Prepared for
Western Power
ABN: 18 540 492 861

Clean Energy Link - North Flora, Vegetation and Fauna Survey

CEL North

30-May-2024

aecom.com

Delivering a better world

Clean Energy Link - North Flora, Vegetation and Fauna Survey

CEL North

Client: Western Power

ABN: 18 540 492 861

Prepared by

[redacted]
ABN 20 093 846 925

30-May-2024

Job No.: 60713462

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document	Clean Energy Link - North Flora, Vegetation and Fauna Survey
Ref	60713462
Date	30-May-2024
Originator	Caitlyn Sepkus, Hannah Spanswick
Checker/s	Floora de Wit
Verifier/s	Jamie Shaw

Revision History

Rev	Revision Date	Details	Approved
A	01-Mar-2024	Draft for Internal Review	[redacted]
B	08-Mar-2024	Draft for Client Review	
0	30-May-2024	Final	

Table of Contents

List of Figures

List of Plates

List of Tables

Executive Summary

Western Power has engaged AECOM Australia Pty Ltd (AECOM) to complete flora, fauna and vegetation surveys for four discrete survey areas between Eneabba and Perth. The Project is being delivered as part of the North Region strategy, referred to as the Clean Energy Link (CEL). This report addresses four CEL sites situated north of the Perth Metropolitan Region. The four sites include, ENB-ENT 132kV (Eneabba), Cataby Substation (Cataby), Yandin Terminal (Yandin) and Regans Terminal (Regans).

A summary of the Eneabba results are presented below:

- Eleven Priority flora species were recorded including *Allocasuarina ramosissima* (P3), *Banksia chamaephyton* (P4), *Banksia cypholoba* (P3), *Banksia fraseri* var. *crebra* (P3), *Cristonia biloba* subsp. *pubescens* (P2), *Grevillea uniformis* (P3), *Hakea longiflora* (P3), *Hemiandra* sp. Eneabba (H. Demarz 3687) (P3), *Lepidobolus quadratus* (P3), *Phlebocarya pilosissima* subsp. *pilosissima* (P3) and *Stylidium drummondianum* (P3). All species were collected and confirmed at the Western Australian Herbarium by Mike Hislop.
- No Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) were recorded. Two were considered however the assessment determined that the vegetation was representative of Kwongan Heath vegetation typical of the bioregion.
- Four native vegetation communities were mapped across 17.15 ha (15%).
- The survey area was predominantly cleared (98.57 ha, 85%). Areas of intact native vegetation were largely considered Excellent (11.47 ha, 10%).
- No direct or indirect evidence of significant fauna species was recorded during the survey.
- Suitable habitat is present for five significant fauna species (those with a ‘High’ or ‘Moderate’ likelihood) including:
    - Carnaby’s Cockatoo (*Zanda latirostris)* Endangered under the *Environment Protection* and *Biodiversity Conservation Act 1999* (EPBC Act) and *Biodiversity Conservation Act 2016* (BC Act) – High, no direct or indirect evidence observed.
    - Graceful Sun Moth (*Synemon gratiosa)* Priority 4 – Moderate
    - Thorny Bush Katydid (*Hemisaga vepreculae*) Priority 2 – Moderate
    - Woolybush Bee (*Hylaeus globuliferus*) Priority 3 – Moderate
    - Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) Priority 1 – Moderate.
- The black cockatoo foraging habitat assessment received a score of ‘7’ with the Commonwealth Department of Agriculture, Water and the Environment (DAWE) (2022) method and 2-5 using the Bamford (2020) method.
- Thirty-three potential black cockatoo nesting trees were recorded.
- No Black Cockatoo roosting sites or habitat was observed.

A summary of the Cataby results are presented below:

- Three Priority flora species were recorded including *Conostephium magnum* (P4), *Hypolaena robusta* (P4) and *Stylidium hymenocraspedum* (P3). All species were collected and confirmed at the Western Australian Herbarium by Mike Hislop.
- The Banksia woodlands of the Swan Coastal Plain TEC (listed as Endangered under the EPBC Act) was recorded for 5.19 ha.
- Two native vegetation communities were mapped for 6.31 ha (82%), and largely considered Excellent condition (4.08 ha, 53%).
- two conservation significant fauna species were recorded this included EPBC and BC Act Endangered Carnaby’s Cockatoo (*Zanda latirostris*) and the Black-faced cuckoo shrike (*Coracina novaehollandiae*).

- Suitable habitat is present for four significant fauna species (those with a ‘High’ or ‘Moderate’ likelihood) including:
  - Carnaby’s Cockatoo (*Zanda latirostris*) Endangered under the EPBC Act and BC Act – known
  - Land Snail (*Bothriembryon perobesus*) Priority 1 – High
  - Quenda (*Isoodon fusciventer*) Priority 4 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High
- The black cockatoo foraging habitat assessment received a score of ‘7’ with the Commonwealth DAWE (2022) method and ‘5’ for native fauna habitat using the Bamford (2020) method.
- Six potential black cockatoo nesting trees were recorded.
- No black cockatoo roosting sites or habitat was observed in the survey area.

A summary of the Regans results are presented below:

- One significant flora species, *Lyginia excelsa* (P2) was recorded.
- One patch of the Banksia Woodlands of the Swan Coastal Plain TEC (listed as Endangered under the EPBC Act) was recorded for 4.60 ha.
- Three native vegetation communities were recorded, extending across 5.16 ha (47%). With areas of native vegetation largely considered Degraded (3.14 ha, 29%).
- The survey area was predominantly cleared (5.73 ha, 53%).
- Two species of conservation significance were identified during the survey. Foraging evidence of Carnaby’s Cockatoo (*Zanda latirostris*) was recorded in the Trees over Cleared habitat. The Black-faced cuckoo shrike (*Coracina novaehollandiae*) was both seen and heard.
- Suitable habitat is present for seven significant fauna species including:
  - Carnaby’s Cockatoo (*Zanda latirostris)* Endangered under the EPBC Act and BC Act – known
  - Quenda (*Isoodon fusciventer)* Priority 4 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High
  - Land Snail *(Bothriembryon perobesus)* Priority 1 – Moderate
  - Woolybush Bee (*Hylaeus globuliferus)* Priority 3 – High
  - Swan Coastal Plain Shield-backed Trapdoor Spider *(Idiosoma sigillatum)* Priority 3 – Moderate
  - A Short-tongued Bee *(Leioproctus contrarius)* Priority 3 – High.
- The Black Cockatoo assessment received a score of ‘10’ with the Commonwealth DAWE (2022) method and ‘4’ for native fauna habitat utilising the Bamford (2020) method.
- Forty-three potential black cockatoo nesting trees were recorded.
- No black cockatoo roosting sites were recorded. Two tall (15-20 m) remnant *Corymbia calophylla* trees along Orange Springs Road are located approximately 500 m south of Moore River and likely provide roosting habitat.

A summary of the Yandin results are presented below:

- One significant flora species, *Anigozanthos humilis* subsp. *chrysanthus* (P4) was recorded.
- No significant vegetation communities were recorded in the survey area.
- Four native vegetation communities were mapped across8.98 ha (75%), with vegetation predominantly in Degraded condition (5.30 ha, 44%).

- Two conservation significant fauna species were recorded within the survey area. An opportunistic sighting of the Western Brush Wallaby was recorded on the way into the adjacent Cataby Mineral Sands Mine. The Black-faced Cuckoo Shrike (*Coracina novaehollandiae)* was also recorded within the survey area.
- Suitable habitat is present for three significant fauna species including:
  - Carnaby's Cockatoo (*Zanda latirostris*) Endangered by EPBC and BC Act – Known
  - Land snail (*Bothriembryon perobesus*) Priority 1 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High.
- The black cockatoo assessment received a score of '9' with the commonwealth DAWE (2022) method and '2-4' for native fauna habitat utilising the Bamford (2020) method.
- No black cockatoo roosting sites were observed in the survey area. The 'Wetland' and 'Trees over Cleared' fauna habitat likely provide roosting habitat.

1.0 Introduction

1.1 Background

In support of the Western Australian state decarbonisation goal and in line with Western Power's corporate strategy, an investment for North Region strategy titled Clean Energy Link (CEL) was created to conduct scoping phase activities. As part of the scoping phase, Western Power has engaged AECOM Australia Pty Ltd (AECOM) to complete flora, fauna, and vegetation assessments for four discreet survey areas between Eneabba and Perth.

1.2 Location

The survey area comprises four locations from Eneabba (234 km north of Perth) to Orange Springs, Western Australia (105 km north of Perth) (Figure 1). The survey area locations are outlined below:

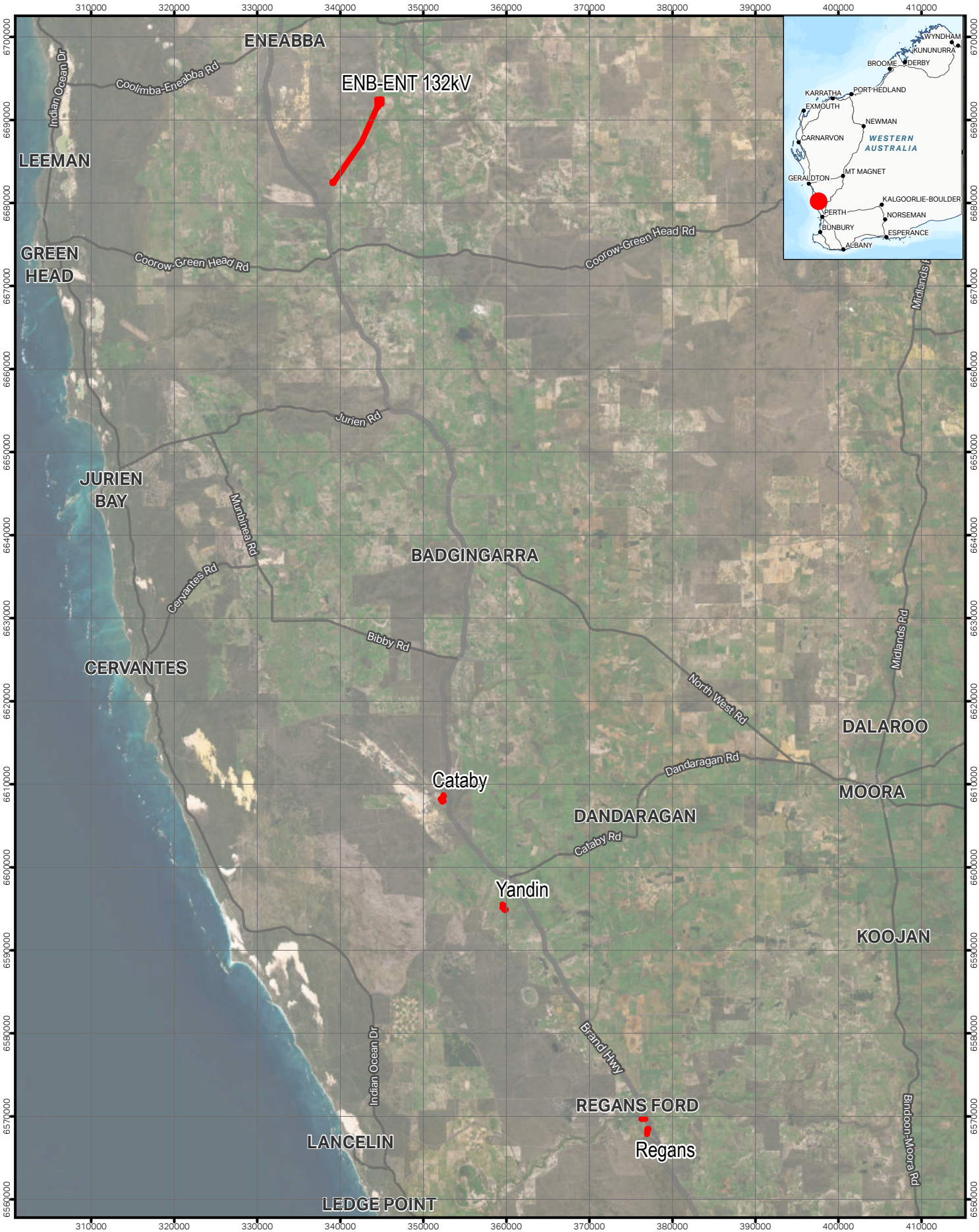
- ENB-ENT 132kV Survey Area (Eneabba) – linear corridor from Rose Thomson Road to Beros Road, Eneabba, WA.
- Cataby Substation Survey Area (Cataby) – linear corridor adjacent to Brand Highway, Cooljarloo, WA.
- Regans Terminal Survey Area (Regans) – two parcels south of Orange Springs Road and west of Brand Highway, Orange Springs, WA.
- Yandin Terminal Survey Area (Yandin) – parcel adjacent to Mimegarra Road, Cataby, WA.

1.3 Objectives

The objective of the assessments was to define the flora, vegetation and fauna values present with a particular focus on significant species and communities.

The specific tasks included:

- a comprehensive desktop assessment to identify significant flora, vegetation and fauna that potentially occur within the area
- a single-phase detailed flora and vegetation survey
- targeted searches for conservation significant flora and communities
- a basic fauna survey including the assessment of the potential usage of the survey area by conservation significant fauna species
- targeted black cockatoo survey including identification and mapping of suitable habitat for black cockatoos including foraging, roosting, and breeding habitat
- a flora, vegetation and fauna assessment report and data package.



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	F. DE WIT

N

0 5 10 15 km

1:600,000 (when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Survey Area

Survey Area - All Sites

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 1.1

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig1_1_NREP_North_SurveyArea_A4P_v1, Last exported: 20/05/2024 12:00 PM

A4 size

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	F. DE WIT

N

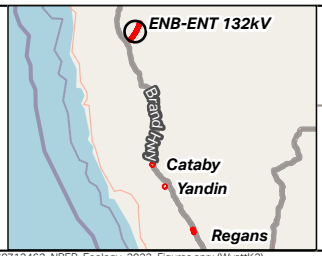
1:65,000 (when printed at A4)

0 250 500 750 1,000
metres

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area



Survey Area - ENB-ENT 132kV

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 1.2

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig1_2to1_5_NREP_North_SurveyArea_A4P_v1, Last exported: 20/05/2024 12:04 PM

A4 size

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	F. DE WIT

N

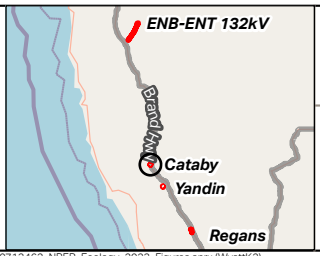
1:10,000
(when printed at A4)

0 30 60 90 120
metres

GDA2020 MGA ZONE 50

LEGEND

Cataby Substation Survey Area



Survey Area - Cataby

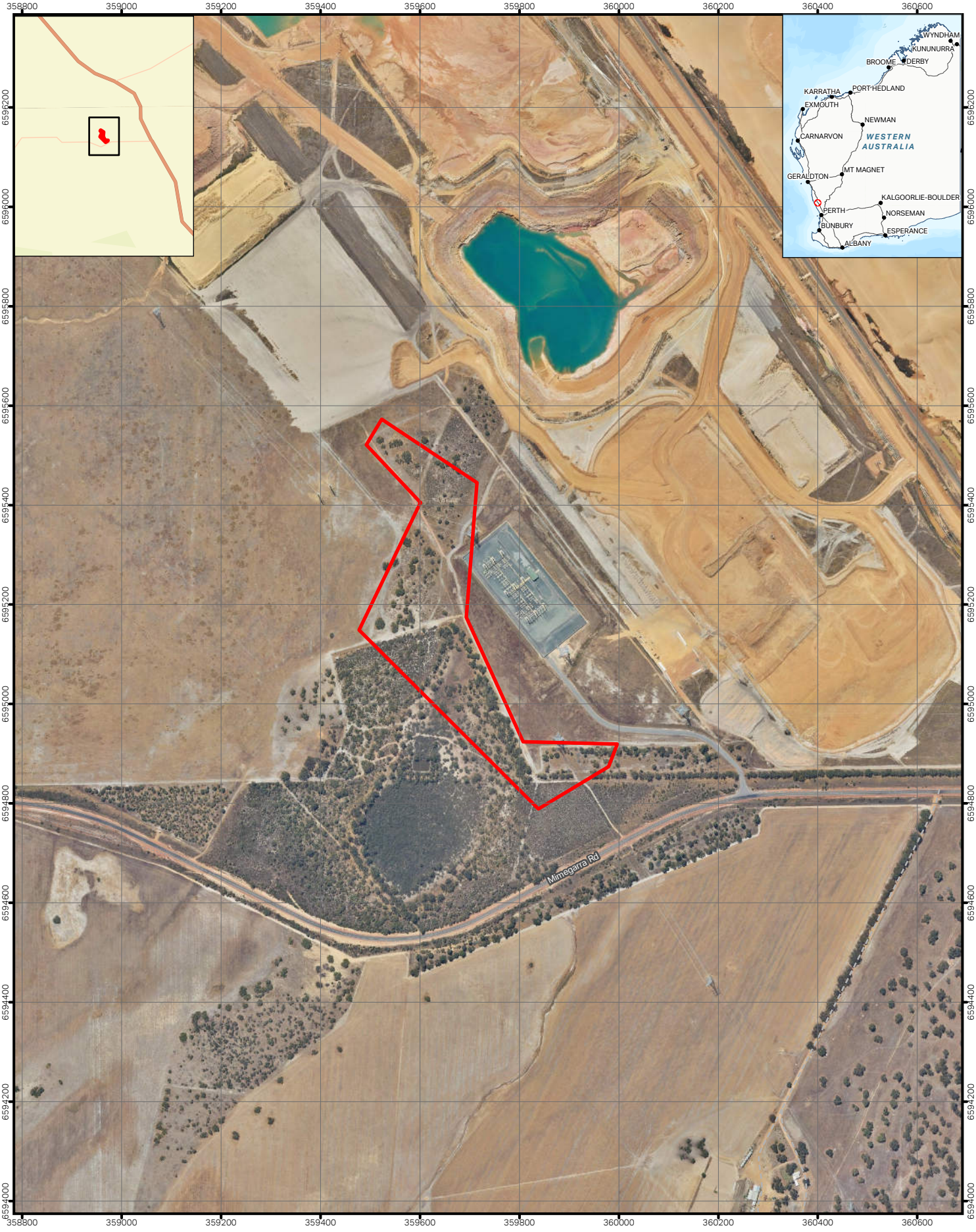
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
1.3

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig1_2to1_5_NREP_North_SurveyArea_A4P_v1, Last exported: 20/05/2024 12:04 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	F. DE WIT

N

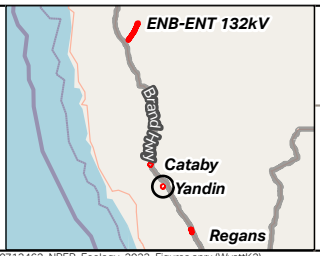
1:10,000 (when printed at A4)

0 30 60 90 120
metres

GDA2020 MGA ZONE 50

LEGEND

Yandin Terminal Survey Area



Survey Area - Yandin

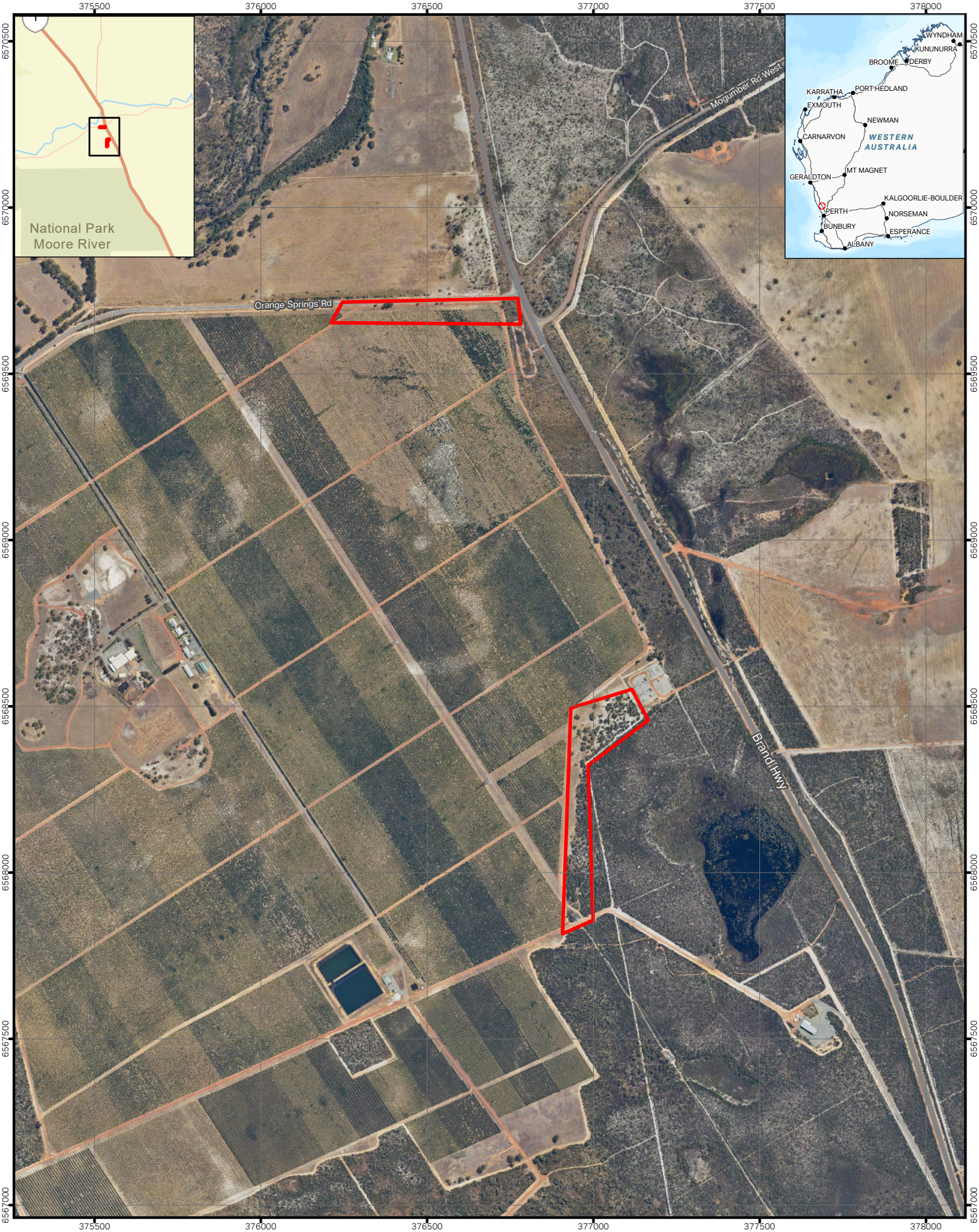
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 1.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig1_2to1_5_NREP_North_SurveyArea_A4P_v1, Last exported: 20/05/2024 12:04 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	F. DE WIT

N

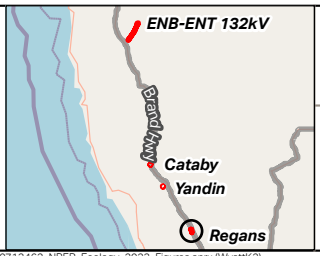
1:15,000
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

Regans Terminal Survey Area



Survey Area - Regans

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
1.5

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig1_2to1_5_NREP_North_SurveyArea_A4P_v1, Last exported: 20/05/2024 12:04 PM

2.0 Existing Environment

2.1 Climate

The four survey areas are situated between Eneabba (234 km north of Perth) and Orange Springs (105 km north of Perth), Western Australia. The climate is warm Mediterranean with mild wet winters and hot dry summers. Precipitation occurs during the winter months, with the possibility of some summer storms.

Badgingarra represents approximately the centre-point between the four survey areas extending from Orange Springs to Eneabba. Therefore, climate data was gathered closest to Badgingarra to capture general climate conditions for all four survey areas. Rainfall and temperature data was obtained from the closest stations with comprehensive data. These were Nambung (ID 009276) for rainfall data and Badgingarra Research Station (ID 009037) for temperature data, located approximately 36.6 km and 6.9 km from Badgingarra respectively. Climate data for the region has been recorded up to October 2023 and is illustrated in Figure 2.

Annual rainfall between November 2022 to October 2023 was considerably less than the long-term historical average. Annual rainfall differed by more than 150 mm, with 346 mm recorded from November 2022 to October 2023, compared to the long-term historical average of 501 mm. Monthly rainfall data differed most in July and August 2023, with these months recording 32 mm and 42 mm less than the long-term historical average respectively.

The mean maximum temperature between November 2022 to October 2023 was very similar to the long-term historical mean, registering 26.2°C as the average temperature for the year, comparative to 25.9°C for the long-term historical average. Annual mean minimum temperatures were also similar to the historical mean for each month, with the lowest mean minimum temperatures recorded between July to September for the year.

The climate data suggests all four survey areas received lower than average rainfall over the 12-months preceding the survey. This may influence the number and abundance of annual plant species and the abundance of some fauna species due to decreased food, water, or shelter resource availability.

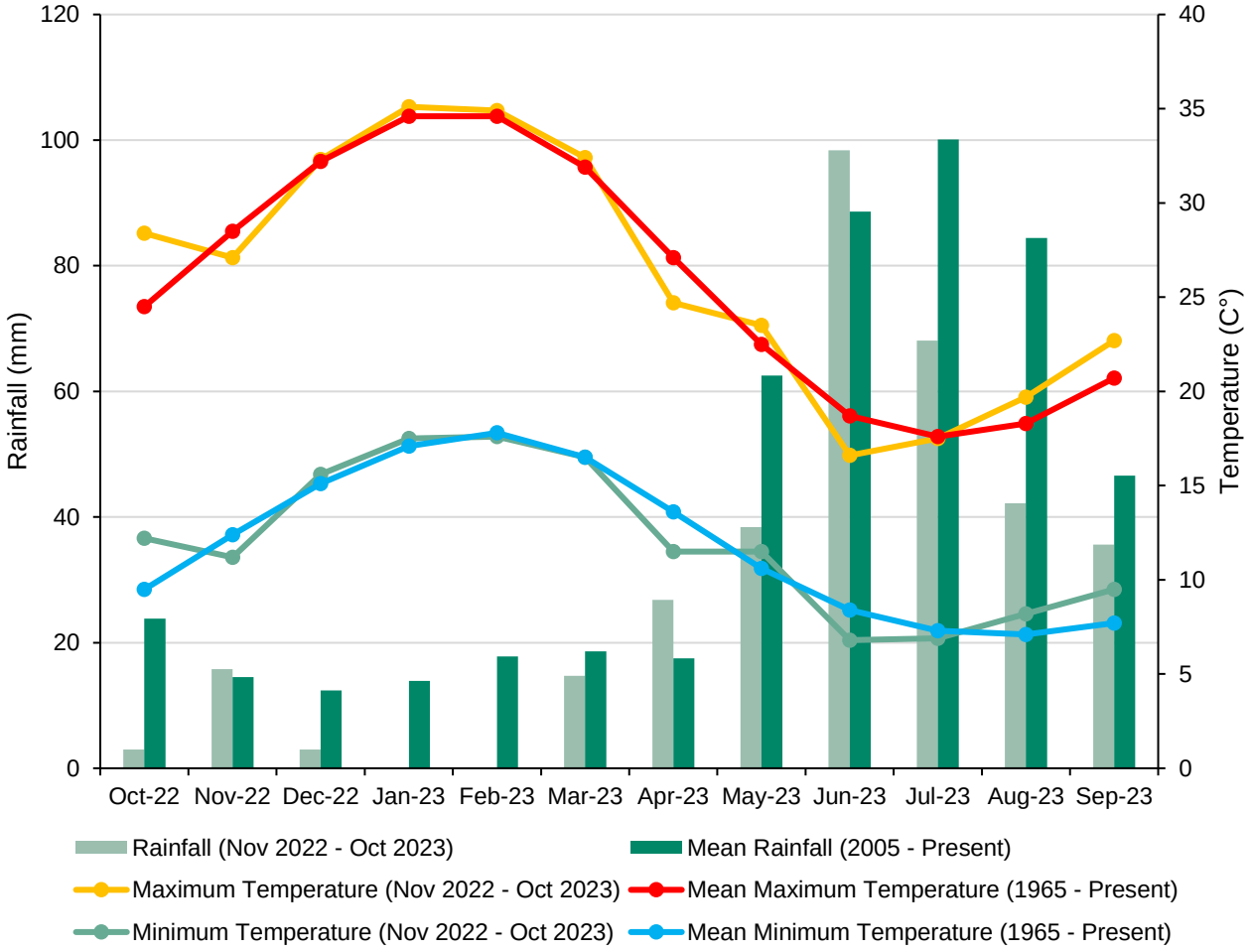


Figure 2 Rainfall from Nambung (ID 009276) and temperature data from Badgingarra Research Station (ID 009037) (BoM, 2023)

2.2 Interim Biogeographical Region of Australia

The largest regional vegetation classification scheme recognised by the EPA is the Interim Biogeographical Region of Australia (IBRA). The IBRA regions provide the planning framework for the systematic development of a comprehensive, adequate, and representative (CAR) national reserve system. There are 89 recognised IBRA regions across Australia that have been defined based on climate, geology, landforms and characteristic vegetation and fauna (IBRA 7, 2012). The four survey areas occur across two IBRA bioregions that are described below:

1. Geraldton Sandplains – includes Eneabba, Cataby and Yandin survey areas
2. Swan Coastal Plain (SCP) – includes Cataby and Regans survey areas

The Geraldton Sandplains bioregion, as described in CALM (2002) is located along the WA coast and includes Shark Bay, Dirk Hartog Island and extensive sand and lateritic plains. The area supports extensive proteaceous heaths and scrub-heaths with emergent Mallee, Banksia and Callitris on undulating, lateritic sandplain mantling Permian to Cretaceous strata. York gums and Acacia woodlands are found on the alluvial outwash plains associated with drainage and valleys and coastal Aeolian sands and limestone support Proteaceous heath and Acacia shrubs. The Geraldton Sandplains is comprised of the Edel, Geraldton Hills, and Lesueur Sandplain bioregions.

The Swan Coastal Plain bioregion, described in CALM (2002), includes Perth and the outer suburbs (excluding the Hills suburbs). The Swan Coastal Plain consists of the Dandaragan Plateau and the Perth Coastal Plain and is comprised of a narrow belt less than 30km wide of Aeolian, alluvial and colluvial deposits of Holocene or Pleistocene age (Gibson et al., 1994). A complex series of seasonal fresh water wetlands, alluvial river flats, coastal limestone and several offshore islands are included in the bioregion. Younger sandy areas and limestone are dominated by heath and/or tuart woodlands, while Banksia and Jarrah-Banksia woodlands are found on the older dune systems. The outwash plains at the foot of the Darling Escarpment were once dominated by *Casuarina obesa*-Marri woodlands and Melaleuca shrublands. Extensive clearing has occurred on the Swan Coastal Plain for urban and agricultural development.

2.3 Geology and Landform Systems

The survey areas intersect five different land systems (Figure 3; Figure 4). These are described as:

- Bassendean System – Occurs across a majority of the survey areas, excluding Eneabba, and is described as sand dunes and sandplains with pale deep sand, semi-wet and wet soils, with Banksia-Paperbark woodlands and mixed heathlands.
- Moore River System – Occurs within the Regans survey area and includes wet soil, semi-wet soil, pale and yellow deep sands with woodlands and heaths.
- Capitella System – Comprises a very small portion in the north-east of the Regans survey area and is described as subdued stripped lateritic plateau, undulating to gently undulating low rises with gently undulating plain including dunes. Includes pale and yellow deep sands, sandy gravels, some duplex; from sandstones plus alluvial and aeolian deposits.
- Yerramullah System – Intersects Cataby and Eneabba survey areas and includes subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. Comprises pale deep sand, sandy gravels and yellow deep sand, with Banksia woodlands on lower slopes/depressions and heathlands elsewhere.
- Boothendarra System – Intersects Eneabba survey area and includes subdued stripped lateritic plateau, undulating and gently undulating rises with sandy duplexes, pale deep sand, sandy and loamy gravels and minor clays.

2.4 Vegetation

Beard et al. (2013) mapping is used to determine the current extent of remnant vegetation remaining when compared to pre-European vegetation extent (Figure 5). Five vegetation associations have been mapped across the four survey areas. These vegetation associations and extents remaining across different boundaries are presented in Figure 5.

Table 1 Beard et al. (2013) vegetation associations and percent remaining across the survey areas (Govt. of WA, 2019)

Vegetation Association	Description	Percentage Remaining (%)					
		Western Australia	IBRA Region	Shire of Carnamah	Shire of Coorow	Shire of Dandaragan	Shire of Gingin
Eneabba							
49	Shrublands; mixed heath	49.75	**Geraldton Sandplains:** 36.5	40.5	51.8		
379	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	23.69	**Geraldton Sandplains**: 23.7	42.7	34.5		
Regans							
949	Low woodland; Banksia	56.42	**SCP:** 57.3				59.18
Cataby							
1030	Low woodland; *Banksia attenuata & B. menziesii*	63.99	**SCP:** 63.8			66.8	
1031	Mosaic: Shrublands; Hakea scrub-heath / Shrublands; Dryandra heath	32.90	**SCP:** 19.3			29.5	
Yandin							
1031	Mosaic: Shrublands; Hakea scrub-heath / Shrublands; Dryandra heath	32.90	**Geraldton Sandplains:** 34.5			29.5	

2.5 Conservation Reserves and Environmentally Sensitive Areas

Three of the four survey areas contain Conservation Reserves or Environmentally Sensitive Areas (ESA's). A summary of these are presented in Table 2 and mapped on Figure 6.

Table 2 Summary of Conservation Estates and Environmentally Sensitive Areas across the survey areas

Survey Area	Summary
Eneabba	The survey area includes a small portion of South Eneabba Nature Reserve, listed under Section 5(1)(d) of the *Conservation and Land Management Act 1984* (CALM Act). This reserve is also associated with an ESA.
Cataby	Over half (56%) of the survey area is situated within an ESA, associated with land listed under the Register of National Estate. Additionally, 1.35 ha of the survey area is situated within the R 41986 Conservation Park, listed under Section 5(1)(ca) of the CALM Act.
Regans	0.47 ha lies within the R 27993 Nature Reserve. No ESA's intersect with the survey area, with the closest ESA 9.5 km south associated with Guraga Lake.
Yandin	No Conservation Reserves or ESA's intersect with the Yandin survey area. The closest ESA is located 272 m east, and is associated with a conservation wetland.

3.0 Conservation Codes

3.1 Flora and Fauna

Species at risk of extinction are recognised at a Commonwealth level under the *Environment Protection, Biodiversity and Conservation Act 1999* (EPBC Act) and are categorised as outlined in Table 3.

Table 3 Categories of species listed under Schedule 179 of the EPBC Act

Code	Category
Ex	**Extinct Taxa** A species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild Taxa** A species which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered Taxa** A species which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered Taxa** A species which is not critically endangered, and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable Taxa** A species which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent Taxa** A species which at a particular time if, at that time: the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered the following subparagraphs are satisfied: the species is a species of fish, the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised the plan of management is in force under a law of the Commonwealth or of a State or Territory cessation of the plan of management would adversely affect the conservation status of the species.
Mi	**Migratory Taxa** The EPBC Act also requires the compilation of a list of migratory species that are recognised under international treaties including the: Japan Australia Migratory Bird Agreement 1981 (JAMBA) China Australia Migratory Bird Agreement 1998 (CAMBA) Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA) Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals). All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as a MNES under the EPBC Act.
Ma	**Marine Taxa** A species established under s248 of the EPBC Act.

Flora and fauna species that are considered Threatened and need to be specially protected because they are under identifiable threat of extinction are listed under the *Biodiversity Conservation Act 2016* (BC Act). These categories are defined in Table 4.

Table 4 Conservation codes for WA flora and fauna listed under the BC Act

Code	Category
CR	**Critically Endangered Taxa** Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
EN	**Endangered Taxa** Threatened species considered to be facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
VU	**Vulnerable Taxa** Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines. Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.
EX	**Extinct Taxa** Species which have been adequately searched for and there is no reasonable doubt that the last individual has died, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
MI	**Migratory Taxa** Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
CD	**Species of special conservation interest (conservation dependent fauna)** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Species that have not yet been adequately surveyed to warrant being listed under the BC Act, or are otherwise data deficient, are added to a Priority List as Priority 1, 2 or 3 by the State Minister for Environment. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are listed as Priority 4. Categories and definitions of Priority Flora and Fauna species are provided in Table 5.

Table 5 Conservation codes for WA flora and fauna as listed by DBCA and endorsed by the Ministers for the Environment

Code	Category
P1	**Priority One – Poorly Known Species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority Two – Poorly Known Species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority Three – Poorly Known Species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority Four – Rare, Near Threatened and other species in need of monitoring** Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

3.2 Vegetation Communities

Threatened Ecological Communities (TECs) are naturally occurring biological assemblages that occur in a particular type of habitat and that may be subject to processes that threaten to destroy or significantly modify the assemblage across its range. TECs are listed by both State and Commonwealth legislation, categories are defined in Table 6.

Table 6 Categories of TECs that are listed under the EPBC Act

Code	Category
CE	**Critically Endangered** If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.
E	**Endangered** If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.
V	**Vulnerable** If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future.

Vegetation communities in Western Australia are described as TECs if they have been endorsed by the Western Australian Minister for Environment following recommendations made by the Threatened Species Scientific Committee. TECs are listed under the BC Act in one of four categories defined in Table 7.

The Department of Biodiversity, Conservation and Attractions (DBCA) maintains a database of state listed TECs which is available for online searches via their website. Possible TECs that do not meet survey criteria or are not adequately defined are listed as Priority Ecological Communities (PECs) under Priorities 1, 2 and 3. Ecological communities that are adequately known and are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. Conservation dependent communities are classified as Priority 5. PECs are endorsed by the Minister for Environment and are described in Table 8.

DBCA requires that all Priority and Threatened ecological communities are considered during environmental impact assessments and clearing permit applications.

Table 7 Conservation codes for state listed Ecological Communities

Code	Category
PD	*Presumed Totally Destroyed*
CR	*Critically Endangered*
EN	*Endangered*
VU	*Vulnerable*

Table 8 Categories for Priority Ecological Communities

Code	Category
P1	**Priority One**: poorly-known ecological communities
P2	**Priority Two**: poorly-known ecological communities
P3	**Priority Three**: poorly known ecological communities
P4	**Priority Four**: ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list.

4.0 Methodology

4.1 Desktop Assessment

A comprehensive desktop assessment was completed prior to completing the field surveys. The objective was to define the existing environment and determine the significant species and/or communities that may occur in the field survey. This information informed the field survey sample plan.

The desktop assessment utilised the following sources:

- DBCA flora, fauna and communities' database searches with various buffers (50 km)
- Protected Matters Search Tool (PMST) with a 50 km buffer
- Atlas of Living Australia (AoLA) database (AoLA, 2023)
- Scar 4 – Flora, Vegetation and Black Cockatoo Assessment (AECOM, 2022a)
- Waddi Wind Farm – Flora, Vegetation and Black Cockatoo Assessment (AECOM, 2022b)
- Yandin Wind Farm Environmental Compliance Monitoring (AECOM, 2020)
- IBSA Portal:
    - Yandin Wind Farm Flora, Vegetation and Avifauna Assessment (Ecologia, 2017).

Significant flora species likelihood of occurrence was assessed systematically using a point-based system which considers proximity (within 5 km) and date of known records (last 20 years), presence within the Local Government Area (LGA) and habitat suitability (Table 9).

Significant fauna species likelihood of occurrence was assessed systematically using a point-based system that considers proximity (within 20 km) and date of known records (last 20 years) as well as habitat suitability (Table 10).

The likelihood of significant ecological communities occurring depends on the presence of suitable landforms, land systems, known occurrences and distance of known occurrences.

Table 9 Categories of likelihood of occurrence for flora species

Likelihood of Occurrence	Score	Definition
Known	6	Species is known to occur in the survey area.
High (Likely)	5	Not known to occur in the survey area however there are records nearby and suitable habitat for the species is known or likely to be present within the survey area.
Moderate (Possible)	4 (if suitable habitat is known to be, or likely to be present within the survey area) 3 (if suitable habitat may be present)	Species is not known to occur within the survey area however there are nearby records AND/OR recent records OR records within the LGA AND suitable habitat for the species is known or likely to be present within the survey area. OR Not known to occur within the survey area but there are records nearby AND recent records AND records within the LGA, and suitable habitat for the species may be present (marginal habitat).
Low (Unlikely)	2,3	Species is not known to occur within the survey area but there are records nearby OR recent records OR within the LGA AND suitable habitat for the species may be present (marginal habitat).
Negligible (Suitable Habitat not Present)	1,2,3	Despite records nearby OR being present within the LGA OR recent records, no suitable habitat is present within the survey area and therefore the likelihood of the species occurring is negligible.

Table 10 Categories of likelihood of occurrence for fauna species

Likelihood of Occurrence	Score	Definition
Known	5	Species is known to occur in the survey area.
High (Likely)	3,4	Not known to occur in the survey area but there are records within close proximity of the survey area AND/OR recent records and suitable habitat for the species is known to be, or likely to be, present within the survey area.
Moderate (Possible)	2,3	Not known to occur within the survey area but there are records in close proximity of the survey area and recent records and suitable habitat for the species is known to be, or likely to be present within the survey area. OR Not known to occur within the survey area but suitable habitat for the species is known to be, or likely to be present within the survey area.
Low (Unlikely)	1,2	Not known to occur within the survey area but there are records in close proximity OR recent records and suitable habitat for the species may be present (marginal habitat).
Negligible (Suitable Habitat not Present)	1,2,3	Despite records in close proximity or recent records, no suitable habitat is present within the survey area, therefore the likelihood of the species occurring there is negligible.

4.2 Flora and Vegetation Survey

A single-phased detailed flora and vegetation assessment was undertaken utilising methods outlined in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The assessment was completed by:

- Floora de Wit (collection permit FB62000249): BSc Environmental Biology (Environmental Restoration, Postgraduate Diploma in Environmental Management and Impact Assessment, 17+ years' experience.
- Caitlyn Sepkus (collection permit FB62000384): BSc Conservation and Wildlife Biology / Environmental Management and Sustainability, 4+ years' experience.

The field survey was undertaken between 19 - 22 September 2023. Floristic data was collected at 17 quadrats and seven relevés, supported by numerous observation points and mapping notes.

Quadrats were non-permanent 10x10 m defined by a measuring tape. Data collected from quadrats included the presence of plant species, their cover abundance, structural composition of vegetation, physical environment, and presence/absence of disturbance. Each site was given a unique site number, and the following parameters recorded:

- date
- location using hand-held GPS (accuracy of 5 m)
- sample site type (quadrat/relevé and size)
- photograph (northwest corner)
- soil details (type, colour, moisture)
- landform
- vegetation condition using the Keighery (1994) scale and description of disturbance
- fire history
- comprehensive species list
    - estimated height
    - estimated percentage cover.

Any species unable to be identified in the field was collected for identification in AECOM's in-house herbarium and the specimens and taxonomic references and keys at the Western Australian Herbarium (WAH). Naming of species followed the convention of WAH (1998-).

4.2.1 Vegetation Mapping

Vegetation communities were described and mapped based on changes in dominant species composition and landform. Vegetation community descriptions were based on the Association Level V in accordance with the National Vegetation Information System (NVIS) Framework (DEE, 2017). Delineation of vegetation communities was supported by analysing floristic data collected within quadrats.

The Keighery et al. (2012) Swan Coastal Plain dataset (Keighery) and the Gibson et al. (1994) dataset (Gibson) were used for the Floristic Community Type (FCT) analysis for sample sites completed on the Swan Coastal Plain IBRA Region.

The following steps were taken in accordance with the DBCA (2023a) TEC identification guidelines:

- nomenclature was reconciled between the Project, Keighery and Gibson data
- species were amalgamated or removed, including hybrids, singletons, indeterminate taxa, or species that are difficult to differentiate
- single-site insertion was used for datasets
- presence/absence matrices were produced.

Analysis was undertaken using Primer-E. The Bray Curtis dissimilarity measure was used to quantify the compositional similarity between the sample sites based on presence absence data. This method is easily interpretable and provides meaningful results. A sense check was completed incorporating appropriate geology, soils, landscape and the description provided in the Gibson et al. (1994) reference material and Bush Forever (Govt. of WA, 2000). Critical analysis of relevant features include soil, landform, hydrological status, and common species was undertaken for all inferred FCTs.

The same software package was used to assess the similarity of sample site data to support vegetation community delineation. The Bray Curtis dissimilarity measure was used to produce dendrograms to provide a visual assessment of the sample site relationships using presence absence data or foliage (scaled) data.

Vegetation condition was determined using the Keighery (1994) vegetation condition scale as recommended in the Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).

4.2.2 Banksia Woodlands TEC Assessment

Native vegetation was traversed on foot. Where patches of Banksia trees were identified, it was then assessed in field using the Banksia TEC conservation advice (DEE, 2016). A preliminary review of Banksia species present was undertaken. Patches that included a dominant or co-dominant overstorey of *B. attenuata, B. menziesii, B. prionotes* or *B. ilicifolia* were considered for further assessment. Where patches that included a dominant or co-dominant overstorey of the aforementioned Banksia species, at least one quadrat was established. The sample site was centred on the area of the highest native floristic diversity and/or cover within the patch.

For each patch the key diagnostic characteristics, condition, size and relevant contextual information was considered in accordance with the Banksia TEC conservation advice (DEE, 2016). FCT analysis was completed where applicable for sample data considered likely to represent the TEC as per the DBCA Methods for survey and identification of Western Australian threatened ecological communities (DBCA, 2023a) and the *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessmen*t (EPA, 2016).

The condition of the patch was informed by species richness of quadrat data compared to available datasets, including the Keighery and Gibson datasets and the relative expected natural range of diversity for the inferred FCT, where applicable. The extent of the patch within the survey area was mapped by marking the extent of Banksia species present. The condition of the patch and size thresholds were then used to determine whether the patch meets the criteria to represent the federally protected ecological community.

4.2.3 Targeted Flora Searches

Targeted flora searches were completed for species considered to have a high likelihood of occurrence. A field booklet of all species considered likely to occur was developed prior to commencing the field survey. The booklet included all available information and photographs relevant for the tentative identification of Threatened and Priority flora in the field.

The survey area was traversed on foot using systematic linear traverses. All species that were considered to potentially resemble a Threatened or Priority species were photographed, their location recorded on a hand-held GPS, and a sample taken (if the specimen was not likely to represent a Threatened species). Samples were submitted to the WA Herbarium for formal identification.

4.3 Basic Fauna Survey

A basic fauna survey was conducted in accordance with *Technical Guidance – Terrestrial Fauna Surveys* (EPA, 2020). The fauna survey was conducted in conjunction with the detailed flora and vegetation survey between 19 - 22 September 2023. The survey was led by Hannah Spanswick (Zoologist). Hannah has a Masters of Biological Science, specialising in Zoology and 3 years' experience as a Zoologist working in environmental consulting. Conducting the two surveys concurrently enabled consistent and clear mapping of the fauna habitats and vegetation communities.

The fauna survey primarily focused on mapping of fauna habitat and searching for evidence of significant fauna. Other data recorded included observations (direct and indirect) of fauna species present.

Fauna habitats were assessed for specific components, including consideration of structural diversity and refuge opportunities for fauna, to determine the potential for these habitats to support significant species. Data recorded included:

- location
- general habitat description
- habitat condition and disturbance types
- dominant / characteristic flora species and vegetation layers
- presence and abundance of key habitat features such as large mature trees, small and large hollows, fallen logs, course and fine litter, decorticating bark, bare ground, grass, stones and boulders, rock crevices, soil cracks, vines, dense shrubs, water bodies etc
- presence of fauna and secondary signs (e.g., scats, digging, tracks, burrows, eggshell, bones, feathers etc)
- connectivity of habitat.

Forty-two detailed habitat assessments were completed throughout the four survey areas.

In addition to recording all observed fauna and birds identified from distinctive calls, details of indirect evidence such as scats, tracks and diggings were documented. All observations were made between daylight hours of 0700 and 1700. Attention was given to searching for conservation significant species identified in the desktop assessment as having the potential to occur in the area. Nomenclature has been confirmed against the Checklist of Terrestrial Vertebrates of Western Australia (WAM, 2023).

4.4 Targeted Black Cockatoo Survey

The survey, specifically aimed at the Carnaby's Cockatoo *(Zanda latirostris*), listed as Endangered under both the EPBC Act and the BC Act, was conducted to identify potential breeding, roosting, and foraging habitats in line with the DAWE Referral Guidelines (2022). Breeding habitat is defined by the DAWE referral guidelines of black cockatoo species (2022). Potential breeding trees are categorised as follows:

- Known nesting trees: Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).

- Suitable nesting trees: Trees with suitable nesting hollows present, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding.
- Suitable nest hollow: Any hollow with dimensions suitable for use for nesting by black cockatoos. Characteristics of hollows used by each species is available in the SPRAT database. Suitable nest hollows are only found in live trees with a DBH of at least 500 mm. Usually this will be a natural hollow, but artificial hollows may also be suitable in some circumstances (for example, where the artificial hollow has been specifically designed for use by black cockatoos).
- Potential nesting trees: Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note: that many species of eucalypt may develop suitable hollows for breeding.

Tree hollow presence and suitability is assessed from ground level with the use of binoculars. Suitability and utilisation by black cockatoos cannot always be assessed adequately at ground level, and hence the Precautionary Principle is used where appropriate.

4.4.1 Foraging Potential

The DAWE (2022) foraging tool (Table 11) was implemented. A size threshold of 1 ha applies to foraging habitat. There is no mechanism under the guidelines to assign foraging scores to different habitat types based on the presence of foraging species or habitat quality (i.e. a Banksia Woodland would score the same as a paddock if it is part of the same survey area).

The foraging score tool does not account for variance in vegetation communities or condition, providing only a single score for the entire area. The assessment result would be different if vegetation communities / fauna habitats were taken into account as foraging species dominance varies.

The Bamford Consulting Ecologists (BCE) scoring tool (BCE, 2020) was used to provide more detailed information for the various fauna habitats identified. This can be used to influence project design by allowing avoidance of habitat with a higher foraging value. The BCE tool (Table 12) considers site condition, site context and species stocking rate to provide foraging habitat scores for different habitat types.

Plant disease was assessed during the vegetation and flora assessment. All notable signs of disease were recorded, and the impact of the disease was assessed. If the disease impacts over 50% of the preferred food or plant species, deductions were taken from the foraging score.

Table 11 Black cockatoo foraging quality tool from the Federal guidelines (DAWE, 2022)

Starting Score	Carnaby's Cockatoo
10	Start at a score of 10 if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.
	Context Adjustor
Foraging Potential	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site
Proximity to breeding	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.

Starting Score	Carnaby's Cockatoo
Impact from sig. plant disease	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total score	
Appraisal	To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.

Table 12 Site condition described by Bamford Consulting (2020)

Site Score	Description of Vegetation Values Carnaby's Cockatoo
0	No foraging value. No Proteaceae, eucalypts or other potential sources of food. Examples: • Water bodies (e.g. salt lakes, dams, rivers) • Bare ground • Developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits) or with vegetation of no food value, such as some suburban landscapes • Mown grass.
1	Negligible to low foraging value. Examples: • Scattered specimens of known food plants but projected foliage cover of these is < 2%. This could include urban areas with scattered foraging trees • Paddocks that are lightly vegetated with melons or other known food-source weeds (e.g. Erodium spp.) that represent a short-term and/or seasonal food source • Blue Gum plantations (foraging by Carnaby's Cockatoo has been reported but appears to be unusual).
2	Low foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have <10% projected foliage cover • Woodland with tree banksias 2-5% projected foliage cover • Open eucalypt woodland/mallee of small- • fruited species • Paddocks that are densely vegetated with melons or other known food-source weeds (e.g. Erodium spp.) that represent a short-term and/or seasonal food source.
3	Low to Moderate foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have 10-20% projected foliage cover • Woodland with tree banksias 5-20% projected foliage cover • Eucalypt Woodland/Mallee of small-fruited species • Eucalypt Woodland with Marri < 10% projected foliage cover.
4	Moderate foraging value. Examples: • Woodland/low forest with tree banksias (of key species *B. attenuata* and *B. menziesii*) 20-40% projected foliage cover • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 20-40% projected foliage cover • Eucalypt Woodland/Forest with Marri 20-40% projected foliage cover.
5	Moderate to High foraging value. Examples: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with 40-60% projected foliage cover

Site Score	Description of Vegetation Values
	Carnaby's Cockatoo
	• Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths • Pine plantations with trees more than 10 years old (but see pine note below in moderation section).
6	High foraging value. • Banksia Low Forest (of key species B. attenuata and B. menziesii) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).

Vegetation structural class terminology follows Keighery (1994).

Site context is a function of site size, availability of nearby habitat and the availability of nearby breeding areas. Site context includes consideration of connectivity, although Black-Cockatoos are very mobile and will fly across paddocks to access foraging sites (Table 13). Based on BC observations, Black-Cockatoos are unlikely to regularly go over open ground for a distance of more than a few kilometres and prefer to follow treelines.

The maximum score for site context is 3, and because it is effectively a function of presence/absence of nearby breeding and the distribution of foraging habitat across the landscape, the following table, developed by Bamford Consulting in conjunction with DEE, provides a guide to the assignation of site context scores. Note that 'local area' is defined as within a 15 km radius of the centre point of the study site. This is greater than the maximum distance of 12km known to be flown by Carnaby's Cockatoo when feeding chicks in the nest.

Table 13 Site context weighting

Site Context Score	Percentage of the existing native vegetation within the 'local' area that the study site represents	
	'Local' breeding known/likely	'Local' breeding unlikely
3	>5%	>10%
2	1-5%	5-10%
1	0.1-1%	1-5%
0	<0.1%	<1%

Species stocking rate is described as "the usage and/or density of a species at a particular site" in the offsets guide. Assignation of the species density score (0 or 1) is based upon the black-cockatoo species being either abundant (score of 1) or not abundant (score of 0).

Scores are moderated based on vegetation composition scores. Where vegetation composition was scored as 2 or less, no context or species density score was given.

Scoring is transposed into one of the following categories:

- 0: None.
- 1: Negligible.
- 2: Low.
- 3: Low to Moderate.
- 4-6: Moderate.
- 7: Moderate to High.
- 8: High.

4.5 Survey Limitations

No significant limitations were identified that may influence the outcome of the field survey. Seven limitations were considered as defined in the EPA Technical Guide (2016). These are discussed in Table 14.

Table 14 Limitations considered for the survey

Limitation	Biological Assessments
Availability of contextual information on the region	**Nil** Contextual information was derived from publicly available datasets for pre-European vegetation mapping, geology, landforms and climate. DBCA database searches and IBSA reports were obtained to inform desktop assessments.
Competency/experience of consultant conducting survey	**Nil** The flora and vegetation assessment was led by Floora de Wit who has 17 years' experience undertaking botanical surveys of similar scope across the Swan Coastal Plain and Geraldton Sandplains IBRA regions. The fauna survey was led by Hannah Spanswick who has more than 4 years' experience undertaking basic fauna surveys and assessing habitat suitability for significant species.
Proportion of flora/fauna identified, recorded and/or collected (based on sampling, timing, and intensity)	**Nil** All flora species encountered in quadrats and during targeted searches were either collected or recorded. All areas of native vegetation were traversed on foot conducting targeted searches. A total of 244 collections were made for formal identification in Perth, indicative of the species richness of the Swan Coastal Plain and Geraldton Sandplains IBRA regions. Fauna data (Including black cockatoo) was conducted to an appropriate standard, without limitations as outlined in the EPA's Environmental Factor Guideline: Terrestrial Fauna. Targeted conservation significant invertebrate and SRE surveys were not part of the scope.
Completion (is further work needed)	**Nil** The survey area was traversed on foot and particular focus was given to areas of intact native vegetation. Several vegetation communities are represented by less than three quadrats, these communities represented small portions of the survey area (<5%) and were better able to be represented using unbounded relevés to accommodate "slivers" and smaller patches. The surveys included consideration of the EPA flora and fauna survey technical guides, the Swan Coastal Plain Conservation Advice, and the black cockatoo referral guidelines. There were no significant deviations from the methods outlined in these documents. Based on the findings of this report, a potential for targeted conservation significant invertebrate and SREs surveys is likely.
Remoteness and/or access problems	**Nil** The entirety of all survey areas were accessible on foot.
Timing, weather, season, cycle	**Minor** The survey was undertaken within the 'ideal survey season' in accordance with the EPA (2016) Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment. Rainfall was below average for the 12 months preceding the survey. This is not considered a significant limitation as annuals were present, with 34 (12%) annual species recorded across all four sites.
Disturbances (e.g., fire flood, accidental human intervention) which affected results of the survey	**Nil** No disturbances were observed that would influence the outcome of the survey.

5.0 Desktop Assessment Results

5.1 Threatened and Priority Ecological Communities

Twenty-nine significant communities were identified in the desktop assessment. This included 11 listed under the EPBC Act, 15 listed under the BC Act and 14 listed by DBCA. Note that at the State level numerous TECs and PECs can be representative of a single EPBC Act-listed community.

The comprehensive desktop study is presented in Appendix A. The community most pertinent to this Project is the Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands TEC) listed as Endangered under the EPBC Act and Priority 3 by DBCA. The buffers (and potential occurrence) overlaps with Cataby and Regans.

All other significant communities are associated with unique landforms, IBRA regions or hydrology that were not present within the survey area.

5.2 Conservation Significant Flora

A systematic review of significant flora records and their preferred habitat has determined the likelihood of Threatened and Priority flora species occurring within each survey area. These results are summarised in Table 15 below.

Significant flora species that have a ‘high’ likelihood of occurrence are outlined in Table 16. The comprehensive desktop assessment is presented in Appendix B and mapped on Figure 7.

Table 15 Significant flora desktop assessment results summary

Survey Area	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Eneabba	3	31	120	26	12	**12**
Cataby	1	13	68	34	17	**140**
Regans	0	8	47	17	15	**87**
Yandin	0	26	72	22	11	**131**

Table 16 Desktop results of conservation significant flora that are known or have a high likelihood of occurrence

Taxon	Cons. Code[1]		Habitat[2]	Pre-survey Likelihood			
	EPBC Act	BC Act/ DBCA		Eneabba	Cataby	Regans	Yandin
Acacia epacantha		P3	Lateritic gravelly loam or clay.	High			
Allocasuarina grevilleoides		P3	Sand over laterite, gravel.	High			
Allocasuarina ramosissima		P3	Lateritic soils, gravel.	High			
Anigozanthos humilis subsp. *chrysanthus*		P4	Grey or yellow sand.				High
Arnocrinum gracillimum		P3	White, grey, yellow or lateritic sand.	High			
Asterolasia drummondii		P4	Lateritic gravel & sand or loam. Lateritic hills & sandplains, breakaways.				High
Banksia chamaephyton		P4	Grey or white sand over laterite.	High			
Banksia cypholoba		P3	Sand and gravelly loam.	Known			
Banksia dallanneyi subsp. *pollosta*		P3	Grey/yellow sand. Flats, lateritic rises.			High	
Banksia fraseri var. crebra		P3	Recorded on a lateritic hilltop with grey/brown sandy clay soil (WAH, 2023)	High			
Beaufortia eriocephala		P3	Lateritic sandy soils. Slopes.				High
Conostephium magnum		P4	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.	High			High
Dampiera tephrea		P3	Sand, gravelly loam.				High
Darwinia carnea		P3	Lateritic loam and gravel. Brown or dark yellow loamy to sandy loam soils.			High	
Desmocladus biformis	E	CR	Sand, sandy clay, lateritic soils. Dry sites.			High	
Desmocladus elongatus		P4	White or grey sand. Dry Kwongan.	High			

Taxon	Cons. Code[1]		Habitat[2]	Pre-survey Likelihood			
	EPBC Act	BC Act/ DBCA		Eneabba	Cataby	Regans	Yandin
Desmocladus microcarpus		P2	Recorded previously on white sand with laterite and gravel (WAH, 2023)				High
Drosera leioblastus		P1	White sandy soils.				High
Drosera prophylla		P3	Laterite hilltops.	High			
Eleocharis keigheryi	V	VU	Clay, sandy loam. Emergent in freshwater: creeks, claypans.				High
Eucalyptus johnsoniana	V	VU	White/grey sand with lateritic gravel. Sandplains, lateritic breakaways.	High			
Eucalyptus macrocarpa subsp. *elachantha*		P3	White or grey sand over laterite. Hillslopes, ridges, sandplains.			High	High
Eucalyptus pendens		P4	White or grey sand with lateritic gravel. Hillsides, breakaways, sandplains.	High			
Eucalyptus suberea	V	VU	Grey sand. Near or on lateritic breakaways	High			
Grevillea amplexans subsp. *adpressa*		P1	Yellow sand, loam. Dunes, road verge.	High			
Grevillea rudis		P4	White, grey, yellow or red sand, often with gravel & over laterite.	High			
Grevillea thyrsoides subsp. *thyrsoides*		P3	Sand or sandy lateritic gravel.				High
Grevillea uniformis		P3	Sand or sandy loam on sandstone, lateritic gravel. Sandstone outcrops, creeklines.	High			
Guichenotia alba		P3	Sandy & gravelly soils. Low-lying flats, depressions.				High
Hakea longiflora		P3	White sand, loam, gravel, laterite. Breakaways.	High			High
Hakea megalosperma	V	VU	Grey sand, loam. Lateritic hills & rocks.	High			
Hemiandra sp. Eneabba (H. Demarz 3687)		P3	Sand. Disturbed sites.	Known			
Hypocalymma × *proliferum*		P1	Grey sand. Occurs along the margins of watercourses in the Cataby and Mullering Brook areas.				High

Taxon	Cons. Code[1]		Habitat[2]	Pre-survey Likelihood			
	EPBC Act	BC Act/ DBCA		Eneabba	Cataby	Regans	Yandin
Hypocalymma gardneri		P3	Grey-brown sand, laterite. Sandplains, upper slopes, heathland.	High			
Hypocalymma tetrapterum		P3	Grey sand, loam, lateritic gravel. Riverbanks, breakaways.				High
Hypolaena robusta		P4	White sand. Sandplains.		Known		High
Jacksonia carduacea		P3	Grey sand, sandy clay.				High
Lepidobolus quadratus		P3	Lateritic gravel, grey/white sand. Dry Kwongan.	High			High
Leucopogon foliosus		P3	Usually occurs on lateritic uplands in shallow gravelly soils over laterite and in association with low, species-rich heath				High
Loxocarya gigas		P2	Sandy gravelly lateritic soils. Low hills & ridges, sandplains.	High			
Lyginia excelsa		P2	Sand. Dry heath & Banksia woodland.		High		
Mesomelaena stygia subsp. *deflexa*		P3	White, grey or lateritic sand, clay, gravel.	High			
Paracaleana dixonii	E	VU	Deep sand in open areas beneath tall dense shrubland with scatted emergent Banksia, or in shallow sand over laterite in heathland.	High		High	
Persoonia filiformis		P3	Yellow or white sand over laterite.	High			High
Persoonia rudis		P3	White, grey or yellow sand, often over laterite.	High	High	High	
Petrophile biternata		P3	Yellow/grey sand & gravel, laterite, quartzite soils. Lateritic ridges, plains.			High	
Phlebocarya pilosissima subsp. *pilosissima*		P3	White or grey sand, lateritic gravel.	Known		High	
Poranthera moorokatta		P2	Banksia Woodland (Barret, 2012).		High		
Ptychosema pusillum	V	VU	Sandy rises.				High
Schoenus griffinianus		P4	White sand.		High		
Stylidium aeonioides		P4	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.				High

Taxon	Cons. Code[1]		Habitat[2]	Pre-survey Likelihood			
	EPBC Act	BC Act/ DBCA		Eneabba	Cataby	Regans	Yandin
Stylidium drummondianum		P3	Sand or clayey sand over laterite. Upper hillslopes, breakaways. Low heath, mallee shrubland.	High			
Stylidium hymenocraspedum		P3	Sand over laterite. Hillslopes. Heath, Banksia and Eucalyptus low open woodland.		High		
Stylidium inversiflorum		P4	White or grey sand over laterite. Sandplains, hillslopes and gullies. Heath, open woodland.	High			
Stylidium longitubum		P4	Sandy clay, clay, seasonal wetlands.				High
Stylidium periscelianthum		P3	Loamy clay, moist soils pockets. Wet flats, low granitic hills.				High
Tetratheca nephelioides	CE	EN	White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges.	High			
Thelymitra apiculata		P4	Grey sand, lateritic gravel.		High		High
Thelymitra stellata	E	EN	Sand, gravel, lateritic loam.	High			
Thysanotus glaucus		P4	White, grey or yellow sand, sandy gravel.	High	High		High
Verticordia argentea		P2	White, grey or yellow sand. Sandy ridges, undulating plains.	High			
Verticordia lindleyi subsp. *lindleyi*		P4	Sand, sandy clay. Winter-wet depressions.				High
Xanthosia tomentosa		P4	Lateritic gravelly soils.	High			

1. Conservation codes: EPBC Act–- V Vulnerable E Endangered CE Critically Endangered, BC Act – VU Vulnerable EN Endangered CR Critically Endangered, DBCA – P1 P2 P3 P4 Priority.
2. Habitat descriptions obtained from WAH, 1998- unless otherwise referenced.

5.3 Conservation Significant Fauna

A total of 43 Threatened, Priority and Migratory fauna species were identified in the desktop database searches. This included 19 invertebrates, ten bird, ten mammal, and four reptile species (presented in Appendix C: Table 17). Species identified in the desktop that are oceanic species, or strictly marine were excluded from the desktop assessment as the survey does not include marine waters.

Of the 42 significant fauna species potentially occurring within the survey area, one species was considered 'known' within the Eneabba survey area, the Carnaby's Cockatoo (*Zanda latirostris)*. Evidence of these species would be expected to be seen during the field survey. The results of the desktop assessments completed for the four survey areas is include below in Table 17. The species with a 'known or 'high' likelihood of occurrence are presented in Table 18. and the results are mapped in Figure 7.

Table 17 Significant fauna desktop assessment results summary

Survey Area	Likelihood of Each Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Eneabba	1	5	5	6	4	**21**
Cataby	0	7	4	8	9	**28**
Regans	0	9	1	11	7	**28**
Yandin	0	5	7	10	10	**32**

Table 18 Desktop results of conservation significant fauna species that are known or have a high likelihood of occurrence

Scientific Name	Common Name	Cons. Code[1]		Ecology	Pre-survey Likelihood			
		EPBC Act	BC Act /DBCA		Eneabba	Cataby	Regans	Yandin
Isoodon fusciventer	Quenda, Southern Brown Bandicoot	-	P4	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).		High	High	
Notamacropus irma	Western Brush Wallaby	-	P4	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).		High	High	High
Leipoa ocellata	Malleefowl	V	VU	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	High	High	High	High
Zanda latirostris	Carnaby's Cockatoo	E	EN	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or Kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	Known	High	High	High
Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled Southwest Ctenotus	-	P3	Amongst heath on coastal dunes, and in open woodland on the Swan Coastal Plain. It is generally restricted to areas with limestone (Wilson & Swan, 2013).		High		
Bothriembryon perobesus	Land Snail	-	P1	Endemic to Western Australian habitats including rocky terrain, woodlands, gorges and gullies and coastal shrub/heath (Whisson and Ryan, 2019).		High	High	High
Synemon gratiosa	Graceful Sun Moth	-	P4	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	High	High		
Hemisaga vepreculae	Thorny Bush Katydid	-	P2	Heath (Western Wildlife, 2021).	High			
Hylaeus globuliferus	Woolybush Bee	-	P3	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	High		High	
Idiosoma kwongan	Kwongan Heath Shield-backed Trapdoor Spider	-	P1	Southern Geraldton Sandplains bioregion of south-western Western Australia, from Eneabba south to Green Head and the Lesueur National Park heath habitat (Rix, Huey, Cooper, Austin, Harvey, 2018).	High		High	
Idiosoma sigillatum	Swan Coastal Plain Shield-backed Trapdoor Spider	-	P3	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).			High	
Leioproctus contrarius	A Short-tongued Bee	-	P3	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).			High	

1. Conservation codes: EPBC Act – V Vulnerable, E Endangered, BC Act – VU Vulnerable EN Endangered OS Other Specially Protected Fauna, DBCA – P1, P2, P3, P4 Priority

6.0 Eneabba Results and Discussion

6.1 Vegetation Communities

Four native vegetation communities were defined and mapped. These include:

- Mallee woodland
- Two Mixed Kwongan Heaths; one on laterite and one on sand
- Trees: remnant native trees over paddock weeds.

Two non-native vegetation communities were mapped. This includes paddock, largely comprised of common pasture weeds and planted areas comprising of plantation and introduced tree species. Cleared areas, devoid of any vegetation was mapped for 10.94 ha.

The vegetation mapping was supported by running similarity analysis of floristic data using the Bray-Curtis similarity index on presence/absence data (Plate 1) and scaled foliage cover data (Plate 2). Vegetation community descriptions are presented in Table 19 and mapped on Figure 8.

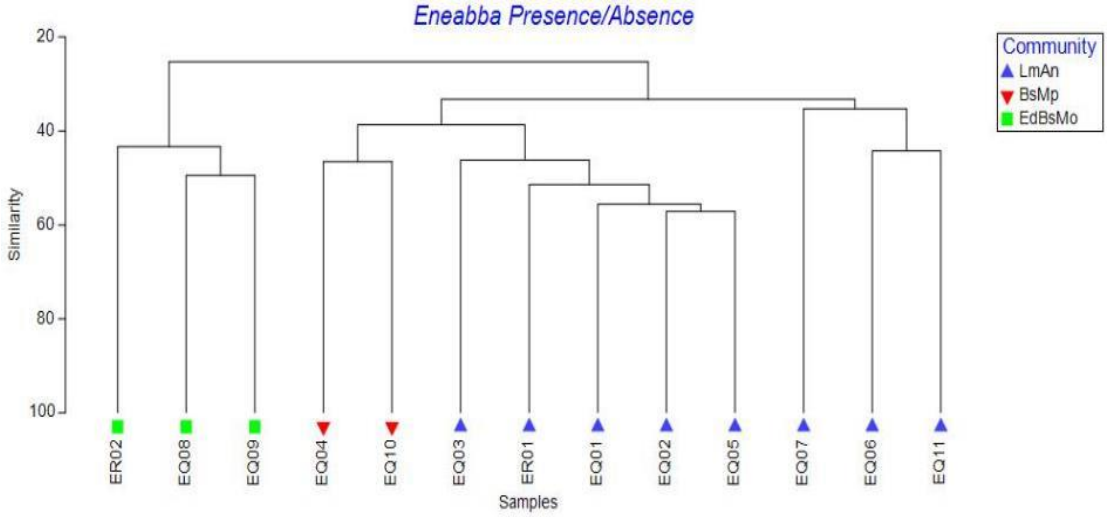


Plate 1 Floristic similarity (Bray Curtis Index) of all Eneabba sites using presence absence

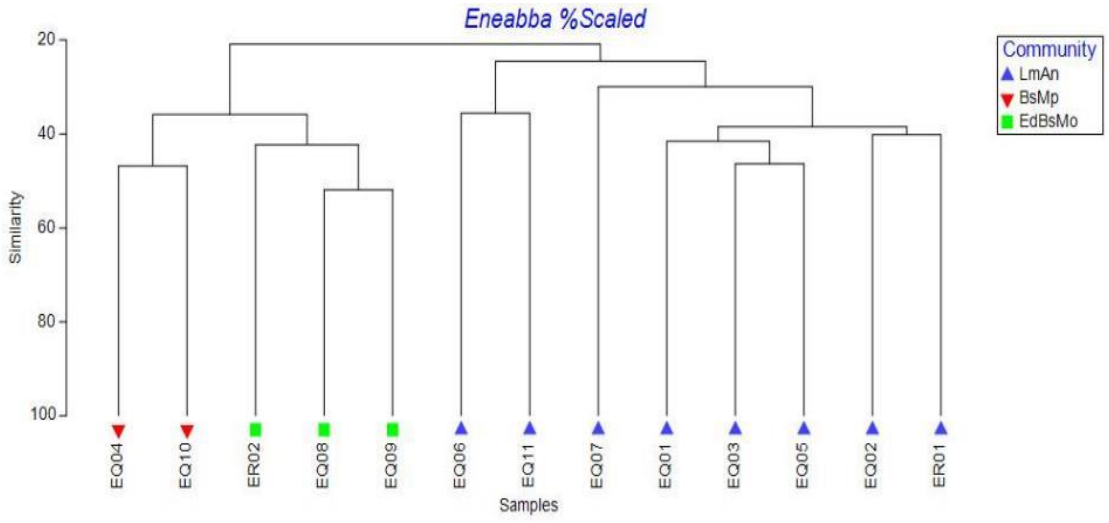


Plate 2 Floristic similarity (Bray Curtis Index) of all Eneabba sites using scaled foliage cover

Table 19 Eneabba vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation Communities		
EdBsMo Mallee Woodland *Eucalyptus drummondii* and *Eucalyptus pleurocarpa* mid to low open mallee woodland, over *Banksia sphaerocarpa*, *Banksia tridentata*, *Hakea auriculata* low heathland, over *Morelotia octandra*, *Amphipogon amphipogonoides* and *Glischrocaryon aureum* mid to low mixed sparse forbland.	Survey effort: ER02, EQ08, EQ09 Species richness: 77 species Condition: Degraded to Excellent Extent: 1.67 ha	
LmAn Mixed Kwongan Heathland *Lambertia multiflora*, *Calothamnus hirsutus* and *Hibbertia hypericoides* subsp. *septentrionalis* tall to low closed heathland over *Alexgeorgea nitens, Caustis dioica* and *Mesomelaena pseudostygia* tall to low sedgeland. Emergent isolated patches of *Banksia attenuata, Eucalyptus todtiana* and *Nuytsia floribunda* trees present. Overstorey dominance varies and can be so sparse that these species were occasionally absent from quadrats. Recorded on sandy soils.	Survey effort: EQ01, EQ02, EQ03, EQ05, EQ06, EQ07, EQ11, ER01 Species richness: 150 species Condition: Degraded to Excellent Extent: 14.14 ha	

Description	Additional Details	Photograph
BsMp Mixed Kwongan Heathland *Banksia shuttleworthiana*, *Hibbertia hypericoides* subsp. *septentrionalis* and *Calothamnus hirsutus* low closed heathland over *Mesomelaena pseudostygia*, *Desmocladus virgatus* and *Amphipogon amphipogonoides* tall to low open forbland. Recorded on lateritic soils. Community represents small proportion of survey area (1.75%).	Survey effort: EQ04, EQ10 Species richness: 87 species Condition: Degraded to Excellent Extent: 2.02 ha	
Trees Stands of native trees in paddocks.	Condition: Completely Degraded Extent: 0.52 ha	

Description	Additional Details	Photograph
Non-native Vegetation Communities		
Paddock Largely comprised of common pasture weeds.	Extent: 60.25 ha	
Planted Planted vegetation including introduced Eucalyptus trees and agricultural trees.	Extent: 27.38 ha	

6.2 Significant Vegetation

Two significant vegetation communities are known to occur in the vicinity of the survey area. These include the Ferricrete Floristic Community (Rocky Springs type) listed as Vulnerable under the BC Act, and Assemblages of Organic Mound Springs of the Three Springs area listed as Endangered under the BC Act.

The Ferricrete Floristic Community (Rocky Springs type) generally comprises tall shrubland and has been recorded between Arrino and Eneabba, on irregularly inundated red brown sandy loams over ferricrete. It is generally dominated by *Acacia blakelyi*, *Allocasuarina campestris* and *Labichea lanceolata* subsp*. lanceolata*. Associated species include *Alyogyne hakeifolia*, *Borya sphaerocephala*, *Isotoma hypocrateriformis*, *Petrophile seminuda*, *Stylidium dichotomum*, *Thysanotus patersonii* and *Pterochaeta paniculata* (DBCA, 2023a). There is a known occurrence 2.4 km north-east of the survey area.

Table 20 presents an assessment of key substrate characteristics and flora assemblages as per DBCA (2023a). All three vegetation communities lie across soils derived from ferricrete, however have a different floristic assemblage and topography than what is described in key references (DBCA, 2023a, Hamilton-Brown et al., 2004). The community only occurs on infrequently inundated red and brown sandy loams over ferricrete soils (Hamilton-Brown et al., 2004), of which are absent from our survey area. Therefore, this TEC has been excluded from occurring within the survey area.

The Assemblages of Organic Mound Springs of the Three Springs habitat is characterised by continuous discharge of groundwater in raised areas of peat. The peat and surrounds provide a stable, permanently moist series of micro-habitats. There is a high level of heterogeneity of invertebrate fauna assemblages between occurrences, and all are associated with a rich and healthy fauna. The distinctive assemblages are composed of invertebrate groups that commonly include beetles, oligochaetes, non-biting midges and bugs. The vegetation component of the community contains many moisture loving species including an overstorey of *Melaleuca preissiana* trees. *Eucalyptus camaldulensis* and *Eucalyptus rudis* are also found in a number of the mound springs. The shrub layer often includes *Hypocalymma angustifolium* and *Acacia saligna* over *Machaerina vaginalis* and other sedges. The herbaceous *Patersonia occidentalis* (swamp variant) has been recorded at several occurrences (DBCA, 2023a).

No areas of peat or communities dominated by riparian species such as *M. preissiana*, *E. camaldulensis* and *E. rudis* occur within the survey area. Therefore, this community has been excluded from occurring.

Table 20 Ferricrete floristic community (Rocky Springs type) assessment

Vegetation Community	Dominant Taxa	IBRA Region	Topography	Land System	Soils	Final determination
BsMp	*Banksia shuttleworthiana*, *Hibbertia hypericoides* subsp. *septentrionalis* and *Calothamnus hirsutus* low closed heathland over *Mesomelaena pseudostygia*, *Desmocladus virgatus* and *Amphipogon amphipogonoides* tall to low open forbland.	Geraldton Sandplains	Undulating flats	• Yerramullah System: Subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. Pale deep sand, sandy gravels and yellow deep sand. Banksia woodlands on lower slopes/depressions, heathlands elsewhere. • Boothendarra System: subdued stripped lateritic plateau, undulating and gently undulating rises; Sandy duplexes, pale deep sand, sandy and loamy gravels and minor clays	• ferruginous duricrust 38498: Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite. • sand plain 38499: Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	• Correct soils: ferricrete • Incorrect floristic assemblage: one key species present (0.1% cover)
LmAn	*Lambertia multiflora*, *Calothamnus hirsutus* and *Hibbertia hypericoides* subsp. *septentrionalis* tall to low closed heathland over *Alexgeorgea nitens, Caustis dioica* and *Mesomelaena pseudostygia* tall to low sedgeland.	Geraldton Sandplains	Undulating flats	• Yerramullah System: Subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. Pale deep sand, sandy gravels and yellow deep sand. Banksia woodlands on lower slopes/depressions, heathlands elsewhere.	• ferruginous duricrust 38498: Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite. • sand plain 38499: Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	• Correct soils: ferricrete • Incorrect floristic assemblage: two key species present (0.1% cover)

Vegetation Community	Dominant Taxa	IBRA Region	Topography	Land System	Soils	Final determination
EdBsMo	*Eucalyptus drummondii* and *Eucalyptus pleurocarpa* mid to low open mallee woodland, over *Banksia sphaerocarpa*, *Banksia tridentata*, *Hakea auriculata* low heathland, over *Morelotia octandra*, *Amphipogon amphipogonoides* and *Glischrocaryon aureum* mid to low mixed sparse forbland.	Geraldton Sandplains	Hills	Yerramullah System: Subdued dissected lateritic plateau, undulating low hills and rises on lateritised weathered sandstone. Pale deep sand, sandy gravels and yellow deep sand. Banksia woodlands on lower slopes/depressions, heathlands elsewhere.	• ferruginous duricrust 38498: Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite.	• Correct soils: ferricrete • Incorrect floristic assemblage: one key species present (0.1% cover)

6.3 Vegetation Condition

Native vegetation was mapped for 17.15 ha, representing 15% of the survey area and excludes areas mapped as cleared. Native vegetation condition varied from Completely Degraded to Excellent. Completely Degraded vegetation represented the Trees community, where stands of native trees occurred over paddock. Non-native vegetation communities and areas devoid of vegetation were mapped as cleared. Vegetation condition is mapped on Figure 8 and the extent of each category is presented in Table 21.

Table 21 Eneabba vegetation condition extent

Condition Rating (Keighery, 1994)	Extent (ha)	Percent of Total Area (%)
Excellent	11.47	9.9
Very Good	3.51	3.0
Good	0.21	0.2
Degraded	1.44	1.2
Completely Degraded	0.52	0.5
Cleared	98.57	85.0
Total	**115.73**	**100%**

6.4 Significant Flora

No Threatened flora listed under the EPBC Act or the BC Act were recorded. Eleven Priority flora species were recorded (Table 22), discussed below. All Priority flora locations for the Eneabba survey area are presented on Figure 8.

Table 22 Priority flora recorded in the Eneabba survey area

Species	Cons. Status	Abundance	Vegetation Community
Allocasuarina ramosissima	P3	8	EdBsMo
Banksia chamaephyton	P4	10	LmAn
Banksia cypholoba	P3	13	EdBsMo / LmAn
Banksia fraseri var. *crebra*	P3	30	LmAn
Cristonia biloba subsp. pubescens	P2	3	EdBsMo
Grevillea uniformis	P3	7	BsMp
Hakea longiflora	P3	14	LmAn
Hemiandra sp. Eneabba (H. Demarz 3687)	P3	36	LmAn
Lepidobolus quadratus	P3	18	BsMp / EdBsMo / LmAn
Phlebocarya pilosissima subsp. *pilosissima*	P3	17	LmAn
Stylidium drummondianum	P3	61	EdBsMo

Allocasuarina ramosissima (P3)

Allocasuarina ramosissima is a divaricate shrub growing on lateritic soils and gravel (WAH, 1998-) and is listed as Priority 3 by DBCA. One sample was collected and verified by Mike Hislop at the WAH as representing the priority species (FDW230921-20, ACC/10717/E). A total of 8 individuals were recorded from five locations within the EdBsMo on laterite hills (Plate 3; Figure 8).

Plate 3 *Allocasuarina ramosissima* (P3) recorded in the Eneabba survey area, leaf morphology (left) and habit (right)

Banksia chamaephyton (P4)

Banksia chamaephyton is a low lignotuberous shrub, growing on grey or white sand over laterite (WAH, 1988-) (Plate 4). The species is listed as Priority 4 by DBCA. One sample was collected (CS230921-135) and was confirmed by Mike Hislop at the WAH as representing the Priority species (ACC/10425/E). A total of 10 individuals were recorded on grey-white sand in vegetation community LmAn towards the western extent of the survey area (Figure 8).

Plate 4 *Banksia chamaephyton* (P4) recorded in the Eneabba survey area, leaf morphology (left) and habit (right)

Banksia cypholoba (P3)

Banksia cypholoba is a Priority 3 species that grows on sand and gravelly loam (WAH, 1998-). Four samples were collected throughout the survey area (FDW230919-3, FDW230920-19, CS230919-16, CS230919-33) and confirmed by the WAH to represent the Priority 3 species (ACC/10717/E). Thirteen individuals were recorded, across 10 locations in vegetation communities EdBsMo and LmAn (Plate 5; Figure 8).

Plate 5 *Banksia cypholoba* (P4) recorded in the Eneabba survey area, leaf morphology (left) and habit (right)

***Banksia fraseri* var. *crebra* (P3)**

Banksia fraseri var. *crebra* is a Priority 3 species that has been recorded previously on grey/brown sandy clay soil (WAH, 2023). The species was verified by the WAH as occurring in the survey area (FdW230920-08, ACC/10425/E). A total of 30 individuals were recorded from 16 locations within vegetation community LmAn (Figure 8). The species was flowering at the time of survey making it easily identifiable in the field (Plate 6).

Plate 6 *Banksia fraseri* var. *crebra* (P3) recorded in the Eneabba survey area leaf morphology (left) and habit (right)

Cristonia biloba subsp. *pubescens* (P2)

Cristonia biloba subsp. *pubescens* is a spindly shrub that is listed as Priority 2 by DBCA. One sample was collected (FDW230921-21) and verified by the WAH as representing the priority species (ACC/10717/E). Three individuals were recorded on a laterite hill in vegetation community EdBsMo (Plate 7; Figure 8).

Plate 7 ***Cristonia bilboba* subsp. *pubescens* (P3) recorded in the Eneabba survey area leaf morphology (left) and habit (right)**

Grevillea uniformis (P3)

Grevillea uniformis is a shrub growing to 1.8 m high on sand, sandy loam on lateritic gravel (WAH, 1998-) (Plate 8). The species is listed as Priority 3 by DBCA. One sample was collected and verified as representing the Priority 3 species within the survey area (FDW230921-25, ACC/10425/E). A total of 34 individuals were recorded from 22 locations in vegetation community BsMp (Figure 8).

Plate 8 *Grevillea uniformis* (P4) recorded in the Eneabba survey area, leaf morphology (left) and habitat (right)

Hakea longiflora (P3)

Hakea longiflora is an erect, pungent shrub growing on white sand, loam, gravel and laterite, listed as Priority 3 by DBCA. One sample was collected (FdW230920-12) and was confirmed by the WAH as representing the Priority species (ACC/10425/E). A total of 14 individuals were recorded within vegetation community LmAn (Figure 8).

Plate 9 *Hakea longiflora* (P3) recorded in the Eneabba survey area leaf morphology (left) and habit (right)

Hemiandra sp. Eneabba (H. Demarz 3687) (P3)

Hemiandra sp. Eneabba (H. Demarz 3687) is a straggly, erect shrub that grows on sand and favours disturbed sites (WAH, 1998-) (Plate 10). One sample of *H*. sp. Eneabba (H. Demarz 3687) was collected (FdW230919-2) and verified by the WAH as representing the Priority species. A total of 35 individuals were recorded during the 2023 survey (Figure 8), within vegetation community LmAn.

Plate 10 ***Hemiandra* sp. Eneabba (H. Demarz 3687) (P3) recorded in the Eneabba survey area, leaf morphology (left) and habit (right)**

***Lepidobolus quadratus* (P3)**

Lepidobolus quadratus is a caespitose perennial herb that grows in dry Kwongan heath on lateritic gravel and grey/white sand (WAH, 1998-). The species is listed as Priority 3 by DBCA. One sample was collected and verified by the WAH as representing *L. quadratus* (FDW230920-09; ACC/10425/E) (Plate 11). Eighteen individuals were recorded across the survey area at eight locations within communities BsMp, EdBsMo and LmAn (Figure 8).

Plate 11 *Lepidobolus quadratus* (P3) recorded in the Eneabba survey area, leaf morphology (left) and habitat (right)

Phlebocarya pilosissima subsp. *pilosissima* (P3)

Phlebocarya pilosissima subsp. *pilosissima* is a Priority 3 species that grows on white or grey sand with lateritic gravel (WAH, 1998-) (Plate 12). The species was verified by the WAH as occurring in the survey area (FdW230919-05, ACC/10425/E) with 16 individuals recorded within vegetation community LmAn (Figure 8). *Phlebocarya pilosissima* subsp. *pilosissima* appears to favour disturbed tracks and can be cryptic at times, observed growing under dense vegetation.

Plate 12 *Phlebocarya pilosissima* subsp. *pilosissima* (P3) recorded in the Eneabba survey area

***Stylidium drummondianum* (P3)**

Stylidium drummondianum is a rosetted perennial herb that grows on sand or clayey sand over laterite (WAH, 1998-) (Plate 13). The species is listed as Priority 3 by DBCA. The species was verified as occurring within the survey area, with one sample sent to the WAH for confirmation (FdW230920-15, ACC/10425/E). A total of 61 individuals were recorded during the survey, restricted to a laterite hill within vegetation community EdBsMo (Figure 8).

Plate 13 ***Stylidium drummondianum* (P3) recorded in the Eneabba survey area flower morphology (left) and habit (right)**

6.5 Flora Inventory

A total of 201 flora species from 41 families were confidently identified to species level. An additional 24 species were denoted with a “?” or “sp.” due to insufficient material for identification. The total includes 188 (94%) locally native species and 13 (6%) introduced or naturalised weed species.

Families with the highest representation are Proteaceae (32 native taxa), Fabaceae (24 taxa; 23 native, and one introduced) and Myrtaceae (22 native taxa).

The comprehensive list of vascular flora species recorded, organised by family and the community they occur in is presented in Appendix D. Quantitative data recorded from samples sites is presented in Appendix E.

6.6 Fauna Species

6.6.1 Conservation Significant Fauna Species

No direct or indirect evidence of significant fauna species was recorded during the survey.

The following significant fauna species are considered to have the potential to utilise the habitats within the survey area:

- Carnaby’s Cockatoo (*Zanda latirostris)* Endangered under the EPBC Act and BC Act
- Graceful Sun Moth (*Synemon gratiosa)* Priority 4
- Thorny Bush Katydid (*Hemisaga vepreculae*) Priority 2

- Woolybush Bee (*Hylaeus globuliferus*) Priority 3
- Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) Priority 1

6.6.2 Fauna Inventory

A total of 23 fauna species were recorded during the field survey (Table 28). This included 19 birds, and four mammals.

Table 23 Eneabba Fauna Species recorded within the survey area.

Class	Common Name	Taxon Name	Observation
Bird	Slender-billed Thornbill	*Acanthiza iredalei*	Seen and heard
	Western Corella	*Cacatua pastinator butleri*	Seen and heard
	Laughing Dove	*Spilopelia senegalensis*	Seen
	Pied Butcherbird	*Cracticus nigrogularis*	Seen
	Emu	*Dromaius novaehollandiae*	Seen
	Pink and Grey Galah	*Eolophus roseicapilla*	Seen and heard
	Australian Magpie	*Gymnorhina tibicen*	Seen and heard
	Welcome Swallow	*Hirundo neoxena*	Seen
	Variegated Fairy-wren	*Malurus lamberti*	Seen and heard
	Splendid Fairy-wren	*Malurus splendens*	Seen and heard
	Yellow-throated Miner	*Manorina flavigula*	Seen and heard
	Brown Honeyeater	*Lichmera indistincta*	Seen
	Nankeen Kestrel	*Falco cenchroides*	Seen
	White-necked Heron	*Ardea pacifica*	Seen
	Crested Pigeon	*Ocyphaps lophotes*	Seen
	Gilber's Whistler	*Pachycephala inornata*	Seen
	Striated Pardalote	*Pardalotus striatus*	Seen
	Tree Martin	*Petrochelidon nigricans*	Seen
	Willie Wagtail	*Rhipidura leucophrys*	Seen
Mammal	Western Grey Kangaroo	*Macropodidae family*	Seen
	European Rabbit	*Oryctolagus cuniculus*	Seen and Burrows
	Cat	*Felis catus*	Other – Tracks
	European Fox	*Vulpes vulpes*	Seen

6.7 Fauna Habitat

Three fauna habitats were defined and mapped for the survey area based on the results of the field assessment (Figure 9). This included one non-native habitat and two native fauna habitats. The native fauna habitats were, ‘Heath’ and ‘Mallee Woodland’, while the modified habitats was ‘Agriculture’. These habitats have been described in Table 24. Cleared areas are representative of tracks, roads and highly modified or degraded vegetation with no biological benefit, this was mapped for 10.94 ha.

Table 24 Eneabba fauna habitats

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Heath (14.96 ha, 13%)	Mixed Kwongan heathland on sandy/laterite soils. Banksia species scattered throughout, in addition to isolated pockets of *Nuytsia floribunda.* Canopy cover was minimal and inconsistent. No grass species present. Fine and coarse leaf litter highly abundant. Mid to low heath shrub with medium to high foliage cover. Bare ground occasional, with spares herbs. Mixed sands as substrate, mainly white.	Potential habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary foraging. • Thorny Bush Katydid (*Hemisaga vepreculae*) DBCA P2 • Woolybush Bee (*Hylaeus globuliferus*) DBCA P3 • Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) DBCA P1	
Mallee Woodland (1.67 ha, 1%)	Mid to low open Mallee species over low *Banksia sp*. & *Hakea sp.* dominated Heath. Mature trees common, consisting of mallee species. Fine and coarse leaf litter highly common. The habitat is considered high to moderate quality due to the presence and abundance of eucalypts. Habitat is encompassed by agricultural land. Sandy soils with mixed herbs and myrtaceous species.	Known to occur: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary foraging. Potential habitat for*:* • Graceful Sun Moth (*Synemon gratiosa)* DBCA P4 • Thorny Bush Katydid (*Hemisaga vepreculae*) DBCA P2 • Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) DBCA P1	

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Agriculture (88.15ha, 76%)	Agriculture is a combination of habitats primarily used for agricultural purposes. This includes, paddocks, crops, planted vegetation and tree breaks. This habitat contains scattered trees, likely to have value for faunal species. Almond crops present and paddock weeds are also recorded to be known foraging for conservation significant species such as the Carnaby's Cockatoo (Scott and Black, 1981; Valentine and Stock, 2008)	Potential marginal habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered	

6.8 Targeted Black Cockatoo Survey

6.8.1 Foraging

A combination of the DAWE (2022) foraging scoring tool and the Bamford (2020) foraging methodology was implemented for the black cockatoo assessments. The DAWE foraging habitat assessment resulted in a score of 7 (Table 25).

Table 25 Eneabba Black Cockatoo foraging habitat assessment (DAWE, 2022).

Starting score		**Carnaby's Cockatoo (*Zanda latirostris*)**	
10		**Start at a score of 10** if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp., *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	
Attribute	**Sub-tractions**	**Context adjustor (attributes reducing functionality of foraging habitat).**	
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☒
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☒
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present	☐
Total score		**7**	

The refined foraging habitat value considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The following factors influenced the results:

- the survey area is situated across a confirmed Carnaby's Cockatoo breeding area (DBCA, 2023c)
- there are substantial areas of suitable foraging habitat adjacent to the survey area. Native vegetation within the survey area represents 0.1% of the available foraging habitat within a 15 km radius
- vegetation present contains key proteaceous and myrtaceous foraging species with 20-40% cover.

The BCE (2020) refined foraging habitat value and associated scores are presented in Table 26. Black cockatoo foraging was mapped for 104.78 ha ranging from 'Low' to 'Moderate' quality. The total extent of the various black cockatoo foraging scores is presented in Table 27.

Table 26 Eneabba refined foraging score calculation (Bamford, 2020)

Fauna Habitat	Carnaby's Cockatoo			Foraging Score
	Site condition	Context	Stocking rate	
Heath	4	1	0	5 (Moderate)
Mallee Heathland	4	1	0	5 (Moderate)
Agriculture	2	0	0	2 (Low)
Cleared	0	0	0	None

Table 27 Eneabba foraging habitat extent

Foraging Habitat Score	Extent (ha)	Percent of Total Area (%)
0 None	10.94	10
2 Low	88.15	76
5 Moderate	16.63	14
Total	**115.73**	**100%**

6.8.2 Breeding

Thirty-three potential nesting trees with a suitable DBH (>500 mm) were identified within the Eneabba survey area. This comprised of 25 *Eucalyptus todtiana* trees and eight introduced Eucalyptus trees. Potential nesting trees are defined by DAWE (2022) as "*trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH*".

6.8.3 Roosting

No known roosting sites were observed within the Eneabba survey area. Vegetation represented shrubby vegetation, with scattered mallee and tree Eucalyptus species reaching a height of up to 7 m. No roosting habitat is present. The closest buffered roost area from Birdlife data provided by DBCA is 110 km south of the survey area.

6.9 Discussion

6.9.1 Flora and Vegetation

Four native vegetation communities were defined and mapped for 17.15 ha (15%) of the survey area. These communities represented a mix of heathlands, one with a Mallee overstorey (EdBsMo), one on sand (LmAn) and one on laterite (BsMp). Additionally, a trees community, defined as remnant trees over paddock was mapped for 0.52 ha in the northern extent of the survey area. Vegetation condition of the three intact communities ranged from Degraded to Excellent, where weed invasion from adjacent paddock and agriculture reduced the condition in some areas.

No significant vegetation communities occur within the survey area. Two State listed TECs were considered to have the potential to occur. These communities were the ferricrete floristic community (Rocky Springs type) listed as Vulnerable under the BC Act, and Assemblages of organic mound springs of the Three Springs area listed as Endangered under the BC Act. Both these communities have distinct floristic assemblages that were absent. Vegetation present was typical of the Geraldton Sandplains with heathland dominated by a mix of sclerophyllous species on undulating flats.

Flora diversity was considered high, with 201 species from 41 families confidently identified to species level within 43.98 ha of native vegetation. This diversity is typical of the Geraldton Sandplains and Kwongan heathland which is considered to be one of the species-richest temperate shrublands (Macintyre, 2020). Endemism is very high on the Geraldton Sandplains (Hopkins & Hnatiuk, 1981), evident by the number of significant flora recorded within a small area of native vegetation.

Eleven Priority species were recorded in the survey area. Of these, three species were known to occur, seven species had a high likelihood of occurrence and one species had a moderate likelihood of occurrence in the pre-survey desktop assessment. These species are discussed below.

Allocasuarina ramosissima is a Priority 3 species that grows on lateritic soils and gravel (WAH, 1998-) and was considered likely to occur. Two verified populations occur within 50 km of the survey area (Threatened and Priority Flora Database (TPFL) population 2 and 5), with additional WAH database records up to 215 m from the survey area. *A. ramosissima* was recorded from two lateritic hills within vegetation community EdBsMo, 6.3 km from the WAH record. These lateritic hills represent isolated pockets of vegetation that are surrounded by paddock and agricultural crops. Therefore, the individuals recorded in the survey area likely represent a distinct population.

Banksia chamaephyton is a Priority 4 species that grows on grey or white sand over laterite (WAH, 1998-) and was considered likely to occur. There is a WAH record 2.3 km from the survey area, however no verified populations of *B. chamaephyton* are known within a 50 km radius, however there are records from the WAH database 2.3 km from the survey area (WAH, 2023). A total of 10 individuals were recorded in the closed mixed Kwongan heathland on sand community (LmAn) which aligns with known habitat.

Banksia cypholoba is a Priority 3 species that grows on sand and gravelly loam (WAH, 1998-), which was known to occur (AECOM, 2020). Fifteen verified populations occur within 50 km of the survey area (TPFL pop# 1-15). Thirteen individuals were recorded from 10 locations across the survey area. Eight of the 13 individuals recorded were located within 500 m of the AECOM (2020) record in community LmAn and likely represent the same population. Two individuals were recorded 4.5 km south in community LmAn, and an additional three individuals were recorded on a laterite hill in community EdBsMo.

Banksia fraseri var. *crebra* is a Priority 3 species that grows on grey/brown sandy clay soil (WAH, 2023) and was considered likely to occur. There is a WAH record less than 50 m from the survey area, dated from 2009. Thirty individuals of *B. fraseri* var. *crebra* were recorded in community LmAn in close proximity to the WAH record. They therefore likely represent the same population.

Cristonia biloba subsp. pubescens is spindly shrub listed as Priority 2 by DBCA and had a moderate likelihood of occurring due to the lack of records nearby or recent. There is one WAH record 11.3 km from the survey area, but no verified (TPFL records) are known from a 50 km radius. Three individuals were recorded on a lateritic hill in vegetation community EdBsMo. *C. biloba* subsp. *pubescens* looks superficially similar when sterile to the common species *Gastrolobium polystachyum.* Both species have a spindly habit with the lower surface of the leaves covered with hairs (Plate 14). Both species were recorded together. Best efforts were made to ensure correct detection of the Priority species.

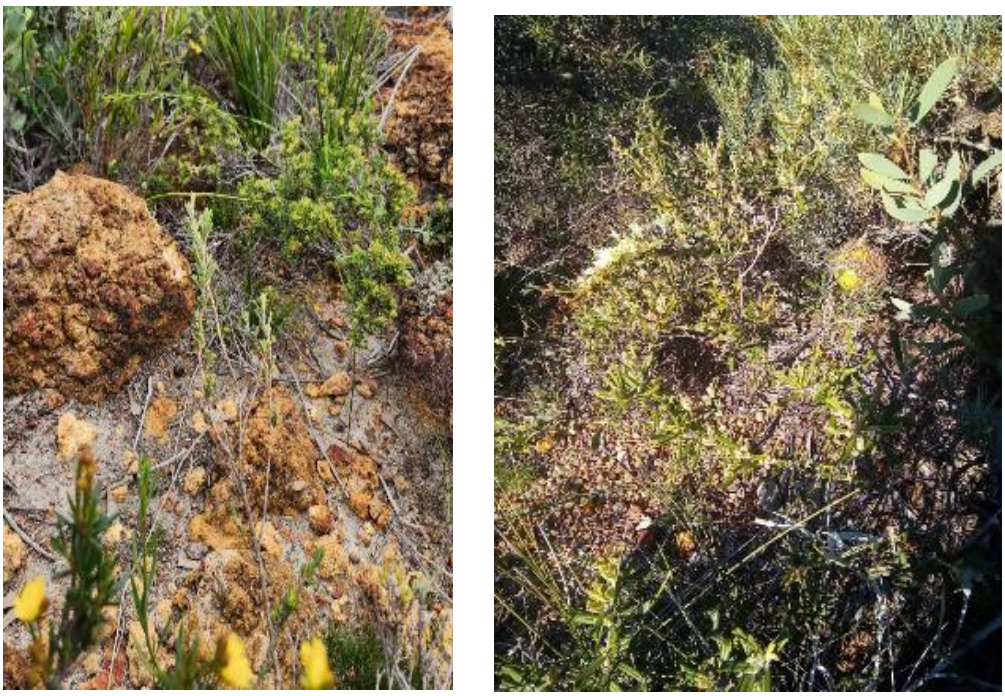


Plate 14 *C. biloba* subsp. *pubescens* (left), *Gastrolobium polystachyum* (right)

Grevillea uniformis is a Priority 3 species that grows on sand, sandy loam on lateritic gravel (WAH, 1998-) and was considered likely to occur. There is a WAH record 20 m from the survey area, however no verified populations occur within 50 km. Two collections suspected to represent the Priority species were taken (FDW230920-14, FDW230921-25), with one collection verified by the WAH as representing *G. uniformis* (ACC/ ACC/10425/E). Collection FDW230920-14 was an anomalous specimen and unable to be identified to species level. Specialist Peter Olde from the WAH believes the specimen is either a hybrid or an unrecognised taxon (pers. comm. Mike Hislop, 10 Oct 2023). Interestingly, this collection was made adjacent to the WAH record.

Hakea longiflora is a Priority 3 species that grows on white sand, loam, gravel and laterite (WAH, 1998-) and was considered likely to occur. There is a WAH database record 43 m from the survey area, but no verified populations within a 50 km radius. A total of 14 individuals were recorded within vegetation community LmAn, 57 m from the known WAH record (WAH, 2023). It is expected that the individuals recorded in this survey represent the same population as the WAH record.

Hemiandra sp. Eneabba (H. Demarz 3687) is a Priority 3 species that grows on sand and favours disturbed sites (WAH, 1998-) and was known to occur based on previous surveys (AECOM, 2020). There are 27 records on the WAH database known from within 50 km, none of which are verified populations. Thirty-six individuals were recorded in the LmAn community across the survey area.

Lepidobolus quadratus is a Priority 3 species that grows on lateritic gravel and grey/white sand (WAH, 1998-) and was considered likely to occur. There is a WAH database record 4.2 km from the survey area, however no verified populations occur within a 50 km radius. Eighteen individuals were recorded across the survey area at eight locations on both sand and laterite within communities BsMp, EdBsMo and LmAn, which aligns with its known habitat requirements.

Phlebocarya pilosissima subsp. *pilosissima* is a Priority 3 species that grows on white or grey sand and lateritic gravel (WAH, 1998-) and was known to occur (WAH, 2023). Seventeen individuals were recorded in vegetation community LmAn. *Phlebocarya pilosissima* subsp. *pilosissima* appears to favour disturbed tracks and can be cryptic at times, growing under dense vegetation. Therefore, total number of the Priority species represents an estimate of abundance.

S. drummondianum is a Priority 3 species that grows on sand or clayey sand over laterite (WAH, 1998-) and was considered likely to occur. There is a WAH record less than 5 km from the survey area, however no verified populations of *S. drummondianum* occur within 50 km. A total of 61 individuals were recorded, isolated to one lateritic hill within the vegetation community EdBsMo.

All species considered to have a high likelihood of occurrence that were not recorded during the survey have been downgraded to a low likelihood. Sufficient survey effort was achieved, with all areas of remnant native vegetation subject to targeted searches. The survey was undertaken during the ideal detection period, and all species have a perennial life cycle that would have been present. This, and the considerable survey effort using systematic traverses, have led to the downgrading of likelihood. All moderate likelihood of occurrence species were downgraded to low, with the exception of *Comesperma griffinii* (P2) and *Comesperma rhadinocarpum* (P3). These species appear to be a post-fire ephemeral (Keighery, 2002) and therefore may not have been detectable yet may be present in the seed bank. These two species have retained their moderate likelihood of occurrence. Table 28 provides a summary of the post-survey likelihoods (Appendix B).

Table 28 Summary of Eneabba likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	3	31	120	26	12	192
Post-survey	11	0	2	141	38	192

6.9.2 Fauna

A total of 23 vertebrate fauna species were recorded during the field survey. This included 19 birds and three mammals.

The desktop assessment identified one known and five species with a ‘high’ likelihood of occurring based on proximity of known records and habitat present. Three fauna habitats were defined and mapped including ‘Heath’ and ‘Mallee Heathland’, and one modified ‘Agriculture’ habitat representing paddocks of weeds.

The Heath and Mallee Woodland are typical habitats for the Eneabba region. They provide suitable habitat for Carnaby’s Cockatoo (*Zanda latirostris*), Graceful Sun Moth (*Synemon gratiosa*), Thorny Bush Katydid (*Hemisaga vepreculae*), Woolybush Bee (*Hylaeus globuliferus*) and the Kwongan heath shield-backed trapdoor spider (*Idiosoma kwongan*). Details of all these species and their associated habitats is presented in Table 29. Carnaby Cockatoos habitat is discussed further in Section 6.9.3.

The Heath habitat is well represented outside the survey area. The linear corridor traverses the edge of large patches of remnant native vegetation comprising of intact Heath habitat. The Mallee Woodland habitat is restricted to two isolated occurrences, both representing lateritic hills. This habitat is geographically restricted from other areas of native vegetation. For this reason, the occurrence of significant species has been reduced to ‘Low’.

There is poor understanding of the significant invertebrate species in WA. An assessment of habitat suitability, and detectability of species relies on targeted short-range endemic surveys or engaging with invertebrate experts at the WA Museum. For this report we have used publicly available information and the fauna habitat assessments to determine whether species are likely to be present. Further, due to the cryptic detectability of these species, and poor guidance on how to target such species, absence of records or lack of recent records does not necessarily reduce the likelihood of occurrence.

Two species, the Malleefowl (*Leipoa ocellata*) and Black Striped Snake (*Neelaps calonotos*) are unlikely to utilise fauna habitats within the survey area. No habitat suitable for these species was encountered.

Table 29 Eneabba fauna habitat utilisation for significant fauna species

Species	Habitat	Number of DBCA Records and Distance	Pre-survey Likelihood	Post-survey Likelihood	Discussion
Fauna species likely to utilise fauna habitat within the Eneabba survey area					
Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) WA P1	This species has been recorded in Southern Geraldton Sandplains bioregion of south-western Western Australia, from Eneabba south to Green Head and the Lesueur National Park heath habitat (Rix, Juey, Cooper, Austin, Harvey, 2018).	6 records within 50 km from 1982 to 1989. No recent records. Several occurrences at Eneabba townsite (6 km north).	High	Moderate	The species has the potential to occur within the survey area, which is within the known distribution and limited range and the preferred habitat type aligns with the Mallee Woodland and Heath fauna habitat. They have a 'Low' likelihood of occurring due to the isolation and low connectivity of Mallee Woodland patches.
Thorny Bush Katydid (*Hemisaga vepreculae*) WA P2	Heath (Western Wildlife, 2021).	3 records within 50 km of the survey area. The closest and most recent record was 23 km away (1980) north west of Eneabba. The other two records are coastal.	High	Moderate	The species has the potential to occur within the survey area, which is within the known distribution and restricted range and the preferred habitat type aligns with Heath fauna habitat. They have a 'Low' likelihood of occurring due to the isolation and low connectivity of Mallee Woodland patches.
Graceful Sun Moth (*Synemon gratiosa*) WA P4	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). 2. *Banksia woodland* on Spearwood and Bassendean dunes, where the known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	26 records have been made within 50 km of the survey area. The closest, most recent records were 35 km away (2011) at Coolimba, Eneabba	High	Moderate	Known host species *L. hermaphrodita* was recorded within the Mallee Heathland habitat. The survey area occurs within the known distribution of this species and therefore could potentially occur within the survey area. Mallee Heathland habitat is also present directly outside the survey area in patches of remnant of vegetation.

Species	Habitat	Number of DBCA Records and Distance	Pre-survey Likelihood	Post-survey Likelihood	Discussion
Woolybush Bee (*Hylaeus globuliferus*) WA P3	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	4 records have been made within 50 km of the survey area. The closest, most recent record was 18 km away (1996) at Tathra National Park	High	Moderate	The Heath fauna habitat contains *Adenanthos cygnorum* and *Banksia attenuata.* The species therefore has the potential to occur within the Heath fauna habitat. Heath habitat is also present directly outside the survey area in patches of remnant of vegetation.
Fauna species unlikely to utilise fauna habitat within the Eneabba survey area					
Malleefowl (*Leipoa ocellata*) EPBC V WA VU	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	22 records from within 50 km of the survey area. The closest record was 9 km (2010) Recent records were in 2014 between Eneabba and Three Springs, 22km away from the survey area	High	Low	There is a low possibly that this species will intermittently forage in the survey area. This is due to its current known range, age of and location of records and lack of suitable habitat within the survey area.
Black Striped Snake (*Neelaps calonotos*) WA P3	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	One record (2007) within 8 km of the survey area at Eneabba	High	Negligible	Historical record. This species is now, presumed to be confined to the Swan Coastal Plain. No suitable Eucalyptus/Banksia woodland habitat has been recorded in the survey area.

6.9.3 Black Cockatoos

The survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris)*. Thirty-three potential nesting trees with a suitable DBH (>500 mm) were identified within the survey area. This comprised of 25 *Eucalyptus todtiana* trees and eight introduced Eucalyptus trees.

No direct or indirect evidence of Carnaby's Cockatoo was recorded during the survey.

The survey area has been assessed as a score of 7 "high-quality foraging habitat" for Carnaby's Cockatoo in accordance with the DAWE (2022) scoring tool (Table 25). Native vegetation within the survey area is largely Kwongan Heath supporting Proteaceous and Myrtaceous sclerophyllous shrubs including recognised Carnaby's Cockatoo foraging species (Bamford, 2020).

A total of 104.78 ha of the survey area represented foraging habitat for Carnaby's Cockatoo, of which 88.15 ha represented 'Low' quality foraging, and 16.63 ha represented 'Moderate' quality. Heath and Mallee Woodland received a score of '5' which represents 'Moderate' foraging and Agriculture habitat received a score of '2' which represents 'Low' quality foraging habitat. Agriculture includes Almond tree crops, which are a known food source of Carnaby's Cockatoo (Scott and Black, 1981; Valentine and Stock, 2008). Cleared was not assessed for foraging habitat.

7.0 Cataby Results and Discussion

7.1 Vegetation Communities

Two Banksia Woodland vegetation communities were defined and mapped for 6.31 ha. The two communities are readily differentiated by the different dominant overstorey species (*B. attenuata* vs. *B. prionotes*). Both communities were recorded on undulating terrain with grey sandy soils typical of the Swan Coastal Plain. Cleared areas, devoid of any vegetation, was mapped for 1.37 ha.

The vegetation mapping was supported by running similarity analysis of floristic data (Plate 15; Plate 16).Vegetation community descriptions are presented in Table 30 and mapped on Figure 8.

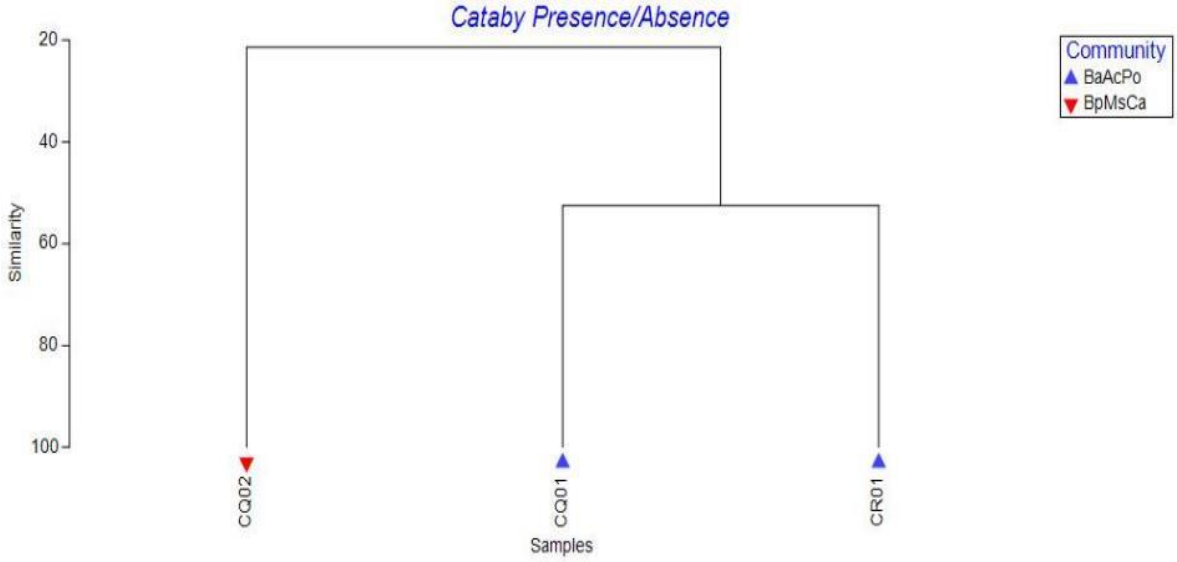


Plate 15 Floristic similarity (Bray Curtis Index) of all Cataby sites using presence absence

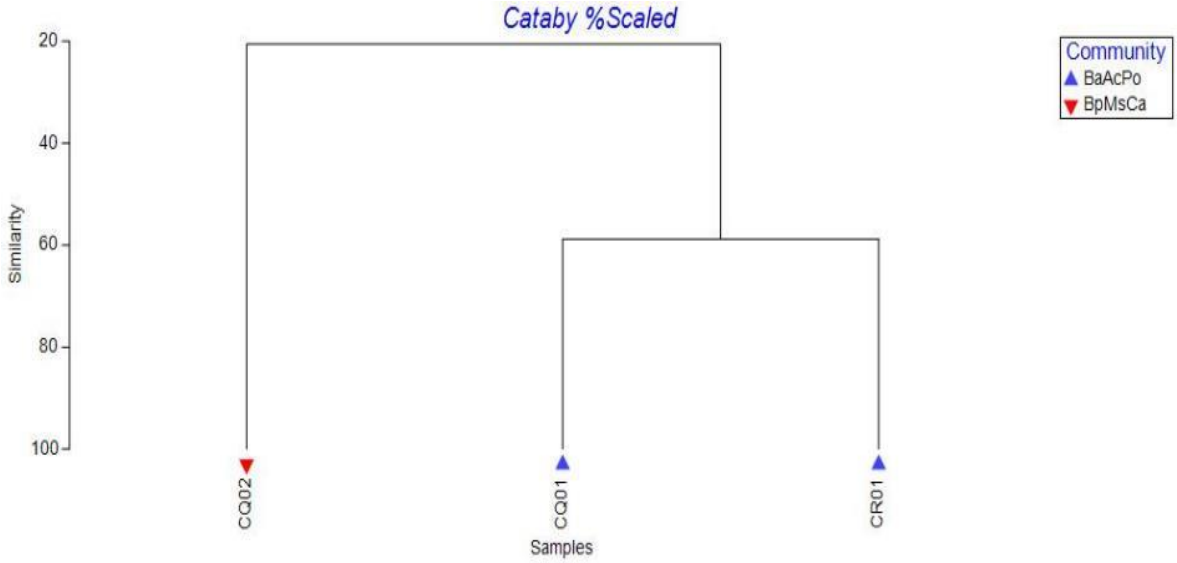


Plate 16 Floristic similarity (Bray Curtis Index) of all Cataby sites using scaled foliage cover

Table 30 Cataby vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation Communities		
BaAcPo Banksia Woodland *Banksia attenuata, Banksia menziesii* and *Eucalyptus todtiana* low woodland, over *Adenanthos cygnorum* subsp. *cygnorum*, *Conostephium magnum* and *Hibbertia subvaginata* tall to low shrubland, over *Patersonia occidentalis* var. *occidentalis*, *Anarthria laevis* and *Dasypogon obliquifolius* low sparse herbland. Sections of this community that are on the Swan Coastal Plain IBRA region represents Banksia Woodland TEC. Recorded on sandy soils. Two sample sites were completed in this community supplemented by existing mapping (AECOM, 2022b).	Survey effort: CQ01, CR01 Species richness: 45 species Condition: Degraded to Excellent Extent: 5.44 ha	
BpMsCa Banksia Woodland *Bankia prionotes*, *Banksia menziesii* and *Eucalyptus todtiana* low open woodland, over *Melaleuca seriata*, *Eremaea asterocarpa* subsp. *asterocarpa* and *Conospermum stoechadis* mid closed shrubland, over *Conostylis angustifolia*, *Drosera erythrorhiza* and *Laxmannia sessiliflora* subsp. *drummondii l*ow sparse herbland. Sections of this community that are on the Swan Coastal Plain IBRA region represents Banksia Woodland TEC. Recorded on sandy soils. One quadrat completed to capture “slither” of community within the linear corridor.	Survey effort: CQ02 Species richness: 21 species Condition: Good to Excellent Extent: 0.87 ha	

7.2 Significant Vegetation

The Banksia Woodlands TEC was recognised as likely to occur based on the desktop assessment. The TEC occurrence was verified during the field survey, represented in Patch 1 and mapped for 5.19 ha (Figure 8). It is synonymous with the State listed Priority 3 ecological community Banksia Dominated Woodlands of the Swan Coastal Plain. Patch 1 is represented by CQ01, CQ02 and CR01 and meets the key diagnostic characteristics, condition and size thresholds outlined in the conservation advice (DEE, 2016). The comprehensive patch assessment is presented in Table 31.

The Banksia Woodlands TEC extent incorporated all woodlands present on the Swan Coastal Plain IBRA region. The conservation advice does not include Geraldton Sandplains as potentially supporting the TEC, therefore woodlands present in the survey area that are situated across the Geraldton Sandplains were excluded from TEC calculations.

Table 31 Cataby Patch 1 assessment

<table>
<tr><td>Patch identification and location</td><td>Patch–1 – north and south of Cooljarloo Access Road. It is represented by CQ01, CQ02 and CR01.</td></tr>
<tr><td>Key characteristics</td><td>Yes, as below.</td></tr>
<tr><td>Location</td><td>Yes, on the Swan Coastal Plain.</td></tr>
<tr><td>Soils and landform</td><td>Yes, on the Bassendean System.</td></tr>
<tr><td>Structure</td><td>Yes, includes and overstorey of Banksia attenuata, Banksia prionotes and Banksia menziesii as a low woodland to low open woodland.</td></tr>
<tr><td>Composition</td><td>Yes, overstorey of B. attenuata, B. prionotes and B. menziesii over shrubs and herbs.</td></tr>
<tr><td>Condition</td><td>55 species, of which three are introduced species, weed cover ranging from 0-1%. Condition is considered Excellent as per the Conservation Advice.</td></tr>
<tr><td>Soil type and colour</td><td>Grey-white, yellow-white sand.</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain.</td></tr>
<tr><td>Tree Data incl. height, canopy percent cover and dominance</td><td>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">CQ01</th><th colspan="2">CQ02</th><th colspan="2">CR01</th></tr>
<tr><th>Height (cm)</th><th>Cover (%)</th><th>Height (cm)</th><th>Cover (%)</th><th>Height (cm)</th><th>Cover (%)</th></tr>
<tr><td>B. attenuata</td><td>350</td><td>15</td><td></td><td></td><td>250</td><td>30</td></tr>
<tr><td>B. menziesii</td><td>300</td><td>5</td><td>80</td><td>2</td><td>200</td><td>5</td></tr>
<tr><td>B. ilicifolia</td><td>-</td><td>-</td><td></td><td></td><td>500</td><td>1</td></tr>
<tr><td>B. prionotes</td><td></td><td></td><td>500</td><td>12</td><td></td><td></td></tr>
<tr><td>Eucalyptus todtiana</td><td>350</td><td>3</td><td>300</td><td>2</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>
<table>
<tr><th>Species</th><th>CQ01</th><th>CQ02</th><th>CR01</th></tr>
<tr><td>Cover (%)</td><td>55.7</td><td>105</td><td>73.4</td></tr>
<tr><td>Diversity total</td><td>28</td><td>20</td><td>30</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CQ01</th><th>CQ02</th><th>CR01</th></tr>
<tr><td>Cover (%)</td><td>3</td><td>1</td><td>0</td></tr>
<tr><td>Dominant species</td><td>*Ursinia anthemoides</td><td>*Hypochaeris glabra</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>Size of patch</td><td>Within the Cataby survey area: 5.19 ha
Estimated total extent: >100 ha.
The patch represents a large area of Banksia woodland that extends south, east and north-west.</td></tr>
</table>

Variety within patch	The patch includes variation in the dominant Banksia species, with 0.84 ha represented by a *Banksia prionotes* open woodland, and 4.35 ha a *Banksia attenuata* woodland. Condition of the patch varies from Degraded to Excellent, with pockets of historical clearing and weed invasion reducing condition.
Summary	The patch meets the condition and size thresholds to be considered representative of the Commonwealth listed TEC.
Photograph	

7.3 Vegetation Condition

Native vegetation was mapped for 6.31 ha, representing 82% of the Cataby survey area and excludes areas mapped as cleared. Vegetation condition varied from Degraded to Excellent. The major contributing factors causing degradation include partial clearing and weed invasion. Weed invasion has displaced native understorey species which has led to vegetation degradation. Areas devoid of vegetation were mapped as cleared.

Vegetation condition is mapped on Figure 8 and the extent of each category is presented in Table 32.

Table 32 Cataby vegetation condition extent

Condition Rating (Keighery, 1994)	Extent (ha)	Percent of Total Area (%)
Excellent	4.08	53
Very Good	0.55	7
Good	1.03	13
Degraded	0.66	9
Cleared	1.37	18
Total	**7.69**	

7.4 Significant Flora

No Threatened flora listed under the EPBC Act or the BC Act were recorded during the survey. Three Priority flora species were recorded (Table 22) and are discussed below. All Priority flora locations for the Cataby survey area are presented on Figure 8.

Table 33 Priority flora recorded in the Cataby survey area

Species	Cons. Status	Abundance	Vegetation Community
Conostephium magnum	P4	227	BaAcPo / BpMsCa
Hypolaena robusta	P4	6	BaAcPo
Stylidium hymenocraspedum	P3	26	BaAcPo

Conostephium magnum (P4)

Conostephium magnum is a Priority 4 species that grows on white-grey sands sometimes associated with laterite gravels (WAH, 1998-) (Plate 17). A sample was collected in the field and confirmed by the WAH to represent the Priority species (FdW230921-27, ACC/10425/E). The species was observed from 80 locations, representing 227 individuals within the Cataby survey area (Figure 8).

Plate 17 *Conostephium magnum* (P4) recorded in the Cataby survey area, flower and leaf morphology (left) and habit (right)

Hypolaena robusta (P4)

Hypolaena robusta is a dioecious rhizomatous perennial herb that grows on white sand on sandplains (WAH, 1998-). The species is listed as Priority 4 by DBCA. One sample was collected and sent to the WAH for verification (FdW230921-28, ACC/10717/E). The species was confirmed to occur at one location within the BaAcPo community, representing six individuals (Plate 18).

Plate 18 *Hypolaena robusta* (P4) recorded in the Cataby survey area

***Stylidium hymenocraspedum* (P3)**

Stylidium hymenocraspedum is a rosetted perennial herb that grows on sand over laterite (WAH,1998-). The species is listed as Priority 3 by DBCA. One sample was collected and sent to the WAH for verification (FdW230921-29, ACC/10425/E). The species was confirmed to occur across nine locations, representing 26 individuals within the Cataby survey area (Figure 8).

Plate 19 ***Stylidium hymenocraspedum* (P3) recorded in the Cataby survey area, flower morphology (left) and habit (right)**

7.5 Flora Inventory

A total of 55 flora species from 22 families were confidently identified to species level. An additional six species were denoted with a "?" or "sp." due to insufficient material for identification. The total includes 51 (94%) locally native species and three (6%) introduced or naturalised weed species.

Families with the highest representation are Proteaceae (11 native taxa), Myrtaceae (8 native taxa), and Fabaceae (7 native taxa). The comprehensive list of vascular flora species recorded, organised by family and the community they occur in is presented in Appendix D. Quantitative data recorded from individual samples sites is presented in Appendix D.

7.6 Fauna Species

7.6.1 Conservation Significant Fauna Species

Two species of conservation significance were recorded including the Carnaby's Cockatoo (listed Endangered under the EPBC Act & BC Act) and the Black-faced Cuckoo-shrike (Listed as Marine under the EPBC Act). Three Carnaby's Cockatoo were seen flying over the Cataby survey area. The Black-faced Cuckoo-shrike was seen and heard. As a marine listed species, the conservation significance is only relevant on Commonwealth land. Marine have not been included into the desktop assessment.

Based on the desktop assessment and the field survey, the following conservation significant fauna species are considered to have the potential to utilise the fauna habitats within the Cataby survey area:

- Carnaby's Cockatoo (*Zanda latirostris*) Endangered under the EPBC Act and BC Act
- Land Snail (*Bothriembryon perobesus*) Priority 1

- Quenda (*Isoodon fusciventer*) Priority 4
- Western Brush Wallaby (*Notamacropus irma*) Priority 4

7.6.2 Fauna Inventory

Fifteen fauna species were recorded during the field survey (Table 34). This included 11 birds, three mammals and one reptile.

Table 34 Cataby Fauna Species recorded within the survey area.

Class	Common Name	Taxon Name	Observation
Reptile	Burton's Legless Lizard	*Lialis burtonis*	Seen
Mammal	Western Grey Kangaroo	*Macropus fuliginosus melanops*	Seen
	European Rabbit	*Oryctolagus cuniculus*	Seen
	Cat	*Felis catus*	Other – Tracks
Bird	Red Wattlebird	*Anthochaera carunculata*	Seen and heard
	Australian Ringneck Parrot	*Barnardius zonarius*	Seen and heard
	Grey Shrike Thrush	*Colluricincla harmonica*	Seen and heard
	Black-faced Cuckoo-shrike (Marine – EPBC)	*Coracina novaehollandiae*	Seen and heard
	Australian Raven	*Corvus coronoides*	Seen and heard
	Brown Falcon	*Falco berigora*	Seen
	Welcome Swallow	*Hirundo neoxena*	Seen
	Brown Honeyeater	*Lichmera indistincta*	Seen and heard
	White-fronted Honeyeater	*Purnella albifrons*	Seen and heard
	Willie Wagtail	*Rhipidura leucophrys*	Seen and heard
	Carnaby's Cockatoo (Endangered – EPBC and BC Act)	*Zanda latirostris*	Seen and heard

7.7 Fauna Habitat

One native fauna habitat type was defined and mapped for the Cataby survey area based on the results of the field assessment. (Table 35). The remaining area was denoted as Cleared, covering 1.37 ha.

Table 35 Cataby fauna habitat

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Banksia Woodland (6.31 ha, 82%)	Tall open *Banksia sp*. woodlands over low mixed native shrubland and sparse herbland. Consisting of mainly of *Banksia attenuata, Bankia prionotes, Banksia menziesii* and *Eucalyptus todtiana.* Bare ground uncommon with abundant fine and coarse leaf litter. Fallen *Banksia sp*. common but no hollowed logs present. Soils were sandy white and yellow.	Potential habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary foraging. • Land Snail (*Bothriembryon perobesus*) DBCA P1 • Quenda (*Isoodon fusciventer*) DBCA P4 • Western Brush Wallaby *(Notamacropus irma)* DBCA P4	

7.8 Targeted Black Cockatoo Survey

7.8.1 Foraging

A combination of the DAWE (2022) foraging scoring tool and the Bamford (2020) foraging methodology was implemented for the black cockatoo assessments. The DAWE foraging habitat assessment resulted in a score of 7 (Table 36).

Table 36 Cataby Black Cockatoo foraging habitat assessment (DAWE, 2022).

Starting score		**Carnaby's Cockatoo (*Zanda latirostris*)**	
10		**Start at a score of 10** if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp., *Hakea* spp. And *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	
Attribute	**Sub-tractions**	**Context adjustor (attributes reducing functionality of foraging habitat).**	
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☒
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☒
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. Or Marri canker) and the disease is affecting more than 50% of the preferred food plants present	☐
Total score		**7**	

The refined foraging habitat value considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The following factors influenced the results:

- The Cataby survey area is situated across a confirmed Carnaby's Cockatoo breeding area (DBCA, 2023c)
- There are substantial areas of suitable foraging habitat adjacent to the Cataby survey area. Native vegetation within the Cataby survey area represents less than 0.1% of the available foraging habitat within a 15 km radius.
- Vegetation present is a woodland with an overstorey dominated by key foraging species (*B. attenuata* and *B. menziesii*) 20-24% projected foliage cover.

The Banksia Woodland fauna habitat scored a '5' according to the Bamford (2020) scoring tool. Table 37 presents the refined foraging habitat value for each fauna habitat type present in the Cataby survey area. Black cockatoo foraging was mapped as 'Moderate' quality for 6.31 ha (Table 38).

Table 37 Cataby refined foraging score calculation (Bamford, 2020)

Fauna Habitat	Carnaby's Cockatoo			Foraging Score
	Site condition	Context	Stocking Rate	
Banksia Woodland	4	0	1	5
Cleared	0	0	0	0

Table 38 Cataby foraging habitat extent

Foraging Habitat Score	Extent (ha)	Percent of Total Area (%)
0 None	1.37	18
5 Moderate	6.31	82
Total	**7.69**	**100%**

7.8.2 Breeding

The Cataby survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris*). There were six potential nesting trees with a suitable DBH (>500 mm) recorded, all of which were *Eucalyptus todtiana*.

7.8.3 Roosting

No known roosting sites were observed within the Cataby survey area. Vegetation present predominately represented Banksia woodland with scattered *Eucalyptus todtiana* to a height of 3.5 m. Vegetation is unlikely to provide roosting habitat. The closest buffered roost area from Birdlife data provided by DBCA is 38 km south of the survey area.

7.9 Discussion

7.9.1 Flora and Vegetation

Two intact native vegetation communities were mapped for 6.31 ha (82%). These communities represented Banksia woodlands dominated by *Banksia attenuata* (BaAcPo) and *Banksia prionotes* (BpMsCa). Vegetation condition was predominately Excellent, with the percent total weed cover varying from 0-1%. Condition reduced in areas that were subjected to partial clearing within the powerline corridor and associated infrastructure.

The Banksia Woodlands TEC listed as Endangered under the EPBC Act was anticipated to occur. The TEC was verified through quadrat and relevé data and assessing the patches against the key diagnostic characteristics defined in the approved conservation advice (DEE, 2016). Patch 1 was defined using aerial imagery to determine its connectivity to other native vegetation. The patch was confirmed to represent the federally protected community and mapped for 5.19 ha. The vegetation within the Cataby survey area represents a linkage between a larger area of remnant native vegetation from southeast to northwest. This TEC is synonymous with the DBCA listed Priority 3 ecological community.

The TEC extent ends on the boundary of the Swan Coastal Plain and Geraldton Sandplains IBRA regions. The approved conservation advice (DEE, 2016) states that "the Banksia Woodlands ecological community primarily occurs in the Swan Coastal Plain IBRA region" and also "extend[s] into the adjacent lower parts of the Darling and Whicher escarpments that lie within the Jarrah Forest IBRA bioregion." As the conservation advice makes no mention of the TEC occurring on the Geraldton Sandplains, it has been excluded from the TEC mapping from this report. FCT analysis was not completed for the Cataby Project. The Gibson data and Keighery data focus on areas south of Seabird, with the nearest quadrat 38. 5 km south of the survey area. Results would likely have low similarity and/or be uninterpretable.

Flora diversity was considered average, with a total of 55 flora species confidently identified to species level within 7.68 ha. An average of 27 species were recorded in each sample site. Other surveys nearby recorded 117 vascular plant taxa from 35 families across 15,360 ha area (Ecologia, 2017), and 202 native flora species from 115.73 ha (AECOM, 2022).

Three significant flora species were recorded throughout the survey area. These species are discussed below.

Conostephium magnum is a Priority 3 species that grows on white-grey sands, sometimes associated with laterite gravels (WAH, 1998-) and was considered likely to occur. There is a WAH database record 20 m from the survey area, however no verified populations occur within a 50 km radius. Within the survey area 227 individuals were recorded. It was considered locally common, particularly adjacent to disturbed areas. The species tended to grow in small groups, however their proximity means they are likely from the same population.

Hypolaena robusta is a Priority 4 species that grows on white sand and sandplains (WAH, 1998-). The species was known to occur, with a WAH record present within the survey area (WAH, 2023). Six individuals were recorded in the BaAcPo community 54 m south of the known record, and therefore likely represent the same population.

Stylidium hymenocraspedum is a Priority 3 species that grows in Heath and Banksia and Eucalyptus low open woodland (WAH, 1998-). The species was considered likely to occur, with a WAH record 55 m from the survey area. However, no verified populations occur within 50 km. A total of 26 individuals were recorded in the BaAcPo vegetation community and likely represent the same population as the WAH record.

The vegetation within the survey area was homogenous with adjacent vegetation. It is likely that all significant flora species occur outside the survey area.

Sufficient survey effort was achieved, with all areas of remnant native vegetation subject to targeted searches. All species considered to have a high likelihood of occurrence that represent a perennial species, and were not recorded during the survey, have been downgraded to a low likelihood of occurrence post-survey, with the exception of two *Poranthera* species.

The Priority 3 *Poranthera moorokatta* is an inconspicuous annual herb. This species was described in 2012 at which time it was known from two locations; Kings Park and Ellenbrook. In Kings Park it was recorded on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high leaf litter cover (Barret, 2012). In Ellenbrook it was recorded in a shallow dampland on mixed grey white sand with scattered leaf litter (Barret, 2012). There are two records within 5 km of the survey area, dated 2021. They are both from rehabilitated areas on open white sand. There are no records in intact native vegetation within 50 km of the survey area. This species has therefore been reduced to having a 'moderate' likelihood.

Poranthera asybosca (P1) is known from one record within 50 km recorded in Wongonderrah Nature Reserve in 2021. It is known only from a small area between Badgingarra and Eneabba in open kwongan shrubland on white sand over laterite (Barrett, 2015). No kwongan shrubland was mapped therefore the likelihood was reduced to low.

Table 39 Summary of Cataby likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	1	13	68	34	17	140
Post-survey	3	0	1	85	51	140

7.9.2 Fauna

Fifteen fauna species were recorded during the field survey. This included eleven birds, two mammals and one reptile. Two species of conservation significance were recorded including Carnaby's Cockatoo (listed Endangered under the EPBC Act & BC Act) and the Black-faced Cuckoo-shrike (Listed as Marine under the EPBC Act). Three Carnaby's Cockatoo were seen flying over the Cataby survey area. The Black-faced Cuckoo-shrike was seen and heard.

One native Banksia Woodland was defined and mapped. This fauna habitat is typical of the region and was observed extensively in adjacent vegetation along Brand Highway and the mine access road. The fauna habitat within the survey area is well connected to this adjacent habitat, with the exception of a parcel that is fenced south of the mine access road for Western Power utilities.

The Banksia Woodlands habitat represents potential habitat for the Carnaby's Cockatoo (*Zanda latirostris*) (discussed separately), the Land Snail (*Bothriembryon perobesus*), Quenda (*Isoodon fusciventer*) and the Western Brush Wallaby (*Notamacropus irma*).

Three fauna species that were considered to have a 'High' likelihood were reduced to 'Low' due to the absence of suitable foraging habitat identified in the survey area. These species include the Malleefowl (*Leipoa ocellata*), Graceful Sun Moth (*Synemon gratiosa*) and Jewelled southwest Ctenotus (*Ctenotus gemmule*).

Details of all these species and their associated habitats is presented in Table 40. Carnaby's Cockatoo is discussed further in Section 7.9.3.

Table 40 Cataby fauna habitat utilisation for significant fauna species

Species	Habitat	Number of DBCA Records and Distance	Pre-survey Likelihood	Post-survey Likelihood	Discussion
Fauna species likely to utilise fauna habitat within the Cataby survey area					
Quenda (*Isoodon fusciventer*) WA P4	This species prefers low woodland assemblages where adequate food and refuge is available (Van Dyck & Strahan, 2008).	There are 11 records on the DBCA database, the closest record is 31 km away and represents a translocated population. The most recent record is 2014. There are no records of this species within the same remnant native vegetation that is adjacent to the survey area.	High	Moderate	The Banksia Woodland identified within the survey area aligns with this preference. The species has the potential to reside within the survey area and is therefore likely to utilise the native fauna habitat.
Western Brush Wallaby (*Notamacropus irma*). WA P4	The Western Brush Wallaby (is relatively understudied to-date (Wayne et al., 2021). Macropods, such as the *N. irma*, typically rest in sheltered areas under trees, in tall grass, or in rocky outcrops. This species has been known to occupy open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	There are 16 records of *N. irma* from within 50 km, the closest being 1.49 km. Records are dated as recent as 2017.	High	High	Records are from the same contiguous vegetation as present in the survey area. No evidence of *N. irma* was recorded however it was sighted outside the survey area during mobilisation to site. This species is likely to utilise the Banksia Woodland habitat is likely to be utilised *N. irma* for transient foraging and temporary resting.
Land Snail (*Bothriembryon perobesus*), WA P1	*Bothriembryon perobesus* ais an SRE with a known linear range of more than 100 km, extending up to 50 km inland from the coast) (Bennelongia, 2013). This species utilises a wide range of habitats including rocky terrain, woodlands, gorges and gullies and coastal shrub/heath (Whisson and Ryan, 2019). This species has been known to inhabit stabilised sand dunes, Low Banksia woodland and Hakea shrublands/dryandra heath amongst other habitats (Bennelongia, 2013).	One record from within 50 km from 2012 located 6 km from survey area. This is within the same area of remnant native vegetation that is connected to the survey area.	High	High	The survey area is within the range for this with a known occurrence nearby. The survey could have overlooked the presence of this species, and suitable habitat is present (low Banksia woodland).

Species	Habitat	Number of DBCA Records and Distance	Pre-survey Likelihood	Post-survey Likelihood	Discussion
Fauna species unlikely to utilise fauna habitat within the Cataby survey area					
Malleefowl(*Leipoa ocellata*) EPBC V WA VU	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	There are 7 records within 50 km. The closest record is 27 km from 1976. Recent records were in 2012 located 29 km from the survey area.	High	Low	This species' current known range, the age and location of records and lack of suitable habitat within the survey area suggest that there is a low possibly that this species will intermittently forage within the survey area.
Graceful Sun Moth (*Synemon gratiosa)* WA P4	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). 2. *Banksia woodland* on Spearwood and Bassendean dunes, where the known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	44 records have been made within 50 km of the survey area. The closest, most recent records were 25 km away (2010) at Wanagarran Nature Reserve	High	Low	No known host species (*L. hermaphrodita)* was recorded within habitat of the survey area. There is a low possibly that this species will occur within the survey area.
Jewelled southwest Ctenotus (*Ctenotus gemmula*) Swan Coastal Plain subpop. WA P3	This species has been found amongst heath on coastal dunes, and in open woodland on the Swan Coastal Plain. It is generally restricted to areas with limestone (Wilson & Swan, 2013.	There is one record of the species in 2012, that was made 5.9 km away from the survey area.	High	Low	Due to the lack of suitable habitat, there is a low possibly that this species will occur within the survey area.

7.9.3 Black Cockatoo Assessment

The Cataby survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris)*. There were six potential nesting trees with a suitable DBH (>500 mm) recorded, all of which were *Eucalyptus todtiana*.

Three Carnaby's Cockatoo's were observed flying over the survey area. No foraging evidence was recorded.

The Banksia Woodland fauna habitat was dominated by suitable foraging species *Banksia attenuata, B. menziesii* and *B. prionotes.* The survey area foraging score was rated as 7 "high-quality native foraging habitat" for Carnaby's Cockatoo accordance with the DAWE (2020) scoring tool (Table 36). This score was reduced due to the lack of foraging evidence observed.

The BCE (2020) refined foraging habitat value considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The Banksia Woodland fauna habitat scored a 5 with site condition scored as 4 and stocking rate as 1.

8.0 Regans Results and Discussion

8.1 Vegetation Communities

Three native vegetation communities were defined and mapped, two of which represent Banksia woodlands, the other representing remnant trees over paddock. Two non-native vegetation communities were observed, these include:

- planted – olive plantation
- paddock - common pasture weeds, with occasional native species

Cleared areas, devoid of any vegetation, was mapped for 3.08 ha.

The vegetation mapping was supported by running similarity analysis of floristic data using the Bray-Curtis similarity index on presence/absence data (Plate 20) and scaled foliage cover data (Plate 21).Vegetation community descriptions are presented in Table 41 and mapped on Figure 8.

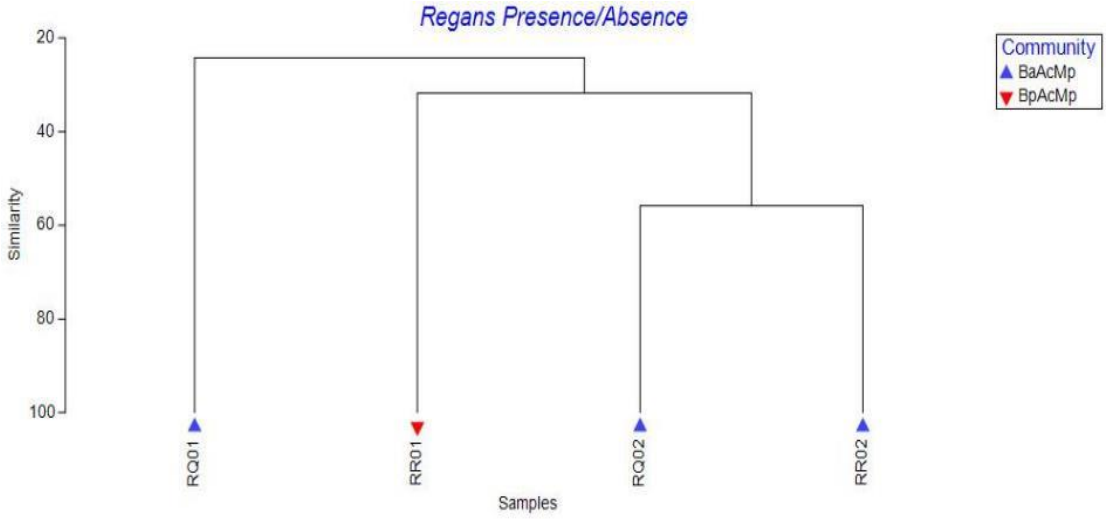


Plate 20 Floristic similarity (Bray Curtis Index) of all Regans sites using presence absence

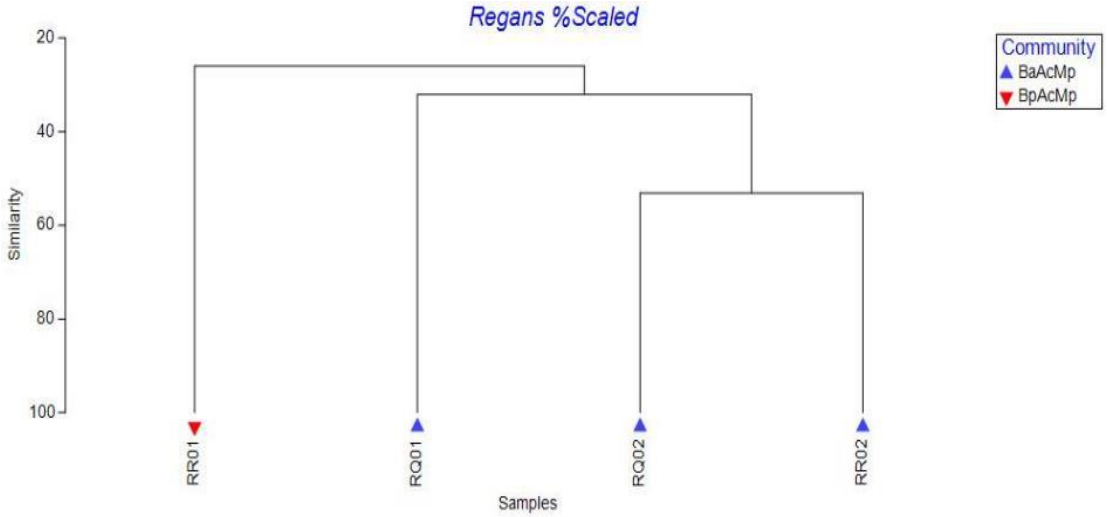


Plate 21 Floristic similarity (Bray Curtis Index) of all Regans sites using scaled foliage cover

Table 41 Regans vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation Communities		
BaAcMp *Banksia* Woodland *Banksia attenuata*, *Banksia menziesii* and *Nuytsia floribunda* low woodland, over *Adenanthos cygnorum* subsp. *cygnorum*, *Lechenaultia floribunda*, and *Allocasuarina humilis* tall to low shrubland, over *Mesomelaena pseudostygia*, **Ehrharta calycina* and *Lyginia excelsa* tall to low forbland. Represents Banksia Woodlands TEC. Recorded on sandy soils.	Survey effort: RQ01, RQ02, RR02 Species richness: 71 species Condition: Completely Degraded to Very Good Extent: 3.86 ha	
BpAcMp *Banksia* Woodland *Banksia prionotes* and *Eucalyptus todtiana* low woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Jacksonia floribunda* and *Scholtzia involucrata* tall to low shrubland, over *Mesomelaena pseudostygia*, *Caustis dioica* and *Patersonia occidentalis* var. *occidentalis* low sparse forbland. Represents Banksia Woodlands TEC. Recorded on sandy soils. One quadrat completed to capture “slither” of community.	Survey effort: RR01 Species richness: 23 species Condition: Degraded to Good Extent: 1.25 ha	

Description	Additional Details	Photograph
Trees Remnant native trees over paddock weeds.	Extent: 0.05 ha Condition: Completely Degraded	
Non-native Vegetation Communities		
Planted Planted non-native trees.	Extent: 1.91 ha	
Paddock Largely comprised of common pasture weeds.	Extent: 0.74 ha	No photo available.

8.2 Significant Vegetation

One patch of the Banksia Woodlands TEC was recorded for 4.60 ha (Figure 8). The patch is represented by RQ01, RQ02, RR01 and RR02 and meets all the key diagnostic characteristics, condition and size thresholds outlined in the conservation advice (DEE, 2016). The comprehensive patch assessment is presented in Table 42.

Table 42 Regans Patch 1 assessment

<table>
<tr><td>Patch identification and location</td><td>Patch 1 – west of Brand Highway. It is represented by RQ01, RQ02, RR01, and RR02.</td></tr>
<tr><td>Key characteristics</td><td>Yes, as below.</td></tr>
<tr><td>Location</td><td>Yes, on the Swan Coastal Plain.</td></tr>
<tr><td>Soils and landform</td><td>Yes, predominantly on the Bassendean System</td></tr>
<tr><td>Structure</td><td>Yes, includes and overstorey of Banksia attenuata and Banksia menziesii as a low open woodland.</td></tr>
<tr><td>Composition</td><td>Yes, overstorey of B. attenuata, B. menziesii and B. prionotes over shrubs, herbs and grasses.</td></tr>
<tr><td>Condition</td><td>75 species, of which 12 are introduced with weed cover ranging from 0.2-5.7%. Condition is considered Very Good as per the Conservation Advice.</td></tr>
<tr><td>Soil type and colour</td><td>Yellow/grey/white sand.</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain.</td></tr>
<tr><td>Tree Data incl. height, canopy percent cover and dominance</td><td>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">RQ01</th><th colspan="2">RQ02</th><th colspan="2">RR01</th><th colspan="2">RR02</th></tr>
<tr><th>Height (cm)</th><th>Cover (%)</th><th>Height (cm)</th><th>Cover (%)</th><th>Height (cm)</th><th>Cover (%)</th><th>Height (cm)</th><th>Cover (%)</th></tr>
<tr><td>B. attenuata</td><td>350</td><td>20</td><td>350</td><td>15</td><td>-</td><td>-</td><td>200</td><td>10</td></tr>
<tr><td>B. menziesii</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>180</td><td>3</td></tr>
<tr><td>B. prionotes</td><td>-</td><td>-</td><td>-</td><td>-</td><td>500</td><td>25</td><td>-</td><td>-</td></tr>
<tr><td>Eucalyptus todtiana</td><td>-</td><td>-</td><td>-</td><td>-</td><td>400</td><td>2</td><td>1000</td><td>5</td></tr>
<tr><td>Nuytsia floribunda</td><td>-</td><td>-</td><td>650</td><td>8</td><td>-</td><td>-</td><td>650</td><td>7</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>
<table>
<tr><th>Species</th><th>RQ01</th><th>RQ02</th><th>RR01</th><th>R02</th></tr>
<tr><td>Cover (%)</td><td>35</td><td>68</td><td>59</td><td>34</td></tr>
<tr><td>Diversity total</td><td>12</td><td>20</td><td>18</td><td>40</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>Q1</th><th>Q02</th><th>R01</th><th>R02</th></tr>
<tr><td>Cover (%)</td><td>5.7</td><td>2.8</td><td>0.2</td><td>5.4</td></tr>
<tr><td>Dominant species</td><td>*Ehrharta calycina</td><td>*Ehrharta calycina</td><td>*Briza maxima, *Gladiolus caryophyllaceus</td><td>*Ehrharta calycina</td></tr>
</table>
</td></tr>
<tr><td>Size of patch</td><td>Within the Regans survey area: 4.6 ha
Estimated total extent: >100 ha</td></tr>
<tr><td>Variety within patch</td><td>Dominant overstorey Banksia species varies within the patch. 1.25 ha represents Banksia prionotes open woodland, and 3.34 ha represents Banksia attenuata woodland. Condition of the patch includes Degraded vegetation where weed invasion has reduced condition.</td></tr>
</table>

Summary	The patch meets the condition and size thresholds to be considered representative of the Commonwealth listed TEC.
Photograph	

Three PECs were recognised as potentially occurring:

- SCP 23b Swan Coastal Plain *Banksia attenuata - Banksia menziesii* woodlands (Banksia Woodlands TEC).
- SCP 22 *Banksia ilicifolia* woodlands (a component of the Banksia Woodlands TEC)
- Banksia Dominated Woodlands of the Swan Coastal Plain (synonymous with the Banksia Woodlands TEC where other State-listed TECs or PECs were not confirmed)

Identification of these PECs was determined through FCT analysis. The sample site data from the Regans survey area did not align strongly with any FCT using the Gibson (1994) and the Keighery (2012) single-site insertion method.

Table 43 presents the results of the four sample sites and the FCT sites that they are most aligned with, along with a description of the cluster dendrogram results. Multiple FCTs were identified across the four sample sites and the dendrogram results did not always align with the similarity results. FCT S16 showed particularly high similarity to two sample sites (based on the Keighery data). This FCT is described as mixed dense shrublands on yellow brown sands and does not represent a Banksia woodland.

FCT S09 *Banksia attenuata* over dense low shrublands was inferred for three sample sites (RQ01 and RQ02). This FCT is part of super group 3 associated with sites on the Bassendean system. This FCT is known over a range about 90 km from Red Gully to Ellenbrook (TSSC, 2016). No further information is available regarding typical species, species richness or distribution; therefore the inference is with low confidence.

Table 43 Floristic Community Type analysis results

Quadrat	Gibson (1994)				Keighery (2012)				Final Determination
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
RQ01	26	22	MELA-5	Broadly clustering with FCT 22 (super group 3).	42	S16	WN107MNR	Clustering with S16 (super group 3).	**S09 low confidence** FCT 28 excluded due to incorrect landform. FCT 22 excluded as topography is not low-lying. S16 excluded as it does not represent a Banksia woodland. FCT 23a is on the correct landform, has similar species richness (71 species), has nine of the 19 typical species present, however is distributed from Bullsbrook south.
	24	23a	WHITE-1		37	S09	BW02		
	23	23a	YULE-1		36	28	moore02		
RQ02	26	22	MELA-5	Broadly clustering with FCT 22 (super group 3).	42	S16	WN107MNR	Clustering with S16 (super group 3).	**S09 low confidence** FCT 28 excluded due to incorrect landform. FCT 22 excluded as topography is not low-lying. S16 excluded as it does not represent a Banksia woodland. FCT 23a is on the correct landform, has similar species richness (71 species), has nine of the 19 typical species present, however is distributed from Bullsbrook south.
	24	23a	WHITE-1		37	S09	BW02		
	23	23a	YULE-1		36	28	moore02		
RR01	29	23b	ELDO-1	Broadly clustering with FCT 3b, FCT 3a and FCT 21a (super group 1 and 3)..	38	S09	BNR20	Broadly clustering with S09 and 23b (super group 3).	**Inconclusive** FCT 21c excluded due to incorrect distribution (Gingin south). FCT 23a, 23b, S09 excluded for incorrect dominant species (RR01 is a *Banksia prionotes* woodland).
	29	21c	low07		33	23b	MR09		
	28	23a	WAND-1		33	23b	ELE03		
RR02	38	23a	hurst03	Broadly clustering with FCT 3b, FCT 3a and FCT 21a (super group 1 and 3).	37	23a	Light02	Clustering with FCT 23c and FCT 28 (super group 3 and 4).	**Inconclusive** FCT 28 excluded due to incorrect landform. FCT 23a is on the correct landform, has similar species richness (71 species), has nine of nine of the 19 typical species present, however is distributed from Bullsbrook south.
	37	28	SHENT-1		37	28	SHENT-1		
	37	28	WABL-4		37	23a	hurst03		

8.3 Vegetation Condition

Native vegetation was mapped for 5.16 ha, representing 47% of the Regans survey area and excludes areas mapped as cleared. Vegetation condition varied from Completely Degraded to Very Good. Native vegetation was largely Degraded, followed by Very Good and Good. The degradation is a result of weed invasion displacing native vegetation.

Completely Degraded vegetation represented the Trees community, where stands of native trees occurred over paddock weeds. Non-native vegetation communities and areas devoid of vegetation were mapped as cleared.

Vegetation condition is mapped on Figure 8 and the extent of each category is presented in Table 44.

Table 44 Regans vegetation condition extent

Condition Rating (Keighery, 1994)	Extent (ha)	Percent of Total Area (%)
Very Good	1.30	11.9
Good	0.47	4.3
Degraded	3.14	28.9
Completely Degraded	0.25	2.3
Cleared	5.73	52.6
Total	**10.89**	**100**

8.4 Significant Flora

One significant flora species, *Lyginia excelsa* (P2) was recorded in the Regans survey area. This species is listed by DBCA as Priority 2. *L. excelsa* was recorded from one location (RQ01) where it was a dominant understorey species in community BaAcMp, representing 7% cover within the quadrat. A sample was collected (CS230922-8) and verified by Mike Hislope as representing the Priority species (ACC/10717/E). The species was not identified as the Priority species in the field and therefore no photos in-situ are available.

Plate 22 *Lyginia excelsa* (P2) habitat

8.5 Flora Inventory

A total of 76 flora species from 34 families were confidently identified to species level. An additional four species were denoted with a “?” or “sp.” due to insufficient material for identification. The total includes 64 (84%) locally native species and 12 (16%) introduced or naturalised weed species.

Families with the highest representation are Fabaceae (10 taxa; nine native, and one introduced), Asteraceae (six taxa; three native, and three introduced), and Poaceae (six taxa; one native, and five introduced).

The comprehensive list of vascular flora species recorded, organised by family and the community they occur in is presented in Appendix D. Quantitative data recorded from individual samples sites is presented in Appendix E.

8.6 Fauna Species

8.6.1 Conservation Significant Fauna Species

One species of conservation significance were identified during the survey. Foraging evidence of the Carnaby's Cockatoo *(Zanda latirostris)* was recorded in the 'Trees over Cleared' habitat.

Based on the desktop assessment and the field survey, the following conservation significant fauna species are considered to have the potential to utilise the habitats within the Regans survey area:

- Carnaby's Cockatoo (*Zanda latirostris)* Endangered under the EPBC Act and BC Act
- Quenda (*Isoodon fusciventer)* Priority 4
- Western Brush Wallaby (*Notamacropus irma*) Priority 4
- The Land Snail *(Bothriembryon perobesus)* Priority 1
- Woolybush Bee (*Hylaeus globuliferus)* Priority 3
- Swan Coastal Plain shield-backed trapdoor Spider *(Idiosoma sigillatum)* Priority 3
- A Short-tongued Bee *(Leioproctus contrarius)* Priority 3

8.6.2 Fauna Inventory

Thirteen fauna species were recorded during the field survey (Table 45). This included 12 birds and one mammal.

Table 45 Regans fauna species recorded within the Regans survey area

Class	Common Name	Taxon Name	Observation
Bird	Australian Raven	*Corvus coronoides*	Seen and heard
	Australian Ringneck	*Barnardius zonarius*	Seen and heard
	Magpie	*Gymnorhina tibicen*	Seen and heard
	Willie Wagtail	*Rhipidura leucophrys*	Seen and heard
	Welcome Swallow	*Hirundo neoxena*	Seen and heard
	Inland Thornbill	*Acanthiza apicalis*	Seen and heard
	Weebill	*Smicrornis brevirostris*	Seen and heard
	Laughing Dove	*Spilopelia senegalensis*	Seen
	Grey Shrike-thrush	*Colluricincla harmonica*	Seen and heard
	Brown Honeyeater	*Lichmera indistincta*	Seen and heard
	Red Wattlebird	*Anthochaera carunculata*	Seen and heard
	Carnaby's Cockatoo (Endangered – EPBC Act and BC Act)	*Zanda latirostris*	Other – Foraging
Mammal	Western Grey Kangaroo	*Macropus fuliginosus*	Seen

8.7 Fauna Habitat

Two native fauna habitats was defined and mapped for the Regans survey area based on the results of the field assessment. (Figure 9). These include:

- Banksia Woodland (5.11 ha, 47%)
- Trees over Cleared (0.05 ha, 0.5%)

One non-native modified community, Agriculture was recorded. Cleared areas represented 3.08 ha. Cleared is representative of tracks, roads and highly modified or degraded vegetation with no biological benefit.

Table 46 Regans fauna habitat

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Conservation Significant Species Potentially Utilising Habitat	Photos
Banksia Woodland (5.11 ha, 47%)	Low open *Banksia sp*. woodlands over mixed native shrubland. Consisting of mainly of *Banksia attenuata, Bankia prionotes, Banksia menziesii* and *Eucalyptus todtiana.* Mid to low native shrubland over herbland. Common fallen banksia trees with high abundance of fine and coarse leaf litter. No hollows or native dens witnessed. Soils were light (yellow and white) and sandy.	Potential habitat for: • Quenda (*Isoodon fusciventer)* DBCA P4 • Western Brush Wallaby (*Notamacropus irma*) DBCA P4 • The Land Snail *(Bothriembryon perobesus)* • Woolybush Bee *(Hylaeus globuliferus)* • Swan Coastal Plain shield-backed trapdoor Spider *(Idiosoma sigillatum)* • A Short-tongued Bee *(Leioproctus contrarius)*	
Trees over Cleared. (0.05 ha, 0.5%)	*Corymbia calophylla* and isolated Eucalyptus over cleared. Grasses and roadside verge weeds common. Notable black cockatoo foraging in high quantities.	Primary foraging habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered	

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Conservation Significant Species Potentially Utilising Habitat	Photos
Agriculture (2.65, 24%)	Agriculture is a combination of habitats primarily used for agricultural purposes. This includes, paddocks, crops, planted vegetation and tree breaks. This habitat contains scattered trees, likely to have value for faunal species.	Secondary exotic foraging habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered	

8.8 Targeted Black Cockatoo Survey

8.8.1 Foraging

A combination of the DAWE (2022) foraging scoring tool and the Bamford (2020) foraging methodology was implemented for the black cockatoo assessments. The DAWE foraging habitat assessment resulted in a score of 10 (Table 47).

Table 47 Regans black cockatoo foraging habitat assessment (DAWE, 2022).

Starting score		**Carnaby's Cockatoo (*Zanda latirostris*)**	
10		**Start at a score of 10** if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp., *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	
Attribute	**Sub-tractions**	**Context adjustor (attributes reducing functionality of foraging habitat).**	
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☐
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☐
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present	☐
Total score		10	

The refined foraging habitat value considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The following factors influenced the results:

- The Regans survey area is situated across a confirmed Carnaby's Cockatoo breeding area (DBCA, 2023c)
- There are substantial areas of suitable foraging habitat adjacent to the survey area. Native vegetation within the survey area represents <0.1% of the available foraging habitat within a 15 km radius.

The native in-tact fauna habitat scored a '4' according to the Bamford (2020) scoring tool (Table 48). Trees over Cleared received a score of 1 as they represent scattered foraging trees. Crops and paddock weeds were recorded to be known secondary foraging for Carnaby's Cockatoo, this had been considered when calculating the foraging score.

Table 48 Regans refined foraging score calculation (Bamford, 2020)

Fauna Habitat	Carnaby's Cockatoo			Foraging Score
	Site condition	Context	Stocking rate	
Banksia Woodlands	4	0	0	4 (Moderate)
Trees over Cleared	1	0	0	1 (Negligible)
Agriculture	2	0	0	2 (Low)
Cleared	0	0	0	None

Table 49 Regans foraging habitat extent

Foraging Habitat Score	Extent (ha)	Percent of Total Area (%)
0 None	3.08	28.3
1 Negligible	0.05	0.5
2 Low	2.65	24.3
5 Moderate	5.11	46.9
Total	**10.89**	**100%**

Foraging evidence was observed under *Corymbia calophylla* trees within the Trees over Cleared fauna habitat (Plate 23).

Plate 23 Carnaby's Cockatoo foraging evidence observed in the Regans survey area

8.8.2 Breeding

A total of 43 potential nesting trees with a suitable DBH (>500 mm) were identified within the Regans survey area. This comprised of 40 *Eucalyptus todtiana* trees, and three *Corymbia calophylla* trees.

8.8.3 Roosting

No known roosting sites were observed within the Regans survey area. Two tall (15-20 m) *Corymbia calophylla* trees along Orange Springs Road are located approximately 500 m south of Moore River and likely provide potential roosting habitat. The closest confirmed roost area from Birdlife data provided by DBCA is 2.2 km north of the survey area, likely tall riparian trees associated with Moore River.

8.9 Discussion

8.9.1 Flora and Vegetation

Two intact vegetation communities were mapped for 5.11 ha (47%) of the Regans survey area. These communities represented Banksia woodlands dominated by *Banksia attenuata* (BaAcMp) and *Banksia prionotes* (BpAcMp). One modified native vegetation community, Trees, was mapped for 0.05 ha and represented stands of native remnant trees over paddock weeds.

Vegetation condition was predominantly Degraded due to the prevalence of weeds (3 to 9% foliage cover) leading to displacement of native vegetation. Degradation was particularly evident where remnant vegetation was adjacent to agricultural paddock (olive plantation).

One patch of Banksia Woodlands TEC was recorded for 4.60 ha. This TEC was anticipated to occur and was verified through quadrat and relevé data and assessing the patch against the key diagnostic characteristics identified in the approved conservation advice (DEE, 2016). Assessment of the patch was initially centred on the area of highest native floristic diversity, with the patch considered Very Good condition as per the conservation advice (DEE, 2016). Condition of the patch did vary, and included areas of Degraded vegetation where weed invasion reduced condition. This patch represents part of a larger contiguous patch that extends for more than 100 ha.

FCT analysis was undertaken to determine the presence of two PECs identified in the desktop assessment. The results were ambiguous, however none of the state-listed PECs were identified during this process. The inability to infer FCTs was not unexpected, as floristics of the Banksia woodlands in the northern portion of the Swan Coastal Plain have not been identified to the same level of detail and floristic community types (DEE, 2016).

Flora diversity was considered high with 76 species confidently identified to species level within a 10.89 ha survey area. An average of 31 species were recorded in each sample site.

Lyginia excelsa is a Priority 2 species that grows on sand in dry heath and Banksia woodland (WAH, 1998-) and had a moderate likelihood of occurring. There are no recent records in the vicinity (closest record from 1995 40 km north of the survey area). The species not recognised as a Priority species in the field and accurate counts of abundance were not obtained. It was one of the dominant understorey species within the BaAcMp community therefore abundance could be assumed to be more than 100 individuals.

A post-survey likelihood was undertaken for significant flora species identified in the desktop study. The likelihoods were revised based on the implementation of systematic targeted searches during the ideal detection period for significant flora species, and their life cycle (perennial vs. annual). All species that had a high likelihood have been downgraded to a low likelihood.

All moderate likelihood of occurrence species were downgraded to low, with the exception of *Comesperma rhadinocarpum* (P3). *C. rhadinocarpum* appears to be a post-fire ephemeral (Keighery, 2002) and therefore may not have been detectable at time of survey. This species has retained their moderate likelihood of occurrence. Table 50 provides a summary of the post-survey likelihoods.

Table 50 Summary of Regans likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	8	47	17	15	87
Post-survey	1	0	1	53	32	87

8.9.2 Fauna

Foraging evidence of the Threatened Carnaby's Cockatoo *(Zanda latirostris)* was recorded in the 'Trees over Cleared' habitat. Thirteen fauna species were recorded during the field survey. This included twelve birds and one mammal species.

The Regans survey area comprises Banksia Woodlands with varying complexity based on disturbance. The survey area represents an edge of a larger patch of remnant native vegetation in better condition. It is separated from adjacent native vegetation by a fence. Towards the western edge of the survey area the condition declines leading to denser paddock weeds on sandy soils and lacking native understorey species.

Targeted searches for indirect evidence of the Western Brush Wallaby and Quenda were undertaken but no evidence was recorded. Despite no evidence, the proximity of records and suitability of habitat, including connectivity of habitat to a large patch of native vegetation presumed to be in Excellent condition, means they remain 'High' as a post-survey likelihood.

The Banksia Woodlands is also considered potential ('High' or 'Moderate') suitable habitat for The Land Snail (*Bothriembryon perobesus*) Priority 1, Woolybush Bee (*Hylaeus globuliferus*) Priority 3, Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) Priority 3 and A Short-tongued Bee (*Leioproctus contrarius*) Priority 3. Details of all these species and their associated habitats is presented in Table 51. Carnaby's Cockatoo is discussed further in Section 8.9.2.1.

Another two species were considered to have a 'High' likelihood of occurring in the desktop study. These have been reduced to Low in the absence of suitable habitat, and lack of recent records in proximity to the survey area and/or the connected patch of remnant native vegetation.

Table 51 Regan fauna habitat utilisation for significant fauna species

Species	Habitat	Number of DBCA Records and Distance	Pre-survey likelihood	Post-survey likelihood	Discussion
Fauna species likely to utilise fauna habitat within the Regans survey area					
Quenda (*Isoodon fusciventer*) WA P4	This species prefers low woodland assemblages where adequate food and refuge is available, such as the Banksia Woodland fauna habitat (Van Dyck & Strahan, 2008). Banksia woodland habitat would then represent potential foraging and core habitat for the Quenda.	4 records within 50 km, the closest is 35 km, the most recent is 2014.	High	Moderate	No evidence of the species was recorded during the survey, this species has the potential to utilise the survey area based on the preferred habitat aligning with the Banksia woodlands. There are no known records in close proximity. Likelihood has been reduced to Moderate.
Western Brush Wallaby *(Notamacropus irma*) WA P4	The Western Brush Wallaby (is relatively understudied to-date (Wayne et al., 2021). Macropods, such as the *N. irma*, typically rest in sheltered areas under trees, in tall grass, or in rocky outcrops.	21 records within 50 km. The closest is 3 km and the most recent was from 2017.	High	High	Records are from the same contiguous vegetation as present in the survey area. The survey area habitat is likely to be utilised for transient foraging and temporary resting.
The Land Snail *(Bothriembryon perobesus)* WA P1	*Bothriembryon perobesus* ais an SRE with a known linear range of more than 100 km, extending up to 50 km inland from the coast) (Bennelongia, 2013). This species utilises a wide range of habitats including rocky terrain, woodlands, gorges and gullies and coastal shrub/heath (Whisson and Ryan, 2019). This species has been known to inhabit stabilised sand dunes, Low Banksia woodland and Hakea shrublands/dryandra heath amongst other habitats (Bennelongia, 2013).	2 records within 50 km, closest record 42 km and most recent is 2012.	High	Moderate	There are no records nearby or known from vegetation that is connected to the survey habitat. To take precaution, the species has been reduced to 'Moderate' but cannot be excluded due to poor understanding and lack of robust invertebrate survey effort.
Woolybush Bee *(Hylaeus globuliferus)* WA P3	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	Two records with 50 km, closest record 9 km and most recent record 1996.	High	High	Suitable foraging habitat is prolific in the survey area and adjacent native vegetation. One record known from Moore River National Park which is connected to the habitat within the survey area. The occurrence of this species cannot be excluded and remains 'High'.

Species	Habitat	Number of DBCA Records and Distance	Pre-survey likelihood	Post-survey likelihood	Discussion
Swan Coastal Plain shield-backed trapdoor Spider *(Idiosoma sigillatum)* WA P3	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	3 records with 50 km, closest record 34 km and most recent record 2011.	High	Moderate	There are no records within connected native vegetation. There is one coastal population at Ledge Point (1967) and one inland near Gingin (2011). Based on the absence of records in Moore River National Park, this species has been reduced to 'Moderate'.
a short-tongued bee *(Leioproctus contrarius)* WA P3	Western Australia, associated with *Goodenia sp*. and *Lechenaultia sp*. (South Metro Connect, 2011).	3 records with 50 km, closest record 5 km (representing four occurrences from 1999) and most recent record 2001.	High	High	There are two occurrences known from the same area of remnant native vegetation that connect to the survey area. A *Goodenia reinwardtii* and *Lechenaultia floribunda* were recorded in the survey area (<10% foliage cover). Their presence insinuates suitable habitat is present. This species likelihood remains High within the Banksia Woodland habitat.
Fauna species unlikely to utilise fauna habitat within the Regans survey area					
Malleefowl (*Leipoa ocellata*) EPBC V WA VU	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (Melaleuca uncinata) and Scrub Pine (Callitris verrucosa) (Benshemesh, 2007).	4 records within 50 km, closest is 18 km and the most recent	High	Low	This species current known range, the age and location of records and lack of suitable habitat within the survey area suggest that there is a low possibly that this species will intermittently forage within the survey area.
Graceful Sun Moth (*Synemon gratiosa*) WA P4	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	62 records within 50 km, all restricted to within 10 km of the coast. The closest records are 32 km and the most recent are 2012.	High	Negligible	No known host species (*L. hermaphrodita*) was recorded within habitat of the survey area. There is a low possibly that this species will occur within the survey area.

8.9.3 Black Cockatoo Assessment

The Regans survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris)*. A total of 43 potential nesting trees with a suitable DBH (>500 mm) were identified within the survey area. This comprised of 40 *Eucalyptus todtiana* trees, and three *Corymbia calophylla* trees. Foraging evidence was observed under *Corymbia calophylla* trees within the Trees over Cleared fauna habitat.

The survey area has been assessed as a score of 10 or "high-quality foraging habitat" for Carnaby's Cockatoo in accordance with the Commonwealth black cockatoo Referral Guidelines foraging tool (Table 47). Native vegetation within the survey area is dominated by Banksia Woodland that includes foraging species such as *Banksia attenuata, B. menziesii* and *B. prionotes.* Other areas of fauna habitat include Trees over Cleared where *Corymbia calophylla* also provide primary foraging for this species.

The foraging score tool does not account for variance in vegetation communities or condition, providing only a single score for the entire area. The assessment result would be different if vegetation communities were taken into account. This is represented by using the Bamford (2020) foraging tool, discussed below. The Banksia Woodland fauna habitat provides the best foraging habitat within the Regans survey area, with a score of 4 (moderate quality) calculated using the Bamford (2020) methodology. This habitat provides key foraging species such as *Banksia attenuata, B. menziesii* and *B. prionotes* with a 20-40% project foliage cover.

The Agriculture fauna habitat provides low foraging habitat for Carnaby's Cockatoo. This is primarily due to planted olive trees in an orchard that provide an opportunistic foraging species. Trees over Cleared and paddock habitats provide negligible habitat with isolated foraging species. As the foraging species in these two fauna habitats are less abundant and condition is scored low, no score is given for site context or stocking rate, resulting in a lower scall overall.

9.0 Yandin Results and Discussion

9.1 Vegetation Communities

Four native vegetation communities were defined and mapped. These communities included:

- Banksia Woodland
- Mixed Heathland
- Eucalyptus Woodland: represents riparian vegetation
- Trees: remnant native trees over paddock weeds

Additionally, one non-native vegetation community was observed. This represents paddock largely comprised of common pasture weeds. Cleared areas, devoid of any vegetation extend across 0.78 ha.

The vegetation mapping was supported by running similarity analysis of floristic data using the Bray-Curtis similarity index of presence/absence data (Plate 24and scaled foliage cover data (Plate 25). Vegetation communities are presented in Table 52 and mapped on Figure 8.

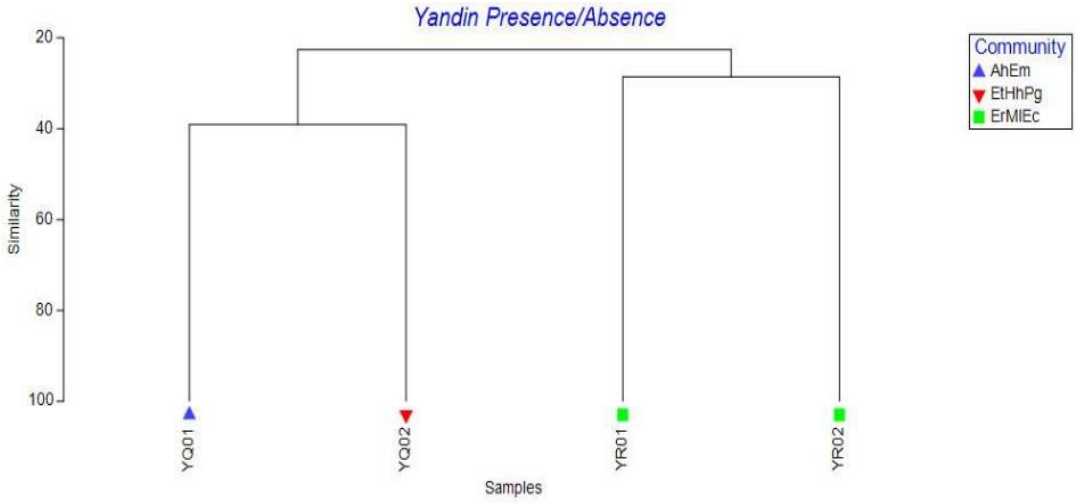


Plate 24 Floristic similarity (Bray Curtis Index) of all Yandin sites using presence absence

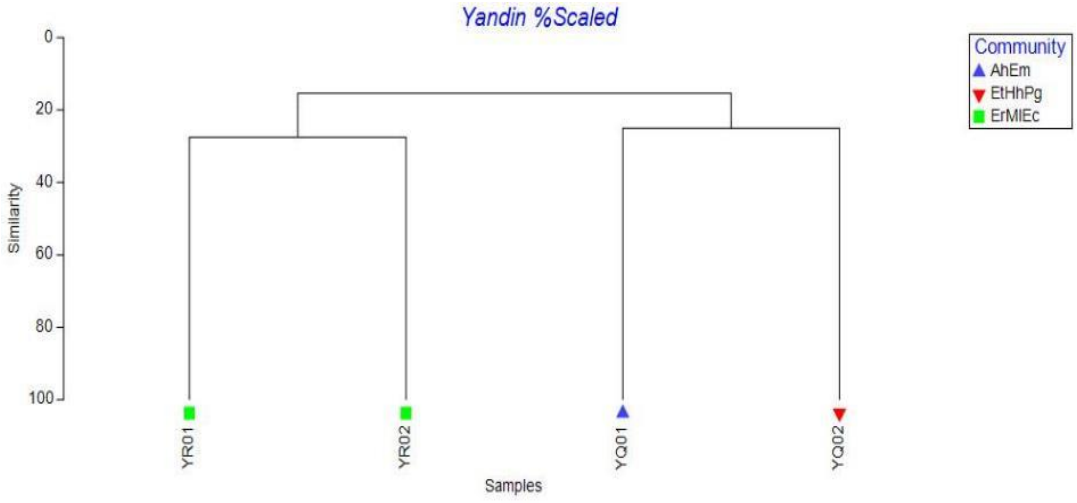


Plate 25 Floristic similarity (Bray Curtis Index) of all Yandin sites using scaled foliage cover

Table 52 Yandin vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation Communities		
EtHhPg *Banksia* Woodland *Eucalyptus todtiana, Banksia attenuata* and *Xanthorrhoea preissii* low open woodland over *Hibbertia hypericoides* subsp. *hypericoides*, *Calothamnus quadrifidus* subsp. *quadrifidus* and *Allocasuarina humilis* mid to low open shrubland over *Podotheca gnaphalioides*, *Dasypogon obliquifolius* and *Lyginia barbata* low sparse herbland. Recorded on white-grey sandy soils. This community was largely in Degraded condition. Quadrat location focused on area of best condition.	Survey effort: YQ02 Species richness: 40 species Condition: Degraded to Very Good Extent: 4.79 ha	
AhEm Mixed Heathland *Allocasuarina humilis*, *Melaleuca ciliosa* and *Hakea incrassata* low shrubland over *Ecdeiocolea monostachya*, *Mesomelaena pseudostygia* and *Caustis dioica* mid to low forbland. Recorded on grey sandy soils. Community represents small proportion of survey area (3.02%).	Survey effort: YQ01 Species richness: 50 species Condition: Excellent Extent: 0.36 ha	

Description	Additional Details	Photograph
ErMlEc Eucalyptus Woodland *Eucalyptus rudis* and *Xanthorrhoea preissii* mid open woodland over *Melaleuca lateritia*, *Banksia dallanneyi* subsp. *dallanneyi* var. *dallanneyi* and *Jacksonia sternbergiana* tall to low open shrubland over **Ehrharta calycina*, **Hypochaeris glabra* and **Ursinia anthemoides* tall to low forbland. Recorded on grey sandy soils. This community was highly disturbed. Relevé location focused on areas of highest native diversity.	Survey effort: YR01, YR02 Species richness: 24 species Condition: Completely Degraded to Degraded Extent: 3.27 ha	
Trees Stands of native trees in paddocks.	Condition: Completely Degraded Extent: 0.56 ha	No photo available.
Non-native Vegetation Communities		
Paddock Largely comprised of common pasture weeds, with occasional native species.	Extent: 2.16 ha	No photo available.

9.2 Significant Vegetation

No significant vegetation communities were recorded in the Yandin survey area, nor were any expected to occur (Appendix A).

9.3 Vegetation Condition

Native vegetation was mapped for 8.98 ha, representing 75% of the Yandin survey area and excludes areas mapped as cleared. Vegetation condition ranged from Completely Degraded to Excellent. The major contributing factor causing degradation was aggressive weed invasion. In some areas the structure of the community was severely altered with introduced species being the predominant understorey (RR01, RR02).

Areas mapped as Cleared represent paddocks and tracks, areas that have been modified where no native vegetation remains.

Extent of vegetation condition categories are presented in Table 53 and mapped in Figure 8

Table 53 Yandin vegetation condition extent

Condition Rating (Keighery, 1994)	Extent (ha)	Percent of Total Area (%)
Excellent	0.36	3
Very Good	0.98	8
Degraded	5.30	44
Completely Degraded	2.34	20
Cleared	2.94	25
Total	**11.92**	**100**

9.4 Significant Flora

One significant flora species, *Anigozanthos humilis* subsp. *chrysanthus* was recorded in the Yandin survey area. One sample was collected (FDW230922-30) and verified by Mike Hislop from the WAH (ACC/10425/E). This species is listed as Priority 4 by DBCA. A total of 22 individuals were recorded in the survey area, at two locations within vegetation community AhEm and EtHhPg in vegetation that was Very Good and Excellent (Figure 8).

Plate 26 ***Anigozanthos humilis*** **subsp.** ***chrysanthus*** **(P4) recorded in the Yandin survey area, flower morphology (left) and habit (right)**

9.5 Flora Inventory

A total of 87 flora species from 33 families were confidently identified to species level. An additional two species were denoted with a “?” or “sp.” due to insufficient material for identification. This total includes 72 (83%) locally native species and 15 (17%) introduced or naturalised weed species.

Families with the highest representation are Myrtaceae (10 native taxa), Fabaceae (nine taxa; six native, and three introduced), and Poaceae (eight taxa; two native, and six introduced).

The comprehensive list of vascular flora species recorded, organised by family and the community they occur in is presented in Appendix D. Quantitative data recorded from individual samples sites is presented in Appendix E.

9.6 Fauna Species

9.6.1 Conservation Significant Fauna Species

Two conservation significant species were recorded within the Yandin survey area. An opportunistic sighting of the Western Brush Wallaby was recorded on the way into the adjacent Cataby Mineral Sands Mine. The Western Brush Wallaby (*Notamacropus irma*) is listed as a Priority 4 species by DBCA and is relatively understudied to-date (Wayne et al., 2021). The Black-faced cuckoo shrike (*Coracina novaehollandiae)* was also recorded within the survey area. The Black-faced Cuckoo-shrike was seen and heard. As a marine listed species, the conservation significance is only relevant on Commonwealth land. Marine have not been included into the desktop assessment.

Based on the desktop assessment and the field survey, the following conservation significant fauna species are considered to have the potential to utilise the fauna habitats within the survey area:

- Carnaby's Cockatoo (*Zanda latirostris*) Endangered by EPBC and BC Act
- Land Snail (*Bothriembryon perobesus*) Priority 1
- Western Brush Wallaby (*Notamacropus irma*) Priority 4

9.6.2 Fauna Inventory

Nineteen fauna species were recorded during the field survey (Table 54). This included fourteen birds, four mammals and one reptile.

Table 54 Yandin Fauna Species recorded within the survey area.

Class	Common Name	Taxon Name	Observation
Bird	Australian Ringneck	*Barnardius zonarius*	Seen and heard
	Black-faced Cuckoo-shrike (Marine)	*Coracina novaehollandiae*	Seen and heard
	Brown Honeyeater	*Lichmera indistincta*	Seen and heard
	Corella	*Cacatua spp.*	Seen and heard
	Emu	*Dromaius novaehollandiae*	Seen
	Grey Fantail	*Rhipidura albiscapa*	Seen
	Laughing Kookaburra	*Dacelo novaeguineae*	Seen and heard
	Magpie	*Gymnorhina tibicen*	Seen and heard
	Magpie Lark	*Grallina cyanoleuca*	Seen and heard
	Pink and Grey Galah	*Eolophus roseicapilla*	Seen and heard
	Weebill	*Smicrornis brevirostris*	Heard only
	Welcome Swallow	*Hirundo neoxena*	Seen
	Willie Wagtail	*Rhipidura leucophrys*	Seen and heard
	Carnaby's Cockatoo	*Zanda latirostris*	Other- Foraging Evidence
Mammal	European Rabbit	*Oryctolagus cuniculus*	Other – Burrow
	Sheep	*Ovis aries*	Other – Bones
	Western Brush Wallaby (Priority 4)	*Notamacropus irma*	Seen
	Western Grey Kangaroo	*Macropus fuliginosus*	Seen
Reptilia	Buchanan's snake-eyed skink	*Cryptoblepharus buchananii*	Seen

9.7 Fauna Habitat

Five fauna habitats were defined and mapped (Table 55) which included four native fauna habitats (8.42 ha, 71%) and one non-native habitat (3.51 ha, 29%). These habitats are described as follows:

- Banksia Woodland (4.79 ha, 40%)
- Heath (0.36, 3%)
- Wetland (3.27 ha, 27%)
- Trees over Cleared (0.56 ha, 5%)
- Paddock (2.16 ha, 18%)

Cleared areas is representative of tracks, roads and highly modified or degraded vegetation with no biological benefit and was mapped for 0.78 ha.

Table 55 Yandin fauna habitat

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Banksia Woodland (4.79 ha, 40%)	Banksia Woodland dominating over Melaleuca species, with a diverse shrub understorey. Grass species are absent, allowing the structural diversity of the woodland to flourish. Mature Banksia trees, scattered across the landscape. Fine leaf litter and sandy loam soil support the habitat's plant community. Evidence of recent burns underscores its dynamic nature. This habitat is of high to moderate quality, owing to the abundance of Banksia trees.	Suitable habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary moderate foraging. • Land Snail *(Bothriembryon perobesus)* DBCA P1 • Western Brush Wallaby (*Notamacropus irma*) DBCA P4	
Heath (0.36, 3%)	Mixed Kwongan heathland on sandy/laterite soils. Banksia species scattered throughout, in addition to isolated pockets of Nuytsia *floribunda.* Canopy cover was minimal and inconsistent. No grass species present. Fine and coarse leaf litter highly abundant.	Potential habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary moderate foraging. • Land Snail *(Bothriembryon perobesus)* DBCA P1 • Western Brush Wallaby (*Notamacropus irma*) DBCA P4	

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Wetland (3.27 ha, 27%)	*Eucalyptus rudis* woodland bordering wetlands features dominant *Eucalyptus rudis* trees with varied shrub understorey and grass species. The habitat likely intermittently floods during rain events. Minimal leaf litter. The soil likely combines sandy loam with moisture-retaining substrates.	Low quality foraging habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered	
Trees over Cleared. (0.56 ha, 5%)	*Corymbia calophylla* and isolated Eucalyptus over cleared. Grasses and roadside verge weeds common. Notable foraging in high quantities.	Recorded foraging habitat for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered – Primary foraging	N/A

Fauna Habitat (Area and % of habitat within the Survey Area)	Description	Significant Species Potentially Utilising Habitat	Photos
Paddock (2.16 ha, 18%)	Highly modified agriculture land with paddock weeds and grasses. Paddock weeds are also recorded to be known foraging for conservation significant species such as the Carnaby's Cockatoo	Secondary foraging for: • Carnaby's Cockatoo (*Zanda latirostris)* EPBC and BC Act Endangered	

9.8 Black Cockatoo Results

9.8.1 Foraging

A combination of the DAWE (2022) foraging scoring tool and the Bamford (2020) foraging methodology was implemented for the black cockatoo assessments. The DAWE foraging habitat assessment resulted in a score of 9 (Table 56).

Table 56 Yandin black cockatoo foraging habitat assessment (DAWE, 2022).

Starting score		**Carnaby's Cockatoo (*Zanda latirostris*)**	
10		**Start at a score of 10** if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp., *Hakea* spp. And *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	
Attribute	**Sub-tractions**	**Context adjustor (attributes reducing functionality of foraging habitat).**	
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☐
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☒
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. Or Marri canker) and the disease is affecting more than 50% of the preferred food plants present	☐
Total score		9	

The refined foraging habitat value considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The following factors influenced the results:

- The Yandin survey area is situated across a confirmed Carnaby's Cockatoo breeding area (DBCA, 2023c)
- There are substantial areas of suitable foraging habitat adjacent to the survey area. Native vegetation within the survey area represents 0.03% of the available foraging habitat within a 15 km radius.

The native fauna habitat scored a '2-4' according to the Bamford (2020) scoring tool (Table 57). Black cockatoo foraging was mapped for 11.14 ha using this method ranging from 'Negligible' to 'Moderate' quality (Table 58).

Foraging evidence was observed under *Corymbia calophylla* trees within the Trees over Cleared fauna habitat (Plate 27).

Table 57 Yandin refined foraging score calculation (Bamford, 2020)

Fauna Habitat	Carnaby's Cockatoo			Foraging Score
	Site condition	Context	Stocking rate	
Banksia Woodlands	2	0	0	2 (Low)
Heath	4	0	0	4 (Moderate)
Wetland	2	0	0	2 (Low)
Trees over Cleared	1	0	0	1 (Negligible)
Paddock	1	0	0	1 (Negligible)
Cleared	0	0	0	None

Table 58 Yandin foraging habitat extent

Foraging Habitat Score	Extent (ha)	Percent of Total Area (%)
0 None	0.78	7
1 Negligible	2.72	23
2 Low	8.06	68
4 Moderate	0.36	3
Total	**11.92**	**100**

Plate 27 Carnaby's Cockatoo foraging evidence observed in the Yandin survey area

9.8.2 Breeding

The Yandin survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris)*. A total of 82 potential nesting trees with a suitable DBH (>500 mm) were identified within the survey area. This comprised of 58 *Eucalyptus rudis* trees, 20 *Eucalyptus todtiana* trees, and four *Corymbia calophylla* trees.

9.8.3 Roosting

No known roosting sites were observed within the Yandin survey area. The 'Wetland' fauna habitat contains tall (18 m) *Eucalyptus rudis* trees that occur across a dampland that may provide potential roosting habitat for black cockatoos. Tall *Corymbia calophylla* trees within the 'Trees over Cleared' fauna habitat likely also provide potential roosting habitat. The closest confirmed buffered roost area from Birdlife data provided by DBCA is 22 km south of the survey area.

9.9 Discussion

9.9.1 Flora and Vegetation

Four native vegetation communities were mapped for 8.98 ha (75%) of the Yandin survey area. This includes a Eucalyptus woodland (ErMlEc) that represents a dampland and is likely associated with surface and/or groundwater hydrology (i.e. groundwater dependent). The dominant *Eucalyptus rudis* is affiliated with riparian vegetation and partially phraetophytic. This vegetation community has been heavily modified and ranges from Completely Degraded to Degraded, primarily due to reduced biodiversity from weeds.

The desktop assessment identified no TECs or PECs that were considered likely to occur. The closest TEC is the Banksia Woodlands TEC located 1.3 km west of the survey area. The survey area is on the Geraldton Sandplains therefore all significant vegetation associated with the Swan Coastal Plain have been excluded from consideration. The Geraldton Sandplains has been specifically excluded from the Conservation Advice (DEE, 2016).

Flora diversity was considered high, with a total of 87 flora species confidently identified to species level within 11.92 ha. This is comparable to the Eneabba survey area that is situated across the Geraldton Sandplains, where 201 species from 42.98 ha of native vegetation was recorded. This high diversity is typical of the Geraldton Sandplains IBRA region (Macintyre, 2020).

One significant flora species, *Anigozanthos humilis* subsp. *chrysanthus* (P3) was recorded in the survey area. *A. humilis* subsp. *chrysanthus* is a rhizomatous perennial herb that grows on grey to yellow sand (WAH, 1998-) and was considered likely to occur. One verified population (TPFL pop# 9) occurs 1.2 km from the survey area. This species is distinguishable from the common *A. humilis* subsp. *humilis* by its bright yellow flowers.,. A total of 22 individuals were recorded in areas of vegetation where condition was Very Good or Excellent and likely represent TPFL population #9.

All species considered to have a high likelihood of occurrence, that were not recorded during the survey, have been downgraded to a low likelihood of occurrence post-survey. Sufficient survey effort was achieved, with all areas of remnant vegetation subject to systematic targeted searches. The survey was undertaken during the ideal detection period, and all species have a perennial lifecycle that would have been present. Table 59 provides a summary of the post-survey likelihoods.

Table 59 Summary of Yandin likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	26	72	22	11	131
Post-survey	1	0	0	98	32	131

9.9.2 Fauna

Two significant species were recorded during the fauna survey. An opportunistic sighting of the Western Brush Wallaby (*Notamacropus irma*) was observed when performing a check-in at the adjacent Cataby Mineral Sands Mine in transit to the Yandin survey area. The Black-faced Cuckoo shrike (*Coracina novaehollandiae)* was recorded during the survey, listed as Marine under the EPBC Act. Nine-teen fauna species were recorded during the field survey. This included fourteen birds, four mammals and one reptile.

Six fauna habitats were defined and mapped including Banksia Woodland, Heath, Trees over Cleared, and Wetland. The remainder of the area was Paddock and Cleared. The survey area is disconnected from other areas of remnant native vegetation. A narrow corridor provides low connectivity along Mimegarra Road. South of the survey area is a wetland captured as a reserve in DBCA legislated land and water.

Carnaby's Cockatoo, the Western Brush Wallaby (*Notamacropus irma*) and Land Snail (*Bothriembryon perobesus*) have the potential to utilise habitats within the survey area. Details of all these species and their associated habitats is presented in Table 60. Carnaby's Cockatoo is discussed further in Section 9.9.3.

There is a low/negligible possibility that three species, the Malleefowl (*Leipoa ocellata*), Graceful Sun Moth (*Synemon gratiosa*) and Black-striped Snake (*Neelaps calonotos*) will utilise fauna habitats within the survey area. The fauna habitat utilisation discussion considers connectivity, number and date of records, and habitat suitability.

Table 60 Yandin fauna habitat utilisation for significant fauna species.

Species	Habitat	Number of DBCA Records and Distance	Pre-survey likelihood	Post-survey likelihood	Discussion
Fauna species likely to utilise fauna habitat within the Yandin survey area					
Western Brush Wallaby (*Notamacropus irma*). WA P4	The Western Brush Wallaby (is relatively understudied to-date (Wayne et al., 2021). Macropods, such as the *N. irma*, typically rest in sheltered areas under trees, in tall grass, or in rocky outcrops. This species has been known to occupy open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	There are 15 records of *N. irma* within 50 km, the closest is 12.76 km and the most recent was 2017.	High	High	The Paddocks and Trees over Cleared are likely to provide suitable habitat where macropods typically rest and forage. The density of understorey (weedy) grasses provide adequate coverage and trees provide adequate shade. The Banksia Woodland habitat represents suitable core habitat for this species, further supported by the nearby sighting.
Land Snail (B*othriembryon perobesus*) WA P1	*Bothriembryon perobesus* ais an SRE with a known linear range of more than 100 km, extending up to 50 km inland from the coast) (Bennelongia, 2013). This species utilises a wide range of habitats including rocky terrain, woodlands, gorges and gullies and coastal shrub/heath (Whisson and Ryan, 2019). This species has been known to inhabit stabilised sand dunes, Low Banksia woodland and Hakea shrublands/dryandra heath amongst other habitats (Bennelongia, 2013).	Known from two locations, one 14 km away and one +60 km away. The nearest one is dated 2012 and represents three separate records/individuals.	High	Moderate	The preferred habitat for this species is so varied, it is difficult to disregard the species based on habitat presence only. There is no rocky terrain, coastal shrub, gorges or gullies, but there is some Low Banksia woodland. The nearest record is in vegetatino disconnected from this patch. The survey area has been disconnected from other remnant vegetation for a long time. The nearby minesite has not identified any records for this species during baseline surveys (assuming they were lodged with DBCA). Based on the above the species cannot be excluded, but it has been reduced to 'Moderate'.

Species	Habitat	Number of DBCA Records and Distance	Pre-survey likelihood	Post-survey likelihood	Discussion
Fauna species unlikely to utilise fauna habitat within the Yandin survey area					
Malleefowl (*Leipoa ocellata*) EPBC V WA VU	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (Melaleuca uncinata) and Scrub Pine (Callitris verrucosa) (Benshemesh, 2007).	There are seven records of this species, mainly of sightings with the closest being 14 km (1988 & 1993) and the most recent was 2012 (40 km away).	High	Low	This species current known range, the age and location of records and lack of suitable habitat within the survey area suggest that there is a low possibly that this species will intermittently forage within the survey area.
Graceful Sun Moth (*Synemon gratiosa*) WA P4	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	There are 29 records of this species with the closest being 27 km from 2010. The most recent record is 2011 from 40 km.	High	Negligible	No known host species (*L. hermaphrodita*) was recorded within the survey area. This species is restricted to a strip of approximately 8 km along the coast. Given the above, it has a 'Negligible' likelihood.
Black-striped Snake (*Neelaps calonotos*) WA P3	Restricted to sandy coastal strip near Perth between Mandura and Cataby with isolated populations from Eneabba and Dongara. It prefers dunes and sandplains with heath and eucalypt/Banksia woodlands (Wilson & Swan, 2023).	Six records from within 50 km including one individual recorded 4 km away in 2015 for Cataby Tiwest mine surveys.	High	Low	This species is confined to the Swan Coastal Plain. There is a low possibly that this species will occur within the survey area.

9.9.3 Black Cockatoo Assessment

The Yandin survey area is within the known range for the threatened Carnaby's Cockatoo (*Zanda latirostris)*. A total of 82 potential nesting trees with a suitable DBH (>500 mm) were identified within the survey area. This comprised of 58 *Eucalyptus rudis* trees, 20 *Eucalyptus todtiana* trees, and four *Corymbia calophylla* trees. The survey area has been assessed as a score of 9 "high-quality foraging habitat" for Carnaby's Cockatoo in accordance with the Commonwealth black cockatoo Referral Guidelines foraging tool (Table 56). Native vegetation within the survey area is comprised of various heath habitats that are dominated by proteaceous and myrtaceous foraging species. One subtraction from the initial score of 10 was made, as the closest confirmed roosting site is 37 km south-east of the survey area.

The foraging score tool does not account for variance in vegetation communities or condition, providing only a single score for the entire area. The Bamford (2020) foraging tool was applied to define values to patches of native vegetation. The Heath fauna habitat provides the best foraging habitat within the Yandin survey area, with a score of 4 (moderate quality) calculated using the Bamford (2020) methodology. The heath habitat provides key foraging species such as shrubby banksias with a 20-40% project foliage cover.

The Banksia Woodlands and the Wetland fauna habitats provides low foraging habitat for Carnaby's Cockatoo. This is primarily due to key foraging species having a low projected cover, as well as no direct or indirect evidence of the species. Trees over Cleared and paddock habitats provide negligible habitat with isolated foraging species. As the foraging species in these three fauna habitats are less abundance and condition are scored low, no score is given for site context or stocking rate, resulting in a lower scall overall.

10.0 Conclusion

Western Power has engaged AECOM to complete flora, fauna and vegetation surveys for four discreet survey areas between Eneabba and Perth. The four sites include, ENB-ENT 132kV (Eneabba), Cataby Substation (Cataby), Yandin Terminal (Yandin) and Regans Terminal (Regans).

A summary of the Eneabba results are presented below:

- Eleven Priority flora species were recorded including *Allocasuarina ramosissima* (P3), *Banksia chamaephyton* (P4), *Banksia cypholoba* (P3), *Banksia fraseri* var. *crebra* (P3), *Cristonia biloba* subsp. *pubescens* (P2), *Grevillea uniformis* (P3), *Hakea longiflora* (P3), *Hemiandra* sp. Eneabba (H. Demarz 3687) (P3), *Lepidobolus quadratus* (P3), *Phlebocarya pilosissima* subsp. *pilosissima* (P3) and *Stylidium drummondianum* (P3). All species were collected and confirmed at the Western Australian Herbarium by Mike Hislop.
- No Threatened or Priority Ecological Communities (TECs or PECs) were recorded. Two were considered however the assessment determined that the vegetation was representative of Kwongan Heath vegetation typical of the bioregion.
- Four native vegetation communities were mapped across 17.15 ha (15%).
- The survey area was predominantly cleared (98.57 ha, 85%). Areas of intact native vegetation were largely considered Excellent (11.47 ha, 10%).
- No direct or indirect evidence of significant fauna species was recorded during the survey.
- Suitable habitat is present for five significant fauna species (those with a ‘High’ or ‘Moderate’ likelihood) including:
    - Carnaby’s Cockatoo (*Zanda latirostris)* Endangered under the *Environment Protection* and *Biodiversity Conservation Act 1999* (EPBC Act) and *Biodiversity Conservation Act 2016* (BC Act) – High, no direct or indirect evidence observed.
    - Graceful Sun Moth (*Synemon gratiosa)* Priority 4 – Moderate
    - Thorny Bush Katydid (*Hemisaga vepreculae*) Priority 2 – Moderate
    - Woolybush Bee (*Hylaeus globuliferus*) Priority 3 – Moderate
    - Kwongan Heath Shield-backed Trapdoor Spider (*Idiosoma kwongan*) Priority 1 – Moderate.
- The black cockatoo foraging habitat assessment received a score of ‘7’ with the Commonwealth DAWE (2022) method and 2-5 using the Bamford (2020) method.
- Thirty-three potential black cockatoo nesting trees were recorded.
- No Black Cockatoo roosting sites or habitat was observed.

A summary of the Cataby result are presented below:

- Three Priority flora species were recorded including *Conostephium magnum* (P4), *Hypolaena robusta* (P4) and *Stylidium hymenocraspedum* (P3). All species were collected and confirmed at the Western Australian Herbarium by Mike Hislop.
- The Banksia woodlands of the Swan Coastal Plain TEC (listed as Endangered under the EPBC Act) was recorded for 5.19 ha.
- Two native vegetation communities were mapped for 6.31 ha (82%), and largely considered Excellent condition (4.08 ha, 53%).
- two conservation significant fauna species were recorded this included EPBC and BC Act Endangered Carnaby’s Cockatoo (*Zanda latirostris*) and the Black-faced cuckoo shrike (*Coracina novaehollandiae*).
- Suitable habitat is present for four significant fauna species (those with a ‘High’ or ‘Moderate’ likelihood) including:
    - Carnaby’s Cockatoo (*Zanda latirostris*) Endangered under the EPBC Act and BC Act – known

  - Land Snail (*Bothriembryon perobesus*) Priority 1 – High
  - Quenda (*Isoodon fusciventer*) Priority 4 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High
- The black cockatoo foraging habitat assessment received a score of '7' with the Commonwealth DAWE (2022) method and '5' for native fauna habitat using the Bamford (2020) method.
- Six potential black cockatoo nesting trees were recorded.
- No black cockatoo roosting sites or habitat was observed in the survey area.

A summary of the Regans results are presented below:

- One significant flora species, *Lyginia excelsa* (P2) was recorded.
- One patch of the Banksia Woodlands of the Swan Coastal Plain TEC (listed as Endangered under the EPBC Act) was recorded for 4.60 ha.
- Three native vegetation communities were recorded, extending across 5.16 ha (47%). With areas of native vegetation largely considered Degraded (3.14 ha, 29%).
- The survey area was predominantly cleared (5.73 ha, 53%).
- Two species of conservation significance were identified during the survey. Foraging evidence of Carnaby's Cockatoo (*Zanda latirostris*) was recorded in the Trees over Cleared habitat. The Black-faced cuckoo shrike (*Coracina novaehollandiae*) was both seen and heard.
- Suitable habitat is present for seven significant fauna species including:
  - Carnaby's Cockatoo (*Zanda latirostris)* Endangered under the EPBC Act and BC Act – known
  - Quenda (*Isoodon fusciventer)* Priority 4 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High
  - Land Snail *(Bothriembryon perobesus)* Priority 1 – Moderate
  - Woolybush Bee (*Hylaeus globuliferus)* Priority 3 – High
  - Swan Coastal Plain Shield-backed Trapdoor Spider *(Idiosoma sigillatum)* Priority 3 – Moderate
  - A Short-tongued Bee *(Leioproctus contrarius)* Priority 3 – High.
- The Black Cockatoo assessment received a score of '10' with the Commonwealth DAWE (2022) method and '4' for native fauna habitat utilising the Bamford (2020) method.
- Forty-three potential black cockatoo nesting trees were recorded.
- No black cockatoo roosting sites were recorded. Two tall (15-20 m) remnant *Corymbia calophylla* trees along Orange Springs Road are located approximately 500 m south of Moore River and likely provide roosting habitat.

A summary of the Yandin results are presented below:

- One significant flora species, *Anigozanthos humilis* subsp. *chrysanthus* (P4) was recorded.
- No significant vegetation communities were recorded in the survey area.
- Four native vegetation communities were mapped across8.98 ha (75%), with vegetation predominantly in Degraded condition (5.30 ha, 44%).
- Two conservation significant fauna species were recorded within the survey area. An opportunistic sighting of the Western Brush Wallaby was recorded on the way into the adjacent Cataby Mineral Sands Mine. The Black-faced Cuckoo Shrike (*Coracina novaehollandiae)* was also recorded within the survey area.
- Suitable habitat is present for three significant fauna species including:

  - Carnaby's Cockatoo (*Zanda latirostris*) Endangered by EPBC and BC Act – Known
  - Land snail (*Bothriembryon perobesus*) Priority 1 – Moderate
  - Western Brush Wallaby (*Notamacropus irma*) Priority 4 – High.
- The black cockatoo assessment received a score of '9' with the commonwealth DAWE (2022) method and '2-4' for native fauna habitat utilising the Bamford (2020) method.
- No black cockatoo roosting sites were observed in the survey area. The 'Wetland' and 'Trees over Cleared' fauna habitat likely provide roosting habitat.

The survey was undertaken by experienced personnel during the ideal detection period for significant flora. Survey effort was considered satisfactory, and no access issues were encountered. The potential presence of several conservation significant invertebrate species was identified. Conservation significant invertebrate surveys and/or Short-range endemic surveys may be required to verify their presence and/or absence within the survey area.

11.0 References

AECOM Australia Pty Ltd (AECOM), 2022a. Scar 4 – Flora, Vegetation and Black Cockatoo Assessment. Unpublished report prepared for Western Power.

AECOM, 2020. Yandin Wind Farm Environmental Compliance Monitoring. Unpublished report prepared for Western Power.

AECOM, 2022b. Waddi Wind Farm – Flora, Vegetation and Black Cockatoo Assessment. Unpublished report prepared for Western Power.

AoLA, 2023. Available at: https://www.ala.org.au/. Accessed September 2023.

Baczocha N, and Start, AN 1996. Status and ecology of the dibbler (Parantechinus apicalis) in Western Australia. Half-yearly report. Department of Conservation and Land Management, Perth.

Bamford, 2020. Scoring System for the Assessment of Foraging Value of Vegetation for Black Cockatoos.

Barrett R, 2012. Poranthera moorokatta (Phyllanthaceae), a rare new species from Perth, Western Australia. *Nuytsia* 22(6): 399-407.

Barrett RL, Barrett M, 2015. Twenty-seven New Species of Vascular Plants from Western Australia. *Nuytsia* 26: 21-87.

Beard JS, Beeston GR, Harvey JM, Hopkins AJM, Shepherd DP, 2013. The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition. Conservation Science Western Australia 9, 1 pp.1–152.

Bennelongia, 2013. Cooljarloo West Proposal: Short Range Endemic Fauna, Pilot and Targeted Surveys; Final report. Prepared for Tronox Pty Ltd.

Benshemesh J, 2007. National Recovery Plan for Malleefowl. Department for Environment and Heritage, South Australia.

BoM, 2023. Climate Statistics for Australian Locations. Bureau of Meteorology. http://www.bom.gov.au/climate. Accessed November 2023.

Brown A, Thomson-Dans C, and Marchant N (eds), 1998, Western Australia's Threatened Flora, Department of Conservation and Land Management, Western Australia.

Bush B, Maryan B, Browne-Cooper R and Robinson D, 2010. Field Guide to Reptiles and Frogs of the Perth Region. Western Australian Museum, Welshpool. 183pp.

CALM, 2002. Bioregional Summary of the 2002 Biodiversity Audit for Western Australia. Department of Conservation and Land Management, Perth, Western Australia.

CALM, 2002. Bioregional Summary of the 2002 Biodiversity Audit for Western Australia. Department of Conservation and Land Management, Perth, Western Australia.

DAWE, 2021. Conservation Advice for Leucopogon obtectus (Hidden Beard-heath). Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/19614-conservation-advice-29092021.pdf. In effect under the EPBC Act from 29-Sep-2021.

DAWE, 2022. Referral Guideline for 3 WA Threatened Black Cockatoo Species. Available online at https://www.dcceew.gov.au/sites/default/files/documents/referral-guideline-3-wa-threatened-black-cockatoo-species-2022.pdf

DBCA, 2023a. Methods for Survey and Identification of Western Australian Threatened Ecological Communities, Biodiversity and Science, Department of Biodiversity, Conservation and Attractions, 8 February 2023.

DBCA, 2023b. Priority Ecological Communities for Western Australia Version 35. Species and Communities Program, Department of Biodiversity, Conservation and Attractions.

DBCA, 2023c. confirmed Carnaby’s Cockatoo breeding Area Communities, Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 2023.

DCCEEW, 2023. Species Profile and Threats Database. Accessed September 2023.

DEC, 2011. Conservation Advice for Synemon gratiosa (graceful sun-moth) – January 2011. Perth: WA DEC. Available from:https://library.dbca.wa.gov.au/static/FullTextFiles/922303.pdf

DEE, 2016. Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community. Canberra: Department of the Environment and Energy.

DEE, 2017. Approved Conservation Advice for Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/21-conservation-advice.pdf. In effect under the EPBC Act from 13-Jul-2017.

DEE, 2017. Australian Vegetation Attribute Manual (Version 7.0). Canberra, Australia.

DEE, 2019. Approved Conservation Advice (incorporating listing advice) for the Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf. In effect under the EPBC Act from 04-Jul-2019.

DEWHA, 2008. Approved Conservation Advice for Chamelaucium sp, Cataby (G.J.Keighery 11009) WA Herbarium (Griffin's Waxflower). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/82022-conservation-advice.pdf. In effect under the EPBC Act from 16-Dec-2008.

DEWHA, 2008. Approved Conservation Advice for Grevillea calliantha (Foote's Grevillea). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/56339-conservation-advice.pdf. In effect under the EPBC Act from 26-Mar-2008.

DEWHA, 2009. Approved Conservation Advice for Banksia fuscobractea (Dark-bract Banksia). Canberra, ACT: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83059-conservation-advice.pdf. In effect under the EPBC Act from 01-Dec-2009.

DotE, 2015. Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/128-conservation-advice.pdf. In effect under the EPBC Act from 04-Dec-2015.

DotE, 2015. Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/128-conservation-advice.pdf. In effect under the EPBC Act from 04-Dec-2015.

Ecologia, 2010. Oakajee Port and Rail Pty Ltd Egernia stokesii badia Summary of Results. Prepared for Oakajee Port and Rail Pty Ltd and submitted as part of EPBC 2010/5500.

Ecologia, 2017. Wind Prospect Pty Ltd – Yandin Wind Farm Flora., Vegetation and Avifauna Assessment. Report prepared for Wind Prospect Pty Ltd.

EPA, 2016. Technical Guidance – Terrestrial flora and vegetation Surveys for Environmental Impact Assessment. EPA, Western Australia.

EPA, 2020. Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment, EPA, Western Australia.

Gibson N, Keighery B, Keighery G, Burbidge A, and Lyons M, 1994. A Floristic Survey of the Southern Swan Coastal Plain. A report prepared by the Western Australian DEC and the Western Australian Conservation Council for the Australian Heritage Commission, Perth Western Australia.

Govt. of WA, 2019. 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Perth, Western Australia: WA Department of Biodiversity, Conservation and Attractions.

Govt. of Western Australia, 2000. Bush Forever Volume 2 Directory of Bush Forever Sites. Department of Environmental Protection, Western Australia.

Griffin E, and Hopkins A, 1990. Vegetation. In: Burbidge, A. A., Hopper, S. D. and van Leeuwen, S. (eds.) Nature Conservation, Landscape and Recreation values of the Lesueur Area, pp. 25-38. A report to the Environmental Protection Authority from the Department of Conservation and Land Management. Bulletin 424, Environmental Protection Authority, Perth.

Hamilton-Brown, Broun G, and Rees R, 2004. Ferricrete floristic community (Rocky Springs type) Interim Recovery Plan 2004-2009. Department of Conservation and Land Management.

Hopkins AJM, and Hnatiuk RJ, 1981. An ecological survey of the Kwongan south of Eneabba, Western Australia. Wildl. Res. Bull. West. Aust. 9: 1-33.

IBRA7, 2012. Interim Biogeographic Regionalisation for Australia, Version 7.

Keighery B, Keighery G, Longman VM, and Clarke KA, 2012. Swan Coastal Plain Survey Dataset. Updated version (Version 6), compiled and edited for the Departments of Environmental Protection and Conservation and Land Management.

Keighery BJ, 1994. Bushland Plant Survey - A Guide to Plant Community Survey for the Community Wildflower Society of WA (Inc.) Nedlands WA.

Keighery GJ, 2012. Two new species of Comesperma (Polygaceae) from Western Australia. *Nuytsia* 15(1):53-57(2002).

Macintyre P, 2020. The vegetation patterns of the Kwongan vegetation of South-West Western Australia. The University of Western Australia.

Rix MG., Huey JA., Cooper SJ., Austin AD, and Harvey MS, 2018. Conservation systematics of the shield-backed trapdoor spiders of the nigrum-group (Mygalomorphae, Idiopidae, Idiosoma): integrative taxonomy reveals a diverse and threatened fauna from south-western Australia. ZooKeys, (756), 1.

Scott JK, and Black R,1981. Selective predation by white-tailed black cockatoos onfruit of Banksia attenuata containing the seed-eating weevil Alphitopis nivea. *Australian Wildlife Research*, 8, 421-30.

South Metro Connect, 2011. Roe Highway Extension Public Environmental Review. Prepared for Main Roads Western Australia. June 2011.

TPFL, 2023. Threatened Priority Flora Database Search for the Shire of Coorow, Carnamah, Dandaragan and Gingin accessed September 2023. Prepared by the Species and Communities Program for Western Power for CEL North.

TSSC, 2015. Conservation Advice Eucalyptus dolorosa Dandaragan mallee. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/56709-conservation-advice-01102015.pdf. In effect under the EPBC Act from 01-Oct-2015.

TSSC, 2016. Conservation Advice Hemiandra gardneri red snakebush. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/7945-conservation-advice-01042016.pdf. In effect under the EPBC Act from 01-Apr-2016.

Valentine L, and Stock WD, 2008. Food Resources of Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy study area. *ECU Publications*. Department of Environment and Conservation. Perth, Western Australia.

Van Dyck S, and Strahan R, 2008. The Mammals of Australia Third Edition. Reed New Holland: Chatswood, New South Wales.

WAH, 1998-. Florabase: Online Resource. Available at https://florabase.dpaw.wa.gov.au.

WAH, 2023. Western Australian Herbarium Database Search for the Shire of Coorow, Carnamah, Dandaragan and Gingin accessed September 2023. Prepared by the Species and Communities Program for Western Power for CEL North.

WAM, 2023. Checklist of the Terrestrial Vertebrate Fauna of Western Australia. Government of Western Australia.

Wayne AF, Read E, Maxwell MA, Ward CG, 2021. Breeding patterns for western brush wallaby (*Notamacropus irma*) in the southern jarrah forest. Biodiversity and Conservation Science Department of Biodiversity, Conservation and Attractions.

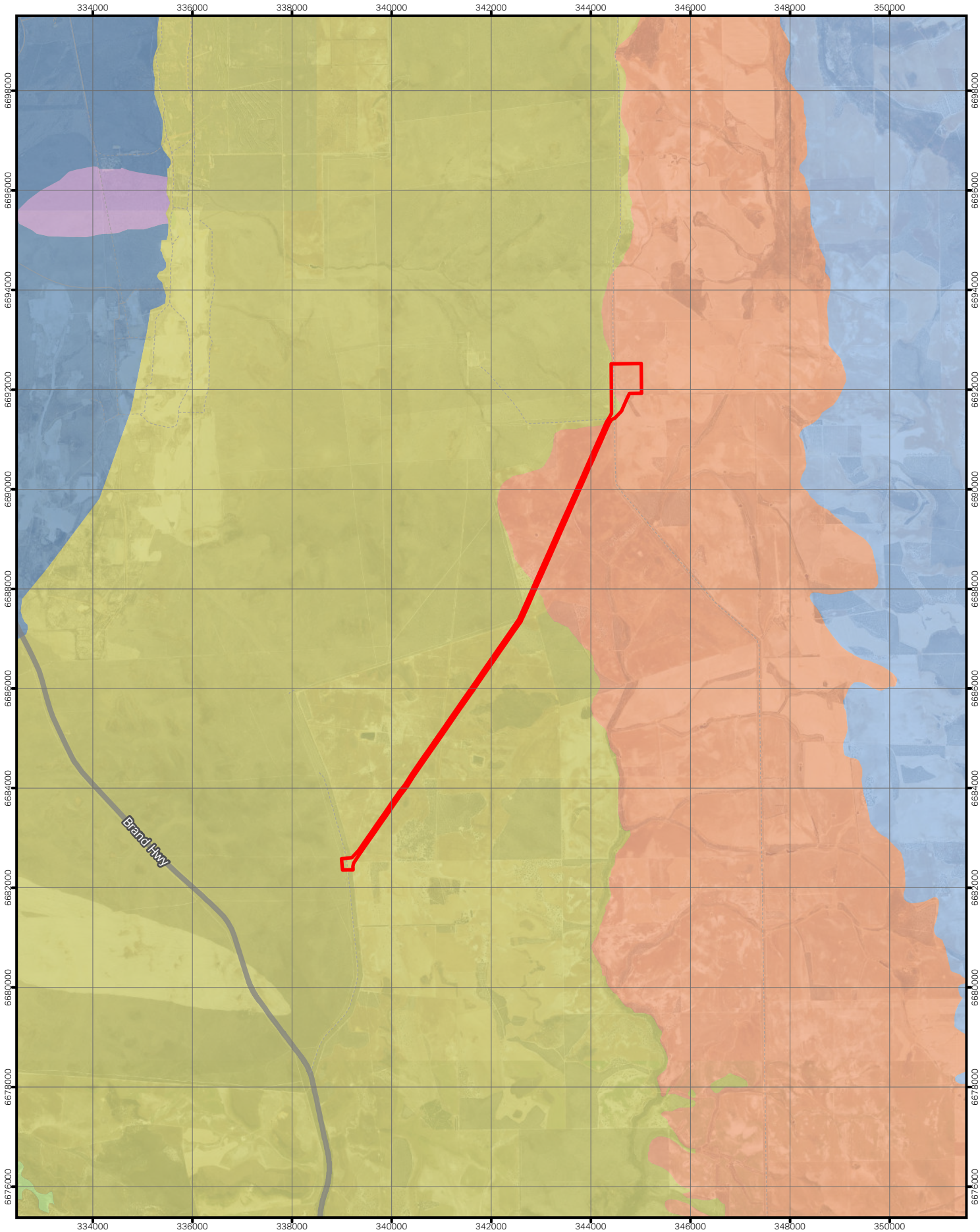
Western Wildlife, 2009. Cockburn Cement, Tenement M70/138, Nowergup: Fauna Assessment 2008. Prepared for Cockburn Cement, Hamilton Hill, WA.

Western Wildlife, 2021. Eneabba Phase 3 Project; Basic Fauna Survey and Targeted Cockatoo Habitat Survey 2021. Prepared for Iluka Resources Limited. Available at https://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/Appendix%20D%20-%20Fauna%20and%20Habitat%20Assessment%20-%20Western%20Wildlife%20-%20Iluka%20EP3%20Fauna%20Report%20v2_Optimizer.pdf

Whisson CS, and Ryan HE, 2019. Review of the Fossil Record of the Australian land snail Genus Bothriembryon Pilsbry, 1984 (Mollusca: Gastropoda: Bothriembryontidae): New Distributional and Geological Data. Records of the Western Australian Museum. 34: pages 38-50.

Wilson S, and Swan G, 2010. A Complete Guide to Reptiles of Australia. New Holland Publishers: Sydney NSW

Wilson S, and Swan G, 2023. A Complete Guide to Reptiles of Australia. 6th Ed. New Holland Publishers: Sydney NSW



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 500 1,000 1,500 2,000
metres

1:100,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- ENB-ENT 132kV Survey Area
- Soil Landscape Mapping - Systems (DPIRD-064)
  - Boothendarra System
  - Coalara System
  - Correy System
  - Eneabba Plain System
  - Mintaja Hills System
  - Yerramullah System

Land Systems - ENB-ENT 132kV

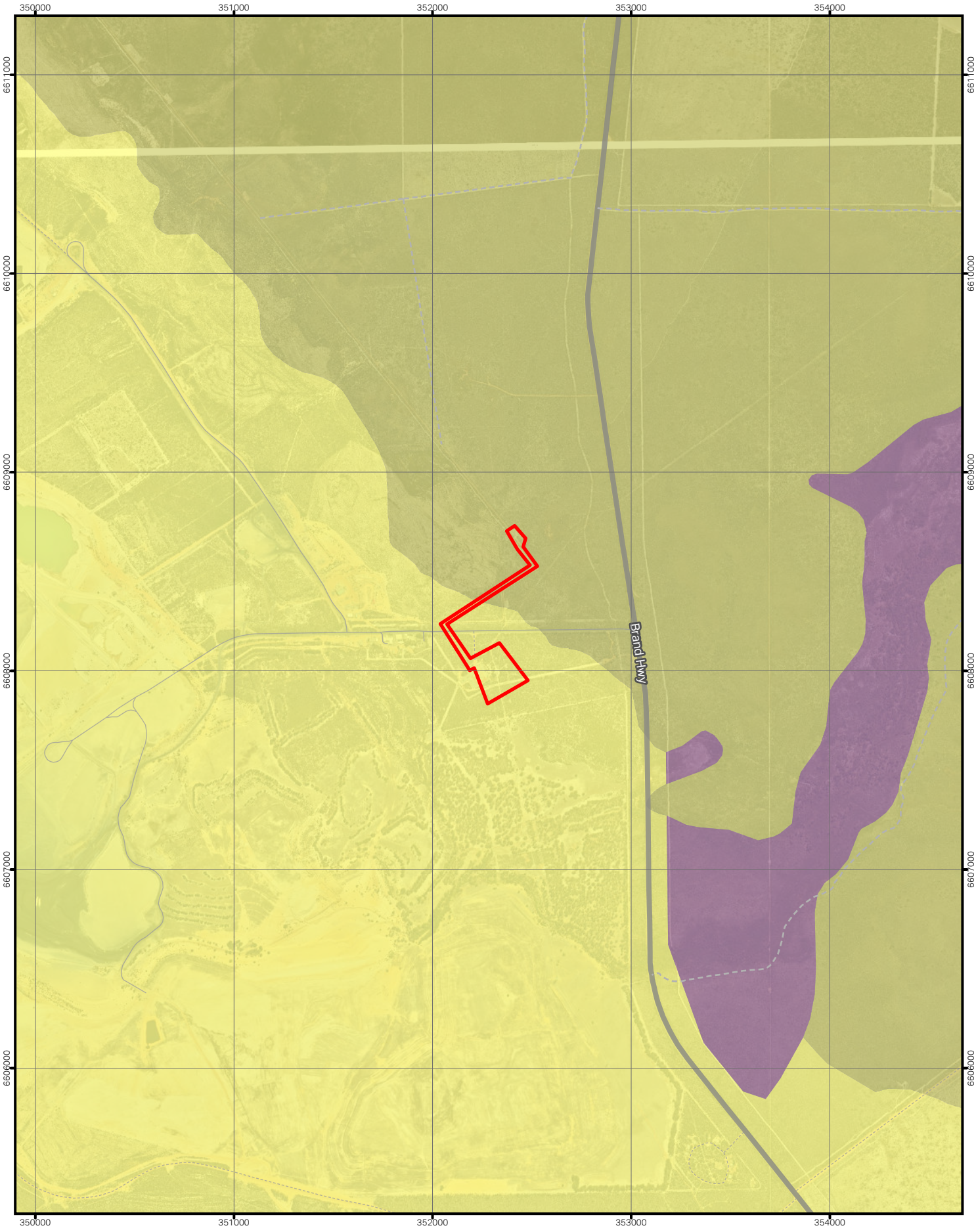
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 3.1

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig3_NREP_North_LandSystems_A4P_v1, Last exported: 20/05/2024 12:09 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Cataby Substation Survey Area

Soil Landscape Mapping - Systems (DPIRD-064)

- Bassendean System
- Nylagarda System
- Yerramullah System

Land Systems - Cataby

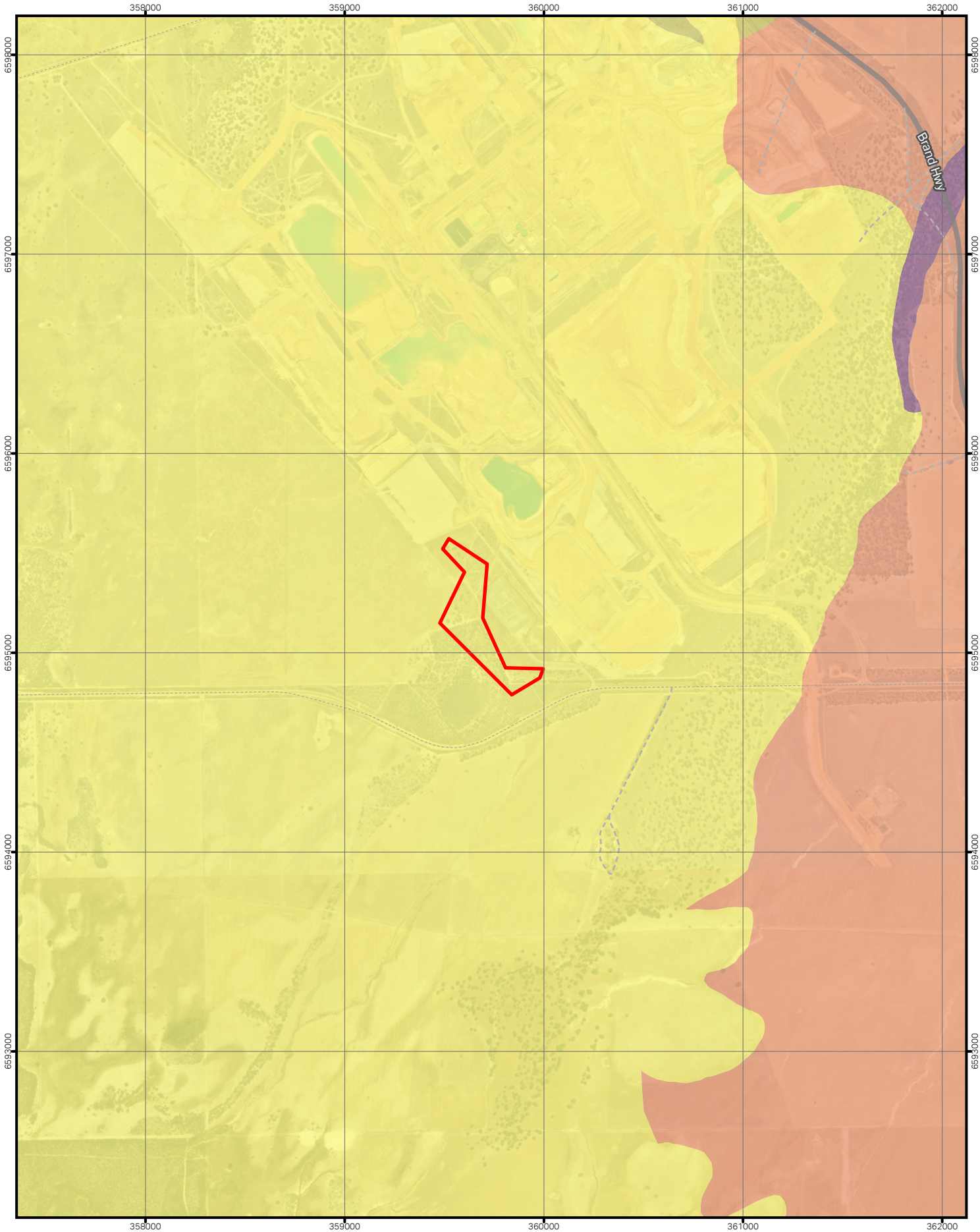
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 3.2

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig3_NREP_North_LandSystems_A4P_v1, Last exported: 20/05/2024 12:09 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Yandin Terminal Survey Area

Soil Landscape Mapping - Systems (DPIRD-064)

- Bassendean System
- Boothendarra System
- Nylagarda System
- Yerramullah System

Land Systems - Yandin

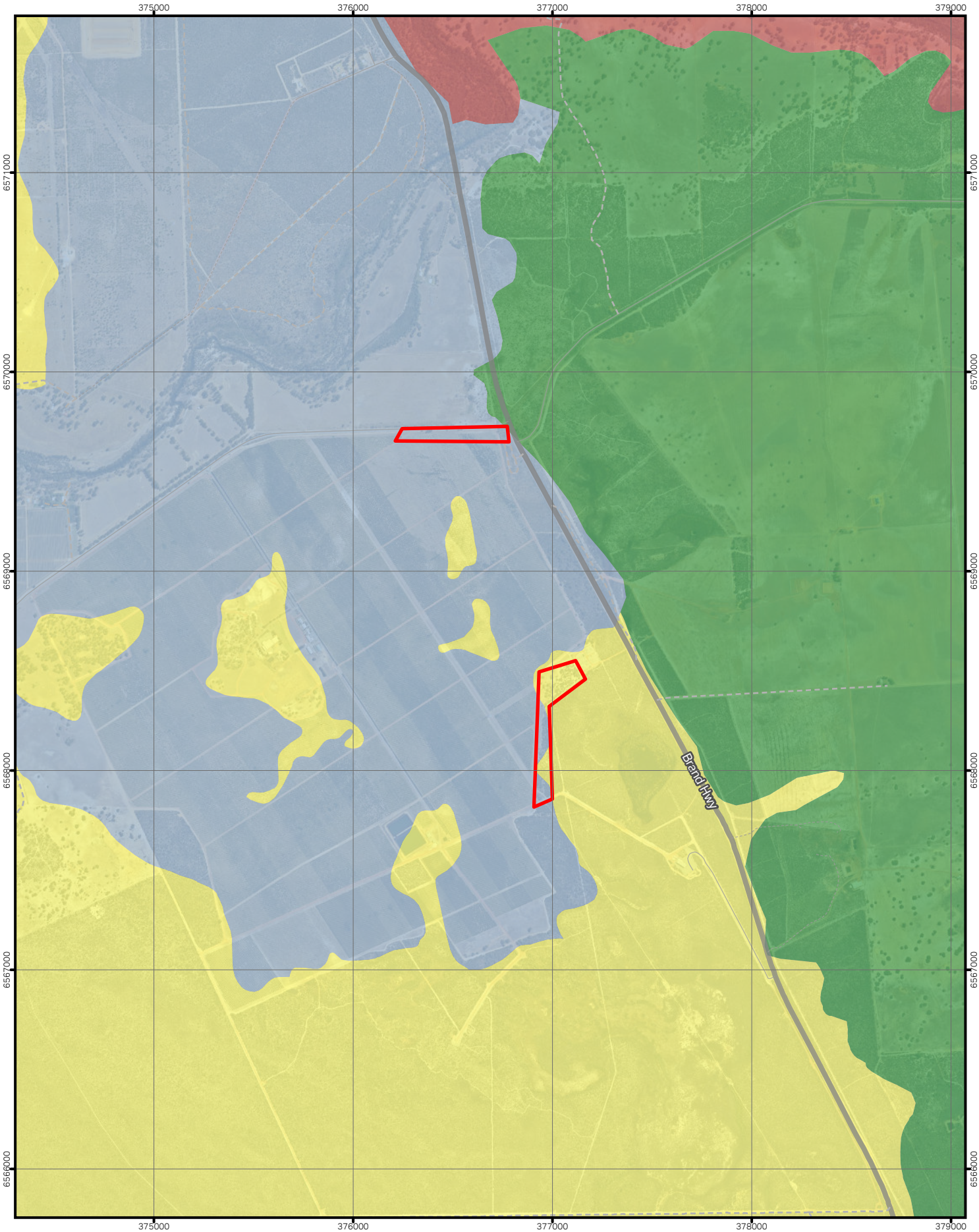
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 3.3

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig3_NREP_North_LandSystems_A4P_v1, Last exported: 20/05/2024 12:09 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Regans Terminal Survey Area

Soil Landscape Mapping - Systems (DPIRD-064)

- Bassendean System
- Capitella System
- Moochamulla System
- Moore River System

Land Systems - Regans

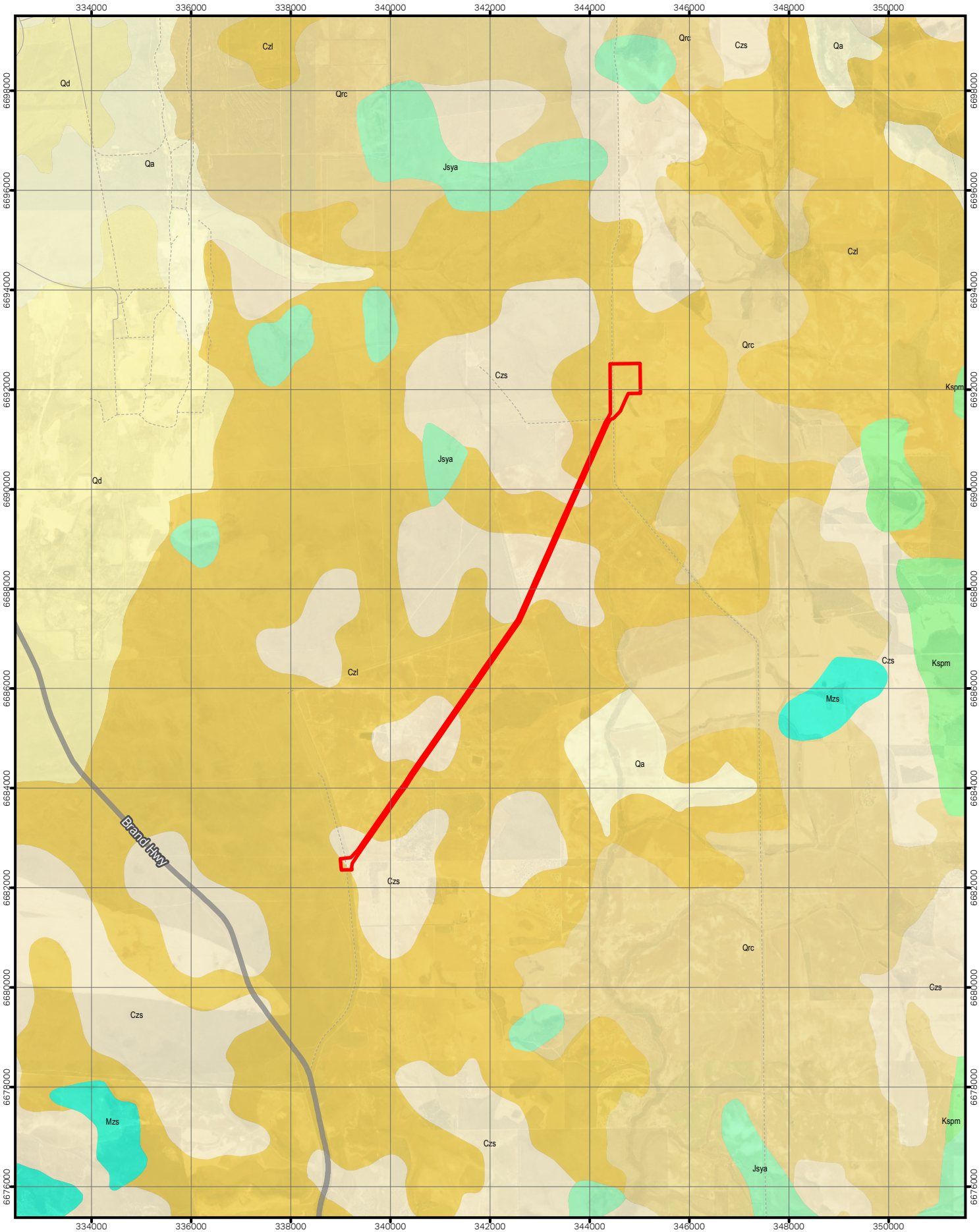
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 3.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig3_NREP_North_LandSystems_A4P_v1, Last exported: 20/05/2024 12:09 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 500 1,000 1,500 2,000

metres

1:100,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- ENB-ENT 132kV Survey Area
- Geoscience Australia (2012) Surface Geology of Australia, 1:1 000 000 scale, 2012 edition

QUATERNARY
- Qa

CENOZOIC
- Qd
- Qrc
- Czl
- Czs

CRETACEOUS
- Kspm

JUASSIC
- Jsya

MESOZOIC
- Mzs

Geology - ENB-ENT 132kV

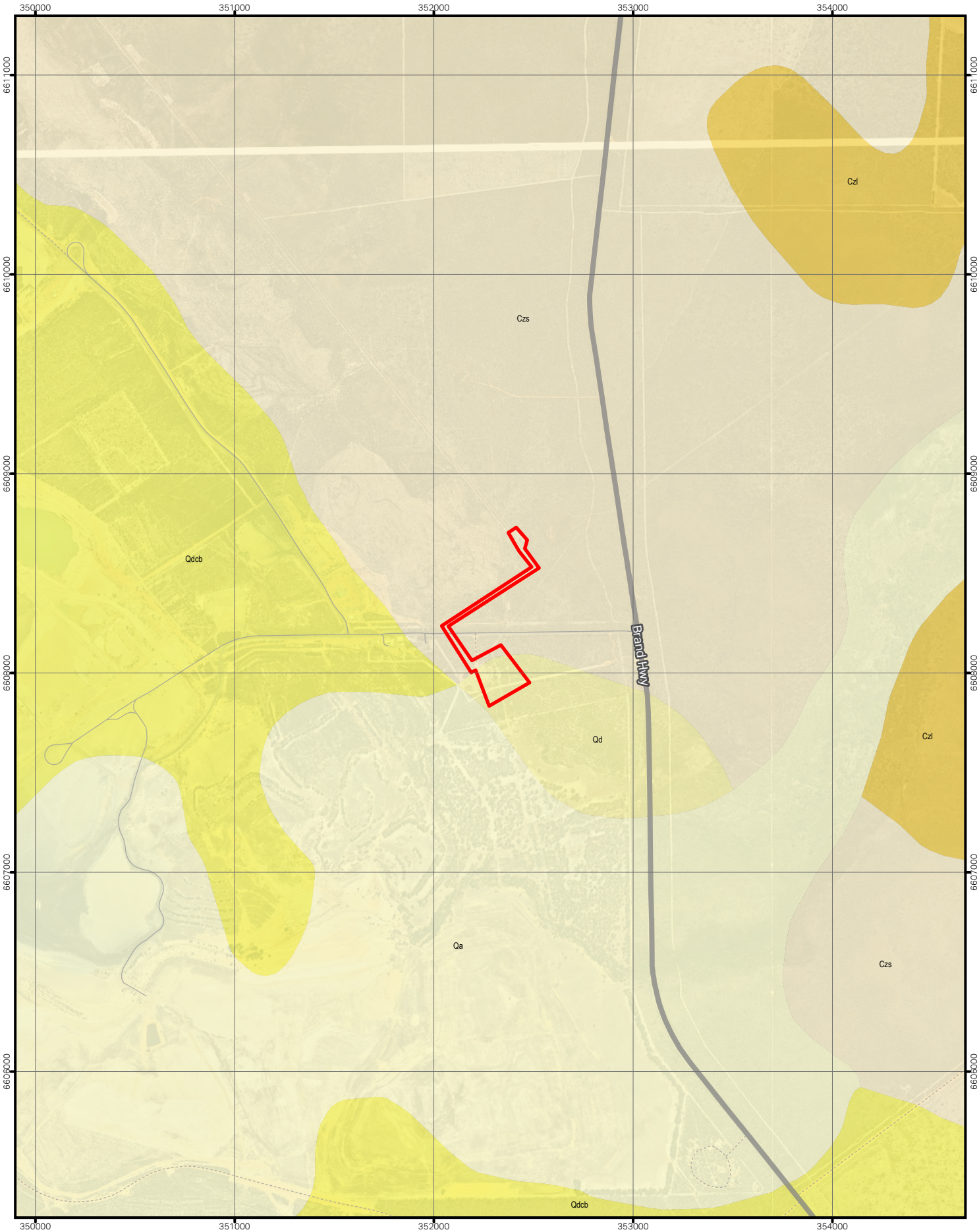
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 4.1

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig4_NREP_North_GeologySoils_A4P_v1, Last exported: 20/05/2024 12:13 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

Cataby Substation Survey Area

Geoscience Australia (2012) Surface Geology of Australia, 1:1 000 000 scale, 2012 edition

QUATERNARY

Qa

Qd

Qdcb

CENOZOIC

Czl

Czs

Geology - Cataby

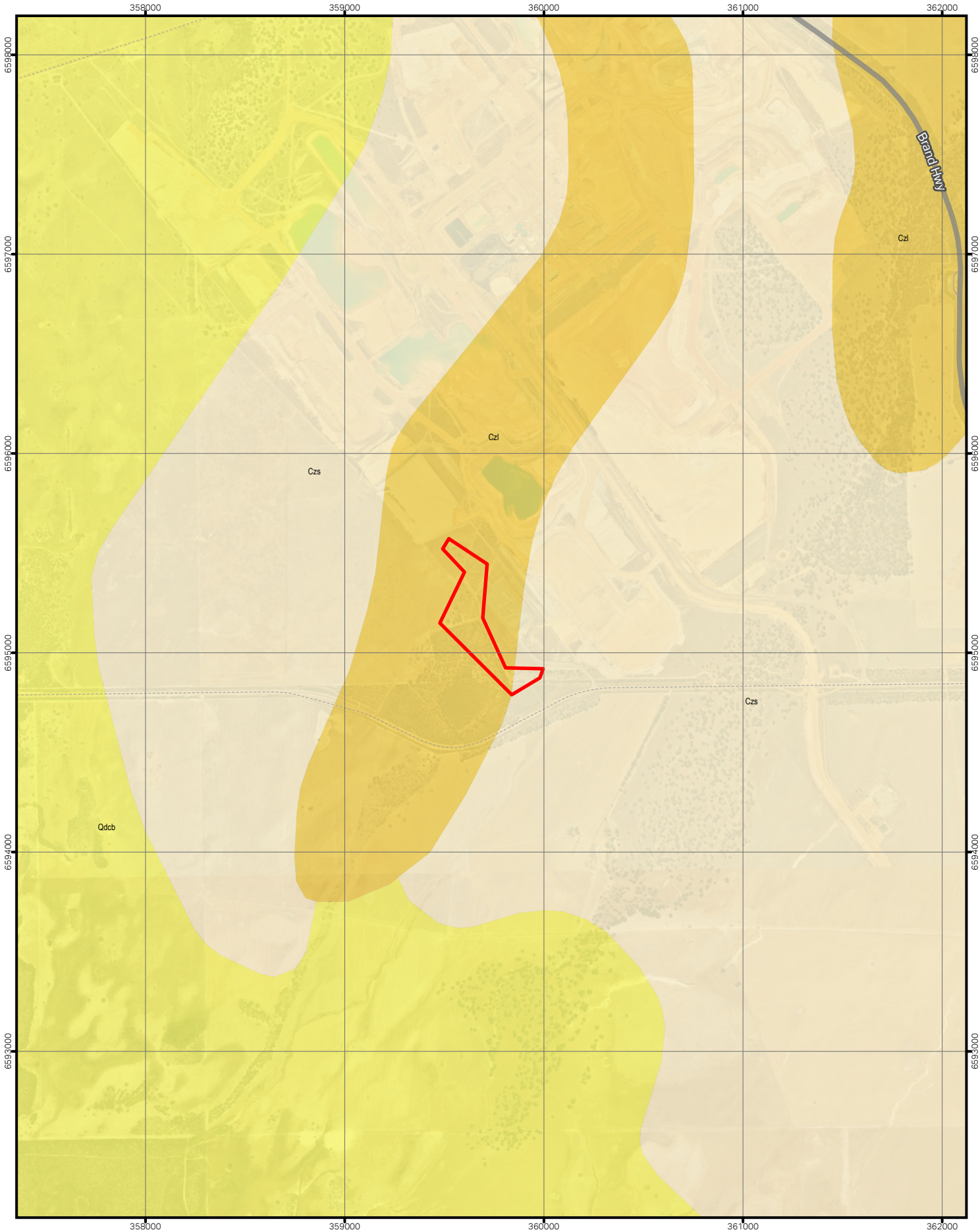
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
4.2

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig4_NREP_North_GeologySoils_A4P_v1, Last exported: 20/05/2024 12:13 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Yandin Terminal Survey Area

Geoscience Australia (2012) Surface Geology of Australia, 1:1 000 000 scale, 2012 edition

QUATERNARY

Qdcb

CENOZOIC

Czl

Czs

Geology - Yandin

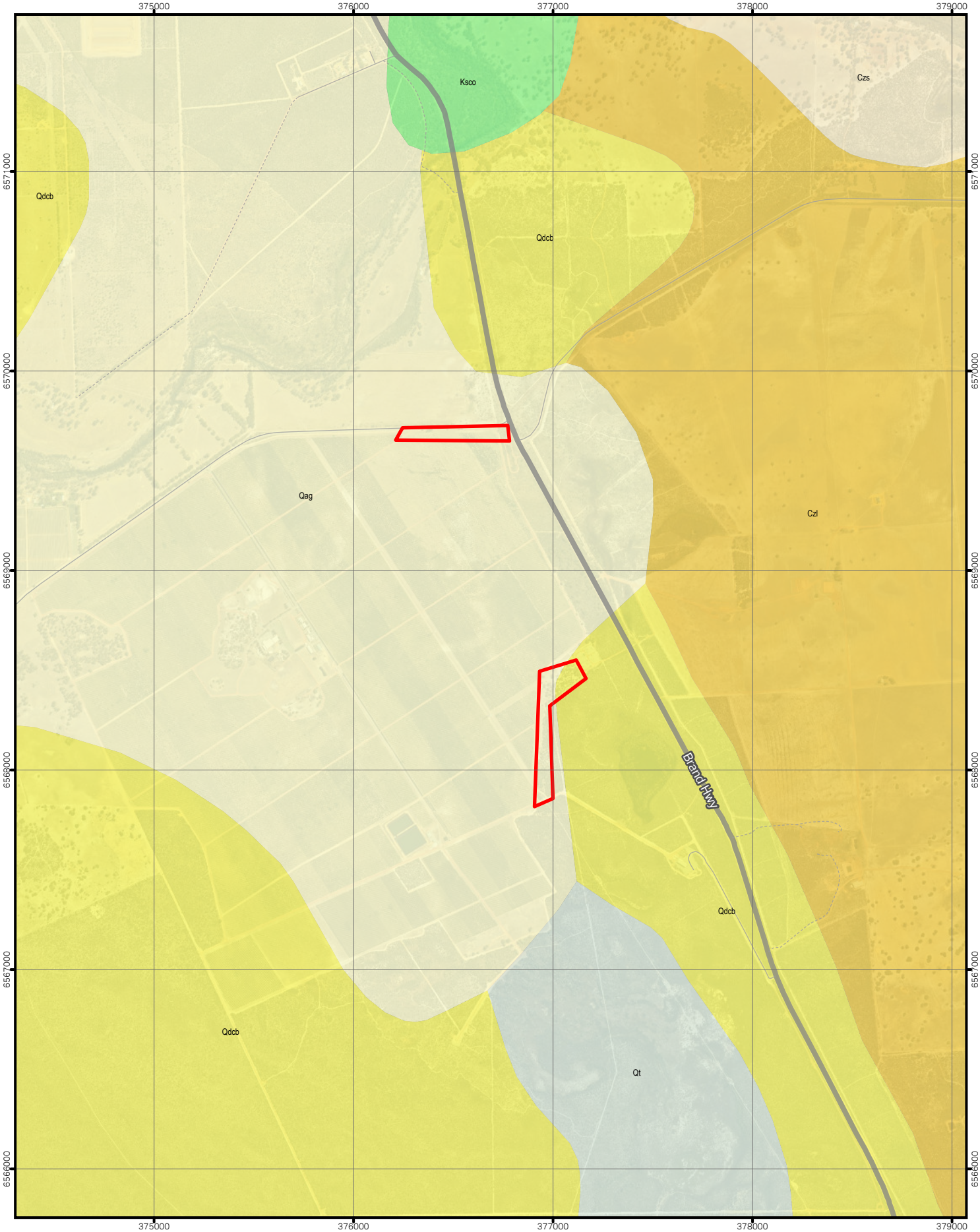
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 4.3

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig4_NREP_North_GeologySoils_A4P_v1, Last exported: 20/05/2024 12:13 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

Regans Terminal Survey Area

Geoscience Australia (2012) Surface Geology of Australia, 1:1 000 000 scale, 2012 edition

QUATERNARY

Qag

Qdcb

Qt

CENOZOIC

Czl

Czs

CRETACEOUS

Ksco

Geology - Regans

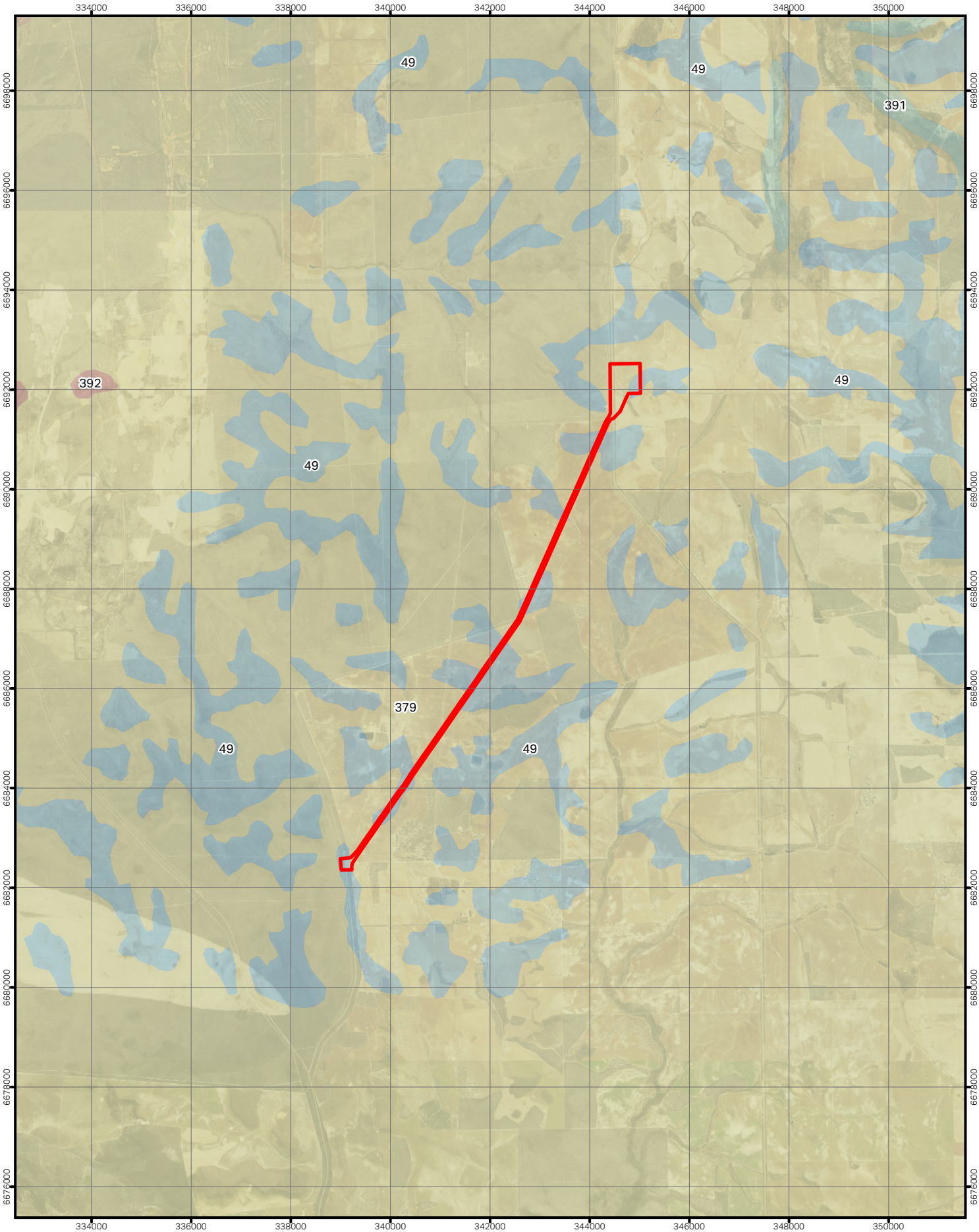
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
4.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig4_NREP_North_GeologySoils_A4P_v1, Last exported: 20/05/2024 12:13 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

1:100,000 (when printed at A4)

0 500 1,000 1,500 2,000 metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

- ENB-ENT 132kV Survey Area

Pre-European Vegetation (DPIRD-006)

- 49,Heath,Low shrubs of mixed composition.
- 378,Scrub-heath,Mixed heath with scattered tall shrubs Acacia spp., PROTEACEAE and MYRTACEAE.
- 379,Scrub-heath,Mixed heath with scattered tall shrubs Acacia spp., PROTEACEAE and MYRTACEAE.
- 391,Thicket,Wattle, casuarina and teatree acacia-allocasuarina-melaleuca alliance.
- 392,Thicket,Wattle, casuarina and teatree acacia-allocasuarina-melaleuca alliance.

Pre-European Vegetation - ENB-ENT 132kV

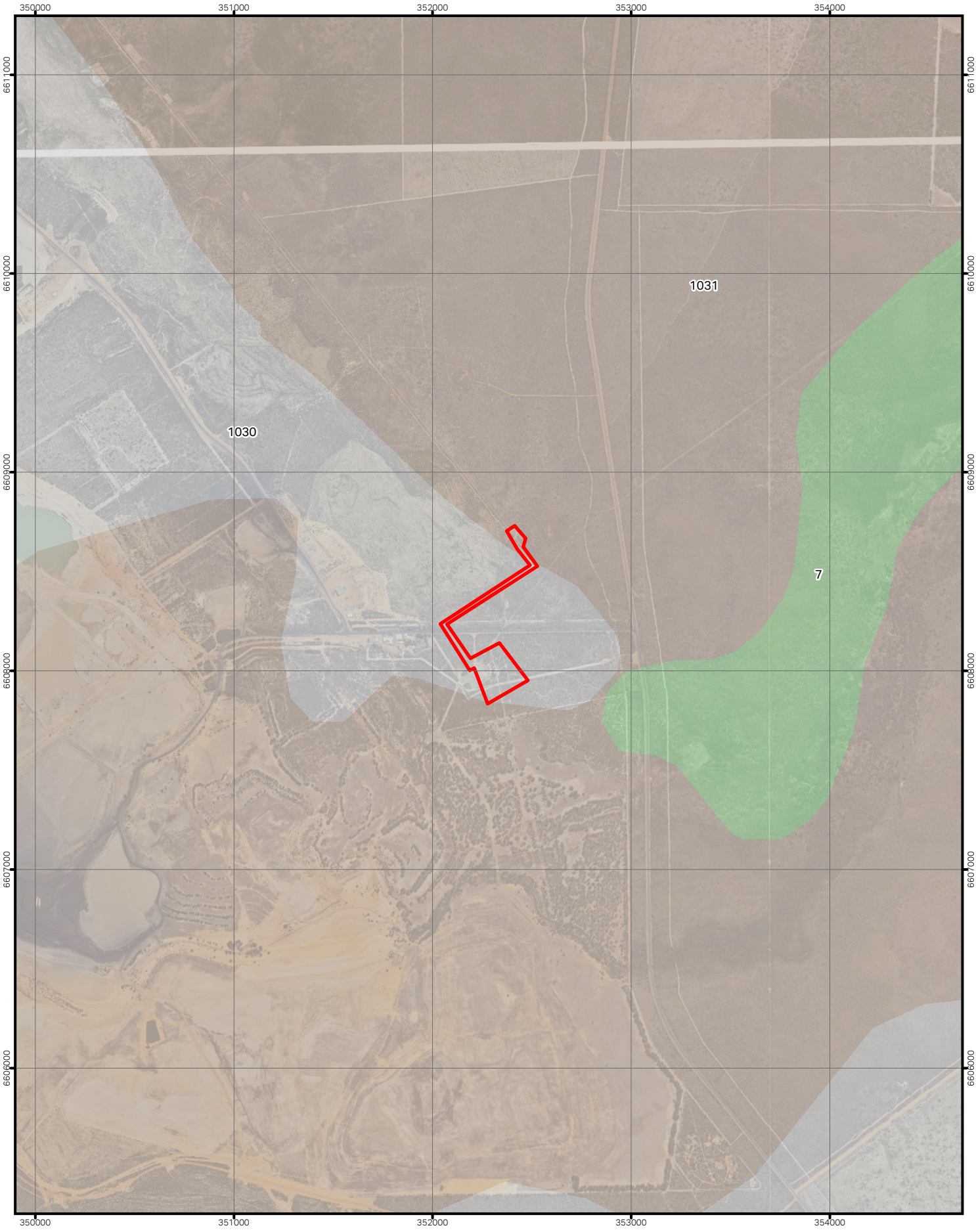
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 5.1

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2), Layout: G60713462_Fig5_NREP_North_PreEuropVeg_A4P_v1, Last exported: 20/05/2024 12:19 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

1:25,000
(when printed at A4)

0 125 250 375 500
metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

- Cataby Substation Survey Area

Pre-European Vegetation (DPIRD-006)

- 7,Woodland other,Wheatbelt; York gum, salmon gum etc. Eucalyptus loxophleba, E. salmonophloia. Goldfields; gimlet, redwood etc. E. salubris, E. oleosa. Riverine; rivergum E. camaldulensis. Tropical; messmate, woolyb
- 1030,Low woodland or open low woodland,Other acacia, banksia, peppermint, cypress pine, casuarina, York gum Acacia spp., Banksia spp., Agonis flexuosa, Callitris spp., Allocasuarina spp., Eucalyptus loxophleba.
- 1031,Scrub-heath / Heath,

Pre-European Vegetation - Cataby

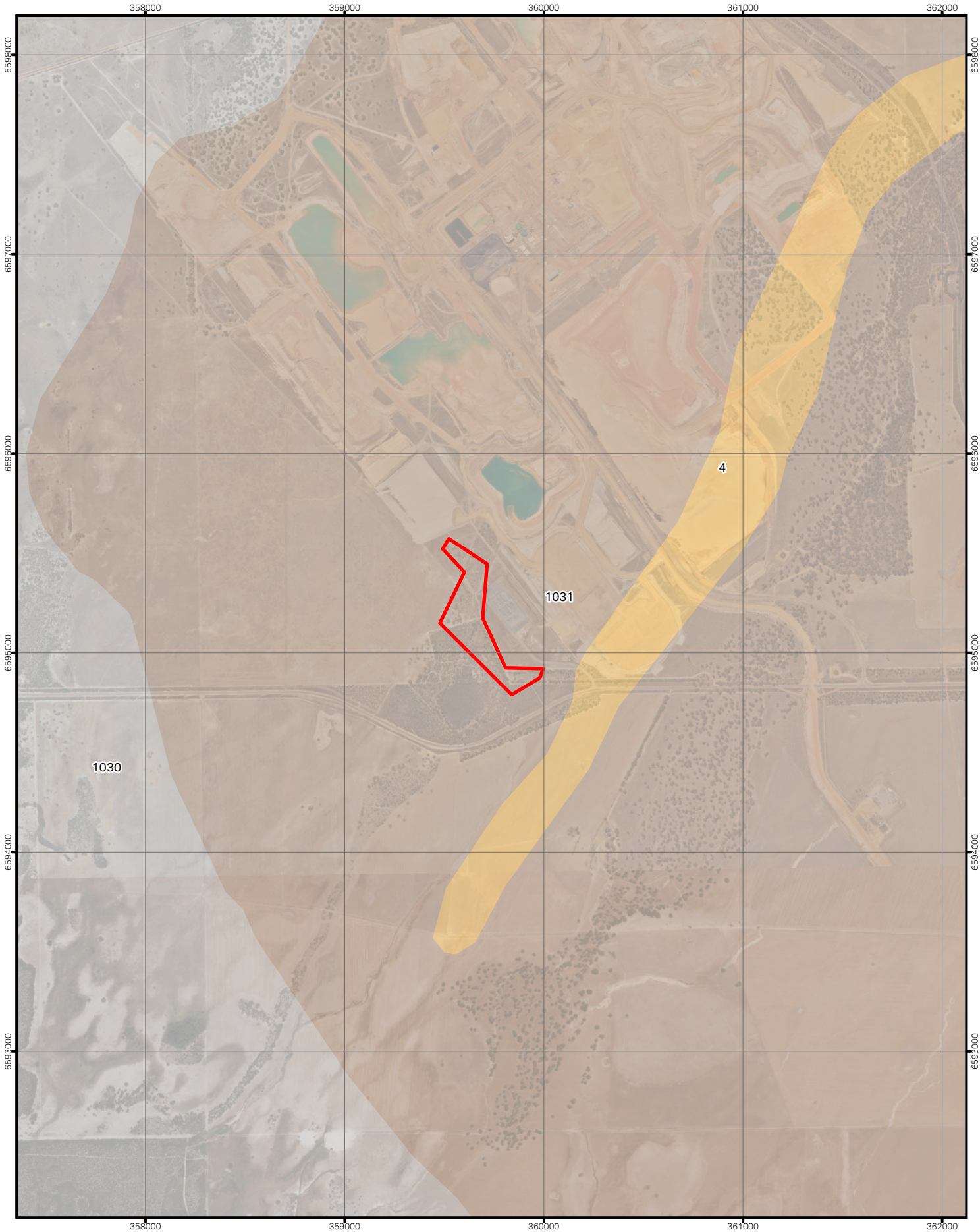
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 5.2

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig5_NREP_North_PreEuropVeg_A4P_v1, Last exported: 20/05/2024 12:19 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 125 250 375 500
metres

1:25,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- Yandin Terminal Survey Area

Pre-European Vegetation (DPIRD-006)

- 4,Woodland southwest,Jarrah, marri and wandoo Eucalyptus marginata, Corymbia calophylla, E. wandoo.
- 1030,Low woodland or open low woodland,Other acacia, banksia, peppermint, cypress pine, casuarina, York gum Acacia spp., Banksia spp., Agonis flexuosa, Callitris spp., Allocasuarina spp., Eucalyptus loxophleba.
- 1031,Scrub-heath / Heath,

Pre-European Vegetation - Yandin

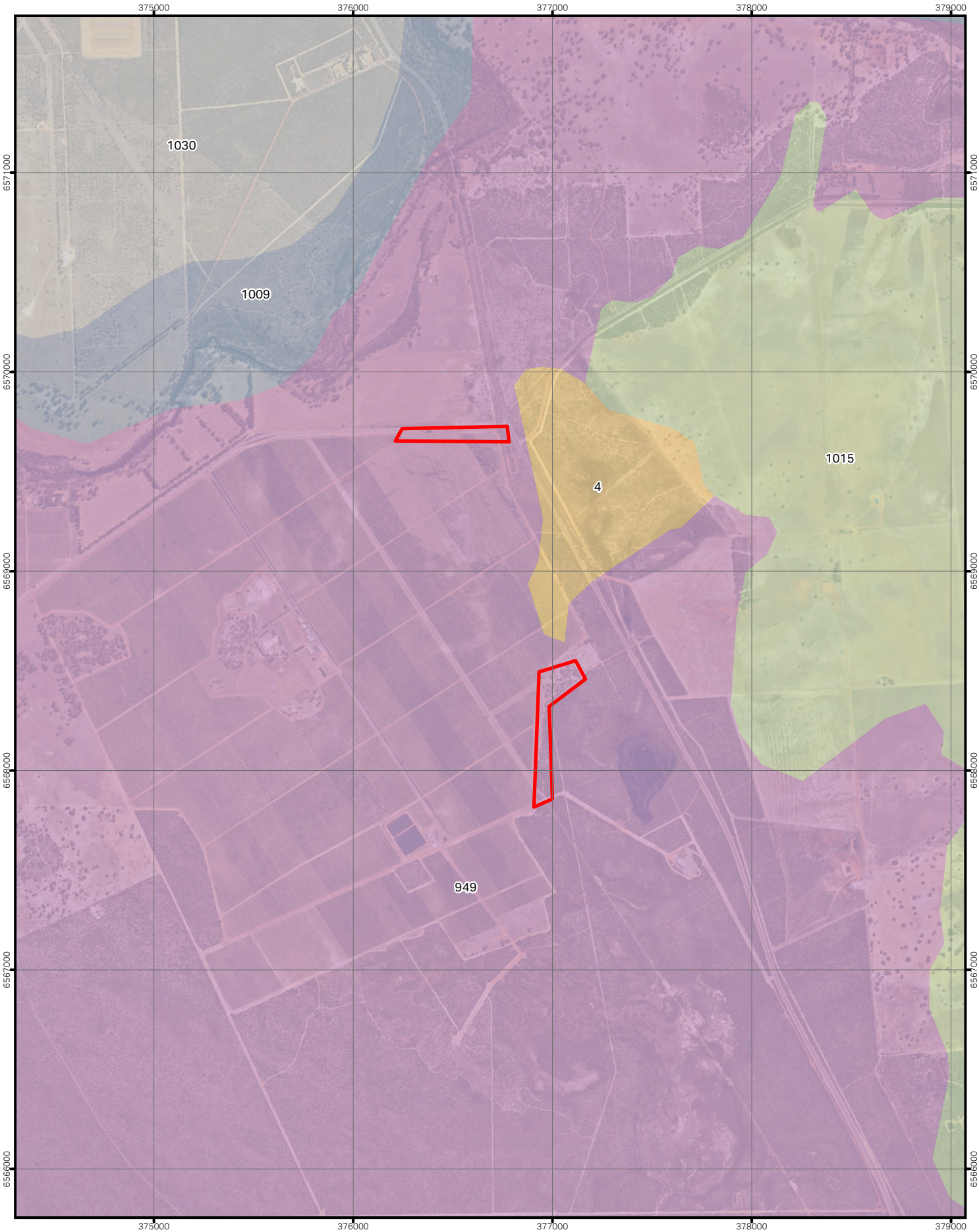
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
5.3

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig5_NREP_North_PreEuropVeg_A4P_v1, Last exported: 20/05/2024 12:19 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

1:25,000
(when printed at A4)

0 125 250 375 500
metres

GDA2020 MGA ZONE 50

LEGEND

- Regans Terminal Survey Area

Pre-European Vegetation (DPIRD-006)

- 4,Woodland southwest,Jarrah, marri and wandoo Eucalyptus marginata, Corymbia calophylla, E. wandoo.
- 949,Low woodland or open low woodland,Other acacia, banksia, peppermint, cypress pine, casuarina, York gum Acacia spp., Banksia spp., Agonis flexuosa, Callitris spp., Allocasuarina spp., Eucalyptus loxophleba.
- 1009,Woodland southwest,Jarrah, marri and wandoo Eucalyptus marginata, Corymbia calophylla, E. wandoo.
- 1015,Scrub-heath / Heath,
- 1030,Low woodland or open low woodland,Other acacia, banksia, peppermint, cypress pine, casuarina, York gum Acacia spp., Banksia spp., Agonis flexuosa, Callitris spp., Allocasuarina spp., Eucalyptus loxophleba.

Pre-European Vegetation - Regans

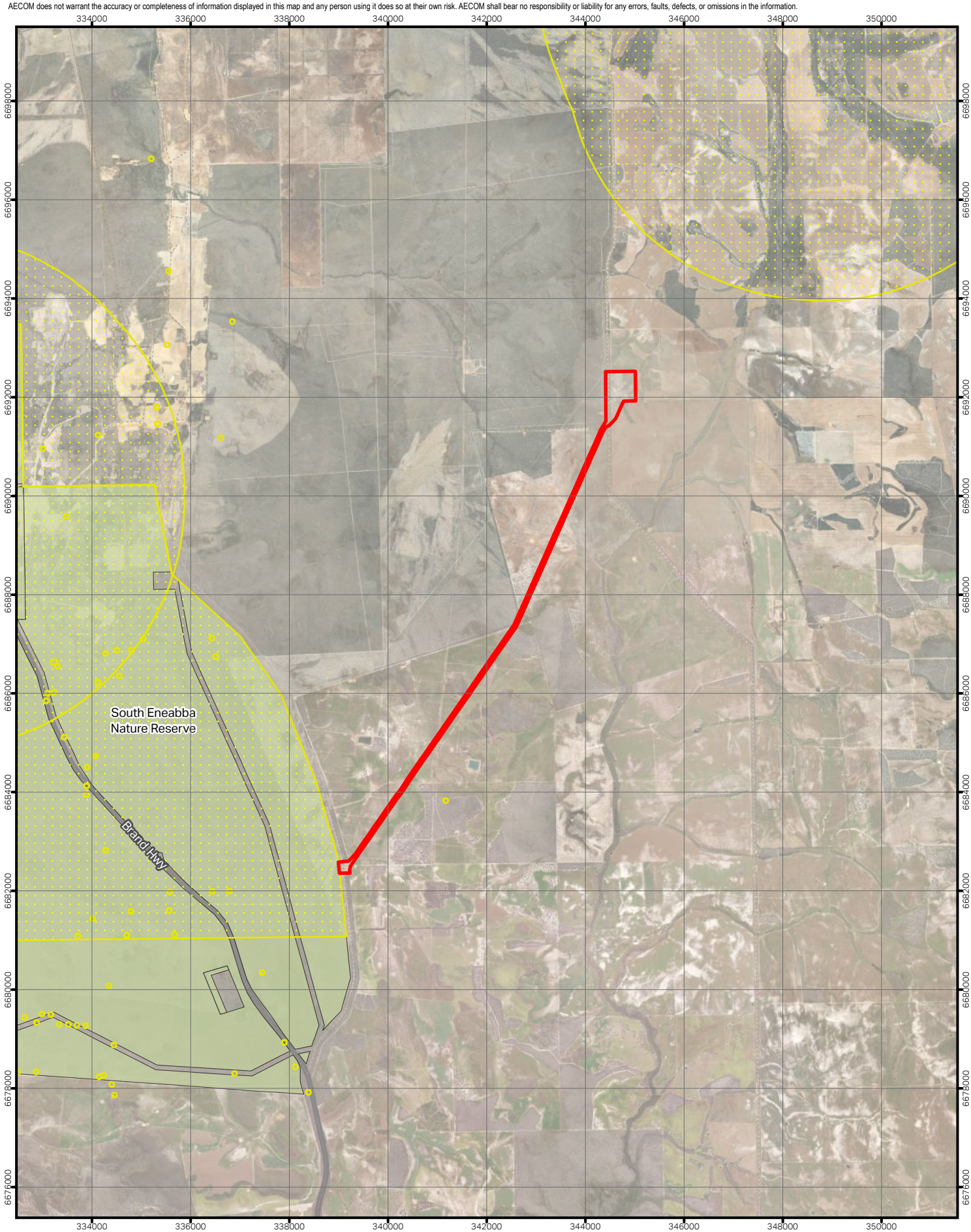
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
5.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig5_NREP_North_PreEuropVeg_A4P_v1, Last exported: 20/05/2024 12:19 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

1:100,000
(when printed at A4)

0 500 1,000 1,500 2,000
metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: World Imagery: Earthstar Geographics

LEGEND

- ENB-ENT 132kV Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- Nature Reserve
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

Conservation Reserves and ESAs - ENB-ENT 132kV

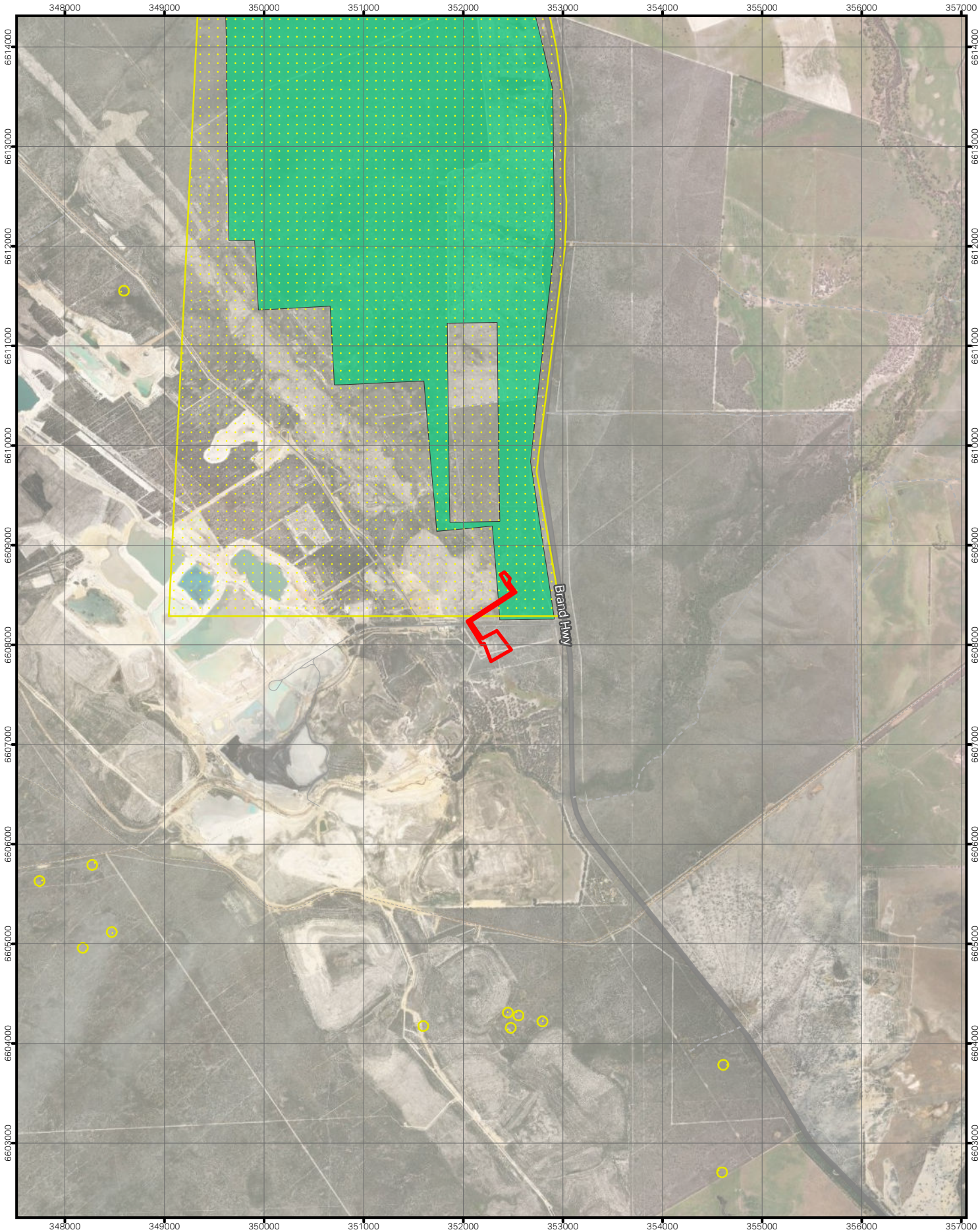
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 6.1

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig6_NREP_North_ConsEstates_ESAs_A4P_v1, Last exported: 20/05/2024 12:46 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 250 500 750 1,000
metres

1:50,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- Cataby Substation Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- Conservation Park
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

Conservation Reserves and ESAs - Cataby

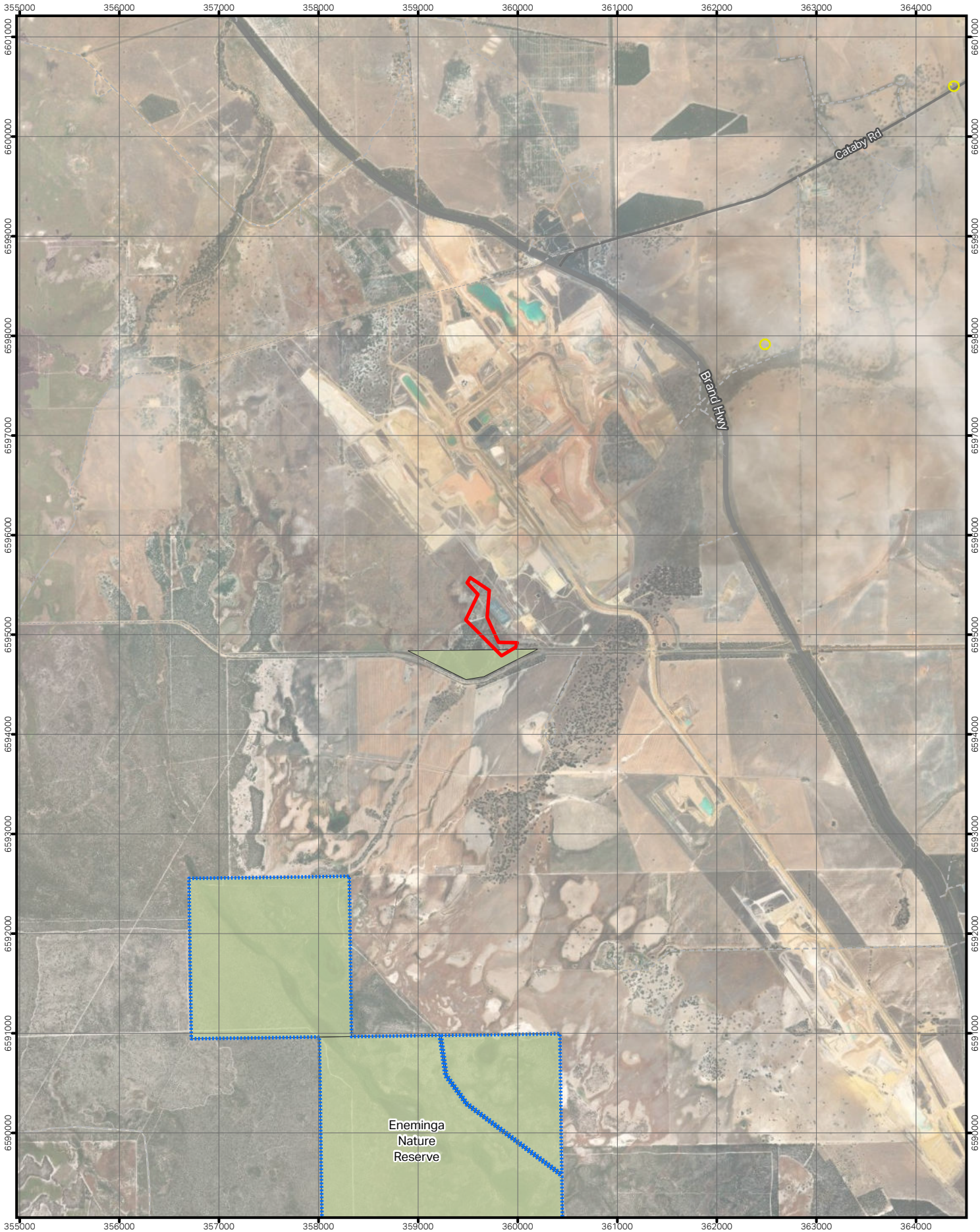
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 6.2

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig6_NREP_North_ConsEstates_ESAs_A4P_v1, Last exported: 20/05/2024 12:46 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

0 250 500 750 1,000
metres

1:50,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- Yandin Terminal Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- Nature Reserve
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- A Class Reserve

Conservation Reserves and ESAs - Yandin

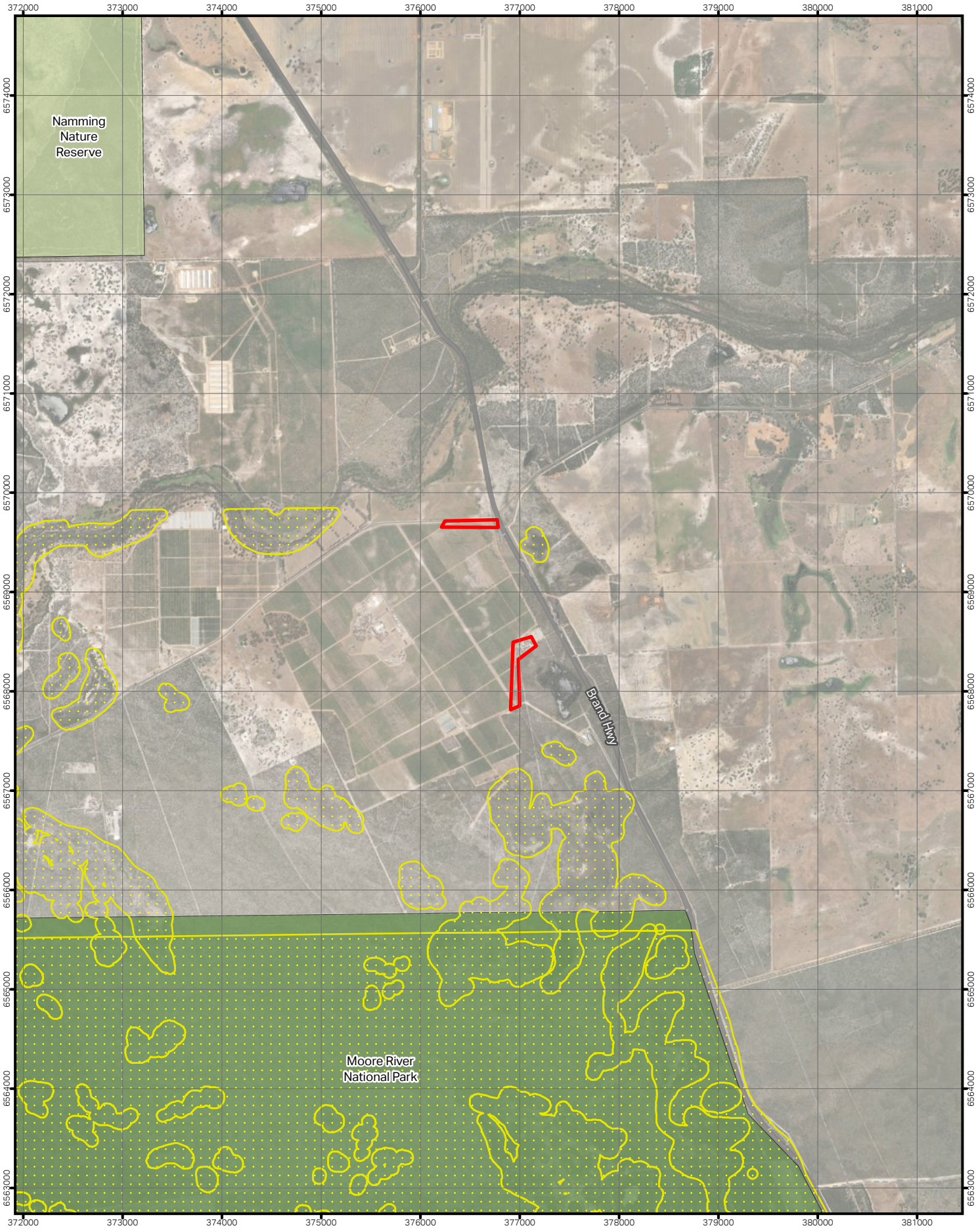
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
6.3

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig6_NREP_North_ConsEstates_ESAs_A4P_v1, Last exported: 20/05/2024 12:46 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	20 MAY 2024	**APPROVED BY**	INITIALS

N

1:50,000
(when printed at A4)

0 250 500 750 1,000
metres

GDA2020 MGA ZONE 50

LEGEND

- Regans Terminal Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- National Park
- Nature Reserve
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

Conservation Reserves and ESAs - Regans

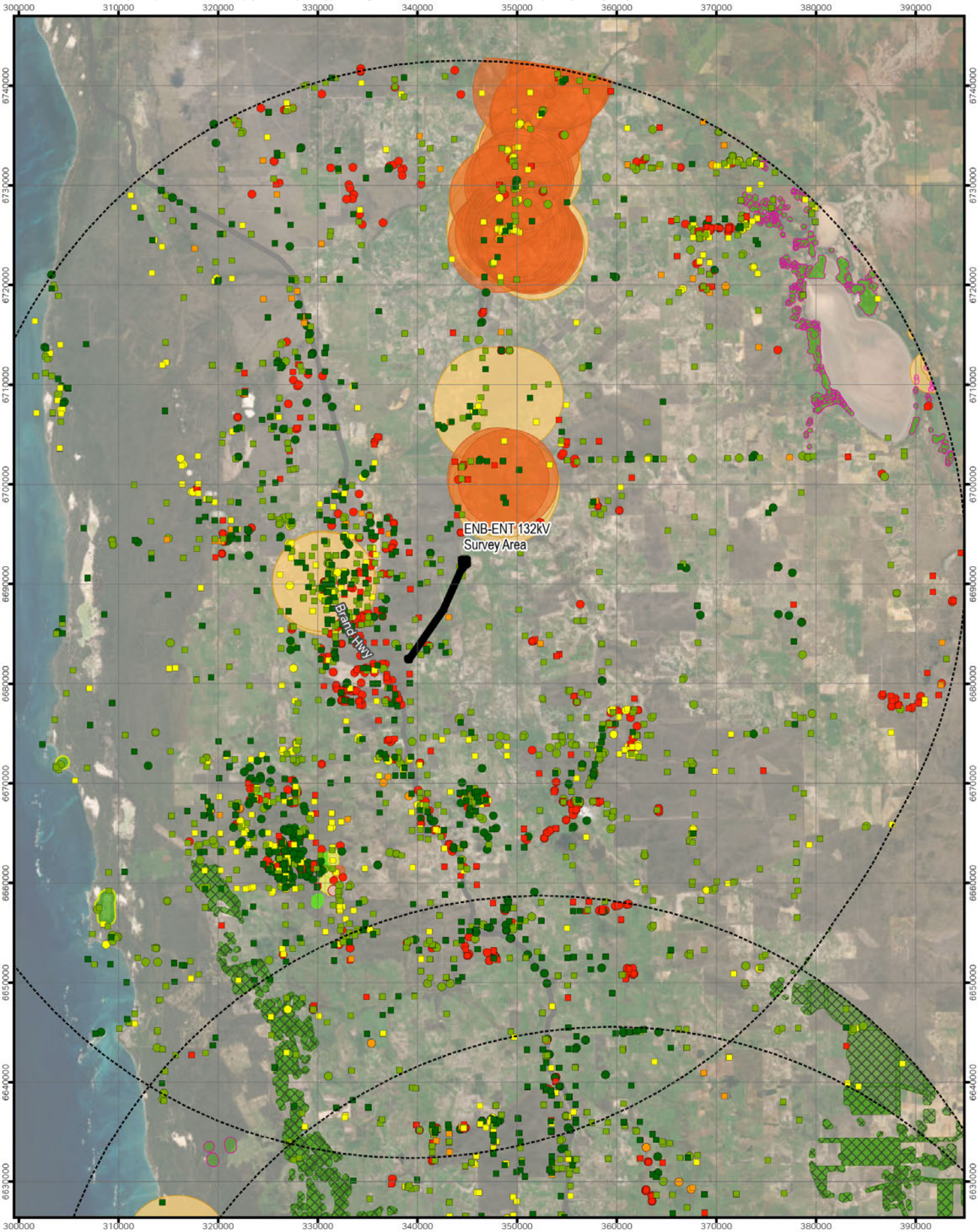
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
6.4

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig6_NREP_North_ConsEstates_ESAs_A4P_v1, Last exported: 20/05/2024 12:46 PM



AECOM Delivering a better world

PROJECT ID	60713462	CREATED BY	WYATTK2
DATE MODIFIED	21 MAY 2024	APPROVED BY	F. DE WIT

N

0 2.5 5 7.5 10
km

1:500,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- Survey Area 50km Buffer
- Survey Areas

WA Herbarium database (WAHERB)
- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)
- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)
- Critically Endangered
- Endangered
- Vulnerable
- Priority 1
- Priority 2
- Priority 3

TEC / PEC (Federally Listed)
- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Desktop Flora, Communities and Fauna

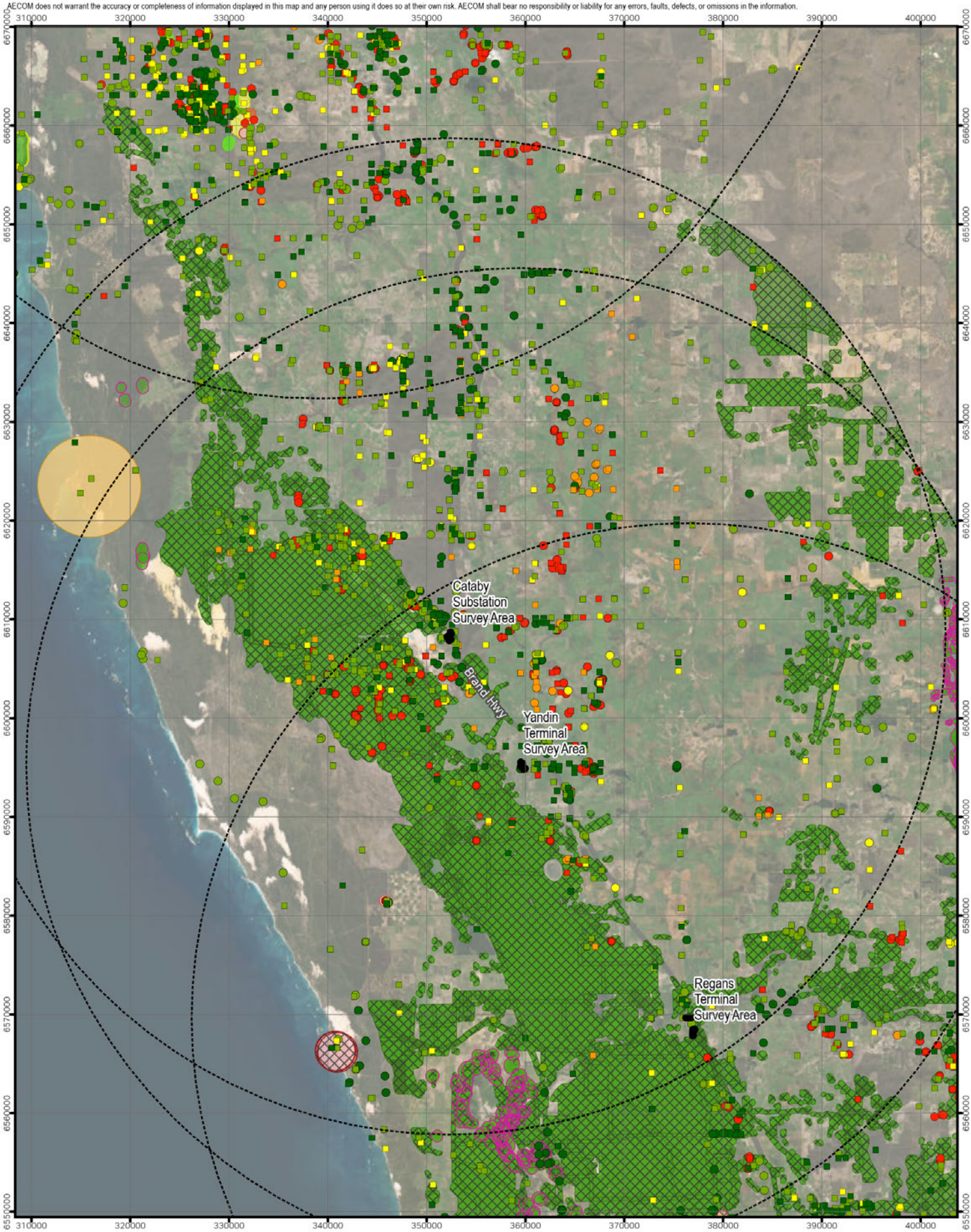
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7.1**

Project: \\na.aecomnet.com\fs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig7a_NREP_North_FloraDesktopDBCA_A4P_v1, Last exported: 21/05/2024 2:44 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	CREATED BY	WYATTK2
DATE MODIFIED	21 MAY 2024	APPROVED BY	F. DE WIT

N

0 2.5 5 7.5 10 km

1:500,000 (when printed at A4)

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: World Imagery: Earthstar Geographics\World Imagery Maxar\WMS

LEGEND

- Survey Area 50km Buffer
- Survey Areas

WA Herbarium database (WAHERB)
- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)
- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)
- Critically Endangered
- Endangered
- Vulnerable
- Priority 1
- Priority 2
- Priority 3

TEC / PEC (Federally Listed)
- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Desktop Flora, Communities and Fauna

WESTERN POWER

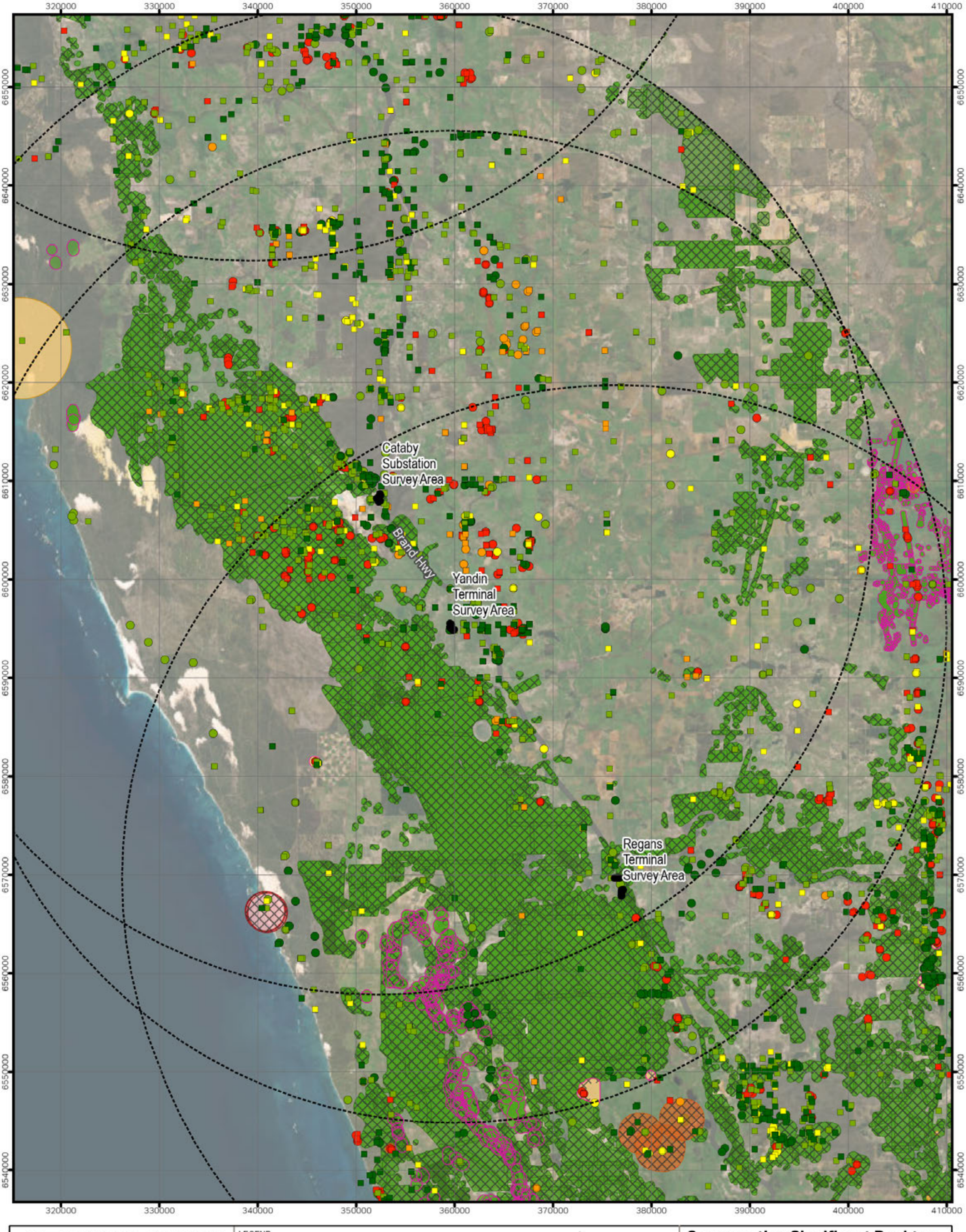
CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7.2**

Project: \\na.aecomnet.com\fs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig7a_NREP_North_FloraDesktopDBCA_A4P_v1, Last exported: 21/05/2024 2:44 PM

A4 size

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.



AECOM Delivering a better world

PROJECT ID	60713462	CREATED BY	WYATTK2
DATE MODIFIED	21 MAY 2024	APPROVED BY	F. DE WIT

N

1:500,000 (when printed at A4)

0 2.5 5 7.5 10 km

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

Service Layer Credits: World Imagery, Earthstar Geographics World Imagery, Maxar (WMS)

LEGEND

- Survey Area 50km Buffer
- Survey Areas

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Vulnerable
- Priority 1
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered

Conservation Significant Desktop Flora, Communities and Fauna

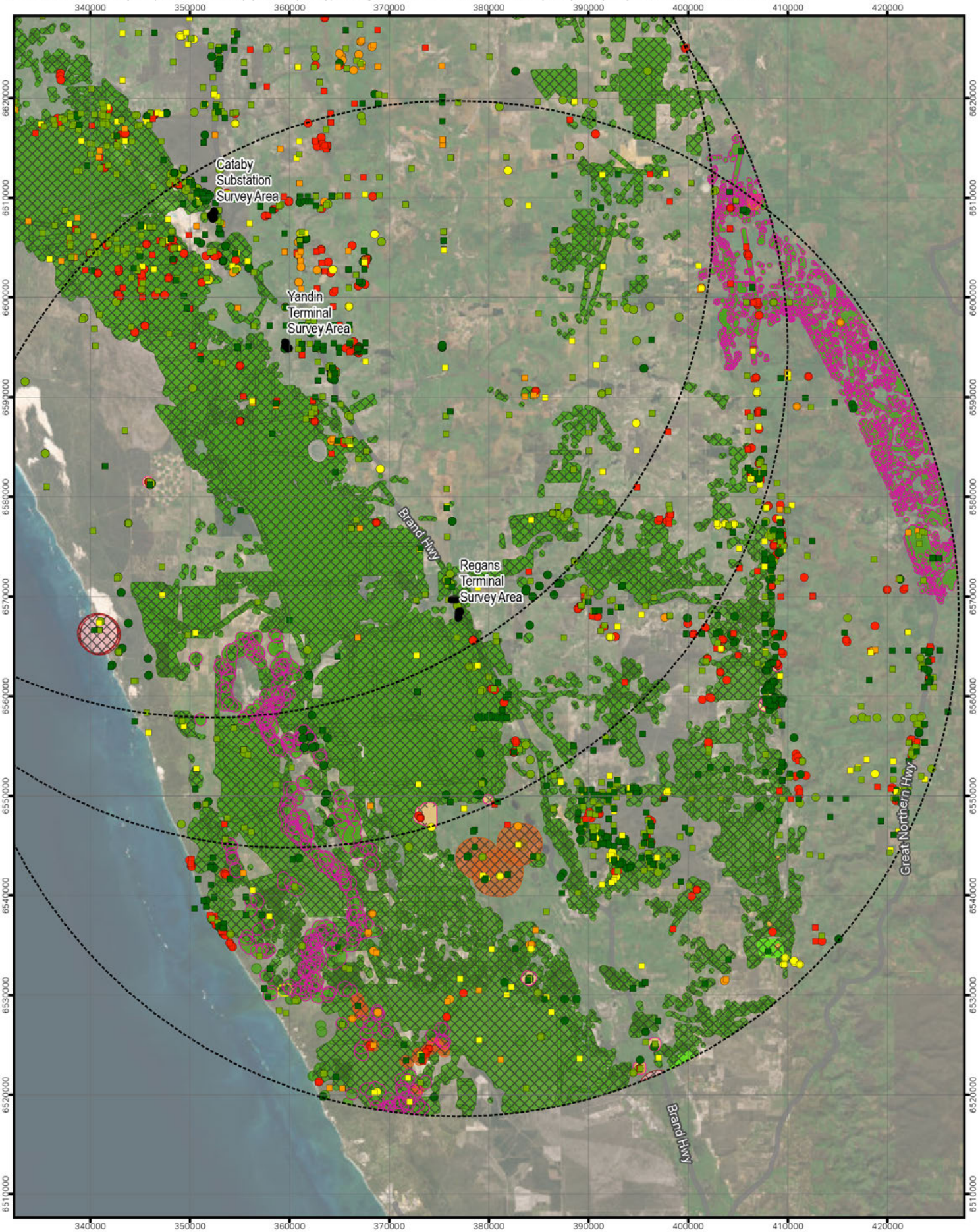
WESTERN POWER

CEL - NORTH FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7.3**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2), Layout: G60713462_Fig7a_NREP_North_FloraDesktopDBCA_A4P_v1, Last exported: 21/05/2024 2:44 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	CREATED BY	WYATTK2
DATE MODIFIED	21 MAY 2024	APPROVED BY	F. DE WIT

N

0 2.5 5 7.5 10 km

1:500,000 (when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

- Survey Area 50km Buffer
- Survey Areas

WA Herbarium database (WAHERB)
- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)
- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)
- Critically Endangered
- Endangered
- Vulnerable
- Priority 1
- Priority 2
- Priority 3

TEC / PEC (Federally Listed)
- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Desktop Flora, Communities and Fauna

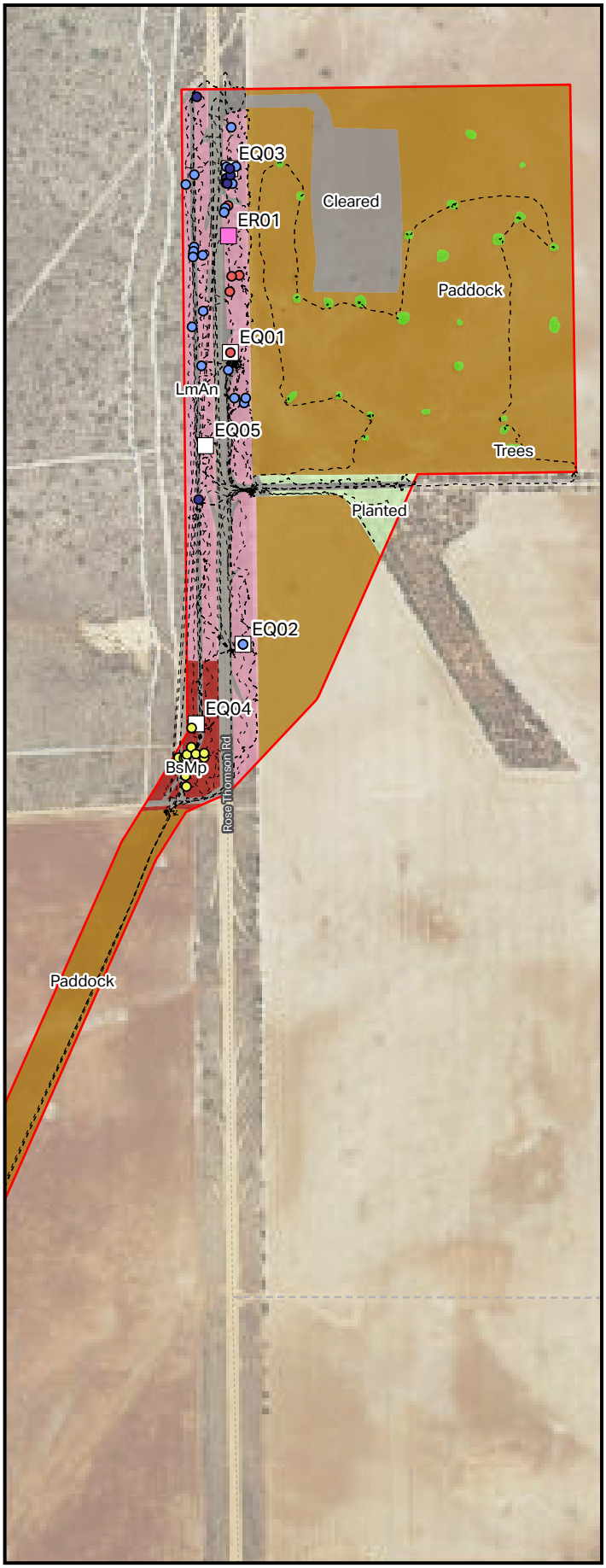
WESTERN POWER

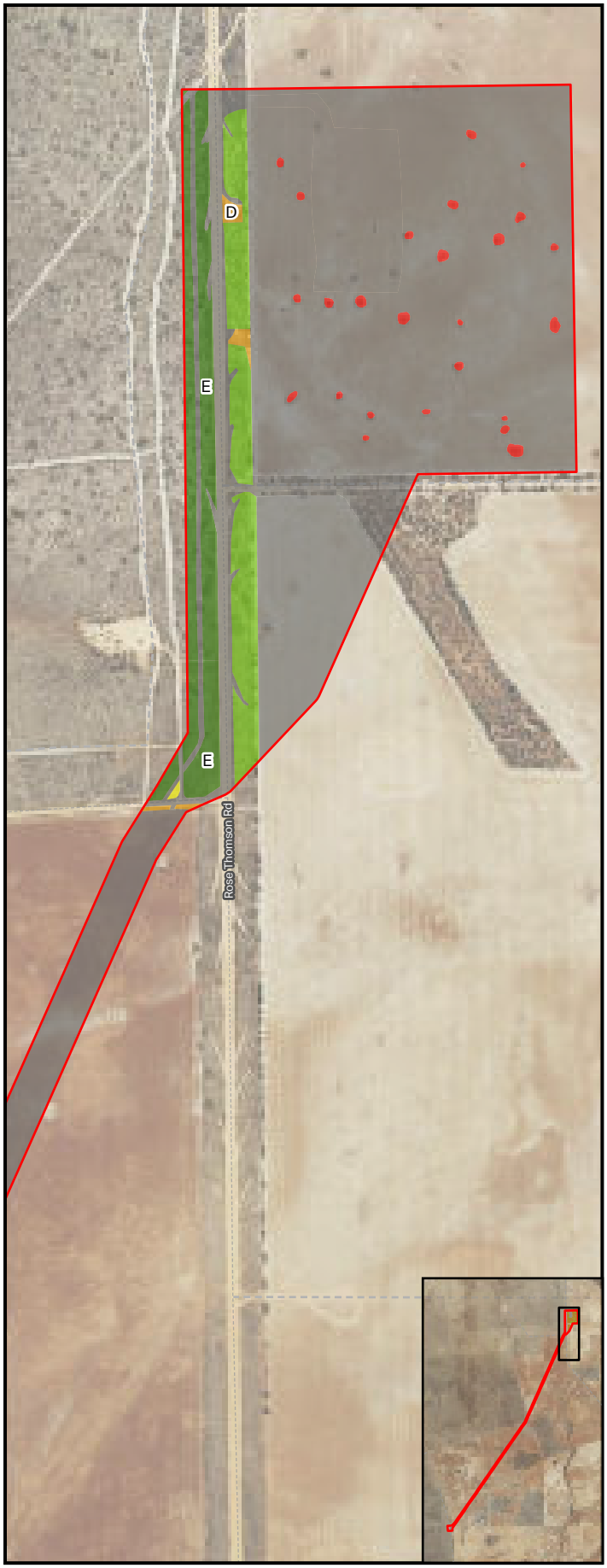
CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7.4**

Project: \\na.aecomnet.com\fs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig7a_NREP_North_FloraDesktopDBCA_A4P_v1, Last exported: 21/05/2024 2:44 PM

A4 size





AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

0 50 100 150 200
metres

1:10,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area

Sample Sites
- Quadrat
- Relevé
- Tracklogs

Significant Flora (AECOM, 2023)
- *Banksia cypholoba*,P3
- *Banksia fraseri* var. *crebra*,P3
- *Hemiandra* sp. Eneabba (H. Demarz 3687),P3
- *Lepidobolus quadratus*,P3
- *Phlebocarya pilosissima* subsp. *pilosissima*,P3

Vegetation Community
- BsMp
- LmAn
- Paddock
- Planted
- Trees
- Cleared

Vegetation Condition
- Excellent
- Very Good
- Good
- Degraded
- Completely Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

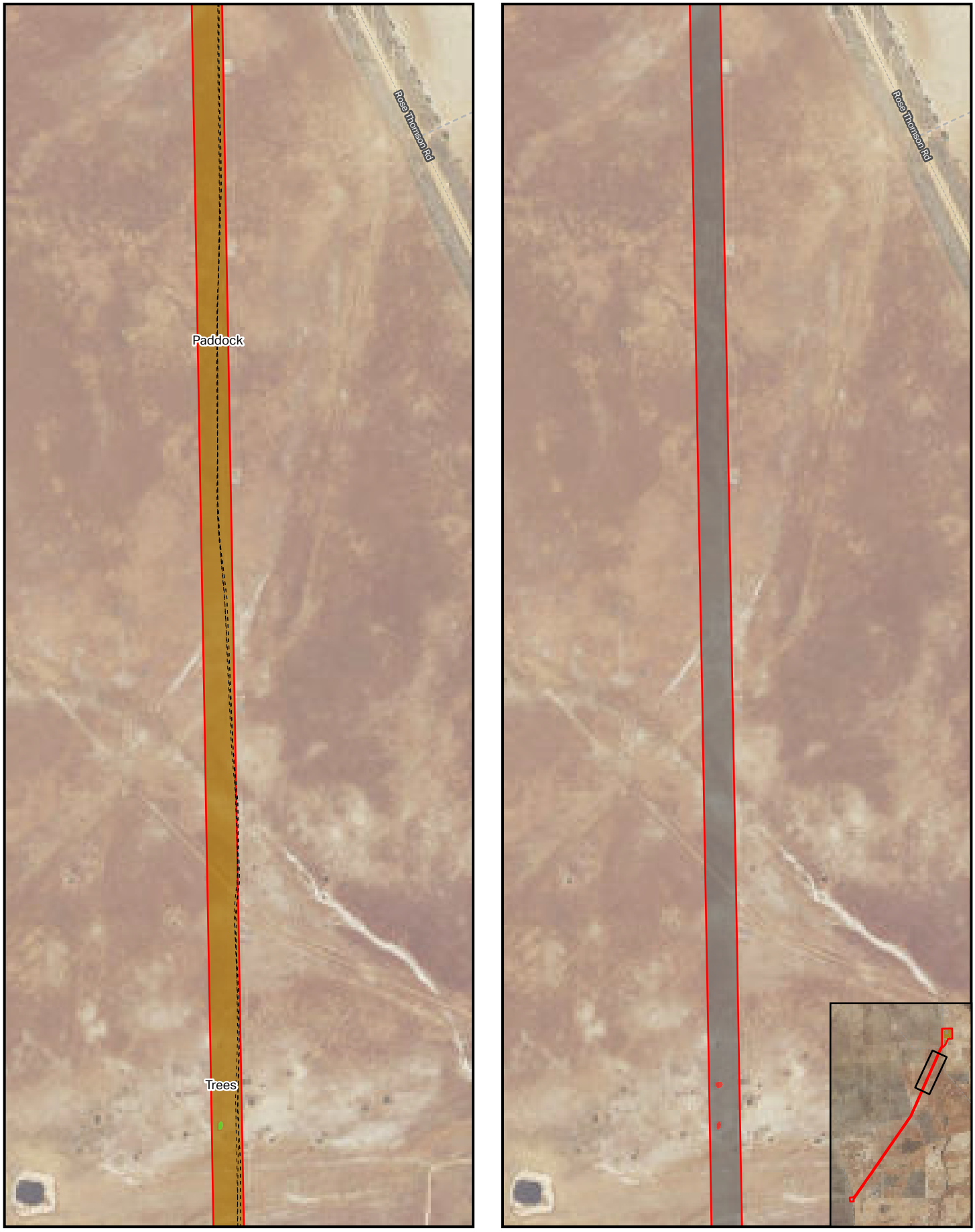
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
8a.1

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000 (when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

- ENB-ENT 132kV Survey Area
- Tracklogs

Vegetation Community
- Paddock

Trees

Vegetation Condition
- Completely Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

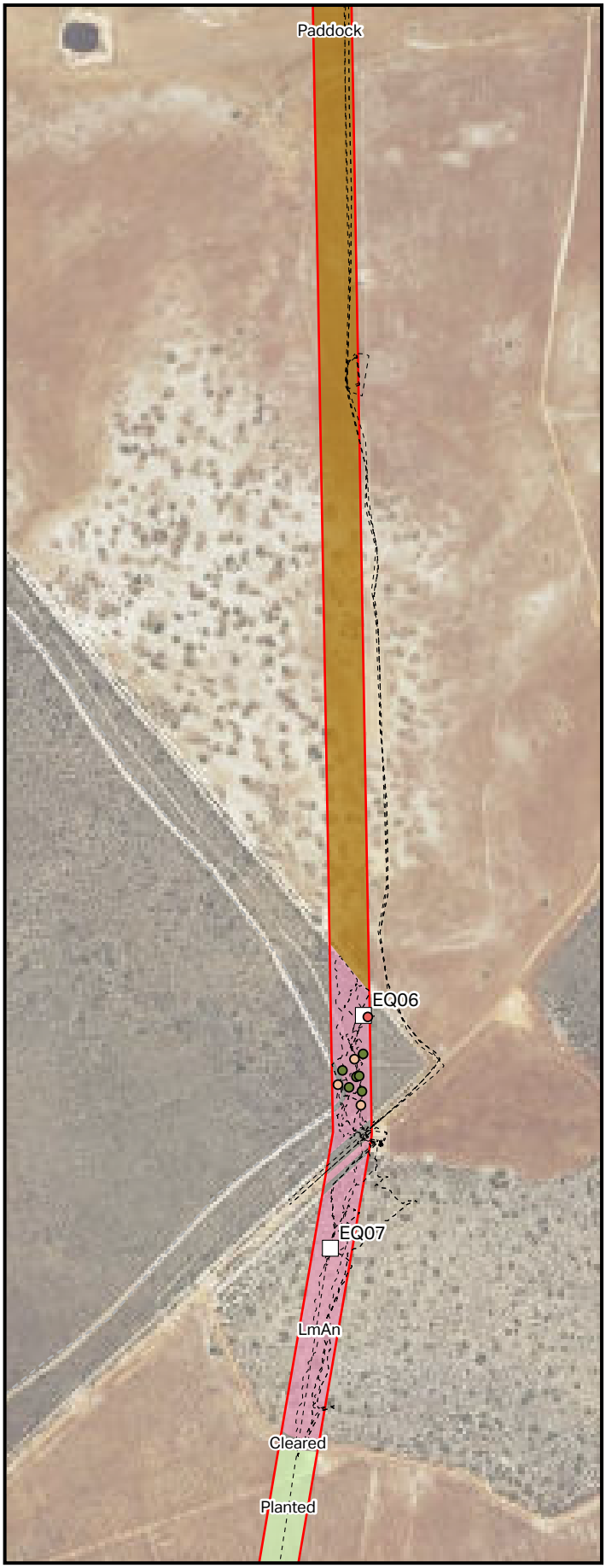
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
8a.2

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

- ENB-ENT 132kV Survey Area
- Sample Sites
  - Quadrat
  - Tracklogs
- Significant Flora (AECOM, 2023)
  - *Banksia cypholoba*,P3
  - *Hakea longiflora*,P3
  - *Lepidobolus quadratus*,P3
- Vegetation Community
  - LmAn
  - Paddock
  - Planted
- Cleared
- Vegetation Condition
  - Excellent
  - Degraded
  - Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

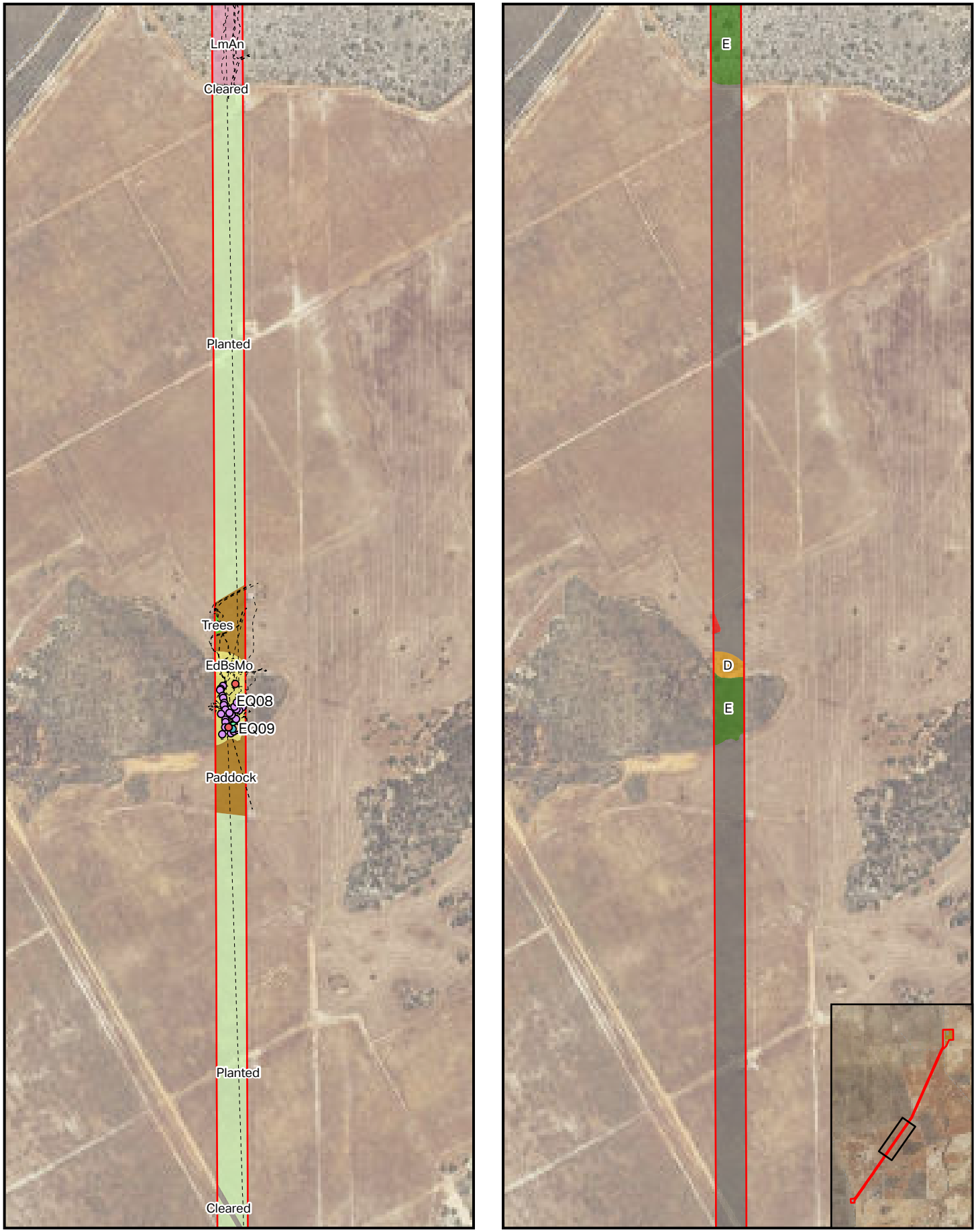
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8a.3

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area

Sample Sites

Quadrat

Tracklogs

Significant Flora (AECOM, 2023)

Allocasuarina ramosissima,P3

Banksia cypholoba,P3

Cristonia biloba subsp. *pubescens*,P2

Lepidobolus quadratus,P3

Stylidium drummondianum,P3

Vegetation Community

EdBsMo

LmAn

Paddock

Planted

Trees

Cleared

Vegetation Condition

Excellent

Degraded

Completely Degraded

Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

WESTERN POWER

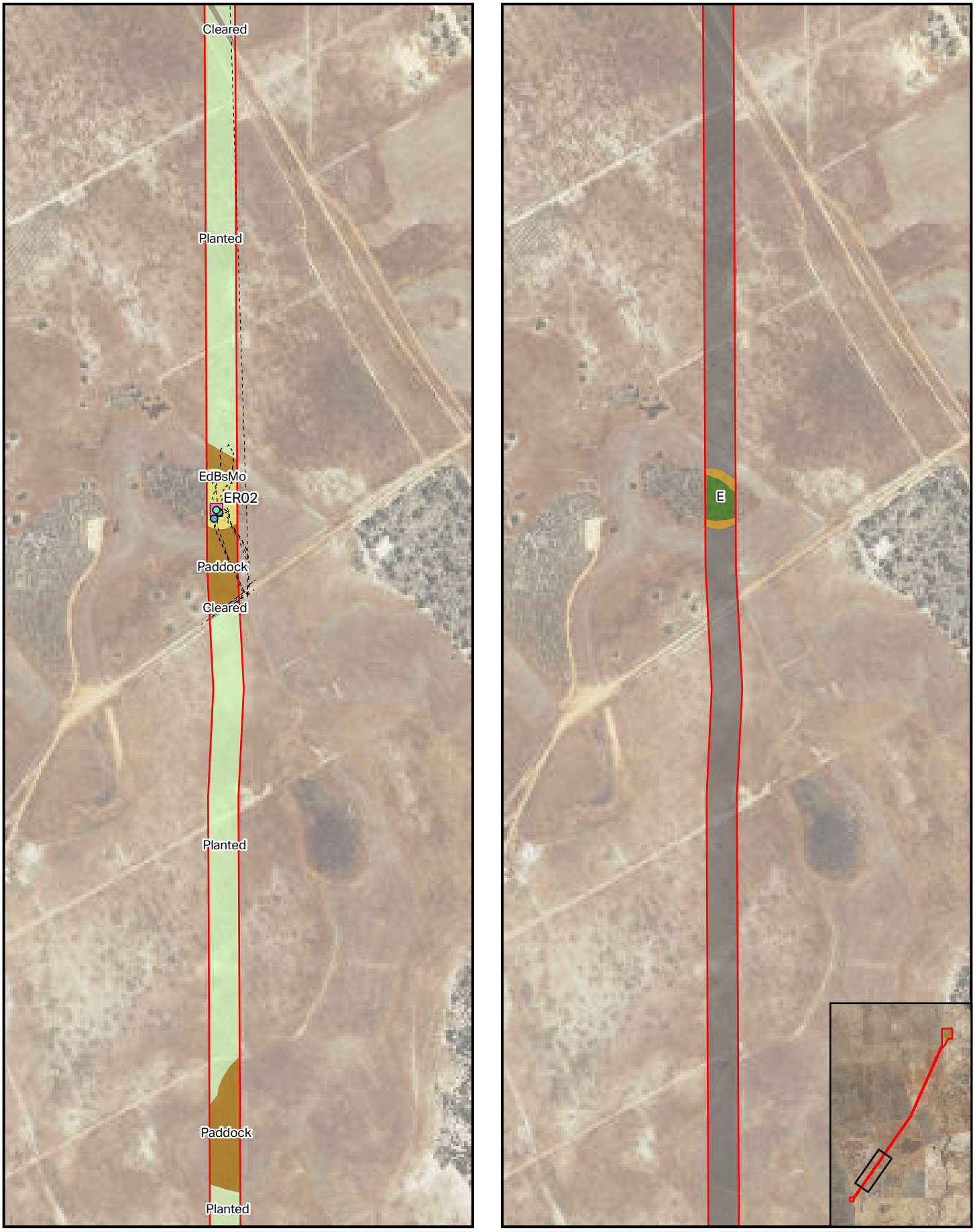
CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure

8a.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

- ENB-ENT 132kV Survey Area
- Sample Sites
  - Relevé
  - Tracklogs
- Significant Flora (AECOM, 2023)
  - *Allocasuarina ramosissima*,P3
  - *Cristonia biloba* subsp. *pubescens*,P2
- Vegetation Community
  - EdBsMo
  - Paddock
  - Planted
- Cleared
- Vegetation Condition
  - Excellent
  - Degraded
  - Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8a.5

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

- ENB-ENT 132kV Survey Area

Sample Sites

- Quadrat
- Tracklogs

Significant Flora (AECOM, 2023)

- *Banksia chamaephyton*,P4
- *Grevillea uniformis*,P3
- *Hemiandra* sp. Eneabba (H. Demarz 3687),P3
- *Lepidobolus quadratus*,P3

Vegetation Community

- BsMp
- LmAn
- Paddock
- Planted
- Cleared

Vegetation Condition

- Excellent
- Good
- Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - ENB-ENT 132kV

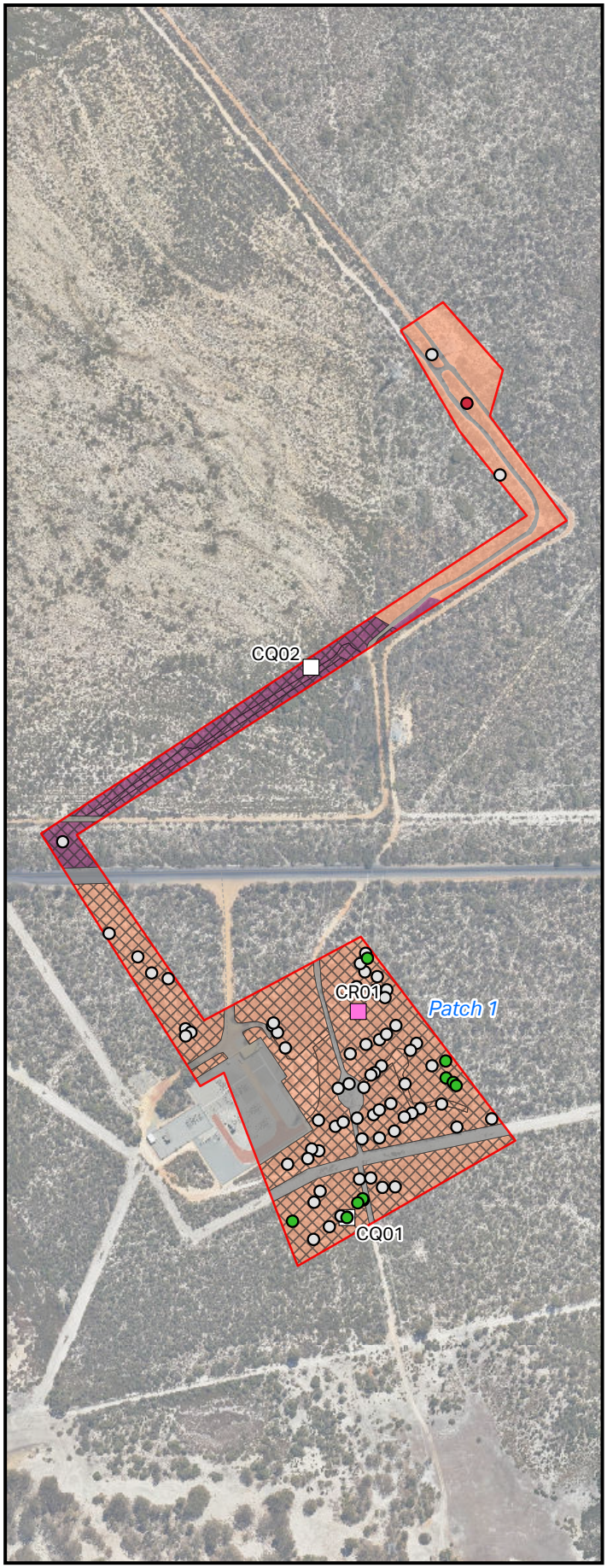
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8a.6

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8a_NREP_North_ENB-ENT 132kV_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:26 PM

A4 size



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

1:6,000 (when printed at A4)

0 30 60 90 120
metres

GDA2020 MGA ZONE 50

LEGEND

- Cataby Substation Survey Area
- Sample Sites
  - Quadrat
  - Relevé
  - Tracklogs
- Significant Flora (AECOM, 2023)
  - *Conostephium magnum*,P4
  - *Hypolaena robusta*,P4
  - *Stylidium hymenocraspedum*,P3
- Vegetation Community
  - BaAcPo
  - BpMsCa
  - Cleared
- Banksia Woodlands of the Swan Coastal Plain
- Vegetation Condition
  - Excellent
  - Very Good
  - Good
  - Degraded
  - Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - Cataby Substation

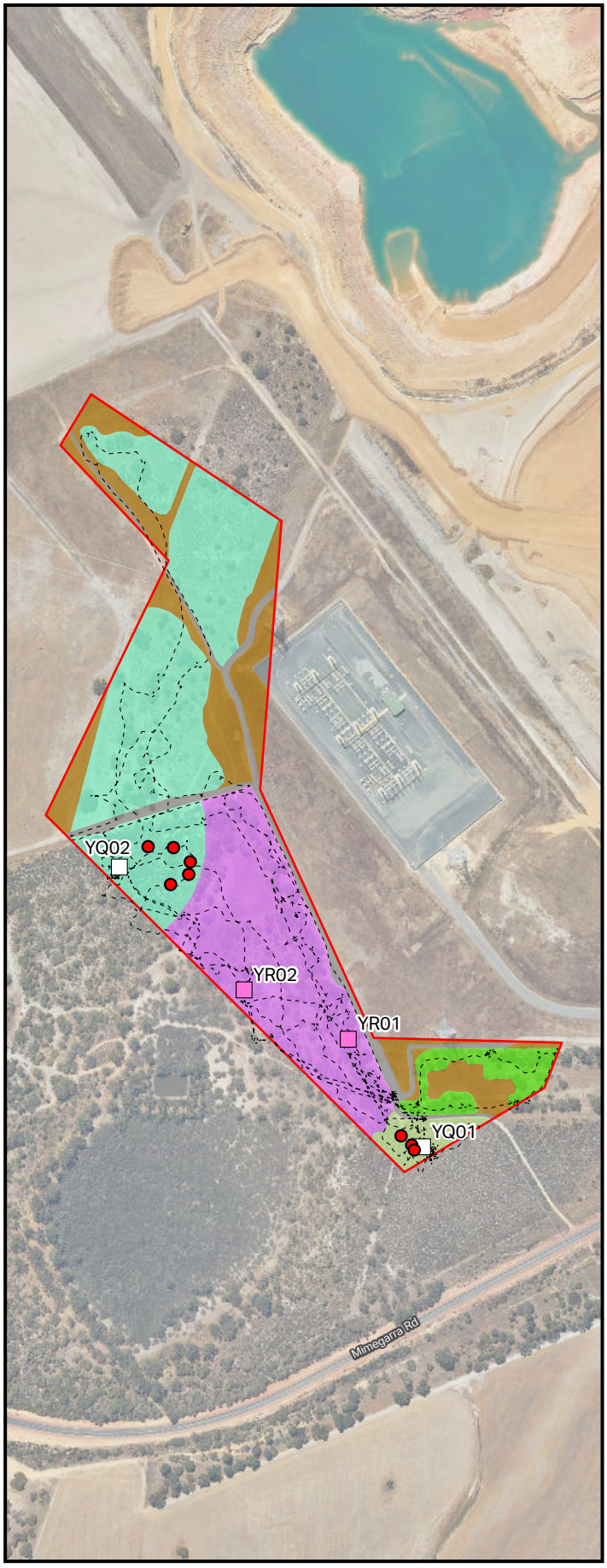
WESTERN POWER

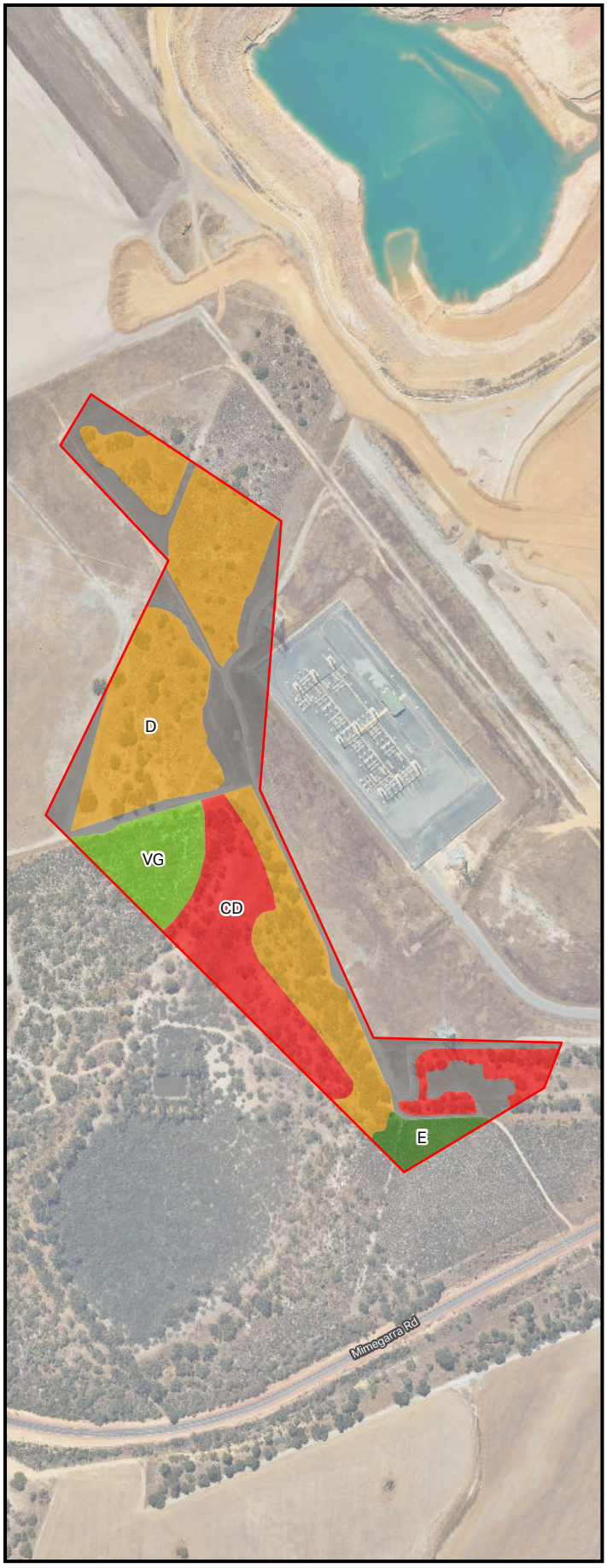
CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8b

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8b_NREP_North_Cataby_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:31 PM





AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

1:6,500 (when printed at A4)

0 30 60 90 120
metres

GDA2020 MGA ZONE 50

LEGEND

Yandin Terminal Survey Area

Sample Sites
- Quadrat
- Relevé
- Tracklogs

Significant Flora (AECOM, 2023)
- *Anigozanthos humilis* subsp. *chrysanthus*, P4

Vegetation Community
- AhEm
- ErMlEc
- EtHhPg
- Paddock
- Trees
- Cleared

Vegetation Condition
- Excellent
- Very Good
- Degraded
- Completely Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - Yandin Terminal

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
8c

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8c_NREP_North_Yandin_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:33 PM

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:8,500 (when printed at A4)

0 40 80 120 160 metres

GDA2020 MGA ZONE 50

LEGEND

- Regans Terminal Survey Area
- Sample Sites
  - Quadrat
  - Relevé
  - Tracklogs
- Significant Flora (AECOM, 2023)
  - *Lyginia excelsa*, P2
- Banksia Woodlands of the Swan Coastal Plain
- Vegetation Community
  - BaAcMp
  - BpAcMp
  - Paddock
  - Planted
  - Trees
- Cleared
- Vegetation Condition
  - Very Good
  - Good
  - Degraded
  - Completely Degraded
  - Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort - Regans Terminal

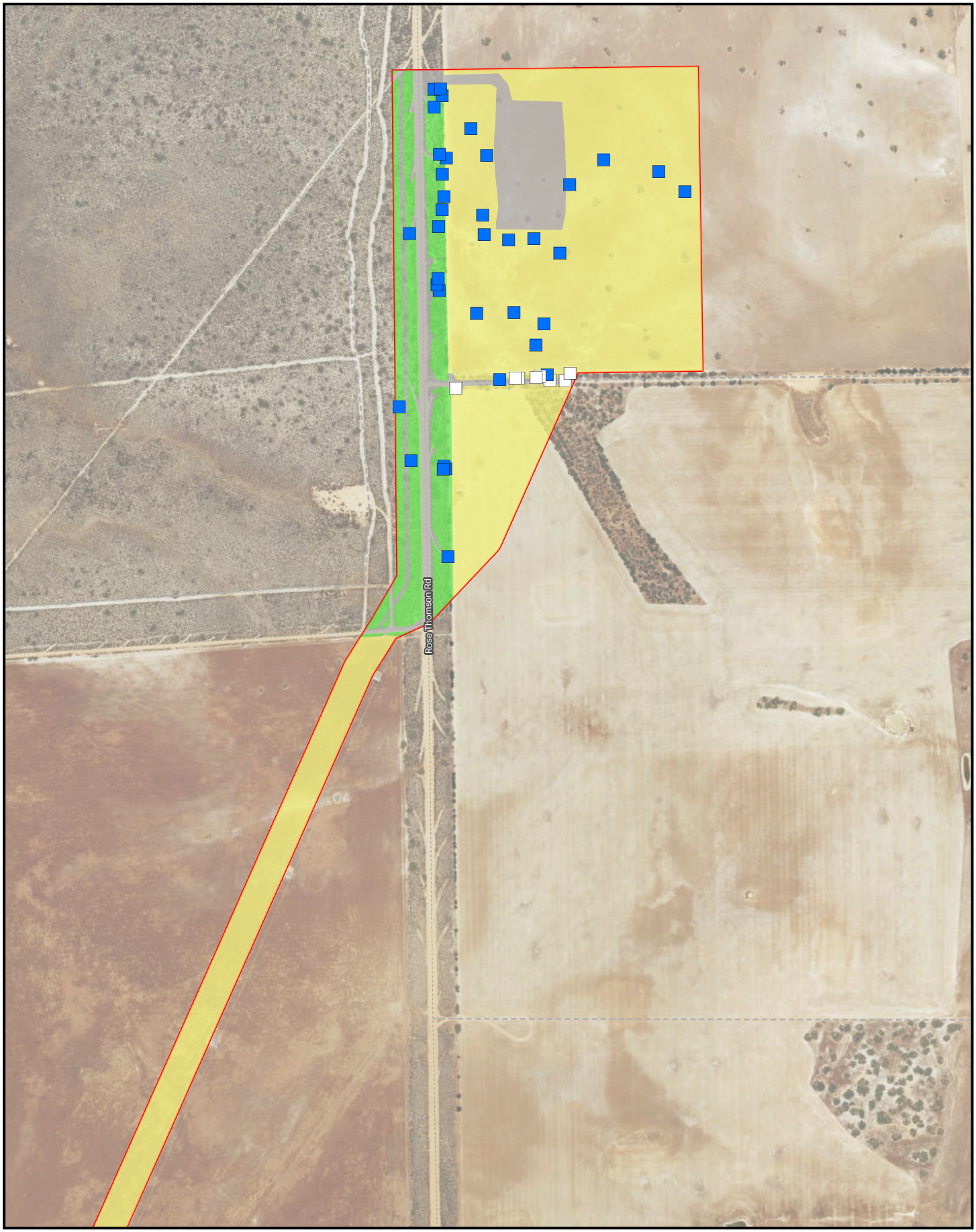
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8d

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig8d_NREP_North_Regans_VegCommCondSurveyEffortA4P_v1, Last exported: 21/05/2024 12:34 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

0 50 100 150 200

metres

1:10,000
(when printed at A4)

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat

- Agriculture
- Heath
- Cleared

Black Cockatoo Trees

- Coastal Blackbutt (*Eucalyptus todtiana*)
- Other (DBH >= 50cm)

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.1

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

0 50 100 150 200
metres

1:10,000
(when printed at A4)

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat

Agriculture

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.2

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat

- Agriculture
- Heath
- Cleared

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

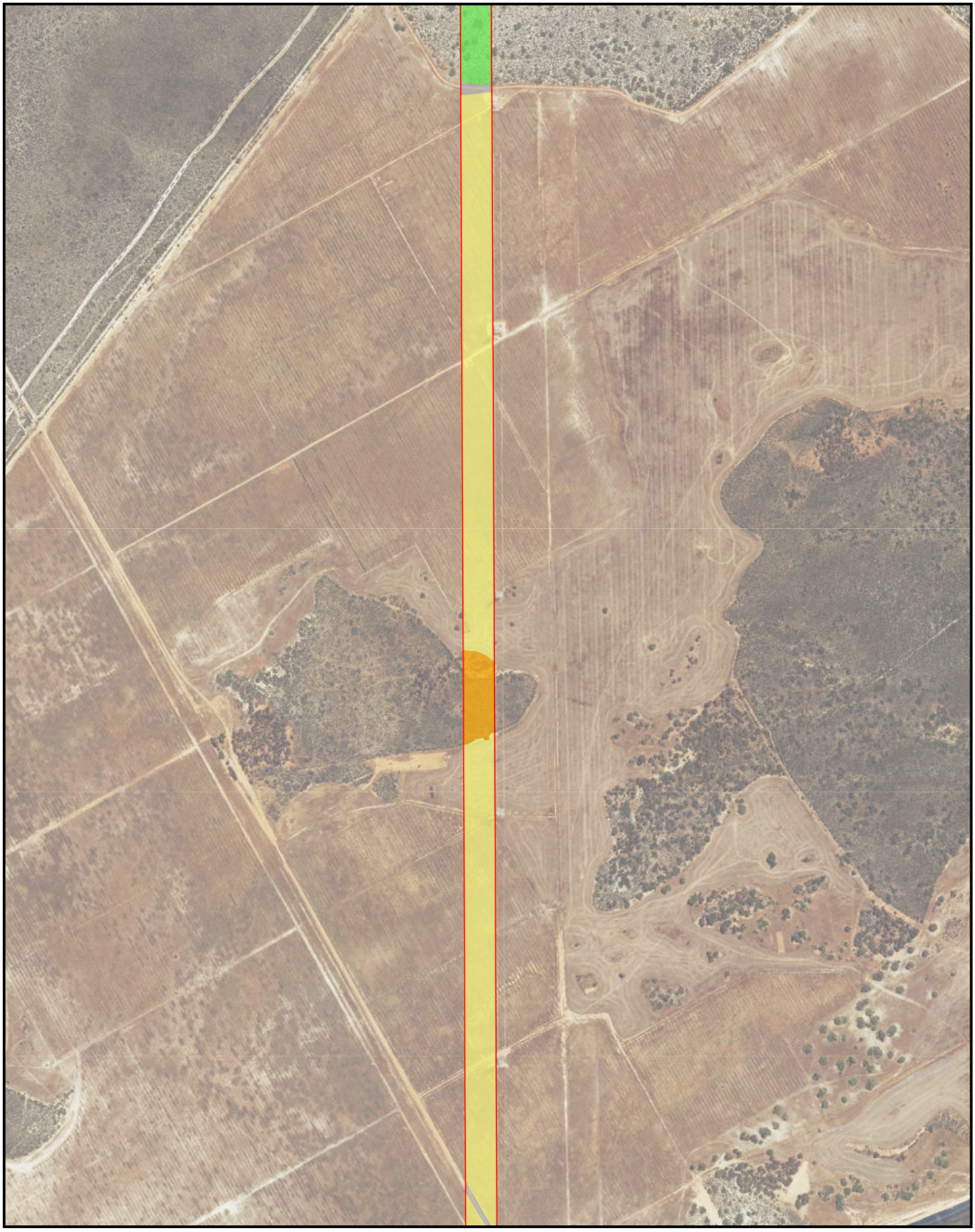
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.3

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

0 50 100 150 200
metres

1:10,000
(when printed at A4)

GDA2020 MGA ZONE 50

DATA SOURCES Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010)

Service Layer Credits: WMS:

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat
- Agriculture
- Heath
- Mallee Woodland
- Cleared

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.4

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM

AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat

- Agriculture
- Mallee Woodland
- Cleared

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

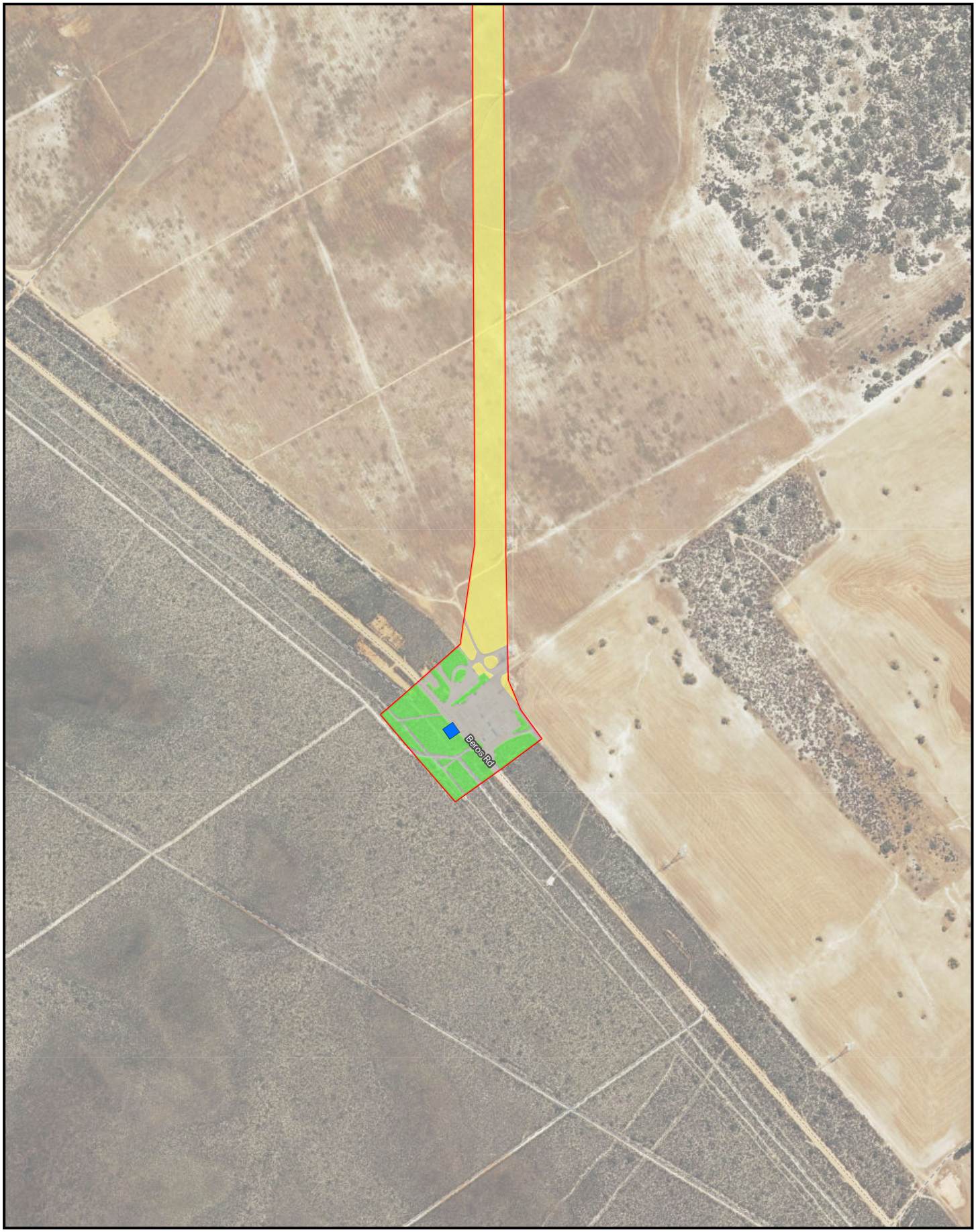
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.5

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:10,000
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

ENB-ENT 132kV Survey Area

Fauna Habitat

- Agriculture
- Heath
- Cleared

Black Cockatoo Trees

- Coastal Blackbutt (*Eucalyptus todtiana*)

Fauna Habitat and Black Cockatoo Habitat - ENB-ENT 132kV

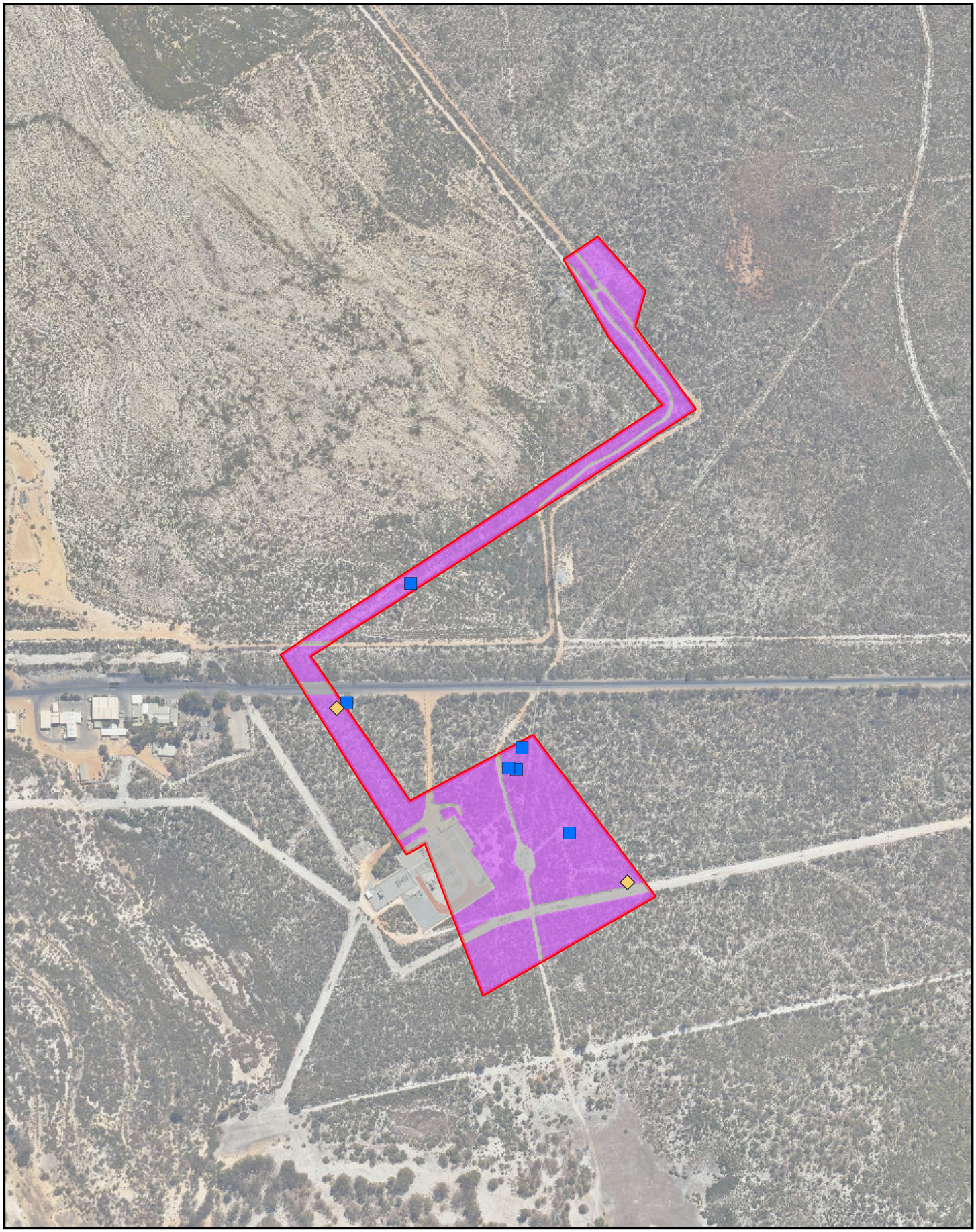
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9a.6

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9a_NREP_North_ENB-ENT 132kV_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:38 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

1:6,000
(when printed at A4)

0 30 60 90 120
metres

GDA2020 MGA ZONE 50

LEGEND

- Cataby Substation Survey Area

Fauna Observation

- Carnaby's Cockatoo (*Zanda latirostris*)

Black Cockatoo Trees

- Coastal Blackbutt (*Eucalyptus todtiana*)

Fauna Habitat

- Banksia Woodland
- Cleared

Fauna Habitat and Black Cockatoo Habitat - Cataby Substation

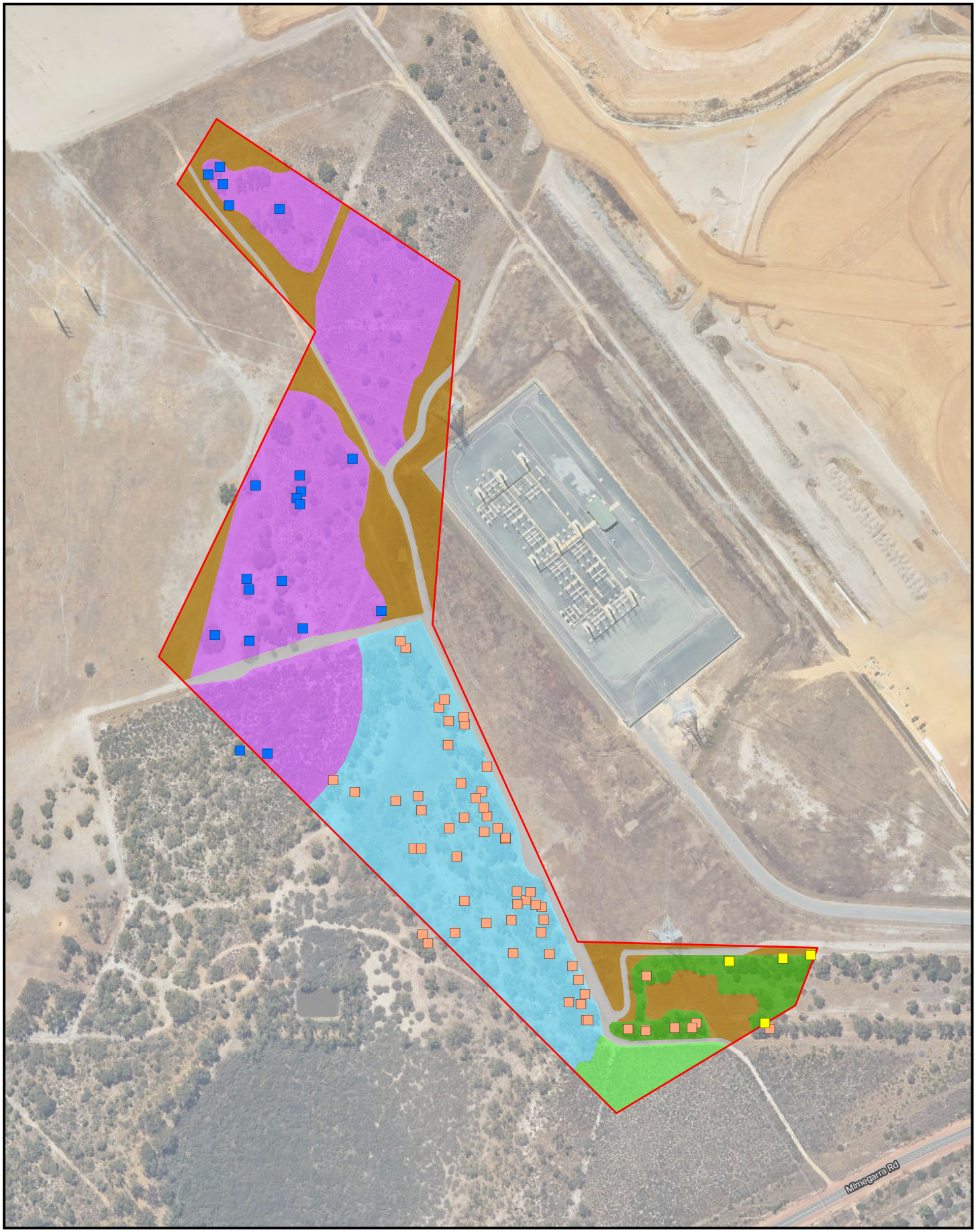
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9b

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9b_NREP_North_Cataby_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:41 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

N

1:4,000
(when printed at A4)

0 20 40 60 80
metres

GDA2020 MGA ZONE 50

LEGEND

- Yandin Terminal Survey Area
- Black Cockatoo Trees
  - Coastal Blackbutt (*Eucalyptus todtiana*)
  - Flooded Gum (*Eucalyptus rudis*)
  - Marri (*Corymbia calophylla*)

Fauna Habitat

- Banksia Woodland
- Heath
- Paddock
- Trees over Cleared
- Wetland
- Cleared

Fauna Habitat and Black Cockatoo Habitat - Yandin Terminal

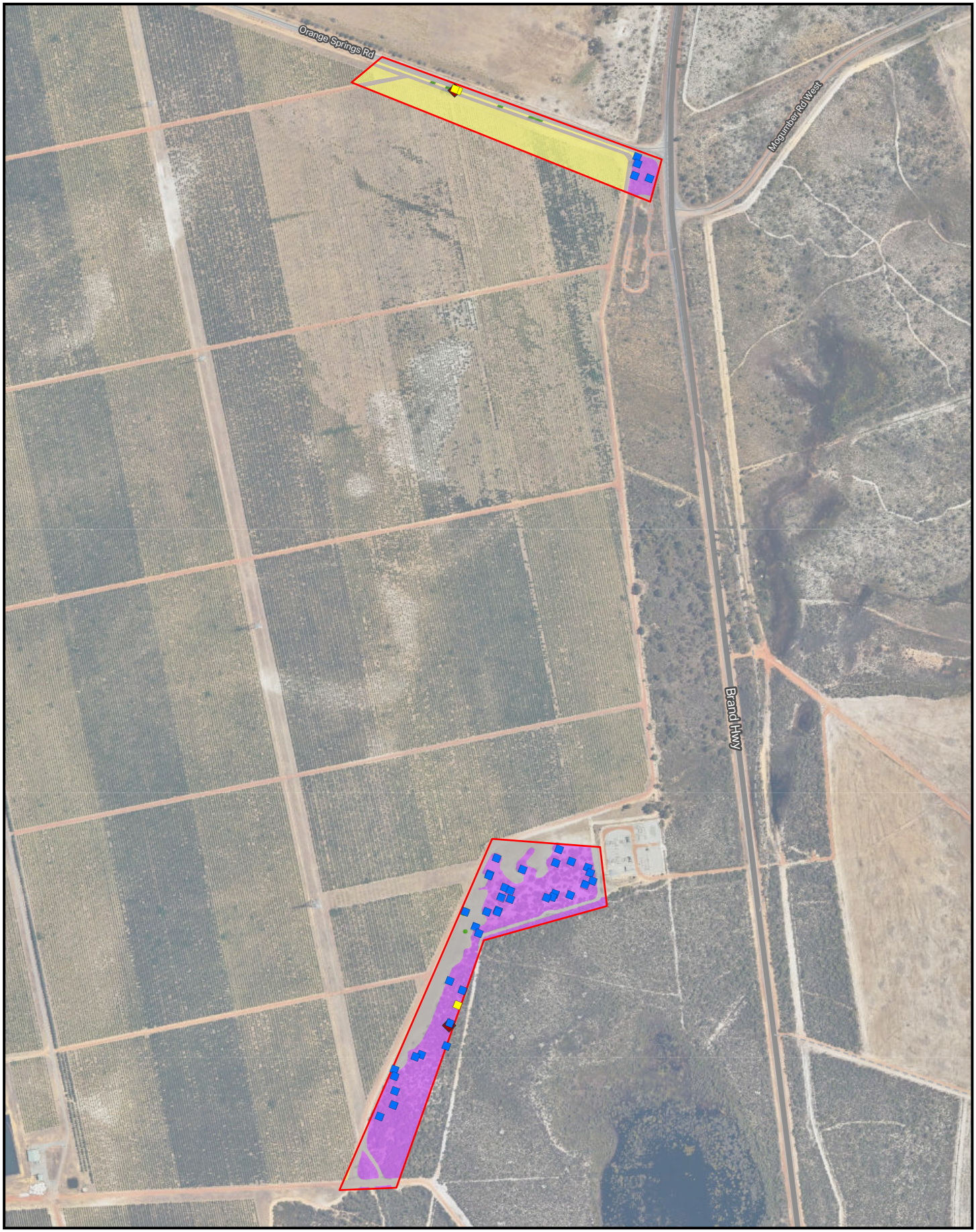
WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9c

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9c_NREP_North_Yandin_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:43 PM



AECOM Delivering a better world

PROJECT ID	60713462	**CREATED BY**	WYATTK2
DATE MODIFIED	21 MAY 2024	**APPROVED BY**	F.DE WIT

1:9,000 (when printed at A4)

0 40 80 120 160 metres

GDA2020 MGA ZONE 50

LEGEND

- Regans Terminal Survey Area
- Black Cockatoo Trees
  - Coastal Blackbutt (*Eucalyptus todtiana*)
  - Marri (*Corymbia calophylla*)
- Fauna Observation
  - Foraging,Carnaby's Cockatoo (*Zanda latirostris*)

Fauna Habitat

- Agriculture
- Banksia Woodland
- Trees over Cleared
- Cleared

Fauna Habitat and Black Cockatoo Habitat - Regans Terminal

WESTERN POWER

CEL - NORTH
FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure

9d

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AUPER1\Legacy\Projects\607x\60713462_NREP_Ecology_2023\900_CAD_GIS\920_GIS\02_MXD_APRX\60713462_NREP_Ecology_2023_Figures.aprx (WyattK2),
Layout: G60713462_Fig9d_NREP_North_Regans_FaunaHabBC_A4P_v1, Last exported: 21/05/2024 12:44 PM

Appendix A

Significant Communities Desktop Assessment

Appendix A Significant Communities Desktop Assessment

Appendix A - Significant Communities Desktop Assessment

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
Acacia shrublands on taller dunes, southern Swan Coastal Plain ('floristic community type 29b') Community is dominated by Acacia shrublands or mixed heaths on the larger dunes. This community stretches from Seabird to south of Mandurah. No consistent dominant but species such as *Acacia rostellifera, Acacia lasiocarpa*, and *Melaleuca acerosa* were important.		P3	Unlikely incorrect distribution. Nearest record 79 km south-west.	Unlikely, nearest record >100 km south-west.	Unlikely incorrect distribution. Nearest record 40 km south-west.	Unlikely incorrect distribution. Nearest record 65 km south-west.
Assemblages of organic mound springs of the Three Springs area The community occurs in the Three Springs area. The mound spring habitat is characterised by continuous discharge of groundwater in raised areas of peat. The peat and surrounds provide a stable, permanently moist series of micro-habitats. There is a high level of heterogeneity of invertebrate fauna assemblages between occurrences, and all are associated with a rich and healthy fauna. The distinctive assemblages are composed of invertebrate groups that commonly include beetles, oligochaetes, non-biting midges and bugs. The vegetation component of the community contains many moisture loving species including an overstorey of *Melaleuca preissiana* (moonah) trees. *Eucalyptus camaldulensis* (river gum) and *Eucalyptus rudis* (flooded gum) are also found in a number of the mound springs. The shrub layer often includes *Hypocalymma angustifolium* (white myrtle) and *Acacia saligna* (orange wattle) over *Machaerina vaginalis* (sheath twigrush) and other sedges. The herbaceous *Patersonia occidentalis* (swamp variant) has been recorded at several occurrences.		EN	Unlikely, distribution incorrect. Nearest record 87 km north.	May occur, Nearest record 3.5km north-west.	Unlikely, nearest record >100 km north.	Unlikely, nearest record >100 km north.
Banksia Woodlands of the Swan Coastal Plain Canopy is most commonly dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. Other Banksia species that can dominate in the community are *B. prionotes* or *B. ilicifolia*. It typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands; it is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau and can occur in other less common scenarios.	E	P3	Known to occur.	Unlikely, incorrect distribution, survey area not within Swan Coastal Plain IBRA region. Nearest record 28 km south-west.	Known to occur.	Unlikely, distribution incorrect. Survey area not within the Swan Coastal Plain IBRA Region.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
SCP 23b Swan Coastal Plain *Banksia attenuata*–- *Banksia menziesii* woodlands (a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC). These woodlands occur in the Bassendean system, from Melaleuca Park to Gingin. Occurs in reasonably extensive Banksia woodlands north of Perth.			Unlikely, incorrect distribution. Nearest record 41 km south.	Unlikely, nearest record >100 km south.	May occur, nearest record 7 km south-east.	Unlikely, incorrect distribution. Nearest record 38 km south.
SCP 22 *Banksia ilicifolia* woodlands (a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) Low lying sites generally consisting of *Banksia ilicifolia – B. attenuata* woodlands, but *Melaleuca preissiana* woodlands and scrubs are also recorded. Occurs on Bassendean and Spearwood systems in the central Swan Coastal Plain north of Rockingham. Typically has very open understorey, and sites are likely to be seasonally waterlogged.			Unlikely, incorrect distribution. Nearest record 54 km south.	Unlikely, nearest record >100 km south.	May occur, nearest record 16 km south-west.	Unlikely, incorrect distribution. Nearest record 40 km south.
Banksia woodland of the Gingin area restricted to soils dominated by yellow to orange sands (a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) Species-rich Banksia woodlands on deep yellow-red sands that appear restricted to the western Dandaragan Plateau. The vegetation is described as scattered *Eucalyptus todtiana* and *Eucalyptus calophylla* over *Banksia menziesii* and Banksia attenuata low open woodland over *Jacksonia sternbergiana* and *Adenanthos cygnorum* high open shrubland over *Allocasuarina humilis* and *Chamelaucium lullfitzii* (DRF) open shrubland over *Eremaea pauciflora* and *Astroloma xerophyllum* low shrubland over *Mesomelaena pseudostygia* open sedgeland.		P2	Unlikely, distribution incorrect. Nearest record 90 km south-east.	Unlikely, nearest record >100 km south.	Unlikely, distribution incorrect. Nearest record 44 km south-east.	Unlikely, distribution incorrect. Nearest record 75 km south-east.
Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs (a component of the Critically Endangered Claypans of the Swan Coastal Plain EPBC listed TEC). Claypans (predominantly basins) usually dominated by a shrubland of *Melaleuca lateritia* occurring both on the coastal plain and the adjacent plateau. These claypans are characterised by aquatic (*Hydrocotyle lemnoides* – Priority 4) and amphibious taxa (e.g. *Glossostigma diandrum*, *Villarsia capitata* and *Eleocharis keigheryi*).	CE	P1	Unlikely, distribution incorrect. Nearest record 26.4 km south-west.	Unlikely, nearest record >100 km south.	Unlikely, distribution incorrect. Nearest record 31 km south-west.	Unlikely, incorrect distribution. Nearest record 18 km south.
Coastal shrublands on shallow sands, southern Swan Coastal Plain ('floristic community type 29a')		P3	Unlikely incorrect distribution.	Unlikely, nearest record >100 km south-west.	Unlikely incorrect distribution.	Unlikely incorrect distribution.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
Mostly heaths on shallow sands over limestone close to the coast. No single dominant but important species include *Spyridium globulosum*, *Rhagodia baccata*, and *Olearia axillaris.*			Nearest record 7 km south-west.		Nearest record 40 km south-west.	Nearest record 58 km south-west.
***Corymbia calophylla*–- *Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (floristic community type 3b as originally described in Gibson et al. (1994))** The community is known from the eastern side of the Swan Coastal Plain largely between Wannamal and Dunsborough. Most occurrences of the community type are dominated by both *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah) with additional common taxa comprising low shrubs, sedges, grasses and herbs. These include *Bossiaea eriocarpa* (common brown pea), *Conostylis juncea, Hibbertia hypericoides* (yellow buttercups), *Morelotia octandra, Chamaescilla corymbosa* (blue squill*), Desmocladus fasciculatus, Banksia dallanneyi* (couch honeypot), *Mesomelaena tetragona* (semaphore sedge), *Babingtonia camphorosmae* (camphor myrtle), *Lepidosperma squamatum, Neurachne alopecuroidea* (foxtail mulga grass), *Philotheca spicata* (pepper and salt), *Burchardia congesta, Caesia micrantha* (pale grass-lily), *Kingia australis* (kingia), *Drosera erythrorhiza* (red ink sundew), *Lomandra hermaphrodita* and *Caladenia flava* (cowslip orchid).		VU	Unlikely incorrect distribution. Nearest record 85 km south-east.	Unlikely, nearest record >100 km south-east.	Unlikely incorrect distribution. Nearest record 40 km south-east.	Unlikely incorrect distribution. Nearest record 70 km south-east.
Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. (1994)) The community occurs as shrublands or open woodlands on clay flats that are inundated for long periods. It has been recorded between Moore River National Park and Dunsborough. Sedges are more apparent in the community than in other claypans, generally with moderate frequencies of *Chorizandra enodis* (black bristlerush), *Cyathochaeta avenacea*, *Lepidosperma longitudinale* (pithy sword-sedge) and Leptocarpus coangustatus. The community has a lower species richness and weed frequency than other claypan threatened ecological communities.	CE	VU	Unlikely, incorrect habitat and distribution. Nearest record 62 km south.	Unlikely, nearest record >100 km south.	Unlikely, incorrect habitat and distribution. Nearest record 19 km south.	Unlikely, incorrect habitat and distribution. Nearest record 46 km south.
Eucalypt woodlands of the Western Australian Wheatbelt The WA Wheatbelt Woodlands ecological community is endemic to south-western WA. It occupies a transitional zone between the wetter forests associated with the Darling Range and the southwest coast, and the low woodlands, mallee and shrublands of the semi-arid to arid interior. The WA Wheatbelt Woodlands ecological community is endemic	CE	P3	Unlikely, distribution incorrect. Survey area not within the	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
to south-western WA. It occupies a transitional zone between the wetter forests associated with the Darling Range and the southwest coast, and the low woodlands, mallee and shrublands of the semi-arid to arid interior (DotE, 2015).			Avon Wheatbelt.			
Ferricrete floristic community (Rocky Springs type) The community generally comprises tall shrubland and has been recorded between Arrino and Eneabba, on irregularly inundated red brown sandy loams over ferricrete. It is generally dominated by *Acacia blakelyi*, *Allocasuarina campestris* and *Labichea lanceolata* subsp. *lanceolata*. Associated species include *Alyogyne hakeifolia*, *Borya sphaerocephala* (pincushions), *Isotoma hypocrateriformis* (Woodbridge poison), *Petrophile seminuda*, *Stylidium dichotomum* (pins-and-needles), *Thysanotus patersonii* and *Pterochaeta paniculata* (woolly4rma4-ha).		VU	Unlikely, nearest record 79 km.	May occur, nearest record 2.4 km north-east.	Unlikely, distribution incorrect. Nearest record 93 km north.	Unlikely, nearest record >100 km north.
Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain (floristic community type 15 as originally described in Gibson et al. (1994)). The community has been recorded from Bambun to Nirimba, on alluvial sediments on sites that are inundated for long periods resulting in more typical aquatic and flora of deeper wetlands. The community is generally dominated by *Melaleuca rhaphiophylla* (swamp paperbark) or *Casuarina obesa* (swamp sheoak). Other species that can occur include *Melaleuca teretifolia* (banbar), *Atriplex cinerea* (grey saltbush), *Samolus repens* (creeping brookweed), *Salicornia quinqueflora* (beaded samphire) and *Sporobolus virginicus* (marine couch).		VU	Unlikely, incorrect habitat and distribution. Nearest record 96 km south.	Unlikely, nearest record >100 km south.	Unlikely, incorrect habitat and distribution. Nearest record 48 km south.	Unlikely, incorrect habitat and distribution. Nearest record 80 km south.
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. (1994)) The community is generally dominated by *Melaleuca viminea* (mohan), *Melaleuca osullivanii*, *Melaleuca cuticularis* (saltwater paperbark) or *Casuarina obesa* (swamp sheoak) or a mixture of these species. It has been recorded between Mogumber and Ambergate on heavy clay soils that are generally inundated from winter into mid-summer. The species *Melaleuca cuticularis* and *Casuarina obesa* may indicate some saline influence for at least part of the year.	CE	VU	Unlikely, incorrect habitat and distribution. Nearest record 63 km south.	Unlikely, nearest record >100 km south.	Unlikely, incorrect habitat and distribution. Nearest record 17 km south.	Unlikely, incorrect habitat and distribution. Nearest record 50 km south.
Lesueur-Coomallo Floristic Community A1.2 as originally described by Griffin and Hopkins (1990)		E	Unlikely, distribution incorrect.	Unlikely, known from one 4 ha occurrence	Unlikely, distribution incorrect.	Unlikely, nearest record >100 km north.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
The community is known from Warradarge. It comprises a species-rich heath with emergent *Hakea obliqua* (needles and corks) on sand with faithful species of *Hakea obliqua* and *Beaufortia elegans* (elegant beaufortia) and constant species of *Dasypogon bromeliifolius* (pineapple bush) and *Stirlingia latifolia* (blueboy) over well-drained grey sand over pale yellow sand on lateritic uplands. Associated species include *Allocasuarina humilis* (dwarf sheoak), *Calothamnus sanguineus* (silky-leaved blood flower), *Hibbertia hypericoides* (yellow buttercups), *Hypocalymma xanthopetalum* and *Schoenus subflavus* (yellow bog-rush).			Nearest record 54 km north.	within Lesueur National Park, Warradarge. . Nearest record 24 km south.	Nearest record 69 km north.	
Lesueur-Coomallo Floristic Community D1 as originally described by Griffin and Hopkins (1990) The community occurs in Hill River. It comprises a species-rich low heath on moderately to well-drained lateritic gravels on lower slopes and low rises, generally dominated by *Allocasuarina microstachya* with *Allocasuarina ramosissima* (priority 3), *Allocasuarina humilis* (dwarf sheoak), *Babingtonia grandiflora* (large-flowered babingtonia), Borya nitida (pincushions), *Calytrix flavescens* (summer starflower), *Calothamnus sanguineus* (silky-leaved blood flower), Conostylis androstemma (trumpets), *Cryptandra pungens*, *Banksia armata* (prickly dryandra), *Gastrolobium polystachyum* (horned poison), *Hakea auriculata*, *Hakea incrassata* (marble hakea), *Hakea erinacea*, *Hibbertia hypericoides* (yellow buttercups), *Hypocalymma xanthopetalum*, *Melaleuca trichophylla*, *Petrophile chrysantha*, *Schoenus subflavus* (yellow bog-rush) and *Xanthorrhoea drummondii*.		CE	Unlikely, distribution incorrect. Nearest record 55 km north.	Unlikely, known from one occurrence at Hill river. Nearest record 24 km south.	Unlikely, distribution incorrect. Nearest record 69 km north.	Unlikely, nearest record >100 km north.
Lesueur-Coomallo Floristic Community DFGH Mixed species-rich heath on lateritic gravel with *Hakea erinacea*, *Melaleuca platycalyx* and *Petrophile seminuda*: a fine scale mixture of four floristically defined communities occurring on lateritic slopes.		P1	Unlikely, distribution incorrect. Nearest record 54 km north.	Unlikely, distribution incorrect. Nearest record 23 km south.	Unlikely, distribution incorrect. Nearest record 68 km north.	Unlikely, nearest record >100 km north.
Lesueur-Coomallo Floristic Community M2 (*Melaleuca preissiana* woodland) Woodland dominated by *Melaleuca preissiana* along sandy drainage lines, with faithful species of *Anigozanthos pulcherrimus* and constant species of *Chamaescilla corymbosa*, *Petrophile brevifolia* and *Xanthorrhoea reflexa*.		P1	Unlikely, distribution incorrect. Nearest record 55 km north.	Unlikely, distribution incorrect. Nearest record 20 km south.	Unlikely, distribution incorrect. Nearest record 70 km north.	Unlikely, nearest record >100 km north.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
***Melaleuca huegelii–- Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))** The community is found on skeletal soils on limestone ridge slopes and ridge tops between Yanchep north of Perth, and south of Perth near Lake Clifton. The community commonly comprises species-rich thickets, heaths and scrubs dominated by *Melaleuca huegelii* (chenille honeymyrtle), *Melaleuca systena* (coastal honeymyrtle) and *Banksia sessilis* (parrot bush), commonly over *Grevillea preissii* (spider net grevillea), *Spyridium globulosum* (basket bush), and *Acacia lasiocarpa* (pajang). A suite of herbs commonly occur under the shrub layer.		EN	Unlikely, incorrect habitat and distribution. Nearest record 80 km south.	Unlikely, nearest record >100 km south.	Unlikely, incorrect habitat and distribution. Nearest record 39 km south.	Unlikely, incorrect habitat and distribution. Nearest record 65 km south.
Perth to Gingin Ironstone Association The community occurs on ironstone soils in the Perth area and is characterised by massed everlastings. Many of the plant species present are specifically adapted to shallow seasonal inundation, specifically the rich herb layer present in late winter and early spring which is a major distinguishing characteristic of the community. The daisies *Rhodanthe manglesii*, *Rhodanthe spicata* and *Myriocephalus helichrysoides* dominate. Other common herbs include *Tribonanthes variabilis*, *Stylidium longitubum* (jumping jacks) (priority 4) and *Isotropis cuneifolia* subsp. *glabra* (priority 3). A very open shrub layer is typical with common shrubs *Melaleuca viminea* (mohan), *Banksia sessilis* (parrot bush), *Acacia saligna* (orange wattle), *Jacksonia furcellata* (grey stinkwood), *Grevillea curviloba* (endangered) and *Kunzea recurva*.	E	CR	Unlikely incorrect distribution. Nearest record 96 km south.	Unlikely, nearest record >100 km south.	Unlikely incorrect distribution. Nearest record 48 km south.	Unlikely incorrect distribution. Nearest record 80 km south.
***Petrophile chrysantha* low heath on Lesueur dissected uplands (Gp200-170)** Low heath dominated by *Petrophile chrysantha* on Lesueur Dissected Uplands. Associated species include *Dryandra armata* and *Hakea undulata*.		P2	Unlikely, distribution incorrect. Nearest record 54 km north.	Unlikely, distribution incorrect. Nearest record 20 km south-west.	Unlikely, distribution incorrect. Nearest record 67 km north.	Unlikely, distribution incorrect. Nearest record 98 km north.
Plant assemblages of the Inering System as originally described in Beard (1976) The community occurs in the Inering Hills in the northern Wheatbelt of Western Australia. It generally comprises: *Allocasuarina campestris* scrub over chert and granite hills; *Allocasuarina campestris* thicket with scattered *Acacia acuminata* (jam) and *Allocasuarina huegeliana* (rock		VU	Unlikely, distribution incorrect. Survey area not within the	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.	Unlikely, distribution incorrect. Survey area not within the Avon Wheatbelt.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
sheoak) over brown sandy loam over stony and lateritic summits and slopes; Acacia sp. mixed low woodland on red brown sandy loam over granite on summits and slopes; *Melaleuca cardiophylla* (tangling melaleuca) thicket with scattered *Eucalyptus loxophleba* (York gum) and *Eucalyptus salmonophloia* (salmon gum) over granite on the lower slopes and foothills; and *Eucalyptus loxophleba* woodland over clay loam on the foothills.			Avon Wheatbelt.			
Sedgelands in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in in Gibson et al. (1994)). The community is within wetland depressions (swales) occurring between parallel Holocene dunes, mostly located on the Rockingham-Becher Plain but also extending further north to Lancelin and south to Dalyellup. Typical and common native species in the community are the shrubs *Acacia rostellifera* (summer-scented wattle), *Acacia saligna* (orange wattle) and *Xanthorrhoea preissii* (balga), the sedges *Machaerina juncea* (bare twigrush), *Ficinia nodosa* (knotted club rush) and *Lepidosperma gladiatum* (coast sword-sedge), and the grass *Poa porphyroclados*.	E	CR	Unlikely, distribution incorrect. Nearest record 41 km south-west.	Unlikely, nearest record >100 km south.	Unlikely, distribution incorrect. Nearest record 34 km west.	Unlikely, distribution incorrect. Nearest record 30 km south-west.
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain The Shrublands and Woodlands on Muchea Limestone of the Swan Coastal Plain ecological community occurs on the heavy soils of the eastern side of the Swan Coastal Plain. It is defined on the basis of rare limestone-influenced substrates (DEE, 2017).	E	EN	Unlikely incorrect distribution. Nearest record 67 km south.	Unlikely, nearest record >100 km south.	Unlikely incorrect distribution. Nearest record 20 km south.	Unlikely incorrect distribution. Nearest record 52 km south.
Stromatolite community of stratified hypersaline coastal lake (Lake Thetis) The community occurs in Lake Thetis, in Cervantes. It comprises a distinctive and diverse group of benthic microbial assemblages, each producing a mat that is associated with one specific zone within the lake. Crenulate cyanobacterial mats occur in the low-lying areas adjacent to the lake. Lithified stromatolites, resembling those at Shark Bay, with patches of living cyanobacterial mats and nodular mats characterise the littoral areas. Filamentous mats reside in cavities and coat the surface of the flocculant mat in the basin, a mobile diatomaceous mat occurs in the shallows, and thick flocculant mats of phototrophic prokaryotes, other microbes or diatoms (or microbes and diatoms) occur in the central		VU	Unlikely incorrect distribution. Nearest record 34 km north-west.	Unlikely incorrect distribution. Nearest record 58 km south-west.	Unlikely incorrect distribution. Nearest record 76 km north-west.	Unlikely incorrect distribution. Nearest record 48 km north-west.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
basin. Lake Thetis has benthic microbial mats adjacent to the lithified stromatolites and well-developed flocculant mats in the basin. Under current conditions microbial reef-forming communities and flocculant mat communities are both scarce. Some stromatolites have branching columns.						
Subtropical and Temperate Coastal Saltmarsh (synonymous with the Subtropical and Temperate Coastal Saltmarsh EPBC-listed TEC). Consists of the assemblage of plants, animals and micro-organisms associated` with saltmarsh in coastal regions of sub-tropical and temperate Australia (south of 23°S latitude). It occurs on the coastal margin, along estuaries and coastal embayments and on low wave energy coast in places with at least some tidal connection, including rarely-inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences. The community occurs on sandy or muddy substrate and may include coastal clay pans and similar habitats. It consists of dense to patchy areas of characteristic coastal saltmarsh plant species that include salt- tolerant herbs, succulent shrubs or grasses, and may also include bare sediment as part of the mosaic. It can occur where the proportional cover by tree canopy such as mangroves, Melaleucas or Casuarinas or seagrass is not greater than 50%. The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name, also apply to this Priority ecological community.	V	P3	Unlikely, distribution incorrect. Nearest record 64 km north-west.	Unlikely, incorrect distribution. Nearest record 36 km south-west.	Unlikely, distribution incorrect. Nearest record 40 km south-west.	Unlikely, distribution incorrect. Nearest record 62 km south-west.
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain The Tuart woodlands and forests occur on the Swan Coastal Plain in Western Australia, from Jurien, approximately 200 km north of Perth, to the Sabina River, near Busselton, 225 km south of Perth. The primary defining feature is the presence of Eucalyptus gomphocephala (Tuart) in the uppermost canopy, although this may co-occur with various other tree species. The ecological community varies in structure, with variable height and canopy closure across its range (DEE, 2019).	CE	P3	Unlikely incorrect distribution. Nearest record 41 km south.	Unlikely, nearest record >100 km south.	Unlikely incorrect distribution. Nearest record 16 km west.	Unlikely incorrect distribution. Nearest record 27 km south-west.
Southern Swan Coastal Plain *Eucalyptus gomphocephala*–- *Agonis flexuosa* woodlands (floristic community type 25) (can be a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC, or the Tuart woodlands andforests of the Swan			Unlikely incorrect distribution.	Unlikely, nearest record >100 km south.	Unlikely incorrect distribution.	Unlikely incorrect distribution.

Community Name[1]	Cons. Code[2]		Likelihood			
	EPBC Act	BC Act / DBCA	Cataby	Eneabba	Regans	Yandin
Coastal Plain EPBC listed TEC). Woodlands of *Eucalyptus gomphocephala–- Agonis flexuosa* south of Woodman Point. Recorded from the Karrakatta, Cottesloe and Vasse units. Dominants other than tuart were occasionally recorded, including *Corymbia calophylla* at Paganoni block and *Eucalyptus decipiens* at Kemerton. Banksias found in this community include *Banksia attenuata, B. grandis* and *B. littoralis*. Tuart formed the overstorey nearby however.			Nearest record 91 km south.		Nearest record 48 km south.	Nearest record 74 km south.
Vegetation alliances on ridges and slopes of the chert hills of the Coomberdale Floristic Region The community occurs on ridges and slopes of the chert hills of the Coomberdale floristic region. It was originally described in Griffin E.A. (1992) "Floristic survey of remnant vegetation in the Bindoon to Moora area, Western Australia" (Agriculture Western Australia Resource Management Technical Report 142, Perth). It encompasses seven vegetation alliances including the core units and three vegetation alliances of the buffer units of the Coomberdale Chert community. Core vegetation alliances include *Allocasuarina campestris* (sheoak) shrubland, *Allocasuarina microstachya* scrub, *Regelia megacephala* (priority 4) shrubland, *Kunzea praestans* shrubland and scrub, *Melaleuca calyptroides* heath, *Hibbertia subvaginata* shrubland and *Xanthorrhoea drummondii* shrubland.		EN	Unlikely, incorrect distribution. Nearest record 53 km east.	Unlikely, incorrect distribution. Nearest record 98 km south.	Unlikely, incorrect distribution. Nearest record 48 km north-east.	Unlikely, incorrect distribution. Nearest record 48 km east.

1. Community descriptions derived from DBCA (2023a; 2023b) unless otherwise stated
2. EPBC: E Endangered, CE Critically Endangered; BC: VU Vulnerable, CR Critically Endangered

Appendix B

Flora Desktop Assessment

Appendix B Flora Desktop Assessment

Eneabba Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Distance KM AECOM (2018)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-Survey Likelihood	Post-Survey Likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0.1.2)				
Acacia carens	Gravel or sandy gravel. Lateritic uplands.		P2	13.57	14.74		2007	2001		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Acacia cummingiana	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways.		P3	3.42	19.38		2009	1996		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Acacia epacantha	Lateritic gravelly loam or clay.		P3	0.00			2009			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Acacia flabellifolia	Rocky loam, lateritic gravelly soils. Low hills & ridges.		P3	11.21			2009			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Acacia forrestiana	Lateritic gravelly soils, clay loam over sandstone. Gullies, hills, breakaways.	V	VU	16.40	16.68		2014	2018	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Acacia lasiocarpa var. *lasiocarpa* Cockleshell Gully variant (E.A. Griffin 2039)	Grey-yellow sand with laterite. Low open heath.		P2	15.40			2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Acacia plicata	Loamy & clayey soils, often over sandstone or siltstone. Has been known to occur along drainage lines.		P3	18.18			2008			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia retrorsa	Grey sand & lateritic gravel, sandy loam.		P2	0.69			2016			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Acacia wilsonii	White/yellow sand & lateritic gravel, sandy clay over laterite.	E	EN	7.96	9.32		2017	2017	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Allocasuarina grevilleoides	Sand over laterite, gravel.		P3	4.65		4.60	2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Allocasuarina ramosissima	Lateritic soils, gravel.		P3	0.21	18.27		2016	1991		0	1	1	1	2	5	High	Known	Recorded in the survey area.
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN						May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Andersonia sp. Mt Lesueur (E.A. Griffin 5536)	Recorded previously on brown sand laterite breakaway (TPFL, 2023)		P2	19.82	20.01		1996	1996		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Arnocrinum gracillimum	White, grey, yellow or lateritic sand.		P3	0.69	2.59		2016	1996		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Asterolasia drummondii	Lateritic gravel & sand or loam. Lateritic hills & sandplains, breakaways.		P4	17.13	17.29		2021	1989		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Austrostipa nunaginensis	Gentle slope, yellow to yellow brown sand (WAHerb, 2023).		P3	10.72			2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia catoglypta	Lateritic breakaways.	V	VU	12.29	11.99		2017	2017	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Banksia chamaephyton	Grey or white sand over laterite.		P4	2.32			2021			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Banksia cypholoba	Sand and gravelly loam		P3	7.64	16.92	0.00	2015	2002		1	1	1	1	2	6	Known	Known	Recorded in the survey area.
Banksia elegans	Yellow, white or red sand. Sandplains, low consolidated dunes.		P4	14.25			2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia fraseri var. *crebra*	Recorded on a lateritic hilltop with grey/brown sandy clay soil (WAH, 2023)		P3	0.03		6.00	2011			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Banksia fraseri var. *effusa*	Recorded previously on brown clay loam with Corymbia calophylla (WAH, 2023)		P2	18.28			2008			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Banksia kippistiana var. *paenepeccata*	Lateritic gravelly soils.		P3	6.01			2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia nana	White/grey sand and/or gravel over laterite. Hills.		P3	15.81			2004			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia nobilis subsp. *fragrans*	Lateritic rises.		P3	12.29			2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia serratuloides subsp. *perissa*	Lateritic gravel and brown loam on ridge tops and slopes or in red-brown sand on lower areas (Brown et al. 1998).	CE	EN	11.55	19.13		2012	2017	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Banksia splendida subsp. *macrocarpa*	Lateritic gravel.		P3	14.09			2015			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia subulata	White/grey or yellow sand over laterite, gravelly laterite.		P3	15.00			2015			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Banksia tricuspis	Lateritic rocky soils. Sides, hillslopes and breakaway edges		P4		16.70			1989		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Beaufortia bicolor	White sand over laterite. Sandplains.		P3	4.16	8.18		2016	1978		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Beyeria gardneri	Yellow sand.		P3	8.16			2014			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Beyeria similis	Yellow or red clayey sand. Sandplains.		P2	11.30			1979			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Boronia scabra subsp. *condensata*	Sandy clay or gravel. Upper slopes, edges of lateritic breakaways.		P2	9.96			2006			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Caladenia denticulata subsp. *albicans*	Recorded previously on clay soil in a riverbank, wet flats (WAH, 2023)		P1	13.75			2018			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Caladenia hoffmanii	Clay, loam, laterite, granite. Rocky outcrops and hillsides, ridges, swamps and gullies.	E	EN						May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU						Known	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Calectasia browneana	White-grey sand, laterite. Adjacent to wet areas of creekline.		P2	8.64			2007			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Calectasia palustris	White or grey sand. Seasonally inundated swamplands		P2		12.13			2002		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Calothamnus arcuatus	Grows in shallow sandy loam over sandstone or siltstone on slopes near creeks, in kwongan, and in yellow sand over gravel.		P2	14.21			2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Calytrix chrysantha	White, grey or yellow/brown sand. Flats.		P4	2.83	3.18		2016	1997		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Distance KM AECOM (2018)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-Survey Likelihood	Post-Survey Likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Calytrix ecalycata subsp. *brevis*	Dry yellow sand. Sandplains, low rises.		P3	19.01			2007			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Calytrix eneabbensis	White, grey or yellow sand over laterite. Sandplains.		P4	1.87	4.22		2016	1993		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Calytrix purpurea	White, grey or yellow sand, often over laterite. Sandplains, sand dunes.		P2	15.40			2006			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Calytrix superba	Sand and laterites. Flats.		P4	5.12	11.24		2009	1992		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Caustis gigas	White or grey sand.		P2	13.03	19.63		2008	2002		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Centrolepis milleri	Recorded previously on sandplains, post-fire (WAH, 2023)		P3	9.80			2010			0	0	1	1	1	3	Moderate	Low	No suitable habitat.
Chordifex reseminans	Dry sand and heath		P2	10.59	9.56		2006	1995		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Comesperma griffinii	Yellow or grey sand plains		P2	7.89			2007			0	0	1	1	2	4	Moderate	Moderate	Appears to be a post-fire ephemeral. Perennial or possible annual (Keighery, 2002)
Comesperma rhadinocarpum	Sandy soils.		P3	7.40			2008			0	0	1	1	2	4	Moderate	Moderate	A short-lived post-fire ephemeral with a corky rootstock (Keighery, 2002)
Conospermum scaposum	White-grey sand, sandy clay. Low swampy areas, road verges.		P3	11.82			1992			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Conostephium magnum	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.		P4	4.19			2014			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Conostylis dielsii subsp. *teres*	White, grey or yellow sand, gravel. Low open woodland.	E	VU						May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Conostylis micrantha	White or grey sand. Sandplains.	E	VU						May	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Conostylis sp. Eneabba (M. Hislop 3864)	Recorded previously on grey sand, upland, heath (WAH, 2023)		P2	16.39			2015			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Cristonia biloba subsp. *pubescens*	Grows on brown sandy loam over laterite and grey and white sands over clay, in shrubland and heathland		P2	11.30			2015			0	0	1	1	2	4	Moderate	Known	Recorded in the survey area.
Cyanothamnus ramosus subsp. *lesueuranus*	Recorded previously on white lateritic sand in road verge heathland (WAH, 2023)		P2	8.66			2014			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Darwinia chapmaniana	Grows around salt lakes in woodland or shrubland dominated by Mallee. Soils are red clayey loam, red sand over broken rock, or yellow soil in low flat areas of sandstone and limestone.	E	VU	12.25			2022		Likely	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Darwinia sp. Strawberry (M.G. Corrick 8279)	Recorded previously on grey sand with lateritic duricrust (WAH, 2023)		P2	14.09			1979			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Daviesia debilior subsp. *debilior*	Sand over lateritic gravel.		P2	6.93	11.24		1997	1979		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Daviesia pteroclada	Sandy gravelly soils over laterite. Hills.		P3	6.01	13.89		2012	1993		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Daviesia speciosa	Gravelly lateritic soils. Undulating plains, rises.	E	EN	14.09	14.03		1986	2017	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Desmocladus biformis	Sand, sandy clay, lateritic soils. Dry sites.		P3	10.95			2012			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Desmocladus elongatus	White or grey sand. Dry kwongan.		P4	2.61		6.40	2016			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Diuris recurva	Loam. Winter-wet areas.		P4	13.82			2016			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Drosera prophylla	Laterite hilltops.		P3	0.00	0.01		2021	2007		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	15.99	15.99		2013	2011	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN	11.27	11.26		2017	2017	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eremophila subangustifolia	Grows in slightly saline, pale brown sandy-clay on the margins of winter-wet flats and lakes.	CE	CR	20.05			2017		Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eucalyptus absita	Known from three small stands in Badgingarra and Dandaragan area where it grows in white lateritic sands and paddocks.	E	EN						May	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus crispata	Clayey soil of shallow gullies and on lateritic or granitic breakaways and slope. In low open woodland mallee.	V	EN	13.26	6.29		2007	2018	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eucalyptus exilis	Grey sand, gravelly loam. Lateritic ridges. Avon Wheatbelt, Geraldton Sandplains, Jarrah Forest.		P4	9.12	9.76		2014	2007		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Eucalyptus impensa	Yellow sand. Lateritic hills.	E	CR	6.38	6.15		2014	2022	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Eucalyptus johnsoniana	White/grey sand with lateritic gravel. Sandplains, lateritic breakaways.	V	VU	0.57	0.83		2021	2013	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Eucalyptus lateritica	White or grey sand with gravel. Lateritic breakaways & mesas.	V	EN	8.13	8.21		2022	2011	Likely	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes.	E	EN	14.43	15.60		2005	2017	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Eucalyptus loxophleba x wandoo	Sandy clay or loam.		P4	6.65	6.47		1988	1988		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Eucalyptus macrocarpa subsp. *elachantha*	White or grey sand over laterite. Hillslopes, ridges, sandplains.		P4	6.40	8.69		2016	1993		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Distance KM AECOM (2018)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-Survey Likelihood	Post-Survey Likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Eucalyptus pendens	White or grey sand with lateritic gravel. Hillsides, breakaways, sandplains.		P4	3.81	13.05		2012	1987		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Eucalyptus pruiniramis	Skeletal soils over sandstone or laterite. Rocky hillslopes.	E	EN						May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus rhodantha var. *rhodantha*	Grey/yellow/red sand over laterite. Undulating country or hillslopes	V	VU	19.88			2006		May	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Eucalyptus suberea	Grey sand. Near or on lateritic breakaways	V	VU	3.07	8.37		2022	2011	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Eucalyptus zopherophloia	Grey/white sand with limestone rubble. Coastal areas.		P4	13.64	13.30		2016	1989		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Gastrolobium hamulosum	Sandy, often gravelly soils or clay. Flats, slopes, ridges.	E	CR	17.17			1964			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Gompholobium gairdnerianum	White, cream or brown sandy clay, white sand over sandstone, brown or grey sand over laterite, gravel. Hill summits and slopes, ridges.		P3	18.76			2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Goodenia xanthotricha	Sandy soils. Gravelly hills.		P2	7.91			2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea althoferorum	Found on the crest of a low rise on pale brown loamy sand or grey sand supporting low heath. Also grows in greyish-yellow colluvial sand in Banksia low woodland.	E	EN						Likely	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Grevillea althoferorum subsp. *althoferorum*	Recorded previously on yellow brown sand, crest, burnt 4-5 years ago (WAH, 2023)	E	CR	7.62	7.65		2009	2008		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea amplexans subsp. *adpressa*	Yellow sand, loam. Dunes, road verge.		P1	0.83			2016			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Grevillea batrachioides	Sandstone outcrops. Sandy loam.	E	CR	17.14			1994		Known	0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea biformis subsp. *cymbiformis*	White sand.		P3	7.32	8.95		2011	2002		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea christineae	Clay loam, sandy clay, often moist.	E	EN						May	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E	EN	14.22			2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E	EN						Known	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Grevillea delta	Sandy clay, loam, gravelly soils, often over sandstone. Sandstone outcrops, creek beds.		P2	17.39			2009			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Grevillea erinacea	White, grey or yellow sand, often with lateritic gravel.		P3	12.91		5.90	2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea florida	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.		P3	12.30	19.30		2012	1997		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea granulosa	Gravelly sand, loam, clay. Sandplains.		P3	14.07			1996			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Grevillea humifusa	Gravelly loam over laterite.	E	CR						Likely	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Grevillea makinsonii	White, grey or yellow sand over laterite, loam, gravel, clay. Rocky hills, sandplains.		P3	9.32			2003			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea metamorpha	White sand. Along creekline.		P1	11.87	12.51		2001	2001		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea olivacea	White or grey sand. Coastal dunes, limestone rocks.		P4	6.17			2018			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea rudis	White, grey, yellow or red sand, often with gravel & over laterite.		P4	3.65			2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Grevillea thyrsoides subsp. *thyrsoides*	Sand or sandy lateritic gravel.		P3	6.29			2014			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea uniformis	Sand or sandy loam on sandstone, lateritic gravel. Sandstone outcrops, creeklines.		P3	0.02			2009			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Guichenotia alba	Sandy & gravelly soils. Low-lying flats, depressions.		P3	18.23			2005			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Guichenotia quasicalva	Sandy clay over laterite. Drainage line.		P2	15.39			2012			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	9.07	11.24		2016	1992		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hakea longiflora	White sand, loam, gravel, laterite. Breakaways.		P3	0.04			2008			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Hakea megalosperma	Grey sand, loam. Lateritic hills & rocks.	V	VU	3.83	4.02		2022	2007	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Hakea neurophylla	Lateritic sandy soils. Hillsides.		P4	9.81			2020			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hemiandra gardneri	Deep yellow to yellow-white sand on sandplains and hills (TSSC, 2016). Usually occurs in open heath with mallee scrub nearby and associated with Bansia, Hakea, Grevillea, Verticordia and Isopogon species (TSSC, 2016).	E	EN						Likely	0	0	0	1	1	2	Low	Negligible	No DBCA records within 50 km.
Hemiandra rutilans	Yellow/grey sand.	E	CR	18.77			1992		May	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Hemiandra sp. Eneabba (H. Demarz 3687)	Sand. Disturbed sites.		P3	0.06		0.00	2016			1	1	1	1	2	6	Known	Known	Recorded in the survey area.
Hemiandra sp. Watheroo (S. Hancocks 4)	Recorded previously on flat to low undulating yellow to white sand, kwongan heathland, often disturbed (WAH, 2023)		P4	17.42	17.42		2016	1999		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hensmania stoniella	White, grey or lateritic sand, often winter-wet.		P3	4.25			2021			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hibbertia propinqua	Recorded previously on yellow sand, kwongan heath (WAH, 2023)		P4	7.86			2020			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Distance KM AECOM (2018)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-Survey Likelihood	Post-Survey Likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Hibbertia subglabra	White sand over laterite, low open heathland (WAH, 2023)		P3	10.22			2019			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Homalocalyx chapmanii	Yellow or grey/brown sand. Undulating plains, weathered granite.		P2	18.38			2003			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hypocalymma gardneri	Grey-brown sand, laterite. Sandplains, upper slopes, heathland.		P3	0.85	12.44		2014	1991		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Hypocalymma tenuatum	Sandy loam over sandstone. Outcrops, ridges.		P2	16.14			2007			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hypolaena robusta	White sand. Sandplains.		P4	0.81			2013			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Jacksonia anthoclada	White or grey sand. Sandplains.		P3	1.87	1.83		2016	1990		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Lasiopetalum rutilans	Recorded previously on dry, white sand in Mallee over heath (WAH, 2023)		P2	15.59			2016			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Lepidobolus densus	Yellow lateritic sand, lateritic gravel. Dry kwongan.		P4	11.08	11.08		2009	2005		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Lepidobolus quadratus	Lateritic gravel, grey/white sand. Dry kwongan.		P3	4.18			2016			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Lepyrodia curvescens	Sand, laterite. Seasonally inundated swampland.		P2	5.14			2007			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Leucopogon foliosus	Usually occurs on lateritic uplands in shallow gravelly soils over laterite and in association with low, species-rich heath		P3	19.54			2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Leucopogon obtectus	Grows mainly on the crests and upper slopes of relictual dunes (or more rarely in interdunal swales) comprised of grey-white or pale yellow sands (DEWHA, 2021).	E	EN		7.03			2005	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Leucopogon plumuliflorus	Lateritic sandy soils. Amongst lateritic boulders, hillslopes.		P2	18.57	18.38		2011	1993		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Liparophyllum congestiflorum	Recorded previously on grey sand/loam over laterite, flats, woodland over herbs (WAH, 2023)		P4	3.32			2007			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Loxocarya gigas	Sandy gravelly lateritic soils. Low hills & ridges, sandplains.		P2	4.16	9.17		2008	2002		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Lyginia excelsa	Sand. Dry heath & Banksia woodland.		P2	12.56			2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Mesomelaena stygia subsp. *deflexa*	White, grey or lateritic sand, clay, gravel.		P3	0.69			2013			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Micromyrtus uniovulum	Recorded previously on sand and laterite in low heath (WAH, 2023)		P2	18.39			2004			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Paracaleana dixonii	Deep sand in open areas beneath tall dense shrubland with scatted emergent Banksia, or in shallow sand over laterite in heathland.	E	VU	4.61	4.61		2013	2013		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Patersonia argyrea	Grey sand and lateritic gravel.		P3	9.40			2016			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Persoonia filiformis	Yellow or white sand over laterite.		P3	3.77			2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Persoonia rudis	White, grey or yellow sand, often over laterite.		P3	3.14	5.67		2016	2005		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Petrophile biternata	Yellow/grey sand & gravel, laterite, quartzite soils. Lateritic ridges, plains.		P3	4.88			1995			0	1	0	1	2	4	Moderate	Low	Perennial species not recorded.
Petrophile clavata	Grey sand, laterite. Hilltops and rises.		P2	7.70			2007			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Petrophile nivea	Dry bare white sand over gravel over laterite. Uplands.	V	VU	14.37	14.51		2008	2006	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Petrophile septemfida	Recorded previously on sandy plains in Eucalyptus todtiana low open woodland (WAH, 2023)		P3	6.82		5.90	2015			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	0.00			2016			1	1	1	1	2	6	Known	Known	Recorded in the survey area.
Pityrodia viscida	Lateritic sand.		P4	7.38			2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Platysace ramosissima	Sandy soils.		P3	12.05			2007			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Ptilotus clivicola	Recorded previously on white grey sand with lateritic gravel (WAH, 2023)		P2	6.55			2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Ptilotus falcatus	Recorded previously on grey to light brown sandy loam, laterite pebbles (WAH, 2023)		P1	10.26			2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Scaevola eneabba	Heath		P2	9.40	13.86		2011	2002		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Schoenus griffinianus	White sand.		P4	5.29	5.29		2015	2005		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Schoenus sp. Eneabba (F. Obbens & C. Godden 1154)	Grey, yellow or white sand. Undulating sandplains, mid slopes, tops of rises.		P2	6.90			2006			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Spirogardnera rubescens	Laterite, sand over laterite, loam.	E	VU						Known	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Stawellia dimorphantha	White, grey, yellow sand		P4	14.11	12.91		2016	2006		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stenanthemum limitatum	Sand & lateritic gravel, sandstone.		P2	8.63			2009			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Stylidium aeonioides	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.		P4	7.27			2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stylidium carnosum subsp. Narrow leaves (J.A. Wege 490)	Recorded previously on white grey sand with laterite (WAH, 2023)		P1	7.68			2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stylidium cornuatum	Recorded previoulsy on brown clay loam in winter wet depression, low heathland (WAH, 2023)		P2	14.74			2010			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium diplotrichum	Clayey sand or clay loam over laterite. Hillslopes and gullies.		P2	17.32			2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Distance KM AECOM (2018)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-Survey Likelihood	Post-Survey Likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Stylidium drummondianum	Sand or clayey sand over laterite. Upper hillslopes, breakaways. Low heath, mallee shrubland.		P3	4.44			2009			0	1	1	1	2	5	High	Known	Recorded in the survey area.
Stylidium inversiflorum	White or grey sand over laterite. Sandplains, hillslopes and gullies. Heath, open woodland.		P4	3.06			2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Stylidium nonscandens	Sand over laterite. Hillslopes and crests.		P3	5.35			2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stylidium periscelianthum	Loamy clay, moist soils pockets. Wet flats, low granitic hills.		P3	18.04			2014			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium torticarpum	Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways. Heath or mallee shrubland.		P3	8.63			2014			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Styphelia carolineae	Recorded previously on grey white sand on laterite in heathland (WAH, 2023)		P2	10.30			2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Styphelia filamentosa	Recorded previously on white sand on hills in Banksia heath (WAH, 2023)		P3	4.75			2008			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Styphelia longissima	Recorded previously on yellow/white sand with gravel, hillside (WAH, 2023)	CE	CR	14.44	14.63		2007	2007	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Styphelia obtecta	Recorded previously on grey, brown sand in low open heath and woodland (WAH, 2023)	E	EN	7.87			2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Synaphea endothrix	Gravelly loam, sand. Lateritic rises.		P3	5.85	15.60		2016	1999		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Synaphea oulopha	Grey sand, gravelly loam, clay. Lateritic breakaways & rises.		P3	10.30			1999			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Synaphea sparsiflora	Sandy loam over laterite.		P2	12.37	14.88		2016	2001		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Synaphea xela	Red-brown gravelly sand, white-pink, grey-brown clayey sand and loam, over laterite. Undulating sites.		P2	15.37			2008			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Tetratheca angulata	Sandy to gravelly laterite soils. Low hill crests, breakaways with massive laterite boulders.		P3	17.71			2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Tetratheca nephelioides	White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges.	CE	EN	4.18	3.53		2018	2009	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Thelymitra pulcherrima	Gravel. Granite rocks, slopes.		P2	11.23			2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN	2.64	2.64		2011	2021	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Thryptomene spicata	Recorded previously on yellow/grey sand with laterite (WAH, 2023)		P2	6.42			2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	1.35			2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel.		P2	17.61			1981			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Thysanotus vernalis	Sandy loam.		P3	14.80			2016			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia albida	Grey-yellow sand. Road verges	E	CR	5.26	15.24		2011	2014	Likely	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Verticordia amphigia	Sandy loam, clay and rocky loam. Winter wet depressions.		P3	11.13	11.12		2005	1985		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Verticordia argentea	White, grey or yellow sand. Sandy ridges, undulating plains.		P2	3.48	9.40		2011	1992		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Verticordia aurea	Deep sand. Sandplains.		P4	3.15	6.84		2016	1988		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia densiflora var. *roseostella*	Sandy gravelly soils.		P3	14.11			2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Verticordia fragrans	White, grey, yellow sand, clay loam. Low lying areas. Sandplains.		P3	4.04	9.99		2012	1993		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Verticordia insignis subsp. *eomagis*	Sandy soils over laterite. Sandplains, rocky rises.		P3	9.44	11.83		2016	1992		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Verticordia luteola var. *rosea*	White sand. Flats.		P1	14.21			2005			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia muelleriana subsp. *muelleriana*	White/grey or yellow sand. Sandplains.		P3	11.35			2011			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia penicillaris	Shallow gritty soils. Granite outcrops.		P4	14.21			2005			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia rutilastra	Sand & lateritic gravel. Hills.		P3	7.70	7.68		2016	1986		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Walteranthus erectus	Sand over limestone. Coastal limestone ridges.		P2	14.25			1982			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Wurmbea tubulosa	Clay, loam. River banks, seasonally-wet places.	E	VU						Likely	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Xanthosia tomentosa	Lateritic gravelly soils.		P4	4.75			2012			0	1	1	1	2	5	High	Low	Perennial species not recorded.

1. Habitat derived from WAH (1998-) unless otherwise stated.

Cataby Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Acacia benthamii	Typically on limestone breakaways.		P2	16.68		2006			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia epacantha	Lateritic gravelly loam or clay.		P3	12.08		2017			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Acacia forrestiana	Lateritic gravelly soils, clay loam over sandstone. Gullies, hills, breakaways.	V	VU	13.41	15.75	2008	1943	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia plicata	Loamy & clayey soils, often over sandstone or siltstone. Has been known to occur along drainage lines.		P3	11.51		2002			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Acacia splendens	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slopes of breakaways, especially southern slopes, hills.	E	EN	11.02	12.76	2011	1934	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Allocasuarina grevilleoides	Sand over laterite, gravel.		P3	10.09		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN	4.27	3.66	2018	1910	Known	0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Angianthus micropodioides	Saline sandy soils. River edges, saline depressions, claypans.		P3	11.21		2018			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	Grey-white sand, rich brown sandy loam, sandy clay, alluvial soils. Low plains, river-banks, winter-wet swamps.		P2	8.81	8.81	2013	1924		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand.		P4	8.15	15.81	2014	1943		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU	2.85	3.81	2018	1910	Known	0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Arnocrinum gracillimum	White, grey, yellow or lateritic sand.		P3	0.45	12.33	2013	1933		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Asterolasia drummondii	Lateritic gravel & sand or loam. Lateritic hills & sandplains, breakaways.		P4	12.20	15.66	2021	1942		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Babingtonia delicata	Sandy soils close to wetlands, described as seasonally wet and low-lying		P1	4.20	5.81	2018	1915		0	1	1	1	0	3	Negligible	Negligible	No suitable habitat.
Babingtonia urbana	associated with wetlands on the Swan Coastal Plain		P3	3.44		2017			0	1	1	1	0	3	Negligible	Negligible	No suitable habitat.
Baeckea sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606)	Recorded previously on slope high in landscape on white sand (WAH, 2023)		P1	9.08		2003			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia catoglypta	Lateritic breakaways.	V	VU					Known	0	0	0	1	0	1	Negligible	Negligible	No DBCA records within 50 km.
Banksia kippistiana var. *paenepeccata*	Lateritic gravelly soils.		P3	19.78		2002			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Banksia nana	White/grey sand and/or gravel over laterite. Hills.		P3	11.82		1996			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Banksia prionophylla	Dry grey sand over laterite with surface boulders. Rises.		CR	19.30	19.31	2015	1952		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia serratuloides subsp. *perissa*	Lateritic gravel and brown loam on ridge tops and slopes or in red-brown sand on lower areas (Brown et al. 1998).	CE	EN					May	0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Beaufortia bicolor	White sand over laterite. Sandplains.		P3	6.80	5.16	2016	1914		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Beaufortia eriocephala	Lateritic sandy soils. Slopes.		P3	10.03	19.89	2008	1954		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Beyeria cinerea subsp. *cinerea*	Yellow, grey or white sand with sandstone or limestone. Coastal cliffs.		P3	16.22		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Beyeria gardneri	Yellow sand.		P3	3.83		2009			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Boronia scabra subsp. *condensata*	Sandy clay or gravel. Upper slopes, edges of lateritic breakaways.		P2	15.46		1988			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Byblis gigantea	Sandy-peat swamps. Seasonally wet areas.		P3	17.51		2007			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Caladenia denticulata subsp. *albicans*	Deep sandy soil. Moist depression nearby (WAH, 2023).		P1	13.34		1991			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Calectasia palustris	White or grey sand. Seasonally inundated swamplands		P2	14.73	14.73	2016	1940		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Calothamnus brevifolius	White/grey or yellow sand.		P4	14.21		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Catacolea enodis	Deep white sand over laterite. Tall heath.		P2	16.23		2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with Eucalyptus todtiana (Pricklybark), Banksia attenuata (Coast Banksia), and Hibbertia sp. (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Chamelaucium sp. Cataby (G.J. Keighery 11009)	Grows in brown loam, sandy clay and lateritic gravel between laterite boulders on the slopes, edge and base of breakaways (Brown et al., 1998; Patrick & Brown, 2001; DEC, 2008).	V	VU	16.62	18.66	2021	1951	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Chordifex chaunocoleus	Grey, siliceous or peaty sand, well to poorly drained. Drainage lines, depressions.		P4	5.48	5.48	1996	1915		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Chordifex reseminans	Dry sand. Heath. This species is endemic to Western Australia and commonly found in drainage lines and depressions.		P2	4.55	5.61	2018	1915		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Comesperma rhadinocarpum	Sandy soils.		P3	9.29	15.33	2017	1941		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Conospermum densiflorum subsp. *unicephalatum*	Clay soils. Low-lying areas.	E	EN					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Conospermum scaposum	White-grey sand, sandy clay. Low swampy areas, road verges.		P3	5.43		2020			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Conostephium magnum	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.		P4	0.04		2016			0	1	1	1	2	5	High	Known	Recorded in survey area.
Cristonia biloba subsp. *pubescens*	Grows on brown sandy loam over laterite and grey and white sands over clay, in shrubland and heathland		P2	9.45		2003			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Cyanothamnus tenuis	Laterite stony soils and granite. Darling Scarp between Dwellingup and Wannamal in the Jarrah Forest and SCP.		P4		1.87		1905		0	1	0	1	1	3	Low	Negligible	No suitable habitat, no recent records in the vicinity.
Dampiera tephrea	Sand, gravelly loam.		P3	8.91	14.13	2018	1938		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Desmocladus biformis	Sand, sandy clay, lateritic soils. Dry sites.		P3	4.63		2017			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Desmocladus elongatus	White or grey sand. Dry kwongan.		P4	4.58		2003			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Desmocladus microcarpus	Recorded previously on white sand with laterite and gravel (TPFL, 2023)		P2	11.51	15.33	2021	1947		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Desmocladus nodatus	Recorded previously on yellow sandy loam in low heath with *Verticordia densiflora* , *Scholtzia involucrata, Calothmnus quadrifidus and Conospermum stoechadis* (WAH, 2023).		P3	2.69		2018			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter wet swamps.	E	CR					Likely	0	0	0	1	1	2	Low	Negligible	No DBCA records within 50 km.
Drosera leioblastus	White sandy soils.		P1	1.08	1.37	1999	1903		0	1	0	1	2	4	Moderate	Low	Perennial species not recorded.
Drosera leucostigma	Sandy soils. Margins of wet depressions.		P1	7.58		1987			0	0	0	1	1	2	Low	Negligible	Suitable habitat, no recent records in the vicinity.
Drosera prophylla	Laterite hilltops.		P3	2.06	1.99	2022	1905		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	14.29	14.29	2011	1939	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eremophila glabra subsp. chlorella	Sandy clay. Winter-wet depressions.	E	EN	5.70		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Eucalyptus abdita	Laterite, sandy clay with gravel over laterite. Slopes, breakaways.		P2	3.64		2007			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Eucalyptus absita	Known from three small stands in Badgingarra and Dandaragan area where it grows in white lateritic sands and paddocks.	E	EN	16.53	19.32	2011	1952	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eucalyptus absita x loxophleba	White lateritic sand. Paddocks.		P1	19.03	19.86	1992	1954		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Eucalyptus dolorosa	Dandaragan mallee is known from a single population west of Dandaragan. It is confined to lateritic breakaway slopes and a summit in mallee heath over low scrub, amongst massive ironstone blocks. Associated species include *Eucalyptus arachnaea, E. gittinsii, E. pluricaulis, E. abdita, Hakea lissocarpha, H. obliqua, H. undulata, Calothamnus quadrifidus, Melaleuca radula, Acacia pulchella* , Scholtzia sp. and *Eremaea asterocarpa* (TSSC, 2015).	E	EN	15.46	15.71	2017	1943	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes.	E	EN					Likely	0	0	0	1	1	2	Low	Negligible	No DBCA records within 50 km.
Eucalyptus macrocarpa subsp. *elachantha*	White or grey sand over laterite. Hillslopes, ridges, sandplains.		P4	2.74	2.76	2003	1907		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Eucalyptus pendens	White or grey sand with lateritic gravel. Hillsides, breakaways, sandplains.		P4	6.90	7.63	2016	1920		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CR					Likely	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Eucalyptus x carnabyi	Grey sand, sandy loam. Lateritic ridges.		P4	8.66	8.59	1996	1923		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Gastrolobium nudum	Red-brown clay, brown loam, gravel, laterite, granite. Flats, slopes, hilltops, ridges, valleys, breakaways.		P2	18.56		1991			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Gompholobium gairdnerianum	White, cream or brown sandy clay, white sand over sandstone, brown or grey sand over laterite, gravel. Hill summits and slopes, ridges.		P3	10.56		2002			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea batrachioides	Sandstone outcrops. Sandy loam.	E	CR					Likely	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea calliantha	Grey or yellow sand or sandy clay on lower to mid levelslopes to low hills and rises, sometimes on slopes in shallow gullies between lateritic ridges (DEWHA, 2008). Associated with low heath and dwarf scrub under open low woodland (DEWHA, 2008).	E	EN	7.93	9.30	2007	1925	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E	EN					May	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea drummondii	Lateritic soils (sandy clay, gravel, loam, sand), sand over granite. Rocky hillsides, boulders, granite outcrops.		P4	12.20	19.54	1988	1953		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea florida	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.		P3	11.51	11.51	1993	1931		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Grevillea rudis	White, grey, yellow or red sand, often with gravel & over laterite.		P4	17.86		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea saccata	Yellow or brown sand, often with lateritic gravel.		P4	1.49	1.27	2007	1903		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Grevillea sp. Cooljarloo (B.J. Keighery 28 B)	Recorded previously on sandy clay, seasonally wet (WAH, 2023)		P1	11.89		2014			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea synapheae subsp. A Flora of Australia (S.D. Hopper 6333)	Gravelly loam.		P1	13.92	15.72	1991	1943		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea synapheae subsp. *minyulo*	Gravel, laterite.		P1	7.93	8.86	2010	1924		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Grevillea thyrsoides subsp. *pustulata*	Sand or sandy gravel.		P3	18.35		1938			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Grevillea thyrsoides subsp. *thyrsoides*	Sand or sandy lateritic gravel.		P3	6.28		2007			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Guichenotia alba	Sandy & gravelly soils. Low-lying flats, depressions.		P3	1.82		2012			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded.
Hakea longiflora	White sand, loam, gravel, laterite. Breakaways.		P3	14.52		2005			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hakea megalosperma	Grey sand, loam. Lateritic hills & rocks.	V	VU	5.35	5.04	2011	1913	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hemiandra gardneri	Deep yellow to yellow-white sand on sandplains and hills (TSSC, 2016). Usually occurs in open heath with mallee scrub maerby and associated with Bansia, Hakea, Grevillea, Verticordia and Isopogon species (TSSC, 2016).	E	EN					Likely	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Hensmania stoniella	White, grey or lateritic sand, often winter-wet.		P3	12.51		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		3.06		1908		0	1	0	1	0	2	Negligible	Negligible	No suitable habitat, no records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Hibbertia leptotheca	Recorded previously on yellow sand in low heath (TPFL, 2023).		P3	16.50	16.30	1992	1944		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hopkinsia anoectocolea	White or grey sand, often saline. Winter-wet depressions, floodplains, salt lakes.		P3	1.66		2018			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hypocalymma serrulatum	Grey or white sand. Along drainage lines.		P2	10.57	2.04	2021	1905		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hypocalymma sp. Cataby (G.J. Keighery 5151)	Grey sand.		P2	13.24	14.28	2014	1939		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Hypocalymma tetrapterum	Grey sand, loam, lateritic gravel. Riverbanks, breakaways.		P3	8.66	2.80	2018	1907		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hypolaena robusta	White sand. Sandplains.		P4	0.00		2021			1	1	1	1	2	6	Known	Known	Recorded in survey area.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	3.28		1993			0	1	0	1	2	4	Moderate	Low	Perennial species not recorded.
Isopogon panduratus subsp. *palustris*	Recorded previously in vegetation containing *Acacia pulchella* / *lasiocarpa* , *Banksia telmatiaea* , *Hakea trifurcata* , *Xanthorrhoea preissii*, *Anigozanthus* sp. (WAH, 2023)		P3	4.06		2016			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Isotropis cuneifolia subsp. *glabra*	Sand, clay loam. Winter-wet flats.		P3	9.51		2018			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Jacksonia anthoclada	White or grey sand. Sandplains.		P3	10.55	10.07	2008	1927		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Jacksonia carduacea	Grey sand, sandy clay.		P3	5.69		2018			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Lasiopetalum rupicola	Steep hillside and summit of a mesa in brown loam with lateritic gravel and boulders associated with low heath of Allocasuarina humilis, Daviesia, Grevillea and Hakea on private property between Cataby and Dandaragan		P1	13.92	15.92	2017	1943		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Lepidobolus quadratus	Lateritic gravel, grey/white sand. Dry kwongan.		P3	4.58		2021			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Lepyrodia curvescens	Sand, laterite. Seasonally inundated swampland.		P2	6.82		2018			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Leucopogon foliosus	Usually occurs on lateritic uplands in shallow gravelly soils over laterite and in association with low, species-rich heath		P3	6.54		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Leucopogon obtectus	Grows mainly on the crests and upper slopes of relictual dunes (or more rarely in interdunal swales) comprised of grey-white or pale yellow sands (DEWHA, 2021).	E	EN					May	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Levenhookia preissii	Grey or black, peaty sand. Swamps.		P1	12.62		2020			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Lyginia excelsa	Sand. Dry heath & Banksia woodland.		P2	4.20		2017			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Macarthuria keigheryi	White or grey sand.	E	EN	7.03	7.03	2021	1919	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Meionectes tenuifolia	Granite flats, shallow soils at margins, inundated. Grey clay.		P3		11.75		1932		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Paracaleana dixonii	Deep sand in open areas beneath tall dense shrubland with scatted emergent Banksia, or in shallow sand over laterite in heathland.	E	VU	4.76	4.53	2012	1912		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Patersonia spirifolia	Sand over laterite. Low hills.	E	EN					Likely	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Persoonia filiformis	Yellow or white sand over laterite.		P3	5.23		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Persoonia rudis	White, grey or yellow sand, often over laterite.		P3	2.09		2010			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Petrophile clavata	Grey sand, laterite. Hilltops and rises.		P2	15.15		2005			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	9.79		2014			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Platysace ramosissima	Sandy soils.		P3		17.17		1947		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Podotheca pritzelii	Sand. Sand ridges in salt flats.		P3	15.30		1994			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Poranthera asybosca	Recorded previously on grey sandy soil in Banksia woodland (WAH, 2023).		P1	12.13		2021			0	0	1	1	2	4	Moderate	Low	Inconspicuous annual species.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Poranthera moorokatta	Banksia Woodland (Barrett, 2012).		P2	4.24		2021			0	1	1	1	2	5	High	Moderate	Inconspicuous annual species.
Ptychosema pusillum	Sandy rises.	V	VU	15.03	15.03	2016	1941	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Schoenus badius	Grey sand, moist areas.		P2	16.48		2011			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Schoenus griffinianus	White sand.		P4	4.40	4.40	2012	1912		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Schoenus natans	Winter-wet depressions.		P4	8.33		2008			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Schoenus pennisetis	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.		P3	0.87		2016			0	1	1	1	0	3	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	4.85		2010			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Stylidium aceratum	Sandy soils. Swamp heathland.		P3	6.40		2018			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium aeonioides	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.		P4	2.18	11.60	2021	1931		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Stylidium hymenocraspedum	Sand over laterite. Hillslopes. Heath, Banksia and Eucalyptus low open woodland.		P3	0.55		2021			0	1	1	1	2	5	High	Known	Recorded in survey area.
Stylidium inversiflorum	White or grey sand over laterite. Sandplains, hillslopes and gullies. Heath, open woodland.		P4	18.01		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands.		P4	13.25		2016			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3		12.79		1935		0	0	0	1	1	2	Low	Negligible	Suitable habitat, no recent records in the vicinity.
Stylidium periscelianthum	Loamy clay, moist soils pockets. Wet flats, low granitic hills.		P3	13.93		2007			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium tinkeri	Grey sandy soil. Seasonal wetlands.		P2	11.02		2010			0	0	1	1	0	2	Low	Negligible	Suitable habitat, no recent records in the vicinity.
Stylidium torticarpum	Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways. Heath or mallee shrubland.		P3	16.86		2005			0	0	1	1	0	2	Low	Negligible	Suitable habitat, no recent records in the vicinity.
Styphelia undulata	Recorded previously in dry white-grey soil, recently burnt (WAH, 2023).		P2	19.44		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Synaphea endothrix	Gravelly loam, sand. Lateritic rises.		P3	6.66	17.15	2021	1946		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Tetratheca angulata	Sandy to gravelly laterite soils. Low hill crests, breakaways with massive laterite boulders.		P3	4.77		2021			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Thelymitra apiculata	Grey sand, lateritic gravel.		P4	4.58		2022			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Thelymitra pulcherrima	Gravel. Granite rocks, slopes.		P2	2.20		2021			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN		2.17		1905	May	0	1	0	1	2	4	Moderate	Low	Perennial species not recorded.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	2.95		2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Verticordia amphigia	Sandy loam, clay and rocky loam. Winter wet depressions.		P3	5.18		1996			0	0	0	1	1	2	Low	Negligible	Suitable habitat, no recent records in the vicinity.
Verticordia huegelii var. *tridens*	Sandy or gravelly loam. Winter-wet areas, low hills.		P3	10.09		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia insignis subsp. *eomagis*	Sandy soils over laterite. Sandplains, rocky rises.		P3	17.53	18.48	2003	1950		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	1.58	14.95	2018	1940		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia rutilastra	Sand & lateritic gravel. Hills.		P3	17.53	18.48	2011	1950		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.

1. Habitat derived from WAH (1998-) unless otherwise stated.

Regans Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Acacia denticulosa	Sand, loam, clay. Granite outcrops, rarely on sandplains. Sites are prone to severe drying out (DCCEEW, 2023).	V	VU	7.93		2011			0	0	1	0	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia drummondii subsp. *affinis*	Lateritic gravelly soils.		P3	14.53	14.39	2007	1994		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia forrestiana	Lateritic gravelly soils, clay loam over sandstone. Gullies, hills, breakaways.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Allocasuarina grevilleoides	Sand over laterite, gravel.		P3	12.67		2012			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN	7.40		2018		Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Andersonia sp. Mysosma (E.A. Griffin 2213)	Previously recorded on grey sand (WAH, 2023).		P2	5.15		1992			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	Grey-white sand, rich brown sandy loam, sandy clay, alluvial soils. Low plains, river-banks, winter-wet swamps.		P2	19.94		2013			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand.		P4	7.59	6.87	2017	2004		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU	12.12	12.13	2018	2013	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Asterolasia nivea	Lateritic soils, clay over granite. Breakaways, hills.		P4					Likely	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Babingtonia delicata	Sandy soils close to wetlands, described as seasonally wet and low-lying		P1	12.94		2018			0	0	1	0	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Babingtonia urbana	associated with wetlands on the Swan Coastal Plain		P3	2.86		2017			0	1	1	0	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Banksia chamaephyton	Grey or white sand over laterite.		P4	13.46		2006			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia dallanneyi subsp. *pollosta*	Grey/yellow sand. Flats, lateritic rises.		P3	4.13	5.15	2018	1999		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Banksia fuscobractea	Lateritic gravel, grey sand over laterite in low dense heath (DEWHA, 2009)	CE	CR					Likely	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Banksia kippistiana var. *paenepeccata*	Lateritic gravelly soils.		P3	7.55		2006			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU	11.79	11.78	2016	2020	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia pteridifolia subsp. *vernalis*	White/grey sand over laterite.		P3	12.54		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Banksia serratuloides subsp. *serratuloides*	Loam or clay loam over laterite, sandy gravel.	V	VU					May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Beaufortia eriocephala	Lateritic sandy soils. Slopes.		P3	7.66	12.65	2019	1993		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Caladenia multiplex	Recorded previously on low-lying plain, red-brown loam (WAH, 2023).		P2	19.99		2018			0	0	1	0	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Calectasia elegans	Recorded previously on yellow sand in Banksia woodland (TPFL, 2023).		P2	15.20	15.20	2020	2021		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Calothamnus accedens	Sandy soils over laterite. Road verge.		P4	16.91		2004			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Calothamnus pachystachyus	Lateritic soils, often gravelly. Ridges, road verges.		P4	12.67		2018			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Calytrix ecalycata subsp. *brevis*	Dry yellow sand. Sandplains, low rises.		P3	18.28		2015			0	0	1	0	2	3	Moderate	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with Eucalyptus todtiana (Pricklybark), Banksia attenuata (Coast Banksia), and Hibbertia sp. (DCCEEW, 2023).	E	VU					Likely	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Chordifex reseminans	Dry sand and heath		P2	7.35		2018			0	0	1	0	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Comesperma rhadinocarpum	Sandy soils.		P3	13.33		2017			0	0	1	1	2	4	Moderate	Moderate	A short-lived post-fire ephemeral with a corky rootstock (Keighery, 2002)
Conospermum densiflorum subsp. *unicephalatum*	Clay soils. Low-lying areas.	E	EN					Likely	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Dampiera tephrea	Sand, gravelly loam.		P3	14.48	3.38	2008	2002		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Darwinia acerosa	Sand, loam, often moist soils. Granite outcrops, road verges.	E	EN	4.38		2013		Likely	0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Darwinia carnea	Lateritic loam and gravel. Brown or dark yellow loamy to sandy loam soils.	E	CR	4.38		2007			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Desmocladus biformis	Sand, sandy clay, lateritic soils. Dry sites.		P3	4.43		2006			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Desmocladus microcarpus	Recorded previously in grey sandy soils that supports *Banksia menziesii, B. attenuata* and *Eucalyptus todtiana* (WAH, 2023)		P2	15.20		2020	2006		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Dillwynia dillwynioides	Sandy soils, winter wet depressions.		P3	4.98		1993	1994		0	1	0	1	1	3	Low	Negligible	No suitable habitat, no records in the vicinity.
Dodonaea hackettiana	Sand, outcropping limestone.		P4	17.62		2005	2005		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter wet swamps.	E	CR				2010	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU					May	0	0	0	1	0	1	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus dolorosa	Dandaragan mallee is known from a single population west of Dandaragan. It is confined to lateritic breakaway slopes and a summit in mallee heath over low scrub, amongst massive ironstone blocks. Associated species include *Eucalyptus arachnaea, E. gittinsii, E. pluricaulis, E. abdita, Hakea lissocarpha, H. obliqua, H. undulata, Calothamnus quadrifidus, Melaleuca radula, Acacia pulchella*, Scholtzia sp. and *Eremaea asterocarpa* (TSSC, 2015).	E	EN					May	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes.	E	EN					May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus macrocarpa subsp. elachantha	White or grey sand over laterite. Hillslopes, ridges, sandplains.		P4	2.55		2006			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Goodenia arthrotricha	Gravel. Granite rocks, slopes.	E	EN					Likely	0	0	0	1	0	1	Negligible	Negligible	No DBCA records within 50 km.
Goodenia xanthotricha	Sandy soils. Gravelly hills.		P2	19.10		2015			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E	EN					Likely	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Grevillea florida	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.		P3	17.83		2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Grevillea rudis	White, grey, yellow or red sand, often with gravel & over laterite.		P4	18.65		1958			0	0	0	0	2	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea thelemanniana	Sand, sandy clay. Winter-wet low-lying flats.	CE	CR	19.02		2018			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Gyrostemon sp. Mogumber (T.J. Hawkeswood 250)	Recorded on the Bassendean system.		P1	10.25		1980			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	2.86	2.86	1988	1994		0	1	0	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Hakea megalosperma	Grey sand, loam. Lateritic hills & rocks.	V	VU					Likely	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Hemiandra gardneri	Deep yellow to yellow-white sand on sandplains and hills (TSSC, 2016). Usually occurs in open heath with mallee scrub maerby and associated with Banksia, Hakea, Grevillea, Verticordia and Isopogon species (TSSC, 2016).	E	EN					May	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Hensmania stoniella	White, grey or lateritic sand, often winter-wet.		P3	4.38		1975			0	1	0	1	1	3	Low	Negligible	No suitable habitat, no records in the vicinity.
Hypocalymma serrulatum	Grey or white sand. Along drainage lines.		P2	10.57		1982			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Hypocalymma sp. Cataby (G.J. Keighery 5151)	Grey sand.		P2		16.32		1992		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Hypolaena robusta	White sand. Sandplains.		P4	17.25		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	12.10		2006			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Isotropis cuneifolia subsp. *glabra*	Sand, clay loam. Winter-wet flats.		P3	3.72	13.51	2018	2005		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Lepidobolus densus	Yellow lateritic sand, lateritic gravel. Dry kwongan.		P4	19.01		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Lepidosperma rostratum	Peaty sand, clay.	E	EN					Known	0	0	0	1	0	1	Negligible	Negligible	No DBCA records within 50 km.
Lepyrodia curvescens	Sand, laterite. Seasonally inundated swampland.		P2	2.93		2018			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Leucopogon squarrosus subsp. *trigynus*	Recorded previously in white sand heath (WAH, 2023)		P2	5.56		2019			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Lyginia excelsa	Sand. Dry heath & Banksia woodland.		P2			1905			0	0	0	1	2	3	Moderate	Known	Recorded in the survey area.
Macarthuria keigheryi	White or grey sand.	E	EN	7.83	7.83	2015	2015	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Paracaleana dixonii	Deep sand in open areas beneath tall dense shrubland with scatted emergent Banksia, or in shallow sand over laterite in heathland.	E	VU		2.66		2016		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Persoonia rudis	White, grey or yellow sand, often over laterite.		P3	1.57	0.56	2014	1984		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Petrophile biternata	Yellow/grey sand & gravel, laterite, quartzite soils. Lateritic ridges, plains.		P3	3.72		2012			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	1.95		2007			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Platysace ramosissima	Sandy soils.		P3	13.58		2014			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Ptychosema pusillum	Sandy rises.	V	VU					Known	0	0	0	1	1	2	Low	Negligible	No DBCA records within 50 km.
Rumex drummondii	Winter-wet disturbed areas.		P4	3.21		2013			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Schoenus griffinianus	White sand.		P4	9.24		2010			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Scholtzia laciniata	Recorded previously on plan yellow-grey sand with limestone outcropping. In tall sparse shrubland of *Banksia sessilis* and *Calothamnus quadrifidus* (WAH, 2023)		P2	17.12		2017			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium aceratum	Sandy soils. Swamp heathland.		P3	13.73		2018			0	0	1	0	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium milleri	Upland habitats, growing in grey sand with lateritic gravel in Allocasuarina and Lambertia shrubland with Xanthorrhoea and scattered mallees, Proteaceous and Myrtaceous shrubland with Allocasuarina and scattered *Banksia attenuata* , or *B. carlinoides* heath		P2	11.58		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Stylidium nonscandens	Sand over laterite. Hillslopes and crests.		P3	6.63		2010			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Stylidium sp. Moora (J.A. Wege 713)	Recorded previously on stoney red-brown clay soil over laterite (WAH, 2023)		P2	3.72		2017			0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Stylidium vinosum	Recorded previously on a hillslope with white-grey sand over laterite (WAH, 2023)		P1	12.69		2011			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Styphelia allittii	Sand over gravel.		P3	10.69		2001			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Tetratheca hirsuta subsp. *boonanarring*	Recorded previously on black-brown loamy sand in Jarrah and Marri woodland (WAH, 2023)		P2	19.31		2016			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Thelymitra apiculata	Grey sand, lateritic gravel.		P4	16.31		2016			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Thelymitra dedmaniarum	Granite	E	EN					May	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN					May	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	15.03		2015			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Recorded previously on winter wet flats, grey sand and clay (WAH, 2023)		P4	14.59		2002			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	7.39	10.13	2018	1994		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.
Verticordia paludosa	White or grey sand. Winter wet flats.		P4	6.33	10.34	2015	1994		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat.

1. Habitat derived from WAH (1998-) unless otherwise stated.

Yandin Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Acacia cummingiana	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways.		P3	18.80		2007			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Acacia epacantha	Lateritic gravelly loam or clay.		P3	15.37		2017			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Acacia forrestiana	Lateritic gravelly soils, clay loam over sandstone. Gullies, hills, breakaways.	V	VU	11.10	11.46	2008	2008	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Acacia plicata	Loamy & clayey soils, often over sandstone or siltstone. Has been known to occur along drainage lines.		P3	1.31		2002			0	1	0	1	1	3	Low	Negligible	No suitable habitat, no records in the vicinity.
Acacia splendens	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slopes of breakaways, especially southern slopes, hills.	E	EN	18.32		2011		Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Allocasuarina grevilleoides	Sand over laterite, gravel.		P3	15.33		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN	5.28	8.67	2018	2011	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Angianthus micropodioides	Saline sandy soils. River edges, saline depressions, claypans.		P3	7.20		2018			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Anigozanthos humilis subsp. Badgingarra (S.D. Hopper 7114)	Grey-white sand, rich brown sandy loam, sandy clay, alluvial soils. Low plains, river-banks, winter-wet swamps.		P2	7.25	7.25	2013	1991		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand.		P4	8.61	1.17	2017	2004		0	1	1	1	2	5	High	Known	Recorded in the survey area.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU	6.49	8.64	2018	2013	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Arnocrinum gracillimum	White, grey, yellow or lateritic sand.		P3	11.56		2013			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Asterolasia drummondii	Lateritic gravel & sand or loam. Lateritic hills & sandplains, breakaways.		P4	2.19	6.97	2021	1989		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Babingtonia delicata	Sandy soils close to wetlands, described as seasonally wet and low-lying		P1	5.79	8.67	2018	2004		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Babingtonia urbana	associated with wetlands on the Swan Coastal Plain		P3	11.70		2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Baeckea sp. Dandaragan (G. Paczkowska s.n. PERTH 08245606)	Recorded previously on a slope high in landscape. White sand over laterite (WAH, 2023)		P1	19.35		2003			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Banksia catoglypta	Lateritic breakaways.	V	VU					Known	0	0	0	0	1	1	Negligible	Negligible	No DBCA records within 50 km.
Banksia dallanneyi subsp. *pollosta*	Grey/yellow sand. Flats, lateritic rises.		P3	12.87		2009			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Banksia fraseri var. *crebra*	Recorded previously in shallow valley between low ridges. Yellow-brown sand (WAH, 2023).		P3	18.11		2016			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Banksia fuscobractea	Lateritic gravel, grey sand over laterite in low dense heath (DEWHA, 2009).	CE	CR					Known	0	0	0	1	2	3	Moderate	Low	No DBCA records within 50 km.
Banksia kippistiana var. *paenepeccata*	Lateritic gravelly soils.		P3	5.27		2006			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Banksia nana	White/grey sand and/or gravel over laterite. Hills.		P3	15.35		1996			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Banksia prionophylla	Dry grey sand over laterite with surface boulders. Rises.		CR	4.72	4.72	2015	2017		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Banksia pteridifolia subsp. *vernalis*	White/grey sand over laterite.		P3	18.80		2016			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Beaufortia bicolor	White sand over laterite. Sandplains.		P3	7.62	19.62	2016	1996		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Beaufortia eriocephala	Lateritic sandy soils. Slopes.		P3	2.87	5.29	2019	1993		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Beyeria cinerea subsp. *cinerea*	Yellow, grey or white sand with sandstone or limestone. Coastal cliffs.		P3	19.13		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Beyeria gardneri	Yellow sand.		P3	18.74		2009			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Boronia scabra subsp. *condensata*	Sandy clay or gravel. Upper slopes, edges of lateritic breakaways.		P2	12.08		1988			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Caladenia speciosa	White, grey or black sand.		P4	19.39		2001			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Calothamnus brevifolius	White/grey or yellow sand.		P4	5.52		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Calytrix ecalycata subsp. *brevis*	Dry yellow sand. Sandplains, low rises.		P3	6.84		2015			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Chamaescilla gibsonii	Clay to sandy clay, winter-wet flats, shallow water-filled clay pans		P3	19.17		2001			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with *Eucalyptus todtiana* (Pricklybark), *Banksia attenuata* (Coast Banksia), and Hibbertia sp. (DCCEEW, 2023).	E	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Chamelaucium sp. Cataby (G.J. Keighery 11009)	Grows in brown loam, sandy clay and lateritic gravel between laterite boulders on the slopes, edge and base of breakaways (DEWHA, 2008).	V	VU	5.56	5.66	2021	1996	Known	0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Chordifex reseminans	Dry sand and heath		P2	8.70	8.75	2018	2002		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Conospermum densiflorum subsp. *unicephalatum*	Clay soils. Low-lying areas.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Conospermum scaposum	White-grey sand, sandy clay. Low swampy areas, road verges.		P3	15.83		2020			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Conostephium magnum	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.		P4	2.29		2016			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Cristonia biloba subsp. *pubescens*	Grows on brown sandy loam over laterite and grey and white sands over clay, in shrubland and heathland		P2	14.76		2003			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Cyanothamnus tenuis	Laterite stony soils and granite. Darling Scarp between Dwellingup and Wannamal in the Jarrah Forest and SCP.		P4		16.49		1996		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Dampiera tephrea	Sand, gravelly loam.		P3	0.90	3.19	2008	2002		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Desmocladus biformis	Sand, sandy clay, lateritic soils. Dry sites.		P3	18.91		2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Desmocladus elongatus	White or grey sand. Dry kwongan.		P4	13.81		1992			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Desmocladus microcarpus	Recorded previously on white sand with laterite and gravel (WAH, 2023)		P2	3.46		2021			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Desmocladus nodatus	Recorded previously on yellow sandy loam in low heath with *Verticordia densiflora, Scholtzia involucrata, Calothmnus quadrifidus and Conospermum stoechadis* (WAH, 2023).		P3	6.44		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter wet swamps.	E	CR	11.33	10.99	1992	2010	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Drosera leioblastus	White sandy soils.		P1	2.31	16.32	1999	2019		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Drosera leucostigma	Sandy soils. Margins of wet depressions.		P1	15.96		1987			0	0	0	1	2	3	Moderate	Low	Perennial species not recorded.
Drosera prophylla	Laterite hilltops.		P3	5.16	5.16	2022	2008		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	1.43	3.05	2011	2011	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN	16.15		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Eucalyptus abdita	Laterite, sandy clay with gravel over laterite. Slopes, breakaways.		P2	7.75		2007			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Eucalyptus absita	Known from three small stands in Badgingarra and Dandaragan area where it grows in white lateritic sands and paddocks.	E	EN					Known	0	0	0	1	0	1	Negligible	Negligible	No DBCA records within 50 km.
Eucalyptus dolorosa	Dandaragan mallee is known from a single population west of Dandaragan. It is confined to lateritic breakaway slopes and a summit in mallee heath over low scrub, amongst massive ironstone blocks. Associated species include *Eucalyptus arachnaea, E. gittinsii, E. pluricaulis, E. abdita, Hakea lissocarpha, H. obliqua, H. undulata, Calothamnus quadrifidus, Melaleuca radula, Acacia pulchella* , Scholtzia sp. and *Eremaea asterocarpa* (TSSC. 2015).	E	EN	10.75	11.45	2017	2003	Known	0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Eucalyptus macrocarpa subsp. *elachantha*	White or grey sand over laterite. Hillslopes, ridges, sandplains.		P4	1.31	2.63	2006	1996		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CR					Known	0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Eucalyptus x carnabyi	Grey sand, sandy loam. Lateritic ridges.		P4	14.02	14.08	1996	1987		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Gastrolobium nudum	Red-brown clay, brown loam, gravel, laterite, granite. Flats, slopes, hilltops, ridges, valleys, breakaways.		P2	6.04		1991			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Gompholobium gairdnerianum	White, cream or brown sandy clay, white sand over sandstone, brown or grey sand over laterite, gravel. Hill summits and slopes, ridges.		P3	13.80		2002			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Gratiola pedunculata	Recorded previously on grey clay in low open woodland over sedgeland over herbs (TPFL, 2023)		P2	19.19	19.19	2001	2001		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea calliantha	Grey or yellow sand or sandy clay on lower to mid levelslopes to low hills and rises, sometimes on slopes in shallow gullies between lateritic ridges (DEWHA, 2008). Associated with low heath and dwarf scrub nder open low woodland (DEWHA, 2008).	E	EN	5.92	6.88	2007	2016	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E	EN					Likely	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Grevillea drummondii	Lateritic soils (sandy clay, gravel, loam, sand), sand over granite. Rocky hillsides, boulders, granite outcrops.		P4	2.19	6.83	1988	1986		0	1	0	1	1	3	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea florida	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.		P3	3.46	3.46	1993	1993		0	1	0	1	2	4	Moderate	Low	Perennial species not recorded.
Grevillea olivacea	White or grey sand. Coastal dunes, limestone rocks.		P4	17.34		1900			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Grevillea rudis	White, grey, yellow or red sand, often with gravel & over laterite.		P4	13.20		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Grevillea saccata	Yellow or brown sand, often with lateritic gravel.		P4	9.76	8.23	2007	1993		0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Grevillea synapheae subsp. A Flora of Australia (S.D. Hopper 6333)	Gravelly loam.		P1	11.10	11.40	1991	1991		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Grevillea synapheae subsp. *minyulo*	Gravel, laterite.		P1	3.46	6.14	2010	2007		0	1	1	1	1	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Grevillea thyrsoides subsp. *thyrsoides*	Sand or sandy lateritic gravel.		P3	2.47		2007			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Guichenotia alba	Sandy & gravelly soils. Low-lying flats, depressions.		P3	3.17		2012			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	9.19	8.95	1988	1994		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Hakea longiflora	White sand, loam, gravel, laterite. Breakaways.		P3	2.73		2005			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Hakea megalosperma	Grey sand, loam. Lateritic hills & rocks.	V	VU	10.85	12.75	2011	2003	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Hemiandra gardneri	Deep yellow to yellow-white sand on sandplains and hills (TSSC, 2016). Usually occurs in open heath with mallee scrub maerby and associated with Bansia, Hakea, Grevillea, Verticordia and Isopogon species (TSSC, 2016).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No DBCA records within 50 km.
Hemigenia curvifolia	Sandy soils.		P2	18.32		2005			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. .
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		11.29		2002		0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Hopkinsia anoectocolea	White or grey sand, often saline. Winter-wet depressions, floodplains, salt lakes.		P3	15.85		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Hypocalymma serrulatum	Grey or white sand. Along drainage lines.		P2		16.91		1994		0	0	0	1	2	3	Moderate	Low	Perennial species not recorded. .
Hypocalymma × proliferum	Grey sand. Occurs along the margins of watercourses in the Cataby and Mullering Brook areas.		P1	2.31	3.11	2014	2003		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Hypocalymma sp. Dandaragan (C.A. Gardner 9014)	Previously recorded on silver sand (WAH, 2023)		P1	19.31		1953			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Hypocalymma tetrapterum	Grey sand, loam, lateritic gravel. Riverbanks, breakaways.		P3	1.11	3.09	2018	1996		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Hypolaena robusta	White sand. Sandplains.		P4	4.45		2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	18.18		2006			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. .
Isopogon panduratus subsp. *palustris*	Recorded previously with *Acacia pulchella* / *lasiocarpa* , *Banksia telmatiaea, Hakea trifurcata, Xanthorrhoea preissii* and Anigozanthus sp. (WAH, 2023)		P3	17.51		2016			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. .
Isotropis cuneifolia subsp. *glabra*	Sand, clay loam. Winter-wet flats.		P3	11.62	19.39	2018	2005		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. .
Jacksonia carduacea	Grey sand, sandy clay.		P3	0.07		2018			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Lasiopetalum rupicola	Steep hillside and summit of a mesa in brown loam with lateritic gravel and boulders associated with low heath of Allocasuarina humilis, Daviesia, Grevillea and Hakea on private property between Cataby and Dandaragan		P1	11.10	11.62	2017	1991		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Lechenaultia galactites	Yellow sand, clay, gravel, laterite. Sandplains.		P3	18.80		1900			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Lepidobolus quadratus	Lateritic gravel, grey/white sand. Dry kwongan.		P3	2.08		2021			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Lepyrodia curvescens	Sand, laterite. Seasonally inundated swampland.		P2	6.28		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Leucopogon follosus	Usually occurs on lateritic uplands in shallow gravelly soils over laterite and in association with low, species-rich heath		P3	4.74		2021			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Leucopogon obtectus	Grows mainly on the crests and upper slopes of relictual dunes (or more rarely in interdunal swales) comprised of grey-white or pale yellow sands (DEWHA, 2021).	E	EN					May	0	0	0	0	0	0	Negligible	Negligible	No DBCA records within 50 km.
Lyginia excelsa	Sand. Dry heath & Banksia woodland.		P2	10.14		2017			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Macarthuria keigheryi	White or grey sand.	E	EN	6.81	6.80	2021	2015	Known	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Paracaleana dixonii	Deep sand in open areas beneath tall dense shrubland with scatted emergent Banksia, or in shallow sand over laterite in heathland.	E	VU	14.56	13.46	2012	2016		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Persoonia filiformis	Yellow or white sand over laterite.		P3	2.78		2018			0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Persoonia rudis	White, grey or yellow sand, often over laterite.		P3	17.01		2010			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Petrophile clavata	Grey sand, laterite. Hilltops and rises.		P2	16.83		2005			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Platysace ramosissima	Sandy soils.		P3	19.04	10.15	2014	2000		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Podotheca pritzelii	Sand. Sand ridges in salt flats.		P3	8.32		1994			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Poranthera moorokatta	Banksia Woodland (Barrett, 2012).		P2	16.96		2021			0	0	1	1	0	2	Low	Low	No recent records in the vicinity.
Ptychosema pusillum	Sandy rises.	V	VU	4.87	4.87	2016	2016	Known	0	1	1	1	2	5	High	Low	Perennial species not recorded.
Rhetinocarpha suffruticosa	Red-brown loamy clay, gravelly loam or clay loam over laterite. Slopes, small ridges.		P1	18.32		2004			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Schoenus griffinianus	White sand.		P4	10.20	10.20	2012	2004		0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Schoenus natans	Winter-wet depressions.		P4	11.11		2008			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Schoenus pennisetis	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.		P3	6.81		2016			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	10.79		2010			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Stylidium aceratum	Sandy soils. Swamp heathland.		P3	10.91		2018			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Stylidium aeonioides	Sandy clay loam over laterite. Hillsides and breakaways. Low heath, open woodland.		P4	2.73	4.78	2021	2002		0	1	1	1	2	5	High	Low	Perennial species not recorded. No suitable habitat.
Stylidium hymenocraspedum	Sand over laterite. Hillslopes. Heath, Banksia and Eucalyptus low open woodland.		P3	7.05		2021			0	0	1	1	2	4	Moderate	Low	Perennial species not recorded.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands.		P4	4.69		2016			0	1	1	1	2	5	High	Low	Habitat says clay, however has been recorded on sandy plains
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3		17.36		2004		0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Pre-survey Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the survey area (0,1,2)				
Stylidium milleri	Upland habitats, growing in grey sand with lateritic gravel in Allocasuarina and Lambertia shrubland with Xanthorrhoea and scattered mallees, Proteaceous and Myrtaceous shrubland with Allocasuarina and scattered *Banksia attenuata* , or *B. carlinoides* heath.		P2	15.74		2021			0	0	1	1	0	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Stylidium periscelianthum	Loamy clay, moist soils pockets. Wet flats, low granitic hills.		P3	2.29		2011			0	1	1	1	2	5	High	Low	Perennial species not recorded.
Stylidium torticarpum	Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways. Heath or mallee shrubland.		P3	19.04		2003			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Synaphea endothrix	Gravelly loam, sand. Lateritic rises.		P3	13.81		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Tetratheca angulata	Sandy to gravelly laterite soils. Low hill crests, breakaways with massive laterite boulders.		P3	10.70		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Thelymitra apiculata	Grey sand, lateritic gravel.		P4	4.72		2022			0	1	1	1	2	5	High	Low	Habitat says clay, however has been recorded on sandy plains
Thelymitra pulcherrima	Gravel. Granite rocks, slopes.		P2	15.94		2021			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded. No suitable habitat .
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN		5.13		2019	May	0	0	1	1	2	4	Moderate	Low	Perennial species not recorded. No suitable habitat .
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	4.31	5.21	2021	1988		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Trithuria australis	Recorded previously on grey clay sand in open woodland over sedgeland over herbs (TPFL, 2023)		P4		19.19		2001		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat, no records in the vicinity.
Verticordia amphigia	Sandy loam, clay and rocky loam. Winter wet depressions.		P3	19.78		1996			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.
Verticordia huegelii var. *tridens*	Sandy or gravelly loam. Winter-wet areas, low hills.		P3	15.33		2012			0	0	1	1	1	3	Moderate	Low	Perennial species not recorded.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	4.70	0.18	2018	1994		0	1	1	1	2	5	High	Low	Perennial species not recorded.
Verticordia rutilastra	Sand & lateritic gravel. Hills.		P3	18.32		1986			0	0	0	1	1	2	Low	Negligible	No suitable habitat, no records in the vicinity.

1. Habitat derived from WAH (1998-) unless otherwise stated.

Appendix C

Fauna Desktop Assessment

Appendix C Fauna Desktop Assessment

Appendix C - Fauna Desktop Assessment

Cataby Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons Code		Date	Records	Distance (km)	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (<20 years)	Habitat Presence (0,1,2)	Total Score	Likelihood	Comments
				EPBC Act	BC Act / DBCA											
Bird	*Aphelocephala leucopsis*	Southern Whiteface	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps (Higgins & Davies, 1996).	V					May	0	0	1	1	2	Low	
	Falco hypoleucos	Grey Falcon	Timered lowland plains, including acacia shrublands particularly with tree-lined watercourses, tussock grassland and open woodland (TSSC, 2020).	V	VU				May	0	0	1	1	2	Low	
	Falco peregrinus	Peregrine Falcon	The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings. (BirdLife, 2021).		OS	2010	4	9.36		0	1	1	1	3	Moderate	
	Leipoa ocellata	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	V	VU	2012	7	27.42	Known	0	0	1	2	3	High	
	Motacilla cinerea	Grey Wagtail	Found across a wide variety of wetlands, watercourses and on the banks of lakes and marshes (DCCEEW, 2023).	MI & MA	IA				May	0	0	1	0	1	Negligible	
	Oxyura australis	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).		P4	2010	11	11.42		0	1	1	0	2	Negligible	
	Platycercus icterotis xanthogenys	Western Rosella	Open eucalypt forest and timbered areas, including cultivated land and orchards. The nominate icterotis is found in high rainfall areas (J.Cork, 2020).		P4	1979	2	23.56		0	0	0	0	0	Negligible	
	Plegadis falcinellus	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	MI & MA	IA	1999	7	7.89		0	1	0	0	1	Negligible	
	Zanda latirostris	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	E	EN	2017	737	0.49	Known	0	1	1	2	4	High	
Invertebrate	*Austrosaga spinifer*	Spiny Katydid (Swan Coastal Plain)	It has been recorded from Boya on the edge of the Perth Scarp. The species is known to hide in shrubs and sing at night (Invertebrate Solutions, 2019).		P2	1984	2	28.56		0	0	0	1	1	Low	
	Bothriembryon perobesus	Land snail	Endemic to Western Australian habitats including; Rocky Terrain, Woodlands, Gorges and Gullies and Coastal Shrub/Heath (Whisson and Ryan, 2019).		P1	2012	1	6.63		0	1	1	2	4	High	
	Hylaeus globuliferus	Woolybush Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).		P3	1996	2	41.62		0	0	0	2	2	Moderate	
	Idiosoma nigrum	Shield-backed Trapdoor Spider	Clay soils are inhabited in the Wheatbelt, and rocky habitats in the Midwest, primarily in positions with increased moisture retention properties like gullies and drainage lines on southern facing slopes (Anonymous 2010; Ecologia Environment 2009a).	V	EN				May	0	0	1	1	2	Low	
	Synemon gratiosa	Graceful Sun Moth	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the prefered habitat (denser population). Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).		P4	2011	37	25.29		0	0	1	2	3	High	
	Westralunio carteri	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	V	VU	1972	2	44.98		0	0	0	0	0	Negligible	
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Tall eucalypt forest and woodland, with a dense understorey of myrtaceous shrubland, kwongan (proteaceous) or mallee heath or thickets. A common characteristic of suitable habitat is the presence of *Gastrolobium* thickets (TSSC, 2018).	E	CR	2005	2	32.25	Known	0	0	1	1	2	Low	
	Dasyurus geoffroii	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	V	VU	2001	3	26.62	Known	0	0	0	2	2	Moderate	
	Hydromys chrysogaster	Rakali	Near permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).		P4	1972	1	46.43		0	0	0	0	0	Negligible	
	Isoodon fusciventer	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).		P4	2014	11	31.24		0	0	1	2	3	High	
	Macroderma gigas	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	V	VU				May	0	0	1	0	1	Negligible	
	Notamacropus eugenii derbianus	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).		P4	2006	3	31.80		0	0	1	1	2	Low	
	Notamacropus irma	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).		P4	2017	16	1.49		0	1	1	2	4	High	
	Parantechinus apicalis	Dibbler	Dibblers likely occupy a diverse range of habitats, prefering a dense canopy greater than 1 m high, unburnt for 10 years or more (Baczocha & Start 1996).	E	EN				May	0	0	1	1	2	Low	
Reptile	*Ctenotus gemmula (Swan Coastal Plain subpop.)*	Jewelled southwest Ctenotus	Amongst heath on coastal dunes, and in open woodland on the Swan Coastal Plain. It is generally restricted to areas with limestone (Wilson & Swan, 2013.		P3	2012	1	5.96		0	1	1	2	4	High	
	Ctenotus lancelini	Lancelin Island Ctentus	Exclusively found on Lancelin Island (TSSC, 2008).	V	VU	2012	20	41.18	Known	0	0	1	0	1	Negligible	
	Egernia stokesii badia	Western Spiny-tailed Skink	Semi-Arid condition in South-West interior of Western Australia in woodlands of York Gum (*Eucalyptus loxophleba*), Gimlet (*E. salubris*) and Salmon Gum (*E. salmonophloia*) (Pearson, 2012).	E	VU	2011	1	46.15	Known	0	0	1	1	2	Low	
	Neelaps calonotos	Black-striped Snake	The snake inhabits sandy open woods and scrublands in the coastal region from southwestern to central Australia (Cogger, 2014)		P3	2015	6	5.18		0	1	1	1	3	Moderate	

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	EPBC Act	BC Act / DBCA	Date	Records	Distance (km)	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (<20 years)	Habitat Presence (0,1,2)	Total Score	Likelihood	Comments
	Pseudemydura umbrina	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CE	CR				Known	0	0	1	0	1	Negligible	

Eneabba Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code		Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Comments
				BC Act / DBCA	EPBC Act											
Bird	*Aphelocephala leucopsis*	Southern Whiteface	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps (Higgins & Davies, 1996).		V				May	0	0	1	1	2	Low	
	Falco hypoleucos	Grey Falcon	Timered lowland plains, including acacia shrublands particularly with tree-lined watercourses, tussock grassland and open woodland (TSSC, 2020).	VU	V	1994	1	47.30	May	0	0	0	0	0	Negligible	
	Falco peregrinus	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	S		2011	4	27.88		0	0	1	0	1	Negligible	
	Leipoa ocellata	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V	2014	22	9.69	Known	0	1	1	2	4	High	
	Zanda latirostris	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2021	538	0.00	Known	1	1	1	2	5	Known	
Invertebrate	*Hemisaga vepreculae*	Thorny Bush Katydid	Heath (Western Wildlife, 2021).	P2		1980	3	22.09		0	0	1	2	3	High	
	Hylaeus globuliferus	Woolybush Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	4	18.11		0	1	0	2	3	High	
	Idiosoma gardneri	Mt Lesueur sheild-backed trapdoor spider	Lesueur National Park, in the southern Geraldton Sandplains bioregion healthland (Rix, Juey, Cooper, Austin, Harvey, 2018).	P3		1989	1	24.31		0	0	0	2	2	Moderate	
	Idiosoma kwongan	Kwongan heath shield-backed trapdoor spirder	Southern Geraldton Sandplains bioregion of south-western Western Australia, from Eneabba south to Green Head and the Lesueur National Park heath habitat (Rix, Juey, Cooper, Austin, Harvey, 2018).	P1		1989	6	13.94		0	1	0	2	3	High	
	Idiosoma nigrum	Shield-backed Trapdoor Spider	Clay soils are inhabited in the Wheatbelt, and rocky habitats in the Midwest, primarily in positions with increased moisture retention properties like gullies and drainage lines on southern facing slopes (Anonymous 2010; Ecologia Environment 2009a).	EN	V				May	0	0	1	1	2	Low	no rocky habiitat, gullies or drainage lines
	Phasmodes jeeba	Stick Katydids	Endemic to Western Australia in coastal sandplain heath communites and is only known from an area near Eneabba (Bamford, 2009a).	P3		1984	1	25.93		0	0	0	2	2	Moderate	
	Synemon gratiosa	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima* , the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2011	26	35.49		0	0	1	2	3	High	
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Tall eucalypt forest and woodland, with a dense understorey of myrtaceous shrubland, kwongan (proteaceous) or mallee heath or thickets. A common characteristic of suitable habitat is the presence of *Gastrolobium* thickets (TSSC, 2018).	CR	E				Known	0	0	1	1	2	Low	
	Macroderma gigas	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V	1990	1	35.94	May	0	0	0	0	0	Negligible	No caves.
	Notamacropus irma	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2016	5	24.59		0	0	1	1	2	Low	No wet flats
	Parantechinus apicalis	Dibbler	Dibblers likely occupy a diverse range of habitats, prefering a dense canopy greater than 1 m high, unburnt for 10 years or more (Baczocha & Start 1996).	EN	E	2001	10	48.73	May	0	0	0	1	1	Low	
	Cyclodomorphus branchialis	Gilled Slender Blue-Tongue	This is a ground dwelling, crepuscular and nocturnal species shelters by day in hammock grass, leaf-litter, including Acacia, and under fallen logs and stumps. This species prefers the deep leaf litter on sandy beaches vegetated mainly with coastal Spinifex (Cogger 2014).	VU		1999	1	23.98		0	0	0	2	2	Moderate	

				Cons. Code												
											Known from	Recent	Potential presence			
Reptile	*Egernia stokesii badia*	Western Spiny-tailed Skink	Semi-Arid condition in South-West interior of Western Australia in woodlands of York Gum (*Eucalyptus loxophleba*), Gimlet (*E. salubris*) and Salmon Gum (*E. salmonophloia*) (Pearson, 2012).	VU	E	2014	3	13.49	May	0	1	1	1	3	Moderate	
	Liopholis pulchra longicauda	Jurien Bay (Rock) Skink	Rock isolates and low shrubland. Pre-existing cavities (limestone crevices and seabird burrows). Desnse fround litter beneath low scrub vegetation (DCCEEW, 2023).	VU	V	2011	10	45.78		0	0	1	1	2	Low	
	Neelaps calonotos	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2007	1	8.62		0	1	1	2	4	High	
	Pseudemydura umbrina	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE				Known	0	0	1	0	1	Negligible	No water located within the survey area. Outside mapped habitat.

Appendix C - Fauna Desktop Assessment

Regans Fauna Dekstop Assessment

Type	Taxon	Common Name	Habitat	Cons Code		Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Comments
				BC Act / DBCA	EPBC Act											
Bird	*Aphelocephala leucopsis*	Southern Whiteface	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps (Higgins & Davies, 1996).		V				May	0	0	1	1	2	Low	
	Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	VU	V	2016	3	41.28	Known	0	0	1	0	1	Negligible	
	Falco hypoleucos	Grey Falcon	Timered lowland plains, including acacia shrublands particularly with tree-lined watercourses, tussock grassland and open woodland (TSSC, 2020).	VU	V				May	0	0	1	1	2	Low	
	Falco peregrinus	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	S		2005	8	25.07		0	0	1	1	2	Low	
	Leipoa ocellata	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V	2005	4	18.13	Known	0	1	1	2	4	High	
	Oxyura australis	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2010	42	11.15		0	1	1	0	2	Negligible	No water located within the survey area.
	Platycercus icterotis xanthogenys	Western Rosella	Open eucalypt forest and timbered areas, including cultivated land and orchards. The nominate icterotis is found in high rainfall areas (J.Cork,	P4		1979	2	35.57		0	0	0	0	0	Negligible	
	Zanda latirostris	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches	EN	E	2020	1295	2.20	Known	0	1	1	2	4	High	
Invertebrate	*Bothriembryon perobesus*	Land snail	Endemic to Western Australian habitats including; Rocky Terrain, Woodlands, Gorges and Gullies and Coastal Shrub/Heath (Whisson and Ryan, 2019).	P1		2012	2	42.10		0	0	1	2	3	High	
	Hesperocolletes douglasi	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE				May	0	0	0	1	1	Low	Outside of known extent.
	Hylaeus globuliferus	Woolybush Bee	Habitats containing flowers from *Adenanthos cygnorum* and also Banksia attenuata (Western Wildlife, 2009).	P3		1996	2	9.68		0	1	0	2	3	High	
	Idiosoma dandaragan	Dandaragan Plateau shield-backed trapdoor spider	Eastern margin of the Dandaragan Plateau, from near New Norcia in the south, north to at least the Watheroo National Park (Rix, Juey, Cooper, Austin, Harvey, 2018).	P2		1954	9	37.41		0	0	0	1	1	Low	
	Idiosoma mcclementsorum	Julimar shield-backed trapdoor spider	Northern Jarrah Forest bioregion of south-western Western Australia, from Chittering Lakes, Julimar, and Toodyay north to Gillingarra. In sandy substrates overlying laterite(Rix, Juey, Cooper, Austin, Harvey, 2018).	P2		2018	22	30.65		0	0	1	1	2	Low	
	Idiosoma nigrum	Shield-backed Trapdoor Spider	Clay soils are inhabited in the Wheatbelt, and rocky habitats in the Midwest, primarily in positions with increased moisture retention properties like gullies and drainage lines on southern facing slopes (Anonymous 2010; Ecologia	EN	V				Known	0	0	1	1	2	Low	
	Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2011	3	34.07		0	0	1	2	3	High	
	Leioproctus contrarius	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		2001	3	5.29		0	1	0	2	3	High	
	Synemon gratiosa	Graceful Sun Moth	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the prefered habitat (denser population). Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2012	62	32.38		0	0	1	2	3	High	
	Throscodectes xederoides	Mogumber bush cricket, Northern Throsco	N/A	P3		1999	4	20.23		0	0	0	1	1	Low	Default
	Westralunio carteri	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	2018	36	1.17	Known	0	1	1	0	2	Negligible	No water within survey area
Mammal	*Hydromys chrysogaster*	Water Rat	Near permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2011	4	5.06		0	1	1	0	2	Negligible	No water located within the survey area.
	Isoodon fusciventer	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2014	4	35.28		0	0	1	2	3	High	
	Notamacropus irma	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2017	21	2.81		0	1	1	2	4	High	
	Parantechinus apicalis	Dibbler	Mainland Dibblers usually live in dense heath and mallee-heath areas. (DCCEEW, 2023).	EN	E		1	46.24	May	0	0	0	1	1	Low	
	Phascogale calura	Red-tailed Phascogale	Restricted to remnant native vegetation throughout the wheat belt of south-western Western Australia (Kitchener 1981) in allocasuarina woodlands with hollow-containing eucalypts (e.g. *Eucalyptus wandoo*) and *Gastrolobium* spp. (Kitchener 1981). It prefers older, vegetation that is unburnt with ample canopy cover	CD	V				Likely	0	0	1	1	2	Low	
	Phascogale tapoatafa wambenger	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD		2001	2	30.82		0	0	0	0	0	Negligible	
Reptile	*Ctenotus lancelini*	Lancelin Island Ctentus	Exclusively found on Lancelin Island (TSSC, 2008).	VU	V	2012	20	36.73	Known	0	0	1	0	1	Negligible	
	Egernia stokesii badia	Western Spiny-tailed Skink	Semi-Arid condition in South-West interior of Western Australia in woodlands of York Gum (*Eucalyptus loxophleba*), Gimlet (*E. salubris*) and Salmon Gum (*E. salmonophloia*) (Pearson, 2012).	VU	E				May	0	0	1	1	2	Low	
	Neelaps calonotos	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2015	10	25.43		0	0	1	2	3	Moderate	

Yandin Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code		Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Comments
				BC Act / DBCA	EPBC Act											
Bird	*Aphelocephala leucopsis*	Southern Whiteface	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps (Higgins & Davies, 1996).		V				May	0	0	1	1	2	Low	
	Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	VU	V	1966	1	48.64		0	0	0	0	0	Negligible	Current distribution excludes it
	Falco hypoleucos	Grey Falcon	Timered lowland plains, including acacia shrublands particularly with tree-lined watercourses, tussock grassland and open woodland (TSSC, 2020).	VU	V				May	0	0	1	1	2	Low	
	Falco peregrinus	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	S		2002	4	10.45		0	1	0	1	2	Low	
	Leipoa ocellata	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (Melaleuca uncinata) and Scrub Pine (Callitris verrucosa) (Benshemesh, 2007).	VU	V	2012	7	14.54	Known	0	1	1	2	4	High	
	Motacilla cinerea	Grey Wagtail	Found across a wide variety of wetlands, watercourses and on the banks of lakes and marshes (DCCEEW, 2023).	IA	Mi & Ma				May	0	0	1	0	1	Negligible	No watercourses
	Oxyura australis	Blue-billed Duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2010	11	9.67		0	1	1	0	2	Negligible	No permanent wetlands within survey
	Platycercus icterotis xanthogenys	Western Rosella	Open eucalypt forest and timbered areas, including cultivated land and orchards. The species is found in high rainfall areas (J.Cork, 2020).	P4		1979	2	18.16		0	1	0	0	1	Negligible	
	Zanda latirostris	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2018	825	0.06	Known	0	1	1	2	4	High	
Invertebrate	*Austrosaga spinifer*	Spiny Katydid (Swan Coastal Plain)	It has been recorded from Boya on the edge of the Perth Scarp. The species is known to hide in shrubs and sing at night (Invertebrate Solutions, 2019).	P2		1984	2	42.04		0	0	0	1	1	Low	
	Bothriembryon perobesus	Land snail	Endemic to Western Australian habitats including; Rocky Terrain, Woodlands, Gorges and Gullies and Coastal Shrub/Heath (Whisson and Ryan, 2019).	P1		2012	1	14.23		0	1	1	2	4	High	
	Hylaeus globuliferus	Woolybush Bee	Habitats containing flowers from *Adenanthos cygnorum* and also I (Western Wildlife, 2009).	P3		1996	2	36.42		0	0	0	2	2	Moderate	
	Idiosoma dandaragan	Dandaragan Plateau shield-backed trapdoor spider	Eastern margin of the Dandaragan Plateau, from near New Norcia in the south, north to at least the Watheroo National Park (Rix, Juey, Cooper, Austin, Harvey, 2018).	P2		1954	9	45.91		0	0	0	1	1	Low	
	Idiosoma nigrum	Shield-backed Trapdoor Spider	Clay soils are inhabited in the Wheatbelt, and rocky habitats in the Midwest, primarily in positions with increased moisture retention properties like gullies and drainage lines on southern facing slopes (Anonymous 2010; Ecologia Environment 2009a).	EN	V				May	0	0	1	1	2	Moderate	
	Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		1967	1	39.81		0	0	0	2	2	Moderate	
	Leioproctus contrarius	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		2001	3	37.22		0	0	0	1	1	Low	
	Synemon gratiosa	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima,* the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2011	29	27.57		0	1	1	2	4	High	
	Throscodectes xederoides	Mogumber bush cricket, Northern Throsco	N/A	P3		1975	1	46.12		0	1	0	1	2	Moderate	Default
	Westralunio carteri	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	1972	3	30.31	Likely	0	0	0	0	0	Negligible	No permanent water
	Bettongia penicillata ogilbyi	Woylie	Tall eucalypt forest and woodland, with a dense understorey of myrtaceous shrubland, kwongan (proteaceous) or mallee heath or thickets. A common characteristic of suitable habitat is the presence of *Gastrolobium* thickets (TSSC, 2018).	CR	E	2005	2	44.68	Known	0	0	1	1	2	Low	

				Cons. Code												
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2001	4	11.62	Known	0	1	0	1	2	Moderate	
	Hydromys chrysogaster	Water Rat	Near permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		1972	2	31.49		0	0	0	0	0	Negligible	No permanent water
	Isoodon fusciventer	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2014	10	36.02		0	0	1	1	2	Moderate	
	Macroderma gigas	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	1	0	1	Negligible	No caves, not in Pilbara
	Notamacropus eugenii derbianus	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).	P4		2006	3	44.28		0	0	1	1	2	Low	
	Notamacropus irma	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2017	15	12.76		0	1	1	2	4	High	
	Parantechinus apicalis	Dibbler	Dibblers likely occupy a diverse range of habitats, prefering a dense canopy greater than 1 m high, unburnt for 10 years or more (Baczocha & Start 1996).	EN	E				May	0	0	1	1	2	Low	
	Phascogale tapoatafa wambenger	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD			1	10.90		0	1	0	0	1	Negligible	No jarrah forest
	Ctenotus lancelini	Lancelin Island Ctentus	Exclusively found on Lancelin Island (TSSC, 2008).	VU	V	2012	20	32.74	Known	0	0	1	0	1	Negligible	
Reptile	*Egernia stokesii badia*	Western Spiny-tailed Skink	Aemi-Arid condition in South-West interior of Western Australia in woodlands of York Gum (*Eucalyptus loxophleb* a), Gimlet (*E. salubris*) and Salmon Gum (*E. salmonophloia*) (Pearson, 2012).	VU	E				May	0	0	1	1	2	Low	
	Neelaps calonotos	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2015	6	4.84		0	1	1	2	4	High	
	Ctenotus gemmula (Swan Coastal Plain subpop.)	Jewelled southwest Ctenotus	Amongst heath on coastal dunes, and in open woodland on the Swan Coastal Plain. It is generally restricted to areas with limestone (Wilson & Swan, 2013.	P3		2012	1	20.41		0	0	1	0	1	Low	
	Pseudemydura umbrina	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range. Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE				Known	0	0	1	0	1	Negligible	Not in known range, no waterbodies

Appendix D

Species x Survey Area x Community Matrix

Appendix D Species x Survey Area x Community Matrix

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
Amaranthaceae																	
			Ptilotus polystachyus										X				
Anarthriaceae																	
			Anarthria laevis	X													
			Lyginia barbata			X	X		X						X	X	
	P2		*Lyginia excelsa*								X						
Apiaceae							X		X		X						
			Platysace xerophila						X								
			Xanthosia huegelii				X		X		X						
Araliaceae																	
			Trachymene pilosa	X			X		X		X			X		X	
Asparagaceae																	
			Laxmannia sessiliflora				X		X		X					X	
			Laxmannia sessiliflora subsp. *drummondii*		X												
			Lomandra hermaphrodita	X				X									
			Lomandra preissii				X		X								
			Lomandra sericea				X										
			Lomandra sp.				X		X								
			Lomandra suaveolens						X		X						
			Sowerbaea laxiflora													X	
			Thysanotus manglesianus											X			
			Thysanotus multiflorus								X						
			Thysanotus patersonii						X								
			Thysanotus thyrsoideus	X													
Asteraceae																	
		*	*Arctotheca calendula*				X		X		X			X	X	X	
		*	*Hypochaeris glabra*	X	X		X	X	X		X			X	X	X	
			Lagenophora huegelii						X								
			Millotia tenuifolia var. *tenuifolia*						X		X						
			Podolepis gracilis											X			
			Podotheca gnaphalioides				X		X		X			X	X	X	
			Pterochaeta paniculata				X	X	X								
		*	*Ursinia anthemoides*	X			X	X	X		X			X	X	X	
			Waitzia acuminata var. *albicans*											X			
			Waitzia suaveolens				X		X		X						
Brassicaceae																	
		*	*Brassica tournefortii*						X								
Campanulaceae																	
		*	*Wahlenbergia capensis*						X		X						
Casuarinaceae																	
			Allocasuarina humilis	X			X	X	X		X			X		X	
			Allocasuarina microstachya				X		X	X							
	P3		*Allocasuarina ramosissima*					X		X							
Centrolepidaceae																	
			Centrolepis aristata											X			
Colchicaceae																	
			Burchardia congesta				X	X	X		X	X		X		X	
Crassulaceae																	
			Crassula colorata						X		X			X	X	X	
			Crassula decumbens var. *decumbens*				X										
Cupressaceae																	
			Callitris acuminata						X		X						

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
Cyperaceae																	
			Caustis dioica				X	X	X		X	X		X			
			Chaetospora curvifolia						X								
			Lepidosperma apricola				X	X	X								
			Lepidosperma leptostachyum												X		
			Lepidosperma pubisquameum				X	X	X							X	
			Mesomelaena pseudostygia		X		X	X	X		X	X		X		X	
			Mesomelaena stygia				X	X	X								
			Morelotia octandra				X	X	X								
			Schoenus ?subflavus subsp. *subflavus*				X	X	X								
			Schoenus brevisetis				X		X								
			Schoenus clandestinus								X	X		X			
			Schoenus nanus				X				X						
			Schoenus pleiostemoneus						X								
			Schoenus subflavus subsp. *subflavus*				X	X	X								
Dasypogonaceae																	
			Calectasia narragara					X	X								
			Dasypogon obliquifolius	X										X		X	
Dilleniaceae																	
			Hibbertia acerosa						X								
			Hibbertia glomerata					X									
			Hibbertia hypericoides								X	X					
			Hibbertia hypericoides subsp. *hypericoides*				X		X					X		X	
			Hibbertia hypericoides subsp. *septentrionalis*				X	X	X								
			Hibbertia leucocrossa						X								
			Hibbertia prolata				X	X	X								
			Hibbertia striata		X									X			
			Hibbertia subvaginata	X					X		X						
Droseraceae																	
			Drosera echinoblastus				X		X								
			Drosera eneabba						X								
			Drosera erythrorhiza	X	X		X	X	X		X	X					
			Drosera glanduligera												X		
			Drosera porrecta				X		X					X			
			Drosera sp.					X	X		X						
Ecdeiocoleaceae																	
			Ecdeiocolea monostachya				X	X						X			
			Georgeantha hexandra				X	X									
Elaeocarpaceae																	
			Tetratheca confertifolia				X	X									
Ericaceae																	
			Andersonia heterophylla						X								
	P4		*Conostephium magnum*	X		X											
			Conostephium pendulum						X							X	
			Leucopogon simulans						X								
			Leucopogon sp. Northern ciliate (R Davis 3393)					X									
			Styphelia oblongifolia					X									
			Styphelia stomarrhena						X		X						
			Styphelia tortifolia	X	X												
			Styphelia xerophylla						X			X					
Euphorbiaceae																	
			Monotaxis grandiflora var. *grandiflora*					X									
			Stachystemon axillaris						X								

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
Fabaceae																	
			Acacia alata					X	X								
			Acacia auronitens								X						
			Acacia barbinervis subsp. *borealis*						X								
			Acacia lasiocarpa var. *lasiocarpa*						X								
			Acacia pulchella var. *pulchella*				X	X									
			Acacia saligna		X						X						
			Acacia sp.						X								
			Bossiaea eriocarpa	X	X		X		X		X						
	P2		*Cristonia biloba* subsp. *pubescens*					X		X							
			Daviesia chapmanii					X									
			Daviesia decurrens					X	X	X	X			X			
			Daviesia divaricata subsp. *divaricata*		X						X						
			Daviesia epiphyllum				X	X									
			Daviesia longifolia					X									
			Daviesia nudiflora											X			
			Daviesia nudiflora subsp. *hirtella*						X								
			Daviesia nudiflora subsp. *nudiflora*						X								
			Daviesia podophylla						X								
			Daviesia triflora						X								
			Gastrolobium ?capitatum					X									
			Gastrolobium linearifolium				X										
			Gastrolobium polystachyum					X		X							
			Gastrolobium spinosum						X								
			Gompholobium tomentosum	X					X		X						
			Isotropis cuneifolia subsp. *cuneifolia*						X							X	
			Jacksonia angulata						X								
			Jacksonia floribunda						X		X	X		X			
			Jacksonia furcellata		X						X				X	X	
			Jacksonia sternbergiana	X	X										X		
			Kennedia prostrata								X						
			Labichea cassioides					X									
			Mirbelia spinosa			X											
		*	*Ornithopus compressus*												X		
			Sphaerolobium pulchellum					X									
		*	*Trifolium arvense* subsp. *arvense*						X		X				X		
		*	*Trifolium campestre*												X		
Goodeniaceae																	
			?Dampiera carinata				X	X	X		X						
			Goodenia reinwardtii								X						
			Goodeniaceae sp.						X								
			Lechenaultia biloba				X	X									
			Lechenaultia floribunda								X						
			Lechenaultia linarioides													X	
			Scaevola canescens					X						X			
			Scaevola phlebopetala											X			
			Scaevola repens								X						X
Gyrostemonaceae																	
			Gyrostemon subnudus								X						
Haemodoraceae																	
			Anigozanthos humilis				X		X		X			X		X	
	P4		*Anigozanthos humilis* subsp. *chrysanthus*														X
			Anigozanthos manglesii						X								
			Anigozanthos sp.				X										
			Blancoa canescens						X								

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
			Conostylis androstemma				X	X									
			Conostylis angustifolia		X												
			Conostylis aurea						X						X		
			Conostylis canteriata	X			X							X			
			Conostylis crassinerva subsp. *absens*						X								
			Conostylis hiemalis						X								
			Conostylis teretifolia								X						
			Conostylis teretifolia subsp. *teretifolia*						X					X			
			Haemodorum laxum				X										
			Haemodorum sp.				X	X	X			X		X			
			Haemodorum venosum					X	X								
			Phlebocarya ciliata	X							X						
	P3		*Phlebocarya pilosissima* subsp. *pilosissima*						X	X							
Haloragaceae																	
			Glischrocaryon aureum				X	X									
			Gonocarpus cordiger						X								
Hemerocallidaceae																	
			Corynotheca micrantha								X					X	
			Dianella revoluta														X
			Johnsonia pubescens subsp. *pubescens*	X					X								
			Stypandra glauca						X								
			Tricoryne sp. Eneabba				X										
Iridaceae																	
		*	*Gladiolus caryophyllaceus*								X	X		X		X	
			Patersonia occidentalis var. occidentalis	X							X	X		X			
Lamiaceae																	
	P3		*Hemiandra* sp. Eneabba (H. Demarz 3687)						X	X							
			Microcorys sp. Coomallo (L. Haegi 2677)				X										
Lauraceae																	
			Cassytha glabella				X		X					X			
Loganiaceae																	
			Orianthera spermacocea								X			X			
Loranthaceae																	
			Nuytsia floribunda						X		X						
Malvaceae																	
			Guichenotia astropletha				X										
			Lasiopetalum drummondii						X								
Montiaceae																	
			Calandrinia granulifera											X			
Myrtaceae																	
			Astartea sp.				X		X								
			Babingtonia grandiflora				X		X							X	
			Beaufortia bracteosa					X									
			Beaufortia elegans						X		X						
			Beaufortia sp.	X													
			Beaufortia squarrosa	X													
			Calothamnus hirsutus				X	X	X								
			Calothamnus quadrifidus subsp. *quadrifidus*		X											X	
			Calothamnus sanguineus											X			
			Calothamnus torulosus					X	X								
			Calytrix sp.	X													
			Darwinia sanguinea				X	X									
			Darwinia speciosa						X								
			Eremaea asterocarpa subsp. *asterocarpa*		X											X	
			Eremaea ectadioclada						X								

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
			Eremaea pauciflora var. *pauciflora*											X			
			Eremaea violacea subsp. *violacea*				X		X								
			Eucalyptus drummondii					X									
			Eucalyptus pleurocarpa					X									
			Eucalyptus rudis												X		
			Eucalyptus todtiana	X	X				X	X	X	X	X			X	
			Hypocalymma angustifolium	X													
			Hypocalymma hirsutum				X	X	X								
			Hypocalymma xanthopetalum					X									
			Kunzea praestans	X													
			Leptospermopsis erubescens						X					X			
			Melaleuca beardii	X													
			Melaleuca ciliosa											X			
			Melaleuca lateritia												X		
			Melaleuca seriata		X		X	X	X								
			Melaleuca sp. 1						X								
			Melaleuca sp. 2						X								
			Melaleuca sp. 3						X								
			Melaleuca systena				X		X								
			Melaleuca trichophylla					X	X								
			Pericalymma ellipticum						X								
			Pileanthus filifolius				X		X								
			Scholtzia involucrata								X	X					
			Verticordia ?eriocephala				X	X	X								
			Verticordia ?pennigera	X			X										
			Verticordia densiflora									X					
			Verticordia grandis						X								
			Verticordia ovalifolia						X	X	X						
			Verticordia sp.	X					X								
Orchidaceae																	
			Caladenia flava				X		X		X			X		X	
			Elythranthera brunonis				X		X								
			Leporella fimbriata	X													
			Orchidaceae sp.	X			X										
			Pterostylis pyramidalis									X					
			Pterostylis sp.						X		X						
Orobanchaceae																	
		*	*Parentucellia latifolia*													X	
Oxalidaceae																	
		*	*Oxalis corniculata*												X		
Phyllanthaceae																	
			Poranthera microphylla						X								
Poaceae																	
			?Amphipogon turbinatus				X		X								
			Amphipogon amphipogonoides				X	X	X			X		X			
			Austrostipa elegantissima				X	X	X					X			
			Austrostipa macalpinei				X		X								
		*	*Briza maxima*						X		X	X		X	X	X	
		*	*Briza minor*												X		
		*	*Bromus diandrus*	X				X	X		X			X	X	X	
		*	*Ehrharta calycina*								X				X	X	
		*	*Ehrharta longiflora*					X	X							X	
		*	*Lolium rigidum*						X		X						
		*	*Pentameris airoides*						X		X			X		X	
			Poaceae sp.				X	X	X								

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
		*	*Vulpia myuros forma myuros*				X		X								
Polygaceae																	
			Comesperma calymega						X		X	X					
Primulaceae																	
		*	*Lysimachia arvensis*						X		X						
Proteaceae																	
			Adenanthos cygnorum subsp. *cygnorum*	X	X	X			X		X	X					
			Banksia attenuata	X					X		X						X
			Banksia bipinnatifida				X	X	X								
			Banksia candolleana						X								
	P4		*Banksia chamaephyton*							X							
	P3		*Banksia cypholoba*					X	X	X							
			Banksia dallanneyi subsp. *dallanneyi* var. *dallanneyi*						X					X	X		
	P3		*Banksia fraseri* var. *crebra*				X			X							
			Banksia ilicifolia	X													
			Banksia kippistiana				X	X	X								
			Banksia menziesii	X	X				X		X						
			Banksia prionotes		X							X	X				
			Banksia sessilis				X			X							
			Banksia shuttleworthiana				X	X						X			
			Banksia sphaerocarpa				X	X	X								
			Banksia tridentata				X	X		X							
			Conospermum crassinervium	X													
			Conospermum incurvum						X								
			Conospermum stoechadis		X				X								
			Conospermum stoechadis subsp. *stoechadis*								X						
			Grevillea ?biformis											X			
			Grevillea sp.							X							
			Grevillea synapheae subsp. *pachyphylla*							X							
	P3		*Grevillea uniformis*							X							
			Hakea anadenia					X									
			Hakea auriculata				X	X	X								
			Hakea conchifolia											X			
			Hakea costata		X												
			Hakea flabellifolia					X	X								
			Hakea incrassata				X	X						X			
			Hakea lissocarpha	X													
	P3		*Hakea longiflora*							X							
			Hakea smilacifolia				X		X								
			Hakea stenocarpa					X	X								
			Lambertia multiflora				X	X	X								
			Petrophile linearis	X					X			X	X			X	
			Petrophile macrostachya				X	X	X					X			
			Petrophile scabriuscula						X								
			Stirlingia latifolia	X					X								
			Strangea cynanchicarpa						X								
			Synaphea spinulosa subsp. *spinulosa*				X	X	X	X				X			
Restionaceae																	
			Alexgeorgea nitens				X		X		X					X	
			Chordifex microcodon							X							
			Chordifex sinuosus				X		X								
			Desmocladus virgatus				X		X	X							
			Hypolaena exsulca						X								
	P4		*Hypolaena robusta*			X											
			Lepidobolus preissianus								X					X	

Family	WA Cons. Status[1]	Weed	Taxon	Cataby			ENBNT				Regans			Yandin			
				BaAcPo	BpMsCa	Opportunistic	BsMp	EdBsMo	LmAn	Opportunistic	BaAcMp	BpAcMp	Opportunistic	AhEm	ErMlEc	EtHhPg	Opportunistic
	P3		*Lepidobolus quadratus*				X	X		X							
Rhamnaceae																	
			Cryptandra myriantha					X			X						
			Stenanthemum humile				X		X								
			Stenanthemum reissekii					X									
Rubiaceae																	
			Opercularia vaginata				X	X	X		X			X	X	X	
Rutaceae																	
			Cyanothamnus ramosus subsp. *anethifolius*						X								
			Diplolaena ferruginea				X	X									
			Philotheca spicata	X					X								
Stylidiaceae																	
			Levenhookia pusilla				X		X								
			Stylidium ?carnosum					X									
			Stylidium bicolor	X													
			Stylidium calcaratum				X										
			Stylidium crossocephalum						X								
			Stylidium diuroides subsp. *diuroides*					X	X								
	P3		*Stylidium drummondianum*					X		X							
	P3		*Stylidium hymenocraspedum*	X		X											
			Stylidium miniatum				X		X								
			Stylidium piliferum									X					
			Stylidium purpureum						X								
			Stylidium repens	X			X		X								
			Stylidium sp.	X													
Thymelaeaceae																	
			Pimelea sp.				X	X									
Violaceae																	
			Pigea calycina													X	
Xanthorrhoeaceae																	
			Xanthorrhoea gracilis				X	X	X								
			Xanthorrhoea preissii	X							X	X			X	X	
Zamiaceae																	
			Macrozamia fraseri													X	

1. P Priority

Appendix E

Flora Site Data

Appendix E Flora Site Data

Appendix E Site Data

Cataby Flora Site Data

Site No: CQ01	**Date**: 21/02/2023	**Longitude**: 115.45875	**Latitude**: -30.65265

Type: Quadrat
Soil Types: Grey-white sand
Topography: Upland
Surface: Bare ground 25%
Outcrops: None
Litter: 20%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: BaAcPo

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Anarthria laevis	20	0.5	
		Banksia attenuata	350	15	
		Banksia menziesii	300	5	
		Beaufortia sp.	15	0.1	
		Beaufortia squarrosa	50	1	
		Bossiaea eriocarpa	30	2	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Bromus diandrus*	12	0.1	
P4		*Conostephium magnum*	150	7	ACC/10425/E
		Eucalyptus todtiana	350	3	
		Hibbertia subvaginata	60	4	
		Hypocalymma angustifolium	40	1	
	*	*Hypochaeris glabra*	3	0.1	
		Jacksonia sternbergiana	100	3	
		Johnsonia pubescens subsp. *pubescens*	20	0.1	
		Kunzea praestans	40	0.5	
		Leporella fimbriata	2	0.1	
		Lomandra hermaphrodita	10	0.1	
		Melaleuca beardii	30	0.5	
		Orchidaceae sp.	4	0.1	
		Patersonia occidentalis var. *occidentalis*	40	0.1	
		Petrophile linearis	60	1	
		Stirlingia latifolia	70	1	
		Stylidium bicolor	5	0.1	
P3		*Stylidium hymenocraspedum*	5	0.1	ACC/10425/E
		Stylidium repens	7	0.1	
		Styphelia tortifolia	10	0.1	
		Thysanotus thyrsoideus	30	0.1	
		Trachymene pilosa	3	0.1	
	*	*Ursinia anthemoides*	6	0.5	
		Verticordia sp.	30	2	
		Xanthorrhoea preissii	90	8	

Site No: CQ02	**Date**: 21/09/2023	**Longitude**: 115.45847	**Latitude**: -30.64803

Type: Quadrat
Topography: Upland
Outcrops: None
Vegetation Condition: Excellent
Soil Condition: Dry
Vegetation Type: BpMsCa

Soil Types: Yellow-white sand
Surface: Bare ground 10%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Acacia saligna	30	0.1	Overhang
		Adenanthos cygnorum subsp. *cygnorum*	220	3	
		Banksia menziesii	80	2	
		Banksia prionotes	500	12	
		Bossiaea eriocarpa	45	2	
		Calothamnus quadrifidus subsp. *quadrifidus*	120	5	
		Conospermum stoechadis	120	5	
		Conostylis angustifolia	15	1	
		Daviesia divaricata subsp. *divaricata*	250	4	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Drosera erythrorhiza	2	0.1	
		Eremaea asterocarpa subsp. *asterocarpa*	40	8	
		Eucalyptus todtiana	300	2	
		Hakea costata	40	0.5	
		Hibbertia striata	40	0.5	ACC/10717/E
	*	*Hypochaeris glabra*	5	0.1	
		Jacksonia furcellata	80	0.5	
		Jacksonia sternbergiana	110	4	
		Laxmannia sessiliflora subsp. *drummondii*	5	0.1	
		Melaleuca seriata	50	55	
		Mesomelaena pseudostygia	30	0.1	
		Styphelia tortifolia	15	0.1	

Site No: CR01	**Date**: 21/02/2023	**Longitude**: 115.45888	**Latitude**: -30.65092

Type: Relevé
Topography: Upland
Outcrops: None
Vegetation Condition: Excellent
Soil Condition: Dry
Vegetation Type: BaAcPo

Soil Types: White-grey sand
Surface: Bare ground 5%
Litter: 20%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Adenanthos cygnorum subsp. *cygnorum*	300	10	
		Allocasuarina humilis	50	1	
		Banksia attenuata	250	30	
		Banksia ilicifolia	500	1	
		Banksia menziesii	200	5	
		Beaufortia sp.	30	0.1	
		Bossiaea eriocarpa	50	2	
		Calytrix sp.	20	0.1	
		Conospermum crassinervium	60	2	
P4		*Conostephium magnum*	11	2	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Conostylis canteriata	40	0.1	
		Dasypogon obliquifolius	30	0.5	
		Drosera erythrorhiza	10	0.1	
		Gompholobium tomentosum	20	0.1	
		Hakea lissocarpha	50	0.1	
		Hibbertia subvaginata	30	5	
		Johnsonia pubescens subsp. *pubescens*	10	0.1	
		Leporella fimbriata	1	0.1	
		Lomandra hermaphrodita	10	0.1	
		Patersonia occidentalis var. *occidentalis*	50	0.5	
		Petrophile linearis	60	1	
		Philotheca spicata	40	0.1	
		Phlebocarya ciliata		0.1	
		Stirlingia latifolia	50	3	
		Stylidium repens	10	0.1	
		Stylidium sp.	30	0.1	
		Styphelia tortifolia	4	0.1	
		Verticordia ?pennigera	50	1	
		Verticordia sp.	60	4	
		Xanthorrhoea preissii	130	4	

1.0 Eneabba Flora Site Data

Site No: EQ01	**Date**: 19/09/2023	**Longitude**: 115.38941	**Latitude**: -29.89185

Type: Quadrat
Soil Types: Grey-brown sand
Topography: Gentle slope
Surface: Bare ground 5%
Outcrops: None
Litter: 15%
Vegetation Condition: Very Good
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: LmAn

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Amphipogon turbinatus	5	0.1	
		?Dampiera carinata	30	0.1	
		Acacia lasiocarpa var. *lasiocarpa*	40	1	
		Alexgeorgea nitens	16	20	
		Allocasuarina humilis	150	5	
		Anigozanthos humilis	20	0.5	
		Anigozanthos manglesii	30	1	
	*	*Arctotheca calendula*	20	0.1	
		Austrostipa elegantissima	60	1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Austrostipa macalpinei	10	0.1	
P3		*Banksia cypholoba*	15	0.5	ACC/10717 Because the taxonomy of the *B. dallanneyi*/*B. nivea* group relies to a large extent on rather subtle differences in foliar morphology (with no co-relating floral differences) there can be a uncomfortable level of subjectivity in identifying specimens. None of the four specimens above sit perfectly in B. cypholoba, and a case could certainly be made for *B. dallanneyi* subsp. *media*.
		Banksia sphaerocarpa	120	10	
		Beaufortia elegans	80	5	
		Bossiaea eriocarpa	60	12	
	*	*Brassica tournefortii*	15	0.1	
		Burchardia congesta	60	0.1	
		Caladenia flava	10	0.1	
		Cassytha glabella	0	0.1	
		Caustis dioica	50	25	
		Chaetospora curvifolia	40	0.1	
		Conostylis aurea	30	10	
		Conostylis crassinerva subsp. *absens*	15	0.1	
		Crassula colorata	5	0.1	
		Drosera erythrorhiza	1	0.1	
	*	*Ehrharta longiflora*	65	1	
		Eremaea ectadioclada	45	0.5	
		Eucalyptus todtiana	700	20	
		Gompholobium tomentosum	10	0.1	
		Gonocarpus cordiger	25	0.1	
		Haemodorum sp.	70	0.1	
		Haemodorum venosum	75	0.1	
		Hibbertia acerosa	30	1	
		Hibbertia subvaginata	45	1	
		Hypocalymma hirsutum	30	2	
	*	*Hypochaeris glabra*	10	2	
		Lagenophora huegelii	5	0.1	
		Lambertia multiflora	200	15	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Laxmannia sessiliflora	15	0.1	
		Lepidosperma apricola	60	0.1	
		Levenhookia pusilla	5	0.1	
		Lomandra preissii	30	0.1	
		Lomandra sp.	15	0.1	
		Lomandra suaveolens	15	0.5	
		Lyginia barbata	35	2	
		Melaleuca systena	110	3	
		Mesomelaena pseudostygia	50	0.5	
		Opercularia vaginata	20	7	
	*	*Pentameris airoides*	10	0.1	
		Pileanthus filifolius	40	0.5	
		Platysace xerophila	12	0.1	
		Podotheca gnaphalioides	10	0.1	
		Pterochaeta paniculata	7	0.1	
		Schoenus ?subflavus subsp. *subflavus*	5	1	
		Schoenus brevisetis	60	0.5	
		Schoenus brevisetis	50	0.5	
		Thysanotus patersonii	5	0.1	
		Trachymene pilosa	5	0.5	
	*	*Ursinia anthemoides*	15	5	
		Verticordia ?eriocephala	55	0.1	
	*	*Vulpia myuros* forma *myuros*	25	0.5	
	*	*Wahlenbergia capensis*	5	0.1	
		Xanthosia huegelii	15	0.1	

Site No: EQ02	**Date**: 19/09/2023	**Longitude**: 115.38955	**Latitude**: -29.89593

Type: Quadrat
Topography:
Outcrops: None
Vegetation Condition: Very Good
Soil Condition: Dry
Vegetation Type: LmAn

Soil Types: White-grey sand
Surface: Bare ground 25%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Acacia alata	60	2	
		Acacia barbinervis subsp. *borealis*	30	0.1	
		Acacia sp.	5	0.1	Seedling
		Allocasuarina humilis	160	30	
		Allocasuarina microstachya	50	0.1	
		Amphipogon amphipogonoides	30	2	
		Anigozanthos humilis	20	0.5	
		Austrostipa elegantissima	80	0.5	
		Banksia bipinnatifida	25	0.1	
P3		*Banksia cypholoba*	25	0.5	ACC/10717

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Beaufortia elegans	80	3	
		Bossiaea eriocarpa	45	4	
	*	*Bromus diandrus*	30	0.5	
		Burchardia congesta	30	0.1	
		Caladenia flava	15	0.1	
		Calectasia narragara		0.1	
		Callitris acuminata	50	0.5	
		Calothamnus hirsutus	150	5	
		Cassytha glabella	0	0.1	
		Caustis dioica	25	3	
		Conostylis aurea	25	1	
		Conostylis teretifolia subsp. *teretifolia*	10	0.5	
		Crassula colorata	5	0.1	
		Daviesia nudiflora subsp. *nudiflora*	70	2	
		Drosera sp.	15	0.1	
	*	*Ehrharta longiflora*	60	2	
		Gompholobium tomentosum	90	2	
		Haemodorum sp.	30	0.1	
		Haemodorum venosum	80	1	
P3		*Hemiandra* sp. Eneabba (H. Demarz 3687)	50	1	
		Hibbertia acerosa	40	1	
		Hibbertia hypericoides subsp. *septentrionalis*	60	25	
		Hypocalymma hirsutum	40	0.5	
	*	*Hypochaeris glabra*	10	3	
		Isotropis cuneifolia subsp. *cuneifolia*	20	0.1	
		Johnsonia pubescens subsp. *pubescens*	15	0.1	
		Lambertia multiflora	180	5	
		Laxmannia sessiliflora	20	0.5	
		Leptospermopsis erubescens	80	3	
		Levenhookia pusilla	5	0.1	
	*	*Lolium rigidum*	65	1	
		Lomandra preissii	30	0.1	
		Lomandra sp.	14	0.1	
	*	*Lysimachia arvensis*	6	0.1	
		Melaleuca systena	35	3	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Melaleuca trichophylla	50	5	
		Mesomelaena pseudostygia	50	15	
		Millotia tenuifolia var. *tenuifolia*	5	0.1	
		Nuytsia floribunda	450	6	
		Opercularia vaginata	25	2	
		Pileanthus filifolius	40	2	
		Podotheca gnaphalioides	12	0.1	
		Pterochaeta paniculata	5	0.1	
		Schoenus ?subflavus subsp. *subflavus*	10	0.5	
		Stylidium purpureum	15	0.1	
		Trachymene pilosa	10	0.1	
	*	*Ursinia anthemoides*	15	3	
	*	*Wahlenbergia capensis*	10	0.1	
		Waitzia suaveolens	10	2	
		Xanthorrhoea gracilis	100	3	

Site No: EQ03	**Date**: 19/09/2023	**Longitude**: 115.38944	**Latitude**: -29.88928

Type: Quadrat
Soil Types: Yellow sand
Topography: Gentle slope
Surface: Bare ground 15%
Outcrops: None
Litter: 3%
Vegetation Condition: Very Good
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: LmAn

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Acacia lasiocarpa var. *lasiocarpa*	20	2	
		Adenanthos cygnorum subsp. *cygnorum*	3	0.1	
		Alexgeorgea nitens	20	2	
		Allocasuarina humilis	200	4	
	*	*Arctotheca calendula*	15	1	
		Astartea sp.	150	3	
		Austrostipa elegantissima	60	3	
		Banksia menziesii	400	22	
		Bossiaea eriocarpa	50	5	
	*	*Briza maxima*	15	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Bromus diandrus*	8	0.5	
		Calothamnus hirsutus	150	15	
		Cassytha glabella	0	0.1	
		Caustis dioica	15	1	
		Comesperma calymega	15	0.1	
		Conospermum incurvum	40	0.5	
		Conospermum stoechadis	70	3	
		Conostylis crassinerva subsp. *absens*	10	0.1	
		Conostylis teretifolia subsp. *teretifolia*	8	0.5	
		Daviesia podophylla	60	6	
		Desmocladus virgatus	16	0.1	
		Drosera sp.	15	0.1	Dead
	*	*Ehrharta longiflora*	20	0.1	
		Eremaea ectadioclada	30	1	
		Gastrolobium spinosum	110	4	
		Gonocarpus cordiger	10	0.5	
		Hibbertia acerosa	10	1	
		Hibbertia hypericoides subsp. *septentrionalis*	40	10	
		Hibbertia hypericoides subsp. *septentrionalis*	40	0.5	
		Hibbertia subvaginata	35	1	
		Hypocalymma hirsutum	30	1	
	*	*Hypochaeris glabra*	5	0.5	
		Lambertia multiflora	220	12	
		Lepidosperma apricola	55	1	
		Lepidosperma pubisquameum	65	1	
		Leptospermopsis erubescens	70	28	
		Leucopogon simulans	45	0.5	
		Levenhookia pusilla	5	0.1	
	*	*Lolium rigidum*	10	0.1	
		Lyginia barbata	50	2	
	*	*Lysimachia arvensis*	4	0.5	
		Melaleuca systena	60	3	
		Mesomelaena pseudostygia	15	5	
P3		*Phlebocarya pilosissima* subsp. *pilosissima*	40	0.1	
		Poaceae sp.	15	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Podotheca gnaphalioides	10	0.1	
		Pterostylis sp.	10	0.1	
		Schoenus ?subflavus subsp. *subflavus*	5	0.1	
		Stirlingia latifolia	60	0.1	
		Stypandra glauca	10	0.1	
		Styphelia xerophylla	65	1	
		Trachymene pilosa	5	0.1	
	*	*Trifolium arvense* subsp. *arvense*	12	0.1	
	*	*Ursinia anthemoides*	10	0.5	
		Xanthosia huegelii	20	0.1	

Site No: EQ04	**Date**: 20/09/2023	**Longitude**: 115.38878	**Latitude**: -29.89703

Type: Quadrat
Soil Types: White-grey sand
Topography: Gentle slope
Surface: Bare ground 10%
Outcrops: Scattered laterite
Litter: 5%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: BsMp

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Amphipogon turbinatus	5	0.1	
		Alexgeorgea nitens	30	0.1	
		Allocasuarina humilis	90	6	
		Allocasuarina microstachya	50	2	
		Amphipogon amphipogonoides	25	2	
		Anigozanthos humilis	20	0.1	
	*	*Arctotheca calendula*	4	0.1	
		Astartea sp.	70	1	
		Austrostipa macalpinei	18	0.1	
		Babingtonia grandiflora	60	1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Banksia bipinnatifida	30	1	
P3		*Banksia fraseri* var. *crebra*	60	0.1	Overhang
		Banksia shuttleworthiana	100	15	
		Banksia tridentata	80	4	
		Bossiaea eriocarpa	15	0.5	
		Burchardia congesta	12	0.5	
		Caladenia flava	5	0.1	
		Calothamnus hirsutus	80	10	
		Cassytha glabella	0	0.1	
		Caustis dioica	15	0.1	
		Crassula decumbens var. *decumbens*	3	0.1	
		Desmocladus virgatus	40	3	
		Diplolaena ferruginea	40	0.5	
		Drosera erythrorhiza	2	0.5	
		Elythranthera brunonis	15	0.5	
		Gastrolobium linearifolium	50	3	
		Glischrocaryon aureum	40	3	
		Guichenotia astropletha	40	1	
		Haemodorum sp.	30	0.5	
		Hakea auriculata	70	4	
		Hakea incrassata	50	3	
		Hakea smilacifolia	100	1	
		Hibbertia hypericoides subsp. *hypericoides*	20	1	
		Hibbertia hypericoides subsp. *septentrionalis*	45	15	
		Hibbertia prolata	30	1	
		Hypocalymma hirsutum	35	1	
	*	*Hypochaeris glabra*	10	0.1	
		Lambertia multiflora	75	3	
		Laxmannia sessiliflora	10	0.1	
		Lepidosperma apricola	30	0.5	
		Lepidosperma pubisquameum	60	0.5	
		Levenhookia pusilla	4	0.1	
		Lomandra preissii	30	0.1	
		Lomandra sericea	45	0.1	
		Lomandra sp.	35	0.1	
		Lyginia barbata	40	1	
		Melaleuca seriata	50	2	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Melaleuca systena	60	5	
		Mesomelaena pseudostygia	40	4	
		Mesomelaena stygia	50	0.5	
		Microcorys sp. Coomallo (L. Haegi 2677)	45	1	
		Opercularia vaginata	25	1	
		Orchidaceae sp.	1	0.1	
		Poaceae sp.	15	0.1	
		Podotheca gnaphalioides	10	0.1	
		Pterochaeta paniculata	58	0.1	
		Schoenus ?subflavus subsp. *subflavus*	8	0.5	
		Schoenus brevisetis	20	0.1	
		Schoenus nanus	3	0.1	
		Stenanthemum humile	3	0.1	
		Stylidium calcaratum	3	0.5	
		Stylidium repens	20	3	
		Trachymene pilosa	5	0.1	
	*	*Ursinia anthemoides*	15	0.1	
		Verticordia ?pennigera	60	1	
		Waitzia suaveolens	10	2	
		Xanthorrhoea gracilis	60	8	
		Xanthosia huegelii	12	0.1	

Site No: EQ05	**Date**: 20/09/2023	**Longitude**: 115.38899	**Latitude**: -29.89315

Type: Quadrat
Soil Types: White-grey sand
Topography: Undulating flats
Surface: Bare ground 20%
Outcrops: None
Litter: 10%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: LmAn

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Alexgeorgea nitens	10	20	
		Allocasuarina humilis	180	3	
		Amphipogon amphipogonoides	60	1	
		Anigozanthos humilis	20	0.5	
		Austrostipa macalpinei	15	0.1	
		Banksia attenuata	200	3	
		Bossiaea eriocarpa	60	0.5	
	*	*Bromus diandrus*	15	0.1	
		Calothamnus hirsutus	160	6	
		Cassytha glabella	0	1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Caustis dioica	20	2	
		Conospermum stoechadis	60	4	
		Conostylis aurea	20	0.5	
		Conostylis crassinerva subsp. *absens*	10	1	
		Crassula colorata	2	0.1	
		Darwinia speciosa	15	0.1	
		Daviesia decurrens	80	4	
		Drosera erythrorhiza	2	0.1	
		Drosera porrecta	20	0.5	
		Drosera sp.	0	0.1	
		Elythranthera brunonis	13	0.1	
		Eremaea ectadioclada	65	2	
		Eucalyptus todtiana	600	5	
		Gompholobium tomentosum	8	0.1	
		Haemodorum venosum	50	0.1	
		Hibbertia acerosa	30	1	
		Hibbertia hypericoides subsp. *septentrionalis*	50	5	
		Hibbertia subvaginata	55	0.5	
		Hypocalymma hirsutum	30	2	
	*	*Hypochaeris glabra*	10	0.5	
		Jacksonia floribunda	120	1	
		Lambertia multiflora	90	4	
		Laxmannia sessiliflora	12	0.1	
		Lepidosperma pubisquameum	65	2	
		Leptospermopsis erubescens	70	2	
		Levenhookia pusilla	2	0.1	
		Lomandra sp.	25	0.5	
		Lyginia barbata	60	2	
	*	*Lysimachia arvensis*	6	0.1	
		Melaleuca sp. 1	30	1	
		Melaleuca sp. 2	40	2	
		Melaleuca systena	70	8	
		Millotia tenuifolia var. *tenuifolia*	5	0.1	
		Opercularia vaginata	20	4	
	*	*Pentameris airoides*	5	0.1	
		Philotheca spicata	50	1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Pileanthus filifolius	30	1	
		Podotheca gnaphalioides	10	0.1	
		Pterochaeta paniculata	5	0.1	
		Schoenus ?subflavus subsp. *subflavus*	8	1	
		Schoenus subflavus subsp. *subflavus*	40	1	
		Stachystemon axillaris	45	0.5	
		Stirlingia latifolia	80	2	
		Stylidium repens	10	0.1	
		Trachymene pilosa	4	0.1	
		Unknown sp.	30	0.1	
	*	*Ursinia anthemoides*	10	0.5	
		Verticordia ovalifolia			ACC/10726/E
	*	*Wahlenbergia capensis*	35	0.1	
		Xanthorrhoea gracilis	55	1	

Site No: EQ06	**Date**: 20/09/2023	**Longitude**: 115.36995	**Latitude**: -29.93295

Type: Quadrat
Soil Types: White-grey sand
Topography: Undulating flats
Surface: Bare ground 20%
Outcrops: None
Litter: 7%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: LmAn

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Dampiera carinata	15	0.1	
		Adenanthos cygnorum subsp. *cygnorum*	10	0.1	
		Allocasuarina humilis	140	2	
		Allocasuarina microstachya	100	1	
		Amphipogon amphipogonoides	10	0.1	
		Anigozanthos humilis	15	2	
	*	*Arctotheca calendula*	10	0.1	
		Babingtonia grandiflora	60	1	
		Banksia bipinnatifida	35	1	
P3		*Banksia cypholoba*	30	30	ACC/10717/E

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Bromus diandrus*	30	0.1	
		Burchardia congesta	40	0.1	
		Calectasia narragara	25	0.5	
		Callitris acuminata	55	10	
		Calothamnus hirsutus	140	10	
		Calothamnus torulosus	70	2	
		Cassytha glabella	0	0.1	
		Chordifex sinuosus	20	2	
		Comesperma calymega	15	0.1	ACC/10717/E
		Conostylis aurea	20	1	
		Conostylis crassinerva subsp. *absens*	10	0.1	
		Darwinia speciosa	15	0.1	
		Daviesia nudiflora subsp. *hirtella*	60	2	
		Daviesia podophylla	50	1	
		Desmocladus virgatus	40	1	
		Drosera eneabba	6	0.1	
		Drosera erythrorhiza	1	0.5	
		Drosera sp.	3	0.1	
		Goodeniaceae sp.		0.1	
		Haemodorum sp.	15	0.1	
		Hakea auriculata	50	0.5	
		Hakea stenocarpa	30	2	
		Hibbertia acerosa	20	0.5	
		Hibbertia hypericoides subsp. *hypericoides*	25	1	
		Hibbertia hypericoides subsp. *septentrionalis*	60	7	
	*	*Hypochaeris glabra*	10	0.1	
		Johnsonia pubescens subsp. *pubescens*	15	0.1	
		Lambertia multiflora	50	8	
		Lasiopetalum drummondii	35	0.5	
		Laxmannia sessiliflora	10	0.5	
		Lepidosperma apricola	35	0.1	
		Leucopogon simulans	65	2	
		Levenhookia pusilla	3	0.1	
		Melaleuca seriata	50	3	
		Melaleuca sp. 2	50	3	
		Mesomelaena pseudostygia	45	3	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Mesomelaena stygia	45	0.5	
		Morelotia octandra	30	2	
		Petrophile linearis	60	3	
		Petrophile scabriuscula	65	1	
		Poaceae sp.	20	0.5	
		Poranthera microphylla	4	0.1	
		Schoenus ?subflavus subsp. *subflavus*	5	0.1	
		Schoenus pleiostemoneus	10	0.1	
		Schoenus subflavus subsp. *subflavus*	30	1	
		Stylidium crossocephalum	10	0.1	
		Styphelia xerophylla	40	0.1	
		Synaphea spinulosa subsp. *spinulosa*	30	0.1	
	*	*Ursinia anthemoides*	10	0.5	
		Verticordia sp.	50	1	
	*	*Wahlenbergia capensis*	6	0.1	
		Xanthorrhoea gracilis	110	3	

Site No: EQ07	**Date**: 20/09/2023	**Longitude**: 115.36785	**Latitude**: -29.93568

Type: Quadrat
Topography:
Outcrops: None
Vegetation Condition: Excellent
Soil Condition: Dry
Vegetation Type: LmAn

Soil Types: White-grey sand
Surface: Bare ground 25%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Dampiera carinata	20	0.1	
		Adenanthos cygnorum subsp. *cygnorum*	100	5	
		Alexgeorgea nitens	10	10	
		Andersonia heterophylla	45	2	
		Beaufortia elegans	80	5	
		Bossiaea eriocarpa	50	2	
		Burchardia congesta	30	0.1	
		Caladenia flava	5	0.1	
		Chordifex sinuosus	20	15	
		Conospermum incurvum	70	0.5	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Conospermum stoechadis	60	2	
		Conostylis aurea	40	0.1	
		Conostylis crassinerva subsp. *absens*	10	0.1	
		Conostylis hiemalis	10	0.5	
		Darwinia speciosa	15	0.1	
		Daviesia nudiflora subsp. *nudiflora*	80	2	
		Daviesia podophylla	40	2	
		Daviesia triflora	50	0.5	
		Drosera eneabba	5	0.1	
		Drosera erythrorhiza	1	0.1	
		Drosera porrecta	4	0.1	
		Eremaea ectadioclada	10	3	
		Eremaea violacea subsp. *violacea*	40	6	
		Eucalyptus todtiana	450	1	Overhang
		Haemodorum sp.	40	0.1	
		Hibbertia hypericoides subsp. *septentrionalis*	50	12	
		Hibbertia leucocrossa	30	0.1	
		Hibbertia prolata	50	2	
		Jacksonia angulata	30	1	
		Jacksonia floribunda	60	4	
		Lepidosperma apricola	50	1	
		Lepidosperma pubisquameum	15	1	
		Levenhookia pusilla	5	0.1	
		Lomandra suaveolens	5	0.1	
		Melaleuca systena	60	4	
		Mesomelaena pseudostygia	30	2	
		Pericalymma ellipticum	40	0.5	
		Petrophile linearis	50	1	
		Petrophile macrostachya	70	5	
		Pileanthus filifolius	60	1	
		Schoenus ?subflavus subsp. *subflavus*	10	0.1	
		Schoenus subflavus subsp. *subflavus*	60	3	
		Stirlingia latifolia	70	2	
		Styphelia stomarrhena	20	0.5	
		Styphelia xerophylla	60	2	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Synaphea spinulosa subsp. *spinulosa*	30	2	
		Verticordia ?eriocephala	8	1	
		Xanthorrhoea gracilis	30	2	

Site No: EQ08	**Date**: 20/09/2023	**Longitude**: 115.35861	**Latitude**: -29.94697

Type: Quadrat
Topography: Hill slope
Outcrops: Laterite
Vegetation Condition: Excellent
Soil Condition: Dry
Vegetation Type: EdBsMo

Soil Types: Grey sand
Surface: Bare ground 25%
Litter: 5%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Allocasuarina humilis	100	3	
		Banksia bipinnatifida	20	1	
		Banksia kippistiana	60	2	
		Banksia shuttleworthiana	70	3	
		Banksia sphaerocarpa	50	5	
		Banksia tridentata	60	2	
		Burchardia congesta	30	0.1	
		Calothamnus hirsutus	110	1	
P2		*Cristonia biloba* subsp. *pubescens*	20	0.1	ACC/10717/E
		Daviesia epiphyllum	80	4	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Ecdeiocolea monostachya	80	1	
		Eucalyptus pleurocarpa	210	8	
		Gastrolobium polystachyum	15	0.5	
		Haemodorum venosum	60	0.1	
		Hakea auriculata	60	2	
		Hakea flabellifolia	40	0.5	
		Hakea stenocarpa	50	2	
		Hibbertia hypericoides subsp. *septentrionalis*	30	3	
		Hibbertia prolata	35	1	
		Hibbertia prolata	35	2	
		Lambertia multiflora	100	4	
		Lechenaultia biloba	15	0.1	
		Melaleuca trichophylla	60	4	
		Mesomelaena pseudostygia	15	0.1	
		Morelotia octandra	15	1	
		Opercularia vaginata	5	0.1	
		Petrophile macrostachya	110	5	
		Pterochaeta paniculata	8	0.1	
		Schoenus ?subflavus subsp. *subflavus*	3	0.1	
		Schoenus subflavus subsp. *subflavus*	12	0.1	
P3		*Stylidium drummondianum*	5	0.1	
		Verticordia ?eriocephala	60	1	
		Xanthorrhoea gracilis	100	1	

Site No: EQ09	**Date**: 21/09/2023	**Longitude**: 115.35842	**Latitude**: -29.94716

Type: Quadrat
Soil Types: Grey sand
Topography: Hill crest
Surface: Bare ground 20%
Outcrops: Laterite
Litter: 5%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: EdBsMo

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Acacia pulchella var. *pulchella*	30	0.1	
		Allocasuarina humilis	50	4	
		Banksia bipinnatifida	20	1	
P3		*Banksia cypholoba*	30	0.5	ACC/10717/E

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Banksia kippistiana	60	2	
		Banksia sphaerocarpa	80	8	
		Banksia tridentata	80	1	
		Beaufortia bracteosa	40	0.5	
		Burchardia congesta	40	0.1	
		Calectasia narragara	30	0.1	
		Calothamnus hirsutus	60	2	
		Caustis dioica	15	1	
		Conostylis androstemma	15	0.1	
P2		*Cristonia biloba* subsp. *pubescens*	60	0.1	ACC/10717/E
		Darwinia sanguinea	20	0.5	
		Daviesia decurrens	50	0.5	
		Daviesia epiphyllum	60	5	
		Daviesia longifolia	80	2	
		Diplolaena ferruginea	40	0.5	
		Drosera erythrorhiza	1	0.1	
		Drosera sp.	10	0.1	
		Ecdeiocolea monostachya	60	0.1	
		Eucalyptus drummondii	450	3	
		Gastrolobium ?capitatum	20	0.1	
		Georgeantha hexandra	40	0.5	
		Glischrocaryon aureum	40	3	
		Haemodorum sp.	2	0.1	
		Hakea anadenia	100	7	
		Hakea auriculata	60	3	
		Hakea incrassata	45	4	
		Hakea stenocarpa	35	3	
		Hibbertia glomerata	30	2	
		Hibbertia hypericoides subsp. *septentrionalis*	40	6	
		Hibbertia prolata	50	2	
		Hypocalymma hirsutum	25	1	
		Labichea cassioides	25	0.1	
		Lechenaultia biloba	15	0.1	
P3		*Lepidobolus quadratus*	15	0.1	
		Lepidosperma pubisquameum	40	0.1	
		Leucopogon sp. Northern ciliate (R Davis 3393)	30	0.1	
		Lomandra hermaphrodita	10	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Melaleuca seriata	80	5	
		Mesomelaena stygia	50	0.1	
		Monotaxis grandiflora var. *grandiflora*		0.1	
		Morelotia octandra	30	0.5	
		Petrophile macrostachya	80	8	
		Pimelea sp.	5	0.1	
		Poaceae sp.	5	0.1	
		Schoenus ?subflavus subsp. *subflavus*	5	2	
		Schoenus subflavus subsp. *subflavus*	20	0.5	
		Stenanthemum reissekii	20	0.5	
		Stylidium ?carnosum	5	0.1	
		Stylidium diuroides subsp. *diuroides*	5	0.1	
P3		*Stylidium drummondianum*	15	0.1	
		Styphelia oblongifolia	15	0.5	
		Verticordia ?eriocephala	30	0.5	
		Xanthorrhoea gracilis	80	6	

Site No: EQ10	**Date**: 21/09/2023	**Longitude**: 115.33300	**Latitude**: -29.97892

Type: Quadrat
Soil Types: White-grey sand
Topography: Undulating flats
Surface: Bare ground 25%
Outcrops: Laterite
Litter: 2%
Vegetation Condition: Excellent
Condition Notes: Evidence of rubbish dumping
Soil Condition: Dry
Fire:
Vegetation Type: BsMp

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Dampiera carinata	15	2	Common
		Acacia pulchella var. *pulchella*	30	1	
		Allocasuarina humilis	40	2	
		Allocasuarina microstachya	50	1	
		Amphipogon amphipogonoides	15	3	
		Anigozanthos sp.	15	0.1	Sterile
	*	*Arctotheca calendula*	10	0.1	
		Austrostipa elegantissima	80	1	
		Babingtonia grandiflora	40	2	
		Banksia kippistiana		0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Banksia sessilis	80	1	
		Banksia shuttleworthiana	20	10	
		Banksia sphaerocarpa	50	1	
		Banksia tridentata	100	5	
		Burchardia congesta	50	0.1	
		Caladenia flava	5	0.1	
		Calothamnus hirsutus	40	0.5	
		Caustis dioica	60	0.5	
		Chordifex sinuosus	35	0.5	
		Conostylis androstemma	10	0.1	
		Conostylis canteriata	10	0.1	
		Darwinia sanguinea	12	0.1	
		Daviesia epiphyllum	80	0.5	
		Drosera echinoblastus	7	0.1	
		Drosera erythrorhiza	2	0.1	
		Drosera porrecta	15	0.1	
		Ecdeiocolea monostachya	90	0.1	
		Eremaea violacea subsp. *violacea*	30	0.5	
		Gastrolobium linearifolium	50	0.5	
		Georgeantha hexandra	70	0.1	
		Haemodorum laxum	90	0.1	
		Haemodorum sp.	40	0.1	
		Hakea incrassata	45	3	
		Hibbertia hypericoides subsp. *septentrionalis*	50	6	
		Hibbertia prolata	40	1	
	*	*Hypochaeris glabra*	6	0.1	
		Laxmannia sessiliflora	15	0.1	
		Lechenaultia biloba	30	0.1	
P3		*Lepidobolus quadratus*	10	0.1	
		Lepidosperma apricola	80	0.1	
		Levenhookia pusilla	5	0.1	
		Lomandra preissii	20	0.1	
		Mesomelaena pseudostygia	60	0.5	
		Mesomelaena stygia	60	0.5	
		Morelotia octandra	20	0.1	
		Petrophile macrostachya	50	3	
		Pileanthus filifolius	20	0.1	
		Pimelea sp.	5	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Podotheca gnaphalioides	15	0.1	
		Pterochaeta paniculata	5	0.1	
		Schoenus ?subflavus subsp. *subflavus*	5	0.5	
		Schoenus subflavus subsp. *subflavus*	15	0.1	
		Stylidium miniatum	15	0.5	
		Synaphea spinulosa subsp. *spinulosa*	60	3	
		Tetratheca confertifolia	10	0.1	
		Trachymene pilosa	10	0.1	
		Tricoryne sp. Eneabba	20	0.1	
	*	*Ursinia anthemoides*	8	0.5	
		Verticordia ?eriocephala	30	0.1	
	*	*Vulpia myuros* forma *myuros*	8	0.1	
		Xanthorrhoea gracilis	40	8	

Site No: EQ11	**Date**: 21/09/2023	**Longitude**: 115.33181	**Latitude**: -29.97785

Type: Quadrat
Soil Types: Grey-white sand
Topography: Undulating flats
Surface: Bare ground 20%
Outcrops: None
Litter: 5%
Vegetation Condition: Excellent
Condition Notes: Scattered laterite in broader community
Soil Condition: Dry
Fire: <5 years
Vegetation Type: LmAn

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Adenanthos cygnorum subsp. *cygnorum*	70	1	
		Alexgeorgea nitens	10	1	
		Allocasuarina humilis	40	1	
		Amphipogon amphipogonoides	15	2	
		Andersonia heterophylla	20	0.5	
		Anigozanthos humilis	15	0.1	
		Banksia attenuata	50	2	
		Banksia candolleana	80	15	
		Banksia dallanneyi subsp. *dallanneyi* var. *dallanneyi*	20	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Banksia sphaerocarpa	60	6	
		Blancoa canescens	10	2	
	*	*Bromus diandrus*	157	0.1	
		Burchardia congesta	30	0.1	
		Callitris acuminata	50	20	
		Chordifex sinuosus	20	0.5	
		Comesperma calymega	35	0.1	
		Conostephium pendulum	30	0.1	
		Conostylis aurea	20	2	
		Conostylis crassinerva subsp. *absens*	15	0.5	
		Crassula colorata	3	0.1	
		Cyanothamnus ramosus subsp. *anethifolius*	40	0.1	
		Daviesia podophylla	60	3	
		Drosera echinoblastus	5	0.1	
		Drosera sp.	15	0.1	
		Eucalyptus todtiana	3	0.1	Overhang
		Hakea flabellifolia	50	1	
		Hibbertia hypericoides subsp. *hypericoides*	35	0.5	
		Hibbertia hypericoides subsp. *septentrionalis*	50	4	
	*	*Hypochaeris glabra*	10	0.1	
		Hypolaena exsulca	40	2	
		Isotropis cuneifolia subsp. *cuneifolia*	15	0.1	
		Johnsonia pubescens subsp. *pubescens*	10	0.1	
		Lambertia multiflora	80	2	
		Melaleuca seriata	40	1	
		Melaleuca sp. 3	20	0.1	
		Mesomelaena pseudostygia	50	2	
		Petrophile linearis	20	1	
		Poaceae sp.	20	0.5	
		Schoenus subflavus subsp. *subflavus*	25	0.1	
		Stenanthemum humile	8	0.5	
		Stirlingia latifolia	40	1	
		Strangea cynanchicarpa	40	2	
		Stylidium crossocephalum	15	0.1	
		Stylidium diuroides subsp. *diuroides*	10	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Stylidium miniatum	15	0.1	
		Stylidium repens	5	0.1	
		Styphelia xerophylla	20	0.1	
	*	*Ursinia anthemoides*	20	0.1	
		Verticordia ?eriocephala	50	0.5	
		Verticordia grandis	50	1	
		Verticordia ovalifolia	10	1	ACC/10717/E

Site No: ER01	**Date**: 20/09/2023	**Longitude**: 115.38941	**Latitude**: -29.89022

Type: Relevé
Topography: Gentle slope
Outcrops: None
Vegetation Condition: Very Good
Soil Condition: Dry
Vegetation Type: LmAn

Soil Types: White-yellow sand
Surface: Bare ground 15%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Alexgeorgea nitens	20	1	
		Allocasuarina humilis	150	20	
		Anigozanthos humilis	15	0.5	
		Austrostipa elegantissima	80	1	
		Banksia attenuata	160	3	
		Banksia kippistiana	130	12	
		Banksia sphaerocarpa	110	15	
		Bossiaea eriocarpa	50	1	
		Burchardia congesta	40	0.1	
		Calectasia narragara	25	0.5	
		Calothamnus hirsutus	150	5	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Conostylis aurea	30	0.1	
		Conostylis teretifolia subsp. *teretifolia*	10	0.1	
		Desmocladus virgatus	40	0.1	
		Drosera erythrorhiza	2	0.1	
		Drosera sp.	15	0.1	
		Eremaea ectadioclada	40	2	
		Eucalyptus todtiana	550	4	
		Haemodorum venosum	85	1	
		Hakea smilacifolia	70	3	
		Hibbertia acerosa	20	0.5	
	*	*Hypochaeris glabra*	7	1	
		Lambertia multiflora	180	5	
		Lepidosperma apricola	35	0.5	
		Leucopogon simulans	70	2	
		Levenhookia pusilla	3	0.1	
		Melaleuca systena	60	8	
		Mesomelaena pseudostygia	40	4	
		Philotheca spicata	65	1	
		Pileanthus filifolius	60	1	
		Pterochaeta paniculata	5	0.1	
		Schoenus ?subflavus subsp. *subflavus*	10	0.1	
		Trachymene pilosa	10	0.1	
	*	*Ursinia anthemoides*	10	0.5	
	*	*Wahlenbergia capensis*	5	0.1	
		Xanthorrhoea gracilis	50	2	

Site No: ER02	**Date**: 21/09/2023	**Longitude**: 115.34674	**Latitude**: -29.96126

Type: Relevé
Topography: Undulating flats
Outcrops: Laterite
Vegetation Condition: Excellent
Soil Condition: Dry
Vegetation Type: EdBsMo

Soil Types: Grey-white sand
Surface: Bare ground 20%
Litter: 5%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Dampiera carinata	20	0.1	
		Acacia alata	20	0.1	
		Acacia pulchella var. *pulchella*	15	0.1	
		Amphipogon amphipogonoides	60	5	
		Austrostipa elegantissima	50	0.1	
		Banksia kippistiana	50	3	
		Banksia shuttleworthiana	30	5	
		Banksia tridentata	50	10	
	*	*Bromus diandrus*	10	1	
		Calectasia narragara	30	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Calothamnus torulosus	20	0.5	
P2		*Cristonia biloba* subsp. *pubescens*	15	0.1	ACC/10717/E
		Cryptandra myriantha	20	0.5	
		Darwinia sanguinea	15	0.1	
		Daviesia chapmanii	50	0.1	
		Daviesia epiphyllum	60	2	
		Diplolaena ferruginea	40	0.5	
		Ecdeiocolea monostachya	50	0.5	
	*	*Ehrharta longiflora*	20	0.1	
		Eucalyptus drummondii	120	15	
		Gastrolobium polystachyum	40	0.1	
		Hakea auriculata	60	8	
		Hakea incrassata	50	0.5	
		Hakea stenocarpa	50	3	
		Hibbertia hypericoides subsp. *septentrionalis*	35	3	
	*	*Hypochaeris glabra*	5	1	
		Lechenaultia biloba	20	0.1	
		Lepidosperma apricola	30	0.5	
		Melaleuca seriata	30	1	
		Mesomelaena pseudostygia	50	0.5	
		Mesomelaena stygia	30	0.1	
		Morelotia octandra	50	4	
		Opercularia vaginata	15	0.5	
		Poaceae sp.	5	0.1	
		Scaevola canescens	30	2	
		Schoenus ?subflavus subsp. *subflavus*	5	0.5	
		Sphaerolobium pulchellum	15	0.1	
		Synaphea spinulosa subsp. *spinulosa*	15	0.1	
		Tetratheca confertifolia	15	0.1	
	*	*Ursinia anthemoides*	5	0.1	
		Xanthorrhoea gracilis	70	2	

2.0 Regans Flora Site Data

Site No: RQ01	**Date**: 22/09/2923	**Longitude**: 115.71115	**Latitude**: -31.01483

Type: Quadrat
Topography: Undulating flats
Outcrops: None
Vegetation Condition: Very Good
Soil Condition: Dry
Vegetation Type: BaAcMp

Soil Types: White-grey sand
Surface: Bare ground 30%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Adenanthos cygnorum subsp. *cygnorum*	200	12	
		Banksia attenuata	350	20	
		Crassula colorata	4	0.1	
	*	*Ehrharta calycina*	70	5	
	*	*Gladiolus caryophyllaceus*	40	0.5	
		Hibbertia hypericoides	60	3	
		Jacksonia floribunda	180	2	
		Lechenaultia floribunda	80	7	
		Lomandra suaveolens	10	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
P2		*Lyginia excelsa*	100	7	ACC/10717/E
		Patersonia occidentalis var. *occidentalis*	40	0.5	
		Phlebocarya ciliata	60	3	
		Schoenus nanus	5	0.1	
		Styphelia stomarrhena	5	0.1	
	*	*Ursinia anthemoides*	10	0.1	
		Verticordia ovalifolia	45	0.1	
	*	*Wahlenbergia capensis*	10	0.1	

Site No: RQ02	**Date**: 22/09/2023	**Longitude**: 115.71140	**Latitude**: -31.01400

Type: Quadrat
Soil Types: Yellow-grey sand
Topography: Undulating flats
Surface: Bare ground 5%
Outcrops: None
Litter: 15%
Vegetation Condition: Very Good
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: BaAcMp

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Acacia auronitens	100	0.1	
		Adenanthos cygnorum subsp. *cygnorum*	350	25	
		Allocasuarina humilis	15	3	
		Anigozanthos humilis	20	0.1	
	*	*Arctotheca calendula*	10	0.1	
		Banksia attenuata	350	15	
		Beaufortia elegans	100	1	
	*	*Briza maxima*	10	0.1	
	*	*Bromus diandrus*	20	0.1	
		Caladenia flava	10	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Caustis dioica	30	3	
		Daviesia divaricata subsp. *divaricata*	100	1	
		Drosera sp.	10	0.1	
	*	*Ehrharta calycina*	80	1	
	*	*Gladiolus caryophyllaceus*	40	0.1	
		Hibbertia hypericoides	50	10	
	*	*Hypochaeris glabra*	5	0.5	
		Jacksonia furcellata	60	2	
		Lepidobolus preissianus	30	1	
	*	*Lolium rigidum*	15	0.1	
	*	*Lysimachia arvensis*	5	0.1	
		Mesomelaena pseudostygia	40	15	
		Nuytsia floribunda	650	8	
		Opercularia vaginata	15	0.1	
		Orianthera spermacocea	20	1	
	*	*Pentameris airoides*	10	0.1	
		Podotheca gnaphalioides	10	0.5	
		Schoenus clandestinus	5	0.5	
		Scholtzia involucrata	90	4	
		Trachymene pilosa	5	0.5	
	*	*Ursinia anthemoides*	15	0.5	
	*	*Wahlenbergia capensis*	10	0.1	
		Xanthorrhoea preissii	100	4	
		Xanthosia huegelii	10	0.1	

Site No: RR01	**Date**: 22/09/2023	**Longitude**: 115.71125	**Latitude**: -31.01589

Type: Relevé
Topography: Undulating flats
Outcrops: None
Vegetation Condition: Good
Soil Condition: Dry
Vegetation Type: BpAcMp

Soil Types: Yellow-brown sand
Surface: Bare ground 10%
Litter: 20%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Adenanthos cygnorum subsp. *cygnorum*	300	50	
		Amphipogon amphipogonoides	10	0.1	
		Banksia prionotes	500	25	
	*	*Briza maxima*	10	0.1	
		Burchardia congesta	30	0.1	
		Caustis dioica	30	0.5	
		Comesperma calymega	10	0.1	
		Drosera erythrorhiza	0	0.1	
		Eucalyptus todtiana	400	2	
	*	*Gladiolus caryophyllaceus*	30	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Haemodorum sp.	10	0.1	
		Hibbertia hypericoides	50	0.5	
		Jacksonia floribunda	100	1	
		Mesomelaena pseudostygia	50	4	
		Patersonia occidentalis var. *occidentalis*	30	0.5	
		Petrophile linearis	50	0.1	
		Pterostylis pyramidalis	10	0.1	
		Schoenus clandestinus	5	0.1	
		Scholtzia involucrata	50	1	
		Stylidium piliferum	20	0.1	
		Styphelia xerophylla	30	0.1	
		Verticordia densiflora	50	0.1	
		Xanthorrhoea preissii	50	0.1	

Site No: RR02	**Date**: 22/09/2023	**Longitude**: 115.70903	**Latitude**: -30.99981

Type: Relevé
Topography: Undulating flats
Outcrops: None
Vegetation Condition: Good
Soil Condition: Dry
Vegetation Type: BaAcMp

Soil Types: Brown sand to clay
Surface: Bare ground 15%
Litter: 3%
Condition Notes:
Fire: 5-10 years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		?Dampiera carinata	20	3	
		Acacia auronitens	50	1	
		Acacia saligna	250	1	
		Adenanthos cygnorum subsp. *cygnorum*	160	3	

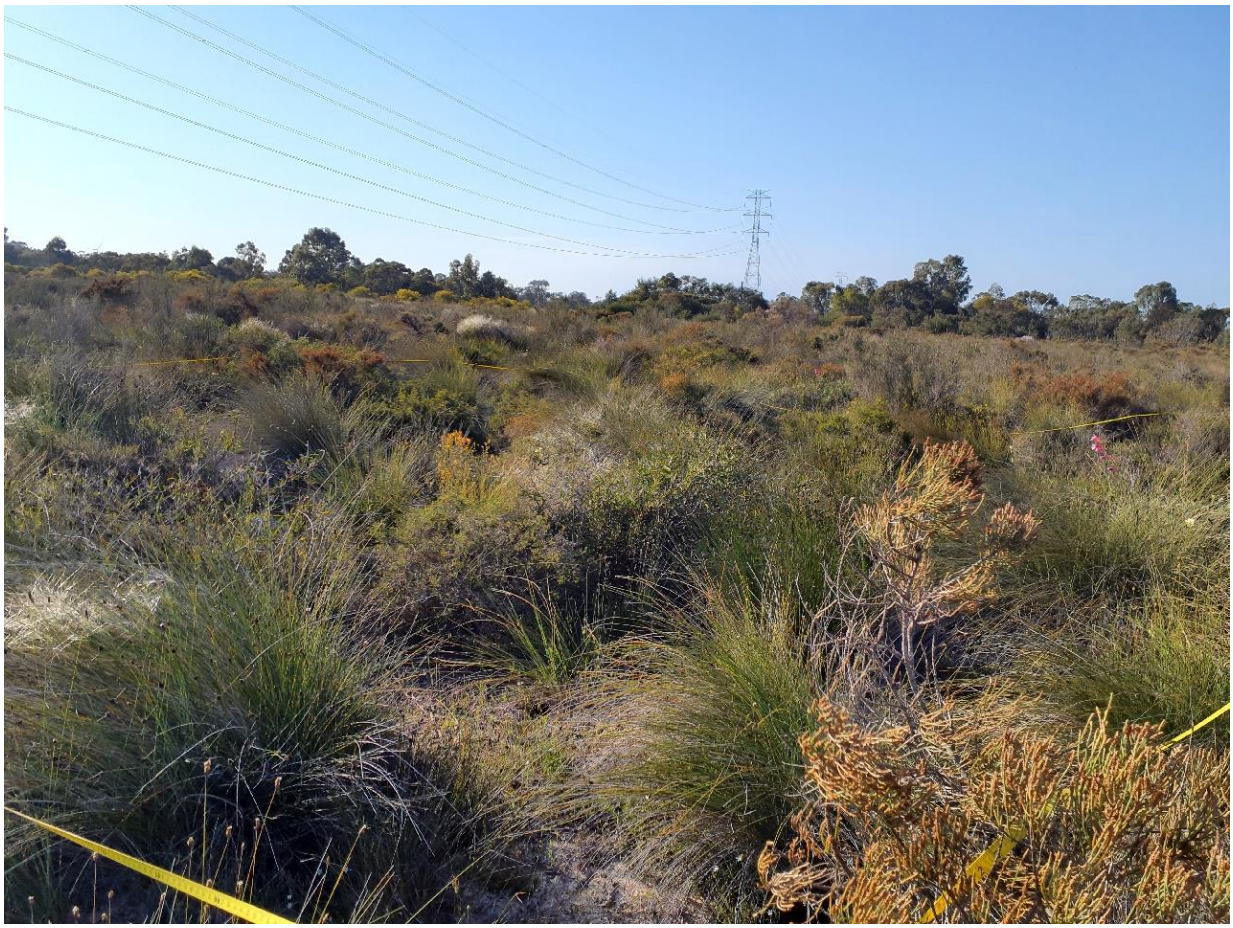
Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Alexgeorgea nitens	20	0.1	
		Allocasuarina humilis	50	3	
		Anigozanthos humilis	30	1	
	*	*Arctotheca calendula*	10	0.1	
		Banksia attenuata	200	10	
		Banksia menziesii	180	3	
		Bossiaea eriocarpa	30	1	
	*	*Bromus diandrus*	20	0.5	
		Burchardia congesta	70	0.1	
		Caladenia flava	5	0.1	
		Callitris acuminata	20	0.5	
		Caustis dioica	30	0.5	
		Comesperma calymega	40	0.1	
		Conospermum stoechadis subsp. *stoechadis*	40	3	
		Conostylis teretifolia	10	0.1	
		Corynotheca micrantha	20	0.1	
		Cryptandra myriantha	20	0.1	
		Daviesia decurrens	50	0.1	
		Drosera erythrorhiza	20	0.1	
		Drosera sp.	10	0.1	
	*	*Ehrharta calycina*	110	4	
		Eucalyptus todtiana	1000	5	
	*	*Gladiolus caryophyllaceus*	50	0.1	
		Gompholobium tomentosum	50	0.1	
		Goodenia reinwardtii	30	0.1	
		Gyrostemon subnudus	100	3	
		Hibbertia hypericoides	60	4	
		Hibbertia subvaginata	20	0.1	
	*	*Hypochaeris glabra*	5	0.5	
		Jacksonia furcellata	20	2	
		Kennedia prostrata	10	2	
		Laxmannia sessiliflora	20	0.1	
		Lepidobolus preissianus	100	0.1	
		Mesomelaena pseudostygia	30	2	
		Millotia tenuifolia var. *tenuifolia*	5	0.1	
		Nuytsia floribunda	650	7	
		Orianthera spermacocea	35	0.5	
		Patersonia occidentalis var. *occidentalis*	30	0.1	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Podotheca gnaphalioides	15	1	
		Pterostylis sp.	10	0.1	
		Scaevola repens	40	0.5	
		Schoenus clandestinus	5	0.1	
		Thysanotus multiflorus	15	0.1	
	*	*Trifolium arvense* subsp. *arvense*	5	0.1	
	*	*Wahlenbergia capensis*	30	0.1	
		Waitzia suaveolens	10	0.1	
		Xanthorrhoea preissii	100	5	
		Xanthosia huegelii	10	0.1	

3.0 Yandin Flora Site Data

Site No: YQ01	**Date**: 22/09/2023	**Longitude**: 115.53557	**Latitude**: -30.77141

Type: Quadrat
Soil Types: Grey sand
Topography: Undulating flat
Surface: Bare ground 5%
Outcrops: None
Litter: 15%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: AhEm



Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Allocasuarina humilis	80	8	
		Amphipogon amphipogonoides	12	0.5	
		Anigozanthos humilis	20	0.5	
	*	*Arctotheca calendula*	25	0.1	
		Austrostipa elegantissima	80	1	
		Banksia dallanneyi subsp. *dallanneyi* var. *dallanneyi*	20	1	
		Banksia shuttleworthiana	60	3	
	*	*Briza maxima*	15	0.5	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Bromus diandrus*	12	0.1	
		Burchardia congesta	50	0.1	
		Caladenia flava	5	0.1	
		Calandrinia granulifera	4	0.1	
		Calothamnus sanguineus	45	1	
		Cassytha glabella	0	0.1	
		Caustis dioica	20	5	
		Centrolepis aristata	5	0.1	
		Conostylis canteriata	25	0.1	
		Conostylis teretifolia subsp. *teretifolia*	15	0.1	
		Crassula colorata	4	0.1	
		Dasypogon obliquifolius	50	1	
		Daviesia decurrens	50	2	
		Daviesia nudiflora	50	1	
		Drosera porrecta	10	0.1	
		Ecdeiocolea monostachya	60	12	
		Eremaea pauciflora var. *pauciflora*	50	1	
	*	*Gladiolus caryophyllaceus*	70	0.1	
		Grevillea ?biformis	15	0.1	Sterile
		Haemodorum sp.	35	0.1	
		Hakea conchifolia	60	1	
		Hakea incrassata	60	4	
		Hibbertia hypericoides subsp. *hypericoides*	50	1	
		Hibbertia striata	40	1	ACC/10717/E
	*	*Hypochaeris glabra*	5	1	
		Jacksonia floribunda	60	2	
		Leptospermopsis erubescens	65	2	
		Melaleuca ciliosa	65	5	
		Mesomelaena pseudostygia	60	8	
		Opercularia vaginata	15	0.1	
		Orianthera spermacocea	20	0.5	
		Patersonia occidentalis var. *occidentalis*	50	0.5	
	*	*Pentameris airoides*	8	0.1	
		Petrophile macrostachya	40	0.1	
		Podolepis gracilis	15	0.1	
		Podotheca gnaphalioides	10	1	
		Scaevola canescens	20	0.5	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Scaevola phlebopetala	20	0.1	
		Schoenus clandestinus	5	0.5	
		Synaphea spinulosa subsp. *spinulosa*	2	1	
		Thysanotus manglesianus	0	0.1	
		Trachymene pilosa	4	0.1	
	*	*Ursinia anthemoides*	20	0.5	
		Waitzia acuminata var. *albicans*		0.1	

Site No: YQ02	**Date**: 22/09/2023	**Longitude**: 115.53242	**Latitude**: -30.76883

Type: Quadrat
Soil Types: White-grey sand
Topography: Undulating flats
Surface: Bare ground 10%
Outcrops: None
Litter: 25%
Vegetation Condition: Very Good
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: EtHhPg

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Alexgeorgea nitens	8	2	
		Allocasuarina humilis	120	5	
	*	*Arctotheca calendula*	15	0.1	
		Babingtonia grandiflora	90	2	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Briza maxima*	30	2	
	*	*Bromus diandrus*	15	0.5	
		Burchardia congesta	30	0.1	
		Caladenia flava	10	0.1	
		Calothamnus quadrifidus subsp. *quadrifidus*	180	7	
		Conostephium pendulum	70	1	
		Corynotheca micrantha	50	1	
		Crassula colorata	2	0.1	
		Dasypogon obliquifolius	35	4	
	*	*Ehrharta calycina*	100	1	
	*	*Ehrharta longiflora*	70	1	
		Eremaea asterocarpa subsp. *asterocarpa*	50	0.5	
		Eucalyptus todtiana	350	6	
	*	*Gladiolus caryophyllaceus*	100	0.1	
		Hibbertia hypericoides subsp. *hypericoides*	60	12	
	*	*Hypochaeris glabra*	5	1	
		Isotropis cuneifolia subsp. cuneifolia	25	0.1	
		Jacksonia furcellata	40	1	
		Laxmannia sessiliflora	10	0.1	
		Lechenaultia linarioides	50	2	
		Lepidobolus preissianus	40	1	
		Lepidosperma pubisquameum	80	1	
		Lyginia barbata	60	2	
		Macrozamia fraseri	200	2	
		Mesomelaena pseudostygia	50	3	
		Opercularia vaginata	20	0.1	
	*	*Parentucellia latifolia*	10	0.1	
	*	*Pentameris airoides*	15	0.5	
		Petrophile linearis	60	1	
		Pigea calycina	80	0.1	
		Podotheca gnaphalioides	10	5	
		Sowerbaea laxiflora	60	0.5	
		Trachymene pilosa	5	0.1	
	*	*Ursinia anthemoides*	20	2	
		Xanthorrhoea preissii	130	10	

Site No: YR01	**Date**: 22/09/2023	**Longitude**: 115.53480	**Latitude**: -30.77043

Type: Relevé
Topography: Drainage
Outcrops: None
Vegetation Condition: Degraded
Soil Condition: Dry
Vegetation Type: ErMlEc

Soil Types: Grey sand
Surface: Bare ground 5%
Litter: 10%
Condition Notes:
Fire: 10+ years

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Arctotheca calendula*	5	1	
		Banksia dallanneyi subsp. *dallanneyi* var. *dallanneyi*	10	3	
	*	*Briza maxima*	10	1	
	*	*Briza minor*	10	0.1	
	*	*Bromus diandrus*	15	0.1	
		Conostylis aurea	20	1	
	*	*Ehrharta calycina*	100	50	
		Eucalyptus rudis	1800	30	
	*	*Hypochaeris glabra*	10	10	
	*	*Oxalis corniculata*	10	0.5	

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
		Jacksonia furcellata	100	0.5	
		Jacksonia sternbergiana	230	1	
		Lyginia barbata	30	0.5	
		Opercularia vaginata	10	0.1	
	*	*Ornithopus compressus*	5	5	
	*	*Trifolium arvense* subsp. *arvense*	10	1	
	*	*Trifolium campestre*	10	1	
	*	*Ursinia anthemoides*	5	0.5	
		Xanthorrhoea preissii	100	6	

Site No: YR02	**Date**: 22/09/2023	**Longitude**: 115.53371	**Latitude**: -30.76997

Type: Relevé
Soil Types: Grey sand
Topography: Drainage
Surface: Bare ground 10%
Outcrops: None
Litter: 5%
Vegetation Condition: Completely Degraded
Condition Notes:
Soil Condition: Dry
Fire: 10+ years
Vegetation Type: ErMlEc

Cons. Status	Weed	Taxon	Height (cm)	Foliage (%)	Comments
	*	*Arctotheca calendula*	10	2	
		Crassula colorata	5	1	
		Drosera glanduligera	5	2	
		Eucalyptus rudis	800	2	
	*	*Hypochaeris glabra*	20	30	
		Lepidosperma leptostachyum	30	0.5	
		Melaleuca lateritia	220	10	
		Podotheca gnaphalioides	10	1	
	*	*Ursinia anthemoides*	10	5	

About AECOM

AECOM is the world's trusted infrastructure consulting firm, delivering professional services throughout the project lifecycle – from advisory, planning, design and engineering to program and construction management. On projects spanning transportation, buildings, water, new energy and the environment, our public- and private-sector clients trust us to solve their most complex challenges. Our teams are driven by a common purpose to deliver a better world through our unrivaled technical and digital expertise, a culture of equity, diversity and inclusion, and a commitment to environmental, social and governance priorities. AECOM is a Fortune 500 firm and its Professional Services business had revenue of $14.1 billion in fiscal year 2024. See how we are delivering sustainable legacies for generations to come at aecom.com and @AECOM.

aecom.com