priority flora searches
Banksia nana (P3)	14	Recorded in grey/brown sand during targeted Priority flora searches
Beaufortia bicolor (P3)	1	Recorded in grey silty sand with laterite rocks on an eastern-facing mid-slope (BIBQ01).
Synaphea endothrix (P3)	3	Recorded in grey/pale yellow sand with gravel during targeted Priority flora searches

Taxon (status)	Number of Individuals	Habitat within the Survey Area (Flora site)
Banksia chamaephyton (P4)	4	Recorded in grey/brown sand during targeted Priority flora searches
Desmocladus elongatus (P4)	17	Recorded in grey sand on mid-slopes during targeted Priority flora searches
Grevillea rudis (P4)	100	Recorded in grey sand during targeted Priority flora searches

4.2.5 Introduced Flora

A total of two introduced species were recorded within the Survey Area, representing 1.2% of the total taxa recorded (Table 8). Neither of these are listed as Declared Pests under the BAM Act (Department of Primary Industries and Regional Development, 2018) or are WoNS (Department of the Environment and Energy, 2018).

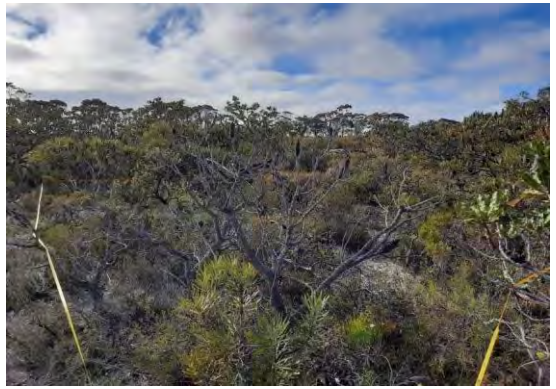
Table 8: Introduced Flora Species within the Survey Area

Species	Common Name	Status under BAM Act	WONS
**Briza maxima*	Blowfly Grass	Permitted – s11	No
**Hypochaeirs glabra*	Smooth Cats-ear	Permitted – s11	No

4.2.6 Vegetation Types

Three vegetation types were described and mapped within the Survey Area and cover 21.8 ha. These included woodlands and shrublands which ranged in condition from Excellent to Degraded. Within the 30.3 ha Survey Area; 0.13 ha consisted of a patch of non-endemic eucalypt trees and 8.46 ha was cleared, comprising roads, tracks, and driveways. Descriptions of vegetation types are provided in Table 9 along with their extent within the Survey Area and are mapped in Figure 9. Detailed site sheets for each quadrat are provided in Appendix D.

Table 9: Vegetation Types Occurring within the Survey Area

Broad Floristic Formation	Vegetation Unit and Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
Shrubland	**AhXssp**: Mid open shrubland of *Lambertia multiflora* var. *multiflora, Allocasuarina humilis, Xanthorrhoea drummondii* and *Adenanthos cygnorum* over low sparse shrubland of *Bossiaea eriocarpa, Hibbertia hypericoides* and *Stirlingia latifolia* over low isolated clumps of sedges of *Mesomelaena tetragona, M. pseudostygia* and *Dasypogon obliquifolius*	13.6 ha 45.0 %	BIBQ04, BIBQ05, BIBQ06	
Low Woodlands	**BaBm**: Low woodland of *Eucalyptus todtiana, Banksia attenuata* and *B. menziesii* over mid sparse shrubland of *Xanthorrhoea preissii, Melaleuca seriata, Conospermum stoechadis* subsp. *stoechadis* and *Adenanthos cygnorum* over low isolated clumps of forbs of *Mesomelaena pseudostygia, Dasypogon obliquifolius* and *Patersonia occidentalis*	8.1 ha 26.7 %	BIBQ01, BIBQ02, BIBQ03	

Broad Floristic Formation	Vegetation Unit and Description	Total Area, Proportion of the Survey Area*	Sites	Photograph
Isolated trees	**Ne**: Isolated mature non-endemic eucalypt trees	0.1 ha 0.5 %	-	
Cleared	Cleared existing track.	8.5 ha 27.9 %	N/A	N/A

*Rounded to the nearest decimal place.

4.2.7 Vegetation Condition

Vegetation condition within the Survey Area ranged from Excellent to Degraded. The majority of the vegetation in the Survey Area was in Excellent condition (61.4%). Disturbance to the vegetation was minimal with the main sources being roads, tracks, and driveways. Weed presence was minimal and did not impact the condition of the vegetation. It is inevitable that being adjacent to a major highway, litter and rubbish would be present, the occurrences however, were minor and seldom encroached into the vegetation. Vegetation condition within the Survey Area is summarised in Table 10 and illustrated in Figure 10.

Table 10: Vegetation Condition within the Survey Area

Vegetation Condition	Extent within the Survey Area (ha)*	Extent within the Survey Area (%) *
Excellent	18.6	61.4
Very Good	0.4	1.3
Very Good to Good	2.1	6.9
Good	0.2	0.7
Degraded	0.5	1.7
Cleared (tracks, roads, and driveways)	8.5	28.1
Total	**30.3**	**100.0**

*Rounded to the nearest decimal place.

4.2.8 Floristic Community Types Analysis

The floristic community type analysis (nearest neighbour method), run against the quadrat data identified five SCP floristic community types, that were statistically similar to vegetation recorded from the quadrats:

- FCT SCP S09 –*Banksia attenuata* woodlands over dense low shrublands
- FCT SCP S10 – *Calothamnus sanguineus* dense low shrublands on sandy laterites
- FCT SCP 20d – Dandaragan Plateau shrublands and woodlands
- FCT SCP 21a – Central *Banksia attenuata* and *Eucalyptus marginata* woodlands
- FCT SCP 23b – Northern *Banksia attenuata* – *Banksia menziesii* woodlands.

Upon further consideration, taking into account other factors that are diagnostic for FCTs, including the presence of indicator species, soil types and landform position, it was determined that two FCTs are represented by the vegetation in the Survey Area. The results of the floristic analysis on the quadrats are presented in Table 11.

Table 11: Floristic Community Type Analysis of Quadrats

Quadrat	Nearest Neighbour Analysis			Notes	FCT Comparison
	Similarity%	Site	FCT		
BIBQ01 (BaBm)	43.83	MR09	23b	-	23b – Northern *Banksia attenuata – Banksia menziesii* woodlands
	40	50	23b		
	39.02	MOOR09	23b		
BIBQ02 (BaBm)	43.24	5C04	23b	-	23b – Northern *Banksia attenuata – Banksia menziesii* woodlands
	40	ELE11	21a		
	38.70	MOOR08	23b		
BIBQ03 (BaBm)	49.31	MR09	23b	-	23b – Northern *Banksia attenuata – Banksia menziesii* woodlands
	44	MOOR02	S09		
	43.24	5C04	23b		
BIBQ04 (AhXssp.)	34.88	MWR05	S10	The flora from these two quadrats predominantly reflects the vegetation type observed across the Survey Area, however, also contained species that separated it from FCT SCP S09 in the statistical analysis. Based on the diagnostics observed, the two quadrats have been grouped with S09.	S09 –*Banksia attenuata* woodlands over dense low shrublands
	33.33	MWR09	S10		
	30.95	RGR06	20d		
BIBQ05 (AhXssp.)	39.02	RGR06	20d		S09 –*Banksia attenuata* woodlands over dense low shrublands
	38.46	BW04	S10		
	37.14	MWR09	S10		
BIBQ06 (AhXssp.)	40	MNP03	S09	-	S09 –*Banksia attenuata* woodlands over dense low shrublands
	38.09	MOOR02	S09		
	34.88	MWR01	20d		

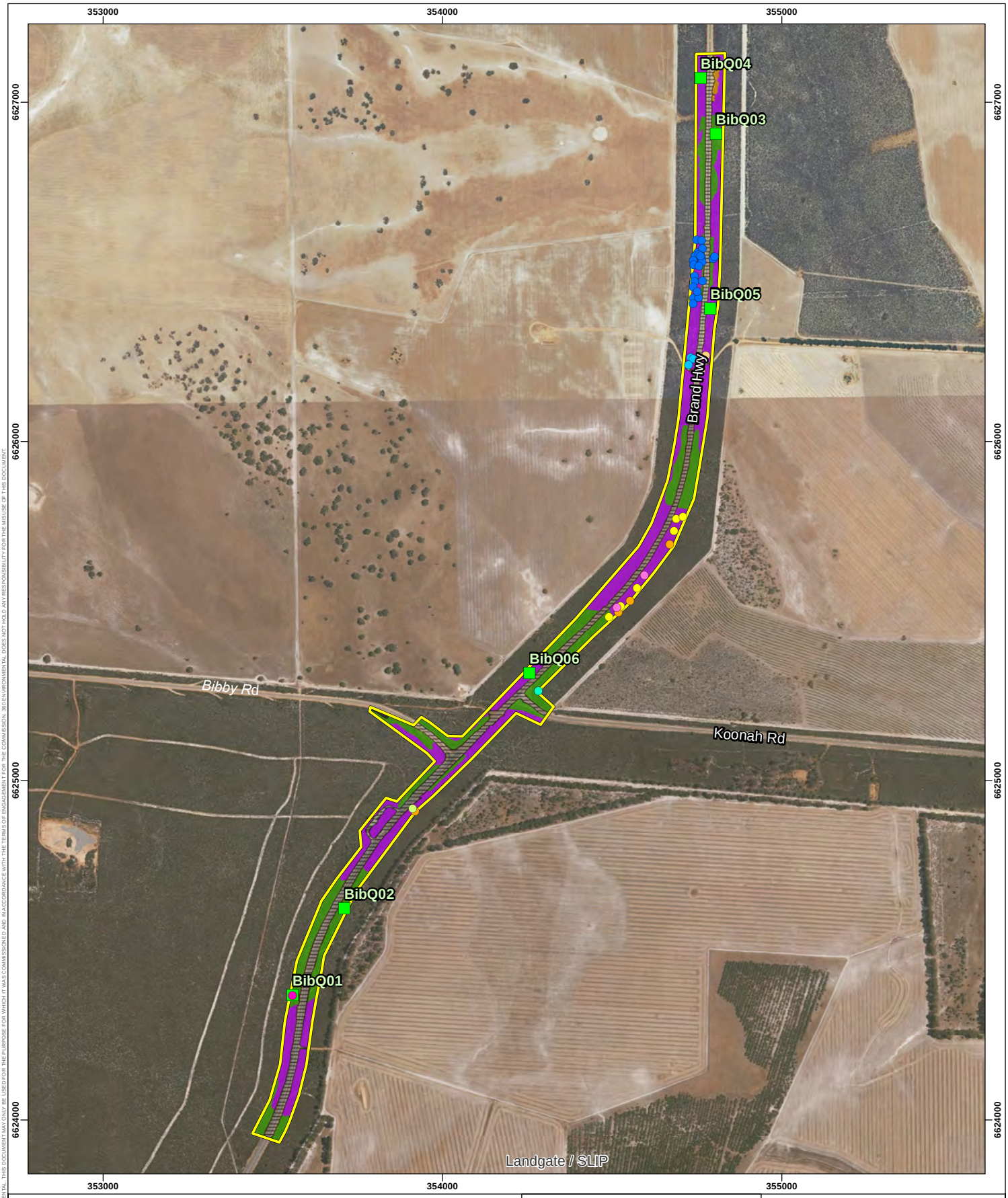
4.2.9 Threatened and Priority Ecological Communities

Two of the FCTs identified as occurring in the Survey Area from the statistical analysis, FCT SCP23b - *Northern Banksia attenuata – Banksia menziesii woodlands* and FCT SCP S09 – *Banksia attenuata* woodlands over dense low shrublands are not listed as TECs by the State, however, are listed as sub-communities under the EPBC Act listed TEC, *Banksia woodlands of the Swan Coastal Plain*, therefore, have the potential to be listed and protected under the EPBC Act (Department of the Environment and Energy, 2016a).

Banksia woodlands of the Swan Coastal Plain are also listed as a Priority 3 ecological by the State, as s FCT SCP 23b.

4.2.10 Regional Representation

Vegetation mapping units described in the Survey Area were correlated with the Beard (1976) and Shepherd *et al.* (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). One vegetation type AhXssp. is considered to be representative of the broad description of the Lesueur Sandplain 1031 as scrub-heath/heath, mosaic of shrublands, *Hakea* scrub-heath/shrubland, *Dryandra* (*Banksia*) heath, which, includes 45% of the Survey Area.



Legend

- Survey Area
- Quadrat

Vegetation Types

- AhXspp
- BaBm
- Ne
- Cleared

Priority Flora

- *Arnocrinum gracillimum* (P3)
- *Babingtonia urbana* (P3)
- *Banksia chamaephyton* (P4)
- *Banksia nana* (P3)
- *Beaufortia bicolor* (P3)
- *Desmocladus elongatus* (P4)
- *Grevillea rudis* (P4)
- *Hypocalymma serrulatum* (P2)
- *Synaphea endothrix* (P3)

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020

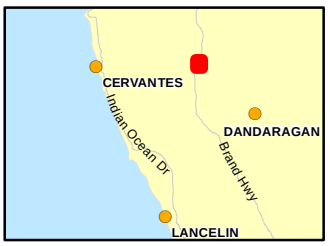
0 160 320 480 Meters

1:15,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	01/02/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 9
Vegetation Types within the Survey Area

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F09 Bibby Rd Vegetation Types.mxd

Legend

- Survey Area

Vegetation Condition

- Excellent
- Very Good
- Very Good to Good
- Good
- Degraded
- Cleared

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

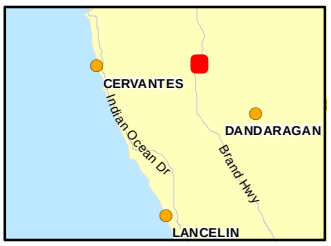
0 160 320 480 Meters

1:15,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 10
Vegetation Condition within the Survey Area

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F10 Bibby Rd Vegetation Condition.mxd

4.2.11 Survey Adequacy

Sixteen flora sites were sampled across the two Survey Area options (Bibby Road and Wongonderrah Road). This was adequate to ensure three flora sites were sampled in each vegetation type, where possible, and that coverage across the Survey Area was sufficient.

The species accumulation curve for the Survey Area produced a smooth Sobs curve steadily increasing towards asymptote (Figure 11).

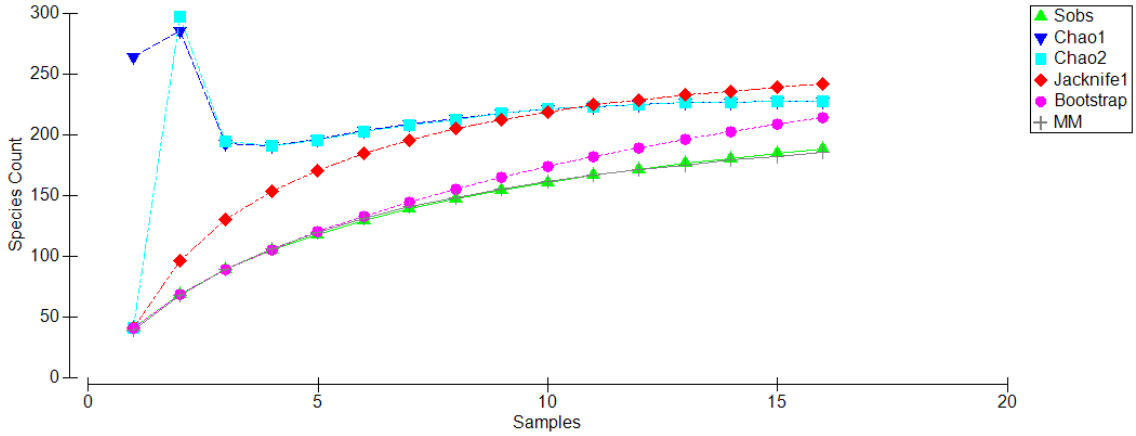


Figure 11: Species Accumulation Curve

Estimated species richness for the Survey Area ranged from 184 to 241, with an observed value of 188 taxa (from both Survey Area Options). Richness estimators indicated that the survey was approximately 83% (Chao 1, Chao 2) to 102% (Michaelis-Menton) adequate in recording the full complement of vascular flora taxa within the Survey Area (Table 12).

Table 12: Species Richness Indicators

Treatment	Expected Species Richness	Percentage Adequate
Chao 1	227	83%
Chao 2	227	83%
Jacknife 1	241	78%
Bootstrap	214	88%
Michaelis-Menton	184	102%

The data used to produce the species accumulation curve was conservative because opportunistic species (which are not associated with a quadrat) were not included.

4.3 Vertebrate Fauna Results

4.3.1 Desktop Assessment

Database searches identified 22 conservation significant terrestrial vertebrate fauna species potentially occurring within the Survey Area, comprising:

- 17 bird species (of which 13 are shorebirds/waders)
- Three mammal species
- Two reptile species.

The results of the DBCA Threatened and Priority Fauna database search are mapped in Figure 12. Database searches are displayed in their entirety in Appendix A.

4.3.2 Likelihood of Occurrence

The likelihood of occurrence assessment within the Survey Area for conservation significant fauna species identified by the databases searches found that:

- Three species have a high likelihood of occurrence
- One species has a medium likelihood of occurrence
- 18 species have a low likelihood of occurrence.

Shorebirds/waders have not been included in the likelihood of occurrence assessment due to the lack of coastal or wetland habitat. The results of the likelihood of occurrence assessment are presented in Table 13.

Table 13: Conservation Significant Fauna Likelihood of Occurrence

Family	Scientific Name	Common Name	Conservation Code		Likelihood of Occurrence	Justification
			State	EPBC		
Bird						
Apodidae	*Apus pacificus*	Pacific Swift (Fork-tailed Swift)	MI	MI and MA	Low	Entirely airborne and will not rely on habitats within Survey Area, no recent DBCA records.
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Black Cockatoo	EN	EN	High	Preferred habitat within Survey Area, DBCA database search shows three nearby records.
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	Low	Survey Area lacks abundant leaf litter therefore habitat is not suitable, no recent DBCA records.
Motacillidae	*Motacilla cinerea*	Grey Wagtail	MI	MI and MA	Low	No suitable habitat or recent DBCA records.
Mammal						
Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU	Low	Outside current known distribution, no recent DBCA records.
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-	High	Suitable habitat occurs within Survey Area, one recent DBCA record.
Dasyuridae	*Parantechinus apicalis*	Dibbler	EN	EN	Low	Mainland population confined to area between Fitzgerald River National Park and Torndirrup National Park.
Reptile						
Scincidae	*Ctenotus gemmula*	Jewelled Sandplain Ctenotus (Swan Coastal Plain subpop.)	P3	-	High	Preferred habitat within Survey Area, within known distribution, DBCA database search shows five nearby records.
Elapidae	*Neelaps calonotos*	Black-striped Snake	P3	-	Medium	Preferred habitat within Survey Area, within known distribution, no recent DBCA records.

Legend

- Survey Area

DBCA Threatened and Priority Flora

- Bar-tailed godwit
- Black-striped snake, black-striped burrowing snake
- Carnaby's cockatoo
- Common greenshank, greenshank
- Crested tern
- Greater sand plover, large sand plover
- Grey plover
- Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)
- Red-necked stint
- Ruddy turnstone
- Western brush wallaby
- White-tailed black cockatoo
- Curlew sandpiper

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2017
- OTHER DATA SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
(© Western Australian Land Information Authority 2017)

0 1,000 2,000 3,000 Meters

1:100,000 @ A4

N

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

LOCALITY MAP

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 11 **DBCA Threatened and Priority Fauna Locations**

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F11 Bibby Rd DBCA Threatened and Priority Fauna Locations.mxd

Legend

- Survey Area

Fauna Habitat

- Banksia woodland / Allocasuarina shrubland
- Non-endemic trees
- Cleared

Powered By SLIP ENABLER

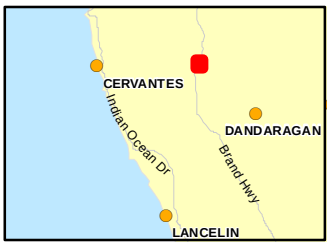
- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

0 160 320 480 Meters
1:15,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 12
Fauna Habitat

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F12 Bibby Rd Fauna Habitat.mxd

4.3.3 Fauna Habitat

Two broad fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area. The majority of the habitat within the Survey Area was in very good condition, with the most prolific disturbances being weeds and litter.

A description, extent within the Survey Area and a representative photo is provided for each fauna habitat in Table 14 (note that small discrepancies in fauna habitat extents are due to rounding). Fauna habitat mapping is presented in Figure 13 and site sheets for each habitat assessment are shown in Appendix E.

Table 14: Fauna Habitats with the Survey Area

Fauna habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	%		
Banksia woodland/ *Allocasuarina* shrubland	21.7	71.6	Undulating plains with predominantly grey sandy soils suitable for fossorial species. Vegetation consists primarily of scattered *Eucalyptus todtiana* trees over open *Banksia attenuata* and *B. menziesii* woodlands over mixed heathland/shrublands containing *Allocasuarina humilis*, *Adenanthos cygnorum*, *B. sessilis* and *Xanthorrhoea* sp. over clumps of sedges and forbs occurs in some areas. Dense heathy vegetation provides shelter and refuge for small fauna species. Important microhabitats include woody debris and logs, leaf litter and peeling bark. The majority of the habitat was in very good condition with litter and weeds impacting the habitat particularly near the road verge.	

Fauna habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	%		
Non-endemic trees	0.1	0.5	Small stand of non-endemic *Eucalyptus* and *Acacia* trees planted adjacent a small roadside rest-stop. Limited habitat value to most fauna species, however the trees provide foraging and nesting opportunities primarily for birds. Magpie-larks were recorded nesting in this habitat. Habitat was disturbed, with large amounts of litter and degraded/absent understorey vegetation.	
Cleared	8.4	27.9	Areas that have been cleared and do not contain vegetation. These areas do not provide habitat value to fauna species.	
Total	**30.3**	**100.0**		

4.3.4 Fauna Records

A total of 20 terrestrial vertebrate fauna species from 16 families were recorded during the field survey comprising:

- 16 bird species from 12 families
- Four mammal species from four families
- No reptiles or amphibians were recorded.

A list of fauna species recorded during the field survey is presented in Table 15, including the number of times each species was recorded and conservation status. Species recorded outside the Survey Area were all observed within habitats directly adjacent to the Survey Area and are therefore likely to use habitats within the Survey Area.

A total of three introduced fauna species were recorded within the Survey Area, of which all were mammals.

Table 15: Fauna Species Recorded During the Field Survey

Family	Scientific Name	Common Name	Conservation Status		Sighting Within Survey Area	Sighting Outside Survey Area	Secondary Evidence	Total
			State	EPBC				
Birds								
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill			4			**4**
Artamidae	*Artamus cinereus*	Black-faced Woodswallow			7			**7**
Cacatuidae	*Cacatua roseicapilla*	Galah				2	1	**3**
Cacatuidae	*Cacatua sanguinea*	Little Corella				22		**22**
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Cockatoo	EN	EN	34	1	2	**37**
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike			1			**1**
Columbidae	*Phaps chalcoptera*	Common Bronzewing			1			**1**
Corvidae	*Corvus coronoides*	Australian Raven			1	1		**2**
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo					1	**1**
Falconidae	*Falco cenchroides*	Australian Kestrel (Nankeen Kestrel)				1		**1**
Locustellidae	*Cincloramphus mathewsi*	Rufous Songlark			1			**1**
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird			1			**1**
Meliphagidae	*Gliciphila melanops*	Tawny-crowned Honeyeater			2			**2**
Meliphagidae	*Phylidonyris niger*	White-cheeked Honeyeater			9			**9**
Monarchidae	*Grallina cyanoleuca*	Magpie-lark			2			**2**
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail			1			**1**
Mammals								
Bovidae	**Bos primigenius taurus*	European Cattle					1	**1**

Family	Scientific Name	Common Name	Conservation Status		Sighting Within Survey Area	Sighting Outside Survey Area	Secondary Evidence	Total
			State	EPBC				
Canidae	**Vulpes vulpes*	Red Fox					1	**1**
Leporidae	**Oryctolagus cuniculus*	Rabbit					5	**5**
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo					6	**6**

*Introduced species.

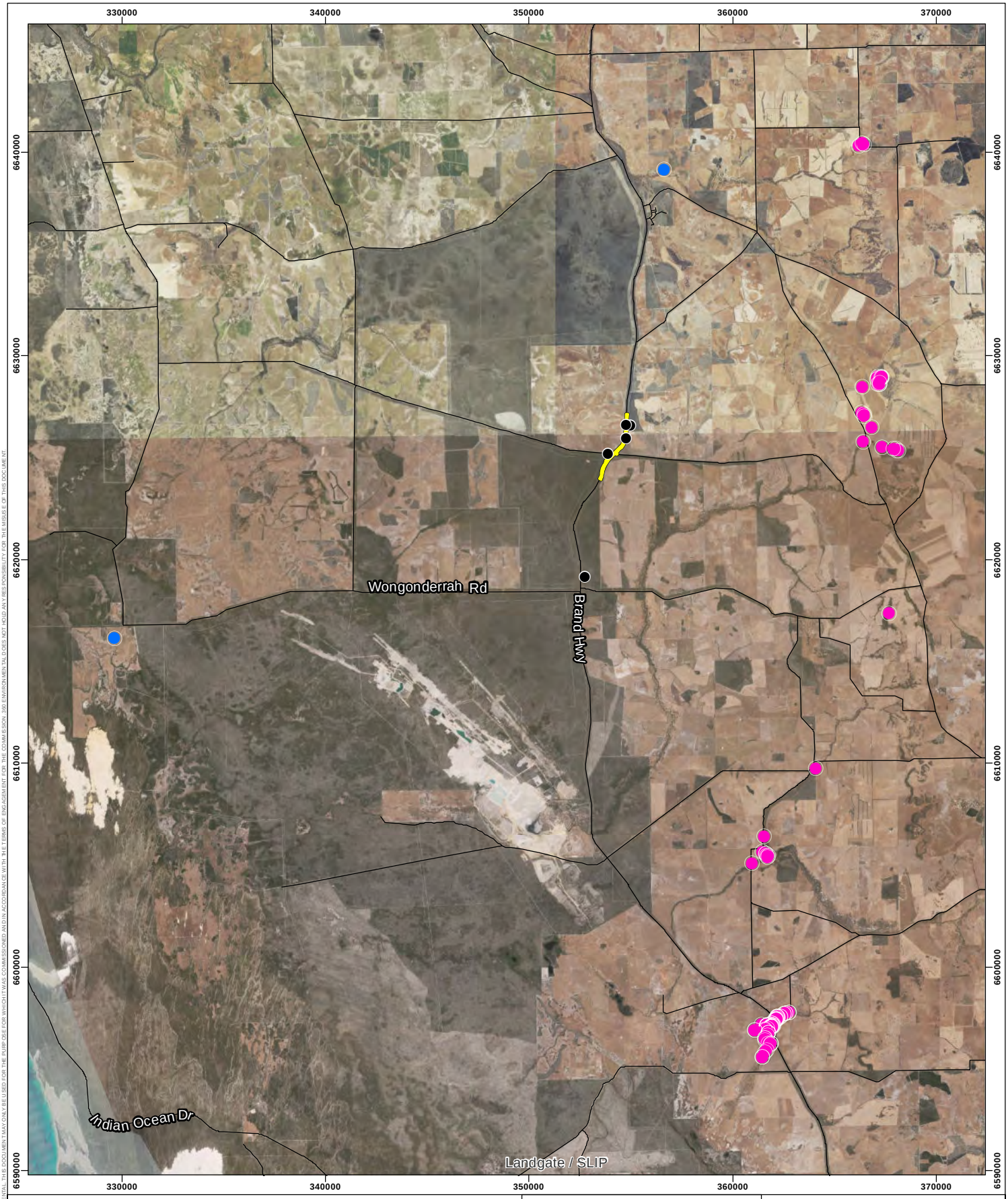
4.3.5 Conservation Significant Fauna

One fauna species of conservation significance the Carnaby's Black Cockatoo (listed as Endangered under the BC Act and EPBC Act) was recorded numerous times during the field survey (Table 16). Plate 1 shows a male individual foraging within the Survey Area.

Table 16: Conservation Significant Fauna Locations

MGA zone 50		Species	Abundance	Comments
Easting	Northing			
355696	6626962	Carnaby's Black Cockatoo	-	Call heard
354747	6625984	Carnaby's Black Cockatoo	4	Direct sighting - observed foraging in Banksia
354976	6626618	Carnaby's Black Cockatoo	10	Direct sighting - observed foraging in Banksia
354770	6626646	Carnaby's Black Cockatoo	30	Flock flew overhead
353895	6625220	Carnaby's Black Cockatoo	-	Extensive foraging evidence (chewed Banksia)

Plate 1: Male Carnaby's Black Cockatoo foraging within Survey Area



Legend

- Survey Area
- Black Cockatoos Locations
- Black Cockatoos Roosting Sites
- Black Cockatoos Breeding Sites

Powered By SLIP ENABLER

- LOCALITY MAP SOURCED FROM LANDGATE 2019
- OTHER DATA SOURCED LANDGATE 2019
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020
(© Western Australian Land Information Authority 2020)

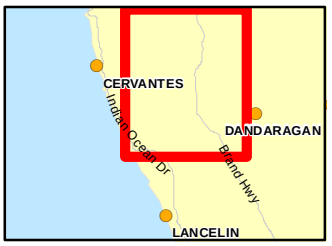
0 2,600 5,200 7,800 Meters

1:250,000 @ A4

N

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

LOCALITY MAP



360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

PROJECT ID	DATE
4045	15/01/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	BD	NW	0

Image Resources NL
Cooljarloo, intersection of Brand Hwy and Bibby Rd

Detailed Flora, Vegetation and Fauna Assessment

Figure 13
Black Cockatoo Records and Habitat

K:\Projects\1.0 EBS\4045 Cooljarloo Detailed Flora, Vegetation and Fauna Assessment\01. Bibby Rd MXDs\4045 F13 Bibby Rd Black Cockatoo Records and Habitat.mxd

4.4 Black Cockatoos

4.4.1 Desktop Assessment

The DBCA black cockatoo database search identified 93 confirmed breeding sites within 30 km of the Survey Area, the nearest of which was approximately 12 km east of the Survey Area. In addition, six potential breeding sites were identified within 30 km of the Survey Area. The database search also identified two roost sites within 30 km of the Survey Area, one approximately 12 km north of the Survey Area and one approximately 25 km east of the Survey Area.

4.4.2 Foraging Habitat

A total of 21.7 ha of black cockatoo foraging habitat was recorded within the Survey Area comprising the *Banksia* woodland/*Allocasuarina* shrubland. The results of the Foraging Habitat Scoring Tool are summarised in Table 17.

Table 17: Summary of Black Cockatoo Foraging Habitat in the Survey Area

Quality	Description	Area (ha)
Very high quality	*Banksia* woodland/*Allocasuarina* shrubland containing known foraging species such as *Banksia attenuata*, *B. menziesii*, *B. sessilis*, *Allocasuarina humilis* and *Eucalyptus todtiana*.	21.7
Total Area		**21.7**

As stated in Section 4.3.5, the field survey confirmed that Carnaby's Black Cockatoos forage within the Survey Area.

4.4.3 Breeding Habitat

No potential breeding habitat was recorded within the Survey Area.

4.4.4 Roosting Habitat

The non-endemic trees (0.1 ha) are considered potential roosting habitat.

5 Discussion

5.1 Flora and Vegetation

5.1.1 Survey Adequacy

The flora and vegetation survey effort was in accordance with the scope of works, and appropriate for a detailed flora and vegetation survey on the Swan Coastal Plain. At least three flora sites were sampled in each vegetation type (across the two Survey Area options), where possible. The inventory of vascular flora, and records of conservation significant flora and weed species was compiled using site data and opportunistic observations made while traversing between sites and during systematic targeted searching.

When a species accumulation curve approaches an asymptote, it indicates sampling effort has been sufficient to adequately collect the species comprising the floral assemblage at the locations sampled. The value at which the curve asymptotes can also be used as an approximate measure of the total size of the species complement at that location. The species accumulation curve and the richness estimators approached asymptote but did not plateau, indicating additional survey could record additional vascular flora taxa.

5.1.2 Flora

The suite of flora taxa recorded during the survey is considered typical for the Lesueur Sandplain subregion 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 within the expected range for the bioregion for the timing of the survey undertaken. Undertaking a secondary survey after a significant rainfall event would, however, likely result in additional annual and ephemeral species being recorded.

The below average rainfall experienced in the area it is also likely to have contributed to the number of specimens that were unable to be identified due to the sterile nature of the specimens.

5.1.3 Flora of Conservation Significance

The database searches identified 20 Threatened species as having potential to occur in the Survey Area. No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act were recorded during the survey. One Threatened species, *Thelymitra stellata*, is still considered to have a medium likelihood of occurring within the Survey Area. This is attributed to it being an annual (orchid) species, which may not emerge every year and/or the timing of the field survey potentially not coinciding with its flowering period.

The database searches identified 72 Priority flora species as potentially occurring in the vicinity of the Survey Area, of these, eight species were found during the field survey, plus an additional Priority flora species that had not been identified by the database searches.

Hypocalymma serrulatum (P2) is an erect shrub, 0.45-1.7 m high that flowers in April to May. *H. serrulatum* (P2) typically grows in grey or white sand along drainage lines. The WAH has 16

specimens lodged, with records spanning between the Swan Coastal Plain and the Geraldton Sandplains regions (Western Australian Herbarium, 2020).

During the survey, *Hypocalymma serrulatum* (P2) was recorded during targeted flora searches. A total of 515 plants were recorded.

Plate 2: *Hypocalymma serrulatum* (P2) – (Source: 360 Environmental, 2020)

Arnocrinum gracillimum (P3) is a rhizomatous, perennial herb, 0.2-0.4 m high that flowers October to November. *A. gracillimum* (P3) grows in white, grey, yellow, or lateritic sand. The WAH has 21 specimens lodged, with records spanning between the Swan Coastal Plain and the Geraldton Sandplains regions (Western Australian Herbarium, 2020).

During the survey, five plants of *Arnocrinum gracillimum* (P3) were recorded during targeted flora searches.

Plate 3: *Arnocrinum gracillimum* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020)

Babingtonia urbana (P3) is a shrub that flowers from January to March. *B. urbana* (P3) is associated with wetlands on the coastal plain. The WAH has 26 specimens lodged, with distribution restricted to the Swan Coastal Plain region (Western Australian Herbarium, 2020).

During the survey, a total of four plants of *Babingtonia urbana* (P3) were recorded during targeted flora searches.

Plate 4: *Babingtonia urbana* (P3) – (Source: 360 Environmental, 2020)

Banksia nana (P3) is a dwarf, prostrate, lignotuberous shrub, 0.1-0.5 m high that flowers in October. *B. nana* (P3) typically grows on white/grey sand and/or gravel over laterite on hills. The WAH has 23 specimens lodged, with distribution spanning between the Swan Coastal Plan and Geraldton Sandplains regions.

During the survey, a total of 14 plants of *Banksia nana* (P3) were recorded during targeted flora searches.

Plate 5: *Banksia nana* (P3) – (Source: 360 Environmental, 2020)

Beaufortia bicolor (P3) is a dense shrub, 0.3-1 m high that flowers from November to December. *B. bicolor* (P3) typically grows in white sand over laterite on sandplains. The WAH has 31 specimens lodged, with records spanning between the Swan Coastal Plain, Avon Wheatbelt and Geraldton Sandplains regions (Western Australian Herbarium, 2020).

During the survey, *Beaufortia bicolor* (P3) was recorded in quadrat BIBQ01. The specimen height was 55 cm, and it was recorded as having low cover (0.5 %). The specimen grew in grey silty sand on an eastern-facing mid-slope. Laterite rocks were present on site. The vegetation condition was classified as Excellent.

Plate 6: *Beaufortia bicolor* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020)

Synaphea endothrix (P3) is an erect clumped shrub to 0.6 m high that flowers from August to September. *S. endothrix* (P3) is associated with gravelly loam and sand, and typically grows on lateritic rises. The WAH has 16 specimens lodged with distribution restricted to the Geraldton Sandplains region.

During the survey, a total of three plants of *Synaphea endothrix* (P3) were recorded during targeted flora searches.

Plate 7: *Synaphea endothrix* (P3) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020)

Banksia chamaephyton (P4) is a low, lignotuberous shrub to 0.4 m high and up to 2 m wide. It flowers from October to December. *B. chamaephyton* (P4) typically grows in grey or white sand over laterite. The WAH has 39 specimens lodged, with distribution spanning between the Swan Coastal Plain, Geraldton Sandplains, Avon Wheatbelt, and Jarrah Forest regions.

During the survey, a total of four plants of *Banksia chamaephyton* (P4) were recorded during targeted flora searches.

Plate 8: *Banksia chamaephyton* (P4) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020)

Desmocladus elongatus (P4) is a rhizomatous, perennial, herb (sedge-like), 0.25-0.5 m high that flowers from August to December. *D. elongatus* (P4) grows in white or grey sand in dry kwongan. The WAH has 43 specimens lodged with distribution spanning between the Swan Coastal Plain and Geraldton Sandplains regions (Western Australian Herbarium, 2020).

During the survey, 17 plants of *Desmocladus elongatus* (P4) were recorded during targeted flora searches.

Plate 9: Desmocladus elongatus (P4) – (Source: 360 Environmental, 2020 and Western Australian Herbarium, 2020)

Grevillea rudis (P4) is a loose, spreading to erect shrub, 0.2-1.2 m high that flowers from January to April or from June to September or from November to December. *G. rudis* (P4) typically grows in white, grey, yellow or red sand, often with gravel and over laterite (Western Australian Herbarium, 2020). The WAH has 68 specimens lodged, with distribution spanning between the Swan Coastal Plain, Geraldton Sandplains and Coolgardie regions.

During the survey, *Grevillea rudis* (P4) was recorded during targeted flora searches. A total of 100 plants were recorded.

Plate 10: *Grevillea rudis* (P4) – (Source: 360 Environmental, 2020)

Two Priority species that were not recorded during the survey were still considered to have a high likelihood off occurrence within the Survey Area based on the habitat types observed, vegetation condition, survey effort and known distribution of the species:

- ***Phlebocarya pilosissima* subsp. *pilosissima* (P3)** is a shortly rhizomatous, compactly tufted perennial grass-like herb that grows between 15-40 cm high. The species has cream-white flowers between August and October. *P. pilosissima* subsp. *pilosissima* favours white or grey sand with lateritic gravel. Given that the closest record to the Survey Area occurs only 300 m away, several collections (5) were made of the *Phlebocarya* genus. All the specimens were confidently identified as *Phlebocarya filifolia*, which is not a conservation significant species.
- ***Thelymitra apiculata* (P4)** is a tuberous perennial herb (orchid) that grows between 20 and 35 cm high. The species has purple and yellow flowers which can be present between May and July. *T. apiculata* favours grey sand with lateritic gravel. The species is considered to have a high likelihood of occurring within the Survey Area due to it being a short-lived species, which may not emerge every year and/or the timing of the field survey not coinciding with its flowering period.

5.1.4 Vegetation

Two native vegetation types were described and mapped within the Survey Area:

- AhXssp: Mid open shrubland
- BaBm: Low woodland.

Quadrats BIBQ01, BIBQ02 and BIBQ03, which represent vegetation type AhXssp., have been determined to have affiliation with FCT SCPS09 - *Banksia attenuata* woodlands over dense low shrublands. AhXssp. consisted of heaths and shrublands with no tree canopy present. Even though SCPS09 is identified as being a sub-community of the Commonwealth *Banksia Woodlands of the Swan Coastal Plain* TEC, one of the defining attributes is the presence of at least one of the four key *Banksia* tree species. Based on this information, and the survey results showing the lack of *Banksia* tree species present in the vegetation type, AhXssp. is not representative of *Banksia Woodlands of the Swan Coastal Plain* TEC and therefore, is not likely to be considered suitable for national protection.

Quadrats BIBQ04, BIBQ05 and BIBQ06, which represent vegetation association BaBm, have been determined to have affiliation with FCT SCP23b - Northern *Banksia attenuata – Banksia menziesii* woodlands. FCT SCP23b is listed as a sub-community of the Commonwealth *Banksia woodlands of the Swan Coastal Plain* TEC.

For vegetation to be considered as the Endangered TEC under the EPBC Act and warrant full national protection, the community has to meet key diagnostic characteristics. Regarding the presence of the TEC, the approved conservation advice for the thresholds state that for vegetation in Excellent condition the minimum patch size should be 0.5 ha, while vegetation in Very Good condition should be a minimum of one hectare, and vegetation in Good condition should be a minimum of two hectares. If a vegetation patch is considered Degraded or worse, it

is not considered favourable for national protection. The TEC generally has a dominant *Banksia* component, which includes at least one of four key species, *Banksia attenuata, B. menziesii, B. prionotes* and/or *B. ilicifolia*.

Based on this information, and the survey results, the vegetation association BaBm is representative of the Commonwealth *Banksia Woodlands of the Swan Coastal Plain* TEC and therefore is likely to be considered suitable for national protection. This is based on the presence of *Banksia* tree species, as well as the patch size and condition of the vegetation.

Under the State legislation, FCT SCP23b and therefore vegetation type BaBm, is considered to form part of the Priority 3 Ecological Community *Banksia dominated woodlands of the Swan Coastal Plain IBRA region*. Vegetation that has an over storey dominated by *Banksia* are all listed as a Priority 3 Ecological Community. There is no written policy on how to respond to the presence of PECs within proposed development sites and the presence of these communities is dealt with by DBCA on a case-by-case basis. SCP23b is also listed as Priority 3 Swan Coastal Plain *Banksia attenuata - Banksia menziesii* woodlands by the State.

5.1.5 Regional Representation

The EPA recognises vegetation complexes that are not well represented as being significant. Vegetation complexes that have 10-30% remaining may be considered regionally significant.

The Lesueur Sandplain 1031 complex has 32.90% remaining in WA and 34.48% within the Geraldton Sandplains Bioregion, which is above the retention rate set by both the EPA (Environmental Protection Authority, 2006) and the Commonwealth of Australia (Department of the Environment and Heritage, 2001) for protecting Australia's biological diversity.

5.2 Vertebrate Fauna

5.2.1 Fauna Habitat

The *Banksia* woodland/*Allocasuarina* shrubland fauna habitat identified within the Survey Area appears reflect the vegetation in the immediate vicinity of the Survey Area and is typical of the habitat within the Geraldton Sandplains bioregion (GES) and the Lesueur Sandplain (GES02) subregion (Desmond and Chant, 2001). The Survey Area occurs within a landscape, where according to statewide vegetation statistics, 67.1% of the pre-European broad vegetation type extent has been cleared (Government of Western Australia, 2019).

While the non-endemic trees were unique within the Survey Area, similar habitat is common and widespread as eucalypts and pines have been planted as windbreaks in the surrounding agricultural lands.

The Survey Area is not integral to the habitat connectivity of the surrounding area, as it comprises a relatively small sliver of roadside vegetation that runs adjacent the eastern boundary of the un-named Conservation Park (Reserve No. 41986). This un-named Conservation Park maintains connectivity with Badgingarra National Park (separated only by a minor road). The Survey Area is therefore not crucial to ecosystem function on a regional context and is unlikely to be wholly relied upon by conservation significant species or broader fauna assemblages.

5.2.2 Conservation Significant Fauna

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – Endangered (BC Act and EPBC Act)

Carnaby's Black Cockatoos were confirmed to occur within the Survey Area and are discussed in Section 5.3.

Western Brush Wallaby (*Notamacropus irma*) – Priority 4 (DBCA)

The Western Brush Wallaby found in sclerophyll forest and woodland, mallee and thickets of shrubs in southwest Western Australia (Menkhorst and Knight, 2004). The species was recorded 5 km east of the Survey Area in 2015 and 9 km south of the Survey Area in 2001 (Department of Biodiversity Conservation and Attractions, 2020d), and is therefore likely to pass through habitat within the Survey Area as both areas are connected by a near-continuous patch of native vegetation.

Jewelled Sandplain Ctenotus (*Ctenotus gemmula*) (Swan Coastal Plain population) – Priority 3 (DBCA)

The Jewelled Sandplain Ctenotus is found in pale sand-plains supporting heaths in association with *Banksia* or mallee woodlands (Wilson and Swan, 2017). This habitat is equivalent to the *Banksia* woodland/*Allocasuarina* shrubland identified within the Survey Area, and is likely to be similar to habitat within which nearby records of the species were identified by DBCA database searches, which were approximately 13 km southwest of the Survey Area (Department of Biodiversity Conservation and Attractions, 2020d). The Survey Area is only 8 km away from the Swan Coastal Plain IBRA region boundary, therefore records in the vicinity of the Survey Area are considered part of the Swan Coastal Plain population, as distinct from populations that occur along the southern coastline.

Black-striped Snake (*Neelaps calonotos*) – Priority 3 (DBCA)

The Black-striped Snake is restricted to the sandy coastal strip near Perth from Mandurah to Cataby, where it inhabits dunes and sand-plains vegetated with heaths and *Eucalyptus*/*Banksia* woodland (Wilson and Swan, 2017). The Survey Areas contains appropriate habitat and occurs within the species predicted distribution. While there are no recent DBCA records, the species was recorded approximately 13 km southwest of the Survey Area in 1990 (Department of Biodiversity Conservation and Attractions, 2020d).

5.3 Black Cockatoos

Carnaby's Black Cockatoos were confirmed to occur within the Survey Area during the field survey. The Survey Area occurs well outside the modelled distribution of Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo, therefore it is highly unlikely either of these species will occupy habitats within the Survey Area (Department of Sustainability Environment Water Population and Communities, 2012; Department of the Environment and Energy, 2017). The Survey Area did not contain suitable breeding habitat as scattered, individual *Eucalyptus todtiana* trees and a small stand of non-endemic trees lacked suitable hollows. The non-endemic trees are considered potential roosting habitat; however, Carnaby's Black Cockatoos are more likely to roost preferentially in taller eucalypts and pines that have been planted as windbreaks in the surrounding agricultural lands.

Although relatively small, the habitat within the Survey Area is considered very high-quality foraging habitat and is used for foraging by Carnaby's Black Cockatoos. Even small areas of foraging habitat are valuable, as continual degradation and reduction of available foraging habitat can result in eventual loss of flocks (Vivia, 2012). The Survey Area contains a relatively small portion of the available foraging habitat for Carnaby's Black Cockatoos within the surrounding area, with large patches of valuable foraging habitat in the un-named Conservation Park (Reserve No. 41986) and Badgingarra National Park. Additionally, road verge vegetation can increase the risk of mortality by road collision as Black Cockatoos typically fly out into clear space when leaving a foraging area; in 2009-2010 up to 10% recorded mortality of the species was due to road collision (Saunders, Mawson and Dawson, 2011).

6 Conclusion

Flora and Vegetation

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

- No Threatened flora species pursuant to the EPBC Act and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act were recorded during the survey.
- Nine DBCA listed Priority flora were recorded; *Hypocalymma serrulatum* (P2), *Arnocrinum gracillimum* (P3), Babingtonia urbana (P3*), Banksia nana (P3), Beaufortia bicolor* (P3), *Synaphea endothrix* (P3), *Banksia chamaephyton* (P4), *Desmocladus elongatus* (P4) and *Grevillea rudis* (P4).
- The presence of Priority flora species is unlikely to form a statutory constraint for the Survey Area and is dealt with by DWER and DBCA on a case-by-case basis.
- Two introduced species were recorded during the survey. None of these are listed as Declared Pests under the BAM Act or are WoNS.
- Three vegetation types were described and mapped in the Survey Area.
    - BaBm was most closely affiliated with FCT SCP23b – *Northern Banksia attenuata – Banksia menziesii woodlands*. SCP23b has been listed as a sub-community under the EPBC Act listed *Banksia woodlands of the Swan Coastal Plain* TEC and is therefore likely to be considered for national protection.
    - AhXssp. was most closely affiliated with FCT SCPS09 - *Banksia attenuata woodlands over dense low shrublands*, however is not likely representative of the EPBC Act listed *Banksia Woodlands of the Swan Coastal Plain* TEC due to having no *Banksia* species present.
    - The remaining vegetation type consisted of non-endemic eucalypt trees and is not considered to be of conservation significance.

Vertebrate Fauna including Black Cockatoos

The following conclusions on the existing vertebrate fauna and black cockatoos are made:

- Two fauna habitats occur within the Survey Area, *Banksia* woodland/*Allocasuarina* shrubland and non-endemic trees.
- One conservation significant fauna species was recorded during the field survey, Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), listed as Endangered.
- Two conservation significant fauna species have a high likelihood of occurrence within the Survey Area, the Western Brush Wallaby (*Notamacropus irma*), listed as Priority 4, and Jewelled Sandplain Ctenotus (*Ctenotus gemmula*), listed as Priority 3.
- One conservation significant fauna species has a medium likelihood of occurrence within the Survey Area, the Black-striped Snake (*Neelaps calono*tos), listed as Priority 3.

- Three introduced species were recorded during the survey via secondary evidence, European Cattle (**Bos primigenius taurus*), the Red Fox (**Vulpes vulpes*) and the Rabbit (**Oryctolagus cuniculus*).
- The black cockatoo habitat assessment identified 21.7 ha of very high-quality foraging habitat and 0.1 ha potential roosting habitat for Carnaby's Black Cockatoo. No suitable breeding was identified.

7 References

Beard, J. S. (1976) *Vegetation survey of Western Australia. Western Australia 1: 1 000 000 vegetation series. Design and cartography by Dept. of Geography, University of W.A*.

Bureau of Meteorology (2020) *Monthly Climate Data Statistics*. Available at: www.bom.gov.au/climate/data.

Department of Agriculture and Food WA (2012) *Soil-landscape systems of Western Australia (GIS dataset)*. Perth, Australia.

Department of Biodiversity Conservation and Attractions (2019a) *NatureMap*. Available at: https://naturemap.dpaw.wa.gov.au/.

Department of Biodiversity Conservation and Attractions (2019b) *Threatened and Priority Ecological Communities database request (custom search).* Perth, Australia.

Department of Biodiversity Conservation and Attractions (2019c) *Threatened and Priority Fauna database request (custom search)*. Perth, Australia.

Department of Biodiversity Conservation and Attractions (2019d) *Western Australia Herbarium Flora Database (custom search)*.

Department of Parks and Wildlife (2013) *Carnaby's Cockatoo (Calyptorhynchus latirostris) recovery plan*. Perth, Australia. Available at: http://www.environment.gov.au/system/files/resources/94138936-bd46-490e-821d-b71d3ee6dd04/files/carnabys-cockatoo-recovery-plan.pdf.

Department of Sustainability Environment Population and Communities (1999) *Survey Guidelines for Australia's Threatened Mammals*. Canberra, Australia. Available at: http://www.environment.gov.au/system/files/resources/b1c6b237-12d9-4071-a26e-ee816caa2b39/files/survey-guidelines-mammals.pdf.

Department of Sustainability Environment Water Population and Communities (2011) *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act*. Canberra, Australia. Available at: http://www.environment.gov.au/resource/survey-guidelines-australias-threatened-reptiles-guidelines-detecting-reptiles-listed.

Department of Sustainability Environment Water Population and Communities (2012) *EPBC Act referral guidelines for three threatened black cockatoo species*. Canberra, Australia.

Department of the Environment (2013) *Matters of National Environmental Significance: Significant impact guidelines 1.1*. Canberra, Australia. Available at: http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf.

Department of the Environment and Energy (2016a) *Banksia woodlands of the Swan Coastal Plain ecological community*. Canberra, Australia.

Department of the Environment and Energy (2016b) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: www.environment.gov.au/land/nrs/science/ibra/.

Department of the Environment and Energy (2017) *Draft revised referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo, Forest Red-tailed Black Cockatoo*. Canberra, Australia.

Department of the Environment and Energy (2018) *Weeds of National Significance*. Available at: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html.

Department of the Environment and Energy (2019a) *Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community*. Available at: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf.

Department of the Environment and Energy (2019b) *Protected Matters Search Tool*. Canberra, Australia. Available at: http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf.

Department of the Environment Water Heritage and the Arts (2010) *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act*. Canberra, Australia. Available at: http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds-april-2017.pdf (Accessed: 24 July 2018).

Department of Water and Environmental Regulation (2014) *Environmentally Sensitive Areas - Fact Sheet*, *Environmentally Sensitive Areas*. Available at: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Fact_sheets/fs24-clearing-regs_ESAs.pdf.

Department of Water and Environmental Regulation (2016) *Hydrography Linear (Heirarchy) (GIS dataset)*. Perth, Australia: Landgate.

Department of Water and Environmental Regulation (2018) *Clearing Regulations - Environmentally Sensitive Areas GIS Dataset*.

Desmond, A. and Chant, A. (2001) *Geraldton Sandplain 3 (GS3 - Lesueur Sandplain subregion*. Available at: https://www.dpaw.wa.gov.au/images/documents/about/science/projects/waaudit/geraldton_sandplains03_p293-313.pdf.

EPA (2016) *Technical Guidance: Flora and Vegetation surveys for Environmental Impact Assessment*. Perth, Australia. Available at: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA Technical Guidance - Flora and Vegetation survey_Dec13.pdf.

Government of Western Australia (2019) *2018 Statewide Vegetation Statistics - Full Report*.

Shepherd, D. P., Beeston, G. R. and Hopkins, A. J. M. (2002) *Native Vegetation in Western Australia Technical Report 249*. Perth, Australia.

Thorp, J. R. and Lynch, R. (2000) *The determination of weeds of national significance*. Launceston, Australia: National Weeds Strategy Executive Committee.

Western Australian Herbarium (2020) *FloraBase - The Western Australian Flora*. Perth, Western Australia. Available at: https://florabase.dpaw.wa.gov.au.

8 Limitations of this Report

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data, and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive, or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness, and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive, and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions, and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

Appendices

Appendix A
Database Searches

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	Location	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Acacia splendens	T	CR	Shire road reserve, 600m E of Mullering Rd on N side of breakaway, 1.95km S of Waddi Rd.	MOORA	LGA	09/09/2003 0:00	N	Low woodland over low scrub A over open herbs; Hakea erinacea, Helipterum sp., Calothamnus quadrifidus.	RI_BRKWY	CLA_LOAM	BROWN	Eucalyptus calophylla, E.loxophleba,Solilya sp.,Xanthorrhoea sp.,Acacia sp.	woodland 10-30m, 20-50%	Eucalyptus calophylla, E.loxophleba	open shrubland 1-2m, 20-50%	Solilya sp.	low open shrubland 0.5-1m, 20-50%	Xanthorrhoea sp.	forbland 0.5-1m, 50-80%	Acacia sp.
Acacia splendens	T	CR	PP, Loc. 1156, 584 & 2373. 600m E of Mullering Rd & 1.95km S of Waddi Rd, on N side of breakaway and follows creekline on both sides southeastwards	MOORA	PRI	29/06/2011 0:00	Y	Some clearing occurred and some areas have regenerated quite well while others are bare ground	SLOPE	SND_LOAM	BROWN	Hakea sp., Grevillea sp., Xanthorrhoea sp., open low herbs: Amphipogon sp., Ptilotus sp., Rhodanthe sp.	open woodland 10-30m, 0.25-20%	Corymbia calophylla	open shrubland 1-2m, 20-50%	Acacia splendens				
Acacia splendens	T	CR	PP, Loc 3804 'Dunearn'. Ca.7.5km E of Brand Hwy on Koonah Rd, on N side of Mullering Brook nr. crossing, 100-700m SW of junction w. Doodenoo Creek.	MOORA	PRI	09/08/1998 0:00	N	Wandoo woodland, uncleared part(240ha) of PP3804 ('Private NR').	OD_RVRBK			Anigozanthos humilis subsp. grandis	Unknown Veg Class	Anigozanthos humilis subsp. grandis						
Allocasuarina ramosissima	3		8.25 kilometers south east of Old Badgingarra. Population is on the road verge of Badgingarra Road approximately 7 kilometers south of the intersection with North West Road.	MOORA	LGA	19/09/1976 0:00	N	In Mallee				Eucalyptus eudesmioides, E. wandoo,Dryandra acuneata,Gastrolobium calycinum,Hakea undulata	Unknown Veg Class	Eucalyptus eudesmioides, E. wandoo	Unknown Veg Class	Dryandra acuneata	Unknown Veg Class	Gastrolobium calycinum	Unknown Veg Class	Hakea undulata
Andersonia gracilis	T	VU	Wongonderrah Nature Reserve, north-west corner, ca.100m south of Wongonderrah Road. Landcare Services found many plants in the vicinity of Wongonderrah/Yerramullah Roads, this reserve and the adjoining UCL & private property. (Sites 2-13)	MOORA	CC	15/11/1998 0:00	N	Verticordia sp., Beaufortia sp.,Open heath. On damp sandy clay flat.	FLAT	CLAY_SND	GREY	Melaleuca sp.,Calothamnus sp.,Banksia sphaerocarpa,Melleostemon	Unknown Veg Class	Melaleuca sp.	Unknown Veg Class	Calothamnus sp.	Unknown Veg Class	Banksia sphaerocarpa	Unknown Veg Class	Melleostemon
Andersonia gracilis	T	VU	Wongonderrah Road and in the vicinity of Yerramullah Road - Landcare Services located many plants in the surrounding un-allocated vacant land, private property, Wongonderrah Nature Reserve and the road verges. (Sites 2-13)	MOORA	LGA	15/11/1998 0:00	Y	Open heath. On damp sandy clay flat.	FLAT	CLAY_SND	GREY	Melaleuca sp.,Calothamnus sp.	Unknown Veg Class	Melaleuca sp.	Unknown Veg Class	Calothamnus sp.				
Andersonia gracilis	T	VU	Private Property. North of Wongonderrah Nature Reserve (opposite Wongonderrah Road), south-west corner of Location No. 3806, west of creek line. Landcare Services found many plants in this area (there Sites 2-13).	MOORA	PRI	15/11/1998 0:00	Y													
Andersonia gracilis	T	VU	UCL. To the west of Wongonderrah Nature Reserve. Landcare Services found many plants in the vicinity of Wongonderrah/Yerramullah Roads, this reserve and the adjoining VCL & private property. (Sites 2-13)	MOORA	NON	15/11/1998 0:00	N													
Andersonia gracilis	T	VU	Wongonderrah Rd, South side road verge,approx. 5.5-6.1km west of the intersection with Brand Hwy.	MOORA	LGA	22/11/1996 0:00	Y	Open Dwarf Scrub C/Low Heath D/Very Open Herbs. Drainage poor, winter damp.				Calothamnus hirsutus,Vertcordia densiflora var. densiflora,Kunzea recurva	low open shrubland 0.5-1m, 20-50%	Calothamnus hirsutus	Unknown Veg Class	Vertcordia densiflora var. densiflora	Unknown Veg Class	Kunzea recurva		
Andersonia gracilis	T	VU	UCL. South side into VCL, Wongonderrah Rd, approx. 5.5-6.1km west of the intersection with Brand Hwy.	MOORA	NON	22/11/1996 0:00	Y	Open Dwarf Scrub C/Low Heath D/Very Open Herbs. Drainage poor, winter damp.				Calothamnus hirsutus,Vertcordia densiflora var. densiflora,Kunzea recurva	low open shrubland 0.5-1m, 20-50%	Calothamnus hirsutus	Unknown Veg Class	Vertcordia densiflora var. densiflora	Unknown Veg Class	Kunzea recurva		
Andersonia gracilis	T	VU	Wongonderrah Nature Reserve, 400m west of the south-east corner; Tiwest Population No. 10.	MOORA	CC	03/03/1998 0:00	N	Nuytsia florabunda; low heath with occasional emergents.	FLAT	SAND	GREY	Beaufortia squarrosa,Banksia incana,Isopogon sp. Watheroo,Calytrix aurea	Unknown Veg Class	Beaufortia squarrosa	Unknown Veg Class	Banksia incana	Unknown Veg Class	Isopogon sp. Watheroo	Unknown Veg Class	Calytrix aurea
Andersonia gracilis	T	VU	Wongonderrah Nature Reserve, 200m north of the south-east corner; Tiwest Population No. 9.	MOORA	CC	03/03/1998 0:00	N	Heath	FLAT	SAND	GREY	Beaufortia squarrosa,Banksia incana,Beaufortia elegans,Isopogon sp. Watheroo	Unknown Veg Class	Beaufortia squarrosa	Unknown Veg Class	Banksia incana	Unknown Veg Class	Beaufortia elegans	Unknown Veg Class	Isopogon sp. Watheroo
Andersonia gracilis	T	VU	UCL, ca. 5.5km north of intersection of Cooljarloo and Woolka Road, the northern extent of Tiwest's lease area; site known as 'Tiwest 12000 (orebody) North Cooljarloo Population No. 11'.	MOORA	NON	10/12/1998 0:00	N	Banksia incana;low heath	FLAT	SAND	YELLOW	Beaufortia squarrosa,Calytrix aurea,Calytrix drummondii,Hakea concifolia	Unknown Veg Class	Beaufortia squarrosa	Unknown Veg Class	Calytrix aurea	Unknown Veg Class	Calytrix drummondii	Unknown Veg Class	Hakea concifolia
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2		Waddi Rd, Muellering Brook Crossing S side, W side of brook.	MOORA	UNKNOWN	26/09/1991 0:00	N	DomSp:Xanthorrhoea sp. VegClass:Open woodlandof marri & wandoo with heath beneath to 1.5m				Allocasuarina humilis,Conospermum stoechadis,Diplopeltis huegelii,Eucalyptus wandoo	Unknown Veg Class	Allocasuarina humilis	Unknown Veg Class	Conospermum stoechadis	Unknown Veg Class	Diplopeltis huegelii	Unknown Veg Class	Eucalyptus wandoo
Anigozanthos viridis subsp. terraspectans	T	VU	PP, Loc 3806. N off Wongonderrah Rd. 10.8km W of Brand Hwy. Opposite R 26248. Dandaragan.	MOORA	PRI	20/09/1989 0:00	Y													
Anigozanthos viridis subsp. terraspectans	T	VU	UCL, Lot 306. Approx 10km W on Wongonderrah Rd from the Brand Highway in rehabilitation area. [On mining tenement M 268SA]	MOORA	NON	21/11/2012 0:00	N	Rehabilitation area.												
Arnocrinum gracillimum	3		Wongonderrah Rd, ca. 3.1 km E of the junction with Yerramullah Rd.	MOORA	LGA	22/11/1992 0:00	N		FLAT	SAND	GREY	Banksia prionotes,Banksia attenuata,Adenanthos cygnorum ssp. cygnorum	low woodland <10m, 20-50%	Banksia prionotes	open shrubland 1-2m, 20-50%	Banksia attenuata	low sparse shrubland 0.5-1m, 0.25-20%	Adenanthos cygnorum ssp. cygnorum	low heathland <0.5m, 50-80%	
Beaufortia bicolor	3		Brand Hwy, at 1 km S of junction with Wongonderrah Rd.	MOORA	MRD	14/11/1978 0:00	N			SND_LOAM	GREY	Adenanthos,Banksia	Unknown Veg Class	Adenanthos	Unknown Veg Class	Banksia				
Beaufortia bicolor	3		Brand Hwy, at 2 km S of Badgingarra.	MOORA	MRD	05/12/1982 0:00	N			SAND	WHITE		low heathland 0.5-1m, 50-80%							
Beaufortia bicolor	3		Cooljarloo Minesite. Approx 5.5 km N of Cooljarloo Rd and 5 km W of Brand Hwy.	MOORA	NON	12/12/1996 0:00	N	Eremaea pauciflora, Scholtzia involucrata.	FLAT	SAND	GREY	Banksia attenuata,Banksia menziesii,Banksia prionotes,Adenanthos cygnorum	open woodland 10-30m, 0.25-20%	Banksia attenuata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia prionotes	Unknown Veg Class	Adenanthos cygnorum
Boronia tenuis	4		Cooljarloo, population on area leased by Tiwest Venture.	MOORA	PRI	03/04/1996 0:00	N	Soil Condition :Saline;	SLOPE	SAND	GREY	Eucalyptus todiana,Banksia menziesii,Banksia attenuata,Adenanthos cygnorum	Unknown Veg Class	Eucalyptus todiana	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum
Calectasia palustris	2		Wongonderrah Road reserve, at corner of Yerramullah Road, Codjarloo (Expl. Lic. 7002898, Metals Sands).	MOORA	LGA	15/10/1984 0:00	Y	Open heath.	FLAT	CLAY_SND												
Calectasia palustris	2		UCL (Expl. Lic. 7002898, Metals Sands).Wongonderrah Road, 11.6 km west of Brand Highway, SW of intersection with Yerramullah Road and Wongonderrah Nature Reserve, Codjarloo. SW of Badgingarra.	MOORA	NON	04/09/2007 0:00	Y	Low lying flat. Low heath with Acacia sp., Conostylis sp., Hemiandra sp. and Verticordia sp.	OD_SWAMP	SAND	WHITE	Anigozanthos pulcherrimus,Banksia micrantha,Melaleuca systena,Grevillea preissii subsp. preissii	Unknown Veg Class	Anigozanthos pulcherrimus	Unknown Veg Class	Melaleuca systena	Unknown Veg Class	Grevillea preissii subsp. preissii	Unknown Veg Class	Banksia micrantha
Chordifex chaunocoleus	4		South of Cadda Rd on the northern boundary of Badgingarra National Park (31809). 18.1km E of Munbinea Rd. 7.9/8.1km west of Brand Hwy.	MOORA	CC	01/11/2002 0:00	N	Macrozamia, Eucalyptus todtiana	OD_GULLY	SAND	BROWN	Adenanthos cygnorum,Jacksonia sp.,Banksia menziesii,Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Jacksonia sp.
Chordifex chaunocoleus	4		NON Lot.4246. 10km N of Cataby.	MOORA	NON	04/04/1996 0:00	N			CLA_LOAM	BROWN	Melaleuca scabra,Banksia sphaerocarpa var. sphaerocarpa,Kunzea recurva,Xanthorrhoea preissii	Unknown Veg Class	Melaleuca scabra	Unknown Veg Class	Kunzea recurva	Unknown Veg Class	Xanthorrhoea preissii	Unknown Veg Class	Banksia sphaerocarpa var. sphaerocarpa
Comesperma rhadinocarpum	3		Bibby Rd 2.2kms W of Brand Hwy. On Gravel Reserve (No.34447) S side of Rd.	MOORA	MRD	06/01/1992 0:00	Y	Slope,dry,grey sandy-clay over laterite. Disturbed roadverge.	SLOPE	CLAY_SND	GREY	Jacksonia sp.,Conospermum stoechadis,Adenanthos cygnorum,Stirlingia sp.	tall sparse shrubland >2m, 0.25-20%	Jacksonia sp.	Unknown Veg Class	Conospermum stoechadis	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Stirlingia sp.

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	Location	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Desmocladus microcarpus	2		Bibby Road reserve, ca 3.8 km west of Brand Highway towards Cervantes, ca 13 km SSW of Badgingarra, [ca 9 km ESE of Yeeramullah Road].	MOORA	LGA	06/09/1990 0:00	N	Disturbed site.		SAND	WHITE									
Desmocladus microcarpus	2		Bibby Road reserve, ca 5 km west of Brand Highway, [ca 8.2 km ESE of Yeeramullah Road].	MOORA	LGA	06/09/1990 0:00	N					Eucalyptus lane-poolei	woodland 10-30m, 20-50%	Eucalyptus lane-poolei						
Drosera prophylla	3		Brand Highway road reserve, 17.2 km N of Cataby Brook.	MOORA	RDL	23/06/1983 0:00	Y	Siliceous soil. Shrubland/heath.	CREST	SAND	WHITE									
Drosera prophylla	3		Brand Highway road reserve, 17.2 km north of Cataby Roadhouse, east side of road..	MOORA	RDL	11/06/2001 0:00	N	Siliceous soils in open ground. Shrub/Heathland.	CREST	SAND										
Drosera prophylla	3		Badgingarra National Park (Crown Reserve 31809), ca 1 km west of Brand Highway along walk trail.	MOORA	CC	19/07/2004 0:00	Y	Upland. Low heath.		SAND	GREY	Calothamnus sanguineus,Allocasuarina humilis,Stirlingia latifolia,Hibbertia hypericoides	Unknown Veg Class	Calothamnus sanguineus	Unknown Veg Class	Allocasuarina humilis	Unknown Veg Class	Hibbertia hypericoides	Unknown Veg Class	Stirlingia latifolia
Eucalyptus absita	T	CR	Badgingarra Road, west side, 3.4km south from the intersection with North West Road (the Old Badgingarra Townsite). Shire of Dandaragan.	MOORA	LGA	04/09/2007 0:00	N	Melaleuca radula, Astroloma glaucescens, Hakea trifurcata, Acacia sp., Hypocalymma sp & Xanthorrhoea sp.	FLAT	CLAY_SND	BROWN	Gastrolobium spinosum,Calothamnus sanguineus,Viminea juncea,Daviesia sp.	low open shrubland 0.5-1m, 20-50%	Gastrolobium spinosum	low open shrubland <0.5m, 20-50%	Calothamnus sanguineus	low open tussock grassland <0.5m, 20-50%	Viminea juncea	low sparse sedgeland <0.5m, 0.25-20%	Daviesia sp.
Eucalyptus absita	T	CR	`Dunearn Farm`, Private Property Location No. 50, 3km W of Badgingarra-Dandaragan Rd along Koonah Road, in paddock south of road & S of creekline, by 200m. 1km W of Duneran Rd (Koonah Rd), 1.2km SSE of Dunearn Farm.	MOORA	PRI	02/05/2000 0:00	N	Open shrubland in paddock.	FL PLAIN	SAND	YELLOW	Eucalyptus wandoo,Eucalyptus rudis,Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus wandoo	Unknown Veg Class	Eucalyptus rudis	Unknown Veg Class	Eucalyptus loxophleba		
Eucalyptus absita	T	CR	Creswick Farm, Private Property Location No. 3803, Badgingarra Road, southeastern end of paddock on either side of a track in a paddock just past a gate marked `Moonee Ponds`, heading northeast of fenceline.	MOORA	PRI	24/05/2000 0:00	Y	Cleared paddock grazed by sheep; creek west of population.	SLOPE	SAND	GREY	Eucalyptus todtiana,Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Eucalyptus loxophleba				
Eucalyptus absita	T	CR	Creswick Farm, Private Property Location No. 3803, Badgingarra Road, southeastern end of paddock 300m north of Pop 6A, west of track and east of fenceline, 100m south of gate marked `Lupin` adjacent gate faces west is marked 'cyclone fencing'.	MOORA	PRI	24/05/2000 0:00	Y	Cleared paddock grazed by sheep.	SLOPE	SAND	GREY	Eucalyptus todtiana,Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Eucalyptus loxophleba				
Eucalyptus absita	T	CR	Creswick Farm, Private Property Location No. 3803, Badgingarra Road, closer to eastern boundary in 'Kulin Paddock' heading north through paddock east of creekline by 100m & 120m west of north-south fenceline; drive thru.'Lupin' gate, turn W to creek.	MOORA	PRI	24/05/2000 0:00	N	Cleared paddock grazed by sheep; stock rub against trunks.	SLOPE	SAND	GREY	Eucalyptus todtiana,Eucalyptus loxophleba,Acacia microbotria	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Eucalyptus loxophleba	Unknown Veg Class	Acacia microbotria		
Eucalyptus absita	T	CR	Creswick Farm, Private Property Location No. 3803, Badgingarra Road, closer to eastern boundary in 'Kulin Paddock' 100m northeast of 7A; population is a dense ring of clumps with a circular gap in the centre.	MOORA	PRI	24/05/2000 0:00	N	Cleared paddock grazed by sheep; stock rub against trunks.	CREST	SAND	GREY	Eucalyptus todtiana,Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Eucalyptus loxophleba				
Eucalyptus absita x loxophleba	1		Koonah Road reserve, 3.1 km west of Badgingarra Road.	MOORA	LGA	11/04/1991 0:00	N					Eucalyptus wandoo,Eucalyptus absita,Eucalyptus loxophleba,Eucalyptus rudis	Unknown Veg Class	Eucalyptus wandoo	Unknown Veg Class	Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus rudis	Unknown Veg Class	Eucalyptus absita
Eucalyptus absita x loxophleba	1		1156 Koonah Road, Badgingarra. 300 m south of road, 3.1 km west of Badgingarra Road.	MOORA	PRI	11/04/1991 0:00	N					Eucalyptus wandoo,Eucalyptus absita,Eucalyptus loxophleba,Eucalyptus rudis	Unknown Veg Class	Eucalyptus wandoo	Unknown Veg Class	Eucalyptus loxophleba	Unknown Veg Class	Eucalyptus rudis	Unknown Veg Class	Eucalyptus absita
Eucalyptus absita x loxophleba	1		Koonah Road reserve, 13.3 km from Brand Highway.	MOORA	LGA	13/11/1991 0:00	N													
Eucalyptus absita x loxophleba	1		Koonah Road, 700m west of `Dunearn Farm's` (Location No.3857) gate; 3.2km west of Badgingarra Road intersection.	MOORA	LGA	02/05/2000 0:00	N	Very open tree mallee, hammock grass, open dwarf scrub C, open low sedges, grass species.		SAND	WHITE	Mesomelaena stygia,Hakea sp.	Unknown Veg Class	Mesomelaena stygia	Unknown Veg Class	Hakea sp.				
Eucalyptus macrocarpa subsp. elachantha	4		Cooljarloo. 7 km N of Cooljarloo Rd, ca 3.5 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N	Hakea costata.	SLOPE	LOAM_SND	YELLOW	Xanthorrhoea preissii,Acacia pulchella,Allocasuarina thuyoides,Banksia sphaerocarpa subsp. sphaerocarpa Conospermum stoechadis,Eremaea pauciflora,Allocasuarina humilis	heathland 1-2m, 50-80%	Xanthorrhoea preissii	Unknown Veg Class	Acacia pulchella	Unknown Veg Class	Banksia sphaerocarpa subsp. sphaerocarpa	Unknown Veg Class	Allocasuarina thuyoides
Eucalyptus macrocarpa subsp. elachantha	4		Verge of Wongonderrah Rd, at 4.8 km W of the junction with Brand.	MOORA	LGA	27/11/1996 0:00	Y			SAND	GREY	Conospermum stoechadis Eremaea pauciflora,Allocasuarina humilis	heathland 1-2m, 50-80%	Conospermum stoechadis	Unknown Veg Class	Eremaea pauciflora	Unknown Veg Class	Allocasuarina humilis		
Eucalyptus macrocarpa subsp. elachantha	4		Verge of Wongonderrah Rd, at 4.8 km W of the junction with Brand.	MOORA	PRI	27/11/1996 0:00	Y			SAND	GREY	Conospermum stoechadis Eremaea pauciflora,Allocasuarina humilis	heathland 1-2m, 50-80%	Conospermum stoechadis	Unknown Veg Class	Eremaea pauciflora	Unknown Veg Class	Allocasuarina humilis		
Eucalyptus pendens	4		Conservation Reserve 41986. 0.2 km W of Brand Hwy, at 2.1 km S of the junction with Wongonderrah Rd (Cervantes turn-off).	MOORA	CC	18/10/1978 0:00	N	Hillside, on grey sand.	SLOPE				low heathland 0.5-1m, 50-80%							
Eucalyptus pendens	4		Badgingarra National Park. ca. 0.5 km W of Brand Hwy, at 4.75 km N of the junction with McNamara Rd.	MOORA	CC	15/09/1980 0:00	N													
Eucalyptus pendens	4		Badgingarra National Park. ca. 0.4 km W of Brand Hwy, at 2.5 km N of the junction with McNamara Rd.	MOORA	CC	15/09/1980 0:00	N													
Eucalyptus pendens	4		0.25 km E of Brand Hwy, at 1.2 km N of the junction with McNamara Rd.	MOORA	PRI	15/09/1980 0:00	N													
Eucalyptus pendens	4		Badgingarra National Park. 1.2 km W of Brand Hwy, at 1.3 km SW of the junction with Bibby Rd.	MOORA	CC	15/09/1980 0:00	N													
Grevillea saccata	4		Badgingarra Rd. 10km N of Mungedar Rd. 30.2km N of Dandaragan. Road res.	MOORA	LGA	13/08/1991 0:00	N		CREST	LOAM	GREY	Lambertia multiflora,Xanthorrhoea sp.,Gastrolobium sp.,Acacia sp.	low heathland 0.5-1m, 50-80%	Lambertia multiflora	low heathland <0.5m, 50-80%	Xanthorrhoea sp.	Unknown Veg Class	Gastrolobium sp.	Unknown Veg Class	Acacia sp.
Grevillea saccata	4		SE area of Loc 1780. S of Koonah Rd. Dunearn farm.	MOORA	PRI	18/08/1991 0:00	Y		OD DRGLN	CLAY_SND	BROWN	Hypocalymma angustifolia,Isopogon dubiuos,Calothamnus quadrifidus,Acacia sp.	low open shrubland 0.5-1m, 20-50%	Hypocalymma angustifolia	Unknown Veg Class	Isopogon dubiuos	Unknown Veg Class	Calothamnus quadrifidus	Unknown Veg Class	Acacia sp.
Grevillea saccata	4		8.5km S of Wongonderra Rd along Brand Hwy, then ca 1200m W. On mining lease 268SA. W of Res 36618.	MOORA	NON	15/08/1991 0:00	N		SLOPE	SAND	YELLOW	Banksia	woodland 10-30m, 20-50%	Banksia	low heathland 0.5-1m, 50-80%					
Grevillea saccata	4		Conservation Park 41986. Track running west from the gravel pit, at 650 m east of SEC powerline track and 1.4 km west from Brand Hwy. Ca. 1 km directly west of Brand Hwy at ca. 4.6 km north from the junction with Mullering Rd.	MOORA	CC	14/09/1993 0:00	Y	Plateau between upper and lower edge of the scarp, running SE to NW. Pale yellow sand over brown loamy snd	SLOPE	LOAM_SND	YELLOW	Banksia prionotes,Eucalyptus todtiana,Hakea trifurcata,Hakea costata	open woodland 10-30m, 0.25-20%	Banksia prionotes	low heathland 0.5-1m, 50-80%	Eucalyptus todtiana	low heathland <0.5m, 50-80%	Hakea trifurcata	Unknown Veg Class	Hakea costata
Grevillea saccata	4		Cons. Park 41986, S boundary, ca. 0.6 km W of Gravel Pit. NW side of track at 390 m NE from its intersection with an E-W running track at 400 m E from its intersection with SEC powerline track at 2.3 km N of the road west to the mine from Brand Hwy.	MOORA	CC	14/09/1993 0:00	Y	Mid slope of shallow valley running NE to SW. Gentle to medium slope. Pale yellow sand over brown loamy	SLOPE	LOAM_SND	YELLOW	Banksia attenuata,Eucalyptus todtiana,Conospermum stoechadis,Hibbertia hypericoides	open woodland 10-30m, 0.25-20%	Banksia attenuata	low heathland 0.5-1m, 50-80%	Eucalyptus todtiana	low heathland <0.5m, 50-80%	Conospermum stoechadis	Unknown Veg Class	Hibbertia hypericoides
Grevillea saccata	4		Boundary of mining lease and Conservation Park 41986. West of population 218, at the east end of the track. Ca. 2 km directly west of Brand Hwy at ca. 5.5 km north of the junction with Mullering Rd.	MOORA	NON	15/09/1993 0:00	Y	Just below crest of rise at edge of scarp. Medium slope. Pale yellow sand over brown loamy sand.	SLOPE	LOAM_SND	YELLOW	Banksia prionotes,Nuytsia floribunda,Grevillea integrifolia,Conospermum stoechadis	open woodland 10-30m, 0.25-20%	Banksia prionotes	heathland 1-2m, 50-80%	Nuytsia floribunda	low heathland 0.5-1m, 50-80%	Grevillea integrifolia	Unknown Veg Class	Conospermum stoechadis
Grevillea saccata	4		Conservation Park 41986. N side of track, 50 m west of Gravel Reserve boundary and track intersection, at 1.1 km W of Brand Hwy and 2.1 km N of road from Brand Hwy to the mine.	MOORA	CC	16/09/1993 0:00	Y	Upper edge of scarp. Pale yellow to white sand over brown loamy sand.	RIDGE	SAND	YELLOW	Banksia prionotes,Leptospermum rubescens,Grevillea integrifolia,Adenanthos cygnorum	open woodland 10-30m, 0.25-20%	Banksia prionotes	low open shrubland 0.5-1m, 20-50%	Leptospermum rubescens	low open shrubland <0.5m, 20-50%	Grevillea integrifolia	Unknown Veg Class	Adenanthos cygnorum

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	Location	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Grevillea saccata	4		Mining lease area west of Conservation Park 41986. Track running west from the Gravel Pit Reserve 36618 at 350 m east of Western Power powerline track and 1.75 km west of Brand Hwy. Ca. 1.2 km directly W of Brand Hwy at ca. 4.8 km N Mullering Rd.	MOORA	NON	14/09/1993 0:00	Y	Lower edge of scarp. Pale yellow sand over brown loamy sand. Gentle slope. Hakea prostrata.	RIDGE	LOAM_SND	YELLOW	Banksia prionotes,Banksia attenuata,Banksia menziesii,Eucalyptus todtiana	open woodland 10-30m, 0.25-20%	Banksia prionotes	low heathland 0.5-1m, 50-80%	Banksia attenuata	low heathland <0.5m, 50-80%	Banksia menziesii	Unknown Veg Class	Eucalyptus todtiana
Grevillea saccata	4		Mining lease area west of Conservation Park 41986. Ca. 2.5 km north of the road west to the mine from Brand Hwy, and ca. 1.4 km west of Brand Hwy. Ca. 1.3 km directly west of Brand Hwy at ca. 5.5 km N of the junction with Mullering Rd.	MOORA	NON	14/09/1993 0:00	Y	Upper slope of shallow valley. Pale yellow sand over pale brown clayey sand.	OPEN_DPN	CLAY_SND	YELLOW	Eucalyptus todtiana,Nuytsia floribunda,Xanthorrhoea drummondii,Calytrix sp.	open woodland 10-30m, 0.25-20%	Eucalyptus todtiana	heathland 1-2m, 50-80%	Nuytsia floribunda	low heathland 0.5-1m, 50-80%	Xanthorrhoea drummondii	low heathland <0.5m, 50-80%	Calytrix sp.
Grevillea saccata	4		Gravel Reserve 36618. West side of the track, 250 m south of the intersection with E-W running track, 800 m west of Brand Hwy, and 1.6 km north of the road from Brand Hwy to the mine. Ca. 650 m directly W of Brand Hwy at ca. 5.1 km N of Mullering Rd.	MOORA	MRD	16/09/1993 0:00	Y	Gentle slope at upper edge of scarp. Yellow sand over brown loamy sand. Leptospermum erubescens,	RIDGE	LOAM_SND	YELLOW	Banksia attenuata,Banksia menziesii,Nuytsia floribunda,Allocasuarina humilis	tall heathland >2m, 50-80%	Banksia attenuata	low heathland 0.5-1m, 50-80%	Banksia menziesii	Unknown Veg Class	Nuytsia floribunda	Unknown Veg Class	Allocasuarina humilis
Grevillea saccata	4		Conservation Park 41986. 350 m NE along the track running from the Western Power powerline track at 3.8 km north from road to the mine from Brand Hwy. A group of 3 plants also at 200 m further south.	MOORA	CC	15/09/1993 0:00	Y	Just below crest of hill. Yellow sand over brown loamy sand. Emergent Nuytsia floribunda and Banksia atten	CREST	LOAM_SND	YELLOW	Allocasuarina humilis,Verticordia nobilis,Hibbertia hypericoides,Conospermum stoechadis	Unknown Veg Class	Allocasuarina humilis	low heathland 0.5-1m, 50-80%	Verticordia nobilis	Unknown Veg Class	Hibbertia hypericoides	Unknown Veg Class	Conospermum stoechadis
Hakea megalosperma	T	VU	Mullering Rd. On both N and and S rd verges, 5.2km to 6.1km E of Brand Hwy. (or 5.6 to 6.5km W of intersection with Wolba rd).	MOORA	LGA	02/10/2003 0:00	N	Banksia incana, Gastrolobium spinosum, Hemiandra sp., Lambertia multiflora, Daviesia pectinata	SLOPE	LOAM_SND	RED_BRWN	Nuytsia floribunda,Petrophile sp.,Allocasuarina humilis,Xanthorrhoea sp.	low open woodland <10m, 0.25-20%	Nuytsia floribunda	sparse shrubland 1-2m, 0.25-20%	Petrophile sp.	low open shrubland 0.5-1m, 20-50%	Allocasuarina humilis	low heathland <0.5m, 50-80%	Xanthorrhoea sp.
Hibbertia helianthemoides	4		UCL. Melbourne Loc 4246. Site 21, ca. 9km E of Nambung Homestead turnoff along Wongonderrah Rd (site is ca. 250m S of Rd). Dandaragan.	MOORA	NON	29/10/1999 0:00	N	Open shrubland, sparse sedges. Verticordia grandis, Xanthorrhoea preisii, Calothamnus quadrifidus.		SAND	WHITE	Banksia menziesii,Adenanthos cygnorum subsp. cygnorum,Calothamnus quadrifidus,Jacksonia nutans	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Adenanthos cygnorum subsp. cygnorum	Unknown Veg Class	Calothamnus quadrifidus	Unknown Veg Class	Jacksonia nutans
Hypocalymma linifolium	1		About 14 miles (22.5 km) north of Dandaragan, [ca 37 km] west of Moora. Herbarium record only.	MOORA	UNKNOWN	23/08/1968 0:00	N			SAND										
Hypocalymma serrulatum	2		Badgingarra National Park. S side of Cadda Rd at 8.1 - 8.2 km W of the junction with Brand Hwy.	MOORA	CC	30/05/1994 0:00	Y	Macrozamia, Eucalyptus todtiana.	OD_GULLY	SAND	BROWN	Adenanthos cygnorum,Jacksonia sp.,Banksia menziesii,Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Jacksonia sp.	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata
Hypocalymma serrulatum	2		Badgingarra National Park. Road verge on the S side of Cadda Rd at 8.1 - 8.2 km W of the juction with Brand Hwy. 0.5 km S of Wongonderra Rd, along the powerline track, at 7 km W of the junction with Brand Hwy. At the causeway across the creek.	MOORA	LGA	30/05/1994 0:00	Y	Macrozamia, Eucalyptus todtiana.	OD_GULLY	SAND	BROWN	Adenanthos cygnorum,Jacksonia sp.,Banksia menziesii,Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Jacksonia sp.	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata
Hypocalymma serrulatum	2		SE corner of Badgingarra National Park. W side of Brand Hwy, along the track extending from the Waddi Rd intersection. S side of the track, on the SW corner of a gravel scrape.	MOORA	NON	15/05/1994 0:00	N	Landform: Swamp & drainageline.	OD_DRGLN	LOAM_SND	GREY	Melaleuca sp.,Banksia sphaerocarpa,Regelia sp.,Beaufortia sp.	tall closed shrubland >2m, >80%	Melaleuca sp.	Unknown Veg Class	Banksia sphaerocarpa	Unknown Veg Class	Regelia sp.	Unknown Veg Class	Beaufortia sp.
Hypocalymma serrulatum	2		1.5 km W of Brand Hwy, at 2.5 km N of the road to Tiwest Cooljarloo Mine (or 5.5 km N of Cooljarloo Rd). Edge of mining lease and SW boundary of Conservation Park 41986. E of the creek line. 1 km E of the powerlines.	MOORA	UNKNOWN	09/01/1992 0:00	Y	Lechenaultia floribunda, Daviesia sp. Grey loamy sand and lateritic gravel.	RIDGE	SAND	GREY	Adenanthos cygnorum,Baeckea sp.,Acacia sp.,Hibbertia sp.	tall heathland >2m, 50-80%	Adenanthos cygnorum	Unknown Veg Class	Baeckea sp.	Unknown Veg Class	Acacia sp.	Unknown Veg Class	Hibbertia sp.
Hypocalymma serrulatum	2		Badgingarra National Park. N side of Bibby Rd, at 4.9 km W of the junction with Brand Hwy.	MOORA	CC	18/09/1993 0:00	N		FL_PLAIN	CLA_LOAM	BROWN	Hakea trifurcata,Allocasuarina humilis,Calothamnus quadrifidis	Unknown Veg Class	Hakea trifurcata	Unknown Veg Class	Allocasuarina humilis	Unknown Veg Class	Calothamnus quadrifidis		
Hypocalymma serrulatum	2		N & S verges of Bibby Rd, at 4.9 km W of the junction with Brand Hwy.	MOORA	LGA	18/09/1993 0:00	N		OD_DRGLN	SAND	WHITE	Eucalyptus todtiana,Banksia sp.,Adenanthos cygnorum,Hypocalymma angustifolium	open woodland 10-30m, 0.25-20%	Eucalyptus todtiana	tall closed shrubland >2m, >80%	Banksia sp.	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Hypocalymma angustifolium
Hypocalymma sp. Cataby (G.J. Keighery 5151)	2		Badgingarra Road reserve, on east side at 0.8 km north of Koonah Road, [2.6 km south of Muellering Brook].	MOORA	LGA	24/08/2003 0:00	Y	Hillside. Low shrubland with grass trees, Gastrolobium, Casuarina, Eucalyptus, Acacia and Hibbertia.	SLOPE	LOAM	BROWN	Eucalyptus todtiana,Banksia sp.,Adenanthos cygnorum,Hypocalymma angustifolium	open woodland 10-30m, 0.25-20%	Eucalyptus todtiana	tall closed shrubland >2m, >80%	Banksia sp.	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Hypocalymma angustifolium
Hypocalymma tetrapterum	3		Cooljarloo. Approx 5.5 km N of Cooljarloo Rd and 2.1 km W of Brand Hwy. SW boundary of reserve 41986.	MOORA	NON	03/04/1996 0:00	N	Allocasuarina microstachya.	CREST	SAND	GREY	Nuytsia floribunda,Banksia prionotes,Beaufortia elegans,Petrophile macrostachya	heathland 1-2m, 50-80%	Nuytsia floribunda	Unknown Veg Class	Banksia prionotes	Unknown Veg Class	Beaufortia elegans	Unknown Veg Class	Petrophile macrostachya
Hypocalymma tetrapterum	3		Cooljarloo. Approx 6.5 km N of Cooljarloo Rd and 5 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N		FLAT	SAND	GREY	Eucalyptus todtiana,Banksia menziesii,Banksia attenuata,Adenanthos cygnorum	woodland 10-30m, 20-50%	Eucalyptus todtiana	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum
Hypocalymma tetrapterum	3		Cooljarloo. Approx 6.5 km N of Cooljarloo Rd and 4.5 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N		SLOPE	SAND	GREY	Banksia prionotes,Banksia attenuata,Adenanthos cygnorum,Conospermum crassinervium	open woodland 10-30m, 0.25-20%	Banksia prionotes	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Adenanthos cygnorum	Unknown Veg Class	Conospermum crassinervium
Hypocalymma tetrapterum	3		Cooljarloo. Approx 6 km N of Cooljarloo Rd and 4.5 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N		FLAT	SAND	GREY	Eucalyptus todtiana,Banksia attenuata,Banksia menziesii,Adenanthos cygnorum	woodland 10-30m, 20-50%	Eucalyptus todtiana	Unknown Veg Class	Banksia attenuata	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Adenanthos cygnorum
Hypocalymma tetrapterum	3		Cooljarloo. Approx 6.5 km N of Cooljarloo Rd and 4 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N		SLOPE	CLA_LOAM	BROWN	Melaleuca scabra,Banksia sphaerocarpa subsp. sphaerocarpa,Kunzea recurva,Xanthorrhoea preissii	heathland 1-2m, 50-80%	Melaleuca scabra	Unknown Veg Class	Banksia sphaerocarpa subsp. sphaerocarpa	Unknown Veg Class	Kunzea recurva	Unknown Veg Class	Xanthorrhoea preissii
Hypocalymma tetrapterum	3		Cooljarloo. Approx 7 km N of Cooljarloo Rd and 3.5 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N	Hakea costata.	SLOPE	LOAM_SND	YELLOW	Xanthorrhoea preissii,Acacia pulchella,Allocasuarina thuyoides,Banksia sphaerocarpa subsp. sphaerocarpa	heathland 1-2m, 50-80%	Xanthorrhoea preissii	Unknown Veg Class	Acacia pulchella	Unknown Veg Class	Allocasuarina thuyoides	Unknown Veg Class	Banksia sphaerocarpa subsp. sphaerocarpa
Hypocalymma tetrapterum	3		Cooljarloo. Approx 5 km N of Cooljarloo Rd and 3 km W of Brand Hwy.	MOORA	NON	02/04/1996 0:00	N		OD_DRGLN	LOAM_SND	YELLOW	Verticordia densiflora,Scholtzia involucrata,Calothamnus quadrifidus,Conospermum stoechadis	low closed heathland 0.5-1m, >80%	Verticordia densiflora	Unknown Veg Class	Scholtzia involucrata	Unknown Veg Class	Calothamnus quadrifidus	Unknown Veg Class	Conospermum stoechadis
Jacksonia anthoclada	3		Badgingarra National Park. 2 km W of Brand Hwy along Wongonderra Rd.	MOORA	CC	14/03/1990 0:00	N		SLOPE	SAND	GREY		heathland 1-2m, 50-80%							
Macarthuria keigheryi	T	EN	Melbourne Location 4246. Falcon Mining Lease, south of Wongonderra Rd and west of Tiwest Cooljarloo minesite (north mine).	MOORA	NON	30/10/2007 0:00	Y	Adenanthos cygnorum,Bossiaea eriocarpa, Hibbertia crassifolium, Dasypogon obliquifolius.	FL_PLAIN	SAND	GREY	Banksia menziesii,Banksia attenuata,Eucalyptus todtiana,Petrophile linearis	Unknown Veg Class	Banksia menziesii	Unknown Veg Class	Eucalyptus todtiana	Unknown Veg Class	Petrophile linearis	Unknown Veg Class	Banksia attenuata
Patersonia spirifolia	T	EN	Yerramulla Road east side, 2.8km south of Cadda Road, on hilltop between road and old gravel pit.	MOORA	LGA	23/04/2003 0:00	N	Dense heath B	CREST	SAND	GREY	Gastrolobium spinulosum,Daviesia chapmanii,Pattersonia occidentalis,Mesomeleana stygia, Allocasuarina humilis	Unknown Veg Class	Gastrolobium spinulosum	Unknown Veg Class	Daviesia chapmanii	Unknown Veg Class	Pattersonia occidentalis	Unknown Veg Class	Mesomeleana stygia, Allocasuarina humilis
Stylidium aeonioides	4		Badgingarra NP. N boundary of park, Bibby Rd. Herbarium Record Only.	MOORA	CC	07/12/1992 0:00	N	Scattered mallees / open dwarf scrub C / low heath D/ open low sedges	CR_SUMMT	SND_LOAM	GREY	Melaleuca trichophylla,Dryandra sp.,Hakea conchifolia	Unknown Veg Class	Melaleuca trichophylla	Unknown Veg Class	Dryandra sp.	Unknown Veg Class	Hakea conchifolia		

Threatened and Priority Flora Database Search

Taxon	ConsStatus	WARank	Location	District	Vesting	CountDate	InFlower	HabNotes	Landform	SoilType	SoilColor	AssSpecies	Veg_Stru_A	Veg_domA1	Veg_Stru_B	Veg_domB1	Veg_Stru_C	Veg_domC1	Veg_Stru_D	Veg_domD1
Stylidium aeonioides	4		Wongonderrah Rd, ca. 4.5 km E of Yerramullah Rd. Herbarium Record Only.	MOORA	LGA	22/11/1992 0:00	N	Low scrub B / open Dwarf scrub C / Low heath D	CR_SUMMT	LOAM	ORANGE	Gastrolobium spinossum subsp. spinossum,Petrophile shuttleworthiana,Calothamnus torulosus	Unknown Veg Class	Gastrolobium spinossum subsp. spinossum	Unknown Veg Class	Petrophile shuttleworthiana	Unknown Veg Class	Calothamnus torulosus		
Synaphea endothrix	3		Koonah Rd, 5.5 km E of Brand Hwy. S of Badgingarra. Herbarium Record Only.	MOORA	UNKNOWN	13/10/1993 0:00	N	Small clumped shrub to 60cm tall, stems yellowish, flowers bright yellow. In Kwongan.	CREST	LOAM_SND										
Thelymitra stellata	T	EN	Private Property, Lot 3899, 914 Mullering Rd, Cataby. South side of the road, private property is unfenced. Apprx 500m east of the Mullering road bend.	MOORA	PRI	22/10/2017 0:00	Y		OU_RIDGE	SAND	YELLOW	Eucalupt, Melalueca, Xanthorrhoea, stylidium, Diuris setacea, Stylidium breviscapum								
Thelymitra stellata	T	EN	Private Property, Lot 101, 935 Mullering Rd, Cooljarloo. North side of the road, private property is unfenced. Apprx 500m east of the Mullering road bend.	MOORA	PRI	22/10/2017 0:00	Y		OU_RIDGE	SAND	YELLOW	Eucalupt, Melalueca, Xanthorrhoea, stylidium, Diuris setacea, Stylidium breviscapum								
Thelymitra stellata	T	EN	Mullering Road Reserve. Pop is ~7.5km E along Mullering Rd off Brand Hwy, in the first 'tongue' of bushland on the N verge, ~20m N from the road.	MOORA	LGA	28/09/2014 0:00	Y	Low scrub and sedges with some small grass trees. Little sign of weed on ridges but some weed infestation arround fences and close to farm roads and fire breaks.	RIDGE	SAND										
Thelymitra stellata	T	EN	Road Reserve. East side of Mullering Rd. Shire of Dandaragan. Approx 2.14km South of Waddi Rd and Mullering Rd T junction. Along the track running east, plants on the slope of breakaway S side of the track.	MOORA	LGA	20/10/2017 0:00	Y		OU_RIDGE	SAND	RED	Eucalupt, Melalueca, Xanthorrhoea, stylidium, Diuris setacea, Stylidium breviscapum								
Thelymitra stellata	T	EN	Road Reserve. East side of Mullering Rd. Shire of Dandaragan. Approx 1.2km South of Waddi Rd and Mullering Rd T junction.	MOORA	LGA	22/10/2017 0:00	Y		OU_RIDGE	SAND	RED	Eucalupt, Melalueca, Xanthorrhoea, stylidium, Diuris setacea, Stylidium breviscapum								
Thelymitra stellata	T	EN	Waddi Road Reserve, Cooljarloo. Pop is ~ 2km E on Waddi Rd off Brand Hwy. Plants are ~ 5-20m N of Waddi Rd. This spot is ~50m E of a pole which is on the southsid of Waddi Rd.	MOORA	LGA	30/09/2014 0:00	Y	Little sign of weeds, narrow (160m) strip of roadside bushland.	FLAT	SAND		Small allocasuarina and grass trees	low sedgeland <0.5m, 50-80%		low shrubland 0.5-1m, 50-80%					
Thelymitra stellata	T	EN	PP, Lot 3902, 12438 Brand Hwy, Cooljarloo. Pop is located ~5.5km N of Brand Hwy and Mullering Rd intersection. Pop is on the W side of a gravel track running N/S which is ~130m N of intersection with a sandy track running E/W.	MOORA	PRI	17/10/2016 0:00														
Verticordia insignis subsp. eomagis	3		Doodenoo Creek, 1.2 km S of Koonah Rd.	MOORA	PRI	31/10/1986 0:00	Y	Sandy loam over gravel, shallow valley.	OPEN_DPN	SND_LOAM			heathland 1-2m, 50-80%							
Verticordia rutilastra	3		Doodenoo Creek, 1.2 km S of Koonah Rd.	MOORA	PRI	31/10/1986 0:00	N	Sandy loam over gravel, in a shallow valley.	OPEN_DPN	LOAM			heathland 1-2m, 50-80%							

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Acacia epacantha	3						15 km S of Badgingarra towards Dandaragan	24/11/1976
Acacia epacantha	3	Rather dense, more or less rounded shrub, 0.5 (0.7) m tall, to 1.5 m diam.; dividing near ground level into many spreading branches; flower heads bright yellow, 10 mm diam.	gravelly loam hillside				15 km S of Badgingarra towards Dandaragan	03/08/1973
Acacia epacantha	3		gravelly loam hillside				15 km S of Badgingarra towards Dandaragan	03/08/1973
Acacia epacantha	3	Compact sub-shrub 0.2 m tall. Pinnules dark green.	Top of laterite breakaway.	Uncleared bush.			16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track	16/05/1985
Acacia retrorsa	2	Sprawling open plant, 0.4 m. Flowers yellow.	On laterite.	Heath.		Abundance: common.	11.4 km W of Brand Highway towards Cervantes, on Bibby Road	14/08/1992
Acacia splendens	T	Shrub to 4 m high.	Brown sandy loam.	Open Corymbia calophylla, Eucalyptus loxophleba subsp. loxophleba woodland over open shrubland of Acacia splendens, Hakea sp., Grevillea sp., Xanthorrhoea sp. over open low herbs of Amphipogon sp., Ptilotus sp., Rhodanthe sp.	c. 65000 plants.	Population 1B.	Shire of Dangaragan. PP, Loc. 1156. 600 m E of Muellering Road and 1.95 km S of Waddi Road, on N side of breakaway and follows creekline on both sides southeastwards	29/08/2011
Acacia splendens	T	Shrub to 4 m high. Flowering specimen.	Red, brown sandy loam.	Open Corymbia calophylla, Eucalyptus loxophleba subsp. loxophleba woodland over open shrubland of Acacia splendens, Hakea sp., Grevillea sp., Xanthorrhoea sp. over open low herbs of Amphipogon sp., Ptilotus sp. and Rhodanthe sp.	c. 20 plants seen but only partial survey.	Population 1A.	Shire of Dandaragan. Shire road reserve, 600 m E of Muellering Road on N side of breakaway, 1.9 km S of Waddi Road	22/06/2011
Acacia splendens	T	Shrub to 4 m high.	Brown sandy loam.	Open Corymbia calophylla, Eucalyptus loxophleba subsp. loxophleba woodland over open shrubland of Acacia splendens, Hakea sp., Grevillea sp., Xanthorrhoea sp. over open low herbs of Amphipogon sp., Ptilotus sp. and Rhodanthe sp.	c. 65000 plants.	Population 1B.	Shire of Dandaragan. PP, Loc. 1156. 600 m E of Muellering Road and 1.95 km S of Waddi Road, on N side of breakaway and follows creekline on both sides southeastwards	29/06/2011
Acacia splendens	T	Shrub to 4 m high.	Brown sandy loam.	Open Corymbia calophylla, Eucalyptus loxophlebe subsp. loxophleba woodland over open shrubland of Acacia splendens, Hakea sp., Grevillea sp., Xanthorrhoea sp. over open low herbs of Amphipogon sp., Ptilotus sp. and Rhodanthe sp.	c. 65000 plants.	Population 1B.	Shire of Dandaragan. PP, Loc. 1156. 600 m E of Muellering Road and 1.95 km S of Waddi Road, on N side of breakaway and follows creekline on both sides southeastwards	29/08/2011
Acacia splendens	T	Spreading tree 5 - 6 m tall, with ca. 4 main trunks from ground level (adjacent tree was single-trunked). Bark grey to grey/brown, rough on main trunks. Phyllodes thinly to moderately coriaceous, rather glaucous (more so than BRM 6024), more elongate tha					16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	16/05/1986
Acacia splendens	T	Glaucous shrub 2 m tall, bark rough.	Pale brown loam, gravel and laterite conglomerate, on breakaway scree, S aspect.	Low woodland of scattered Eucalyptus rudis, E. loxophleba and E. E. calophylla over low scrub with Acacia saligna.			16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along a track through uncleared bush	20/05/1982
Acacia splendens	T	Spindly shrub 1.5 m tall (grows to a somewhat open and craggy shrub 2 - 5 m tall (rarely tree 5 - 6 m) in this population). Mature phyllodes large, undulate, coriaceous, glaucous. Younger phyllodes at ends of branchlets not undulate, less coriaceous and	S-facing slope of a laterite breakaway.	Eucalyptus woodland.		Very common here (with BRM 6022 - 6025).	16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	16/05/1986
Acacia splendens	T	Phyllodes glaucous, undulate, lower edge often continuous with branchlet rib. Legumes pruinose, flat, slightly raised over seeds and not or scarcely constricted between them, purplish just prior to maturity. Funicle green (very young), passing through ye	Saddle between two breakaways.			Forming a very dense, almost monotypic population in exposed areas.	16 km due NW of Dandaragan: 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	01/12/1986
Acacia splendens	T	Erect open shrub 2.4 m high x 1.7 m wide. Flowers golden. Phyllodes bluish green.	Breakaway. Dry brown soil over laterite.	Low Woodland A, Eucalyptus marginata.	frequent.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Bark dark grey, rough. Phyllodes +/- straight, acuminate, rather glaucous and somewhat pruinose (but a little less bluish than BRM 6116). Legumes 6 - 7 mm wide (a little narrower than BRM 6116) only slightly pruinose. Less so than BRM 6116.	Lower southern slope of breakaway				16 km due NW of Dandaragan: 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush.	01/12/1986
Acacia splendens	T	Erect open shrub 1.8 m high x 1.4 m wide. Flowers golden. Phyllodes bluish- green.	Breakaway. Dry brown soil over laterite.	Low Woodland A. Eucalyptus marginata.	frequent.		2 km S along Mullering Road from Waddi Road,	14/05/2000
Acacia splendens	T	Erect open shrub 2.1 m high x 1.1 m wide. Flowers golden. Phyllodes bluish- green.	Alluvial flat. Dry to moist, cracked brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Erect open shrub 2.1 m high x 1.1 m wide. Flowers golden. Phyllodes bluish- green.	Alluvial flat. Dry to moist, cracked brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Erect, open shrub 2.2 m high x 1.5 m wide. Flowers golden. Phyllodes bluish green.	Slope (gentle). Dry brown soil over laterite.	Thicket. Eucalyptus rudis, Hakea.	common.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect, open shrub 2.2 m high x 1.5 m wide. Flowers golden. Phyllodes bluish green.	Slope (gentle). Dry brown soil over laterite.	Thicket. Eucalyptus rudis, Hakea.	common.		2 km S along Mullering Road from Waddi Road,	22/05/2000

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Acacia splendens	T	Erect open shrub 2.4 m high x 1.7 m wide. Flowers golden. Phyllodes bluish green.	Breakaway. Dry brown soil over laterite.	Low Woodland A, Eucalyptus marginata.	frequent.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect and open shrub 1.8 m high x 1.2 m wide. Flowers golden. Phyllodes bluish green.	Gully. Dry brown soil over laterite.	Thicket. Eucalyptus rudis, Hakea.	common.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect open shrub 2 m high x 1.4 m wide. Flowers golden. Phyllodes bluish green.	Alluvial flat. Cracked, dry to moist brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Erect open shrub 2 m high x 1.4 m wide. Flowers golden. Phyllodes bluish green.	Alluvial flat. Cracked, dry to moist brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Erect, open shrub 2.8 m high x 2.1 m wide. Flowers golden. Phyllodes bluish green.	Breakaway. Dry brown soil over laterite.	Low Woodland A. Eucalyptus marginata.	frequent.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect open shrub 2 m high x 1.9 m wide. Flowers golden, phyllodes bluish green.	Slope (gentle). Dry brown soil over laterite.	Thicket. Eucalyptus rudis, Hakea.	common.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect open shrub 2 m high x 1.9 m wide. Flowers golden, phyllodes bluish green.	Slope (gentle). Dry brown soil over laterite.	Thicket. Eucalyptus rudis, Hakea.	common.		2 km S along Mullering Road from Waddi Road,	22/05/2000
Acacia splendens	T	Erect open shrub 1.5 m high x 1 m wide. Flowers golden. Phyllodes bluish green.	Alluvial flat. Cracked, dry to moist brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Erect open shrub 1.5 m high x 1 m wide. Flowers golden. Phyllodes bluish green.	Alluvial flat. Cracked, dry to moist brown soil.	Woodland, Eucalyptus rudis.	frequent.		2 km S along Mullering Road from Waddi Road,	23/05/2000
Acacia splendens	T	Spreading tree to 3 m. Bark grey-brown, phyllodes glaucous.	South west facing slope of breakaway. Brown gravelly loam.	Open woodland over low heath C & D with Corymbia calophylla, Eucalyptus loxophleba, Haemodorum sp., Hakea sp., Xanthorrhoea sp.	at least 100 plants.		1.95 km S on Mullering Road from Waddi Road 500 m in to edge of breakaway	01/12/2005
Acacia splendens	T	Erect open shrub 1.8 m high x 1.4 m wide. Flowers golden. Phyllodes bluish- green.	Breakaway. Dry brown soil over laterite.	Low Woodland A. Eucalyptus marginata.	frequent.		2 km S along Mullering Road from Waddi Road	14/05/2000
Acacia splendens	T	Spreading tree to 3 m. Bark grey-brown, phyllodes glaucous. In mature fruit.	SW facing slope of breakaway. Sandy clay. Parent material: laterite.	Low woodland with Eucalyptus calophylla, E. loxophleba, Xanthorrhoea sp., Sollya sp.		Abundance: 100+ plants in area 10 m.	1.95 km S of Mullering Road from Waddi Road - 500 m into edge of breakaway	09/12/1995
Acacia splendens	T	Bark dark grey, rough. Phyllodes +/- straight, acuminate, rather glaucous and somewhat pruinose (but a little less bluish than BRM 6116). Legumes 6 - 7 mm wide (a little narrower than BRM 6116) only slightly pruinose. Less so than BRM 6116.	Lower southern slope of breakaway				16 km due NW of Dandaragan: 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush.	01/12/1986
Acacia splendens	T	Tall shrub 4 m high. Bark dark grey/brown and slightly roughened. Flower-heads 8 mm diam. Compared with BRM 6021 this plant (BRM 6022) lacks the characteristic large, glaucous, undulate phyllodes, its flower-heads are, however the same mid- golden colour	South-facing slope of a laterite breakaway	Woodland Eucalyptus			16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	16/05/1986
Acacia splendens	T	Erect, open, rather gangly shrubs to 3 m tall. Bark dark grey, rather roughened. Branchlets thick, prominently ribbed, more or less angular, pruinose (greenish on new shoots). Phyllodes slightly undulate, lateral veins apparnet on mature phyllodes. Juven	Slopes of laterite breakaway			Common.	300 metres due SE of Mullering Road, 2.3 km S from where it intersects Waddi Road, about 23 km due NW of Dandaragan	11/08/1983
Acacia splendens	T	Slender, single-stemmed tree 8 m tall, trunk straight and erect. Bark +/- smooth, light grey. Phyllodes grey-green to sub-glaucous. No fruit set.	Watercourse (dry) leading from breakaway on its southern side				16 km due NW of Dandaragan: 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush.	01/12/1986
Acacia splendens	T	Open, spreading shrub 3 m tall, branches slightly craggy. Bark rough, grey. Branchlets terete, faintly pruinose. Phyllodes scarcely undulate, colour as for BRM 6119. Legumes 7 mm wide, rounded over sees and very slightly constricted between them, very fa	Roadside.	Eucalyptus woodland with Banksia and dense understory.		A solitary roadside plant (?introduced).	About 17 km due NW of Dandaragan, Mullering Road, 0.5 km S of Waddi Road intersection	01/12/1986
Acacia splendens	T	Spreading tree 4 m tall, bark and phyllodes (mature and juvenile) as for BRM 5359, branchlets sometimes angular. Phyllodes narrower and differently shaped than 5359				Two plants seen in a dense population of 5359.	300 metres due SE of Mullering Road, 2.3 km S from where it intersects Waddi Road, about 23 km due NW of Dandaragan	11/08/1983
Acacia splendens	T	Spreading tree 4 m tall, bark and phyllodes (mature and juvenile) as for BRM 5359, branchlets sometimes angular. Phyllodes narrower and differently shaped than 5359				Two plants seen in a dense population of 5359.	300 metres due SE of Mullering Road, 2.3 km S from where it intersects Waddi Road, about 23 km due NW of Dandaragan	11/08/1983
Acacia splendens	T	Spreading tree 4 m tall, bark and phyllodes (mature and juvenile) as for BRM 5359, branchlets sometimes angular. Phyllodes narrower and differently shaped than 5359.				Two plants seen in a dense population of 5359.	300 metres due SE of Mullering Road, 2.3 km S from where it intersects Waddi Road, about 23 km due NW of Dandaragan	11/08/1983
Acacia splendens	T	Tall, single-stemmed, infundibular +/- mature shrub 4 m high with a rather open habit and slightly crooked main branches. Bark dark grey/brown and slightly roughened. Flower-heads 11 mm diam. Phyllodes large, undulate, glaucous, midribs pruinose.	South-facing slope of a laterite breakaway	Woodland Eucalyptus		Very common here (with BRM 6021-6022, 6024-6025).	16 km NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	16/05/1986

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Acacia splendens	T		White/red/laterite/clay/dry.	Low woodland of stunted E. calophylla over low Scrub A over open herbs. Hakea erinacea, Helipterum sp., Calothamnus quadrifidus, Billardiera.		Abundance: 100 + plants	Occurs on both road reserve and adjoining private land, 600 m ESE along track on edge of breakaway, 1.95 km S of Waddi road on Mullering road	26/09/1991
Acacia splendens	T	Low scrub up to 2 m tall. Light blue/grey phyllodes, golden yellow flowers.	Brown loam and laterite. Ironstone. Southern slope of steep valley, all the way down slope.	Growing as Low Scrub A under Low woodland A over Dwarf Scrub C over herbs and weeds. Eucalyptus calophylla, Xanthorrhoea aff. crispata.	300+ plants.		500 m E of Mullering road at point, 2.1 km S of Waddi road, 17 km NNE of Cataby BP garage	12/08/1988
Acacia splendens	T	Mid-aged, single-trunked shrub 2.5 tall (plants in this population are usually craggy, openly branched and 1-2.5 m tall, taller plants (4-5 m) are less frequent:stand structure could well be the result of fire; can flower at less than 1 m tall - perhaps					16 km due NW of Dandaragan, 2 km S along Mullering Road from Waddi Road then 0.6 km SE along track through uncleared bush	16/05/1986
Allocasuarina grevilleoides	3	Shrub 0.45 m high; pungent tips to branchlets; hairs on seeds golden brown and shining; lignotuberous.	Gravel scrape beside road. Soil lateritic gravel and sandy loam.	Very open; growing with Casuarina microstachya and C. ramosissima.		(Three specimens from one plant.)	On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road	27/01/1981
Allocasuarina grevilleoides	3	Shrub 0.45 m high; pungent tips to branchlets; hairs on seeds golden brown and shining; lignotuberous.	Gravel scrape beside road. Soil lateritic gravel and sandy loam.	Very open; growing with Casuarina microstachya and C. ramosissima.		(Three specimens from one plant.)	On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road	27/01/1981
Allocasuarina grevilleoides	3	Shrub 0.45 m high; pungent tips to branchlets; hairs on seeds golden brown and shining; lignotuberous.	Gravel scrape beside road. Soil lateritic gravel and sandy loam.	Very open; growing with Casuarina microstachya and C. ramosissima.		(Three specimens from one plant.)	On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road	27/01/1981
Allocasuarina ramosissima	3	Height 0.8 m; branchlets sinuose whorled, interlocking, flexible. Non ligno- tuberous.	On gravel scrape beside road. Lateritic gravel and sandy loam soil.	Very open; growing with Casuarina microstachya and C. ramosissima.			On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road [Ca 12 km SE of Badgingarra]	27/01/1981
Allocasuarina ramosissima	3	Height 0.8 m; branchlets sinuose whorled, interlocking, flexible. Non ligno- tuberous.	On gravel scrape beside road. Lateritic gravel and sandy loam soil.	Very open; growing with Casuarina microstachya and C. ramosissima.			On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road [Ca 12 km SE of Badgingarra]	27/01/1981
Allocasuarina ramosissima	3	Shrub to 0.6 m; branchlets glaucous; curved stigmas, dull red brown.	Gravel pit. Lateritic gravel soil.	Open vegetation (low shrubland).			10.8 km E of junction of Brand Highway and Badgingarra Road, on North West Road [Ca 4 km S of Old Badgingarra]	14/11/1978
Allocasuarina ramosissima	3	Height 0.8 m; branchlets sinuose whorled, interlocking, flexible. Non ligno- tuberous.	On gravel scrape beside road. Lateritic gravel and sandy loam soil.	Very open; growing with Casuarina microstachya and C. ramosissima.			On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road [Ca 12 km SE of Badgingarra]	27/01/1981
Allocasuarina ramosissima	3	Height 0.8 m; branchlets sinuose whorled, interlocking, flexible. Non ligno- tuberous.	On gravel scrape beside road. Lateritic gravel and sandy loam soil.	Very open; growing with Casuarina microstachya and C. ramosissima.			On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road [Ca 12 km SE of Badgingarra]	27/01/1981
Allocasuarina ramosissima	3	Height 0.8 m; branchlets sinuose whorled, interlocking, flexible. Non ligno- tuberous.	On gravel scrape beside road. Lateritic gravel and sandy loam soil.	Very open; growing with Casuarina microstachya and C. ramosissima.			On North West Road, 10.8 km E of junction of Brand Highway and Badgingarra Road [Ca 12 km SE of Badgingarra]	27/01/1981
Allocasuarina ramosissima	3	Open shrub. Height: 1.35 m and width: 2.95 m. Flower colour: yellow, red and brown. Female.	Topography: hillside. Collection site: road verge, very narrow, mown road verge. Soil colour: brown. Soil disturbed old. Soil: loam ironstone gravel.	Associated vegetation: low shrubland, bare areas. A few shrubs along cleared mown road verge, right next to paddock fence (which is herbicide-sprayed on the other side). Characteristic species: Gastrolobium, Grass trees, Casuarina, Eucalyptus, Hibbertia,	2-5 plants.	Population structure: 100% flowering. Reproductive method: seeds. Total weed cover: over 50% of site.	Badgingarra Road, 0.8 km N of Koonah Road intersection, W side of road	24/09/2003
Andersonia gracilis	T	Open straggly shrub 10-30 cm x 10-40 cm wide. Woody stems, pink flowers. Most plants appear very old.	Slight depression. Dry ? seasonally moist grey sand over clay.	Low Heath D to C. Melaleuca, Calothamnus.		Abundance: frequent	5.6-6.1 km W of Brand Highway on Wongonderrah Road, S side, c. 50 m off the road,	22/11/1996
Andersonia gracilis	T		Swamp. Dry, yellow sand-loam.	Low Closed Heath with Calytrix aurea, C. drummondii, Hakea conchifolia, Banksia incana, Beaufortia squarrosa.	24 mature plants.		Vacant Crown Land on northern end of Tiwest Joint Venture lease area, N of Cataby along Brand Highway	14/01/1999
Andersonia gracilis	T	Intertwined shrub 50 cm tall. Flowers pale lilac.	In white sand over nodular ironstone.	Low heath with Kingia.			12 km W of Gingin - Dongara road on road to Nambung National Park	29/11/1974
Andersonia gracilis	T	Slender shrub 40 cm; calyx and corolla pink.	On damp, sandy-clay flat.	In open heath.			Corner of Wongonderrah Road and Yerramullah Road	15/10/1984
Andersonia gracilis	T	Open straggly shrub up to 1 m high x 30 cm wide. Flowering, Pale pink to lilac flowers, lower part of branchlets bald.	Depression, dry winter moist grey sand over clay.	Low Heath D - C. Melaleuca, Calothamnus.		Abundance: locally frequent. Grows tall within other shrubs. Healthy habitat. P.C. recorded in area.	100 m E of Yerramullah road on Wongonderrah road,	22/11/1996
Andersonia gracilis	T	In moderate to heavy mature fruit.	Grey sandy clay, seasonally waterlogged.				Wongonderrah Nature Reserve, Wongonderrah and Yerramullah Roads, ca 11.5 km W of Brand Highway	10/01/1997
Andersonia gracilis	T	Shrub to 1 m.	Grey sand over sandy clay.	Open shrubland (2 m high). Associated species: Hakea spp., Grevillea spp., Melaleuca sp., Calothamnus sp. and Banksia sp.	c. 46 plants.	Population 4B.	Wonganderrah Road, S side road verge, c. 5.5 km - 6.1 km W of the intersection with Brand Highway. UCL S side into VCL	05/01/2012
Andersonia gracilis	T	Slender shrub, to 0.2 m.	Midslope upon an undulating plain. Grey and white sand.	Heath of Banksia telmatiaea.		Cooljarloo West Flora and Vegetation Survey 12 - 37.	C. 8 km SW of the corner of Wongonderrah Road and Brand Highway	20/11/2012
Andersonia gracilis	T	Slender shrub 50 cm; flowers pink.	On clay flat near swamp.				Strathmore Road Reserve (No. 26248) S of Badgingarra	05/11/1975

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Andersonia gracilis	T		Landform: valley flat, Slope - 0; Soil: brown sand/ red gravelly loam; Drainage: poor, winter damp.	Structure (Muir 1977): Open Dwarf Scrub C/ Low Heath D/ Very Open Herbs; Major spp: Calothamnus hirsutus, Verticordia densiflora var. densiflora, Kunzea recurva; long unburnt.			AMG-Zone 50 346310mE 6618212m N; Wongonderrah Rd, E of Yerramullah Rd, SSE of Cervantes.	22/11/1992
Angianthus micropodioides	3	Low herb with blue-green glaucous or reddish leaves and yellow flower heads.	Roadside drainage ditch, swampy depressions.	Low heath scrubland.			E edge of Nambung National Park, Mullering Brook Region	29/11/1974
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Rhizomatous perennial herb 80 cm. Red/yellow flowers.	Undulating hills. White sand over laterite gravel.	Proteaceous heath. With Allocasuarina humilis, Hakea incrassata, Lambertia multiflora, Xanthorrhoea drummondii, Calothamnus hirsutus.	scattered 3 specimens located.		Lot 3897 Mullering Road, Dandaragan	31/10/2013
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Scapes 60-80 cm tall.	E bank of creek, alluvial powdery brown clay loam.	Eucalyptus wandoo puluerea 15-18 m woodland over Scholtzia 2 m thicket over Calothamnus quadrifidus, Hypocalymma angustifoilum, Hakea lissocarpha and Briza maxima.		Common 200+ plants, some still green but finished flowering.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmea, Conostylis		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2	Erect hirsute herb, scapes to 90 cm tall, still green.	Alluvial flat, powdery brown clay loam.	Eucalyptus wandoo puluerea 8-15 m and marri Open Low Woodland A over Scholtzia open scrub over dwarf heath of Ptilotus manglesii, P. stirlingii, Hakea lissocarpha, Loxocarya ?flexuosa, Baeckea camphorosmae, Conostylis.		aculeata breviflora. Collected tallest scape on each of plants on a 10 m line transect.	S of (Old) Badgingarra	19/12/1988

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	2		North aspect of brown-grey sandy loam.	Open woodland of marri and wandoo with heath beneath to 1.5 m, Allocasuarina humilis, Conospermum stoechadis, Diplopeltis huegelii, Xanthorrhoea sp.		Abundance: estimated 10+ mature plants, in flower.	Waddi Road, Mullering Brook crossing south side, west side of brook	26/09/1991
Anigozanthos viridis subsp. terraspectans	T	Perennial herb, to 0.2 m.	In rehabilitation.				Ca 10 km WSW of intersection of Wongonderrah Road and the Brand Highway in rehabilitation	21/11/2012
Arnocrinum gracillimum	3	Perennial herb 25 cm. In flower - lilac.	Sandy flats. Grey sand over laterite. Laterite gravel 15%.	Proteaceous heath. With Banksia candolleana, Allocasuarina humilis, Lambertia multiflora, Petrophile macrostachya, Hakea spathulata, Xanthorrhoea drumondii.	8 individuals recorded in survey area.		Crown Reserve adjacent to Brand Highway, Lot 4134 Brand Highway, Dandaragan	31/10/2013
Arnocrinum gracillimum	3	Herb to 0.1 m, in flower.	Lower slope. Yellow sand.	Mixed Banksia attenuata / B. menziesii / B. prionotes woodland, with Melaleuca clavifolia.	10 plants.		Near Pinjar-Eneabba transmission line in UCL ca 3 km S of Wongonderrah Road, just E of Wongonderrah Nature Reserve, ca 10 km W of Brand Highway, ca 20 km SW of Badgingarra	18/11/2010
Arnocrinum gracillimum	3		Landform: flat, Slope - 0; Soil: grey sand / yellow sand; Drainage: good.	Structure (Muir 1977): Low Woodland B / Low Scrub B / Open Dwarf Scrub C / Low Heath D / Open Low Sedges; Major spp: Banksia prionotes, Banksia attenuata, Adenanthos cygnorum ssp. cygnorum; long unburnt.			AMG-Zone 50 344503mE 6618300m N; Wongonderrah Rd, W of Yerramullah Rd, SSE of Cervantes.	22/11/1992
Babingtonia urbana	3	Pink flowered shrub, 0.8 m high x 0.8 m wide.		Heath of Banksia telmatiaea 1 m, Beaufortia squarrosa 1.4m, Acacia pulchella 1m, Jacksonia hakeoides, Kingia australis 0.5 m, emergent Adenanthos cygnorum 1.5 to 2 m, Petrophile seminuda Western Swamps Form 1m, Isopogon panduratus subsp. palustris 1.5m,	locally common. >10,000 in estimated area >1km x 1 km.		Roadside verge of Yerramullah Road, 750 m N of Wongonderrah	06/02/2014
Babingtonia urbana	3	Open shrub to 1.2 m high x 1.2 m wide. Petals pink.	Low flat. Winter wet. Brown loam.	Mixed heath, mostly 1-1.5 m with Kunzea micrantha, Melaleuca viminea, Calothamnus hirsutus.	scattered.		Yerramullah Road 9.7 km S of Bibby Road, SW of Badgingarra	04/01/2005
Baeckea sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606)	1	Shrub 0.3 m to 0.5 m.	Slope high in landscape. White sand over laterite.	Heath, Scholtzia sp.			Dandaragan area, 3.8 km W of Mullering Road along north property line of Lot 3897. Edge of firebreak E of Brand Highway	18/03/2003
Banksia nana	3	Prostrate.	Sandy laterite, near top of ridge.	Low open heath.			Water tank S of Badgingarra	01/08/1983
Banksia nana	3	Stems underground; leaves blue-green; perianth tube pale greenish; claws cream or pale pink, limb yellow.	In sand over laterite.	In Kwongan.			c. 61 km N of Regans Ford on Brand Highway,	10/10/1996
Beaufortia bicolor	3	Shrub to 0.35 m; branches; filaments cream-yellow in lower half, dark pink in top half; anther red, pollen yellow; no scent.	Grey sandy loam.	"Low closed heath" (Specht-ABRS), emergent Adenanthos and Banksia to 3 m.			1 km S of Wongonderrah Road junction on Brand Highway	14/11/1978
Beaufortia bicolor	3	Dense shrub 0.5-1 m, flowers varying from pink-and-white to reddish and pale yellow.	On plain of whitish sand.	Heath ca 1 m tall.			By Brand Highway 2 km S of Badgingarra.	05/12/1982
Beaufortia bicolor	3	Compact dwarf shrub, 30 cm high, 30 cm wide, flowers red/yellow.	Hill, grey sand over deep sand.	Heath.	frequent.		30 km ENE of Cervantes	12/12/1995
Beaufortia bicolor	3	Shrub, 50 cm tall.	Sandy lateritic rise.	Allocasuarina humilis, Calothamnus sanguineus, Xanthorrhoea drummondii, Banksia telmatiaea, Adenanthos cygnorum, Hakea conchifolia, Schoenus sp., Banksia shuttleworthiana, Mesomelaena pseudostygia.	55 plants in 100 m x 200 m.		Cooljarloo West Tronox Pty Ltd lease	08/12/2016
Beaufortia bicolor	3	Low shrub to 0.5 m, in flower and fruit.	Plain. Grey sand.	Mixed Banksia attenuata / B. menziesii with Melaleuca clavifolia.	10+ plants.		Near Pinjar-Eneabba transmission line in UCL just S of Wongonderrah Road, just E of Wongonderrah Nature Reserve, ca 10 km W of Brand Highway, ca 20 km SW of Badgingarra	18/11/2010
Beaufortia bicolor	3	Shrub, flowers bicoloured but predominantly yellow.					16 km S of Badgingarra on Brand Highway	19/12/1984
Beaufortia bicolor	3	Seedling.	Burnt ca 1 year before; grey sand over laterite.	Low Heath C - Banksia candolleana, Adenanthos cygnorum, Conospermum stoechadis.			Badgingarra National Park	11/11/1982
Beaufortia bicolor	3	Shrub to 40 cm.	Grey sand over laterite.	Low Heath C - Banksia canolleana, Adenanthos cygnorum, Conospermum stoechadis over open low sedges.			Badgingarra National Park on Brand Highway	11/11/1982
Beaufortia bicolor	3	Shrub.	White sand over laterite.	Kwongan.			Badgingarra National Park, Brand Highway 4.3 km S of Bibby Road	07/11/1984
Beyeria gardneri	3	Viscid shrub with small yellowish flowers, also in fruit, to 0.3 m high.					Approx. 10 km N of Cataby, 2 km W of Brand Highway	12/09/2009
Calectasia palustris	2	Stilting undershrub to 70 cm.	Deep white sand.	Low proteaceous heath (Kwongan to 0.4 m). Swampy area with Anigozanthos pulcherrimus, Banksia ?micrantha, Byblis gigantea, Calytrix spp., Grevillea preissii subsp. preissii and Melaleuca ?systena.	occasional (very locally common). Population totals c. 120 plants.		11.6 km W of Brand Highway on Wongonderrah Road, 25 m past intersection with Yerramullah Road on S side of road, 25 m W of Wongonderrah Nature Reserve,	30/07/1999

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Calectasia palustris	2	Stilting undershrub to 70 cm.	Deep white sand.	Low proteaceous heath (Kwongan to 0.4 m). Swampy area with Anigozanthos pulcherrimus, Banksia ?micrantha, Byblis gigantea, Calytrix spp., Grevillea preissii subsp. preissii and Melaleuca ?systena.	occasional (very locally common). Population totals c. 120 plants.		11.6 km W of Brand Highway on Wongonderrah Road, 25 m past intersection with Yerramullah Road on S side of road, 25 m W of Wongonderrah Nature Reserve,	30/07/1999
Calectasia palustris	2		Moist, grey clay-loam over limestone in a swamp.	Harperia latifolia, Calytrix depressa, C. flavescens, Verticordia densiflora, Melaleuca ciliata and Petrophile brevifolia.		Condition of population and disturbed. Weeds.	Quadrat 7 of Transect 3 of control plot WTHT for Environmental Department, Iluka Resources, Badgingarra	14/10/2002
Calectasia palustris	2	Small shrub to 40 cm tall. Purple flowers with showy yellow anthers.	Low lying flat (swamp) with white sand.	Low heath with Acacia sp., Banksia sp., Conostylis sp., Grevillea sp., Hemiandra sp., Melaleuca sp. and Verticordia sp.	at least 30 plants. Plants located S of drain and W of track running S (pop. RL Barrett 1307).		SW of intersection of Wongonderrah and Yerramullah Roads (SW of Badgingarra)	04/09/2007
Calectasia palustris	2	Small shrub to 40 cm tall. Purple flowers with showy yellow anthers.	Low lying flat (swamp). White sand.	Low heath. With Acacia sp., Banksia sp., Conostylis sp., Grevillea sp., Hemiandra sp., Melaleuca sp., Verticordia sp.	at least 30 plants.		SW of intersection of Wongonderrah and Yerramullah Roads (SW of Badgingarra). Plants located south of drain and W of track running S (pop. R.L. Barrett 1307)	05/11/2007
Calectasia palustris	2	Perennial herb with several erect stems; tepals deep blue turning reddish. Flowers almost over.	On damp sandy clay flat.	In open heath.			Corner of Wongonderrah Road and Yeeramullah Road,	15/10/1984
Calytrix ecalycata subsp. brevis	3	Shrub about 1 m tall. Flowers yellow.	On dry sandy plain.				N of Perth between Moora and Jurien Bay	16/08/1973
Catacolea enodis	2			Sand heath with mixed shrubs.			6.9 km from Brand Highway on Bibby road (Cervantes road); [c. 14 km (direct) SW of Badgingarra]	06/09/1990
Catacolea enodis	2	Tufts to 30 cm.	Red laterite ground.	Various shrubs.			13.5 km S of Badgingarra on Brand Highway	08/09/2004
Catacolea enodis	2	Restio to 30 cm tall with nodding inflorescences (male).	Hill, grey-brown clay loam over laterite.		a few plants seen (male plants only).		Brand Highway reserve, W side of Brand Highway, ca. 1.6 km N of the intersection between Brand Highway and McNamara Road, ca. 6 km S of Badgingarra	07/11/2017
Chordifex chaunocoleus	4	Sedge.	On brown clay-loam.	Heath with Melaleuca scabra, Banksia sphaerocarpa subsp. sphaerocarpa, Kunzea recurva, Xanthorrhoea preissii.			10 km N of Cataby	02/04/1996
Chordifex reseminans	2		Drainageline gully, moist yellow/brown sand.	Dense shrubline of Adenanthos cygnorum, Jacksonia sp., Banksia menziesii, B. attenuate, Macrozamia with emergent Eucalyptus todtiana.		Abundance: estimated 10,000+ mature, vegetative, over several hundred metres area.	8.1 km W along Cadda Road from Brand Highway, wet lowlying area at base of low hills extending for some distance to the SW	30/05/1994
Chordifex reseminans	2	Herb ? caespitose. 30+ cm high. Not in flower.	Yellow/grey/brown sand. Natural drainage line.	Shrubland, Adenanthos cygnorum, Banksia menziesii, B. attenuata, Jacksonia sp., Eucalyptus todtiana, Macrozamia.	abundant in local area.		Badgingarra National Park, 8.1 km W of Brand Highway adjacent to Cadda Road in buffer	/07/1994
Chordifex reseminans	2	Sedge.	Drainage line. Brown sand.	Dense Heath B. Associated species: Conospermum sp., Allocasuarina sp., Macrozamia riedlei, Adenanthos cygnorum, Banksia attenuata, B. menziesii, Eucalyptus todtiana, Hypocalymma serrulatum.	1000's.		Cadda Road, 7.9 km W of Brand Highway, northern boundary of Badgingarra National Park (Population 3)	01/11/2002
Chordifex reseminans	2		Landform: vale (upper drainage line). Slope - 0; Soil: grey sand; Drainage: good.	Structure (Muir 1977): Scattered Low Trees/ Open Low Scrub A/ Low Scrub B/ Low Heath C/ Dwarf Scrub D/ Open Low Sedges; Major spp: Banksia menziesii, Jacksonia sp., Restio chaunocoleus.			AMG-Zone 50 346875mE 6635457mN; N boundary of Park, Bibby road, Badgingarra National Park (Reserve 31809), W of Badgingarra.	07/12/1992
Chordifex reseminans	2	Note wide opening of fruit and striped.	Depression; slightly sloping country, below laterite hill. Deep peaty sand, somewhat moist at time of collection.	Shrubland.		Abundance: Locally abundant, very localised. Not seen elsewhere, but thought to occur at one other similar lens nearby.	8 km (+/-0.2 km) W of along Cadda road from Brand highway turn off 3 km N of Badgingarra, N boundary of Park, Badgingarra National Park	08/09/1990
Comesperma rhadinocarpum	3	Small slender herb to 40 cm with pale blue-purple flowers and narrow, pointed fruits.	Lower slope of hill, grey-brown sandy loam.		common.	Plants predominantly on gravel shoulder of highway, some extending into vegetation.	Brand Highway reserve, W side of Brand Highway, ca. 400 m S of the intersection between Brand Highway and Wongonderrah Road, ca. 20 km S of Badgingarra townsite	09/11/2017
Conospermum scaposum	3		Sand plain with white sand. Road verge regrowth.				Wongonderrah Road, ca. 2.3 km W of Yerramullah Road, (SE of Cervantes)	09/01/2008
Conostephium magnum	4	Shrub, 1.1 m high, spreading from 3-4 main stems. Flowers white and mauve.	Disturbed, roadside site. On grey brown sand.	Margin of Banksia swamp.	locally frequent.		4 km S along Yerramullah Road, margin of Badgingarra National Park	15/08/1986
Conostephium magnum	4	Multistemmed shrub 50 cm x 50 cm, fruiting.	Dry grey sand. Sand dune.	Shrubland with Banksia attenuata, Adenanthos cygnorum, Bossiaea eriocarpa, Allocasuarina humilis and Dryandra tortifolia.		Abundance: 750 plants.	Conservation Park 41986 on Brand Highway, N of Cataby	27/11/1996
Conostephium magnum	4	Tall shrub to 2 m high. Flowers conical, widest below the middle, corolla white with rose tips.	On sand.			Abundance: very scattered.	Between Moore and Hill Rivers on the Northern Sand Plains: 10.6 km N of Cataby Road House, track off to the W side,	10/09/1981
Conostephium magnum	4	Plant to 1.6 m tall.	Ridge, concretionary gravel.	Low woodland of Banksia prionotes and Adenanthos cygnorum, assoc. with Boronia sp., Leptospermum ellipticum.	1 mature plant, flowering, healthy.		Ca 3.5 km N of road into Tiwest Cooljarloo Mine Site on edge of firebreak W of Brand Highway, on gravel ridge	14/09/1993
Conostephium magnum	4	Erect shrub 1 m high.	Yellow sand and lateritic gravel.	Scrub of Adenanthos cygnorum.	2 plants.		Brand Highway at 50 m N of Wongonderrah Road	05/08/1992
Conostephium magnum	4	Shrub 180 cm tall, 1 stemmed at base, extensively branched above; leaves and flowers on upper 2-5 cm of branches; sepals and bracts white, corolla tip purple.	E facing slope (above road). Laterite with small rocks and humusy sand between.	Scrub 1-2 m tall, mostly less than 1 m tall; Xanthorrhoea, Proteaceae, Myrtaceae (including Calothamnus), Casuarina, Leucopogon conostephioides complex.	rare.		Road to Waddi Farm, 700 m N of bridge at entrance: ca 20 km S of Badgingarra,	02/10/1997

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Conostephium magnum	4	Erect shrub to 90 cm high x 90 cm wide. Plants single-stemmed at ground level but very robust and possibly fire tolerant. Flowers pendulous, corolla pink.	Upland. Dry white sand over laterite at depth.	Mixed heath with emergent Eucalyptus todtiana. With Banksia menziesii, Banksia attenuata, Hypocallyma xanthopetalum.	locally common.		High Hill corner of Badgingarra National Park, on internal firebreak ca 150 m W of corner	26/07/2008
Conostephium magnum	4		Gentle W slope, white sand.	Heath to 1 m and 0.5 m and emergent trees, assoc. with Xanthorrhoea drummondii, Adenanthos cygnorum, Nuytsia floribunda, Eucalyptus todtiana, Lambertia multiflora, Jacksonia sp.		Abundance: estimated 5+ mature plants, flowering, healthy.	Edge of firebreak W side of Brand Highway, ca 500 m N of road into Ti West Cooljarloo Minesite	13/09/1993
Conostephium magnum	4		Grey sand.				Private property, SE cnr of intersection of Brand Highway and Waddi Rd, S of Badgingarra	28/09/1992
Conostephium magnum	4		Grey sand.				Private property, SE cnr of intersection of Brand Highway and Waddi Rd, S of Badgingarra	28/09/1992
Conostephium magnum	4	Erect shrub to 1.5 m, in flower.	Plain on edge of winter-wet depression. Grey sand.	Banksia attenuata / B. menziesii woodland with Melaleuca clavifolia.	100+ plants.		Near Pinjar-Eneabba transmission line in UCL adjacent to Tiwest Cooljarloo minesite, a few km N of main mine entrance road, ca 1 km W of Brand Highway, ca 15 km N of Cataby	17/11/2010
Conostephium magnum	4	Tall shrub >1 m.	Sandplain.	Banksia attenuata and B. menziesii low open woodland.	5 plants.		Ca. 12 km N of Cataby	06/10/2016
Conostephium magnum	4	Tall, much-branched shrub, but single at base. 1 - 1.6 m high x 1 m wide. Flowers creamy - white, apex red - purple, spicy scent; in flower.	Slope. White sand over sand - laterite.	Banksia attenuata / B. menziesii low open woodland.	locally very common.		Southern boundary of Badgingarra National Park, N of Waddi Road	26/08/2015
Desmocladus biformis	3	Tangled perennial herb, just past flowering.	Lateritic sandy soil.		common, some evidence clumps interconnected.		5 km S of New Badgingarra	09/09/1979
Desmocladus biformis	3	Male.	Depression, in low heathland, on yellow sand.	Low heathland.	locally common.		Brand Highway 1 km S of Badgingarra	24/08/2003
Desmocladus biformis	3	Restio to 20 cm (male) and 10 cm (female).	Lower slope of hill, brown clay loam with laterite gravel.		somewhat common.	Male and female specimens collected.	Brand Highway reserve, W side of Brand Highway, ca. 5 km S of the intersection between Brand Highway and Wongonderrah Road, ca. 25 km S of Badgingarra	09/11/2017
Desmocladus elongatus	4		Grey sand/midslope.	Low heath.			New Badgingarra townsite AMG 50JLM559362 (Badgingarra 1:50,000 sheet)	23/09/1988
Desmocladus elongatus	4	Erect caespitose sedge 27 cm high.	Red-brown sandy clay, slight rise lateritic.	Open shrubland.		Abundance: occasional	5.6 km E of Brand Highway along Mullering road	02/07/1992
Desmocladus elongatus	4	Tufted herb 25-35 cm high with brown spikelets. Male plant.	In white sandy soil.	In heath in assoc. with Eucalyptus sp., Hakea sp., Banksia sp., Conostylis sp., etc.		Abundance: common.	65 miles (104.6 km) NNW of Gingin. [11 km S of Badgingarra]	02/09/1970
Desmocladus microcarpus	2	Very small clumps. Stems green (not greyish).	White sand with laterite gravel. Mostly on disturbed site of old road and road verge.		rare.		13 km (direct) SSW of Badgingarra, Bibby road, c. 3.8 km W of Brand Highway towards Cervantes	06/09/1990
Desmocladus microcarpus	2		Upland, well drained; shallow grey sand over lateritic gravel and duricrust.	Low open heath.		O. laxiflorum is restricted to the Southern Sandplains. pers. comm. B.G. Briggs, August 2009.	Badgingarra National Park, just W of Brand Highwawy near new Townsite, along Dampier to Perth Gas pipeline route	06/10/1981
Desmocladus microcarpus	2			Eucalyptus lane-poolei woodland.			Bibby Road, ca 5 km W of Brand Highway	/09/1990
Desmocladus microcarpus	2			Eucalyptus lane-poolei woodland.			Bibby Road, ca 5 km W of Brand Highway	/09/1990
Desmocladus nodatus	3	Grassy herb to 0.1, flowering.	Flat. Orange/brown sandy loam.		1 plant seen.		Ca 32 km WN-W of Dandaragan, 5 km W of the Brand Highway on Tiwest Cooljarloo minesite	20/10/2010
Desmocladus nodatus	3	Tufted perennial herb.	On sandy clay, seasonally wet.	In Banksia telmatiaea heath over sedges.		O. laxiflorum is restricted to the Southern Sandplains. pers. comm. B.G. Briggs, August 2009.	N Woolka Road ca 8 km W junction Cooljarloo Road AMG 50JLM382040 Wedge Island 1:100,000	06/11/1988
Desmocladus nodatus	3	Sedge to 15 cm. Female.	On yellow sandy loam.	Low heath with Verticordia densiflora, Scholtzia involucrata, Calothamnus quadrifidus, Conospermum stoechadis.			10 km N of Cataby	23/01/1996
Desmocladus nodatus	3	Sedge to 10 cm. Female.	On yellow sandy loam.	Low heath with Verticordia densiflora, Scholtzia involucrata, Calothamnus quadrifidus, Conospermum stoechadis.			Tiwest, 10 km N of Cataby	12/12/1995
Desmocladus nodatus	3	Small sedge to 0.2 m.	Edge of winter-wet depression. Grey sand.	Heath with Banksia telmatiaea, with Melaleuca clavifolia, Verticordia lindleyi subsp. lindleyi.	5+ plants.		Near Pinjar-Eneabba transmission line in UCL adjacent to Tiwest Cooljarloo minesite, 5 km N of main mine entrance road, ca 3 km W of Brand Highway, ca 15 km N of Cataby	17/11/2010
Desmocladus nodatus	3	Female. Caespitose perennial sedge.	On clay flat near swamp.			O. laxiflorum is restricted to the Southern Sandplains. pers. comm. B.G. Briggs, August 2009.	Strathmore Road Reserve (no. 26248), S of Badgingarra	05/11/1975
Desmocladus nodatus	3		Drainageline. Dry grey sand.	Heath dominated by Banksia telmatiaea with mixed shrubs.		Condition of population: healthy.	Tiwest Falcon project area, SW of Wongonderrah Nature Reserve, ca 20 km N of Cataby	11/10/2006
Desmocladus nodatus	3		Dampland. Grey sand.	Low heath with emergent Banksias.		Mining threat. 7 records in 5 km, none elsewhere.	Cooljarloo / Falcon Mining Lease (UCL), Midwest Region, Moora District, Shire of Dandaragan	27/08/2008

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Desmocladus nodatus	3		Topography: plain. Slope: flat. Surface soil: sandy. Soil colour: grey. Leaf litter: 30% cover, <0.5 cm depth. Distribution: mainly under shrubs. Wood litter: sparse. Disturbance details: very few weeds. Kangaroos grazing in this area. Fire history: old.	Sparse Kingia australia and Banksia menziesii over low heath. Vegetation condition: excellent. Total vegetation cover: 75% (overstorey/understorey). Trees <5 m, 2-10%: Banksia menziesii. Shrubs >2 m, 0-2%: Jacksonia hakeoides, Jacksonia nutans, Kingia au			Site 34, 10 km E of Nambung Homestead along Wongonderrah road, 1.75 km S of road	30/10/1999
Desmocladus nodatus	3	Small dense clumps to 15 cm across. Male plant.	Slightly moist site. On sand.	Open woodland with Banksia attenuata, Melaleuca spp. and other shrubs.	locally frequent.		Wongonderrah Road opposite junction with Yerramullah Road, just W of Wongonderrah Nature Reserve	17/10/2008
Desmocladus nodatus	3	Small dense clumps to 15 cm across. Female plant.	Slightly moist site, sand.	Open woodland with Banksia attenuata, Melaleuca spp. and other shrubs.	locally frequent.		Wongonderrah Road opposite junction with Yerramullah Road, just W of Wongonderrah Nature Reserve	17/10/2008
Drosera leioblastus	1		Sandy white soils, surrounded by laterite.				14.3 km N of Cataby, on Brand Highway	29/09/1985
Drosera leucostigma	1						Brand Highway, 14.3 km NW of Cataby	08/12/1983
Drosera leucostigma	1		White sand.				On Brand Highway, 14.3 km N of Cataby	07/11/1987
Drosera prophylla	3	Free standing/upright. Herb. Plant pale green up to 30 cm high. Petals white, leaves scattered, lamina orbicular inflorescence a panicle.	White soil, laterite sand over laterite rock. Found on the tops of hills only, in laterite/silica sand mixture.	Shrubland/heath.	occasional.		Brand Highway, 17.2 km N of Cataby Brook	23/06/1983
Drosera prophylla	3	Tuberous herb with white flowers.	In laterite-silica sand soils, only on hill tops in open ground.	Heathland.			On Brand Highway, 17.2 km N of Cataby; C.R.D. of W.A. map 69, A1	23/06/1983
Drosera prophylla	3	Tuberous herb with white flowers.	In laterite-silica sand soils, only on hill tops in open ground.	Heathland.			On Brand Highway, 17.2 km N of Cataby; C.R.D. of W.A. map 69, A1	23/06/1983
Drosera prophylla	3	Erect perennial herb. Flowers white.	Upland. Dry grey sand over laterite.	Low heath mostly 0.5-1 m with Calothamnus sanguineus, Allocasuarina humilis, Stirlingia latifolia, Hibbertia hypericoides.	common, at least many hundreds in this area.		Badgingarra National Park along walk trail c. 1 km W of Brand Highway	19/07/2004
Drosera prophylla	3	Erect, tuberous perennial herb, 30 cm high x 3 cm wide, flowers white.	Hill, shallow grey-white sand over laterite.	Low scrub, associated with Daviesia epiphyllum.	occasional.		Ca. 15 km N of Cataby along Brand Highway, then 1 km E along track	18/07/2018
Eucalyptus absita	T	Tree to 4 m x 6 m.	Brown, grey sand.	Isolated Eucalyptus over open heathland. Associated species: Hakea incrassata, Melaleuca radula, Hypocalymma sp. and Isopogon sp.	1 individual.	Population 2.	Shire of Dandaragan. Badgingarra Road 3.4 km S of junction with North West Road	25/02/2011
Eucalyptus absita	T	Large spreading mallee 5 m tall, bark rough to 1 m only, leaves glossy green, no pith glands.					Between Brand Highway and Badgingarra - Dandaragan road, S of road and creek, on farm, 1 km W of Dunearn road, 1.2 km SSE of Dunearn Farm	13/11/1991
Eucalyptus absita	T	Erect open mallee 4 m high.	White lateritic sand.	Open shrubland in paddock.		Abundance: occasional		02/07/1992
Eucalyptus absita	T	Mallee 8 m. Bark rough, red-brown for 1 m, then smooth pink-grey; bark shed in ribbons.	In paddock 200 m S of creek.	With E. wandoo, E. rudis, E. loxophleba and hybrid E. loxophleba x absita.		Abundance: single plant.	Koonah Road, 3 km W of Badgingarra - Dandaragan Road	11/04/1991
Eucalyptus absita	T	Mallee. Rough bark at base of trunks. Smooth green bark on top half of trunks- branches.	Cleared paddock on private property. Slope, dry grey sand and gravel over clay.	Scattered Eucalyptus todtiana and E. loxophleba in the cleared paddocks.	11 clumps.		Creswick Farm (B. & I. Kielman), Badgingarra Road, Badgingarra	24/05/2000
Eucalyptus absita	T	Mallee. Quite a weeping habit. Rough bark at base of mallee stems but primarily smooth green bark. Stems have small girth.	Cleared paddocks on undulating private property, 100 m E of creekline. Dry, grey sand over gravel over clay.	Eucalyptus loxophleba, E. todtiana, isolated stand of Acacia microbotrya.	35 clumps.	The mallee clumps are in a distinct circular group.	Creswick Farm, Badgingarra Road, Badgingarra	24/05/2000
Eucalyptus absita	T	Mallee. Weeping habit, predominantly smooth green bark on the small girthed stems of each mallee clump.	Cleared paddock on private property. Dry, grey sand and gravel over clay.	Scattered Eucalyptus todtiana, E. loxophleba and a nearby stand of Eucalyptus absita hybrid.	23 clumps.	Clumps are all the same height and size and grouped in a dense ring around a bare circular gap in the centre of the stand.	Creswick Farm, Badgingarra Road, Badgingarra	24/05/2000
Eucalyptus absita	T	Mature tree, broad trunk, rough bark at base, smooth green on upper branches.	Clear paddock on undatling private property. A few hundred metres from creek- line. Dry, grey sand and gravel over clay.	Scattered Eucalyptus todtiana, E. loxophleba especially along creekline.	one tree.		Creswick Farm, Badgingarra Road, Badgingarra	24/05/2000
Eucalyptus absita	T	Mallee to 5 m tall. Rough bark at base of trunks. Smooth grey bark on top half of trunks - branches.	Gentle N facing slope with brown loam.	Dense heath with Acacia spp., Calothamnus sp., Hakea sp., Hakea trifurcata, Hypocalymma sp. and Xanthorrhoea sp.	1 clump.	Population 2.	Badgingarra Road, 3.2 km S of North West Road, Western Road verge (SE of Badgingarra)	04/09/2007
Eucalyptus absita	T	Erect mallee 2.7 m high. Bark smooth - stringy, flowers white.			occasional.		4.5 km SSW of Old Badgingarra townsite	02/05/1991
Eucalyptus absita x loxophleba	1	Mallee 10 m. Bark fibrous, box-like, pale grey for 4 m, then smooth greenish- grey. Leaves contain 4-methyl-2pentyl acetate. Many stems probably regrowth.	Beside road.	With E. loxophleba, E. absita, E. rudis and E. wandoo.		Abundance: single plant.	Beside Koonah Road, 3.1 km W of Badgingarra - Dangaragan Road	11/04/1991
Eucalyptus absita x loxophleba	1	Erect open mallee 3 m high.	White lateritic sand.	Open shrubland, road verge.		Abundance: occasional	0.7 km from Dunearn Farm gate on Dunearn road	02/07/1992
Eucalyptus absita x loxophleba	1	Mallee 10 m. Bark fibrous, box-like, pale grey for 5 m, then smooth greenish- grey. Many oil glands in leaves (unlike E. absita); oil glands in pith only at nodes. Leaves contain 4-methyl-2-pentyl acetate.	In paddock 300 m S of road.	With E. wandoo, E. absita, E. rudis and E. loxophleba.		Abundance: single plant, but another similar hybrid beside Koonah Road, ca 300 m to the N.	300 m S of Koonah Road, 3.1 km W of Badgingarra - Dandaragan Road	11/04/1991
Eucalyptus macrocarpa subsp. elachantha	4	Spreading mallee 1.5 m high, flowering.	Flat below rise. Grey sand.	Edge of laterite heath with Conospermum stoechadis, Eremaea pauciflora, Allocasuarina humilis.		Abundance: ca 25 plants.	4.8 km W on Wongonderrah Road from Brand Highway, Cataby	27/11/1996
Eucalyptus pendens	4	Mallee spindle 3 m. Smooth grey bark. Adult leaves dull to slightly glossy. Branchlets glaucous.	Mid slope E facing. Lateritic gravel - white sands.	Heath. With Eucalyptus todtiana nearby.	5 clumps.		250 m due W of GPS, W of Brand Highway, S of Badgingarra	12/02/2012

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Eucalyptus pendens	4						120 mile peg N of Perth on new Geraldton Road. [12 km S of Badgingarra on the Brand Highway].	06/06/1969
Eucalyptus pendens	4						New Badgingarra Highway near Cervantes turnoff at approx 110-120 mile post (175 - 190 km) [Ca 2 km S of Badgingarra].	/09/1969
Eucalyptus pendens	4	Stems to 4 - 5 m long but pendant towards the ends. Flowers white.				Abundance: scattered clumps of 5 - 20 plants.	119 mile peg on road to Badgingarra from Cataby Roadhouse. [14 km S of Badgingarra on the Brand Highway].	20/09/1975
Eucalyptus pendens	4						120 mile peg N of Perth on New Geraldton Road. [12 km S of Badgingarra on the Brand Highway]	06/06/1969
Eucalyptus pendens	4						120 mile peg N of Perth on New Geraldton Road. [12 km S of Badgingarra on the Brand Highway]	06/06/1969
Eucalyptus pendens	4						120 mile peg N of Perth on New Geraldton Road [12 km S of Badgingarra on the Brand Highway]	06/06/1969
Eucalyptus pendens	4	Slender mallee ca 4 m. Bark smooth, branchlets glaucous.	In laterite soil on hillside.	With low scrub.			38 miles N of Regans Ford.	14/05/1969
Eucalyptus pendens	4	Stems slender with a drooping habit.	White sand.				38.5 miles N of Regan's Ford on the Eneabba - Gingin Road. [Brand Highway].	21/10/1970
Eucalyptus pendens	4	Slender mallee ca 4 m. Bark smooth, branchlets glaucous.	In lateritic soil lon hillside.	With low scrub.			38 miles N of Regans Ford.	14/05/1969
Eucalyptus pendens	4	A very pendulous mallee 5 m high, d.b.h. 1.5 cm.	Hillside, on grey sand.	Low heath country, the only eucalypt present.			2.1 km S of Cervantes turnoff on Highway 1, ca 87 km S of Eneabba.	18/10/1978
Eucalyptus pendens	4	Slender stemmed mallee to 3 km.	Sandplain, undulating country.	With low heath.		Abundance: localised and rare.	119 - 120 miles N of Perth on Highway 1 ([Ca 30 km] N of Cataby)	07/10/1975
Eucalyptus pendens	4	Slender mallee to 4 m. Bark smooth; branchlets glaucous.	In lateritic soil on hillside.	With low scrub.			38 miles N of Regans Ford.	14/05/1969
Eucalyptus pendens	4	Very slender mallee 4 m [high]. Bark smooth, grey. Branchlets shiny, glabrous.	Laterite rise, white sand.				32.4 km N of Cataby	07/10/1986
Eucalyptus pendens	4	Whipstick mallee to 4.5 m tall. Stems thin and finally pendulous. Bark smooth throughout, pink-tan and grey. Leaves dull, slightly blue-green. Branchlets waxy.	On white sand on slight slope.	In low heath with very scattered and depauperate Eucalyptus todtiana.	very scattered small clumps.		Brand Highway, S of Badgingarra	21/01/2007
Eucalyptus pendens	4	Open mallee to 4 m; stems smooth, the lower dark red, upper glaucous; stamens cream.	In sandy loam over laterite.	In Kwongan.			c. 61 km N of Regans Ford on Brand Highway,	10/10/1996
Eucalyptus pendens	4	Open mallee to 4 m; stems smooth, the lower dark red, upper glaucous; stamens cream.	In sandy loam over laterite.	In Kwongan.			c. 61 km N of Regans Ford on Brand Highway,	10/10/1996
Eucalyptus pendens	4	Slender mallee ca 4 m. Bark smooth, branchlets glaucous.	In lateritic soil on hillside.	With low scrub.		Inflorescence buds in FAA.	38 miles N of Regans Ford	14/05/1969
Eucalyptus pendens	4	Whipstick mallee to 3 m tall. Bark smooth throughout. Leaves becoming glossy, dark green.	On white sand over laterite.	Low heath with some Eucalyptus todtiana.	scattered clumps, emergent in low heath.		200 m W of Brand Highway, S of Badgingarra	15/09/2016
Grevillea rudis	4		Slope. Dry grey sand/fluviatile gravel.	Low heath, relatively open. With Hibbertia sp., Chittick, Dryandra glauca.	10+ plants.	Condition of population: moderate. Plants straggly and old looking.	Brand Highway, 1.6 km N of Bibby Road, W side	08/09/2008
Grevillea rudis	4	9 ft, spreading.	In gravel.				7 miles SE of Badgingarra	08/01/1966
Grevillea saccata	4	Scrambling subshrub with red flowers.		Eucalypt woodland.			16 km S of Badgingarra, which is ca 175 km N of Perth	02/11/1965
Grevillea saccata	4		Just below crest of hill, yellow sand over brown loamy sand.	Emergent Nuytsia floribunda & Banksia attenuata over low heath to 1 m, assoc. Allocasuarina humilis, Verticordia nobilis, Hibbertia hypericoides, Conospermum stoechadis, Calytrix sp., Calothamnus sanguineus, Mirbelia spinosa.		Abundance: 2, flower & immature fruit, undisturbed, burnt 1988.	350 m NE along track running from SEC powerline track at 3.8 km N from road to Mine from Brand Hwy	15/09/1993
Grevillea saccata	4		Mid slope of shallow valley running NE to SW, pale yellow sand over yellow brownloamy sand.	Very open low woodland of Eucalyptus todtiana & Banksia attenuata with Adenanthos cygnorum to 2 m & seedlings of Banksia to 1 m over low heath to 0.6 m, assoc. Conospermum stoechadis, Hibbertia hypericoides, Daviesia divaricata.		Estimated 16 in flower & immature fruit, undisturbed, burnt in 1988.	NW side of track at 390 m NE of intsec. with E-W running track at 400 m E of itsintsec. with SEC powerline track 2.3 km N of rd to mine from Brand H	15/09/1993
Grevillea saccata	4		Just below crest of rise at edge of scarp, pale yellow sand over brown loamy sand.	Open low woodland of Banksia prionotes & Nuytsia floribunda over emergent shrubsof Grevillea integrifolia to 1.5 m & low heath to 0.6 m, assoc. Conospermum stoechadis, Petrophile ericifolia, P. macrostachya, Hibbertia hypericoides		Estimated 4 plants in flower and immature fruit, undisturbed, burnt 1988.	W of Population no. 4, see mud map, at E end of track, marked with tape	15/09/1993
Grevillea saccata	4		Gentle slope at upper edge of scarp, yellow sand over brown loamy sand.	Emergent Banksia attenuata, B. menziesii, Nuytsia floribunda, Allocasuarina humilis, & Leptospermum erubescens to 3 m over low heath to 1 m, assoc. Adenan- thos cygnorum, Eremaea sp., Jacksonia sp., Hibbertia hypericoides.		Abundance: 2 mature plants, late flower & immature fruit, undisturbed, over 0.5 x 0.5 m area.	W side of track, 250 m S of intsect. with E-W running track, 800 m W of Brand Hwy & 1.6 km N of road from Brand Hwy to mine	16/09/1993

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Grevillea saccata	4		Upper slope of shallow valley, pale yellow sand over pale brown clayey sand.	Very open low woodland of Eucalyptus todtiana & Nuytsia floribunda with Xanthor-rhoea drummondii & Calytrix sp. to 2 m over low heath to 0.5 & 1 m, assoc. with Conospermum stoechadis, Hibbertia hypericoides, Calothamnus spp., etc.		2 mature & 2 young plants, each with one inflorescence only, in flower & mature plants with immature fruits.	C. 2.5 km N of road west to mine from Brand Highway & c. 1.4 km west of Brand Hwy	14/09/1993
Grevillea saccata	4	Shrub 80 cm tall, leaves dark green, paler beneath, flowers light red/orange.	By roadside on laterite.	Shrubland.		Abundance: Common.	10 km N of Mungedar turnoff on Badgingarra Road [Ca 5 km S of Badgingarra]	31/08/1984
Grevillea thyrsoides subsp. thyrsoides	3	Prostrate shrub, flowers red on racemes along ground, leaves spindly, pinnate.	Gravel.				5.6 miles S of Badgingarra - Dandaragan	28/09/1970
Grevillea thyrsoides subsp. thyrsoides	3						14.6 miles along Jurien Bay road from Dandaragan	13/12/1958
Grevillea thyrsoides subsp. thyrsoides	3		Laterite and sandplain.	Low scrub.			Hill River and Cowalla	22/09/1951
Grevillea thyrsoides subsp. thyrsoides	3	0.7 m high, 1.5 m wide. Stout rootstock c. 4 cm diameter from which trailing branches develop. Leaves erect (Some parts of this collection from other plants of similar habit and size.)	On gravelly sand over laterite.	In heath.		Abundance: Occasional.	6 km from Badgingarra on the road to Dandaragan	10/06/1976
Grevillea thyrsoides subsp. thyrsoides	3	Low prostrate shrub with red flowers.	Road construction track off to the E side, on gentle slopes.	Low scrub.		Abundance: Scattered but frequent.	Between Moore and Hill Rivers on the N Sand Plains: 23.8 km N of S junction of Dandaragan Road with Brand Highway; 5.4 km S of Cataby Road House	09/09/1981
Grevillea thyrsoides subsp. thyrsoides	3	Spralling [sprawling] shrub 30 cm high.	Fine pale yellow sand / gravel mid slope.	Mallee heath, Allocasuarina ramossissima.			AMG 50JLM654281 (Badgingarra 1:50,000 sheet) roadverge Badgingarra Road just N of Mungedar Road, N of Dandaragan	28/09/1988
Grevillea thyrsoides subsp. thyrsoides	3	Recumbent shrub 30 cm.	Grey sandy lateritic gravel, lateritic upland.	Low open heath.			AMG 50JLM 626208 (Dandaragan 1:50,000 Sheet), Dunearn NW of Dandaragan	11/08/1988
Grevillea thyrsoides subsp. thyrsoides	3	Prostrate shrub. Leaves dark to mid green. Flowers dark red, borne at ground level.	By roadside on laterite.	Shrubland.		Abundance: Common.	10 km N of Mungedar turnoff on Badgingarra Road	31/08/1984
Guichenotia alba	3	Shrub to 30 cm with white flowers.	Shallow sand with lateritic gravel.	With Xanthorrhoea drummondii, Hakea incrassata, Lambertia multiflora and many other low heath shrubs.			18 km N [NW] of Cataby	/08/1994
Guichenotia alba	3	Spreading shrub growing on and shaped like a small mound, up to 0.15 m high, calyx white with a small light green centre, filaments pale yellow, anthers red-black and style light green.	Gentle NE-facing slope with some drainage but seasonally damp, with grey silty sand (hidden by a very thin brownish surface).	Scattered Xanthorrhoea and Jacksonia plants (only in upper parts of site ?) over Calothamnus cf. quadrifidus-Hakea lissocarpha-Melaleuca conothamnoides low open heath over Mesomelaena-Schoenus open sedgeland. Associated species included Allocasuarina, Hi			Ca 20 m N of Waddi Road, 0.45 km E of Brand Highway, Badgingarra National Park	18/08/2003
Hakea megalosperma	T	Erect compact 1 m high, flowers white-pink.				Abundance: occasional	5.6 km E of Brand highway along Mullering Road	30/04/1991
Hakea megalosperma	T	Shrub to 1 m.	Hilltop and E and W facing slopes. Brown sandy loam with lateritic gravel over laterite.	Low heath C. Associated species: Hakea trifurcata, Allocasuarina sp., Lambertia multiflora var. multiflora, H. incrassata, Petrophile sp., Dryandra ssp., H. conchifolia.	at least 30.	(Population 6).	Mullering Road, 5.5 km E of the Brand Highway to 6.2 km E of the Brand Highway	01/11/2002
Hakea megalosperma	T	Shrub to 1 m.	Hilltop and E and W facing slopes. Brown sandy loam with lateritic gravel over laterite.	Low heath to 0.5 m. With Banksia sp., Calothamnus sp., Dryandra spp,. Hakea conchifolia, Hakea incrassata, Lambertia multiflora, Melaleuca sp., Petrophile sp.	at least 75 plants.		Mullering Road, 5.2 km E of the Brand Highway to 6 km E of the Brand Highway, Pop 6A. N of Cataby	01/02/2008
Hakea megalosperma	T	1 m tall, healthy with many fruits.		Associated with Hakea spathulata, Xanthorrhoea, H. conchifolia, Drosera rosettes; bush remnant adjacent to pasture, open and sunny heath.	abundant.		Mullering Road, 25 m S of road, Cataby	04/08/2011
Hensmania stoniella	3		Midslope. Grey sand. Mining Lease / UCL.	Low heath with emergent taller Banksias.		Mining threat. No other records within 10 km.	Cooljarloo / Falcon, Midwest Region, Moora District, Shire of Dandaragan	26/08/2008
Hensmania stoniella	3	Clumping plant with brown/white/red flowers. To 20 cm.	Dry cream sand with gravel.	Heath.			Bibby Road, Badgingarra: at Hakea Reserve rest stop	27/10/2002
Hensmania stoniella	3		Landform: pediment, Slope - 3; Soil: grey sand / white sand; Drainage: good.	Structure (Muir 1977): Scattered Low Trees / Low Scrub B / Dwarf Scrub C / Low Heath D / Open Low Sedges; Major spp: Banksia attenuata, Banksia menziesii, Melaleuca acerosa.			AMG-Zone 50 339435mE 6629253m N; Cadda road, E of Munbinea rd, W of Badgingarra.	07/12/1992
Hensmania stoniella	3	Scarious margins with translucent margins on outer involucral bracts. Not rhizomatous.		Banksia woodland Low Open Woodland of Banksia priontes, B. attenuata, B. menziesii with occasional Eucalyptus todtiana over Open Shrubland of Adenanthos cygnorum, Jacksonia nutans, Eremaea pauciflora, Dasypogon obliquifolius. Significant species present:			ca 16 km N of Cataby on the W side of Brand Highway. In bushland on the north mine area of Tiwest Cooljarloo mineral sands mine	13/12/2006
Hopkinsia anoectocolea	3	Tufted rush to 0.6 m high.	Slope adjacent to seepage. Light grey gritty sandy clay. Unburnt.	Isolated low trees of Eucalyptus rudis over tall isolated clumps of shrubs of Jacksonia sternbergiana, Kunzea glabrescens and Melaleuca rhaphiophylla over mid isolated shrubs of Kunzea micrantha.	scattered.		Within rehabilitated area (Plot 100B) at Tronox's Cooljarloo tenement, 14.4 km NW of Cataby	10/11/2015

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Hypocalymma serrulatum	2		Gully drainageline, moist yellow/brown sand.	Dense shrubland of Adenanthos cygnorum, Jacksonia sp., Banksia menziesii, B. attenuata, Macrozamia sp. with emergent Eucalyptus todtiana.		Abundance: estimated 1000+ mature plants in flower & flower buds, over several hundred metres.	8.1-8.2 km along Cadda Road from Brand Highway wet low lying area at base of low hills extending for distance to the SW	30/05/1994
Hypocalymma serrulatum	2						Wongonderrah Powerline	20/05/1991
Hypocalymma serrulatum	2		E facing ridge, grey loamy sand and lateritic gravel. On S side of track on SW side of gravel scrape.	Thicket to 3 m, Adenanthos cygnorum, Chamelaucium ? uncinatum, Baeckea sp., Acacia sp., Hibbertia sp., Lechenaultia floribunda, Daviesia sp.		Abundance: 50+ mature plants, in flower and immature fruit, disturbed.	SE corner of Badgingarra National Park, 100 metres W along track from Brand Highway, opposite intersection with Waddi Road	09/01/1992
Hypocalymma serrulatum	2						10 km S of Badgingarra along Brand Highway	29/04/1993
Hypocalymma serrulatum	2		Drainage line at lowest point in swale, white sand.	Open low woodland of Eucalyptus todtiana, with dense thicket of Banksia sp. to 3m assoc. Adenanthos cygnorum, Hypocalymma angustifolium.	50+ plants in fruit and healthy.		4.9 km W along Bibby Road from Brand Hwy, N & S road verges extending into National Park	18/09/1993
Hypocalymma serrulatum	2	1 - 2 ft high, flowers pink.	Sand.	With Astroloma xerophyllum, Leucopogon oldfieldii.			118 mile peg Gingin - Jurien Bay Road [26 km N of Cataby on Brand Highway]	22/08/1972
Hypocalymma serrulatum	2	Slender erect shrub, single stemmed at base. Flowers white, flushed with pink at base, in full flower.	Slope above swampy depression, sand.	Eucalyptus todtiana Mallee over Banksia attenuata - Banksia menziesii low woodland.	very common.		5.7 km along Wongonderrah road from Brand Highway	09/07/2005
Hypocalymma serrulatum	2	Spindly shrub to 1.8 m, in flower and fruit.	Edge of winter-wet depression. Grey sand.	Mixed Banksia attenuata / B. menziesii woodland, with Melaleuca clavifolia, Beaufortia bicolor.	300+ plants, very common.		Near Pinjar-Eneabba tranmission line in UCL just S of Wongonderrah Nature Reserve, ca 10 km W of Brand Highway, ca 20 km SW of Badgingarra	18/11/2010
Hypocalymma serrulatum	2		Landform: vale (upper drainage line), Slope - 0; Soil: grey sand; Drainage: good.	Structure (Muir 1977): Scattered Low Trees/ Open Low Scrub A/ Low Scrub B/ Low Heath C/ Dwarf Scrub D/ Open Low Sedges; Major spp: Banksia menziesii, Jacksonia sp., Restio chaunocoleus.			AMG-Zone 50 346875mE 6635457mN; N boundary of Park, Bibby road, Badgingarra National Park (Reserve 31809), W of Badgingarra.	07/12/1992
Hypocalymma sp. Cataby (G.J. Keighery 5151)	2	Shrub c. 0.5 m tall, flowers white.	Dry sandy plain.				N of Perth between Moora and Jurien Bay	16/08/1973
Hypocalymma tetrapterum	3		Slope. W aspect. Brown loam/laterite. Undisturbed.	Open wandoo woodland with heath to 1 m with Hakea undulata, Hibbertia hypericoides, Nemcia sp., Acacia sp., Drosera sp.	estimated 100+ plants. Area occupied 5 m x 100 m.		22.1 km N of Dandaragan on Badgingarra road, W road verge	21/08/1991
Hypocalymma tetrapterum	3	Spreading to erect shrub. Flowers white; in full flower.	Slope above creek.	Eucalyptus wandoo low woodland over Hypocalymma shrubland.	abundant.		0.8 km N Koonah Road and Badgingarra Road intersection to Dandarragan	10/07/2005
Hypolaena robusta	4	Rather open clump c. 30 cm across. Tepals and stigmas red-brown. Male.	White sand.	Shrubland of Adenanthos, Allocasuarina and Nuytsia.			7.6 km from Brand Highway on Cadda Road. Irwin District	06/10/1995
Hypolaena robusta	4	Rather open clump c. 30 cm across. Tepals and stigmas red-brown. Female.	White sand.	Shrubland of Adenanthos, Allocasuarina and Nuytsia.			7.6 km from Brand Highway on Cadda Road. Irwin District	06/10/1995
Hypolaena robusta	4	Rhizomes hairy, although becoming glabrous in parts.	Sand heath.	Heath with mixed shrubs.			6.9 km from Brand Highway on Bibby Road (Cervantes Road); ca 14 km direct SW of Badgingarra, Irwin district	06/09/1990
Hypolaena robusta	4		Sand heath.	Sand heath with mixed shrubs.			6.9 km from Brand Highway on Bibby Road (Cervantes Road), ca 14 km direct SW of Badgingarra, Irwin district	06/09/1990
Hypolaena robusta	4			Sand heath with mixed shrubs.			6.9 km from Brand Highway on Bibby Road (Cervantes Road); [ca 14 km (direct) SW of Badgingarra]	06/09/1990
Isopogon autumnalis	3		Pale brown loamy sand flat.	Low heath to 1 m with emergent Banksia attenuata with Allocasuarina humilis, Jacksonia sp., Banksia candolleana, Petrophile sp., Melaleuca sp., Dryandra nivea, Leucopogon sp., Hakea ruscifolia.	estimated 30+ plants with flower buds.		Gazetted Conservation Park 41986 N of Cooljarloo Road, W side of Brand Highway, 100 m W of firebreak & c. 700 m N of road into gravel pit	13/09/1993
Isopogon panduratus subsp. palustris	3	Shrub, to 0.5.	Rehabilitation area.				Ca 3.4 km W of Brand Highway, 6.9 km S of Wongonderrah Road and 16.9 km NW of Cataby within rehabilitation area	25/10/2012
Isopogon panduratus subsp. palustris	3	Shrub 1 m high, stems red.	In sandy clay.	Low heath.			Strathmore road Reserve (No 26248), S of Badgingarra	05/11/1975
Isopogon panduratus subsp. palustris	3	Shrub 4 ft, stems red, flowers pinky-white.	Swampy area.	Heath.			10 miles W of North West Coastal Highway on Strathmore road,	17/09/1976
Isopogon panduratus subsp. palustris	3	Dense shrub 60-80 cm. Flowers pinkish.	Winter wet sand.				Strathmore road, W of Brand Highway	01/01/1976
Isopogon panduratus subsp. palustris	3		Yellow sand.	Sand heath. Dominant species: Acacia lasiocarpa, Hypocalymma angustifolium, Jacksonia nutans, Banksia telmatiaea. Less dominant species: Jacksonia hakeoides, Eremaea asterocarpa, Isopogon sp. Watheroo. Significant species occuring in the sand heath inclu			ca 16 km N of Cataby on the W side of Brand Highway. In bushland on the north mine area of Tiwest Cooljarloo mineral sands mine	13/12/2006
Isopogon panduratus subsp. palustris	3	Shrub.	Winter wet depression.				VCL N of Tiwest Joint Venture, N of Cataby	12/02/2002
Isopogon panduratus subsp. palustris	3	Plants to 70 cm, regenerating from seed after January 2003 fire.		Winter damp heath.			Cataby area	//

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Isopogon panduratus subsp. palustris	3	Erect shrub to 70 cm high x 50 cm wide. Plants single-stemmed at ground level. All mature leaves canaliculate, pale green to slightly glaucous, lowest leaves more or less flat. Perianth very pale pink, the limb darker.	Low flat. Winter wet white sand. Ca 5-6 years post fire.	Heath (mostly ca 1 m). Banksia telmatiaea, Beaufortia squarrosa, Hypocalymma angustifolium, Hakea obliqua.	localised population ca 50-70.		S side Wongonderrah Road, 800 m W of Yerramullah Road, SW of Badgingarra	15/08/2008
Isopogon panduratus subsp. palustris	3	Erect shrub to 1.8 m high, 1.5 m wide. Perianth pale pink.	Low flat. Winter wet pale yellow sand.	Heath (1.5-2 m). Banksia telmatiaea, Hakea obliqua, Conospermum stoechadis.	very occasional.		E side of Yerramullah Road, 1.2 km N of Wongonderrah Road, SW of Badgingarra	16/08/2008
Isopogon panduratus subsp. palustris	3	Erect shrub, 1.5 m tall. Flowers rose pink.	On dark grey loam, seasonally wet.	In Regelia ciliata heath over sedges.			S Wongonderrah Road, approx. 10 km W of Brand Highway [Ca 11 km E of Nambung Homestead] AMG 50JLM 418187 Wedge Island 1:100,000	26/11/1988
Isopogon panduratus subsp. palustris	3	Flowers present.	Mining lease.				Cooljarloo	28/10/2008
Jacksonia anthoclada	3	Fruit 11.6-11.7 x 6.3-7.4 mm.	White sand.				2 km N of Wongonderrah Road on Brand Highway	12/12/1991
Jacksonia anthoclada	3	Fruit 11.6-11.7 x 6.3-7.4 mm.	White sand.				2 km N of Wongonderrah Road on Brand Highway	12/12/1991
Jacksonia anthoclada	3	Fruit 11.6-11.7 x 6.3-7.4 mm.	White sand.				2 km N of Wongonderrah Road on Brand Highway	12/12/1991
Jacksonia anthoclada	3	Erect low branching, 2 m.	Cream sand over laterite sandplain.	Adenanthos, Banksia.			2 km N of Wongonderra Road on Brand Highway	25/05/1992
Jacksonia anthoclada	3		On sand over laterite.				Brand Highway 5.9 km S of Koonah Road	03/09/1992
Jacksonia anthoclada	3		Dry white sand.	Thick medium heath with emerging Banksias. With Leucopogon sp., (KJH 6), Daviesia chapmanii, Dryandra tortifolia, Banksia menziesii, Hibbertia, many epacrids, Banksia candolleana.	20+ mature plants.	Condition of population: healthy. Individuals mostly in old partially cleared track/firebreak.	3.8 km W of Brand Highway on Bibby Road, Badgingarra National Park	08/09/2008
Jacksonia carduacea	3	Small shrub to 30 cm tall.	Plain. Grey sand.	Low heath. With Banksia sp., Calothamnus sp., Calyxtrix sp., Melaleuca sp., Verticordia sp.			NW corner of Wongonderrah Nature Reserve. Ca 100 m S of the intersection of Wongonderrah and Yerramullah Roads	13/12/2007
Jacksonia carduacea	3	Low shrub.	White sand over laterite.	Shrubland.			Corner Yerramullah and Wongonderrah Road	12/12/1991
Jacksonia carduacea	3		On yellow sands.	Sand heath. Dominant species: Acacia lasiocarpa, Hypocalymma angustifolium, Jacksonia nutans, Banksia telmatiaea. Less dominant species: Jacksonia hakeoides, Erenaea astericarpa, Isopogon sp. Watheroo. Significant species occuring in the sand heath inclu			ca 16 km N of Cataby on the W side of Brand Highway. In bushland on the north mine area of Tiwest Cooljarloo mineral sands mine	14/12/2006
Lepidobolus quadratus	3	Erect caespitose sedge 15 cm high, square stems, male and female plants.	Red-brown sandy clay, slight rise lateritic.	Open shrubland.		Abundance: frequent	5.6 km E of Brand Highway along Mullering road	02/07/1992
Lepyrodia curvescens	2	Rhizomatous herb, to 0.2 m.	Flat plain. Grey/yellow sand.	Banksia telmatiaea heath.			9.21 km W of Brand Highway, Tiwest's Cooljarloo North mine area in Quadrat 18 (2m x 2 m) of Plot VS02 (20m x 20m) of vegetation stress monitoring program	07/07/2011
Leucopogon foliosus	3	Erect shrub to 40 cm high x 30 cm wide. Plants single stemmed at ground level. Flowers white.	Upland, lateritic rise. Dry, yellow gravelly sand over laterite.	Low heath mostly .5-1 m with emergent Eucalyptus drummondii. Lambertia multiflora, Dryandra glauca, Gastrolobium oxylobioides.	locally common.		Badgingarra National Park, 7 km W of Brand Highway along Cadda Road	13/11/2004
Leucopogon foliosus	3	Erect, open few branching shrub to 25 cm high. White-pink flowers. Senescent flowers.	Slope - flat. Dry, white-brown sand. Gravel and laterite.	Heath with Adenanthos cygnorum, Dryandra armata, Lambertia multiflora var. multiflora, Calothamnus sp.	scarce.		1.1 km W of Brand Highway then 0.6 km S to S of gravel excavation site. Badgingarra National Park, Cervantes - Jurien Road, Badgingarra	05/02/2004
Leucopogon foliosus	3	Low spreading shrub 20 cm high x 20 cm wide. Early flowering. Flowers white. Plants single stemmed at ground level.	Upper slopes. Dry, bare, brown loamy gravelly sand over laterite.	Heath mostly .5-1 m. Dryandra glauca. D. carlinoides, Gastrolobium spinosum.	occasional.		Badgingarra National Park, S side of Bibby Road, 1.2 km W of Brand Highway,	08/12/2001
Leucopogon foliosus	3		Landform: upland plain, Slope - 2; Soil: lateritic cream sandy gravel; Drainage: good.	Structure (Muir 1977): Open Dwarf Scrub C/ Low Heath D; Major spp: Petrophile shuttleworthiana, Calothamnus torulosus, Allocasuarina humilis.			Cadda road, E of Munbinea rd, W of Badgingarra	07/12/1992
Leucopogon foliosus	3		Landform: upland plain, Slope - 1; Soil: lateritic grey sandy gravel; Drainage: good.	Structure (Muir 1977): Open Dwarf Scrub C/ Low Heath D; Major spp: Petrophile shuttleworthiana, Allocasuarina humilis, Hibbertia hypericoides; long unburnt.			Waddi Rd, just E of Brand Highway, S of Badgingarra	22/11/1992
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect shrub, 1 m high x 40 cm wide.	Slope. Sand.	Heath with occasional Banksia. Associated species: Banksia attenuata, Astroloma xerophyllum, Adenanthos cygnorum.	very frequent in local area. Ca 350 000 in population based on quadrat extrapolation.		Badgingarra National Park, from intersection with Yerramullah Road travel 6.4 km E along Cadda Road, then S on N-S break for ca 3.25 km	07/11/2014
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect open shrub, 70(100) cm high, 40 cm wide, flowers white.	Hill, grey sand.	Heath.	frequent.		25 km SW of Badgingarra	18/12/1995
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect shrub .5 m high x .1 m wide. Flowers white - cream.	Hillside. Dry, white-grey sand. Burnt summer 2003.	Low shrubland. Heath B. Adenanthos cygnorum, Stirlingia latifolia, Banksia attenuata.	300 + plants.		Badgingarra National Park, 1.3 km S of Cadda Road down internal track, 6.4 km E of Yerramullah Road	15/03/2007
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect herb 0.5 m high x 0.1 m wide. Flowers white - cream.	Hillside. Dry, white-grey sand. Burnt summer 2003.	Low shrubland. Heath B. Adenanthos cygnorum, Stirlingia latifolia, Banksia attenuata.	500+ plants.		Badgingarra National Park, 2-4.8 km S of Cadda Road, down internal track 6.4 km E of Yerramullah Road	15/03/2007

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect shrub 0.5 m high x 0.1 m wide. Flowers white - cream.	Hillside. Dry, white-grey soil. Burnt summer 2003.	Low shrubland. Heath B.	100+ plants.	Percentage of population flowering 100%.	Badgingarra National Park, internal firebreak in SE corner of the park, ca 300 N of Bibby Road	15/03/2007
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect open shrubs to 1.5 m high x 1.5 m wide on unburnt bush. Flowers white. Probably with fire sensitive rootstock. Most plants have regenerated from seed after fire ca. 5 - 6 years previous.	Upland. Dry, white sand with underlying geology; laterite at depth.	Mixed heath with emergent Eucalyptus todtiana. Associated vegetation: Banksia menziesii, B. attenuata, Hypocalymma xanthopetalum, Banksia candolleana.	200 + in restricted area.	Coordinates marl the W side edge of population. Other epacrids in immediate area; Astroloma xerophyllum, Leucopogon crassiflorus, L. sp. Moore River, L. sp. Lesueur and Croninia kingiana.	High hill corner of Badgingarra National Park, on internal firebreak ca. 150 m W of corner	20/01/2007
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect open shrubs to 70 cm high x 70 cm wide. Plants fruiting.	Upland. Dry white sand over laterite at depth.	Mixed heath with emergent Eucalyptus todtiana. With Banksia menziesii, Banksia attenuata, Hypocallyma xanthopetalum.	locally common.		High Hill corner of Badgingarra National Park, on internal firebreak ca 150 m W of corner	26/07/2008
Leucopogon sp. Badgingarra (R. Davis 421)	2	White flowers. Erect shrub to 50 cm tall.	White sand, sandplain, N facing slope.	Dense heath 1 m with Adenanthos cygnorum, Banksia attenuata, Banksia menziesii, Eucalyptus todtiana, Stirlingia latiflora and Verticordia sp.	100's of plants.		Badgingarra National Park, 1.2 km S of Cadda Road on internal firebreak at about 6.5 km E of Yerramullah Road	10/01/2008
Leucopogon sp. Badgingarra (R. Davis 421)	2	Erect open shrub, 80 cm high x 80 cm wide. Flowers white, early flower. Multistemmed at ground level.	Plain. Dry, bare, white sand.	Heath B (Muir 1977) with Banksia attenuata, Adenanthos cygnorum and Persoonia comata.	occasional.		On firebreak running N-S ca 150 m NE of `High Hill' corner of Badgingarra National Park	06/12/1999
Leucopogon sp. Badgingarra (R. Davis 421)	2	Tall, open shrub to 1.5 m, in fruit.	Lower slope / broad open drainage line high in the landscape, grey sand.		>50 plants.		Cadda Road Reserve / Badgingarra National Park, just S of firebreak, ca. 260 m S of Cadda Road, ca. 8.0 km WSW of the intersection between Cadda Road and Brand Highway	25/10/2017
Levenhookia preissii	1	Small herb to 0.1 m, in flower.	Winter wet area with grey sand.	Heath, with Banksia telmatiaea, Melaleuca viminea, Banksia nivea, Beaufortia squarrosa, Tripterococcus brunonis and Verticordia densiflora.			Tiwest Falcon Project Area, Just S of Wongonderrah Road W of Wongonderrah Nature Reserve	24/11/2005
Lyginia excelsa	2	Erect, caespitose, ca 15 cm wide.	White sand.	Banksia woodland over scrub/sedgeland. With Banksia menziesii, B. attenuata, Adenanthos sp., Lyginia spp.			Melbourne Location 3806, Badgingarra, adjacent to powerline easement (W side) in remnant vegetation, ca 1.6 km NW of creek crossing	22/01/2014
Lyginia excelsa	2	Rhizomatous, tufted perennial, herb, 100 cm high x 28 cm wide.	Plain. Deep grey sands. Old fire history.	Low open woodland of Banksia attenuata and B. menziesii over Allocasuarina sp. closed shrubland over sparse mixed low shrubs and herbs. Adenanthos cygnorum, Conospermum spp., Scholtzia involucrata, Patersonia sp., Calytrix spp., Leucopogon spp. and Desmo	common is small areas.		Both sides of internal fire break adjacent to the Brand Highway, 1.4 km N of Waddi Road, Badgingarra National Park	16/01/2017
Lyginia excelsa	2	Tall sedge to 1 m.	Plain. Grey sand.	Mixed Banksia attenuata / B. menziesii / Eucalyptus todtiana woodland, with Adenanthos cygnorum, Stylidium hymenocraspedum, Lasiopetalum lineare.	7 plants, infrequent.		Near Pinjar-Eneabba tranmission line in remnant vegetation on private property, ca 3.5 km N of Wongonderrah Road, 1.5 km E of Yerramullah Road, ca 10 km W of Brand Highway, ca 20 km SW of Badgingarra	18/11/2010
Lyginia excelsa	2	Upright, caespitose sedge, 80 cm high x 20 cm wide.	Open depression. White grey sands. Old fire history.	Eucalyptus todtiana, Banksia menziesii, B. attenuata woodland. Associated species: Adenanthos cygnorum, Nuytsia floribunda and Lyginia barbata.	scattered.		Badgingarra National Park	19/08/2017
Lyginia excelsa	2	Upright, caespitose sedge, 80 cm high x 20 cm wide.	Plain low in the landscape. Deep grey sands. Old fire history.	Eucalyptus todtiana low scattered trees over Banksia menziesii, B. attenuata and Adenanthos cygnorum tall shrubland over mixed shrubland of Hibbertia spp., Daviesia sp. and Calytrix sp. over Mesomelaena spp., Lepidosperma sp. and Lyginia barbata sedges.	abundant.		13 km SW of Badgingarra townsite	19/08/2017
Lyginia excelsa	2		Flat site. Road verge.	Tall heathland with Adenanthos and Banksia.		Colonising road verge and in nearby undisturbed heathland.	Brand Highway 105 km N of Gingin	24/08/2003
Macarthuria keigheryi	T		On dry grey sand in low plain, evidense of grazing on many plants (likely to be Kangaroos). Potential threat from mining and grazing. Fencing and road markers not required. Population flagged with red and white tape.	Open Banksia woodland over low shrubland of Bossiaea eriopoda, Petrophile linearis, Adenanthos cygnorum, Hibbertia crassifolium, Dasypogon obliquifolius, Jacksonia densiflora, Patersonia occidentalis. Trees include Banksia attenuata, B. menzeisii and Euc	50 mature plants.	Some plants in population flowering. Evidence of grazing on many plants (likely Kangaroos). Population flagged with red and white tape, however, fencing and roadside markers not required. Potnetial threats include mining and grazing.	Falcon mining lease, S of Wongonderrah Road and W of Tiwest Cooljarloo minesite (N mine), Moora District in the Midwest	30/10/2007
Macarthuria keigheryi	T	Low spreading shrub 20 cm high x 20 cm wide. Stems covered with pale yellow hairs.	Dune crest and eastern dune face. White sand.	Banksia menziesii and B. attenuata woodland. Open heathland. Associated species: Allocasuarina sp., Stylidium sp., Jacksonia sp., Verticordia sp. and Eremaea sp.		Abundant on fire break, scattered in vegetation.	Woolka Road, ca 8 km W of junction with Cooljarloo Road, northern side road along fire break	06/11/1988
Patersonia spirifolia	T	Tussock forming shrub 0.4 m x 0.5 m.	Grey sand with 20% laterite.		3 plants.	Population 5.	Yerramullah Road, 2.8 km S of Cadda Road	01/10/2012
Patersonia spirifolia	T	Tufted perennial woody herb from a spreading rootstock, to 30 x 30 cm. Flowers purple, in full flower.	Lateritic ridge.	With low mixed heath.			4.6 km W of extension Cadda Road and Yerramullah Road, Badgingarra	15/10/1988
Persoonia filiformis	3	Small shrub to 0.2 m, flowering.	Undulating plain. Grey sand, laterite nearby.	Heath with Melaleuca clavifolia, Banksia spp., Logania campanulata.	1 plant.		Near Pinjar-Eneabba transmission line in UCL adjacent to Tiwest Cooljarloo minesite, 5 km N of main mine entrance, ca 3 km W of Brand Highway, ca 15 km N of Cataby	17/11/2010

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Persoonia filiformis	3	Low shrub to 0.2 m with yellow flowers.	Low hill, grey-brown sandy loam over laterite.		a few plants seen.		Brand Highway reserve, W side of Brand Highway, ca. 550 m N of the intersection between Brand Highway and McNamara Road, ca. 7 km S of Badgingarra	07/11/2017
Persoonia rudis	3	Erect shrub to 0.5 m, in flower.	Plain. Grey sand, laterite nearby.	Heath with Melaleuca clavifolia, Calothamnus torulosus, Banksia spp.	4 plants.		Near Pinjar-Eneabba transmission line in UCL adjacent to Tiwest Cooljarloo minesite, a few km N of main mine entrance road, ca 1 km W of Brand Highway, ca 15 km N of Cataby	17/11/2010
Phlebocarya pilosissima subsp. pilosissima	3	Forms clumps.	Along drainage channel.	In woodland, canopy of Banksia menziesii.			W margin Badgingarra National Park where Bibby Creek meets road	14/10/1978
Phlebocarya pilosissima subsp. pilosissima	3	Tufted herb, to 20 cm x 20 cm. Flowers creamy-white.	Grey sand with lateritic pebbles.	Lambertia heath.		Abundance: common.	5 km SE of Badgingarra	10/09/1979
Phlebocarya pilosissima subsp. pilosissima	3	Tufted herb 15 - 25 cm high with creamy white flowers.	White sandy soil intermixed with laterite.	Heath in association with Hakea prostrata, Isopogon linearis, Calectasia cyanea, etc.		Abundance: common.	67 miles (197.8 km) NNW of Gingin by road	02/09/1970
Phlebocarya pilosissima subsp. pilosissima	3		White sand.				Ca 35 km E of Cervantes: intersection of Brand Highway and Strathmore Road	08/07/1975
Phlebocarya pilosissima subsp. pilosissima	3	Last flowers, stems and leaves sparsely villous, anthers appendiculate.		In Heath D, Conostylis aurea in full flower, Conostylis angustifolia last flowers, Lambertia multiflora.			27.3 km N from BP Cataby on Brand Highway, 25.5 km NNW of Cataby	18/10/1984
Phlebocarya pilosissima subsp. pilosissima	3	Rhizomatous herb, 20 cm high. Flowers white.	Gentle slope. White/grey sand.	Heath with Eucalyptus todtiana, Banksia attenuata, Adenanthos sp., Xanthorrhoea sp. and Allocasuarina humilis.	occasional.		NW corner of intersection of Brand Highway and Wongonderrah Road	30/08/2014
Schoenus pennisetis	3		Fine grained moist dark grey sandy loam in broad low-lying flat terrain interested by drainage lines of low energy water flow. Area burnt 1-2 years ago.	Scrub. Associated species: Melaleuca viminea, Calothamnus hirsutus, Kunzea micrantha subsp. petiolata, Regelia ciliata, Acacia saligna, Verticordia densiflora var. densiflora, Lepidosperma longitudinale.	30 plants.	Plant status: healthy and fruiting. Informal population - T.	Scrub in Wongonderrah Nature Reserve	15/11/2007
Schoenus pennisetis	3		Fine to medium grained grey sand on borad low-lying flat terrain. Recently burnt area.	On track adjacent to Low Heath. Associated species: Banksia telmatiaea, Verticordia densiflora var. densiflora, Stirlingia abroantoides, Regelia ciliata, Calothamnus hirsutus, Schoenus subfascicularis.	50 plants.	Plant status: healthy and fruiting. Informal population - R.	Access track S of Wongonderrah Road (Wongonderrah Road runs W off Brand Highway, N of Cataby)	15/11/2007
Schoenus pennisetis	3		Fine to medium grained moist grey/brown sandy loam in broad flat low-lying terrain, intersected by drainage lines of low energy water flow. Area burnt ca 2 years ago.	Low Heath. Associated species: Banksia telmatiaea, Calothamnus hirsutus, Regelia ciliata, Conostylis aculeata subsp. aculeata, Melaleuca viminea, Viminaria juncea.	150 plants.	Plant status: healthy and fruiting. Informal population - S.	Low Heath in Wongonderrah Nature Reserve	15/11/2007
Schoenus pennisetis	3		Moist white/grey fine sand. Depression within low sandplain. Burnt in 2003 ?	Heath to 0.8 m (edge of Banksia attenuata), Regelia ciliata, Jacksonia hakeoides, Verticordia densiflora subsp. densiflora, Calytrix aurea, Olax scalariformis, Dryandra platycarpa, Isopogon sp. Cooljarloo, Banksia telmatiaea.	3 mature plants. Area occupied: 1 m squared.	Appears to be a disturbance opportunistic. Condition of population: healthy.	On track - S of Wongonderrah Road, W of Tiwest Cooljarloo offices. In UCL W of Cooljarloo N mine boundary	31/10/2007
Schoenus pennisetis	3		Fine to medium grained moist grey (some iron-staining) sand in a broad flat low-lying area within gently undulating terrain.	In Open Herbs adjacent to Low Heath. Associated species: Herbs include: Centrolepis polygyna, Calandrinia sp., Angianthus micropodioides, Siloxerus humifusus, Schoenus nanus. Heath spp. include Banksia telmatiaea, Calytrix aurea, Dasypogon obliquifolius,	25 plants.	Plant status: healthy and fruiting. Informal population - E.	900 m S of Wongonderrah Road junction with Yerramullah Road. Firebreak boundary of Wongonderrah Nature Reserve ? Wongonderrah Road runs W off Brand Highway N of Cataby, near Tributary of Mount Jetty Creek	02/11/2007
Schoenus pennisetis	3		Moist, white-grey, fine sand with a depression of a low plain, last burnt in 2003. On UCL.	Heath to 0.8 m with Banksia telmatiaea, Dasypogon obliquifolius, Jacksonia hakeoides, Calytrix aurea, Melaleuca subtrigona, Verticordia densiflora subsp. densiflora, Synaphea spinulosa and Calothamnus sanguineus.	15 mature plants.	A healthy population with some vehicle damage and potential threats from firebreaks and mining. Appears to be disturbance opportunist and possibly disappears in mature bushland.	Boundary of Tiwest Mining Tenement. S of Wongonderrah Road. W of Tiwest Cooljarloo offices	30/10/2007
Schoenus pennisetis	3		In fine white grey sand in a depression of a low sand plain. Within a fire break on UCL. Burnt in 2003.	Heath to 0.8 m. Banksia telmatiaea, Regelia ciliata, Calytrix flavescens, Verticordia densiflora ssp., Dryandra nivea subsp. nivea and Isopogon sp. cooljarloo.	6 mature plants.	Vehicle movement, appears to be a disturbance opportunist.	S of Wongan Derrah Road. W of Cooljarloo Minesite offices. On boundary of mine lease Cooljarloo N (Western firebreak), Moora District, Shire of Dandaragan, Midwest	30/10/2007
Schoenus pennisetis	3		Fine grained moist dark grey sandy loam in broad low-lying flat terrain interested by drainage lines of low energy water flow. Area burnt 1-2 years ago.	Low Heath/Scrub. Associated species: Dryandra nivea subsp. nivea, Regelia ciliata, Banksia telmatiaea swampy 'open area' with Melaleuca viminea patches adjacent.	20 plants.	Plant status: healthy and fruiting. Informal population - T.	Low Heath/Scrub boundary in Wongonderrah Nature Reserve	15/11/2007
Schoenus pennisetis	3		Fine to medium grained moist grey/brown sandy loam in broad flat low-lying terrain, intersected by drainage lines of low energy water flow. Area burnt ca 2 years ago.	Adjacent to Low Heath. Associated species: Regelia ciliata, Banksia telmatiaea, Calothamnus hirsutus, occasional Kingia australis, Melaleuca brevifolia, Viminaria juncea.	5 plants.	Plant status: healthy and fruiting. Informal population - S.	On track S of Wongonderrah Road adjacent to Low Heath	15/11/2007
Stylidium aceratum	3	Herbaceous annual, < 10 cm tall.	White grey to grey brown sand in damp depressions.	Low isolated clumps of trees to low woodland of Banksia attenuata, Banksia menziesii and/or Banksia ilicifolia over low sparse shrubland to mid closed shrubland of Adenanthos cygnorum subsp. cygnorum, Banksia telmatiaea, Beaufortia squarrosa, Hypocalymma	1 plant only recorded in this area.		Adjacent to Tronox North mine at Cooljarloo, c. 600 m SW of workings; c. 6.5 km due W of the Brand Highway and Wongonderrah Road	10/10/2013

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Stylidium aeonioides	4	Yellow flowers.	Flat. White sand with lateritic gravel.	Banksia and Eucalyptus todtiana low open woodland. With Adenanthos cygnorum, Banksia sp., E. todtiana, Hibbertia sp., Patersonia sp., Stylidium sp.			Badgingarra National Park, 0.5 km N of Waddi Road on Brand Highway, ca 200 m E of road, S of Badgingarra	20/10/2007
Stylidium aeonioides	4	Herb 15 cm. Yellow flowers.	Rocky laterite slope. Grey sand over laterite gravel.	Proteaceous heath.	50 individuals recorded.		Powerline easement Crown Reserve 3901, Dandaragan	31/10/2013
Stylidium aeonioides	4		Landform: upland plain, Slope - 1; Soil: grey loamey gravelly sand / lateritic gravel; Drainage: good.	Structure (Muir 1977): Scattered Mallees / Open Dwarf Scrub C / Low Heath D / Open Low Sedges; Major spp: Melaleuca trichophylla, Dryandra sp. 9, Hakea conchifolia; long unburnt.			AMG-Zone 50 348099mE 6636024mN; N boundary of Park, Bibby road, Badgingarra National Park (Reserve 31809), W of Badgingarra	07/12/1992
Stylidium aeonioides	4		Landform: upland plain, Slope - 2; Soil: lateritic orange loamey gravel; Drainage: good.	Structure (Muir 1977): Low Scrub B / Open Dwarf Scrub C / Low Heath D; Major spp: Gastrolobium spinosum ssp. spinosum, Petrophile shuttleworthiana, Calothamnus torulosus; long unburnt.			AMG-Zone 50 345712mE 6618182m N; Wongonderrah Road, E of Yerramullah Road, SSE of Cervantes	22/11/1992
Stylidium hymenocraspedum	3	Basally rosetted stylidium. Yellow flowers. Scape 75 cm long. 3 whorls of bracts on scape.	Plain. White to grey sand.	Banksia woodland with dense shrub to 1.5 m. Allocasuarina sp., Banksia attenuata, Banksia menziesii, Melaleuca sp., Xanthorrhoea preissii.	7 rosettes.		Eastern firebreak of Wongonderrah Nature Reserve, ca 550 m S of Wongonderrah Road, SE of Cervantes	19/10/2011
Stylidium hymenocraspedum	3	Yellow flowers.	Grey sand.				2 km N of Mullering Brook Bridge on Gingin-Jurien Bay Road [Brand Highway]	/09/1974
Stylidium hymenocraspedum	3	Erect plant to 68 cm. With a basal rosette of flat, tiled spatulate leaves with transparent margins, yellow horizontally paired petals with brown striping on the underside - 6 prominent throat appendages. Mid flowering stage. Generally single stemmed pla	Dry brown sand.	Low heath.	20+ plants.		Waddi Road, 2 km E of Brand Highway then N of the road for ca 80 m, Badgingarra	09/10/2002
Stylidium hymenocraspedum	3	Erect plant to 60 cm. With a basal rosette of flat, tiled spatulate leaves with transparent margins, yellow horizontally paired petals with brown striping on the underside - 6 prominent throat appendages. Mid flowering stage. A single stemmed plant.	Dry brown sand.	Heath.	scarce.		Wongonderrah Road, 6.65 km W of Brand Highway then N of the road for ca 30 m, just W of the gravel excavation site, Badgingarra	09/10/2002
Stylidium hymenocraspedum	3	Erect perennial herb to 50 cm high, basal leaves adpressed to soil surface. In late flowers; corolla lobes pale yellow, laterally paired; 6 yellow throat appendages arranged in a semi-circle, labellum boss whitish with a thin maroon margin and terminal a	Midslope, white grey sand over laterite.	Banksia shrubland with Stylidium spp.	occasional.		ca 800 m E on Waddi Road from Brand Highway, S of Badgingarra	25/10/2002
Stylidium hymenocraspedum	3	Erect plant to 73 cm. With a basal rosette of flat, tiled spatulate leaves with transparent margins, yellow horizontally paired petals with brown striping on the underside - 6 prominent throat appendages. Mid flowering stage. Generally single stemmed pla	Dry brown sand.	Banksia and Eucalyptus todtiana low open woodland with Adenanthos cygnorum, Baeckea grandiflora, Patersonia sp., Hibbertia hypericoides and other Stylidium spp.	in scattered patches.		Brand Highway, 2.2 km N of Waddi Road, mainly on the w side of road, Badgingarra	09/10/2002
Stylidium hymenocraspedum	3	Basally rosetted stylidium.	Flat. White sand.	Banksia and Eucalyptus todtiana low open woodland. With Adenanthos sp., Banksia sp., Eucalyptus todtiana, Patersonia sp., Stylidium sp.	at least 30 plants.		Badgingarra National Park, 0.5 km N of Waddi Road on Brand Highway, ca 200 m E of road (S of Badgingarra)	02/12/2007
Stylidium hymenocraspedum	3		Hill. Well drained white sand.	Banksia woodland.			Brand Highway location 50 m away near highway, NE of Cataby	29/07/2013
Stylidium hymenocraspedum	3	Erect plant to 60 cm. With a basal rosette of flat, tiled spatulate leaves with transparent margins, yellow horizontally paired petals with brown striping on the underside - 6 prominent throat appendages. Mid flowering stage. Generally single stemmed pla	Dry brown sand.	Banksia and Eucalyptus todtiana low open woodland with Adenanthos cygnorum, Baeckea grandiflora, Patersonia sp., Hibbertia hypericoides and other Stylidium spp.	in scattered patches.		Brand Highway, 0.4 km N of Waddi Road, mainly on the E side of road, Badgingarra	09/10/2002
Stylidium hymenocraspedum	3	Rosetted perennial 40-80 cm high, leaves adpressed to soil; corolla lobes pale yellow, sometimes with a faint maroon markings abaxially; throat appendages dark yellow.	Gentle hillslope; white sand.	Eucalyptus todtiana and Banksia woodland with scattered Nuytsia; Stylidium adpressum, S. bicolor and S. crossocephalum.	scattered plants.		500 m S of Waddi Road on Brand Highway, S of Badgingarra	23/10/2009
Stylidium inversiflorum	4	Rosetted, perennial herb 5-10 cm high. Corolla lobes vertically-paired, yellow with small red throat markings. Throat appendages small and yellow. Column yellow.	Upland. White sand.	Banksia heath with scattered Eucalypts and Stylidium spp.	locally frequent (> 200 plants seen)		7.98 km along Cadda Road from Brand Highway, Badgingarra National Park	11/10/2006
Stylidium inversiflorum	4	Rosetted perennial herb 12-15 cm high. Corolla lobes vertically-paired, yellow with small red throat markings. Throat appendages small and yellow. Column yellow.	Upland. White sand.	Tall Banksia shrubland with Stylidium spiciforme.	2 plants seen		Bibby Road, 2.44 km W of Brand Highway, Badgingarra National Park	11/10/2006

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Stylidium inversiflorum	4	Stilted perennial herb in early flower; corolla lobes paired vertically, pale yellow with red-maroon throat markings; throat appendages yellow tipped red-maroon; column ventral.	Hillslope; white sand over laterite.	Low shrubland with scattered emergent mallees; Stylidium spp.	Only a few plants seen.		7.9 km W on Cadda Rd from Brand Highway, Badgingarra National Park	20/10/2009
Stylidium tinkeri	2	Annual herb 2-3 cm high; corolla lobes paired vertically to spreading, white with prominent pink-red markings on the upper lobes, yellow throat; throat appendages yellow. Plants small in stature and with solitary flowers due to drought conditions.	Winter-wet depression; grey-brown clay sand.	Melaleuca scrub.	very few flowering plants seen.		UCL 5.4 km W on Wongonderrah Road from Brand Highway, SW of Badgingarra	18/10/2010
Stylidium tinkeri	2	Annual herb 6 cm high x 1 cm wide. White-pink yellow centres.	Seasonal wetland. Brown clayey loam.	Melaleuca scrub. Utricularia multifida, Burchardia sp., Viminaria juncea.	occasional.		5.4 km along Wongonderrah Road from junction Brand Highway	20/10/2009
Stylidium torticarpum	3	Corolla pink. Calyx tube extremely twisted in fruit.	Loamy soils between low shrubs.				On Banovich Road (S end), 0.1 km S of the creek crossing, Mount Lesueur area	18/10/1991
Synaphea endothrix	3	60 cm tall. Peduncles pink and green, or all red, or all green on the same plant. Stems yellow-brown. Looks very similar to S. spinulosa and S. sparsiflora (RB 685/6). Shape of flowers slightly different. Stigma broadly lobed with ventral projection.	Steep hilltop. White sand over laterite.	Heath with Allocasuarina, Conospermum, Hakea, Adenanthos, Lambertia, Synaphea aephynsa and S. spinulosa (still in bud and leaves much finer than RB 687).	occasional.		5.4 km E along Koonah Road from Brand Highway	28/08/1999
Synaphea endothrix	3	Small clumped shrub to 60 cm tall, stems yellowish, flowers bright yellow.	In sandy loam over laterite in Kwongan, on hilltop.				Koonah road, 5.5 km E of Brand Highway	13/08/1993
Tetratheca angulata	3	Erect, slender, multistemmed herb from woody rootstock.	Grey sand over laterite.	Mallee heath.		Abundance: common.	5 km SE of Badgingarra	09/09/1979
Tetratheca angulata	3	Perennial from semi woody base, 0.2 m high, several stemmed from underground base, petals 5, deep magenta, flowers pendant, fragrance slight.	Soil.				S arm of McNamara road, 3.4 km E of Brand Highway	27/09/1979
Tetratheca angulata	3	Low shrub 20 cm. Pink/purple flowers.	Undulating lateritic hills. White/grey sand over lateritic gravel.	Proteaceous heath. With Scattered Nuytsia floribunda with Open Shrubland of Xanthorrhoea ? drummondii and Allocasuarina humilis over closed Proteaceous Heath including specimes such as Petrophile shuttleworthiana, Banksia sphaerocarpa var. sphaerocarpa,			Mullering Road Reserve adjacent to Lot 3899/Lot 105 also in Lot 101, Dandaragan	03/10/2013
Tetratheca angulata	3	Small slender shrub to 40 cm with pink flowers.	Lateritic breakaway, skeletal grey-brown clay loam.		locally common.		Brand Highway reserve, W side of Brand Highway, ca. 70 m N of the intersection between Brand Highway and McNamara Road, ca. 7.5 km S of Badgingarra	07/11/2017
Thelymitra apiculata	4	Erect annual orchid 25 cm high, flowers royal purple edged in gold.	Red-brown sandy clay, slight rise lateritic.	Open shrubland.		Abundance: occasional.	5.6 km E of Brand Highway along Mullering road	02/07/1992
Thelymitra apiculata	4	Flowers blotched purple, margins golden.	In sand over laterite.	With low scrub.			7 miles SE of Badgingarra homestead	19/06/1961
Thelymitra apiculata	4	Flowers blotched purple, margins golden.	In sand over laterite.	With low scrub.			7 miles SE of Badgingarra homestead	19/06/1961
Thelymitra apiculata	4	Flowers blotched purple, margins golden.	In sand over laterite.	With low scrub.			7 miles SE of Badgingarra homestead	19/06/1961
Thelymitra apiculata	4		Lateritic hillside. Gravel slope.	Heath and shrubs to 2 m.	12 plants scattered.		Bibby Road, 600 m W of Brand Highway, to SW	10/07/2005
Thelymitra apiculata	4	Flowers closed up in rain.	Crest of lateritic hilltop high in landscape.	Hakea megalosperma, Banksia species rich heath, Calectasia, Conostylis teretifolia.	5 plants.		Mullering Road, 5.6 km E of Brand Highway, 10.3 km 349 degrees N of Cataby	02/07/1986
Thelymitra pulcherrima	2	Orchid to 0.2 m, spiral leaved, flowers variegated.	Slope of low lateritic hill, grey-brown sandy clay with some lateritic gravel.	Species-rich low heath, with Ecdeiocolea monostachya.	3 plants seen, all early flower.		100 m E of Dampier-Bunbury pipeline at 100 m N of EW firebreak, which is 2.2 km N of Cooljarloo mine site turn-off on Brand Highway, c. 13 km NNW of Cataby roadhouse	27/07/2014
Thysanotus glaucus	4		Mining lease.				Cooljarloo	27/10/2008
Thysanotus glaucus	4	Perennial herb, to 0.2 m.					Ca 10.1 km W of Brand Highway, 2.2 km S of Wongonderrah Road and 25 km NW of Cataby	15/11/2012
Thysanotus glaucus	4	Tufted herb to 0.15 m high.	Plain. Grey sand.			2013 Rehabilitation Monitoring - Tronox 13-33. This taxon has been recorded at numerous locations within rehabilitated areas at the Tronox Cooljarloo mineral sands mine and it is worth noting that it is recruiting well in the rehabilitation.	C. 35 km NW of Dandaragan, 1 km S of Wongonderrah Road, 13 km W of Brand Highway	12/11/2013
Verticordia amphigia	3	Small yellow flowers.	Clay pan.				Site 7, Vacant Crown Land, Tiwest mine, Cooljarloo, S of Badgingarra	30/10/1996
Verticordia insignis subsp. eomagis	3	Shrub 40 cm; flowers pale pink, reddish in centre.	In sandy loam over gravel in shallow valley.	In heath.			1.2 km S of Koonah Road	31/10/1986
Verticordia lindleyi subsp. lindleyi	4	Spindly shrub to 0.6 m high.	Plain. Grey sand.			2013 Rehabilitation Monitoring - Tronox 13-33. This taxon has been recorded at numerous locations within rehabilitated areas at the Tronox Cooljarloo mineral sands mine. In addition, this specimen is of interest as it has affinities to Verticordia blepha	C. 30 km NW of Dandaragan, 4 km S of Wongonderrah Road, 5 km W of Brand Highway	13/11/2013

WA Herbarium Database Search

Taxon	Cons_Code	Plant_Desc	Site	Vegetation	Frequency	Notes	Locality	Date
Verticordia lindleyi subsp. lindleyi	4	Spindly shrub to 1 m, in flower.	Edge of winter-wet depression. Grey sand.	Heath with Banksia telmatiaea, with Melaleuca clavifolia.	20+ plants.		Near Pinjar-Eneabba transmission line in UCL adjacent to Tiwest Cooljarloo minesite, a few km N of main mine entrance road, ca 1 km W of Brand Highway, ca 15 km N of Cataby	17/11/2010
Verticordia rutilastra	3	Shrub 35 cm; flowers bright yellow turning red.	In sandy loam over gravel, in shallow valley.	In heath.			1.2 km S of Koonah Road	31/10/1986

Threatened and Priority Fauna Database Search

NAME_SCI	NAME_COM	CLASS	CONS_CODE	Date	SOURCE_ID	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	LOCALITY	SITE	NAME_ID	FAMILY
Arenaria interpres	Ruddy turnstone	BIRD	MI	30/11/1977	16202|129	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	25736	Scolopacidae
Arenaria interpres	Ruddy turnstone	BIRD	MI	15/08/1979	67147|129	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	25736	Scolopacidae
Arenaria interpres	Ruddy turnstone	BIRD	MI	15/10/1979	67145|129	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	25736	Scolopacidae
Calidris ferruginea	curlew sandpiper	BIRD	CR	13/02/1978	22146|161	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24784	Scolopacidae
Calidris ruficollis	Red-necked stint	BIRD	MI	30/11/1977	16202|162	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24788	Scolopacidae
Calidris ruficollis	Red-necked stint	BIRD	MI	05/01/1978	16187|162	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24788	Scolopacidae
Calidris ruficollis	Red-necked stint	BIRD	MI	13/02/1978	22146|162	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24788	Scolopacidae
Calidris ruficollis	Red-necked stint	BIRD	MI	15/08/1979	67147|162	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24788	Scolopacidae
Calidris ruficollis	Red-necked stint	BIRD	MI	15/10/1979	67145|162	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24788	Scolopacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/01/2016	81988	TFAUNA	Very certain	Opportunistic sighting	Dead	1	Badgingarra	Bibby Rd, 200m W of Emu Downs entry	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	15/11/2017	99863	TFAUNA	Very certain	Monitoring	Sighting	1	Cooljaroo	Wongonderrah Rd	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	22/11/2015	1209706	FAUNASURVEY	Certain	Survey	Unknown	1	BADGINGARRA	BADGINGARRA, Brand	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	30/10/2003	412913|794	BIRDATLAS2	Moderately certain	Observational	Sighting	1	BADGINGARRA	Waddi Farms	24734	Cacatuidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	10/11/2001	5651	TFAUNA	Moderately certain	Opportunistic sighting	Day sighting	5	Badgingarra	Brand Hwy, South Badgingarra, south of Jurien East Rd.	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	18/11/2001	9636	TFAUNA	Very certain	Community survey	Day sighting	0	Dandaragan	Dandaragan	24734	Psittacidae
Calyptorhynchus latirostris	Carnaby's cockatoo	BIRD	EN	18/11/2001	9637	TFAUNA	Very certain	Community survey	Day sighting	3	Dandaragan	Dandaragan	24734	Psittacidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	12/08/1977	51632|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	29/08/1977	60050|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	31/08/1977	3873|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	10/09/1977	45111|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	17/09/1977	22151|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	23/09/1977	16206|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	28/09/1977	55026|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	13/10/1977	16166|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	20/11/1977	16190|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	30/11/1977	16202|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	09/05/1978	22144|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	24/06/1978	45099|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	24/08/1978	45106|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	24/08/1978	45114|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	28/11/1978	55020|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	06/08/1979	67157|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	15/10/1979	67145|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	15/11/1979	83778|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	BIRD	EN	22/10/1980	90846|266	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48400	Cacatuidae
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	30/11/1977	16202|141	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	25575	Charadriidae
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)	REPTILE	P3	26/11/2013	892202	FAUNASURVEY	Certain	Survey	Unknown	1	COOLJARLOO	Cataby, Cooljarloo	41334	Scincidae
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)	REPTILE	P3	02/08/2014	892331	FAUNASURVEY	Certain	Survey	Unknown	1	COOLJARLOO	Cataby, Cooljarloo	41334	Scincidae
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)	REPTILE	P3	15/07/2015	1113792	FAUNASURVEY	Certain	Survey	Unknown	1	COOLJARLOO	Cooljarloo, North Transect	41334	Scincidae
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)	REPTILE	P3	23/11/2012	674001	FAUNASURVEY	Certain	Survey	Unknown	1	COOLJARLOO	Cooljarloo, South Transect	41334	Scincidae
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus (Swan Coastal Plain subpop.)	REPTILE	P3	24/11/2013	892068	FAUNASURVEY	Certain	Survey	Unknown	1	COOLJARLOO	Cataby, Cooljarloo	41334	Scincidae
Limosa lapponica	Bar-tailed godwit	BIRD	MI	30/11/1977	16202|153	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	30932	Scolopacidae
Limosa lapponica	Bar-tailed godwit	BIRD	MI	15/10/1979	67145|153	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	30932	Scolopacidae
Neelaps calonotos	black-striped snake, black-striped burrowing snake	REPTILE	P3	27/01/1990	15135	TFAUNA	Very certain	Survey	Caught or trapped	1	Cooljarloo	Cooljarloo, ~10km WNW, Walyering Hill	25249	Elapidae
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	REPTILE	P3	27/01/1990	REPT:R103639	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	COOLJARLOO	WALYERING HILL	25249	Elapidae
Notamacropus irma	Western brush wallaby	MAMMAL	P4	01/12/1968	MAMM:M8707	WAM_MAMMALS	WAM Vouchered	Collection	Specimen	1	BADGINGARRA	ENNEABA HIGHWAY	48022	Macropodidae
Notamacropus irma	Western brush wallaby	MAMMAL	P4	20/11/2015	1209742	FAUNASURVEY	Certain	Survey	Unknown	1	BADGINGARRA	BADGINGARRA, Brand	48022	Macropodidae
Notamacropus irma	western brush wallaby	MAMMAL	P4	11/02/2001	6597	TFAUNA	Very certain	Opportunistic sighting	Day sighting	1	Cataby	19km N of the BP Roadhouse at Cataby on Brand Hwy.	48022	Macropodidae
Pluvialis squatarola	Grey plover	BIRD	MI	30/11/1977	16202|136	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24383	Charadriidae
Thalasseus bergii	Crested tern	BIRD	MI	30/11/1977	16202|115	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48597	Laridae
Thalasseus bergii	Crested tern	BIRD	MI	05/01/1978	16187|115	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48597	Laridae
Thalasseus bergii	Crested tern	BIRD	MI	15/10/1979	67145|115	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	48597	Laridae
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	13/02/1978	22146|158	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24808	Scolopacidae
Tringa nebularia	Common greenshank, greenshank	BIRD	MI	15/10/1979	67145|158	BIRDATLAS1	Moderately certain	Observational	Sighting	1	BADGINGARRA	BADGINGARRA	24808	Scolopacidae

Black Cockatoo Breeding Data Database Search

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
116.000000	natural	confirmed	2001	2001	DBNO	9638
226.000000	natural	confirmed	2006	2006	DBNO	14399
225.000000	natural	confirmed	2006	2006	DBNO	14400
492.000000	natural	confirmed	0	0		
452.000000	natural	confirmed	0	0		
487.000000	natural	confirmed	0	0		
453.000000	natural	confirmed	0	0		
509.000000	natural	confirmed	0	0		
454.000000	natural	confirmed	0	0		
508.000000	natural	confirmed	0	0		
146.000000	natural	confirmed	2003	2003	DBNO	18833
248.000000	natural	confirmed	2007	2007	DBNO	14366
247.000000	natural	confirmed	2007	2007	DBNO	14365
166.000000	natural	confirmed	2004	2004	DBNO	18859
177.000000	natural	confirmed	2004	2004	DBNO	18897
258.000000	natural	confirmed	2007	2007	DBNO	14379
260.000000	natural	confirmed	2007	2007	DBNO	14385
178.000000	natural	confirmed	2004	2005	DBNO	18898
137.000000	natural	confirmed	2003	2004	DBNO	18834
262.000000	natural	confirmed	2007	2007	DBNO	14388
249.000000	natural	confirmed	2007	2007	DBNO	14367
157.000000	natural	confirmed	2004	2004	DBNO	18861
239.000000	natural	confirmed	2007	2007	DBNO	14386
193.000000	natural	confirmed	2004	2004	DBNO	18903
241.000000	natural	confirmed	2007	2007	DBNO	14390
138.000000	natural	confirmed	2003	2003	DBNO	18836
250.000000	natural	confirmed	2007	2007	DBNO	14368
264.000000	natural	confirmed	2007	2007	DBNO	14393
135.000000	natural	confirmed	2003	2005	DBNO	18835
244.000000	natural	confirmed	2007	2007	DBNO	14362
251.000000	natural	confirmed	2007	2007	DBNO	14369
133.000000	natural	confirmed	2003	2003	DBNO	18831

Black Cockatoo Breeding Data Database Search

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
230.000000	natural	confirmed	2007	2007	DBNO	14360
494.000000	natural	confirmed	0	0		
507.000000	natural	confirmed	0	0		
231.000000	natural	confirmed	2007	2007	DBNO	14361
240.000000	natural	confirmed	2007	2007	DBNO	14389
136.000000	natural	confirmed	2003	2003	DBNO	18830
233.000000	natural	confirmed	2007	2007	DBNO	14373
144.000000	natural	confirmed	2003	2004	DBNO	18839
139.000000	natural	confirmed	2003	2005	DBNO	18844
234.000000	natural	confirmed	2007	2007	DBNO	14374
228.000000	natural	confirmed	2007	2007	DBNO	14358
150.000000	natural	confirmed	2003	2003	DBNO	18849
140.000000	natural	confirmed	2003	2003	DBNO	18846
156.000000	natural	confirmed	2004	2004	DBNO	18856
243.000000	natural	confirmed	2007	2007	DBNO	14357
263.000000	natural	confirmed	2007	2007	DBNO	14391
142.000000	natural	confirmed	2003	2004	DBNO	18838
232.000000	natural	confirmed	2007	2007	DBNO	14372
259.000000	natural	confirmed	2007	2007	DBNO	14381
257.000000	natural	confirmed	2007	2007	DBNO	14378
148.000000	natural	confirmed	2003	2004	DBNO	18842
506.000000	natural	confirmed	0	0		
147.000000	natural	confirmed	2003	2004	DBNO	18841
256.000000	natural	confirmed	2007	2007	DBNO	14377
149.000000	natural	confirmed	2003	2003	DBNO	18832
246.000000	natural	confirmed	2007	2007	DBNO	14364
237.000000	natural	confirmed	2007	2007	DBNO	14383
261.000000	natural	confirmed	2007	2007	DBNO	14387
211.000000	natural	confirmed	2004	2004	DBNO	18857
252.000000	natural	confirmed	2007	2007	DBNO	14370
143.000000	natural	confirmed	2003	2004	DBNO	18837
245.000000	natural	confirmed	2007	2007	DBNO	14363

Black Cockatoo Breeding Data Database Search

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
493.000000	natural	confirmed	0	0		
134.000000	natural	confirmed	2003	2003	DBNO	18840
242.000000	natural	confirmed	2007	2007	DBNO	14392
255.000000	natural	confirmed	2007	2007	DBNO	14376
236.000000	natural	confirmed	2007	2007	DBNO	14382
238.000000	natural	confirmed	2007	2007	DBNO	14384
253.000000	natural	confirmed	2007	2007	DBNO	14371
235.000000	natural	confirmed	2007	2007	DBNO	14380
132.000000	natural	confirmed	2003	2004	DBNO	18843
1100.000000	natural	confirmed	2011	2011	hollow code	DANCOOH001
1101.000000	natural	confirmed	2011	2016	hollow code	DANCOOH002
1102.000000	natural	confirmed	2011	2011	hollow code	DANCOOH003
1103.000000	natural	confirmed	2011	2011	hollow code	DANCOOH004
1104.000000	natural	confirmed	2011	2013	hollow code	DANCOOH005
1105.000000	natural	confirmed	2011	2016	hollow code	DANCOOH006
1106.000000	natural	confirmed	2012	2012	hollow code	DANCOOH007
1107.000000	natural	confirmed	2015	2015	hollow code	DANCOOH008
1108.000000	natural	potential	0	0	hollow code	DANCOOH009
1109.000000	natural	confirmed	2011	2011	hollow code	DANKENH001
1121.000000	natural	potential	0	0	hollow code	DANSCOH001
1122.000000	natural	confirmed	2011	2012	hollow code	DANSCOH002
1123.000000	natural	confirmed	2011	2013	hollow code	DANSCOH003
1124.000000	natural	confirmed	2011	2011	hollow code	DANSCOH004
1125.000000	natural	confirmed	2011	2012	hollow code	DANSCOH005
1126.000000	natural	confirmed	2011	2012	hollow code	DANSCOH006
1127.000000	natural	confirmed	2011	2015	hollow code	DANSCOH007
1128.000000	natural	confirmed	2011	2012	hollow code	DANSCOH008
1129.000000	natural	potential	0	0	hollow code	DANSCOH009
1130.000000	natural	confirmed	2011	2011	hollow code	DANSCOH010
1131.000000	natural	potential	0	0	hollow code	DANSCOH011
1132.000000	natural	potential	0	0	hollow code	DANSCOH012
1133.000000	natural	confirmed	2015	2015	hollow code	DANSCOH013

Black Cockatoo Breeding Data Database Search

WT_ID	HOL_TYPE	TREE_CAT	YRFIRSTBR	YRLASTBR	SCE_ID_FLD	SCE_ID_VAL
1134.000000	natural	potential	0	0	hollow code	DANSCOH014
1135.000000	natural	confirmed	2011	2011	hollow code	DANTJRH001
1136.000000	natural	confirmed	2011	2011	hollow code	DANTJRH002

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 26/08/2020

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 27' 46" E,30° 31' 17" S
Buffer 10km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	250	434
Priority 1	4	13
Priority 2	6	23
Priority 3	20	54
Priority 4	10	41
Rare or likely to become extinct	4	12
TOTAL	**294**	**577**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	20439	*Acacia splendens*		T	
2.	6309	*Andersonia gracilis*		T	
3.	13093	*Eucalyptus absita (Badgingarra Box)*		T	
4.	10862	*Thelymitra stellata (Star Orchid)*		T	
Priority 1					
5.	46033	*Baeckea sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606)*		P1	Y
6.	31232	*Drosera leucostigma*		P1	
7.	19245	*Lyginia excelsa*		P1	
8.	19316	*Stylidium tinkeri*		P1	
Priority 2					
9.	29437	*Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)*		P2	
10.	17812	*Catacolea enodis*		P2	
11.	46364	*Desmocladus microcarpus*		P2	
12.	14080	*Hypocalymma serrulatum*		P2	
13.	14493	*Hypocalymma sp. Cataby (G.J. Keighery 5151)*		P2	
14.	19369	*Leucopogon sp. Badgingarra (R. Davis 421)*		P2	
Priority 3					
15.	3319	*Acacia epacantha*		P3	
16.	7831	*Angianthus micropodioides*		P3	
17.	1263	*Arnocrinum gracillimum*		P3	
18.	32206	*Banksia nana (Dwarf Dryandra)*		P3	
19.	5377	*Beaufortia bicolor (Badgingarra Beaufortia)*		P3	
20.	19980	*Calytrix ecalycata subsp. brevis*		P3	
21.	4560	*Comesperma rhadinocarpum (Slender-fruited Comesperma)*		P3	
22.	16593	*Desmocladus biformis*		P3	
23.	48789	*Drosera prophylla*		P3	
24.	14423	*Grevillea thyrsoides subsp. thyrsoides*		P3	
25.	13233	*Guichenotia alba*		P3	
26.	14747	*Jacksonia anthoclada*		P3	
27.	48179	*Leucopogon foliosus*		P3	
28.	14563	*Persoonia filiformis*		P3	
29.	11557	*Phlebocarya pilosissima subsp. pilosissima*		P3	
30.	20701	*Stylidium hymenocraspedum*		P3	
31.	16858	*Synaphea endothrix*		P3	
32.	23982	*Tetratheca angulata*		P3	
33.	12434	*Verticordia insignis subsp. eomagis*		P3	
34.	12456	*Verticordia rutilastra*		P3	
Priority 4					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
35.	19026	*Conostephium magnum*		P4	
36.	15828	*Desmocladus elongatus*		P4	
37.	13531	*Eucalyptus macrocarpa subsp. elachantha (Small-leaved Mottlecah)*		P4	
38.	5741	*Eucalyptus pendens (Badgingarra Mallee)*		P4	
39.	2086	*Grevillea rudis*		P4	
40.	2087	*Grevillea saccata (Pouched Grevillea)*		P4	
41.	17622	*Hypolaena robusta*		P4	
42.	7680	*Stylidium aeonioides*		P4	
43.	7743	*Stylidium inversiflorum*		P4	
44.	11032	*Thelymitra apiculata*		P4	

Non-conservation taxon

45.	3242	*Acacia blakelyi*			
46.	3332	*Acacia fagonioides*			
47.	11519	*Acacia lasiocarpa var. bracteolata*			
48.	15483	*Acacia pulchella var. pulchella*			
49.	3541	*Acacia sessilis*			
50.	15486	*Acacia sphacelata subsp. verticillata*			
51.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
52.	1056	*Alexgeorgea nitens*			
53.	1057	*Alexgeorgea subterranea*			
54.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
55.	1734	*Allocasuarina microstachya*			
56.	1058	*Anarthria gracilis*			
57.	1060	*Anarthria laevis*			
58.	6311	*Andersonia heterophylla*			
59.	6314	*Andersonia lehmanniana*			
60.	11434	*Anigozanthos humilis subsp. humilis*			
61.	1414	*Anigozanthos pulcherrimus (Yellow Kangaroo Paw)*			
62.	3692	*Aotus procumbens*			
63.	1116	*Aphelia brizula*			
64.	1264	*Arnocrinum preissii*			
65.	6328	*Astroloma glaucescens*			
66.	6332	*Astroloma microdonta (Sandplain Cranberry)*			
67.	6339	*Astroloma xerophyllum*			
68.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
69.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
70.	1809	*Banksia candolleana (Propeller Banksia)*			
71.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
72.	1820	*Banksia grossa*			
73.	1823	*Banksia incana*			
74.	33398	*Banksia incana var. brachyphylla*			
75.	1835	*Banksia micrantha*			
76.	32163	*Banksia platycarpa*			
77.	1842	*Banksia prionotes (Acorn Banksia)*			
78.	32086	*Banksia sclerophylla*			
79.	32077	*Banksia sessilis var. cygnorum*			
80.	32074	*Banksia shuttleworthiana (Bearded Dryandra)*			
81.	33401	*Banksia sphaerocarpa var. pumilio*			
82.	12111	*Banksia sphaerocarpa var. sphaerocarpa (Fox Banksia)*			
83.	1852	*Banksia telmatiaea (Swamp Fox Banksia)*			
84.	32033	*Banksia tortifolia*			
85.	32031	*Banksia vestita (Summer Dryandra)*			
86.	5393	*Beaufortia squarrosa (Sand Beaufortia, Sand Bottlebrush, Puno)*			
87.	1417	*Blancoa canescens (Winter Bell)*			
88.	11381	*Boronia ramosa subsp. anethifolia*			
89.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
90.	15369	*Caladenia lorea*			
91.	18019	*Caladenia vulgata*			
92.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
93.	16365	*Calandrinia sp. Kenwick (G.J. Keighery 10905)*			
94.	36560	*Callitris arenaria (Sandplain Cypress)*			
95.	36600	*Callitris pyramidalis (Swamp Cypress)*			
96.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
97.	5431	*Calothamnus torulosus*			
98.	5439	*Calytrix angulata (Yellow Starflower)*			
99.	5458	*Calytrix flavescens (Summer Starflower)*			
100.	5465	*Calytrix leschenaultii*			
101.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
102.	17685	*Chaetanthus aristatus*			
103.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
104.	17833	*Chordifex microcodon*			
105.	13111	*Chorizema aciculare subsp. laxum*			
106.	4550	*Comesperma calymega (Blue-spike Milkwort)*			
107.	1857	*Conospermum acerosum (Needle-leaved Smokebush)*			
108.	15607	*Conospermum acerosum subsp. acerosum*			
109.	15041	*Conospermum canaliculatum*			
110.	1864	*Conospermum crassinervium (Summer Smokebush)*			
111.	1876	*Conospermum incurvum (Plume Smokebush)*			
112.	1878	*Conospermum nervosum*			
113.	1882	*Conospermum stoechadis (Common Smokebush)*			
114.	15611	*Conospermum stoechadis subsp. stoechadis (Common Smokebush)*			
115.	6348	*Conostephium pendulum (Pearl Flower)*			
116.	6349	*Conostephium preissii*			
117.	11414	*Conostylis aculeata subsp. breviflora*			
118.	1420	*Conostylis androstemma (Trumpets)*			
119.	1421	*Conostylis angustifolia*			
120.	1423	*Conostylis aurea (Golden Conostylis)*			
121.	48452	*Conostylis crassinerva subsp. absens*			
122.	48453	*Conostylis crassinerva subsp. crassinerva*			
123.	1436	*Conostylis juncea*			
124.	11870	*Conostylis teretifolia subsp. teretifolia*			
125.	1458	*Conostylis teretiuscula*			
126.	13527	*Croninia kingiana*			
127.	5528	*Darwinia sanguinea*			
128.	1220	*Dasypogon obliquifolius*			
129.	18560	*Daviesia divaricata subsp. divaricata*			
130.	15505	*Daviesia incrassata subsp. incrassata*			
131.	3833	*Daviesia podophylla*			
132.	15831	*Desmocladus castaneus*			
133.	17691	*Desmocladus fasciculatus*			
134.	17846	*Desmocladus parthenicus*			
135.	15272	*Diplolaena cinerea*			
136.	18542	*Diplopeltis huegelii subsp. subintegra*			
137.	44162	*Diuris tinkeri*			
138.	3097	*Drosera gigantea (Giant Sundew)*			
139.	376	*Eragrostis curvula (African Lovegrass)*	Y		
140.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
141.	5540	*Eremaea fimbriata*			
142.	5541	*Eremaea pauciflora*			
143.	14103	*Eremaea pauciflora var. calyptra*			
144.	13818	*Eremaea pauciflora var. lonchophylla*			
145.	14104	*Eremaea pauciflora var. pauciflora*			
146.	15684	*Eucalyptus conveniens*			
147.	5690	*Eucalyptus lane-poolei (Salmon White Gum)*			
148.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
149.	3872	*Euchilopsis linearis (Swamp Pea)*			
150.	20515	*Gastrolobium axillare*			
151.	3916	*Gastrolobium polystachyum (Horned Poison)*			
152.	3924	*Gastrolobium spinosum (Prickly Poison)*			
153.	3945	*Gompholobium aristatum*			
154.	6161	*Gonocarpus pithyoides*			
155.	29362	*Goodenia coerulea*			
156.	15839	*Grevillea preissii subsp. preissii*			
157.	17745	*Grevillea shuttleworthiana subsp. canarina*			
158.	14420	*Grevillea synapheae subsp. pachyphylla*			
159.	14421	*Grevillea synapheae subsp. synapheae*			
160.	5013	*Guichenotia micrantha (Small Flowered Guichenotia)*			
161.	2788	*Gyrostemon subnudus*			
162.	2131	*Hakea auriculata*			
163.	2143	*Hakea conchifolia (Shell-leaved Hakea)*			
164.	2146	*Hakea costata (Ribbed Hakea)*			
165.	2164	*Hakea gilbertii*			
166.	2175	*Hakea lissocarpha (Honey Bush)*			
167.	45333	*Hakea neospathulata*			
168.	2197	*Hakea prostrata (Harsh Hakea)*			
169.	12233	*Hakea psilorrhyncha*			
170.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
171.	6838	*Hemiandra linearis (Speckled Snakebush)*			
172.	6839	*Hemiandra pungens (Snakebush)*			
173.	38320	*Hemiandra sp. Jurien (B.J. Conn & M.E. Tozer BJC 3885)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
174.	41020	*Hemiphora bartlingii (Woolly Dragon)*			
175.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
176.	5112	*Hibbertia aurea*			
177.	5116	*Hibbertia crassifolia*			
178.	45534	*Hibbertia hypericoides subsp. hypericoides*			
179.	48697	*Hibbertia pubens*			
180.	43280	*Hibbertia sericosepala*			
181.	5172	*Hibbertia stellaris (Orange Stars)*			
182.	48381	*Hibbertia striata*			
183.	5173	*Hibbertia subvaginata*			
184.	3967	*Hovea stricta*			
185.	5216	*Hybanthus calycinus (Wild Violet)*			
186.	31431	*Hypocalymma sp. Nambung (R. Spjut & R. Smith s.n. 22/09/1992)*			
187.	5829	*Hypocalymma xanthopetalum*			
188.	1070	*Hypolaena exsulca*			
189.	17841	*Hypolaena pubescens*			
190.	2221	*Isopogon asper*			
191.	2238	*Isopogon teretifolius (Nodding Coneflower)*			
192.	4010	*Jacksonia floribunda (Holly Pea)*			
193.	4015	*Jacksonia hakeoides*			
194.	14778	*Jacksonia nutans*			
195.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
196.	19632	*Johnsonia pubescens subsp. pubescens*			
197.	4044	*Kennedia prostrata (Scarlet Runner)*			
198.	5835	*Kunzea micrantha*			
199.	17785	*Kunzea micrantha subsp. petiolata*			
200.	15528	*Lambertia multiflora var. multiflora*			
201.	5031	*Lasiopetalum drummondii*			
202.	5036	*Lasiopetalum lineare*			
203.	1305	*Laxmannia omnifertilis*			
204.	7577	*Lechenaultia hirsuta (Hairy Leschenaultia)*			
205.	2344	*Leptomeria empetriformis*			
206.	6370	*Leucopogon cochlearifolius*			
207.	6374	*Leucopogon conostephioides*			
208.	6379	*Leucopogon crassiflorus*			
209.	6420	*Leucopogon oldfieldii*			
210.	6429	*Leucopogon phyllostachys*			
211.	6430	*Leucopogon planifolius*			
212.	6434	*Leucopogon polymorphus*			
213.	14637	*Leucopogon sp. Coujinup (M.A. Burgman 1085)*			
214.	34163	*Leucopogon sp. Newdegate (M. Hislop 3585)*			
215.	48184	*Leucopogon stenophyllus*			
216.	7677	*Levenhookia stipitata (Common Stylewort)*			
217.	34736	*Lysinema pentapetalum*			
218.	2838	*Macarthuria apetala*			
219.	2839	*Macarthuria australis*			
220.	1477	*Macropidia fuliginosa (Black Kangaroo Paw)*			
221.	5888	*Melaleuca ciliosa*			
222.	19387	*Melaleuca clavifolia*			
223.	5904	*Melaleuca depressa*			
224.	19365	*Melaleuca ryeae*			
225.	5964	*Melaleuca seriata*			
226.	5983	*Melaleuca trichophylla*			
227.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
228.	10954	*Microtis media (Tall Mignonette Orchid)*			
229.	4100	*Mirbelia spinosa*			
230.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
231.	2367	*Olax scalariformis*			
232.	18255	*Opercularia vaginata (Dog Weed)*			
233.	46255	*Orianthera campanulata*			
234.	46254	*Orianthera spermacocea*			
235.	16477	*Pericalymma ellipticum var. ellipticum*			
236.	2281	*Persoonia trinervis*			
237.	2286	*Petrophile brevifolia*			
238.	2299	*Petrophile linearis (Pixie Mops)*			
239.	16874	*Petrophile recurva*			
240.	6797	*Physopsis spicata (Hill River Lambstail)*			
241.	33460	*Pilostyles coccoidea*			
242.	2408	*Pilostyles hamiltonii*			
243.	11402	*Pimelea imbricata var. piligera*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
244.	18353	*Pithocarpa pulchella var. pulchella*			
245.	6255	*Platysace juncea*			
246.	6262	*Platysace xerophila*			
247.	1680	*Prasophyllum parvifolium (Autumn Leek Orchid)*			
248.	1687	*Pterostylis dilatata*			
249.	45343	*Pterostylis platypetala*			
250.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
251.	6012	*Regelia ciliata*			
252.	19942	*Ricinocarpos undulatus*			
253.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
254.	7603	*Scaevola canescens (Grey Scaevola)*			
255.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
256.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
257.	13182	*Scaevola repens var. repens*			
258.	979	*Schoenus caespititius*			
259.	984	*Schoenus curvifolius*			
260.	1000	*Schoenus minutulus*			
261.	1009	*Schoenus pleiostemoneus*			
262.	16274	*Schoenus sp. A3 Ciliate Sheaths (K.R. Newbey 9402)*			
263.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
264.	20382	*Scholtzia sp. Wongonderrah (M.E. & M.R. Trudgen MET 12000)*			
265.	17645	*Senna artemisioides*			
266.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
267.	17551	*Sphaerolobium drummondii*			
268.	10800	*Sphaerolobium pulchellum*			
269.	13475	*Stenanthemum humile*			
270.	2316	*Stirlingia latifolia (Blueboy)*			
271.	2319	*Strangea cynanchicarpa (Heath Strangea)*			
272.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			
273.	7710	*Stylidium cygnorum*			
274.	18420	*Stylidium flagellum*			
275.	25837	*Stylidium purpureum (Purple Fountain Triggerplant)*			
276.	7785	*Stylidium repens (Matted Triggerplant)*			
277.	20521	*Stylidium rigidulum*			
278.	25836	*Stylidium spiciforme (Spiciform Triggerplant)*			
279.	20608	*Stylidium stenosepalum*			
280.	16882	*Synaphea aephynsa*			
281.	15532	*Synaphea spinulosa subsp. spinulosa*			
282.	1036	*Tetraria octandra*			
283.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
284.	1358	*Thysanotus triandrus*			
285.	6280	*Trachymene pilosa (Native Parsnip)*			
286.	18587	*Triglochin nana*			
287.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
288.	7665	*Velleia trinervis*			
289.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
290.	6083	*Verticordia grandis (Scarlet Featherflower)*			
291.	10822	*Verticordia nobilis*			
292.	6105	*Verticordia patens*			
293.	6107	*Verticordia pennigera*			
294.	6289	*Xanthosia huegelii*			

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

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely 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.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 26/08/2020

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115° 27' 46" E,30° 31' 17" S
Buffer	10km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	133	411
Priority 4	1	1
Rare or likely to become extinct	2	7
TOTAL	**136**	**419**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
2.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
Priority 4					
3.	48022	*Notamacropus irma (Western Brush Wallaby)*		P4	
Non-conservation taxon					
4.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
5.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
6.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
7.	24262	*Acanthiza inornata (Western Thornbill)*			
8.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
9.		*Acariformes sp.*			
10.	24282	*Accipiter fasciatus subsp. fasciatus (Brown Goshawk)*			
11.		*Aeshnidae sp.*			
12.	24316	*Anas superciliosa (Pacific Black Duck)*			
13.	24561	*Anthochaera carunculata (Red Wattlebird)*			
14.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
15.	24599	*Anthus australis subsp. australis (Australian Pipit)*			
16.	24285	*Aquila audax (Wedge-tailed Eagle)*			
17.	24610	*Ardeotis australis (Australian Bustard)*			
18.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
19.		*Barnardius zonarius*			
20.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
21.	25715	*Cacatua roseicapilla (Galah)*			
22.	25716	*Cacatua sanguinea (Little Corella)*			
23.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
24.	24269	*Calamanthus campestris (Rufous Fieldwren)*			
25.		*Ceinidae sp.*			
26.		*Ceratopogonidae sp.*			
27.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
28.		*Chironominae sp.*			
29.	24289	*Circus assimilis (Spotted Harrier)*			
30.		*Coenagrionidae sp.*			
31.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
32.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
33.		*Corduliidae sp.*			
34.		*Corixidae sp.*			
35.	25592	*Corvus coronoides (Australian Raven)*			
36.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
37.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
38.	25595	*Cracticus tibicen (Australian Magpie)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
39.	25596	*Cracticus torquatus (Grey Butcherbird)*			
40.	24424	*Cracticus torquatus subsp. torquatus (Grey Butcherbird)*			
41.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
42.	30893	*Cryptoblepharus buchananii*			
43.	30899	*Ctenophorus adelaidensis (Southern Heath Dragon, Western Heath Dragon)*			
44.	25039	*Ctenotus fallens*			
45.	25047	*Ctenotus impar*			
46.	25065	*Ctenotus pantherinus subsp. pantherinus (Leopard Ctenotus)*			
47.		*Culicidae sp.*			
48.	24322	*Cygnus atratus (Black Swan)*			
49.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
50.	30906	*Delma concinna (Javelin Legless Lizard)*			
51.	30905	*Delma concinna subsp. concinna (Javelin Legless Lizard)*			
52.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
53.	25468	*Demansia psammophis (Yellow-faced Whipsnake)*			
54.	24470	*Dromaius novaehollandiae (Emu)*			
55.		*Dytiscidae sp.*			
56.	25100	*Egernia napoleonis*			
57.		*Egretta novaehollandiae*			
58.		*Elanus axillaris*			
59.	24290	*Elanus caeruleus subsp. axillaris (Australian Black-shouldered Kite)*			
60.		*Eolophus roseicapillus*			
61.	24567	*Epthianura albifrons (White-fronted Chat)*			
62.	24570	*Epthianura tricolor (Crimson Chat)*			
63.	25621	*Falco berigora (Brown Falcon)*			
64.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
65.	24041	*Felis catus (Cat)*	Y		
66.	25530	*Gerygone fusca (Western Gerygone)*			
67.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
68.	24443	*Grallina cyanoleuca (Magpie-lark)*			
69.	24491	*Hirundo neoxena (Welcome Swallow)*			
70.		*Hydrophilidae sp.*			
71.	24367	*Lalage tricolor (White-winged Triller)*			
72.		*Leptoceridae sp.*			
73.		*Lestidae sp.*			
74.	25005	*Lialis burtonis*			
75.	25661	*Lichmera indistincta (Brown Honeyeater)*			
76.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
77.	25388	*Litoria moorei (Motorbike Frog)*			
78.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
79.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
80.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
81.	25654	*Malurus splendens (Splendid Fairy-wren)*			
82.	24552	*Malurus splendens subsp. splendens (Splendid Fairy-wren)*			
83.		*Megapodagrionidae sp.*			
84.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
85.	25184	*Menetia greyii*			
86.	24598	*Merops ornatus (Rainbow Bee-eater)*			
87.		*Missulena hoggi*			
88.	25192	*Morethia obscura*			
89.	24223	*Mus musculus (House Mouse)*	Y		
90.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
91.		*Notonectidae sp.*			
92.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
93.		*Oligochaeta sp.*			
94.	24618	*Oreoica gutturalis (Crested Bellbird)*			
95.		*Orthocladiinae sp.*			
96.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
97.		*Ozarchaea westraliensis*			
98.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
99.	25253	*Parasuta gouldii*			
100.	25682	*Pardalotus striatus (Striated Pardalote)*			
101.	48061	*Petrochelidon nigricans (Tree Martin)*			
102.	24659	*Petroica goodenovii (Red-capped Robin)*			
103.	24409	*Phaps chalcoptera (Common Bronzewing)*			
104.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
105.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
106.		*Pinkfloydia harveii*			
107.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
108.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
109.	24230	*Pseudomys albocinereus (Ash-grey Mouse)*			
110.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
111.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
112.	48096	*Rhipidura albiscapa (Grey Fantail)*			
113.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
114.		*Scirtidae sp.*			
115.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
116.		*Simuliidae sp.*			
117.	30948	*Smicrornis brevirostris (Weebill)*			
118.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
119.	24111	*Sminthopsis gilberti (Gilbert's Dunnart)*			
120.	24112	*Sminthopsis granulipes (White-tailed Dunnart)*			
121.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
122.		*Stratiomyidae sp.*			
123.	25597	*Strepera versicolor (Grey Currawong)*			
124.	24943	*Strophurus spinigerus subsp. inornatus*			
125.	24942	*Strophurus spinigerus subsp. spinigerus*			
126.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
127.		*Tanypodinae sp.*			
128.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
129.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
130.	25519	*Tiliqua rugosa*			
131.	25207	*Tiliqua rugosa subsp. rugosa*			
132.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
133.	24851	*Turnix velox (Little Button-quail)*			
134.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
135.	24040	*Vulpes vulpes (Red Fox)*	Y		
136.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

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

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely 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.

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

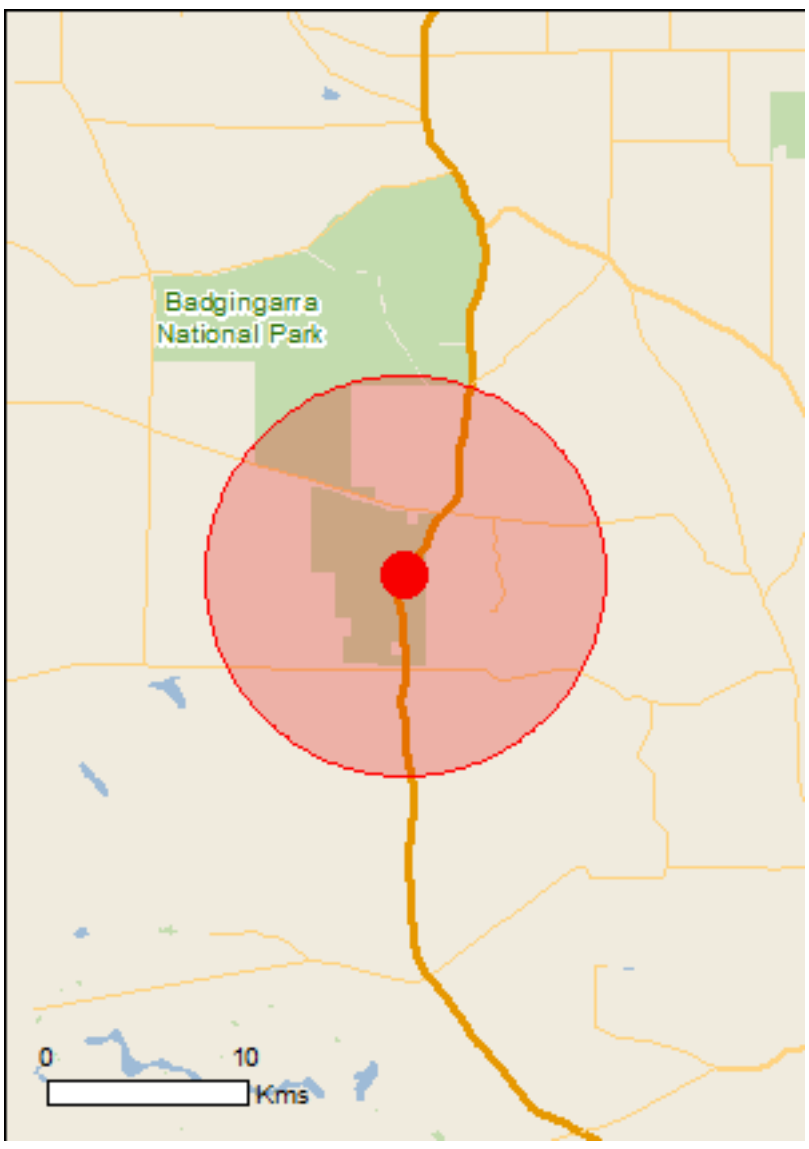
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

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.

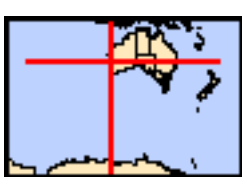
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/08/20 11:36:44

Summary
Details
Matters of NES
Other Matters Protected by the EPBC Act
Extra Information
Caveat
Acknowledgements



Coordinates
Buffer: 10.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	27
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	22
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

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
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Parantechinus apicalis Dibbler [313]	Endangered	Species or species habitat may occur within area
Plants		
Acacia splendens Splendid Wattle, Dandaragan Wattle [81510]	Endangered	Species or species habitat likely to occur within area
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
Banksia catoglypta [85021]	Vulnerable	Species or species habitat known to occur within area
Banksia serratuloides subsp. perissa Northern Serrate Dryandra [82767]	Critically Endangered	Species or species habitat may occur within area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat may occur within area
Eucalyptus absita Badgingarra Box [24260]	Endangered	Species or species habitat known to occur within area
Eucalyptus dolorosa Dandaragan Mallee, Mount Misery Mallee [56709]	Endangered	Species or species habitat may occur within area
Eucalyptus impensa Eneabba Mallee [56711]	Endangered	Species or species habitat likely to occur within area
Eucalyptus leprophloia Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat likely to occur within area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat likely to occur within area
Grevillea batrachioides Mt Lesueur Grevillea [21735]	Endangered	Species or species habitat likely to occur within area
Hakea megalosperma Lesueur Hakea [10505]	Vulnerable	Species or species habitat likely to occur within area
Hemiandra gardneri Red Snakebush [7945]	Endangered	Species or species habitat may occur within area
Leucopogon obtectus Hidden Beard-heath [19614]	Endangered	Species or species habitat may occur within area
Macarthuria keigheryi Keighery's Macarthuria [64930]	Endangered	Species or species habitat likely to occur within area
Paracaleana dixonii Sandplain Duck Orchid [86882]	Endangered	Species or species habitat may occur within area
Patersonia spirifolia Spiral-leaved Patersonia [83927]	Endangered	Species or species habitat likely to occur within area
Ptychosema pusillum Dwarf Pea [11268]	Vulnerable	Species or species habitat may occur within area
Thelymitra stellata Star Sun-orchid [7060]	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
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within

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

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Badgingarra	WA
Unnamed WA41986	WA

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		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
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

Name	Status	Type of Presence
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
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
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 within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-30.52132 115.46287

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.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix B
Conservation Significant Flora Likelihood of Occurrence

Appendix/Table B: Assessment of the Likelihood of Occurrence of Conservation signficant Flora speacies as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Acacia splendens	T	EN	X	X	X	4.9	May	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slopes of breakaways, especially southern slopes, hills.	No	Low	Low
Andersonia gracilis	T	EN	X	X	X	9	Sep - Nov	Currently known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils.[1]	No	Low	Low
Anigozanthos viridis subsp. terraspectans	T	VU		X	X	13.1	Aug - Sep	Occurs in winter-wet depressions where it grows on grey sandy clay loam, or grey sand, in low post-fire regenerating heath.[1]	No	Low	Low
Banksia catoglypta	T	VU		X		33.3	Jun - Jul	Grows in white sand over gravel in close proximity to, or on top of, lateritic breakaways.[1]	No	Low	Low
Banksia serratuloides subsp. perissa	T	CR		X		13.4	Aug - Sep	Gravelly lateritic soils.	No	Low	Low
Drakaea elastica	T	EN		X		41.1	Oct - Nov	White, grey sand, low-lying situations adjoining winter-wet swamps.[1]	No	Low	Low
Eucalyptus absita	T	EN	X	X	X	1.6	Apr - Jul	White lateritic sand. Paddocks.[2]	Yes	Medium	Low
Eucalyptus dolorosa	T	EN		X		24.4	Feb - Mar	Laterite. Hillsides.[2]	No	Low	Low
Eucalyptus impensa	T	EN		X		43.7	Jun - Jul	Yellow sand. Lateritic hills.[2]	No	Low	Low
Eucalyptus leprophloia	T	EN		X		26.1	Aug - Oct	White or grey sand over laterite. Valley slopes.[2]	No	Low	Low
Eucalyptus x balanites	T	EN		X		13.9	Oct - Jan	Sandy soils with lateritic gravel.[2]	Yes	Medium	Low
Grevillea batrachioides	T	EN		X		45.8	Oct	Sandy loam. Sandstone outcrops.[2]	No	Low	Low
Hakea megalosperma	T	VU		X	X	15.1	May - Jun	This Hakea grows in low heath in grey sand and lateritic gravel or laterite boulders on hilltops and ridges, or occasionally with emergent Eucalyptus todtiana in white or yellow grey sand.[1]	No	Low	Low
Hemiandra gardneri	T	EN		X		53.7	Aug - Oct	Grey or Yellow sand, clayey sands. Sandplains.[2]	Yes	Low	Low
Styphelia obtecta	T	EN		X		41.7		Pale grey sand, White sand, dry yellow sand	Yes	Low	Low
Macarthuria keigheryi	T	EN		X	X	16	Sep - Dec or Feb - Mar	White or grey sand.[2]	Yes	Low	Low
Paracaleana dixonii	T	EN		X		27.7	Oct - Dec or Jan	Typically occurs in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland.[2]	Yes	Low	Low
Patersonia spirifolia	T	EN		X	X	9.6		Sand over laterite. Low hills.	Yes	Medium	Low
Ptychosema pusillum	T	VU		X		13.9	Aug - Oct	Sand. Rises.[2]	Yes	Low	Low
Thelymitra stellata	T	EN	X	X	X	5.6	Oct - Nov	Grows on both on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams clay or gravel over laterite or gravel. Dry, moist or saline conditions are tolerated.[1]	Yes	Medium	Medium
Baeckea sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606)	P1		X		X	10.6		White sand over laterite	Yes	Medium	Low
Drosera leioblastus	P1				X	14.6	Sep - Dec	White sandy soils.	Yes	Medium	Medium
Drosera leucostigma	P1		X		X	7.7	Nov - Dec or Jan	Sandy soils. Margins of wet depressions.	No	Low	Low
Eucalyptus absita x loxophleba	P1				X	10.3		Lateritic sand.[2]	Yes	Medium	Low
Hypocalymma linifolium	P1				X	12.3		Sand.	Yes	Low	Low
Levenhookia preissii	P1				X	15.5	Sep - Dec or Jan	Grey or black, peaty sand. Swamps.	No	Low	Low
Acacia retrorsa	P2				X	10.6	Aug - Sep	Grey sand and lateritic gravel, sandy loam.[2]	Yes	Medium	Low
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	P2		X		X	6.6	Sep - Oct	Grey-white sand, rich brown sandy loam, sandy clay, alluvial soils. Low plains, river-banks, winter-wet swamps.[2]	No	Low	Low
Calectasia palustris	P2				X	9.7	Jul - Oct	White or grey sand. Seasonally inundated swamplands.	No	Low	Low
Catacolea enodis	P2		X		X	0.4	Sept - Nov	Deep white sand over laterite. Tall heath.	Yes	High	Low
Chordifex reseminans	P2				X	11.5	Mar- May	Dry sand. Heath.	Yes	Low	Low
Desmocladus microcarpus	P2		X		X	3.6		Grey/cream moist sand, Lower slope of hill, grey-brown sandy loam over laterite, Grey sandy soils.	Yes	Medium	Low
Hypocalymma serrulatum	P2		X		X	1.5	Apr - May	Grey or white sand. Along drainage lines.	Yes	High	Recorded
Hypocalymma sp. Cataby (G.J. Keighery 5151)	P2		X		X	4.2	Aug	Grey sand.	Yes	High	Low
Lepyrodia curvescens	P2				X	9.1	Sep - Nov	Sand, laterite. Seasonally inundated swampland.[2]	No	Low	Low
Leucopogon sp. Badgingarra (R. Davis 421)	P2		X		X	4.9	Dec	Grey sand, dry white sand. Hills, plains.	Yes	High	Low
Lyginia excelsa	P2		X		X	3.7	Mar - Nov	Sand. Dry heath and Banksia woodland.	Yes	High	Low
Stylidium tinkeri	P2		X		X	8.5	Oct	Grey sandy soil. Seasonal wetlands.[2]	No	Low	Low
Thelymitra pulcherrima	P2				X	13.5		Gravel.	Yes	Medium	Medium
Acacia epacantha	P3		X		X	1.9	Jul - Aug	Lateritic gravelly loam or clay.	Yes	High	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table B: Assessment of the Likelihood of Occurrence of Conservation signficant Flora speacies as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Allocasuarina grevilleoides	P3				X	9.8	Sep - Nov	Sand over laterite, gravel.[2]	Yes	Medium	Low
Allocasuarina ramosissima	P3				X	9.8	Jun - Sep	Lateritic soils, gravel.[2]	Yes	Medium	Low
Angianthus micropodioides	P3		X		X	5.3	Nov - Dec or Jan - Feb	Saline sandy soils. River edges, saline depressions, claypans.[2]	No	Low	Low
Arnocrinum gracillimum	P3		X		X	10.5	Oct - Nov	White, grey, yellow or lateritic sand.[2]	Yes	Medium	Recorded
Babingtonia urbana	P3				X	13	Jan - Mar	Associated with wetlands on the coastal plain.[2]	No	Low	Recorded
Banksia nana	P3		X		X	1.2	Oct	White/grey sand and/or gravel over laterite. Hills.	Yes	High	Recorded
Beaufortia bicolor	P3		X		X	0.7	Nov - Dec	White sand over laterite. Sandplains.[2]	Yes	High	Recorded
Beyeria gardneri	P3				X	12.7	Aug - Sep	Yellow sand.	No	Low	Low
Calytrix ecalycata subsp. brevis	P3		X		X	4.1	Aug - Sep	Dry yellow sand. Sandplains, low-rises.[2]	No	Low	Low
Comesperma rhadinocarpum	P3		X		X	0.5	Oct - Nov	Sandy soils.[2]	Yes	High	Medium
Conospermum scaposum	P3				X	15.4	Oct - Feb	White-grey sand, sandy clay. Low swampy areas, road verges.[2]	No	Low	Low
Desmocladus biformis	P3		X		X	5.2	Sep - Oct	Sand, sandy clay, lateritic soils. Dry sites.[2]	Yes	Medium	Low
Desmocladus nodatus	P3				X	12.7	Oct	Wetland, grey brown sandy loam, White/grey sand with clay.	No	Low	Low
Drosera prophylla	P3		X		X	5.2	July	Hill, shallow grey-white sand over laterite	Yes	Medium	Medium
Grevillea thyrsoides subsp. thyrsoides	P3		X		X	2.5	Feb or Aug - Sep	Sand or sandy lateritic gravel.	Yes	High	Low
Guichenotia alba	P3		X		X	5.3	Jul - Aug	Sandy and gravelly soils. Low-lying flats, depressions.[2]	No	Low	Low
Hensmania stoniella	P3				X	14.5	Sep - Nov	White, grey or lateritic sand, often winter-wet.[2]	No	Low	Low
Hopkinsia anoectocolea	P3				X	14.6	Sep - Dec	White or grey sand, often saline. Winter-wet depressions, floodplains, salt lakes.	No	Low	Low
Hypocalymma tetrapterum	P3				X	11	Aug	Grey sand, loam, lateritic gravel. Riverbanks, breakaways.	No	Low	Low
Isopogon autumnalis Rye & T.Macfarlane	P3				X	12.3	Feb - May	Occurs in sandy soils.[2]	Yes	Medium	Low
Isopogon panduratus subsp. palustris	P3				X	12.4	Jan, Aug - Oct or Nov	Open depression. Grey / brown sand.white dry sand.	Yes	Medium	Low
Jacksonia anthoclada	P3		X		X	3.8	Apr	White or grey sand. Sandplains.	Yes	High	Low
Jacksonia carduacea	P3				X	13.5	Aug - Dec	Grey sand, sandy clay.	Yes	Medium	Low
Lepidobolus quadratus	P3				X	15.1	Aug - Sep	Lateritic gravel, grey/white sand. Dry kwongan.[2]	Yes	Low	Low
Leucopogon foliosus	P3		X		X	0.7		Dry white sand over laterite, Upland, lateritic rise. Dry, yellow gravelly sand over laterite	Yes	High	Low
Persoonia filiformis	P3		X		X	4.1	Nov - Dec	Yellow or white sand over laterite.[2]	Yes	High	Low
Persoonia rudis	P3				X	13.8	Sep - Dec or Jan	White, grey or yellow sand, often over laterite.[2]	Yes	Medium	Low
Phlebocarya pilosissima subsp. pilosissima	P3		X		X	0.3	Aug - Oct	White or grey sand, lateritic gravel.[2]	Yes	High	High
Schoenus pennisetis	P3				X	13.4	Aug - Sep	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.[2]	No	Low	Low
Stylidium aceratum	P3				X	14.7	Oct - Nov	Sandy soils. Swamp heathland.[2]	No	Low	Low
Stylidium hymenocraspedum	P3		X		X	3.2	Sep - Oct	Sand over laterite. Hillslopes. Heath, Banksia and Eucalyptus low open woodland.	Yes	High	Low
Stylidium torticarpum	P3				X	13.7	Sep - Nov	Sandy clay and clay loam over laterite. Adjacent to creek lines, depressions, and beneath breakaways. Heath or mallee shrubland.[2]	No	Low	Low
Synaphea endothrix	P3		X		X	3.1	Aug - Sep	Gravelly loam, sand. Lateritic rises.	Yes	High	Recorded
Tetratheca angulata	P3		X		X	3.7	Aug-Oct	Sandy to gravelly laterite soils. Low hill crests, breakaways with massive laterite boulders.[2]	No	Low	Low
Verticordia amphigia	P3				X	13.2	Oct - Nov	Sandy loam, clay and rocky loam. Winter-wet depressions.[2]	No	Low	Low
Verticordia insignis subsp. eomagis	P3		X		X	8	Aug - Nov	Sandy soils over laterite. Sandplains, rocky rises.[2]	No	Low	Low
Verticordia rutilastra	P3		X		X	8	Sep - Nov	Sand and lateritic gravel. Hills.[2]	No	Low	Low
Boronia tenuis	P4				X	14.8	Aug - Nov	Laterite, stony soils, granite.[2]	No	Low	Low
Chordifex chaunocoleus	P4				X	11.7	Sep	Grows in brown, siliceous or peaty sand on flat or slightly sloping terrain.[1]	No	Low	Low
Conostephium magnum	P4		X		X	3.9	Jul - Sep	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.	Yes	High	Low
Desmocladus elongatus	P4		X		X	1.4	Aug - Dec	White or grey sand, sandy soil.[2]	Yes	High	Recorded
Eucalyptus macrocarpa subsp. elachantha	P4		X		X	8	Aug - Sep or Nov - Dec	White or grey sand over laterite. Hillslopes, ridges, sandplains.[2]	Yes	Medium	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix/Table B: Assessment of the Likelihood of Occurrence of Conservation signficant Flora speacies as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2020 DBCA database. High = Suitable habitat present and records less than 5 km from the Survey Area, Medium = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 15 km from the Survey Area, Unknown = Insufficient information available to classify . CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EBPC Act, VU = listed as Vulnerable under the EBPC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing.

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Prefered Habitat	Habitat occurs within the Survey Area	Pre-Survey Likelihood of Occurrence	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Eucalyptus pendens	P4		X		X	0.2	Aug - Nov	White or grey sand with lateritic gravel. Hillsides, breakaways, sandplains.[2]	Yes	High	Low
Grevillea rudis	P4		X		X	within survey area	Jan or Apr or Jun - Sep or Nov - Dec	White, grey, yellow or red sand, often with gravel & over laterite	Yes	High	Recorded
Grevillea saccata	P4		X		X	2.4	Apr or Jun - Nov	Yellow or brown sand, often with lateritic gravel.[2]	Yes	High	Low
Hibbertia helianthemoides	P4				X	15.8	Jul or Sep - Oct	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes	No	Low	Low
Hypolaena robusta	P4		X		X	7.5	Sep - Oct	White sand. Sandplains.[2]	Yes	Medium	Low
Stylidium aeonioides	P4		X		X	4.8	Sep - Nov	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.[2]	Yes	High	Medium
Stylidium inversiflorum	P4		X		X	2.8	Sep - Nov	White or grey sand over laterite. Sandplains, hillslopes and gullies. Heath, open woodland.[2]	Yes	Medium	Low
Thelymitra apiculata	P4		X		X	0.4	May - Jul	Grey sand, lateritic gravel.	Yes	High	High
Thysanotus glaucus	P4				X	13.3	Nov-Feb	White, grey or yellow sand, sand gravel.[2]	Yes	Medium	Medium
Verticordia lindleyi subsp. lindleyi	P4				X	11.9	May or Nov - Dec or Jan	Sand, sandy clay. Winter-wet depressions.[2]	No	Low	Low

[1] Department of Agriculture, Water and Environment (2020) [2]Western Australian Herbarium (2020)

Appendix C
Flora Species List

Appendix C: Vascular Flora Inventory

Family	Species
Anarthriaceae	*Lyginia barbata*
Araliaceae	*Trachymene pilosa*
Asparagaceae	*Lomandra hermaphrodita*
	Lomandra sericea
	Thysanotus sp. Ajana
	Thysanotus triandrus
Asteraceae	**Hypochaeris glabra*
	Podotheca angustifolia
	Pterochaeta paniculata
Campanulaceae	*Wahlenbergia gracilenta*
Casuarinaceae	*Allocasuarina humilis*
	Allocasuarina microstachya
Colchicaceae	*Burchardia congesta*
Crassulaceae	*Crassula colorata*
Cyperaceae	*Caustis dioica*
	Chaetospora curvifolia
	Lepidosperma pubisquameum
	Lepidosperma scabrum
	Mesomelaena pseudostygia
	Mesomelaena tetragona
	Schoenus caespititius
	Schoenus nanus
	Schoenus pleiostemoneus
	Schoenus unispiculatus
	Schoenus clandestinus
	Tetraria octandra
Dasypogonaceae	*Calectasia narragara*
	Dasypogon obliquifolius
Dilleniaceae	*Hibbertia huegelii*
	Hibbertia hypericoides
Droseraceae	*Drosera ?porrecta*
	Drosera erythrorhiza
	Drosera sp.
	Drosera menziesii
Elaeocarpaceae	*Tetratheca confertifolia*
Ericaceae	*Andersonia lehmanniana*
	Conostephium pendulum
	Leucopogon oldfieldii
	Styphelia crassifolia
	Styphelia tortifolia
	Styphelia xerophylla
Euphorbiaceae	*Monotaxis grandiflora* var. *grandiflora*
	Ricinocarpos undulatus
Fabaceae	*Acacia stenoptera*
	Chorizema aciculare subsp. *laxum*
	Daviesia podophylla
	Gastrolobium oxylobioides
	Gastrolobium polystachyum
	Hovea stricta

Appendix C: Vascular Flora Inventory

Family	Species
	Isotropis cuneifolia subsp. *cuneifolia*
	Jacksonia floribunda
	Jacksonia furcellata
	Jacksonia lehmannii
	Labichea punctata
	Sphaerolobium drummondii
Goodeniaceae	*Dampiera oligophylla*
	Dampiera sp.
	Dampiera spicigera
	Goodenia coerulea
	Scaevola repens
Haemodoraceae	*Anigozanthos humilis*
	Anigozanthos sp.
	Blancoa canescens
	Conospermum stoechadis subsp. *sclerophyllum*
	Conostylis ?angustifolia
	Conostylis angustifolia
	Conostylis aurea
	Conostylis crassinerva
	Conostylis festucacea
	Conostylis sp.
	Haemodorum venosum
	Phlebocarya filifolia
Hemerocallidaceae	*Arnocrinum gracillimum* (P3)
	Johnsonia pubescens subsp. *pubescens*
Iridaceae	*Patersonia juncea*
	Patersonia occidentalis
Lamiaceae	*Hemiphora bartlingii*
	Microcorys sp. Coomallo (L. Haegi 2677)
	Quoya verbascina
Lauraceae	*Cassytha flava*
Loganiaceae	*Orianthera campanulata*
	Orianthera spermacocea
	Phyllangium divergens
Malvaceae	*Lasiopetalum lineare*
	Thomasia grandiflora
Myrtaceae	*Babingtonia camphorosmae*
	Babingtonia grandiflora
	Babingtonia urbana (P3)
	Beaufortia bicolor (P3)
	Calothamnus sanguineus
	Calothamnus torulosus
	Calytrix angulata
	Calytrix flavescens
	Conothamnus trinervis
	Eremaea pauciflora var. *calyptra*
	Eucalyptus arachnaea subsp. *arachnaea*
	Eucalyptus camaldulensis
	Eucalyptus todtiana

Appendix C: Vascular Flora Inventory

Family	Species
	Eucalyptus utilis
	Hypocalymma serrulatum (P2)
	Hypocalymma xanthopetalum
	Leptospermum spinescens
	Melaleuca platycalyx
	Melaleuca seriata
	Melaleuca ciliosa
	Verticordia densiflora var. *densiflora*
	Verticordia ovalifolia
	Verticordia pennigera
Orchidaceae	*Caladenia flava*
	Diuris ?corymbosa
	Pterostylis ?orbiculata
Poaceae	*Amphipogon turbinatus*
	Austrostipa elegantissima
	**Briza maxima*
	Neurachne alopecuroidea
Proteaceae	*Adenanthos cygnorum* subsp. *cygnorum*
	Banksia attenuata
	Banksia candolleana
	Banksia chamaephyton (P4)
	Banksia menziesii
	Banksia nana (P3)
	Banksia shuttleworthiana
	Banksia stenoprion
	Banksia tortifolia
	Conospermum acerosum
	Grevillea rudis (P4)
	Grevillea shuttleworthiana subsp. *canarina*
	Grevillea synapheae subsp. *pachyphylla*
	Hakea conchifolia
	Hakea costata
	Hakea incrassata
	Hakea sp.
	Isopogon linearis
	Lambertia multiflora var. *multiflora*
	Petrophile chrysantha
	Petrophile linearis
	Petrophile rigida
	Petrophile seminuda
	Petrophile shuttleworthiana
	Stirlingia latifolia
	Synaphea endothrix (P3)
	Synaphea sp.
	Synaphea spinulosa subsp. *spinulosa*
Restionaceae	*Alexgeorgea subterranea*
	Chordifex microcodon
	Chordifex ?sinuosus
	Chordifex sinuosus

Appendix C: Vascular Flora Inventory

Family	Species
	Desmocladus elongatus (P4)
Rubiaceae	*Opercularia vaginata*
Rutaceae	*Cyanothamnus ramosus* subsp. *anethifolius*
	Philotheca spicata
Stylidiaceae	*?Levenhookia pusilla*
	Stylidium bicolor
	Stylidium crossocephalum
	Stylidium divaricatum
	Stylidium repens
	Stylidium repens group
	Stylidium schoenoides
Xanthorrhoeaceae	*Xanthorrhoea drummondii*

Appendix D
Flora Site Sheets

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ01
Location Cooljarloo 353558 **mE** 6624367 **mN**

Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m

Landform: Mid slope
Soil Type: Gravel,Sand
Soil Colour: Grey
Total PFC: 80 %
Bareground: 8 %
Leaf Litter: 10 %
Logs: 0 %

Vegetation: Low woodland of Banksia attenuata and B. menziesii over mid open shrubland of Melaleuca seriata, Adenanthos cygnorum and Stirlingia latifolia over low sparse forbland of Dasypogon obliquifolius, Lyginia barbata and Mesomelaena pseudostygia
Condition: Excellent
Disturbance: None

SPECIES LIST

Name	Cover %	Height (cm)
Acacia stenoptera	0.5	30
Adenanthos cygnorum subsp. cygnorum	7	140
Alexgeorgea subterranea	0.5	8
Allocasuarina humilis	1.5	120
Amphipogon turbinatus	0.5	15
Anigozanthos humilis	0.5	15
Banksia attenuata	6	200
Banksia menziesii	25	200
Beaufortia bicolor	0.5	55
Blancoa canescens	2	15
Burchardia congesta	0.5	45
Calytrix flavescens	0.5	30
Cassytha flava	0.5	60
Chaetospora curvifolia	1.5	30
Chordifex microcodon	1	35
Conostylis ?angustifolia	1	15
Conostylis angustifolia	3	35
Dasypogon obliquifolius	5	45
Drosera ?porrecta	0.5	25
Drosera erythrorhiza	0.5	1
Drosera menziesii	0.5	50
Eremaea pauciflora var. calyptra	2	50
Hibbertia huegelii	2.5	1.5
Hibbertia hypericoides	0.5	35
Hypocalymma xanthopetalum	0.5	35
Leptospermum spinescens	1	60
Leucopogon oldfieldii	2	60
Lomandra hermaphrodita	0.5	15
Lyginia barbata	3	50
Melaleuca seriata	14	100
Mesomelaena pseudostygia	3	40
Neurachne alopecuroidea	1	10
Petrophile linearis	0.5	40
Petrophile rigida	1	60
Schoenus caespititius	2	40
Schoenus clandestinus	0.5	2
Stirlingia latifolia	5	40
Styphelia xerophylla	0.5	60
Thysanotus triandrus	0.5	35

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ02
Location Cooljarloo 353710 **mE** 6624622 **mN**

Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m

Landform: Mid slope
Soil Type: Sand
Soil Colour: Brown, grey
Total PFC: 70 %
Bareground: 5 %
Leaf Litter: 3 %
Logs: 0 %

Vegetation: Low woodland of Banksia attenuata, B. menziesii and Eucalyptus todtiana over low sparse shrubland over Eremaea pauciflora var. calyptra, Melaleuca seriata and Stirlingia latifolia over low sparse forbland of Lyginia barbata, Conostylis angustifolia and Lepidosperma pubisquameum

Condition: Excellent
Disturbance: Weeds

SPECIES LIST

Name	Cover %	Height (cm)
**Briza maxima*	0.5	20
**Hypochaeris glabra*	0.5	1
Acacia stenoptera	0.5	30
Adenanthos cygnorum subsp. cygnorum	2	150
Alexgeorgea subterranea	0.5	5
Amphipogon turbinatus	1.5	15
Anigozanthos sp	0.5	35
Banksia attenuata	12	250
Banksia candolleana	3	80
Banksia menziesii	8	450
Blancoa canescens	0.5	15
Caladenia flava	0.5	15
Cassytha flava	0.5	70
Conostephium pendulum	0.5	45
Conostylis ?angustifolia	0.5	15
Conostylis angustifolia	4	35
Conostylis crassinerva	0.5	7
Conostylis sp.	0.5	30
Dasypogon obliquifolius	0.5	40
Daviesia podophylla	3	100
Drosera erythrorhiza	0.5	1
Eremaea pauciflora var. calyptra	8	100
Eucalyptus todtiana	15	500
Haemodorum venosum	0.5	30
Hypocalymma xanthopetalum	1	25
Isotropis cuneifolia subsp. cuneifolia	0.5	10
Jacksonia furcellata	1	100
Lepidosperma pubisquameum	2	40
Lomandra hermaphrodita	0.5	15
Lyginia barbata	8	50
Melaleuca seriata	4	70
Neurachne alopecuroidea	1.5	6
Patersonia occidentalis	1	60
Petrophile linearis	0.5	40
Phlebocarya filifolia	0.5	35
Scaevola repens	0.5	10
Stirlingia latifolia	4	65
Stylidium crossocephalum	0.5	10
Stylidium repens	0.5	4
Trachymene pilosa	0.5	3

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ03
Location Cooljarloo 354805 **mE** 6626907 **mN**

Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m

Landform: Mid slope
Soil Type: Loam,Sand
Soil Colour: Brown, Grey
Total PFC: 70 %
Bareground: 3 %
Leaf Litter: 20 %
Logs: 1 %

Vegetation: Low open forest of Banksia attenuata and B. menziesii over low sparse shrubland of Melaleuca seriata, Allocasuarina humilis and Stirlingia latifolia over low forbland of Mesomelaena pseudostygia, Dasypogon obliquifolius and Lyginia barbata
Condition: Excellent
Disturbance: Banksia death

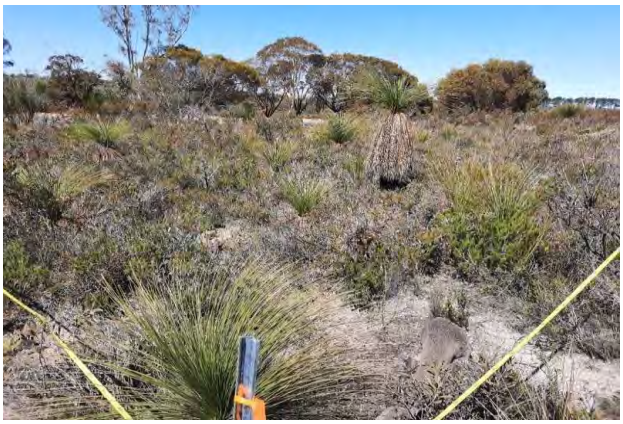
SPECIES LIST

Name	Cover %	Height (cm)
Adenanthos cygnorum subsp. cygnorum	1.5	160
Alexgeorgea subterranea	0.5	8
Allocasuarina humilis	2	80
Amphipogon turbinatus	2	20
Banksia attenuata	20	250
Banksia menziesii	20	500
Caladenia flava	0.5	15
Calytrix flavescens	1	35
Cassytha flava	0.5	25
Chaetospora curvifolia	0.5	25
Conospermum stoechadis subsp. sclerophyllum	0.5	55
Conostephium pendulum	0.5	40
Conostylis ?angustifolia	0.5	15
Conostylis angustifolia	1	30
Dasypogon obliquifolius	6	45
Drosera erythrorhiza	0.5	1
Drosera menziesii	0.5	40
Eremaea pauciflora var. calyptra	2	40
Hibbertia huegelii	2	40
Hibbertia hypericoides	1	40
Hypocalymma xanthopetalum	1	35
Jacksonia floribunda	2	45
Johnsonia pubescens subsp. pubescens	0.5	10
Lepidosperma scabrum	0.5	50
Leptospermum spinescens	1.5	100
Lomandra hermaphrodita	0.5	15
Lyginia barbata	2	45
Melaleuca seriata	3	45
Mesomelaena pseudostygia	8	45
Patersonia occidentalis	0.5	50
Philotheca spicata	0.5	50
Schoenus caespititius	1	45
Schoenus pleiostemoneus	0.5	15
Schoenus clandestinus	0.5	3
Stirlingia latifolia	4	55
Synaphea spinulosa subsp. spinulosa	1	40
Thysanotus sp. Ajana	0.5	45
Xanthorrhoea drummondii	2	85

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ04
Location Cooljarloo 354761 **mE** 6627070 **mN**

Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m



Landform: Mid slope
Soil Type: Clay,Sand
Soil Colour: Grey,White
Total PFC: 70 %
Bareground: 5 %
Leaf Litter: 5 %
Logs: 0 %

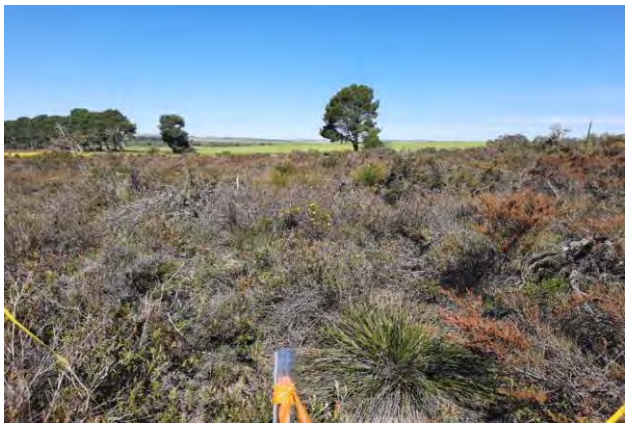
Vegetation: Mid sparse shrubland of Xanthorrhoea drummondii, Lambertia multiflora var. multiflora and Allocasuarina humilis over low sparse shrubland of Melaleuca seriata, Hakea incrassata and Calothamnus sanguineus over low sparse forbland of Neurachne alopecuroidea, Mesomelaena tetragona and Schoenus clandestinus
Condition: Excellent
Disturbance: None

SPECIES LIST

Name	Cover %	Height (cm)
Allocasuarina humilis	3	110
Allocasuarina microstachya	1	45
Banksia shuttleworthiana	2	45
Banksia stenoprion	1	20
Caladenia flava	0.5	15
Calothamnus sanguineus	4	40
Calothamnus torulosus	4	35
Calytrix flavescens	2	30
Chaetospora curvifolia	1	20
Chordifex ?sinuosus	1	35
Chordifex sinuosus	1	40
Chorizema aciculare subsp. laxum	1	35
Conostylis festucacea	0.5	10
Conothamnus trinervis	0.5	40
Drosera erythrorhiza	0.5	1
Drosera menziesii	0.5	30
Gastrolobium oxylobioides	1.5	40
Haemodorum venosum	0.5	45
Hakea conchifolia	1	80
Hakea incrassata	4	50
Hibbertia hypericoides	3	40
Hypocalymma xanthopetalum	0.5	25
Isotropis cuneifolia subsp. cuneifolia	0.5	15
Labichea punctata	0.5	25
Lambertia multiflora var. multiflora	5	110
Lepidosperma scabrum	0.5	40
Levenhookia pusilla	0.5	2
Melaleuca seriata	4	45
Melaleuca ciliosa	0.5	40
Mesomelaena tetragona	3	45
Neurachne alopecuroidea	6	3
Opercularia vaginata	0.5	10
Patersonia juncea	0.5	10
Petrophile seminuda	0.5	35
Pterochaeta paniculata	0.5	4
Schoenus nanus	0.5	3
Schoenus unispiculatus	0.5	15
Schoenus clandestinus	3	3
Synaphea spinulosa subsp. spinulosa	1	35
Tetraria octandra	2	45
Tetratheca confertifolia	0.5	35
Thomasia grandiflora	2	45
Trachymene pilosa	0.5	3
Verticordia pennigera	0.5	40
Xanthorrhoea drummondii	6	160

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ05
Location Cooljarloo 354789 **mE** 6626391 **mN**



Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m

Landform: Mid slope
Soil Type: Clay,Gravel,Sand
Soil Colour: Grey, White
Total PFC: 75 %
Bareground: 6 %
Leaf Litter: 6 %
Logs: 0 %

Vegetation: Mid sparse shrubland of Allocasuarina humilis, Lambertia multiflora var. multiflora and Xanthorrhoea drummondii over low sparse shrubland of Gastrolobium polystachyum, Hibbertia hypericoides and Banksia shuttleworthiana over low isolated clumps of grasses of Neurachne alopecuroidea, Mesomelaena pseudostygia and Tetraria octandra

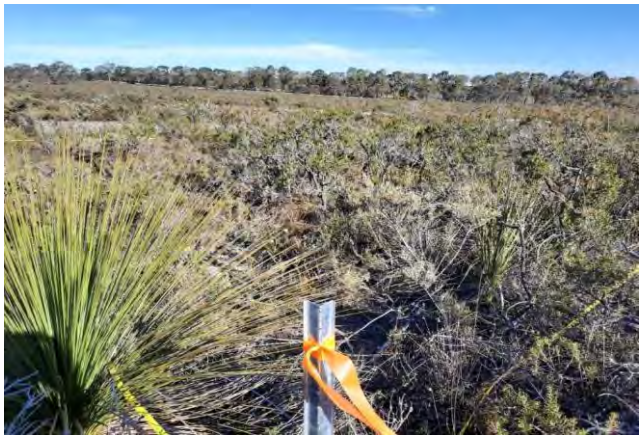
Condition: Excellent
Disturbance: None

SPECIES LIST

Name	Cover %	Height (cm)
Allocasuarina humilis	4	110
Allocasuarina microstachya	1	55
Amphipogon turbinatus	0.5	15
Austrostipa elegantissima	0.5	35
Babingtonia camphorosmae	0.5	35
Banksia shuttleworthiana	3	100
Banksia stenoprion	1	15
Calectasia narragara	1	35
Calothamnus sanguineus	2	40
Calothamnus torulosus	1	25
Caustis dioica	1	40
Chaetospora curvifolia	0.5	15
Conostylis crassinerva	0.5	5
Conothamnus trinervis	0.5	45
Crassula colorata	0.5	2
Dampiera spicigera	0.5	30
Drosera ?porrecta	0.5	15
Drosera menziesii	0.5	35
Gastrolobium oxylobioides	1	40
Gastrolobium polystachyum	12	40
Haemodorum venosum	0.5	50
Hakea incrassata	1	50
Hibbertia hypericoides	6	45
Hypocalymma xanthopetalum	0.5	25
Hypochaeris glabra	0.5	5
Labichea punctata	0.5	30
Lambertia multiflora var. multiflora	4	120
Lepidosperma pubisquameum	1	40
Lepidosperma scabrum	1	45
Lomandra sericea	0.5	35
Melaleuca ciliosa	1	40
Mesomelaena pseudostygia	5	40
Neurachne alopecuroidea	5	10
Opercularia vaginata	0.5	15
Petrophile shuttleworthiana	1	60
Pterostylis ?orbiculata	0.5	10
Schoenus unispiculatus	0.5	15
Schoenus clandestinus	1	3
Stylidium crossocephalum	0.5	10
Styphelia tortifolia	0.5	20
Synaphea spinulosa subsp. spinulosa	0.5	40
Tetraria octandra	4	45
Thomasia grandiflora	1	50
Trachymene pilosa	0.5	3
Wahlenbergia gracilenta	0.5	10
Xanthorrhoea drummondii	2	80

FLORA SITE SHEET

Project Name Brand Highway Cooljarloo Spring Survey
Site: BIBQ06
Location Cooljarloo 354256 **mE** 6625317 **mN**



Described by: NW, BD
Date: 17/09/2020
Type: Quadrat 10 x 10m

Landform: Mid slope
Soil Type: Sand
Soil Colour: Grey, white
Total PFC: 75 %
Bareground: 8 %
Leaf Litter: 4 %
Logs: 0 %

Vegetation: Mid sparse shrubland of Lambertia multiflora var. multiflora, Allocasuarina humilis and Xanthorrhoea drummondii over low sparse shrubland of Hibbertia hypericoides, Banksia shuttleworthiana and Calothamnus sanguineus over low forbland of Mesomelaena pseudostygia, Dasypogon obliquifolius and Schoenus caespititius

Condition: Excellent
Disturbance: None

SPECIES LIST

Name	Cover %	Height (cm)
Allocasuarina humilis	6	110
Amphipogon turbinatus	0.5	15
Anigozanthos humilis	0.5	15
Austrostipa elegantissima	0.5	45
Babingtonia camphorosmae	2	40
Banksia shuttleworthiana	4	50
Banksia stenoprion	2	20
Caladenia flava	0.5	10
Calectasia narragara	0.5	40
Calothamnus sanguineus	3	40
Cassytha flava	0.5	50
Chordifex ?sinuosus	0.5	30
Conostylis ?angustifolia	0.5	15
Conostylis angustifolia	0.5	30
Conostylis crassinerva	0.5	10
Conothamnus trinervis	0.5	35
Crassula colorata	0.5	2
Dasypogon obliquifolius	3	45
Drosera erythrorhiza	0.5	1
Drosera menziesii	0.5	35
Haemodorum venosum	0.5	35
Hakea conchifolia	1	60
Hibbertia huegelii	1	35
Hibbertia hypericoides	5	40
Hypocalymma xanthopetalum	0.5	35
Isopogon linearis	0.5	40
Jacksonia floribunda	0.5	45
Lambertia multiflora var. multiflora	8	130
Lepidosperma scabrum	1	40
Levenhookia pusilla	0.5	2
Lyginia barbata	1.5	45
Melaleuca ciliosa	0.5	45
Mesomelaena pseudostygia	6	40
Patersonia occidentalis	0.5	50
Petrophile shuttleworthiana	1	45
Phyllangium divergens	0.5	2
Podotheca angustifolia	0.5	3
Schoenus caespititius	2	40
Schoenus clandestinus	0.5	2
Stylidium repens group	0.5	4
Synaphea spinulosa subsp. spinulosa	0.5	40
Trachymene pilosa	0.5	3
Xanthorrhoea drummondii	3	100

Appendix E
Fauna Habitat Assessments

Coo-01 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	354813	**Northing**	6626939
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Soil type	Sandy clay	**Surface stone cover**	0
Soil colour	Grey	**Surface stone size classes present**	0
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter,Weeds	**Microhabitats**	Woody debris,Peeling bark,Leaf litter
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Banksia attenuata, B. menziesii, Eucalyptus todtiana
Mid stratum	Low (0.5-1 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fulcrum photo ID	61e3aaa4-1cea-4baa-a7d3-4668e3701f4d

Coo-02 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	354764	**Northing**	6626580
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sandy clay	**Surface stone cover**	<5%
Soil colour	Grey	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Woody debris,Peeling bark,Leaf litter,Termite mounds
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent	0	0
Mid stratum	Mid (1-2 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fu	

Coo-03 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	354710	**Northing**	6626147
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sandy loam	**Surface stone cover**	5 - 25%
Soil colour	Grey	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	0
Mid stratum	Low (0.5-1 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fulcrum photo ID	f217a1d2-a6d8-467f-a26a-38fed5511741

Coo-04 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	353910	**Northing**	6625139
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sand	**Surface stone cover**	<5%
Soil colour	Grey	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Woody debris,Peeling bark,Leaf litter
Introduced fauna	Rabbit		

Vegetation

Upper stratum	Low (<10 m)	Woodland (20-50%)	Banksia attenuata, B. menziesii, Eucalyptus todtiana
Mid stratum	Low (0.5-1 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fu

Coo-05 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	353764	**Northing**	6624799
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Soil type	Sand	**Surface stone cover**	0
Soil colour	Grey	**Surface stone size classes present**	0
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Woody debris,Peeling bark,Leaf litter,Logs > 10 cm
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Banksia attenuata, B. menziesii, Eucalyptus todtiana
Mid stratum	Low (0.5-1 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fulcrum photo ID	01c9a0bd-396b-49d6-8118-af41c877670e

Coo-07 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	353666	**Northing**	6624536
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	None
Soil type	Sand	**Surface stone cover**	0
Soil colour	Grey	**Surface stone size classes present**	0
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Woody debris,Logs > 10 cm,Leaf litter,Peeling bark
Introduced fauna	None observed		

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	Banksia attenuata, B. menziesii, Eucalyptus todtiana
Mid stratum	Mid (1-2 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fu

Coo-06 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	353521	**Northing**	6624106
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sand	**Surface stone cover**	<5%
Soil colour	White	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Unknown	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Burrows,Leaf litter,Peeling bark,Woody debris
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Absent	Absent	0
Mid stratum	Mid (1-2 m)	Shrubland/heathland (50-80%)	0
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fulcrum photo ID	9a58422c-1fbb-4c4a-b251-ae92d505b5cb

Coo-08 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	354394	**Northing**	6625391
Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sandy loam	**Surface stone cover**	<5%
Soil colour	Grey	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Burrows,Logs > 10 cm,Leaf litter,Woody debris,Peeling bark
Introduced fauna	Rabbit		

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	0
Mid stratum	Low (0.5-1 m)	Open shrubland/heathland (20-50%)	0
Ground stratum	Low (>0.5 m)	Sparse grassland/sedgeland/forbland (0.25-20%)	0

Fu

Coo-09 - Habitat assessment

Project:	4045 Cooljarloo Flora and Fauna Survey		
Date	2020-09-16	**Personnel**	EW
Easting	354673	**Northing**	6625742

Landform and soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Laterite
Soil type	Sand	**Surface stone cover**	<5%
Soil colour	Grey	**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
Condition		**Habitat Features**	
Quality	Very good		
Fire History	Little or no fire evidence (>5 years)	**Water Source**	Absent
Disturbance	Litter	**Microhabitats**	Woody debris,Peeling bark,Leaf litter
Introduced fauna	None observed		

Vegetation			
Upper stratum	Absent	Absent	0
Mid stratum	Tall (>2 m)	Shrubland/heathland (50-80%)	Banksia sessilis
Ground stratum	Low (>0.5 m)	Open grassland/sedgeland/forbland (20-50%)	0

Fulcrum photo ID	b6fc6df5-bf28-4c3b-9f32-bf41956c648a

360 environmental

10 Bermondsey Street West Leederville WA 6007 **t** (+618) 9388 8360 **f** (+618) 9381 2360
PO BOX 14, West Perth WA 6872
w 360environmental.com.au **e** admin@360environmental.com.au

people • planet • professional