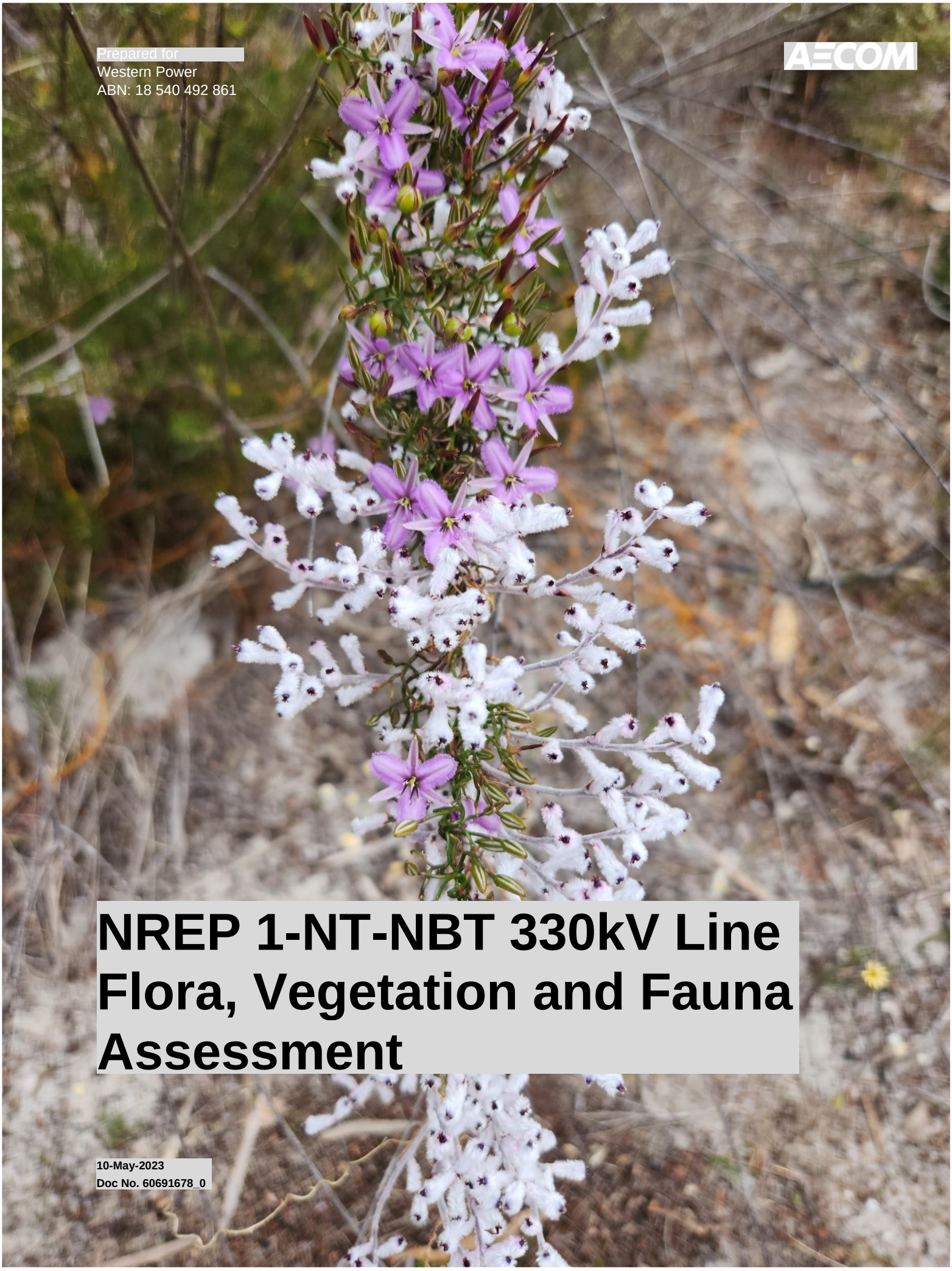
Appendix B - AECOM (2023) Flora and Vegetation Assessment



Prepared for
Western Power
ABN: 18 540 492 861

NREP 1-NT-NBT 330kV Line Flora, Vegetation and Fauna Assessment

10-May-2023
Doc No. 60691678_0

NREP 1-NT-NBT 330kV Line Flora, Vegetation and Fauna Assessment

Client: Western Power

ABN: 18 540 492 861

Prepared by

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10-May-2023

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Originator	F de Wit, C Sepkus, H Spanswick
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0	10-May-2023	Final	Floora De Wit Team Leader - Natural Resources	

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Executive Summary

AECOM Australia Pty Ltd (AECOM) was engaged by Western Power to undertake a spring flora, vegetation, fauna and black cockatoo assessment for a defined linear corridor (the survey area) North of Perth, between Malaga and Pinjar. The results of the assessment will be used to analyse options for new line routes between Malaga and Pinjar Power Station.

The assessment included a detailed desktop study, preparation of a survey sample plan, a field survey and reporting component. Following the desktop study, it was apparent that large parts of the survey area represented Pine plantation or regeneration following plantation within the Gnangara State Forest. The survey sample plan predominantly targeted areas that represented remnant native vegetation, with less effort spent sampling disturbed areas.

The desktop study identified:

- Sixteen significant vegetation communities listed as Threatened or Priority, of which three had buffers that overlapped with the survey area.
- 108 significant flora species, of which eight species were considered likely to occur.
- 72 significant fauna species, of which five species were known and 14 were considered likely to occur.

The field survey results are summarised below:

- The Priority 2 *Calectasia ?elegans* was recorded at one location. It is depicted with a question mark as confident identification requires photographs of the root system which was not done at the time of collection.
- Thirteen native vegetation communities were mapped including four Banksia Woodlands, three Eucalypt Woodlands and five Wetlands. Four altered/non-native areas were mapped including plantation, cleared areas, and paddocks.
- Five Floristic Community Types (FCTs) were confidently inferred, three quadrats represented hybrid FCTs and two quadrats were inconclusive. The results identified two Priority 3 Ecological Communities (PECs):
    - Low lying *Banksia attenuata* woodlands or shrublands (Floristic Community Type 21c) – 6.80 ha
    - Swan Coastal Plain *Banksia attenuata-B. menziesii* woodlands (Floristic Community Type 23b) – 27.76 ha.
- One Threatened Ecological Community (TEC) Banksia Woodlands of the Swan Coastal Plain, was recorded at eight patches, extending 63.18 ha. This TEC correlates to the Priority 3 PEC Banksia Dominated Woodlands of the Swan Coastal Plain unless another PEC is recognised (i.e the two PECs mentioned above) .
- Four conservation significant species were recorded. This comprised of:
    - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso)* (EPBC Act and BC Act Vulnerable)
    - Baudin's Cockatoo (*Zanda baudinii*) (EPBC Act and BC Act Endangered)
    - Carnaby's Cockatoo (*Zanda latirostris)* (EPBC Act and BC Act Endangered)
    - Quenda (*Isoodon obesulus)* (Priority 4 BC Act).

- The foraging habitat score was **10** for Forest Red-tailed Black Cockatoos and Carnaby's Cockatoo. Baudin's Cockatoo received a foraging score of **8** as no foraging evidence was observed on site, which resulted in a two-point subtraction. No additional subtractions to the DAWE scoring tool were applicable.
- Twenty-two (22) fauna species were sighted with the dominant class consisting of bird species.

A few limitations were considered to have affected the results of the survey. This includes the inability to confidently identify the Priority 2 *Calectasia elegans* because we did not take photographs of the root system. A few vegetation communities were represented by less than three quadrats. These communities were generally restricted (i.e. less than 5 ha), or degraded vegetation. Lastly, not all parts of the survey area were accessible, particularly private properties near Malaga Power Station, and a patch of Banksia Woodland near the Tonkin Highway / Malaga-Ellenbrook Train Line. The access limitation was partly addressed by using data from the Malaga to Ellenbrook Rail Works environmental reports to supplement this dataset.

1.0 Introduction

1.1 Background

To support the Western Australia state decarbonisation goal and consistent with Western Power's corporate strategy, an investment for North Region strategy titled North Region Energy Program (NREP) was created to conduct scoping phase activities for future works. The details outlined in this report are in relation to NT-NBT 330kV Line (the Project). AECOM Australia Pty Ltd (AECOM) was engaged through the Project to undertake spring flora, vegetation, fauna and black cockatoo assessment to be used to analyse options for new line routes.

1.2 Location

The survey area represents a linear corridor extending from Malaga to Pinjar. It intersects with the City of Wanneroo and the City of Swan (Figure 1).

1.3 Objectives

The purpose of the flora, vegetation, fauna and black cockatoo assessment was to define the environmental values present within the linear corridor. The scope included:

- a desktop assessment and literature review for flora, communities, and fauna
- field surveys to record floristic data, define vegetation communities, vegetation condition and fauna habitat, and search for conservation significant flora, fauna and communities, targeted black cockatoo habitat assessment
- a technical report and data package.

This document represents the final technical report covering the desktop assessment, literature review and field surveys.

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Survey Area

Survey Area

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NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 1

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2.0 Existing Environment

2.1 Climate

The survey area is situated approximately 11.4 km north of Perth Central Business District (CBD) and extends north to Pinjar Power Station, 43.9 km north of Perth CBD. The climate is warm Mediterranean with mild wet winters and hot dry summers. Precipitation occurs predominantly during the winter months, with the possibility of some summer storms.

Rainfall data was obtained from Whiteman Park (station number 009263), located 2.7 km east of the survey area. Temperature data was obtained from Millendon (station number 009281), located 12.4 km East from the survey area. The long-term rainfall and temperature data is compared against the September 2021 to August 2020 data in Figure 2 (BoM, 2022) to determine if climatic conditions posed a constraint to the survey.

The survey was undertaken across multiple days in September, October and November 2022 following a year of below average rainfall, with a total rain fall 108.9 mm below the long-term average in the preceding 12 months. Rainfall was particularly low across the summer months (December 2021 – February 2022), with larger rainfall events occurring just prior to the survey, in August 2022. Rainfall was not considered a limitation for the survey as surveys were undertaken in September following high August rainfall, October, and November following high October rainfall. Ample annual species were present including numerous orchids, all of which were able to be confidently identified in the field or at the herbarium.

Maximum temperatures were higher than average across eight of the 12 preceding months. While minimum temperatures have deviated from the mean, with 11 months of the year experiencing colder minimum temperatures than average. During periods of increased temperature, fauna struggle to lose excess body heat through evaporation, and have an elevated probability to develop heat stress. As a result, fauna will likely seek shelter from the sun. This would in turn reduce the number of sightings of fauna during the survey, as habitat assessments were conducted this does not have a significant impact on the survey efforts.

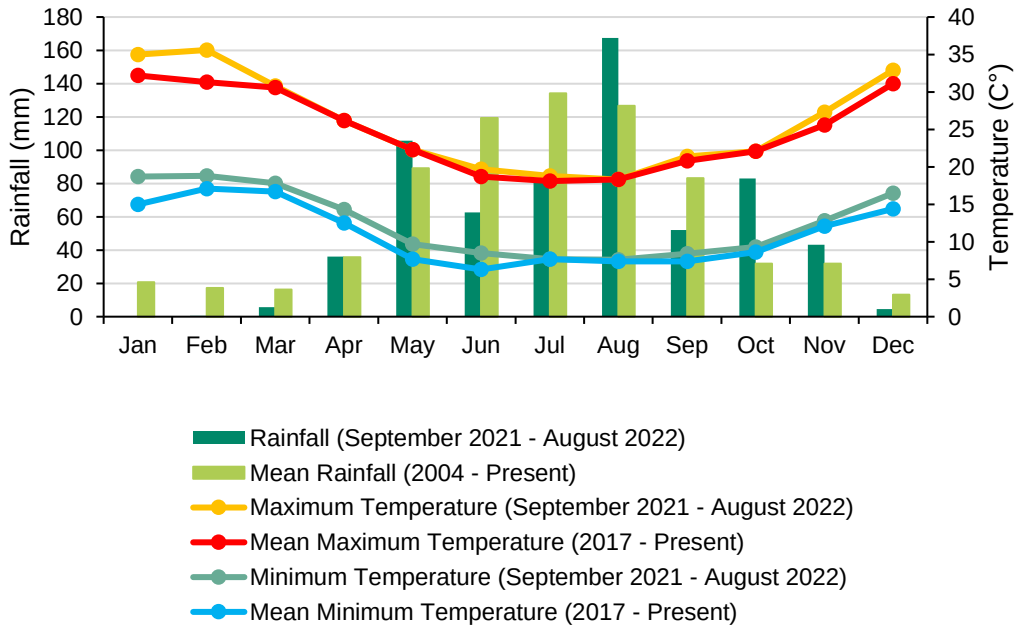


Figure 2 Rainfall from Whiteman Park (Station 009263) and Temperature from Millendon (Station 009281) (BOM, 2022)

2.2 Interim Biogeographical Region of Australia Regions

The largest regional vegetation classification scheme recognised by Environmental Protection Authority (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 (IBRA7, 2012). The survey area across the Swan Coastal Plain.

The Swan Coastal Plain bioregion, described in CALM (2002), includes Perth and the outer suburbs (excluding the Hills suburbs). The Swan Coastal Plain 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 freshwater 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.

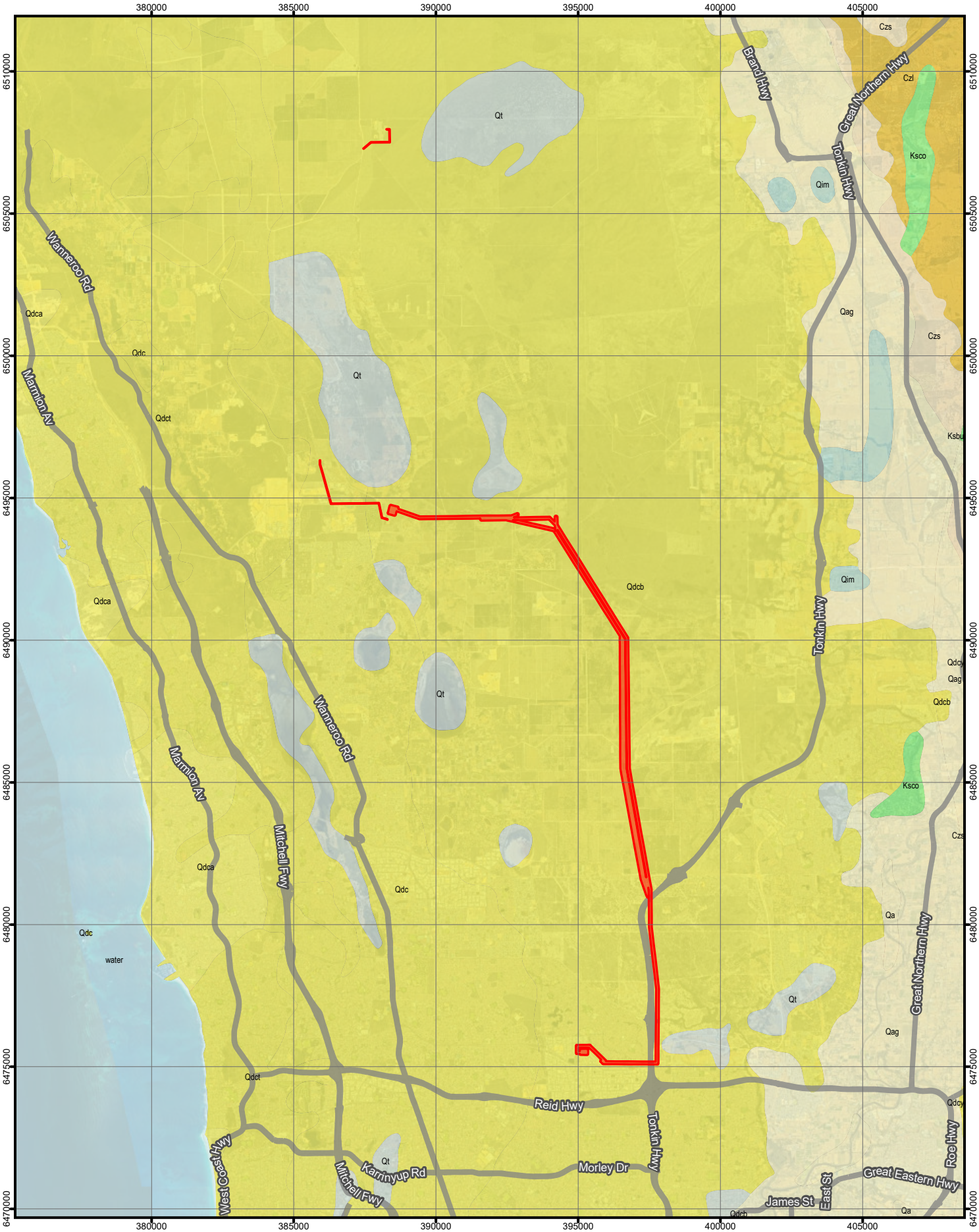
2.3 Geology and Landform System

The survey area is situated across three land systems (Figure 4), and one geological system (Figure 3):

- Bassendean System occurs across majority of the survey area and is described as sand dunes and sandplains with pale deep sand, semi-wet and wet soils with Banksia-Paperbark woodlands and mixed heathlands.
- Pinjarra Systems occurs across the most southern extent of the survey area and represents poorly drained coastal plain with variable alluvial and aeolian soils. Vegetation is variable and includes Jarrah, Marri, Paperbark, Sheoak and Flooded Gum.
- Spearwood System which includes sand dunes and plains on yellow deep sands, pale deep sands and yellow/brown shallow sands. The survey area intersects with a small portion of Spearwood.

A further breakdown of soil landscapes can be found in Figure 5.

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Survey Area

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

water

QUATERNARY
- Qa
- Qag
- Qdc
- Qdca
- Qdcb
- Qdcy
- Qdct
- Qim
- Qt

CENOZOIC
- Czl
- Czs

CRETACEOUS
- Ksco
- Ksbu

Geology

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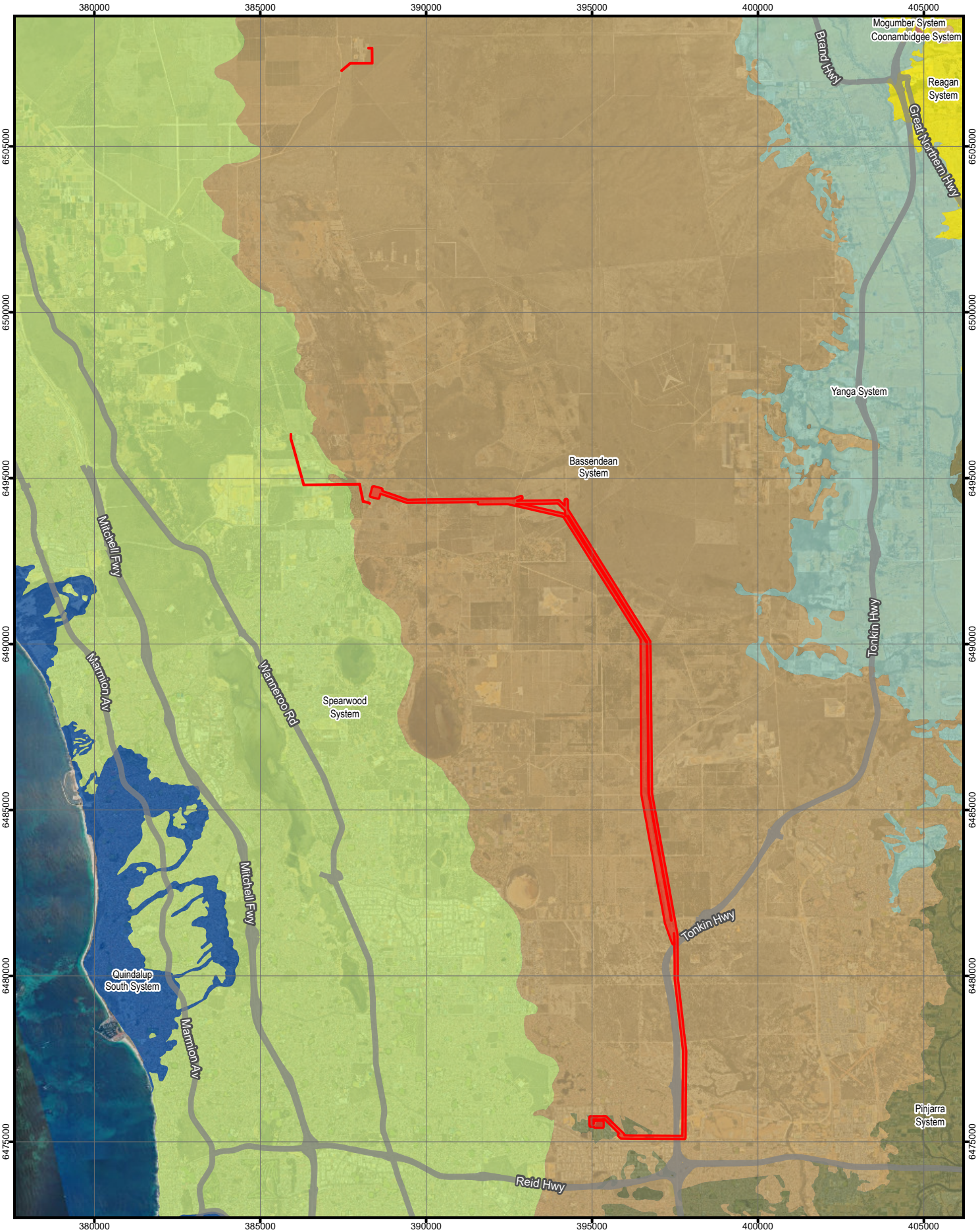
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Figure 3

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Survey Area

WFS Soil Landscape Mapping - Systems (DPIRD-064)

Map unit name

- Bassendean System
- Coonambidgee System
- Mogumber System
- Pinjarra System
- Quindalup South System
- Reagan System
- Spearwood System
- Yanga System

Land Systems

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Figure 4

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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 6). There are three vegetation associations recorded across the survey area. Table 1 describes the three vegetation associations and the percentage remaining across different boundaries.

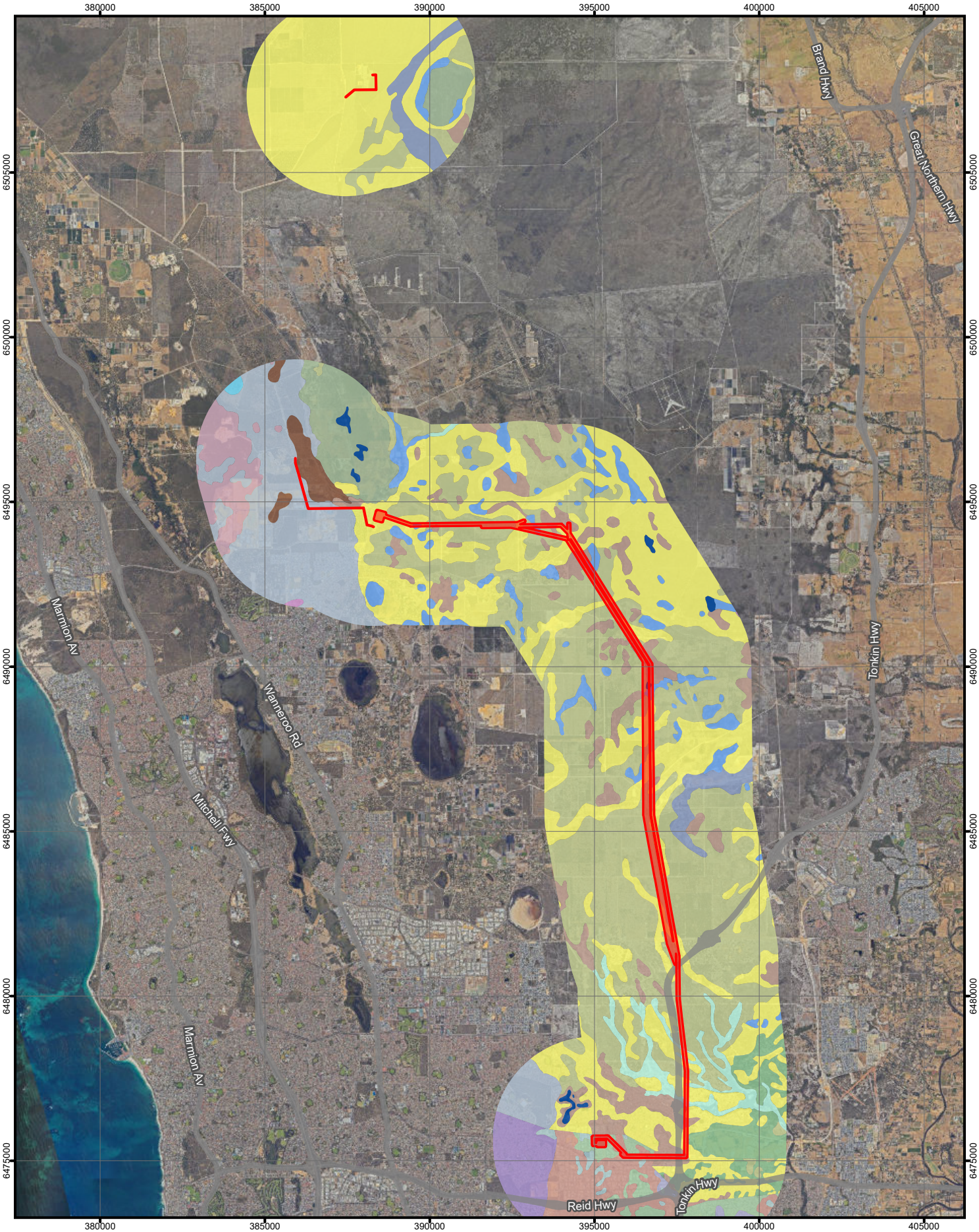
Table 1 Beard et al. (2013) Vegetation Associations and Percent Remaining (Govt. of WA, 2019)

Vegetation Association	Description	Percentage Remaining (%)			
		Western Australia	Swan Coastal Plain IBRA Region	City of Wanneroo	City of Swan
6	Medium woodland; Tuart & Jarrah	23.72	23.72	21.94	3.13
949	Low woodland; *Banksia*	56.42	57.28	46.30	49.09
1001	Medium very sparse woodland; Jarrah, with low woodland; *Banksia* & *Casuarina*	22.05	22.05	27.71	26.18

2.5 Conservation Reserves and Environmentally Sensitive Areas

A total of 434 ha (75%) of the survey area lies within the Gnangara-Moore River State Forest (Figure 7). In addition, the survey area intersects with 98.69 ha of Environmentally Sensitive Areas (ESAs) of which, 63.88 ha is associated with Bush Forever Sites 104, 198, 295, 304, 380, 398, 399 and 428. The other ESAs pertain to wetlands and places listed on the Register of the National Estate.

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Survey Area

Soil Landscape Mapping - Best Available (DPIRD-027) [clipped to 3km buffer]

Map Unit Name

- Bassendean Yanga phase (Bassendean)
- Bassendean drainage lines phase
- Bassendean permanent lakes and swamps phase
- Bassendean seasonal swamps phase
- Bassendean, Gavin phase
- Bassendean, Jandakot phase
- Bassendean, Jandakot steep phase
- Bassendean, Joel phase
- Bassendean, Pinjar phase
- EnvGeol Cps phase
- EnvGeol Mgs1 phase
- EnvGeol S10 phase
- EnvGeol S7 phase
- EnvGeol S8 phase
- Karrakatta Sand Grey phase
- Karrakatta Sand Yellow phase
- Karrakatta shallow soils phase
- Spearwood Sand phase
- Spearwood seasonal swamps phase
- Yanga 13 subsystem
- Yanga 8x phase

Soil Landscape Mapping - Best Available

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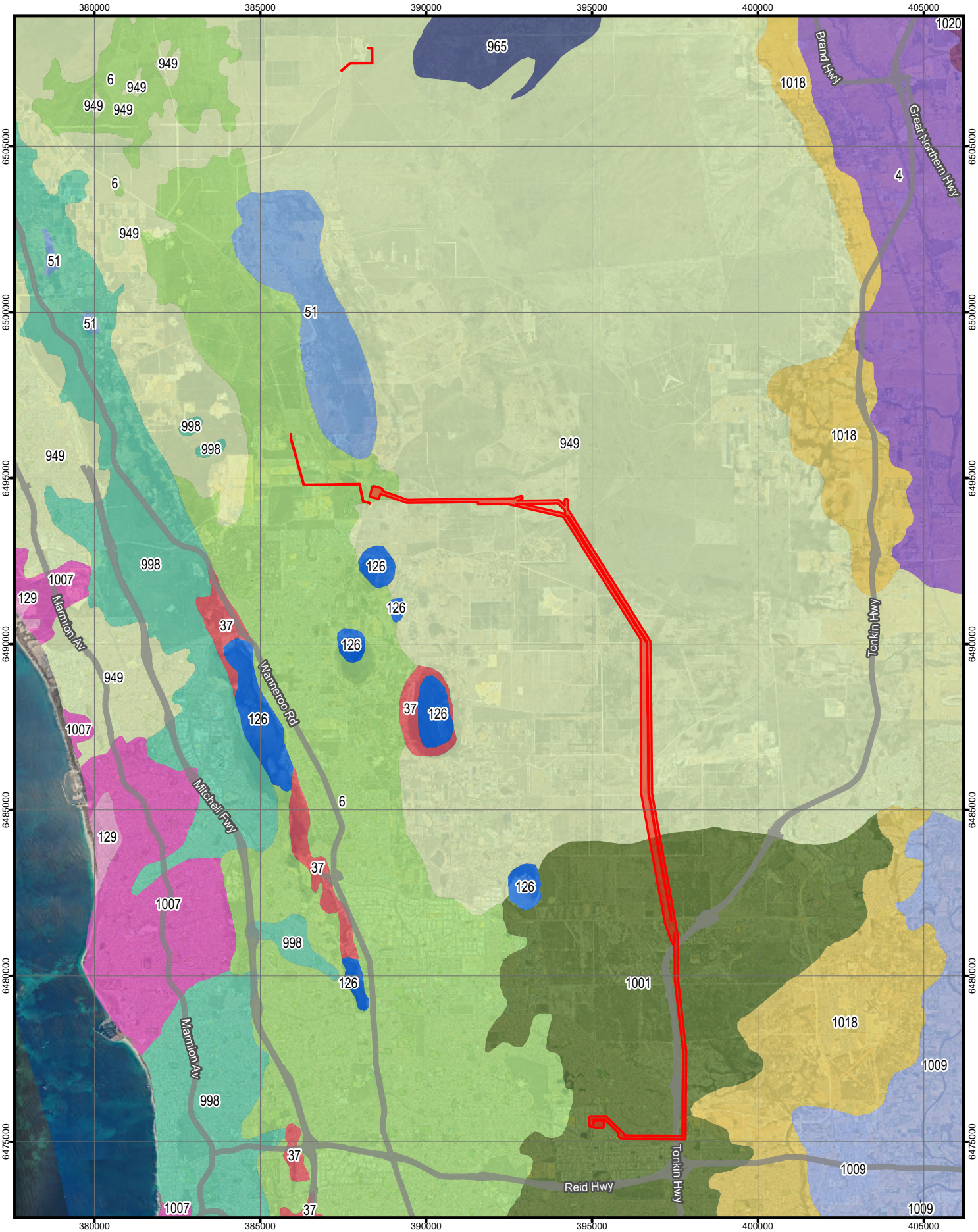
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Figure 5

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Survey Area

Pre-European Vegetation (DPIRD-006)
[veg_assoc,struct_des]

- 4,Woodland southwest
- 6,Woodland southwest
- 37,Thicket
- 51,Sedgeland
- 126,Freshwater lake
- 129,Dune sand
- 949,Low woodland or open low woodland
- 965,Woodland southwest
- 998,Woodland southwest
- 1001,Low forest, woodland or low woodland with scattered trees
- 1007,Scrub-heath / Thicket
- 1009,Woodland southwest
- 1018,Woodland / Low woodland / Low forest or Woodland
- 1020,Forest

Pre-European Vegetation

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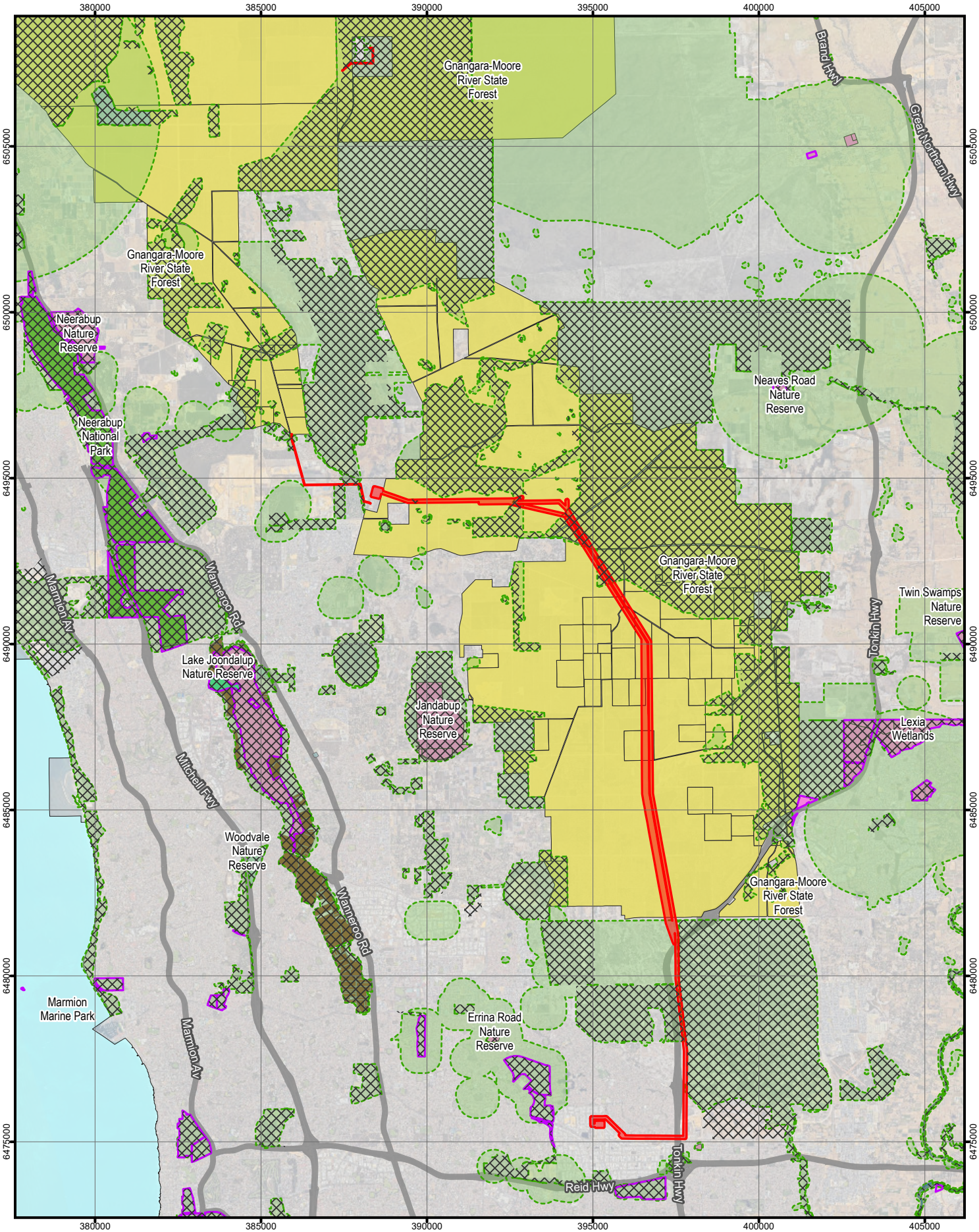
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Figure 6

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Service Layer Credits: WMS:

LEGEND

- Survey Area
- Bush Forever Areas - 2000 (DPLH-019)
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- A-Class Reserves (LGATE-227)
- DBCA - Legislated Lands and Waters (DBCA-011)
- National Park
- Nature Reserve
- Conservation Park
- Section 5(1)(g) Reserve
- Section 5(1)(h) Reserve
- State Forest
- Marine Park
- SCRM Act - River Reserve
- Crown Freehold - Dept Managed

Environmentally Sensitive Areas, Reserves and Conservation Estates

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 7

Project: L:\Legacy\Projects\606X\60691678_NREP_Biological_Survey\900_CAD_GIS\920_GIS\02_MXD_APRX\60691678_NREP_BiologicalSurvey_WP.aprx (wyattk2),
Layout: G60691678_Fig7_ESAs_Reserves_ConsEstates_A4P_v1, Last exported: 27/04/2023 10:40 AM

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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 2.

Table 2 Categories of species listed under Schedule 179 of the EPBC Act

Code	Category
Ex	**Extinct Taxa** 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** 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** 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** 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** 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** 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	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	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 3.

Table 3 Conservation codes for WA flora and fauna listed under the BC Act (DBCA, 2019)

Code	Category
CR	**Critically Endangered Species** 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 Species** 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 Species** 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 Species** 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 species** 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 4.

Table 4 Conservation codes for WA flora and fauna as listed By DBCA and endorsed by the Minister for 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.

Communities can be classified as Threatened Ecological Communities (TECs) under the EPBC Act. Categories of EPBC Act listed TECs are described in Table 5.

Table 5 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 6.

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 7.

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

Table 6 Conservation codes for State listed Ecological Communities

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

Table 7 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.

3.3 Biosecurity and Agriculture Management Act 2007

Biosecurity is the management of the risk of animal and plant pests and diseases entering, emerging, establishing or spreading in WA to protect the economy, environment and community. Biosecurity is managed under the BAM Act which came into effect 1 May 2013. Exotic animals and plants can become an invasive species if they can establish in new areas where local conditions are favourable for their growth. Each organism listed under the BAM Act comes with certain legal / import requirements:

- Declared Pest, Prohibited - s12. Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits.
- Permitted - s11. Permitted organisms may be subject to an import permit if they are potential carriers of high-risk organisms.
- Declared Pest - s22(2). Declared pests may be subject to an import permit if they are potential carriers of high-risk organisms, and may also be subject to control and keeping requirements once within Western Australia.
- Permitted, Requires Permit - r73. Regulation 73 permitted organisms may only be imported subject to an import permit.

- Declared pests can be assigned to a C1, C2 or C3 control category under the Biosecurity and Agriculture Management Regulations 2013:
  - C1 Exclusion - Organisms which should be excluded from part or all of Western Australia
  - C2 Eradication - Organisms which should be eradicated from part or all of Western Australia
  - C3 Management - Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
- Unassigned - Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the BAM Act.

4.0 Methodology

4.1 Desktop Assessment

A comprehensive desktop assessment was undertaken prior to the field survey to identify significant environmental values likely to be present in the survey area including flora, and vegetation communities. Desktop database searches were requested from the following government databases (including a variable radius):

- DBCA Threatened Species and Communities database including Threatened and Priority flora (20 km buffer from survey area), communities (20 km buffer from survey area), and Threatened and Priority fauna (20 km buffer from the survey area).
- Western Australian Herbarium (WAH, 1998) records.
- EPBC Act Protected Matters Search Tool (PMST) (20 km buffer from survey area).
- Atlas of Living Australia (AoLA) database.
- BirdLife Australia.
- Index of Biodiversity Surveys for Assessments (IBSA) portal.

Significant flora and fauna species likelihood of occurrence was assessed systematically using a point-based system which takes into account proximity (defined as less than5 km) and date of known records (defined as less than 20 years old), presence within the Local Government Area (LGA) and habitat suitability (Table 8, Table 9).

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

Table 8 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 may be present within the survey area) 3 (if suitable habitat is known to be, or likely to 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 9 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 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 there are recent records in close proximity of the survey area 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 there are recent records and suitable habitat for the species may be present.
Moderate (Possible)	2,3	Not known to occur within the survey area but there are recent records in close proximity/within the LGA and suitable habitat for the species may be present (marginal habitat) OR suitable habitat present.
Low (Unlikely)	1,2	Records present within the LGA and marginal suitable habitat is present within the survey area, therefore the likelihood of the species occurring there is low OR marginal habitat present OR recent record within LGA
Negligible (Suitable Habitat not Present)	0,1	No nearby records or suitable habitat OR recent record with no suitable habitat within the survey area OR records nearby with no suitable habitat within the survey area

4.2 Flora and Vegetation Assessment

A detailed flora and vegetation assessment was undertaken utilising methods outlined in the *Flora Survey Technical Guide* (EPA, 2016). The field surveys were undertaken by Floora De Wit (collection permit FB62000249). Floora has 14 years' experience undertaking flora and vegetation assessments. Floora completed a Bachelor of Science in Environmental Biology (Environmental Restoration) and completed a Postgraduate Diploma in Environmental Management and Impact Assessment. Floora was assisted by Environmental Scientist Caitlyn Sepkus (collection permit FB62000384) and Graduate Environmental Scientist Beau Eaton.

The survey was undertaken across a number of days including 5, 8 and 9 September, 5, 6, and 7 October and 8 November 2022. Floristic data was collected from 23 quadrats, 12 relevés, and 8 observation points as well as countless mapping notes. Data collected 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 and size
- photograph (north-west corner)
- soil details (type, colour, moisture)
- landform
- vegetation condition
- fire history
- species list including:
  - estimated height
  - estimated percentage cover (for trees both percentage within relevé and within community was recorded to enable better description of vegetation community).

Any species unable to be identified in the field were 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 the 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 (DotEE, 2017a). Delineation of vegetation communities was supported by analysing floristic data collected within quadrats.

Vegetation condition was determined using the Keighery (1994) vegetation condition scale as recommended in the *Flora Survey Technical Guide* (EPA, 2016).

The survey area lies within the known range of the Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (Banksia Woodlands TEC). Patches that included a dominant or co-dominant overstorey of *B. attenuata, B. menziesii B. prionotes* or *B. ilicifolia* were considered for further assessment. Patches that were clearly not associated with Banksia Woodlands, e.g. had no Banksia overstorey species, were excluded.

For each patch the key diagnostic characteristics, condition, size and relevant contextual information was considered as published in the Conservation Advice (DEE, 2016). The condition of the patch was informed by species richness of quadrat data compared to available datasets, most notably the Keighery et al. (2012) Swan Coastal Plain (SCP) dataset and weed cover.

The condition of the patch and size thresholds are then used to determine whether the quality of the patch is suitable to meet the federally protected ecological community standards.

4.2.2 Targeted Flora Searches

Targeted searches were undertaken for conservation significant flora species that were known or likely to occur. A detailed field guide was produced which included photographs and describing morphological features that would assist in identifying the species in the survey area.

Where a potential Priority species was encountered, the following was recorded:

- location (using a hand-held GPS accuracy 5m)
- the number of individuals in the immediate population, or an estimate of the size (number) of the population with an estimated radius of its spatial extent plant height
- vegetation condition
- associated dominant species
- soil type and colour
- topography
- additional information relevant to the area including key characteristics and landforms.

1.1.1 Floristic Community Type Analysis

Floristic Community Type (FCT) analysis was undertaken for two quadrats situated in Banksia Woodlands in very good condition. The Keighery (2012) and Gibson et al. (1994) Swan Coastal Plain (SCP) datasets were used for the Floristic Community Type (FCT) analysis. The survey data was reconciled with this dataset. Analysis was undertaken using Primer-e, adding three quadrats separately to the SCP dataset. This avoids skewing the original clustering results of the data. Methods were undertaken as best as practicable according to draft DBCA methods (DBCA 2021).

The analysis considered the Keighery et al (2012) (herein after referred to as Keighery SCP) dataset with 1,098 quadrats. The following steps were taken in accordance with the DBCA (2021) TEC identification guidelines:

- nomenclature was reconciled between the Project, Keighery SCP and Gibson SCP 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.

Primer-E was used to undertake the following:

- Bray-Curtis coefficient was used to generate resemblance matrices. Sites with the highest similarity were extracted and documented in the results table.
- Agglomerative hierarchical clustering using group average linkage method to produce dendrograms that represent relationships between the Project quadrats and SCP groups and sites.

The Bray Curtis dissimilarity measure was used to quantify the compositional similarity between the quadrats 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.

4.3 Black Cockatoo Assessment

The targeted Black Cockatoo survey targeted all three threatened Western Australian black cockatoo species. These species are Carnaby's Cockatoo *Zanda latirostris* (Endangered under the EPBC Act and the BC Act), Baudin's Cockatoo *Zanda baudinii* (Endangered under the EPBC Act and the BC Act] and the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii subsp. naso* (Vulnerable under the EPBC Act and under the BC Act). The survey was conducted to identify potential breeding, roosting and foraging habitat, in accordance with DAWE Referral Guidelines (2022).

'Breeding habitat' is defined by the DAWE referral guidelines of black cockatoo species (2022). Habitat that contains known, suitable, or potential nesting trees is defined 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.
- 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.

Breeding trees are those that currently provide suitable hollows, and Potential breeding trees are within a size class known to develop hollows DAWE (2022). Size class is determined through the measurement of tree diameter at breast height (DBH).

Note that 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.

4.3.1 Foraging Potential

The quality of foraging habitat for Black Cockatoo species was determined through assessing the vegetation and calculating a foraging score using DAWE Foraging Quality Scoring Guide (DAWE, 2022).

The foraging value score provides a numerical value that reflects the significance of vegetation as foraging habitat for Black Cockatoos, and this numerical value is designed to provide the information needed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to assess impact significance and offset requirements.

4.3.2 Connectivity

Connectivity is vital to maintaining Black Cockatoo habitat, remnant patches of vegetation provide foraging resources, breeding habitat and night roosting (DAWE, 2022). Connectivity was defined by other foraging being present within 12 km of the survey area.

4.3.3 Proximity To Breeding

Records of known nesting trees were accounted for utilizing data from the WA Department of Biodiversity, Conservation and Attractions, BirdLife Australia, and the WA Museum. As outlined in the scoring tool from DAWE (2022) if breeding habitat occurred within 12 km no deduction to foraging occurred.

4.3.4 Proximity To Roosting

Carnaby's Cockatoos roost in or near riparian environments or near other permanent water sources, generally within any tall trees, but particularly Flat-topped Yate, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced eucalypts and introduced pines (DAWE, 2022). Potential roosting trees were searched for during the field survey.

Records of known roosting sites were accounted for utilizing data from the WA Department of Biodiversity, Conservation and Attractions, BirdLife Australia, and the WA Museum. As outlined in the scoring tool from DAWE (2022) if roosting sites occurred within 20km no deduction to foraging occurred.

4.3.5 Impact From Significant Plant Disease

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.

4.4 Fauna Survey

Fauna habitat assessments were conducted throughout the survey area and were used to define the structure, complexity, and continuity of the habitat present, and documented the presence and abundance of habitat features that included but were not limited to presence or absence of large mature trees, water bodies, dense vegetation, hollows, and leaf litter.

The habitat assessment was used to verify the findings in the desktop survey as per the EPA (2020) Technical Guidance. Potential usage within the survey area of conservation significant fauna was recorded, using hand-held GPS (accuracy of 5 m).

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. Attention was given to searching for conservation significant species identified in the desktop assessment as having the potential to occur in the area. All observations were made between daylight hours of 0700 and 1700.

The taxonomy and nomenclature of vertebrate species for mammals, reptiles and amphibians is consistent with the Western Australian Museum's Checklist of Vertebrates of Western Australia (2020) and the Australian Faunal Directory for bird species. Correspondence with these departments will be conducted where necessary**.**

4.5 Limitations

Limitations of the survey are discussed in Table 10. No limitations were identified that would influence the outcome of the flora, vegetation and black cockatoo surveys.

Table 10 Limitations considered for the biological assessments

Limitation	Flora and Vegetation	Fauna and Black Cockatoo
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 were obtained to inform desktop studies. The Keighery (2012) Swan Coastal Plain dataset was used for FCT analysis and further informed by Gibson (1994).	**Nil** Conservation significant fauna information was gathered utilising sufficient resources. Resources used to inform surveys included publicly available databases (PMST, Atlas of Living Australia), DBCA Priority and Threatened fauna data and black cockatoo known breeding and roosting locations (DBCA, 2019).
Competency/experience of consultant conducting survey	**Nil** The surveys were led by Floora de Wit who has more than 15 years' experience conducting surveys of similar scope.	**Nil** The survey was conducted by Zoologist Hannah Spanswick (3+ years' experience).
Proportion of flora/fauna identified, recorded and/or collected (based on sampling, timing and intensity)	**Nil** Floristic data was collected from 23 quadrats, 12 relevés, and 8 observation points as well as countless mapping notes (Figure 9.1 - 9.32). All species not recorded in quadrats were collected and recorded opportunistically.	**Minor** The fauna survey search effort was distributed effectively to provide a representative assessment of fauna species and available habitats across the survey area. The survey areas were traversed on foot covering the accessible locations of the polygon.
Completion (is further work needed)	**Minor** The Priority 2 species *Calectasia ?elegans* should be revisited and photographs taken of the root structure to verify whether it is the Priority species. Survey effort focussed on areas of remnant native vegetation. The patch of Banksia Woodland TEC that represents regenerated Banksia (Patch 7) is only represented by one quadrat. Several vegetation communities are represented by less than three quadrats. These communities were generally degraded, or very restricted (<5 ha).	**Nil** The objectives of the basic fauna assessment and targeted black cockatoo survey were met, and no further work is required.

Limitation	Flora and Vegetation	Fauna and Black Cockatoo
Remoteness and/or access issues	**Nil** The entire survey area was not accessible on foot, several private properties were not accessible and the patch of Banksia near Malaga-Ellenbrook Train was not accessible. This had no serious implications for the flora survey as the private properties represented degraded vegetation while the patch of Banksia Woodland near the Train has been extensively surveyed in the past.	**Moderate** The entire survey area was not accessible on foot. Access to areas of private residential lots and large-scale construction projects limited the access to the entire corridor.
Timing, weather, season, cycle	**Nil** The field survey was undertaken during the typical ideal survey season in accordance with EPA (2016) Flora Survey Technical Guide. Numerous orchids and annual species were confidently identified in the field or sampled and confirmed at the WA Herbarium. Three samples were unable to be identified to species level due to absence of suitable material including two daisies and a potential *Comesperma* spp.	**Minor** The survey was conducted during a period of increased temperature (See section 2.1). This has the potential to reduce the sightings of fauna. The survey occurred within the known active periods for all three of WA's Black Cockatoos. The survey timing is within range for basic fauna surveys based on the EPA Guidelines (2020).
Disturbances (e.g. fire, flood, accidental human intervention) which affected results of the survey	**Minor** One patch of Banksia Woodlands near Pinjar Power Station was recently burnt which may influence species composition. This did not affect the ability to identify the Banksia Woodlands TEC. The historical land use of the pine plantation made it difficult to differentiate vegetation communities. These areas were grouped together as one "vegetation community" although the composition of vegetation varied greatly.	**Nil** No disturbances were observed that would influence the outcome of the survey.

5.0 Desktop Assessment

5.1 Threatened and Priority Ecological Communities

Sixteen communities listed either under the EPBC Act, BC Act or by DBCA were identified. This includes seven communities listed under the EPBC Act and eight listed under the BC Act. Five TECs have a buffer that overlaps with the survey area, and another two occur within 1 km. The communities are described in Table 11 and mapped in Figure 9.1-9.32.

Table 11 Threatened Ecological Communities identified in the desktop study

Community Name and Description	Cons. Status[1]		Distance from Survey Area and Comments
	EPBC	WA	
Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region	E	P3	0 km, extrapolated mapping using aerial imagery
Banksia attenuata woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))	(E)	EN	0.7 m
Banksia attenuata and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. (1994))	(E)	EN	9 km
Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c)	(E)	P3	0 km, between Malaga-Ellenbrook Train and Tonkin Highway
Banksia ilicifolia woodlands (floristic community type 22)	(E)	P3	0 km, Pinjar Park
Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)	(E)	P3	0 km at Malaga-Ellenbrook Train and Tonkin Highway
Northern Spearwood shrublands and woodlands (floristic community type 24)	(E)	P3	4 km
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	E	EN	5.5 km
Melaleuca huegelii - Melaleuca systena shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))		EN	1 km
Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain.	CE	P3	7 km
Southern *Eucalyptus gomphocephala-Agonis flexuosa* woodlands	(CE)	P3	7 km
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	E	CR	0.3 km
Subtropical and Temperate Coastal Saltmarsh	V	P3	8 km

Community Name and Description	Cons. Status[1]		Distance from Survey Area and Comments
	EPBC	WA	
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))	E	CR	8 km
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. (1994))	CE	EN	3 km
Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. (1994))		EN	0 km, cleared for Tonkin Highway

1. Acronyms in brackets indicates it is part of, or entirely representative of a federally listed TEC
EPBC: CE Critically Endangered E Endangered, V Vulnerable
WA: CR Critically Endangered EN Endangered VU Vulnerable P Priority

5.2 Conservation Significant Flora

The desktop study identified 108 significant flora species that may potentially occur in the survey area. Of these, eight species are considered to have a 'high' likelihood of occurrence. These species and their habitat are described in Table 12.

Twenty-two (22) significant flora species were considered to have a 'moderate' likelihood. This was largely informed by either marginal habitat being present, or lack of records within 5 km, and the age of records from the 20 km study area. The remaining 76 significant flora had a 'low' to 'negligible' likelihood based on lack of suitable habitat.

The comprehensive flora desktop study is presented in Appendix A and mapped in Figure 8a.

Table 12 Conservation significant flora species that have a 'high likelihood' of occurrence

Species	Habitat	Cons. Code[2]	
		EPBC Act	BC Act / DBCA
Caladenia huegelii	Soil is usually deep grey-white or brown sand, clay loam. Organic litter. Grey sand over sand. Low forest: *Banksia menziesii, Banksia attenuata.* Occurs in areas of mixed woodland of *E. marginata, C. calophylla, B. ilicifolia, B. attenuata* and scattered *Allocasuarina fraseriana* over dense shrubs (DEC, 2009).	CE	CR
Jacksonia sericea	Calcareous and sandy soils. Disturbed area. Slope/flat. Dry grey sand over limestone. Organic litter. Grey Bassendean sand. Coastal plain, gentle low slope on yellow sand. Open low woodland with Banksia, mid woodland of *Eucalyptus marginata* subsp. *marginata* over low woodland, tall open shrubland over open/low shrubland	-	P4
Poranthera moorokatta	Flat to very slight depression on a broad flat dampland floor. Soil: surface light grey to grey, set clay with some coarse sand, thick white sand cover in some places. Below surface light grey-grey clay with some sand. Some litter in patches around shrub. *M. preissiana* mid woodland over Banksia low woodland, over low open shrubland		P2
Stachystemon exilis	Dry flat, grey sand some humus, over humus and sand, well drained. Seasonally damp. Very gently inclined plain, grey sand. Open scrub, Marri open low woodland over scrub, low woodland of Banksia over mid open shrubland	-	P1

Species	Habitat	Cons. Code[2]	
		EPBC Act	BC Act / DBCA
Stenanthemum sublineare	Littered white sand. Coastal plain./ Sand plain. Low rise on an undulating plain. Dry, grey sand. Open Banksia low woodland over heath	-	P2
Stylidium longitubum	Sandy clay, clay. Seasonal wetlands. Flat ground. Dark brown clay loam some peat, over clay. Poor drainage, wet during winter/spring. Small winter-wet depressions, winter-wet claypan. Open low scrub. Under and around shrubs. Shrubland	-	P4
Styphelia filifolia	On brown sand on midslopes. Sandy soil. Coastal plain. Dry, littered grey sand. Flat, slope. Dry, white sand. Banksia woodland	-	P3
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions. Gravelly soil. Damp, grey-brown clay-sand-humus. Plain, low lying, flat. Dense tall shrub over sedges. Shrubland. Some emergent Marri, Banksia, *Nuytsia.*	-	P4

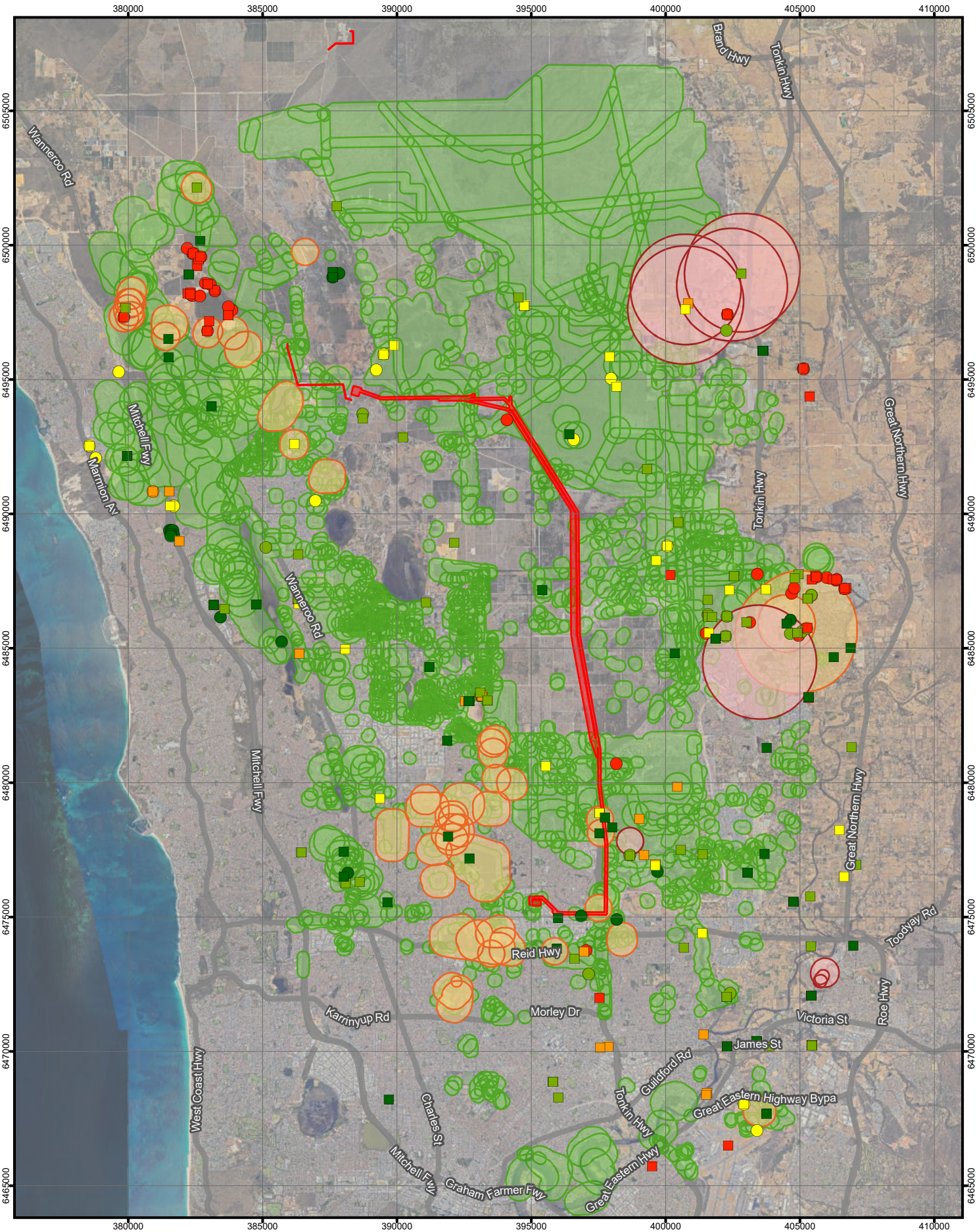
1. Habitat derived from WAH (1998) Florabase
2. Conservation codes P Priority

5.3 Conservation Significant Fauna

A total of 72 significant fauna species were identified in the desktop study as potentially occurring in the survey area (Figure 8a). This included 41 bird, 14 mammal, 12 invertebrate, four reptile and one fish species (presented in Appendix B). 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 72 significant fauna species, 19 species were evaluated to be either known to highly likely to occur, 21 species had a ‘moderate’ likelihood of occurrence, and the remaining 32 species were considered to have a low or negligible likelihood of occurrence due to lack of suitable habitat or outdated records. The species known to occur or considered to have a ‘high’ or ‘known’ likelihood of occurrence are presented in Table 13.

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APPROVED BY F. DE WIT
LAST MODIFIED 27 APR 2023

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1:185,000
(when printed at A4)

Datum: GDA2020 MGA Zone 50
0 1 2 3 4
km

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

Survey Area

Threatened and Priority Flora database (TPFL)
- Threatened
- P1
- P2
- P3
- Priorty 4

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

TEC / PEC
- Critically Endangered
- Endangered
- Priority 3

Conservation Significant Flora and Communities Desktop Results

WESTERN POWER

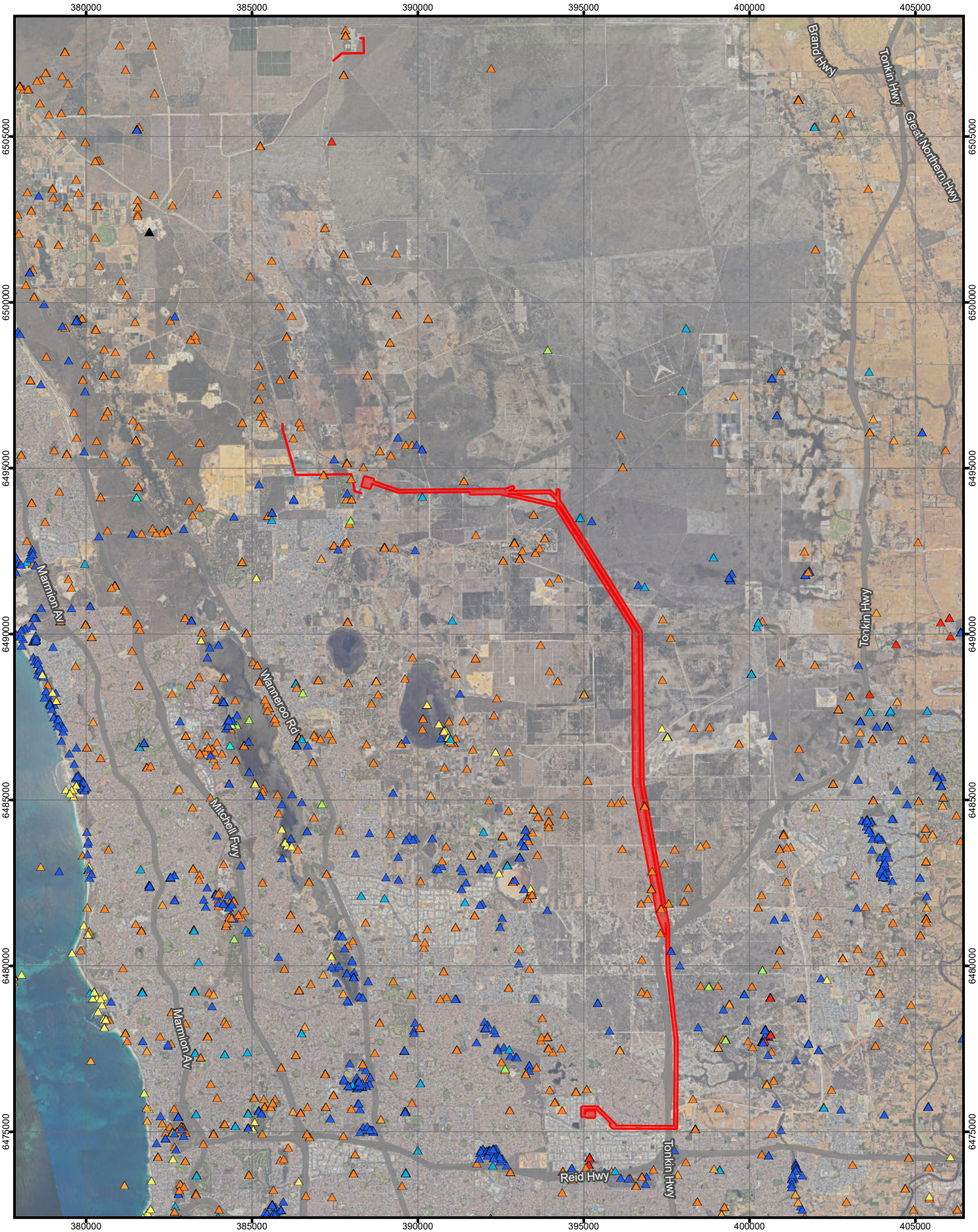
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8a

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Datum: GDA2020 MGA Zone 50
0 1 2 3 4
km

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

- Survey Area

Threatened Fauna database (DBCA)

- Critically Endangered
- Endangered
- Vulnerable
- Migratory Species
- Conservation Dependant
- Specially Protected
- Priority 2
- Priority 3
- Priority 4
- Extinct

Conservation Significant Fauna Desktop Results

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8b

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Table 13 Conservation significant fauna species that are known or have a 'high' likelihood of occurrence

Class	Scientific Name	Common Name	Conservation Status		Ecology
			BC Act / DBCA[2]	EPBC Act[1]	
Known					
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	V	The Forest Red-tailed Black Cockatoo inhabits the dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests receiving more than 600mm of annual average rainfall (DAWE, 2022).
Mammal	*Isoodon fusciventer*	Quenda	EN	E	The Quenda or Southern Brown Bandicoot is found in forest, woodland, heath and shrub communities usually consisting of a combination of sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).
Mammal	*Notamacropus irma*	Western Brush Wallaby	P4		Preferred habitat for *Macropus irma* is open forest or woodlands with seasonally wet sites and low vegetation. This species is often found in dry sclerophyll forests, such as jarrah, and areas of mallee and heathland scrub.
Bird	*Zanda baudinii*	Baudin's Cockatoo	EN	E	Baudin's Cockatoo occurs in temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *E. diversicolor* (Karri) (DAWE, 2022).
Bird	*Zanda latirostris*	Carnaby's Cockatoo	EN	E	Carnaby's Cockatoo have a widespread distribution across the Jarrah Forest between Mundaring, Nannup, Hopetoun, Perth and Peel (DAWE, 2022).
High likelihood					
Mammal	*Bettongia penicillata ogilbyi*	Woylie	CR	E	Populations of Woylies in south-western Australia inhabit woodlands and adjacent heaths with dense understorey of shrubs, particularly *Gastrolobium spp.*
Fish	*Galaxiella nigrostriata*	Black-stripe minnow	EN	E	Largely restricted to near-coastal wetlands from Augusta to Albany, although populations are also known near Bunbury and in the Ellen Brook catchment north of Perth. (DWER, 2023)
Bird	*Falco peregrinus*	Peregrine Falcon	S		The Peregrine Falcon is widespread across Australia and inhabits a variety of habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings (DCCEEW, 2023).
Invertebrate	*Hesperocolletes douglasi*	Douglas' Broad-headed Bee, Rottnest Bee	CR		The geographic range of this species is unknown, with only one extant population known in Pinjar. The population size is also unknown, though it is likely a small population (< 250 mature individuals) as there have only been two individuals ever found, even though there has been intensive searching and targeted surveys (Houston, 2018).

Class	Scientific Name	Common Name	Conservation Status		Ecology
			BC Act / DBCA[2]	EPBC Act[1]	
Invertebrate	*Hylaeus globuliferus*	Woollybush Bee	P3		This species is believed to feed on flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Houston, 2018).
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain Shield-backed Trapdoor Spider	P3		The Swan Coastal Plain Shield-backed Trapdoor Spider occurs in remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).
Bird	*Ixobrychus dubius*	Australian Little Bittern	P4		Mainly found in freshwater wetlands, where they inhabit dense emergent vegetation of reeds and sedges, and inundated shrub thickets. They are also occasionally found in brackish and saline wetlands such as mangrove swamps, Juncus-dominated salt marsh and the wooded margins of coastal lagoons (Marchant & Higgins, 1991).
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	P3		A short-tongued native bee found in Western Australia, associated with *Goodenia sp*. and *Lechenaultia sp*. (Houston, 2018).
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	EN	CE	This small black native bee species is known from the SCP (Kenwick wetlands, Cannington and Forestdale Lake) and has an association with *Goodenia filiformis* and *Anthotium junciforme* (Houston, 2018).
Reptile	*Neelaps calonotos*	Black-striped Burrowing Snake	P3		The Black-striped Snake is mostly confined to the Swan Coastal Plain between Mandurah and Lancelin. It takes shelter 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).
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	P4		*Notamacropus eugenii derbianus* is a small nocturnal Tammar Wallaby subspecies that is native to south-western Western Australia and five offshore islands. Tammar Wallabies shelter in dense low vegetation during daylight and move to open grassy areas to feed after dark. They inhabit coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland.
Mammal	*Phascogale tapoatafa wambenger*	South-western Brush-tailed Phascogale	VU & CD		In the southwest, brush-tailed phascogales are found in Jarrah forests. In the Kimberley, they are found in woodlands and grasslands with *Eucalyptus* and *Corymbia* trees. (DPAW, 2018)
Bird	*Plegadis falcinellus*	Glossy Ibis	IA	MI	The Glossy Ibis occupies well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	CR	CE	The Western Swamp Tortoise has a very small geographic range. The species has only been 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).

Class	Scientific Name	Common Name	Conservation Status		Ecology
			BC Act / DBCA[2]	EPBC Act[1]	
Invertebrate	*Synemon gratiosa*	Graceful Sunmoth	P4		The Graceful Sun Moth occurs throughout the Swan Coastal Plain and extends north into the Geraldton Sandplains (DEC, 2011). It is associated with two habitat types: 1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*. 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread.

1. EPBC Conservation status codes: E Endangered, V Vulnerable, CE Critically Endangered, MI Migratory

2. BC Conservation status codes: EN Endangered, VU Vulnerable, IA Migratory, S Other Specially Protected Fauna, CR Critically Endangered, CD Conservation Dependent Fauna, P1-5 Priority Species.

6.0 Field Survey Results

6.1 Vegetation

6.1.1 Vegetation Communities

Fifteen vegetation communities were defined and mapped. The diversity of vegetation communities reflects the length of the linear corridor as well as the influence of historical disturbance and isolation of some patches.

Native vegetation was mapped for 307.11 ha. The remaining 268.96 ha represents cleared areas.

The vegetation is summarised below and presented in detail in Table 14 and mapped in Figure 9.1-9.32:

- four Banksia Woodlands
  - BaBeAn: high diversity woodland recorded in Wanneroo north of Gnangara Road
  - BaCpSr: a recently burnt patch of woodland recorded near Pinjar Power Station
  - BaXpPo: high diversity woodland recorded near Gnangara Road, supports denser understorey than BaBeAn
  - EtHsLb: Banksia and Eucalypt woodland occurring sporadically in Gnangara State Forest, includes areas historically cleared that floristically appear to be regenerating towards a natural state of Banksia Woodland.
- three Eucalypt Woodlands
  - CcSxDf: diverse Marri woodland isolated to private property and parkland near Marshall Road.
  - EmHhMp: Jarrah woodland occurs sporadically along survey area including Whiteman Park paddocks (disturbed) and patches of very good condition vegetation near Wanneroo Raceway.
  - CcXpHg: disturbed Marri mixed woodland with variable to no understorey restricted to Whiteman Park paddocks.
  - BaEpPo: species rich woodlands near Pinjar Station, represented and discussed in detail in the Scar4 (AECOM 2022) project.
- five Wetlands
  - MpHaDb: diverse wetland community that occurs sporadically, represents several Conservation Category wetlands, considered surface-water dependent.
  - MpKgDs: Paperbark wetland community that represents one Conservation Category wetland. Has a dense Paperbark overstorey that may indicate dependence on groundwater.
  - KmHg: Kunzea thicket on edge of basin/damplands
  - MlCa: disturbed wetland community lacking overstorey species due to clearing. Represents regeneration since Pine plantation.
  - MpXpCe: disturbed wetland community, generally Paperbarks and Grasstrees in low-lying areas.
- disturbed areas
  - PpAcCe: Pine plantation regrowth with variable understorey component.
  - Trees: parkland cleared with stands or isolated native trees and/or shrubs.

Two non-native areas were mapped including:

- Paddock: cleared areas with occasional native trees
- Plantation: **Pinus pinaster* plantation.

The delineation of vegetation communities was supported by comparing floristic similarity of quadrats and or quadrats and relevés using both presence absence and foliage cover (scaled) data. The two dendrograms that were most informative were presence absence data for quadrats and relevés (Plate 1), and foliage cover data from quadrats only (Plate 2).

Table 14 Vegetation community descriptions and photographs

Description	Additional Detail	Photograph
Banksia Woodlands		
BaBeAn *Banksia attenuata* and *Banksia menziesii* low open woodland over *Beaufortia elegans, Jacksonia sternbergiana* and *Bossiaea eriocarpa* mid to low open shrubland over *Alexgeorgea nitens, Desmocladus flexuosus* and *Lyginia barbata* low sedgeland. Represents Banksia Woodland TEC.	Survey effort: Q13, Q30, Q32, R33, R34 Species richness: 76 native and 13 weed species Area: 9.52 ha, represents 3% of vegetation	
BaCpSr Banksia Woodland *Banksia attenuata* and *Banksia menziesii* low open woodland over *Conostephium pendulum*, *Melaleuca trichophylla* and *Xanthorrhoea preissii* mid to low sparse shrubland over *Scaevola repens*, *Lobelia heterophylla* and Phlebocarya ciliata low open forbland. This area has been affected by fire. Plant density and species composition is likely to change as regeneration occurs. Represents Banksia Woodland TEC.	Survey effort: Q27, Q28 Species richness: 70 native and 5 weed species Area: 0.42 ha, represents <1% of vegetation	

Description	Additional Detail	Photograph
BaXpPo *Banksia attenuata, Banksia menziesii* and *Nuytsia floribunda* low woodland over *Xanthorrhoea preissii, Beaufortia elegans* and *Melaleuca seriata* mid to low open shrubland over *Patersonia occidentalis, Lyginia barbata* and *Stylidium repens* low open forbland. Represents Banksia Woodlands TEC.	Survey effort: Q10, Q14, Q22 Species richness: 70 native and 6 weed species Area: 20.18 ha, represents 7% of vegetation	
EtHsLb Banksia Woodland *Eucalyptus todtiana, Banksia attenuata* and *Banksia menziesii* low open woodland over *Hibbertia subvaginata*, *Adenanthos cygnorum* var. *cygnorum* and *Hemiandra glabra* tall to low shrubland over *Lyginia barbata, Patersonia occidentalis* and *Alexgeorgea nitens* low sparse forbland. Represents Banksia Woodland TEC.	Survey effort: Q12, Q21, Q23, Q26 Species richness: 105 native and 8 weed species Area: 41.58 ha, represents 14% of vegetation	

Description	Additional Detail	Photograph
BaEbPo Banksia woodland *Banksia attenuata*, *Banksia menziesii* and *Eucalyptus todtiana* low woodland over *Eremaea beaufortioides*, *Beaufortia elegans* and *Hibbertia hypericoides* low shrubland over *Patersonia occidentalis*, *Alexgeorgea nitens* and *Phlebocarya ciliata* low to mid open herbland. Representative of the Banksia Woodlands of the Swan Coastal Plain TEC. Represents both FCT 23b northern *B. attenuata-B. menziesii* woodlands. This part of the survey area was represented in the Scar4 survey (AECOM 2022) including FCT analysis and comprehensive species list and site data.	Survey effort: AECOM (2022) Scar4 Q2, Q7, Q11 and Q12 Species richness: 116 native and 9 weed species Area: 1.17 ha, represents 0% of vegetation	
Eucalypt Woodlands		
CcSxDf *Corymbia calophylla* and *Eucalyptus todtiana* low open woodland over *Styphelia xerophylla, Xanthorrhoea preissii* and *Eremaea pauciflora* low sparse shrubland over *Desmocladus flexuosus*, *Mesomelaena pseudostygia* and Conostylis aurea low forbland. This community represents an isolated patch on private property. Site 6 was a rapid site to capture more species that occur in this isolated patch.	Survey effort: Q5, R6 Species richness: 60 native and 5 weed species Area: 3.10 ha, represents 1% of vegetation	

Description	Additional Detail	Photograph
EmHhMp *Eucalyptus marginata, Banksia menziesii* and occasional *Banksia attenuata* low open woodland over *Hibbertia hypericoides, Xanthorrhoea preissii* and *Brachyloma preissii* mid to low shrubland over *Mesomelaena pseudostygia*, *Lomandra sonderi* and *Patersonia occidentalis* low open sedgeland (or sedge-like). Represents small pockets adjacent to Wanneroo raceway. Most of this community in the survey area was degraded.	Survey effort: R3, Q29, R31 Species richness: 53 native and 14 weed species Area: 1.83 ha, represents 1% of vegetation	
CcXpHg *Corymbia calophylla* and *Nuytsia floribunda* mid to low woodland to open woodland over *Xanthorrhoea preissii, Acacia saligna* and *Stirlingia latifolia* tall sparse shrubland over **Hypochaeris glabra, *Ursinia anthemoides* and **Podotheca gnaphalioides* low open forbland. Degraded vegetation in Whiteman Park paddock. Density of trees and understorey natives vary.	Survey effort: R1, R4, Obs3 Species richness: 22 native and 15 weed species. Area: 52.14 ha, represents 17% of vegetation	
Wetland		

Description	Additional Detail	Photograph
MpHaDb *Melaleuca preissiana, Nuytsia floribunda* and *Banksia ilicifolia* low open woodland over *Hypocalymma angustifolium, Xanthorrhoea preissii* and *Adenanthos obovatus* tall to low open to sparse shrubland over *Dasypogon bromeliifolius, *Hypochaeris glabra* and *Podotheca gnaphalioides* low forbland. This community represents part of UFI 13956 Conservation Category dampland (sites 15, 16, 17, 19) and UFI 8238 Multiple Use dampland (sites 24, 25). Lacking any phraetophytic or partial phraetophytic species, this community probably represents a surface-water dependent community. Eucalyptus marginata was observed along the edge of this community.	Survey effort: Obs4, R2, Q15, R16, R17, Q19, R24, Q25 Species richness: 83 native and 19 weed species Area: 13.13 ha, represents 4% of vegetation	
MpKgDs *Melaleuca preissiana* low open woodland over *Kunzea glabrescens*, *Regelia inops* and *Hypocalymma angustifolium* mid shrubland over *Dielsia stenostachya, Patersonia occidentalis* and *Desmocladus flexuosus* low open to closed forbland. Density of shrubs varies across the community. The community represents two patches including one that is isolated within a pine regeneration area which has influenced species composition. One site (11) represents UFI 12105, a Conservation Category dampland.	Survey effort: Q9, Q11, Obs4, Obs7, R7 Species richness: 52 native and 10 weed species Area: 4.10 ha, represents 1% of vegetation	

Description	Additional Detail	Photograph
KmHg *Kunzea micrantha, Xanthorrhoea preissii* and *Leucopogon squarrosus* tall to mid shrubland over **Hypochaeris glabra*, *Lepidosperma pubisquameum* and *Dasypogon bromeliifolius* low forbland. Variability might be a reflection of depth to groundwater and/or level of inundation following rainfall. Lacks an overstorey stratum.	Survey effort: Q18, Q20 Species richness: 27 native and 7 weed species Area: 4.10 ha, represents 1% of vegetation	
MlCa *Melaleuca lateritia* and *Acacia pulchella* mid sparse shrubland over *Centrolepis aristata, Lepidosperma longitudinale* and *Drosera glanduligera* low forbland with **Briza maxima* low open grassland. Represents a Multiple Use basin wetland, UFI 8238. Includes a dominant weed component of **Hypochaeris glabra, *Parentucellia latifolia* and **Ursinia anthemoides*.	Survey effort: Q8 Species richness: 13 native and 7 weed species Area: 5.30 ha, represents 2% of vegetation	

Description	Additional Detail	Photograph
MpXpCe *Melaleuca preissiana* low sparse trees over *Xanthorrhoea preissii* tall shrubland over **Carpobrotus edulis, *Petrorhagia dubia* and **Ursinia anthemoides* low open forbland. Very degraded isolated wetland. Could be representative of other wetlands mapped in survey area but difficult to tell due to degradation.	Survey effort: R35 Species richness: 4 native and 10 weed species Area: 5.94 ha, represents 2% of vegetation	
Disturbed		
Trees Scattered native species including *Eucalyptus, Banksia, Acacia, Xanthorrhoea* and *Hypocalymma* species.	Survey effort: observations only Area: 12.50 ha, represents 4% of vegetation	

Description	Additional Detail	Photograph
PpAcCe Pine regrowth **Pinus pinaster* tall isolated trees over *Adenanthos cygnorum* var. *cygnorum*, *Xanthorrhoea preissii* and *Macrozamia fraseri* tall to mid sparse shrubland over **Carpobrotus edulis, *Pelargonium capitatum* and **Ornithopus pinnatus* low sparse forbland. Eclectic mix of species including *E, todtiana, Acacia pulchella, Rhagodia baccata, Hardenbergia comptoniana*. Isolated stands of juvenile *Banksia* species were noted.	Survey effort: Obs5, Obs6, Obs8 Species richness: 11 native and 5 weed species Area: 132.23 ha, represents 43% of vegetation	 
Non-Native		

Description	Additional Detail	Photograph
Plantation Dominated by **Pinus pinaster* or recently cleared and largely devoid of native species.	Area: 188.51 ha	
Paddock Grassland with occasional native tree / shrub.	Area: 13.18 ha	

Note, Cleared represents 67.37 ha and is not representative of native vegetation

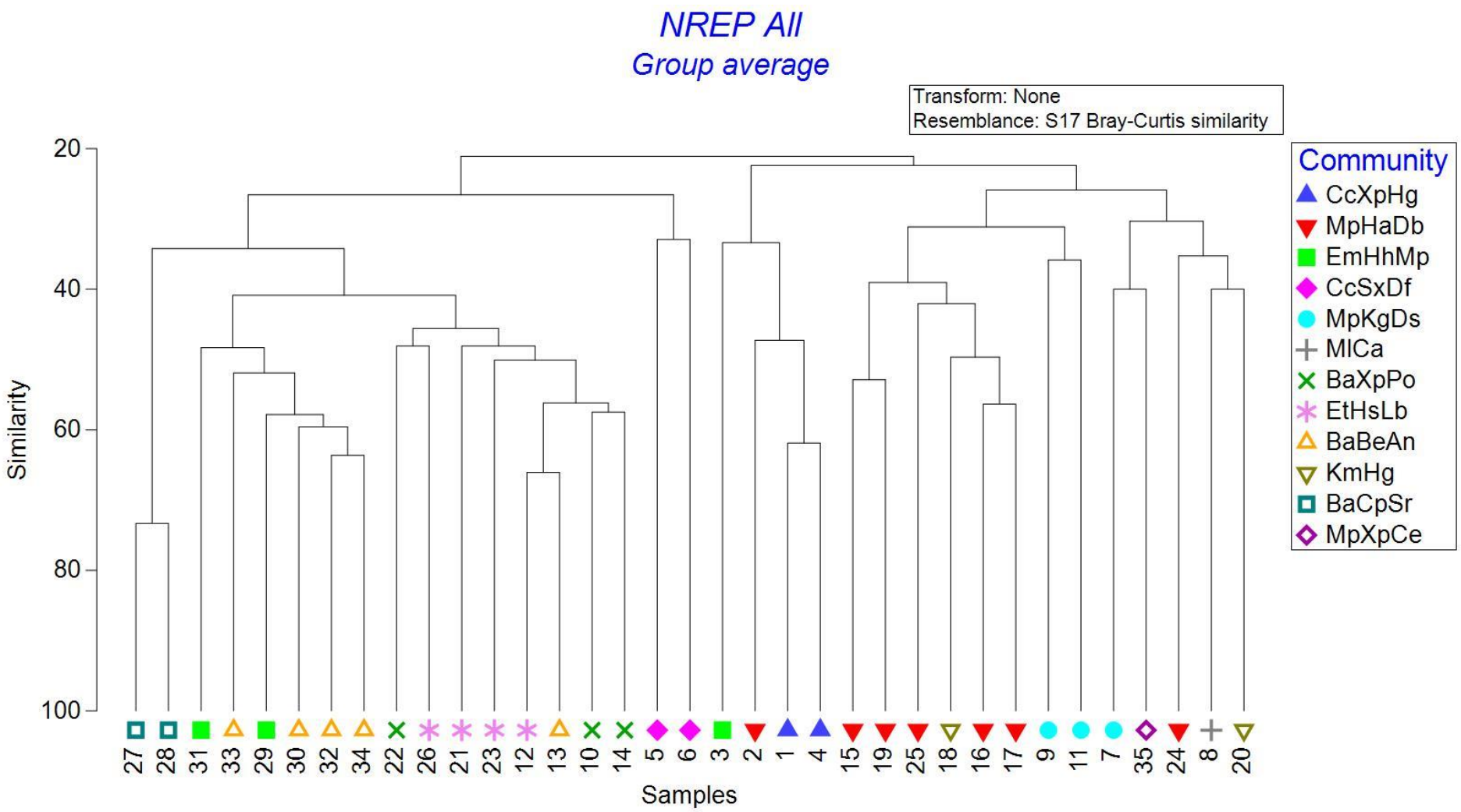


Plate 1 Floristic Similarity (Bray Curtis Index) of all Sites using Presence Absence of all Sites

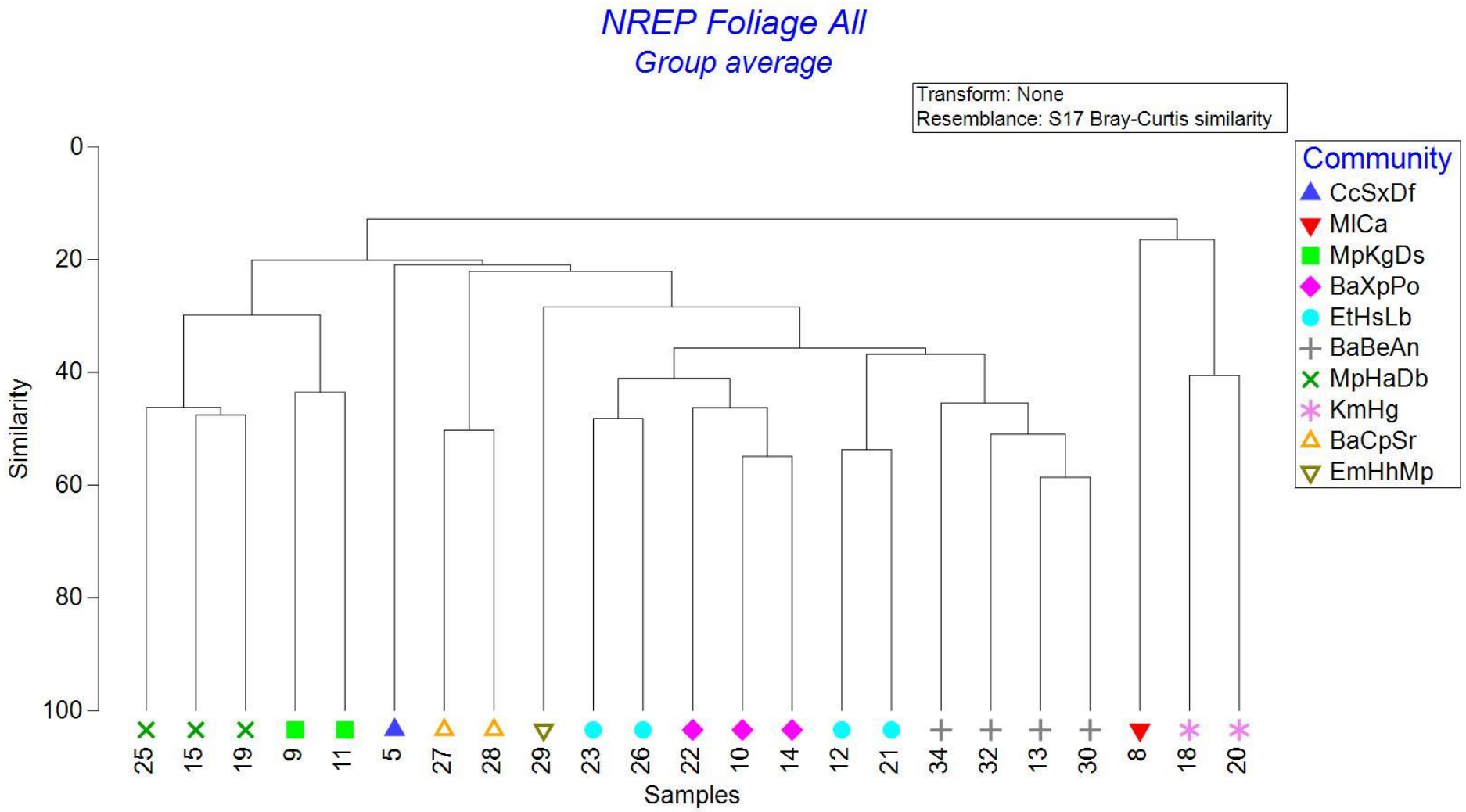


Plate 2 Floristic Similarity (Bray Curtis Index) of Quadrats using Scaled Foliage Cover

6.1.2 Floristic Community Type Analysis

Analysis results confidently inferred five FCTs for the 23 quadrats analysed. Three quadrats represent hybrid FCTs and two quadrats were inconclusive. A brief description of each is presented below. The comprehensive results for each quadrat, including similarity percentage, FCT, and justification for the inferred FCT, is presented in Appendix D.

FCT 4 *M. preissiana* damplands

This FCT was inferred for three quadrats (8, 9 and 25). Interestingly these quadrats are mapped as three different vegetation communities. All three quadrats are situated in wetland basins and support *M. preissiana* overstorey from open woodland to forest. Two of these quadrats represent regenerated vegetation post-disturbance in Gnangara State Forest. This has contributed to low similarity of quadrats to the Keighery SCP dataset and incomparable species richness (average 21 spp. compared to 36.9 spp. in SCP dataset). Similarity was low, varying at best between 30% (quadrat 8) and 50% (quadrat 25).

FCT 21a Central *Banksia attenuata – Eucalyptus marginata* woodlands

Inferred for one quadrat (29) situated at the northern end of the survey area. This quadrat is one of the few quadrats on the Spearwood system and included an overstorey of *E. marginata* over *Banksia.* Species diversity was comparable (48 spp. in quadrat compared to 52 spp. in SCP dataset). The three Keighery SCP sites with highest similarity all represented FCT 21c (highest similarity was 52%).

FCT 21c Low lying Banksia attenuata woodlands or shrublands

Four quadrats represent FCT 21c (11, 14, 19, 22). These quadrats represent three different communities however they all are situated in low-lying areas, potentially winter-wet, and can include an overstorey of *M. preissiana* or *E. marginata*. Species richness is comparable, with an average of 39 spp. compared to 40 spp. in SCP dataset. All four quadrats were in excellent condition vegetation, despite this similarity was average, with highest similarity ranging from 39% (quadrat 11) to 52% (quadrat 22). Quadrats 14 and 22 also had characteristics representative of FCT 23b, which were excluded due to the low-lying position of the quadrat, and higher overlap of key species.

The identification of FCT 21c appears very location and site specific. It is unlikely that extrapolating mapping for this FCT beyond the quadrat would be an accurate representation. This is evident in that this FCT was inferred for quadrats across three vegetation communities.

FCT 21c represents a Priority 3 Ecological Community.

FCT 23a Central *Banksia attenuata – B. menziesii* woodlands

Two quadrats represent FCT 23a (32 and 34). These quadrats are situated at the edge of a patch of Banksia woodland along Pederick Road in Wanneroo. Species richness was not that comparable (average 44 spp. compared to 52 spp. in SCP dataset). This decline is considered a reflection of the quadrat position along the edge. Numerous key species were present and similarity was relatively high (50% and 52% for quadrats 32 and 34 respectively).

FCT 23b Northern *Banksia attenuata-B. menziesii* woodlands

FCT 23b was the most common across the survey area, inferred for seven quadrats (10, 12, 13, 21, 23, 27 and 28). These quadrats represent four different vegetation communities. Species diversity was comparable, with an average of 52.3 spp. compared to 53 spp. in SCP dataset. Similarity was relatively high, varying between 46% as the lowest (quadrat 27 and 28, likely because vegetation had been recently burnt) up to 64% (quadrat 10 and 13).

FCT 23b represents a Priority 3 Ecological Community.

Hybrids

Three quadrats represent hybrid FCTs, that is characteristics from two FCTs were prevalent based on published data and the floristic data collected.

Quadrat 26 is in Gnangara State Forest and represents regenerated vegetation post-disturbance. Condition was mapped as Good, with clear disturbance to the vegetation structure and diversity. The quadrat showed affinities to both FCT 23b and 22. The quadrat was in a low-lying position in the landscape and included *Banksia ilicifolia* with *B. attenuata* and *E. todtiana*. Its position and key species lean towards FCT 22, however the presence of some key species may also be an indication of disturbance opportunists, including *Adenanthos cygnorum* and *Hypocalymma angustifolium*. This quadrat had the highest similarity to Keighery SCP dataset sites representing FCT 23b with 49% similarity, therefore 23b was not entirely excluded.

Quadrat 15 is on the south side of Gnangara Road (less than 1 km) on the edge of Banksia Woodlands and adjacent wetlands. Adjacent Banksia woodlands represent 23b while wetlands represent FCT 21c and FCT 4. This quadrat showed affinities to both FCT 22 and FCT 4. The highest similarity was to FCT 22 (48%). Overstorey was dominated by *B. ilicifolia* and *M. preissiana*. Species richness was high with 51 spp. compared to 36.9 spp. (FCT 4) or 32.5 spp. (FCT 22). The quadrat

Quadrat 30 is at the northern end of the survey area on Spearwood Sands. It had highest similarity to FCT 24 (51% followed by 23a (49%) however it does not really have strong support for either of these FCT. Species richness and landform comparable to 24 (44 spp. compared to 41.8 spp. in SCP dataset), but only a few key species are present and it does not occur as a heath. Comparing attributes to FCT 213a, it does not occur on the correct landform (Bassendean Sands), species richness is not really comparable (62 spp. in SCP dataset), and only a few key species are present. The project quadrat nearby, quadrat 29, represents FCT 21a which was considered however no *E. marginata* was present and few key species occurred. It therefore is listed as a hybrid FCT.

Two quadrats were inconclusive, (18 and 20). These quadrats represent wetland vegetation KmHg *Kunzea* thicket on edge of basin/damplands which was restricted to bands of vegetation separating wetland basins from adjacent upland Banksia woodlands. Species diversity was low as the *Kunzea* thicket reduced resource-availability for other species. Similarity results included FCT 21c, 21a, 4, 28 and 5. These quadrats represent a combination of features from several of these FCTs, however there was no evidence, including similarity, that was strong enough to justify inferring one FCT.

6.1.3 Conservation Significant Vegetation

Eight patches of Banksia Woodland TEC were assessed against the key diagnostic characteristics outlined in the DEE (2016) Conservation Advice. All eight patches met the key characteristics, size and condition threshold to be considered representative of the federally protected ecological community. The Banksia Woodlands TEC is mapped for 63.18 ha. A summary of patches is presented here, with detailed patch assessments in the Table 15 to Table 22.

No TECs listed under the BC Act were recorded. Three PECs listed as Priority 3 by DBCA (2022) were identified through FCT analysis:

- Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c) (FCT 21c).
- Northern *Banksia attenuata-B. menziesii* woodlands (floristic community type 23b) (FCT 23b), also referred to as Swan Coastal Plain *Banksia attenuata-B. menziesii* woodlands by DBCA (2022).
- Banksia dominated woodlands and shrublands of the Swan Coastal Plain (Banksia Woodlands PEC).

FCT 21c was inferred for four quadrats situated in low-lying areas and mapped for 6.80 ha. It includes some areas with an overstorey of *Melaleuca preissiana* and *Eucalyptus marginata*. This PEC does not correlate with the Banksia Woodlands TEC at all locations, particularly the edge of wetlands/winter-wet areas.

FCT 23b was inferred for seven quadrats and mapped for 27.76 ha and corresponds with the Banksia Woodlands TEC.

Banksia Woodlands PEC was inferred for all patches of Banksia Woodlands TEC that was not captured as FCT 21c or FCT 23b, extending for 29.82 ha. This PEC corresponds with the Banksia Woodlands TEC.

6.1.3.1 Banksia Woodlands Patch Assessment

Patch 1 (refer Table 15) represents Banksia Woodlands near Pinjar Power Station. This data was supplemented by AECOM (2022) Scar4 project data which overlaps with this survey area. Part of Patch 1 was recently burnt. The patch is 1.58 ha and is part of a larger patch of greater than1,000 ha. In the survey area the patch is intersected by numerous minor tracks and one road (Pinjar Power Station access road).

Patch 2 (refer Table 16) is located adjacent to Wanneroo Raceway in Banksia and mixed Banksia Eucalypt Woodland. It is mapped in Very Good condition and infers FCT 21a and 23a. Species diversity is medium with weed encroachment influencing presence of native herbs. The patch is 0.88 ha as part of a larger patch approximately 24 ha.

Patch 3 (refer Table 17) represents Banksia Woodlands on the edge of Pinjar Park in Wanneroo, directly north of the golf course. The vegetation was mapped as Very Good, representing FCT 23a with moderate species diversity. The patch extends for 0.73 ha and is part of a larger patch approximately 9 ha.

Patch 4 (refer Table 18) represents a corridor of native vegetation that intersects with the survey area. It is in Excellent condition but is intersected by a number of tracks. It is 5.72 ha and is part of a larger patch greater than100 ha. The patch represents FCT 23b.

Patch 5 (refer Table 19) is remnant native vegetation north of Gnangara Road, represented by two quadrats. The patch is in Excellent condition and represents FCT 21c and FCT 23b. It extends for 7.97 ha which is part of a larger patch greater than100 ha.

Patch 6 (refer Table 20) is remnant native vegetation south of Gnangara Road. The patch is in Excellent condition, represents FCT 21c and FCT 23b and supports high diversity and low weed cover. The patch extends 18.12 ha and is part of a larger, greater than1,000 ha patch.

Patch 7 (refer Table 21) represents regenerated vegetation following pine plantation in Gnangara State Forest. This patch was difficult to assess due to the lack of obvious overstorey species as a result of historical clearing. Banksia trees were present although mature trees were scattered. The patch represents 24.01 ha, and is part of a patch of more than 100 ha based on the assumption that adjacent vegetation is in similar condition and of similar diversity. The patch was considered in Good condition.

Patch 8 (refer Table 22) represents an area of Banksia Woodland on the northeast corner of Tonkin Highway, Marshall Road, and intersected now by the Malaga-Ellenbrook rail corridor. Access was restricted therefore RPS (2021) data was used to inform the patch assessment. The patch is 4.21 ha, extending approximately 15 ha in total, and was mapped in Good to Excellent condition.

Table 15 Patch 1 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 1</td></tr>
<tr><td>Date</td><td>Q27 and Q28 scored on 8-Nov-23
Q12 (Scar4; AECOM, 2022) scored on 4-Nov-22</td></tr>
<tr><td>Location</td><td>Near Pinjar Power station.
Quadrats 27 and 28 represent burnt (<5 years) vegetation.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaCpSr and BaEbPo – described in Table 14</td></tr>
<tr><td>Structure</td><td>Low open woodland to low woodland</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">Q27</th><th colspan="2">Q28</th></tr>
<tr><th>Ht</th><th>Cover</th><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>600</td><td>5</td><td>450</td><td>4</td></tr>
<tr><td>B. menziesii</td><td>600</td><td>2</td><td></td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees
<table>
<tr><th>Species</th><th>Q27</th><th>Q28</th></tr>
<tr><td>Cover (%)</td><td>30.7</td><td>28.31</td></tr>
<tr><td>Diversity total</td><td>56</td><td>53</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>Q27</th><th>Q28</th></tr>
<tr><td>Cover (%)</td><td>0.4</td><td>0.6</td></tr>
<tr><td>Dominant species</td><td>No clear dominant</td><td>No clear dominant</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>Grey sand</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 1.58 ha
Estimated total extent: >1,000 ha</td></tr>
<tr><td>Summary</td><td>This patch is part of the larger Gnangara State Forest Banksia Woodland.
The patch meets the condition and size thresholds to be considered representative of the Commonwealth listed TEC.</td></tr>
<tr><td>Photograph</td><td>  </td></tr>
</table>

Table 16 Patch 2 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 2</td></tr>
<tr><td>Date</td><td>Quadrats 29 and 31, relevé 30 scored on 8-Nov-23</td></tr>
<tr><td>Location</td><td>Wanneroo Raceway</td></tr>
<tr><td>Patch vegetation description</td><td>Represents two vegetation communities influenced by the presence of Jarrah E. marginata trees and changes in ground stratum dominance, including BaBeAn and EmHhMp described in Table 14.</td></tr>
<tr><td>Structure</td><td>Low open woodland</td></tr>
<tr><td>Tree Data incl. height, canopy percent cover and dominance</td><td>Low Banksia cover in Q29 is attributed to Quadrat placement rather than a reflection of Banksia absence.
<table>
<tr><th rowspan="2">Species</th><th colspan="2">Q29</th><th colspan="2">R30</th><th colspan="2">Q31</th></tr>
<tr><th>Ht</th><th>Cover</th><th>Ht</th><th>Cover</th><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>-</td><td>-</td><td>500</td><td>25</td><td>400</td><td>1</td></tr>
<tr><td>B. menziesii</td><td>200</td><td>0.5</td><td>200</td><td>1</td><td>400</td><td>8</td></tr>
<tr><td>E. marginata</td><td>1200</td><td>12</td><td>-</td><td>-</td><td>1000</td><td>10</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees
<table>
<tr><th>Species</th><th>Q29</th><th>R30</th><th>Q31</th></tr>
<tr><td>Cover (%)</td><td>62.1</td><td>70.1</td><td>66.1</td></tr>
<tr><td>Diversity total</td><td>38</td><td>34</td><td>25</td></tr>
</table>
</td></tr>
</table>

Weed cover (%) and dominant weed species	**Species** / **Q29** / **R30** / **Q31** Cover (%) / 5.2 / 10.4 / 6.2 Dominant species / **Briza maxima* / **B. maxima* / **Hypochaeris glabra*
Soil type and colour	Brown sand
Landform	Upper slope
Size of patch	Within survey area: 0.88 ha Estimated total extent: >1,000 ha
Summary	Patch meets size and condition thresholds. Degraded vegetation east of the track is not considered representative of the TEC. The corridor extends south where vegetation is reduced to a 30 m corridor. Here, the vegetation within the survey area is largely cleared and mapped as Completely Degraded. This has also been excluded from the TEC mapping.
Photograph	

Table 17 Patch 3 Banksia TEC Assessment

ID	Patch 3						
Date	Quadrats 32 and 34, relevé 33 scored on 8-Nov-23						
Location	Pinjar Park, corner Old Yanchep Road and Pederick Street.						
Patch vegetation description	Represents BaBeAn – described in Table 14						
Structure	Low open woodland						
Tree Data incl. height, canopy percent cover and dominance	**Species**	**Q32**		**R33**		**Q34**	
		Ht	**Cover**	**Ht**	**Cover**	**Ht**	**Cover**
	B. attenuata	800	18	500	10	600	2
	B. menziesii	200	10	500	5	500	20
	E. todtiana	400	2			700	5
Native understorey present (%) and diversity	Excludes trees **Species** / **Q32** / **R33** / **Q34** Cover (%) / 55.7 / 46.3 / 66.7 Diversity total / 35 / 17 / 32						
Weed cover (%) and dominant weed species	**Species** / **Q32** / **R33** / **Q34** Cover (%) / 12.3 / 35.5 / 6.4						

	Dominant species	*Ursinia anthemoides* *Ehrharta calycina*	*Hypochaeris glabra* *Briza maxima*	*Ursinia anthemoides*
Soil type and colour	Brown sand			
Landform	Mid slope			
Size of patch	Within survey area: 0.73 Estimated total extent: 9.00 ha			
Summary	Patch meets size and condition thresholds. Vegetation condition varies with weed invasion and rubbish affecting some areas.			
Photograph				

Table 18 Patch 4 Banksia TEC Assessment

ID	Patch 4
Date	Quadrats 12 and 21 scored on 9-Sep-23 and 7-Oct-23 respectively
Location	East of Pinjar Power Station in Gnangara State Forest
Patch vegetation description	EtHhLb – described in Table 14
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	

Species	Q12		Q21	
	Ht	Cover	Ht	Cover
B. attenuata	600	2	300	4
B. menziesii	300	4	300	5
Nuytsia floribunda	250	4	-	-

Native understorey present (%) and diversity

Excludes trees

Species	Q12	Q21
Cover (%)	84.3	66.2
Diversity total	50	42

Weed cover (%) and dominant weed species

Species	Q12	Q21
Cover (%)	2	1.6
Dominant species	No dominant	No dominant

Soil type and colour	Grey sand
Landform	Upper slope / dune
Size of patch	Within survey area: 5.72 ha Estimated total extent: >100 ha
Summary	Patch meets size and condition thresholds. Intersected by various tracks and powerlines.
Photograph	

Table 19 Patch 5 Banksia TEC Assessment

ID	Patch 5
Date	Quadrats 13 and 22 scored on 9-Sep-23 and 7-Oct-23 respectively
Location	Gnangara State Forest, north of Gnangara Road.
Patch vegetation description	BaBeAn and BaXpPo described in Table 14
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	<table><tr><th rowspan="2">Species</th><th colspan="2">Q13</th><th colspan="2">Q22</th></tr><tr><th>Ht</th><th>Cover</th><th>Ht</th><th>Cover</th></tr><tr><td>*B. attenuata*</td><td>400</td><td>20</td><td>500</td><td>20</td></tr><tr><td>*B. menziesii*</td><td>-</td><td>-</td><td>500</td><td>5</td></tr><tr><td>*Nuytsia floribunda*</td><td>-</td><td>-</td><td>500</td><td>15</td></tr></table>
Native understorey present (%) and diversity	Excludes trees <table><tr><th>Species</th><th>Q13</th><th>Q22</th></tr><tr><td>Cover (%)</td><td>73.9</td><td>49.1</td></tr><tr><td>Diversity total</td><td>40</td><td>31</td></tr></table>
Weed cover (%) and dominant weed species	<table><tr><th>Species</th><th>Q13</th><th>Q22</th></tr><tr><td>Cover (%)</td><td>7.8</td><td>21.7</td></tr><tr><td>Dominant species</td><td>**Briza maxima*</td><td>**Briza maxima* **Hypochaeris glabra*</td></tr></table>
Soil type and colour	Grey sand
Landform	Mid slope / dune
Size of patch	Within survey area: 7.97 ha

	Estimated total extent: >1,00 ha
Summary	Patch meets size and condition thresholds. Considered separate from south of Gnangara Road as the gap of road, powerline corridor and a firebreak is wider than 20 m.
Photograph	

Table 20 Patch 6 Banksia TEC Assessment

ID	Patch 6
Date	Quadrats 10 on 8-Sep-22, 14 on 9-Sep-22 and 23 on 7-Oct-22
Location	Gnangara State Forest, north of Gnangara Road.
Patch vegetation description	BaBeAn and BaXpPo described in Table 14
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	

Species	Q10		Q14		Q23	
	Ht	Cover	Ht	Cover	Ht	Cover
B. attenuata	400	12	400	30	400	8
B. menziesii	400	5	400	4	400	10
E. todtiana	-	-	-	-	600	15

Native understorey present (%) and diversity

Excludes trees

Species	Q10	Q14	Q23
Cover (%)	64.4	96.8	78.3
Diversity total	38	38	46

Weed cover (%) and dominant weed species

Species	Q10	Q14	Q23
Cover (%)	1.6	1	0.2
Dominant species	No dominant	No dominant	No dominant

Soil type and colour	Grey sand
Landform	Lower slopes, undulating terrain.
Size of patch	Within survey area: 18.12 ha Estimated total extent: >1,000 ha
Summary	Patch meets size and condition thresholds.

	Although not joined within survey area, this patch represents one large Banksia Woodland in Gnangara State Forest.
Photograph	

Table 21 Patch 7 Banksia TEC Assessment

ID	Patch 7
Date	Quadrat 26 scored on 7-Oct-22, 4 mapping points
Location	Pine forest regeneration in Gnangara State Forest
Patch vegetation description	EtHsLb described in Table 14. The patch is in 'Good' condition.
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	<table><tr><th rowspan="2">Species</th><th colspan="2">Q10</th></tr><tr><th>Ht</th><th>Cover</th></tr><tr><td>*B. attenuata*</td><td>500</td><td>10</td></tr><tr><td>*B. ilicifolia*</td><td>400</td><td>5</td></tr><tr><td>*E. todtiana*</td><td>400</td><td>15</td></tr></table>
Native understorey present (%) and diversity	Excludes trees <table><tr><th>Species</th><th>Q26</th></tr><tr><td>Cover (%)</td><td>64.6</td></tr><tr><td>Diversity total</td><td>31</td></tr></table>
Weed cover (%) and dominant weed species	<table><tr><th>Species</th><th>Q26</th></tr><tr><td>Cover (%)</td><td>6.1</td></tr><tr><td>Dominant species</td><td>**Briza maxima, *Hypochaeris glabra*</td></tr></table>
Soil type and colour	Grey sand
Landform	Flat low-lying
Size of patch	Within survey area: 24.01 ha Estimated total extent: 100 ha
Summary	The tree stratum and native species diversity is variable in this patch. However, it is likely that lacking any more clearing, the patch will regenerate to a state that resembles Banksia Woodland. For this reason, the patch is considered representative of the federally listed TEC.

Photograph	

Table 22 Patch 8 Banksia TEC Assessment

ID	Patch 8
Date	Quadrat 8, 10 and 11 scored 26 Oct 2017
Location	Malaga-Whiteman Park west adjacent to Tonkin Highway
Patch vegetation description	EtHsLb described in Table 14. The patch is in 'Very Good' condition. This assumes some edge effects and weeds have influenced the patch since rail works began.
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	

Species	PTA8		PTA10		PTA11	
	Ht	Cover	Ht	Cover	Ht	Cover
B. attenuata	400	15	500	1		
B. menziesii	400	11	300	2-10	800	8
E. todtiana			400	2-10	600	11

Native understorey present (%) and diversity	Excludes trees. Cover cannot be calculated from data presented in RPS (2020).

Species	PTA8	PTA10	PTA11
Diversity total	56	35	46

Weed cover (%) and dominant weed species	Cannot be calculated from data presented in RPS (2020)
Soil type and colour	Grey sand
Landform	Sand dune
Size of patch	Within survey area: 4.21 ha Estimated total extent: 15 ha
Summary	Patch of Banksia Woodland which has since been fragmented by the Malaga-Ellenbrook Rail Project. No access to this area therefore RPS (2020) data was used. Woodman has assessed the area since that time for verify Banksia Woodland TEC is present.
Photograph	Not provided by RPS

6.1.4 Vegetation Condition

Areas of native vegetation were mostly considered in Excellent condition. Minor weed invasion was present which is expected on the Swan Coastal Plain, particularly where parcels of vegetation have been dissected by tracks, fences, powerlines or similar linear infrastructure. Areas where rubbish, or more aggressive weeds were present were mapped as Very Good. No areas of Pristine vegetation were encountered since the survey area generally followed existing powerlines and associated access tracks.

Condition decline was prevalent in Whiteman Park paddocks, on private properties, and in Gnangara State Forest where historical clearing had occurred. Here vegetation was mapped as Good or Degraded. Paddocks and cleared areas with scattered native shrubs and trees, or areas where pine plantation has been removed and native species were slowly regenerating were mapped as Completely Degraded.

Cleared areas represent hardstand cleared (buildings, roads) and are not included in percentage calculations below. Vegetation condition is mapped on Figure 9.1 – 9.32 and extent of each category is presented in Table 23.

Table 23 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Excellent	41.36	8%
Very Good	12.92	3%
Good	34.39	7%
Degraded	49.85	10%
Completely Degraded	370.55	73%
Total	**509.07**	**100%**
Cleared	67.37	

6.2 Flora

6.2.1 Conservation Significant Flora

A Priority 2 species, *Calectasia ?elegans* was collected in the survey area (FdW221007-52). The sample was submitted to the WAH for formal identification (M. Hislop Acc 9927). Mike has advised that photographs of the root system are needed to verify whether the specimen represents the Priority 2 species. The individual was flowering at the time of the survey (Plate 3).

This species was recorded opportunistically at one location within Banksia Woodland north of Gnangara Road. There was one individual, mapped on Figure 9.17.



Plate 3 Calectasia ?elegans flowering

6.2.2 Flora Inventory

A total of 291 flora species were recorded including and 246 native and 45 weed species. Native species were best represented by Myrtaceae (31 species) and Fabaceae (25 species), followed by Asparagaceae (17 species), Orchidaceae (16 species) and Stylidiaceae (15 species). A total of 16 orchid species were identified, four of which can be seen in Plate 4.

A comprehensive species list, organised by family and the community they occur in, is presented in Appendix C. The flora quadrat data is presented in Appendix E.



Plate 4 **Four of the 16 orchids recorded clockwise from top left: *Caladenia arenicola, Diuris magnifica, Paracaleana nigrita* and *Pterostylis brevisepala,***

6.3 Fauna

6.3.1 Fauna Inventory

A total of 22 vertebrate fauna species were recorded during the field survey. This comprised of 17 bird and five mammals. A complete inventory of fauna species recorded within the survey area is provided in Table 24.

Three introduced species were recorded, all of which are listed under the BAM Act:

- Cat *Felis catus* (Declared Pest - s22(2)).
- European Red Fox *Vulpes* (Declared Pest - s22(2)).
- European Rabbit *Oryctolagus cuniculus* (Declared Pest - s22(2)).

Table 24 Fauna observations within the survey area

Class	Common Name	Taxon	Observation Type
Bird	*Anthochaera carunculata*	Red Wattlebird	Seen and heard
Bird	*Barnardius zonarius*	Australian Ringneck	Seen and heard
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Foraging evidence, seen and heard,
Bird	*Corvus coronoides*	Australian Raven	Seen and heard
Bird	*Dromaius novaehollandiae*	Emu	Tracks
Bird	*Eolophus roseicapilla*	Pink and Grey Galah	Seen and heard
Bird	*Grallina cyanoleuca*	Magpie-lark	Seen and heard
Bird	*Gymnorhina tibicen*	Australian Magpie	Seen and heard
Bird	*Lichenostomus virescens*	Singing Honeyeater	Seen and heard
Bird	*Lichmera indistincta*	Brown Honeyeater	Seen and heard
Bird	*Malurus splendens*	Splendid Fairywren	Seen and heard
Bird	*Phaps chalcoptera*	Common Bronzewing Pigeon	Seen and heard
Bird	*Rhipidura leucophrys*	Willie-wagtail	Seen and heard
Bird	*Smicrornis brevirostris*	Weebil	Seen and heard
Bird	*Zanda baudinii*	Baudin's Cockatoo	Seen and heard
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Foraging evidence, seen and heard
Bird	*Zosterops lateralis*	Silvereye	Seen and heard
Mammal	*Felis catus*	Feral Cat	Seen
Mammal	*Isoodon fusciventer*	Quenda	Tracks
Mammal	*Macropus fuliginosus*	Western Grey Kangaroo	Scat, tracks
Mammal	*Oryctolagus cuniculus*	European Rabbit	Scat, foraging evidence
Mammal	*Vulpes*	European Red Fox	Tracks

6.3.2 Conservation Significant Species

Evidence of four conservation significant species were recorded during the survey. This comprised of three birds and one mammal species. This included:

- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksia naso* (EPBC Act and BC Act Vulnerable).
- Baudin's Cockatoo *Zanda baudinii* (EPBC Act and BC Act Endangered).
- Carnaby's Cockatoo *Zanda latirostris* (EPBC Act and BC Act Endangered).
- Quenda *Isoodon obesulus* (Priority 4 BC Act).

Forest Red-tailed Black Cockatoos, Baudin's Cockatoo and Carnaby's Cockatoo were all seen or heard during the survey. Additionally foraging evidence for Carnaby's Cockatoos and Forest Red-tailed Black Cockatoos were identified (**Table 27**). Quenda were recorded via distinct tracks (Plate 5) Evidence of conservation significant species is mapped in Figure 10.1-10.32.



Plate 5 Quenda (Isoodon obesulus) tracks from 115.89006678, -31.6938726

6.3.3 Fauna Habitat

In total, nine fauna habitats were allocated to the linear corridor. The linear corridor covers a total of 576.37 ha of the survey area. Four native fauna habitat and five modified fauna habitats were recorded, fauna habitat is mapped in Figure 10.1-10.32. Native fauna habitat represents 160.35 ha (27.82%) of the survey area. The remaining survey area is represented by modified fauna habitat (416.02 ha, 72.18%). The modified habitat is described as mixed native introduced vegetation, urbanised land, clearing, tracks and infrastructure.

Fauna habitats are described in Table 25 including habitat suitability for conservation significant fauna species.

Table 25 Fauna habitat descriptions

Habitat Type	Area	Significant Fauna Species Likely to Utilise Habitat
Native Fauna Habitats		
Banksia Woodlands Low *Banksia* sp. woodlands with mixed understorey. Moderate understorey and leaf litter. Frequent logs of large mature Jarrah and Marri. Understorey contains *Gastrolobium* spp., *Lechenaultia* sp. and *Lomandra hermaphrodita.*	71.7 ha (12%)	Suitable habitat for: • a short-tongued bee *Leioproctus contrarius* • Bauldin's Cockatoo *Zanda baudinii* • Black-striped Burrowing Snake *Neelaps calonotos* • Carnaby's Cockatoo *Zanda latirostris* • Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* • Graceful Sunmoth *Synemon gratiosa* • Quenda *Isoodon fusciventer* • South-western Brush-tailed Phascogale *tapoatafa wambenger* • Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum* • Western Brush Wallaby *Notamacropus Irma* • Woollybush Bee *Hylaeus globuliferus* • Woylie *Bettongia penicillata ogilbyi*
Marri Woodlands Marri (*Corymbia calophylla*), Costal Blackbutt (*Eucalyptus todtiana*) and Jarrah (*Eucalyptus marginata*) dominate low open woodland with mixed understorey.	55.24 ha (10%)	Suitable habitat for: • Bauldin's Cockatoo *Zanda baudinii* • Black-striped Burrowing Snake *Neelaps calonotos* • Carnaby's Cockatoo *Zanda latirostris* • Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* • Peregrine Falcon *Falco peregrinus* • Quenda *Isoodon fusciventer* • South-western Brush-tailed Phascogale *tapoatafa wambenger* • Western Brush Wallaby *Notamacropus Irma* • Woylie *Bettongia penicillata ogilbyi*,
Wetlands Mixed ephemeral Paperbark (*Melaleuca preissiana)* wetlands, with *Kunzea micrantha* dominated shrub and mixed heath patches.	31.68 ha (5%)	Suitable habitat for: • Australian Little Bittern *Ixobrychus dubius* • Glossy Ibis *Plegadis falcinellus* • Western Swamp Tortoise *Pseudemydura umbrina*

Habitat Type	Area	Significant Fauna Species Likely to Utilise Habitat
Xanthorrhoea Shrubland Grasstree (*Xanthorrhoea preissii)* dominated shrublands, with mixed native understorey. Grasstrees have full skirts, and the soil present is sandy. Signs of native diggings were common. Infrequent Paperbark (*Melaleuca preissiana*) and other native trees.	1.73 ha (0.3%)	Suitable habitat for: • Black-striped Burrowing Snake *Neelaps calonotos* • Quenda *Isoodon fusciventer.* • Western Brush Wallaby *Notamacropus Irma* • Woylie *Bettongia penicillata ogilbyi,*
Modified Fauna Habitat		
Plantations Pine (*Pinus pinaster)* plantation or recently cleared land containing minimal to no native species. Consistent fine leaf litter. No understorey present and frequent logs common.	186.81 ha (32%)	Suitable habitat for: • Bauldin's Cockatoo *Zanda baudinii,* • Carnaby's Cockatoo *Zanda latirostris* • Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*
Adenanthos/Plantation Isolated pine (*Pinus pinaster*) over Woollybush (*Adenanthos cygnorum* var. *cygnorum), Grasstree* (*Xanthorrhoea preissii)* and *Macrozamia fraseri.* Proximately Woollybush, with minimal leaf litter and scattered native shrub on sandy soil.	135 ha (23%)	Suitable habitat for: • Bauldin's Cockatoo *Zanda baudinii,* • Carnaby's Cockatoo *Zanda latirostris* • Quenda *Isoodon fusciventer* • Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum* • Woollybush Bee *Hylaeus globuliferus* • Woylie *Bettongia penicillata ogilbyi,*
Tree over Cleared Scattered native species including *Eucalyptus, Banksia, Acacia, Xanthorrhoea* and *Hypocalymma* species.	18.17 ha (3%)	Suitable habitat for: • Bauldin's Cockatoo *Zanda baudinii,* • Carnaby's Cockatoo *Zanda latirostris* • Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* • Peregrine Falcon *Falco peregrinus*
Urban/Residential Mixed urban/residential land, containing both scattered native and introduced vegetation. Unnaturalised debris potentially utilised by native species as makeshift habitat.	14.14 ha (2%)	Unlikely to be suitable for significant fauna. Peregrine Falcon (*Falco peregrinus)* likely to conduct opportunistic hunting within the area, due to spiked invasive pests present. Urbanised habitat types are more frequently associated with pests and introduced species.

Habitat Type	Area	Significant Fauna Species Likely to Utilise Habitat
Cleared These areas are largely devoid of vegetation and include infrastructure and historically cleared tracks. Cleared tracks between vegetation are likely to be used as a crossing to other vegetated areas.	61.89 ha (11%)	Not suitable for significant fauna.

6.3.4 Black Cockatoo Survey

6.3.4.1 Foraging

The survey area has been assessed as a score of **10** 'High-quality foraging habitat' (Table 26) for Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Carnaby's Cockatoo (*Zanda latirostris).* Based on the scoring tool criteria, no subtractions were made. Bauldin's Cockatoo (*Zanda baudinii)* received a score of **8**, as no foraging evidence for this species was located within the survey area. As per the guidelines, the foraging tool is applied once to the total impact area. This tool only applies to sites equal to or larger than 1 hectare in size. The survey area contains Banksia Woodlands, Marri Woodlands with Jarrah, Banksia Woodlands, Trees Over Cleared and Plantations with suitable foraging species.

Foraging habitat is presented spatially in Figure 10.1 – 10.32. The foraging quality assessments are presented in Table 26. Foraging evidence from Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Carnaby's Cockatoo (*Zanda latirostris)* were recorded within the survey area (Table 27). This included chewed Marri nuts and Banksia cone foraging. All three species were recorded via sightings or call identification within the survey area.

Table 26 Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)

Starting Score		Baudin's Cockatoo (*Zanda baudinii)*		Carnaby's Cockatoo (*Zanda latirostris)*		Forest Red-Tailed Black Cockatoo *(Calyptorhynchus banksii naso)*	
		Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation**. This tool only applies to sites equal to or larger than 1 hectare in size.**		**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.**		**Start at a score of 10** if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri Forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. **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.	☒	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☐	**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.	☐	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐	**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.	☐	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐

Starting Score		Baudin's Cockatoo (*Zanda baudinii)*		Carnaby's Cockatoo (*Zanda latirostris)*		Forest Red-Tailed Black Cockatoo *(Calyptorhynchus banksii naso)*	
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.	☐	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☐	**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.	☐	**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.	☐	**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.	☐
		8		**10**		**10**	

Table 27 Black Cockatoo Foraging Evidence

Species	Description	Photo
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)*	Typical chewing on marri nuts.	
Carnaby's Cockatoo (*Zanda latirostris)*	*Banksia* cone foraging.	

6.3.4.2 Roosting

Seven confirmed Black Cockatoo roosting sites intersect with the survey area. A total of 63 known Black Cockatoo roosting sites were identified by DBCA within 20 km of the survey area. This 20 km buffer is the required buffer size for the DAWE (2022) Black Cockatoo referral guidelines.

6.3.4.3 Breeding

A total of 217 trees with a suitable DBH (>500 mm) were recorded (Figure 10.1 – 10.32). This consisted of 172 Marri (*Corymbia calophylla*), 18 Jarrah (*Eucalyptus marginata*), ten Stags, nine Costal Blackbutt (*Eucalyptus todtiana*), two introduced species, one Flooded Gum (*Eucalyptus rudis*), and five unidentified *Eucalypt* species. Across the entire survey area 14 potential breeding trees were determined to have a hollow with suitable entrance sizes for Black Cockatoos (Table 28; Plate 6). No active Black Cockatoo breeding activity or nesting was observed during the field survey.



Plate 6 Black Cockatoo Potential Breeding Trees

Table 28 Black Cockatoo Breeding and Potential Breeding Trees with Hollows

ID	Species	Height (m)	DBH (cm)	Coordinates	
9	Marri (*Corymbia calophylla*)	20-25	128	115.9178338	-31.8098632
10	Stag	5-10	98	115.9175183	-31.8085776
11	Stag	10-15	105	115.917501	-31.80761604
18	Stag	5-10	60	115.9174619	-31.80690047
18	Stag	20-25	110	115.9174888	-31.8042759
87	Stag	20-25	110	115.9174888	-31.8042759
87	Stag	5-10	83	115.8864656	-31.6890502
101	Stag	5-10	83	115.8864656	-31.6890502
156	Coastal Blackbutt (*Eucalyptus todtiana*)	15-20	110	115.9173776	-31.80191304
160	Marri (*Corymbia calophylla*)	20-25	84	115.9153696	-31.79914635
160	Marri (*Corymbia calophylla*)	20-25	68	115.9171117	-31.8013066
160	Marri (*Corymbia calophylla*)	20-25	68	115.9171117	-31.8013066
166	Marri (*Corymbia calophylla*)	20-25	68	115.9171117	-31.8013066
167	Marri (*Corymbia calophylla*)	15-20	70	115.9171558	-31.80092704

7.0 Discussion

7.1 Vegetation

Fifteen native vegetation communities were mapped across 307.11 ha between Pinjar and Malaga Power Station. The survey area intersects with five Wetlands, four Banksia Woodlands, three Eucalypt Woodlands and two Disturbed Areas. The diversity of the survey area is typical of linear corridors covering numerous land systems, soil types, landforms and condition.

As is typical of the Swan Coastal Plain, all intact areas of vegetation had a high diversity, in particular the Banksia Woodlands. Banksia Woodlands BaCpSr had the highest species richness with an average of 60 species per 100 m^2. Species richness was directly correlated with disturbance, in particular weed displacement and clearing (both historically and for current access tracks).

Areas of Banksia Woodlands all represented the Banksia Woodlands TEC listed as Endangered under the EPBC Act. This TEC was expected to occur, informed by the desktop study results and local knowledge of the area. Its presence was supported by assessing patches against the key diagnostic characteristics, the FCT analysis, and applying the condition and size thresholds.

The TEC occurs sporadically throughout between the very northern extent of the survey area near Pinjar Power Station, down to Marshall Paddocks in Whiteman Park where the Malaga-Ellenbrook train intersects with the survey area. Eight patches were mapped, extending a total of 63.18 ha. All eight occurrences the TEC extends beyond the survey area. In two cases (Patch 2 and 3) the survey area intersects with the edge of the patch therefore the true value of that TEC should consider the value of the entire patch rather than data collected from the edge where weed invasion and erosion have influenced species richness.

Three Priority 3 PECs listed by DBCA (2022) were confirmed to occur. FCT 21c (low lying *Banksia attenuata* woodlands or shrublands) was confirmed at one location represented by four quadrats. This FCT/PEC represents low-lying areas adjacent to wetlands and sometimes presented as an ecotone between the winter-wet areas and adjacent Banksia Woodlands. The PEC did not directly correlate to the Banksia Woodlands TEC with two quadrats dominated by *Melaleuca preissiana*. The desktop study shows that this PEC intersects with the survey area at Malaga-Ellenbrook Train Line/ Tonkin Highway Banksia Woodlands (Patch 8 Banksia Woodlands PEC). This PEC was not inferred at this patch by RPS (2021) and may have been cleared recently.

FCT 23b was recorded at numerous locations throughout the survey area including Patch 1, 4, 5 and 6. It seemed restricted to areas adjacent to, and north of, Gnangara Road. The PEC was inferred for seven quadrats with moderate to high similarity to SCP dataset quadrats representing this FCT. This PEC was known to occur at Patch 8, similar to FCT 21c, near Malaga-Ellenbrook Train / Tonkin Highway. It was not inferred in the RPS (2021) report and may have been cleared.

The Banksia Woodlands PEC was inferred for all patches of Banksia Woodlands TEC that did not represent FCT 21c or FCT 23b.

One TEC listed as Endangered under the BC Act intersects with the survey area according to the DBCA desktop results. the Southern wet shrublands, Swan Coastal Plain (FCT 2) was known to occur at the Tonkin Highway / Marshall Road intersection. This community has been cleared for development and no longer exists.

No Tuart Woodlands or limestone outcrops were encountered during the survey, thereby excluding the Tuart Woodlands of the Swan Coastal Plain TEC and the two TECs associated with limestone (shrublands and woodlands on Muchea limestone and, *Melaleuca huegelii-Melaleuca systena* shrublands on limestone).

Other significant communities worth a mention would be intact remnant native vegetation associated with wetlands. All wetlands encountered were considered ‘typical’ of the Bassendean land system, i.e. shallow wetlands between dune swales on sandy soils. Riparian vegetation plays an important role in maintaining wetland function and values. Five wetland communities were mapped, three of these represent intact native vegetation and two represent regenerated vegetation post disturbance. Intact wetland vegetation (MpHaDb, MpKgDs and KmHg) as mapped for 21.33 ha.

7.2 Flora

Flora diversity was considered high, with 246 native flora species recorded. This is typical for linear corridors on the Swan Coastal Plain where diversity is generally high. Diversity was influenced by the extent of the corridor, and the number of vegetation communities and landforms encountered, including the regenerated pine plantation, intact Banksia and Eucalypt woodlands and wetland vegetation.

One individual of the Priority 2 species *Calectasia ?elegans* was recorded at one location in Gnangara State Forest. This species can only be verified by assessing root structure and verifying the presence (or absence) of stilted roots.

Targeted searches for *Caladenia huegelii* were undertaken walking linear traverses 10 m apart in Banksia Woodlands. The intact woodlands in the survey area are considered marginal habitat, except perhaps at Patch 2 Banksia Woodlands TEC near Wanneroo Station. *C. huegelii* prefers mixed woodlands (*E. marginata, C. calophylla, B. ilicifolia, B. attenuata, B. menziesii* and *Allocasuarina fraseriana* with dense understorey (DEC, 2009).

7.3 Fauna

A total of 22 vertebrate fauna species were recorded during the field survey. This comprised 17 bird species and five mammals. Four conservation significant species were recorded during the survey. This comprised of; *Calyptorhynchus banksia naso*, Bauldin's Cockatoo *Zanda baudinii*, Carnaby's Cockatoo *Zanda latirostris* and Quenda *Isoodon obesulus*.

Based on the fauna habitats that were assessed, the habitats observed are considered suitable habitat for 16 conservation significant fauna species, including:

- A short-tongued bee *Leioproctus contrarius* (Priority 3 BC Act).
- Australian Little Bittern *Ixobrychus dubius,* (Priority 4 BC Act).
- Bauldin's Cockatoo *Zanda baudinii,* (EPBC Act and BC Act Endangered).
- Black-striped Burrowing Snake *Neelaps calonotos,* (Priority 3 BC Act).
- Carnaby's Cockatoo *Zanda latirostris,* (EPBC Act and BC Act Endangered).
- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso,* (EPBC Act and BC Act Vulnerable).
- Glossy Ibis *Plegadis falcinellus,* (EPBC Act and BC Act Migratory).
- Graceful Sunmoth *Synemon gratiosa,* (Priority 4 BC Act).
- Peregrine Falcon *Falco peregrinus,* (Other Specially Protected BC Act).
- Quenda *Isoodon fusciventer.* (Priority 4 BC Act).
- South-western Brush-tailed Phascogale *tapoatafa wambenger,* (Vulnerable and Conservation Dependant BC Act).
- Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum,* (Priority 3 BC Act).
- Western Brush Wallaby *Notamacropus Irma,* (Priority 4 BC Act).
- Western Swamp Tortoise *Pseudemydura umbrina,* (EPBC Act and BC Act Critically Endangered).
- Woollybush Bee *Hylaeus globuliferus,* (Priority 3 BC Act).
- Woylie Bettongia penicillata ogilbyi (EPBC Act Endangered and BC Act Critically Endangered) .

Due to the elusive nature of some of these significant species, they may occur within the survey area despite not being recorded during the course of the survey.

Plantation is the largest habitat type present and represents 32% of the survey area (186.81 ha). The plantation present is directly mentioned in the DAWE referral guidelines (2022) as suitable foraging and night roosting habitat. Pines are considered 'Exotic foraging habitat' for all three Black Cockatoo species and is known to be utilised within the survey area (DAWE, 2022).

Adenanthos/Plantation was the second most dominate habitat type at 23% (135.01 ha). This habitat is a mixed habitat of Woollybush (*Adenanthos cygnorum var. cygnorum)* regrowth with scattered *Pinus pinaster*. Xanthorrhoea preissii* and *Macrozamia fraseri* are also frequent in this habitat type. Logs were infrequent and only that of the pine species. Woollybush (*Adenanthos cygnorum var. cygnorum))* is the core source of food for Woollybush Bees (*Hylaeus globuliferus),* therefore this habitat type is ideal habitat for this species (Houston, 2018). Again, the pines present are known considered exotic foraging habitat for the three WA Black Cockatoo species. Woylie's (*Bettongia penicillata ogilbyi*) and Quenda (*Isoodon fusciventer)* would benefit from this habitat as the low dense shrubland and sandy soil is ideal for foraging and predation protection (Van Dyck & Strahan, 2008). The Swan Coastal Plain Shield-backed Trapdoor Spider would utilise this habitat as the sandy soil and abundance of leaf litter are ideal for burrow building (Rix et al., 2018).

Banksia Woodlands is the largest native fauna habitat (12%, 71.70 ha). A total of 13 species would utilise this habitat as a result of the assemblage of native woodlands mixed with a diverse native understorey on sandy soil. Black Cockatoos would utilise the presence of Banksia, Jarrah and Marri for foraging and tree hollow utilisation. These same trees species would be ideal shelter and connectivity for *Phascogale tapoatafa wambenger,* who is likely to inhabit hollows present within this habitat.

Banksia Woodlands are known to be core habitat for the Black-striped Burrowing Snake (*Neelaps calonotos*) as the presence of loose soil beneath leaf litter and abundance of suitable tree and shrub bases are typical resting and hunting locations for the species (Bush et al., 2010). The sandy soil and leaf litter also appeals to The Swan Coastal Plain Shield-backed Trapdoor Spider as ideal burrow building conditions (Rix et al., 2018).

The low woodlands assemblage of vegetation in the Banksia Woodlands habitat type would be ideal for Quenda, Woylie and Western Brush Wallabies. It is their preferred habitat type that provides food and shelter (Van Dyck & Strahan, 2008). The flora and vegetation survey identified core species within the Banksia Woodlands habitat that would be of benefit to certain invertebrate species (Houston, 2010: DEC, 2011), relevance of these species are discussed below.

The presence of *Lechenaultia sp.* is associated heavily with the short-tounged bee species, *Leioproctus contrarius,* and therefore the species is highly likely to utilise the habitat. Woollybush (*Adenanthos sericeus)* was also noted to be present within the Banksia Woodlands, as a result the Woollybush Bee would likely reside within the habitat type. *Lomandra sp*. were identified within the Banksia Woodlands, in particular *Lomandra hermaphrodita.* The Graceful Sunmoth (*Synemon gratiosa)* is associated with Banksia woodland where the known host plant *L. hermaphrodita* is widespread.

Marri Woodlands would be ideal for Black Cockatoos, Black-striped Burrowing Snake, Quenda, Woylie, Western Brush Wallaby and South-western Brush-tailed Phascogale. The Marri Woodlands were open in nature with a sparse tree canopy. The presence of open woodlands would be ideal for Peregrine Falcons (*Falco peregrinus).* This Marri Woodland was restricted to the southern sector of the linear corridor. The open vegetation is ideal for hunting and the presence of Jarrah and Marri could be utilised by the species at temporary roosting.

Xanthorrhoea Shrubland lacks a tree canopy and therefore the habitat type would be better suited to small marsupials and species that would take advantage of *Xanthorrhoea preissii* skirts for shelter. Woylies, Quenda and Black-striped Burrowing Snakes are known to inhabit *Xanthorrhoea preissii,* especially those that are unburnt and dense. *Xanthorrhoea preissii* provide dense understorey vegetation, in addition to food, and shelter from predation pressures. This habitat allows for high levels of nesting and foraging for small marsupial and reptile species (Haby et al., 2013).

Wetlands represent Mixed ephemeral Paperbark (*Melaleuca preissiana)* wetlands, with *Kunzea glabrescens* dominated shrub and mixed heath patches. Wetland birds such as the Australian Little Bittern (*Ixobrychus dubius*) and the Glossy Ibis (*Plegadis falcinellus)* are likely to utilise this habitat. Western Swamp Tortoise are historically known to inhabit ephemeral swamps on the clay soils of the Swan Coastal Plain (DBCA, 2017).

Trees over Cleared represents scattered native species in paddocks. Tree species include *Eucalyptus, Banksia and Acacia.* This habitat also included scattered *Xanthorrhoea* and *Hypocalymma*. This habitat presents foraging and roosting habitat for avian species including listed species such as Black Cockatoos and Peregrine Falcon *Falco peregrinus*.

Urban/Residential land was mapped for 14.14 ha these areas would provide little suitable habitat for any conservation significant species. Opportunistic hunting habitat for birds of prey such as the Peregrine Falcon, would occur. Urbanisation and residential lands have enhanced invasive and introduced species potential (Marques et al., 2020). As a bird of prey that is known to reside within urban locations (DCCEEW, 2023), the Peregrine Falcon would likely prey on the increased pest species such as mice and rats. Urban/Residential fauna habitat is unique to cleared habitat as, urban and residential contains infrastructure and mixed in with gardens and other scattered vegetation often planted. Cleared habitat fauna is devoid of any vegetation, and often represents roads, tracks, and allotments of clearing.

The remaining habitat within the survey area is cleared. Cleared habitat between vegetated areas is critical for connectivity but does not provide suitable vegetation or food source itself. Therefore, it is not a suitable habitat for any conservation significant species listed.

7.3.1 Black Cockatoo Survey

Direct or indirect evidence of all three species of WA's Black Cockatoo were recorded during the survey. Additionally, Forest Red-tailed Black Cockatoos, Baudin's Cockatoo and Carnaby's Cockatoo were all seen or heard during the survey.

Fourteen hollows had dimensions and characteristics described by Johnstone et al (2010) and Groom (2010) that would be suitable to support breeding for Black Cockatoos.

The foraging score of vegetation within the survey area was rated as 10 (High quality foraging) for Forest Red-tailed Black Cockatoos and Carnaby's Cockatoo as per DAWE (2022) guidelines. The score was 8 (also High quality foraging) for Baudin's Cockatoo. The score for Baudin's was reduced due to lack of foraging evidence.

As there is currently no impact area defined, it is a requirement of the DAWE Black Cockatoo Referral Guidelines that the full impact area, allowing for all direct and indirect impacts, is assessed when using assessing foraging habitat value.

The DAWE (2022) foraging score tool does not incorporate variance in fauna habitat types within a survey area. Instead, it encourages one score to be applicable for an entire area. it should be noted that areas of native habitat containing foraging species such as *Banksia sp.* and *Eucalypts sp*. such as the Banksia Woodlands, Marri Woodlands are considered higher value foraging habitat. Trees over Cleared would provide scattered foraging species likely to be utilised by Black Cockatoo species. Areas representing Wetlands and *Xanthorrhoea* Shrubland, have lower value, and did not show any evidence of Black Cockatoo foraging or abundance of foraging species. Plantations and *Adenanthos*/Plantation habitat are exotic foraging species and represent their own value to habitat foraging, as introduced adapted foraging. Urban/Residential and Cleared are largely devoid of native or exotic foraging species and therefore provide little to no value for Black Cockatoo species.

The Black Cockatoo habitat value varies based on the vegetation present. The cleared areas provide no habitat value for Black Cockatoos as there is no viable species for breeding, roosting or foraging present. Plantations and *Adenanthos*/Plantation habitat has been identified as 'High quality native foraging' in the Figure 10.1 – 10.32. These habitat types are more correctly identified as 'Exotic foraging habitat' in the referral guidelines (DAWE, 2022). In this project they have been visually grouped with native foraging as the referral threshold for both foraging types is the same.

8.0 Conclusion

AECOM was engaged by Western Power to complete a spring flora, vegetation, fauna and Black Cockatoo assessment. The assessment included a detailed desktop study, numerous field days undertaken between September and November, and a reporting component.

A summary of significant results is presented below.

- One individual of *Calectasia ?elegans* (P2) was recorded.
- The Banksia Woodlands TEC listed under the EPBC Act was mapped for 63.18 ha across 8 patches.
- Three PECs were recorded including Low lying *Banksia attenuata* woodlands or shrublands (Floristic Community Type 21c) mapped over 6.80 ha, Swan Coastal Plain *Banksia attenuata-B. menziesii* woodlands (Floristic Community Type 23b) mapped over 27.76 ha, and Banksia Dominated Woodlands of the Swan Coastal Plain mapped over 29.82 ha.
- Intact Wetland vegetation is considered high value to maintain important functions of the wetland, mapped for 21.33 ha.
- The foraging habitat quality for Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo was 10 (High quality native foraging). A foraging score of 8 was applicable for Baudin's Cockatoo in the absence of foraging evidence.
- Four conservation significant fauna species were recorded: Forest Red-tailed Black Cockatoo (Calyptorhynchus banksia naso) (EPBC Act and BC Act Vulnerable), Bauldin's Cockatoo (Zanda baudinii) (EPBC Act and BC Act Endangered), Carnaby's Cockatoo (Zanda latirostris) (EPBC Act and BC Act Endangered), and Quenda (Isoodon obesulus) (Priority 4 BC Act).
- Fauna habitats represented suitable habitat for 16 conservation significant fauna species:
    - A short-tongued bee *Leioproctus contrarius* (Priority 3 BC Act),
    - Australian Little Bittern *Ixobrychus dubius*, (Priority 4 BC Act),
    - Bauldin's Cockatoo *Zanda baudinii,* (EPBC Act and BC Act Endangered),
    - Black-striped Burrowing Snake *Neelaps calonotos*, (Priority 3 BC Act),
    - Carnaby's Cockatoo *Zanda latirostris*, (EPBC Act and BC Act Endangered),
    - Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*, (EPBC Act and BC Act Vulnerable),
    - Glossy Ibis *Plegadis falcinellus*, (EPBC Act and BC Act Migratory),
    - Graceful Sunmoth *Synemon gratiosa*, (Priority 4 BC Act),
    - Peregrine Falcon *Falco peregrinus*, (Other Specially Protected BC Act),
    - Quenda *Isoodon fusciventer.* (Priority 4 BC Act),
    - South-western Brush-tailed Phascogale *tapoatafa wambenger*, (Vulnerable and Conservation Dependant BC Act),
    - Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum*, (Priority 3 BC Act),
    - Western Brush Wallaby *Notamacropus Irma,* (Priority 4 BC Act),
    - Western Swamp Tortoise *Pseudemydura umbrina*, (EPBC Act and BC Act Critically Endangered),
    - Woollybush Bee *Hylaeus globuliferus*, (Priority 3 BC Act),
    - Woylie *Bettongia penicillata ogilbyi* (EPBC Act Endangered and BC Act Critically Endangered).

The survey area represents a long linear corridor that traverses a variety of vegetation communities and fauna habitats. Significant values were restricted to areas that represent intact native vegetation including Banksia and Eucalypt Woodlands and Wetland vegetation, or areas that supported mature trees suitable for Black Cockatoo breeding and foraging.

A few limitations influenced the survey including; access to private properties which was mitigated through assessing areas from the edge and aerial imagery interpretation, and the ability to confirm the presence of the Priority 2 *Calectasia ?elegans* lacking suitable information from root structure.

9.0 References

Atlas of Living Australia (AoLA), 2022. Available at: https://www.ala.org.au/. Accessed December 2021.

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

Birdlife Australia, 2023 Species profile. Available online at: https://birdlife.org.au/bird-profiles/

BOM, 2022. Climate Statistics for Australian Locations. Bureau of Meteorology. http://www.bom.gov.au/climate. Accessed March 2022.

Burbidge, A.A. & G. Kuchling, 2004. NON-CURRENT National Recovery Plan for the Western Swamp Tortoise (Pseudemydura umbrina). Perth: Department of Conservation and Land Management.

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

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.

Davis, R.W. & C. Tauss, 2011. A new and rare species of Ptilotus (Amaranthaceae) from a suburban wetland of the eastern Swan Coastal Plain, Western Australia. Nuytsia. 21(3):97-102.

DBCA, 2018. Carnaby's Cockatoo Confirmed Roost Sites (DBCA-050). Government of Western Australia.

DBCA, 2021. Methods for Survey and Identification of Western Australian Threatened Ecological Communities, Biodiversity and Science, Department of Biodiversity, Conservation and Attractions, 21 December 2021.

DBCA, 2022. Priority Ecological Communities for Western Australia Version 34. Species and Communities Program, Department of Biodiversity, Conservation and Attractions, 21 December 2022.

DCCEEW, 2022. Species Profiles and Threats Database. Online resource: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl. Accessed November 2021.

DEC, 2006. *Slender Andersonia* (Andersonia gracilis) *Interim Recovery Plan 2006-2011. Interim Recovery Plan No. 228*. Department of Environment and Conservation, Western Australia

DEC, 2007. Records held in DEC's Declared Flora Database and rare flora files. Perth, Western Australia: Department of Environment and Conservation.

DEC, 2009. Grand Spider Orchid (Caladenia huegelii) Recovery Plan. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.

DEC, 2009a. Wavy-leaved Smokebush (Conospermum undulatum) Recovery Plan. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.

DEC, 2009b. Glossy-leafed Hammer Orchid (Drakaea elastica) Recovery Plan. Department of Environment and Conservation, Western Australia.

DEC, 2009c. Keighery's Macarthuria (Macarthuria keigheryi) Recovery Plan. Department of Environment and Conservation, Perth, Western Australia.

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.

Department of Agriculture, Water and the Environment (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

Department of Biodiversity, Conservation and Attractions, 2017. Fauna Profile. Retrieved from http://www.dbca.wa.gov.au/

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023. Species Profile and Threats Profile. Available from: https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Department of Environment and Conservation (DEC), 2008. Western Swamp tortoises released at Moore River Nature Reserve.

Department of Environment and Conservation (DEC), 2011. Survey guidelines for the Graceful sun-moth (Synemon gratiosa) & site habitat assessments. Kensington, Western Australia.

DEWHA, 2008a. *Approved Conservation Advice for* Acacia anomala *(Grass Wattle)*. Canberra: Department of the Environment, Water, Heritage and the Arts

DEWHA, 2008b. Approved Conservation Advice for Acacia aphylla (Leafless Rock Wattle). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008c. Approved Conservation Advice for Dryandra mimica (Summer Honeypot). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008d. Approved Conservation Advice for Diuris micrantha (Dwarf Bee-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008e. Approved Conservation Advice for Diuris purdiei (Purdie's Donkey-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008f. Approved Conservation Advice for Eleocharis keigheryi (Keighery's Eleocharis). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008g. *Approved Conservation Advice for* Grevillea flexuosa *(Zig Zag Grevillea)*. Canberra: Department of the Environment, Water, Heritage and the Arts

DEWHA, 2008h. Approved Conservation Advice for Lepidosperma rostratum (Beaked Lepidosperma). Canberra: Department of the Environment, Water, Heritage and the Arts

DEWHA, 2008i. Approved Conservation Advice for Thelymitra stellata (Star Sun-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008j. Approved Conservation Advice for Hydatella dioica (One-sexed Hydatella). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2008k. Approved Conservation Advice for Grevillea christineae (Christine's Grevillea). Canberra: Department of the Environment, Water, Heritage and the Arts

DEWHA, 2009. Approved Conservation Advice for Darwinia sp. Muchea (B.J.Keighery 2458) (Muchea Bell). Canberra: Department of the Environment, Water, Heritage and the Arts.

DEWHA, 2009. Approved Conservation Advice for Synaphea sp. Fairbridge Farm (D. Papenfus 696) (Selena's Synaphea). Canberra, ACT: Department of the Environment, Water, Heritage and the Arts.

DotEE, 2017. Australian Vegetation Attribute Manual Version 7.0, Department for the Environment and Energy, Canberra

DSEWPaC, 2012. EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered), Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable), Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable), Calyptorhynchus banksii naso.

DSEWPaC, 2012. EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species. Australian Government. Department of Sustainability, Environment, Water, Population and Communities, Canberra

DWER, 2023. Healthy Rivers Southwest – Black-stripe minnow - *Galaxiella nigrostriatal*. Accessed 19/04/2023. https://rivers.dwer.wa.gov.au/species/galaxiella-nigrostriata/

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

French M, 2012. Eucalyptus of Western Australia's Wheatbelt. Malcolm French.

Gibson N, Keighery B, Keighery G, Burbidge A, & 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.

Gilfillan et al., 2007. South Coast Threatened Birds Recovery Plan Western Ground Parrot Pezoporus wallicus flaviventris, Western Bristlebird Dasyornis longirostris, Noisy Scrub-bird or Tjimiluk Atrichornis clamosus, Western Whipbird (Western Heath Subspecies) Psophodes nigrogul. Western Australian Department of Environment and Conservation, Perth.

Groom C, 2010. Artificial hollows for Carnaby's black cockatoo: An investigation of the placement, use, monitoring and maintenance requirements of artificial hollows for Carnaby's black cockatoo. Department of Environment and Conservation.

Haby et al., 2013. Microhabitat and vegetation structure preference: an example using southern brown bandicoots (Isoodon obesulus obesulus). Journal of Mammalogy, 94(4), 801-812. doi: 10.1644/12-mamm-a-220.1

Heddle EM, Loneragan OW, and Havel JJ, 1980 Vegetation of the Darling System. IN: DCE 1980 Atlas of Natural Resources, Darling System, Western Australia. Department of Conservation and Environment, Perth, Western Australia

Higgins, P. J., & Davies, S. J.,1996. Handbook of Australian, New Zealand & Antarctic birds. Vol. 3, Snipe to pigeons. Oxford University Press.

Hopper, S.D. & A.P. Brown, 2006. Australia's wasp-pollinated flying duck orchids revised (Paracaleana: Orchidaceae). Australian Systematic Botany. 19:211-44.

Houston, T.F., 2018. A guide to native bees of Australia. CSIRO Publishing, Clayton, South Victoria.

IBRA7, 2012. Interim Biogeographic Regionalisation for Australia, Version 7. Available at http://www.environment.gov.au/system/files/pages/5b3d2d31-2355-4b60-820c-e370572b2520/files/bioregions-new.pdf.

Invertebrate Solutions, 2019. Short Range Endemic (SRE) Desktop Habitat Assessment report, Western Australia. Prepared for the Public Transport Authority, Western Australia

Johnstone RE, Johnstone C, Kirkby T, 2010. Carnaby's cockatoo, Baudin's Cockatoo and the Forest red-tailed black cockatoo on the Swan Coastal Plain, Western Australia: Studies on distribution, status, breeding, food movements and historical changes. Report to the Department of Planning, Perth.

Johnstone, R. E., & Storr, G. M., 1998. Handbook of western Australian birds. Western Australian Museum.

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

Klunzinger MW., 2012. Ecology, life history and conservation status of Westralunio carteri Iredale 1934, an endemic freshwater mussel of south-western Australia. PhD Thesis, Murdoch University: Perth, Western Australia.

Marchant S, Higgins PJ, (Eds)., 1993. 'Handbook of Australian, New Zealand and Antarctic birds (Vol. 2).' (Oxford University Press: Melbourne)

Marques et al., 2020. Urbanization can increase the invasive potential of alien species. *J Anim Ecol*. 2020; 89: 2345– 2355. https://doi.org/10.1111/1365-2656.13293

Mitchell D, Williams K, Desmond A, 2002, 'Swan Coastal Plain 2 (SWA2 – Swan Coastal subregion)' in CALM 2002. Bioregional Summary of the 2002 Biodiversity Audit for Western Australia. Department of Conservation and Land Management, Perth, Western Australia.

Mitchell, D Williams, K Desmond, A 2002, 'Swan Coastal Plain 2 (SWA2 – Swan Coastal subregion)' in CALM 2002. *Bioregional Summary of the 2002 Biodiversity Audit for Western Australia*. Department of Conservation and Land Management, Perth, Western Australia.

Morgan et al., 2011. A Field Guide to Freshwater Fishes, Crayfishes and Mussels of South Western Australia. Published by SERCUL, Western Australia.

Newton, I., Kavanagh, R., Olson, J. and Taylor, I. (eds.)., 2002. Ecology and Conservation of Owls. CSIRO Publishing. Collingwood Victoria.

Pizzey, G., & Knight, F., 2012. The field guide to the birds of Australia, 9th edition. Harper Collins. Sydney.

Rix, M. G., Huey, J. A., Cooper, S. J., Austin, A. D., & Harvey, M. S., 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.

TSSC, 2015. Conservation Advice Conospermum densiflorum subsp. unicephalatum one-headed smokebush. Canberra: Department of the Environment.

TSSC, 2016a. Conservation Advice Chamelaucium sp. Gingin (N.G.Marchant s.n., 4/11/1988) Gingin wax. Canberra: Department of the Environment and Energy.

TSSC, 2016b. Conservation Advice Eucalyptus leprophloia scaly-butt mallee. Canberra: Department of the Environment.

TSSC, 2016c. *Conservation Advice* Grevillea althoferorum *split-leaved grevillea*. Canberra: Department of the Environment.

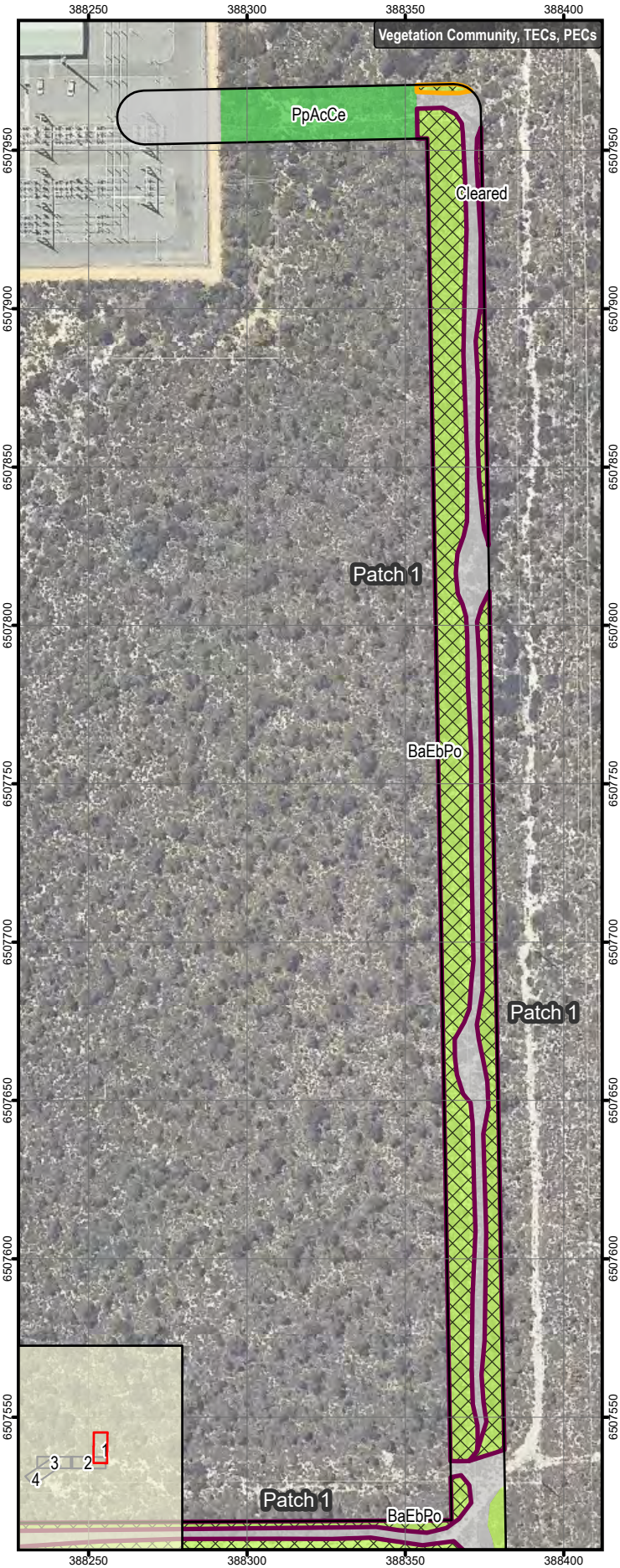
TSSC, 2016d. Conservation Advice Thelymitra dedmaniarum cinnamon sun orchid. Canberra: Department of the Environment and Energy.

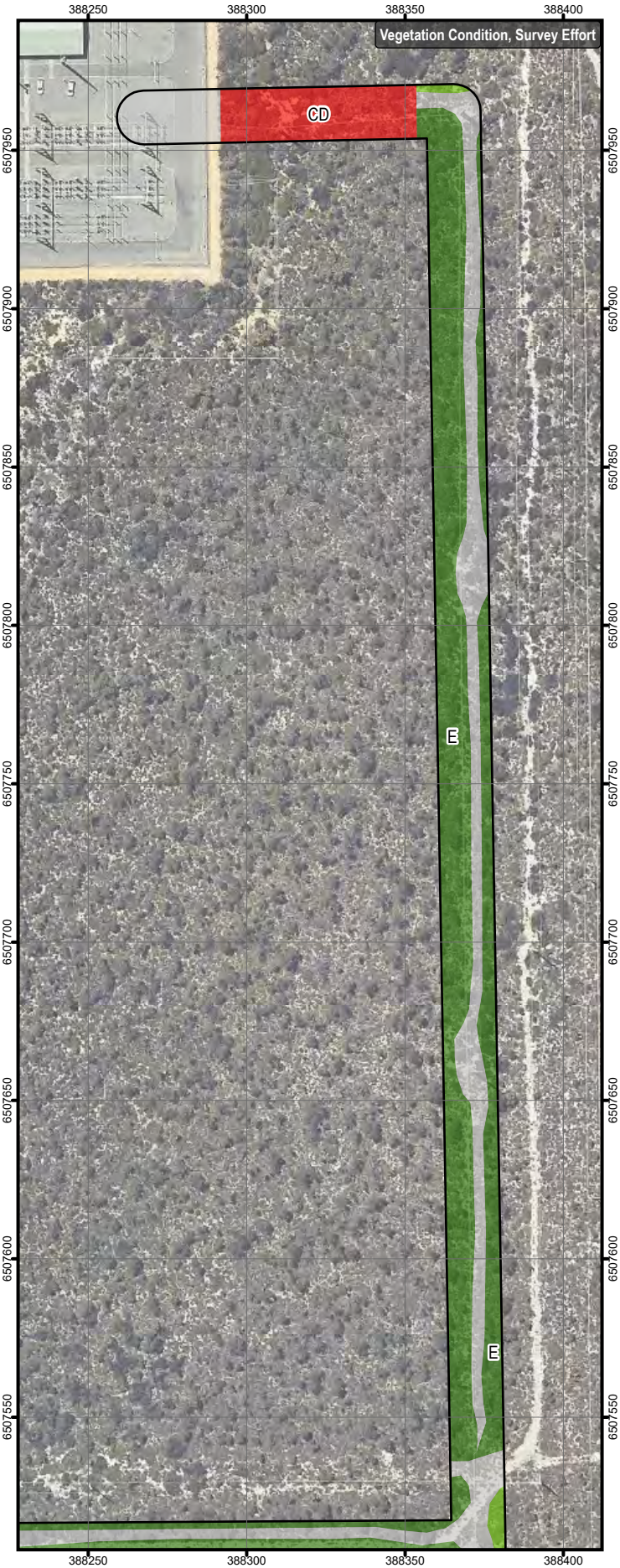
Van Dyck S, & Strahan R, 2008. The Mammals of Australia Third Edition. Reed New Holland: Chatswood, New South Wales.

Western Australian Herbarium (WAH), 1998-. Florabase: Online Resource. Available at https://florabase.dpaw.wa.gov.au. Accessed August 2021.

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

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LEGEND

Survey Area

Vegetation Unit
- BaEbPo
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

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

Vegetation Communities and Condition

WESTERN POWER

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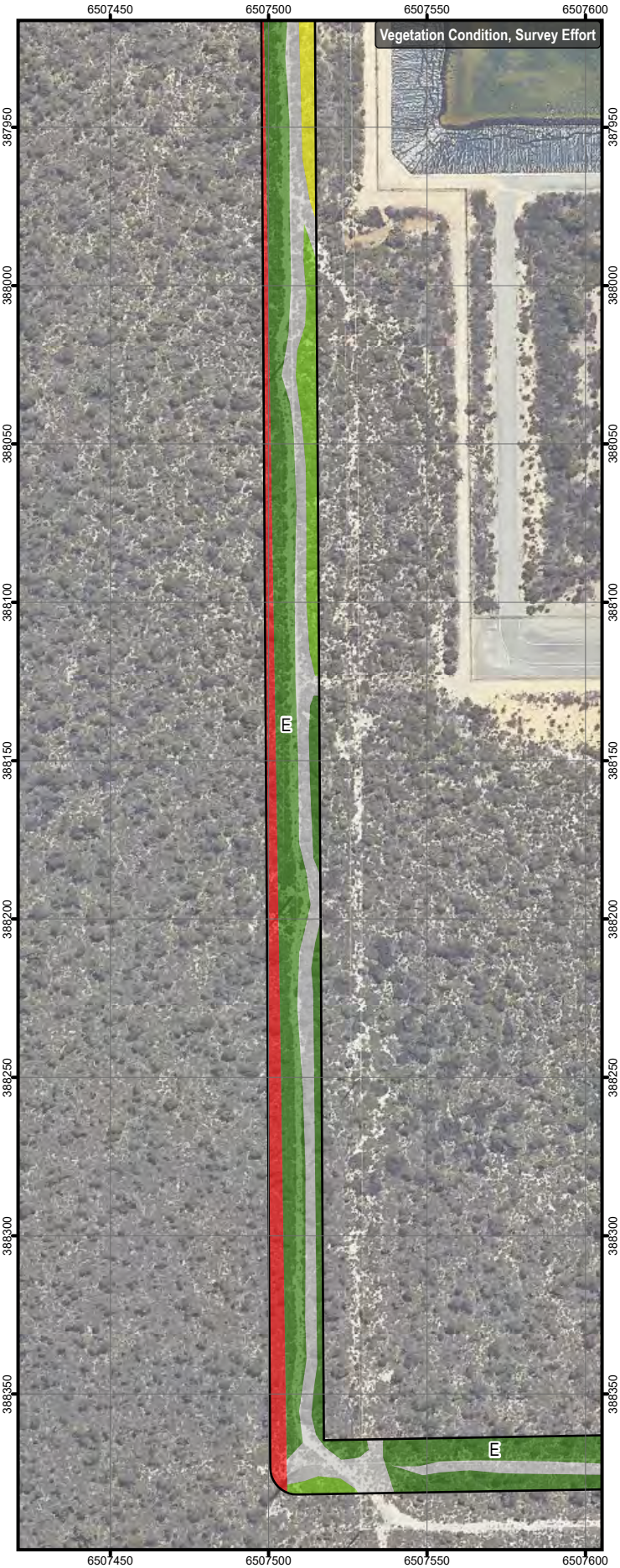
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LEGEND

Survey Area

Vegetation Unit
- BaEbPo
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

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

Vegetation Communities and Condition

WESTERN POWER

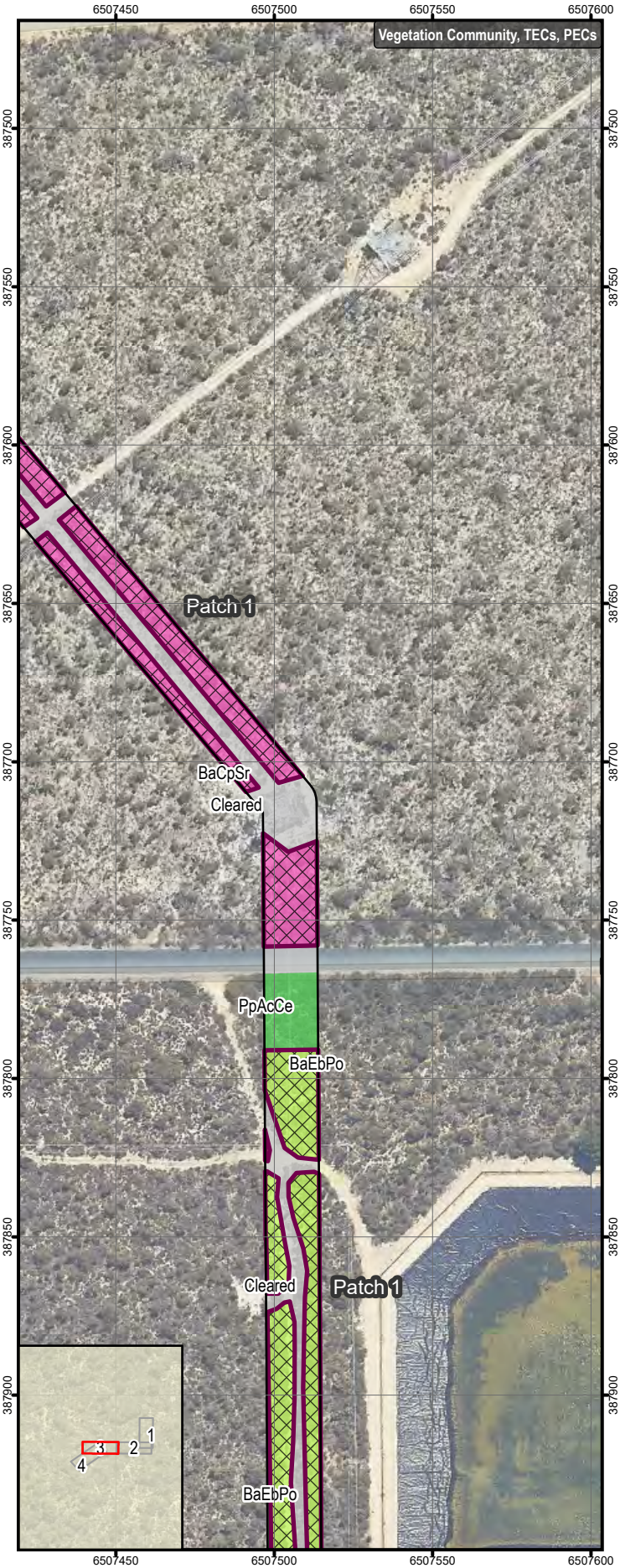
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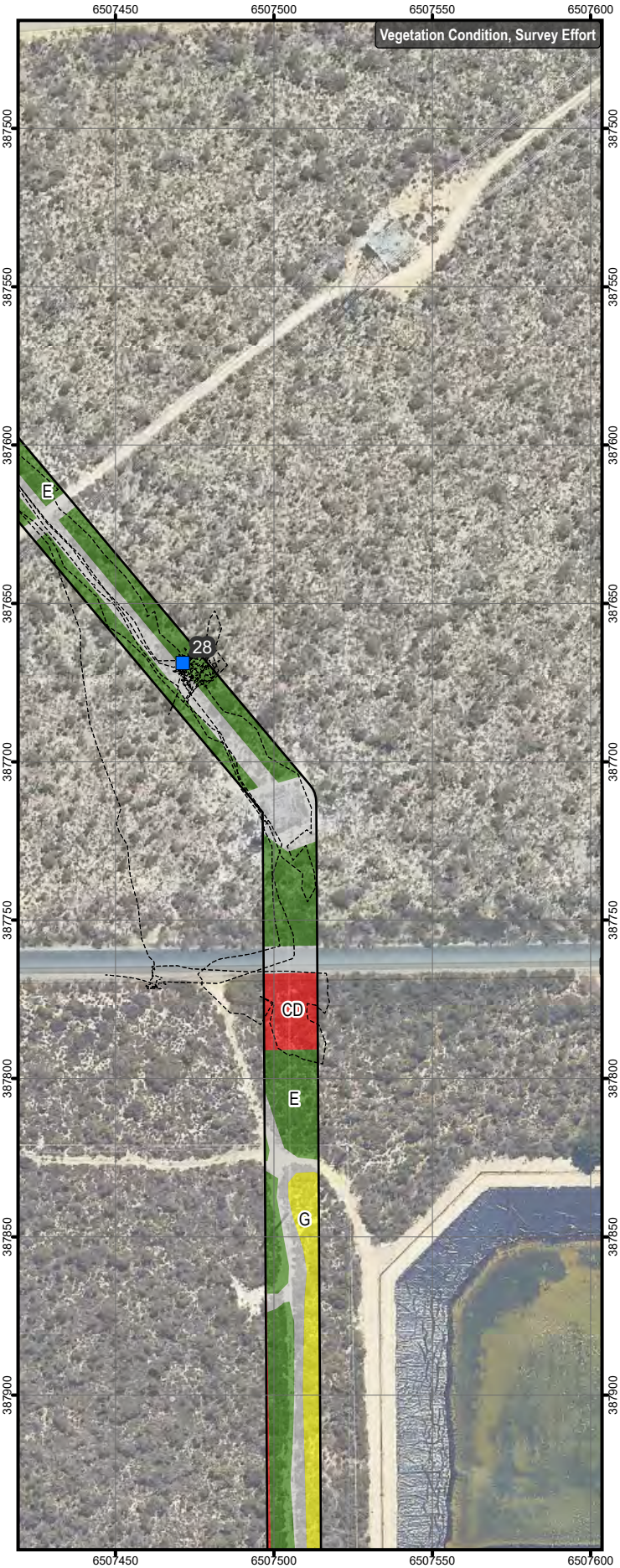
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LEGEND

Survey Area

Vegetation Unit
- BaCpSr
- BaEbPo
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

Vegetation Condition
- Excellent
- Good
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Quadrat

Vegetation Communities and Condition

WESTERN POWER

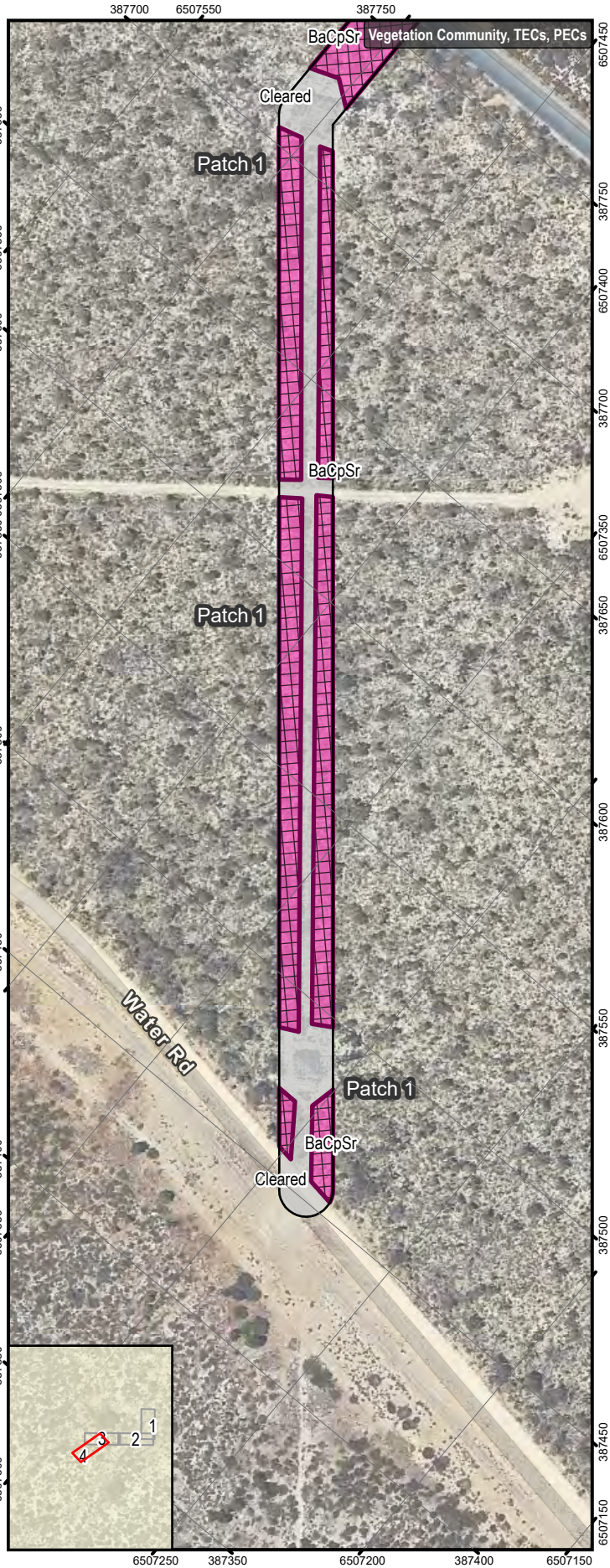
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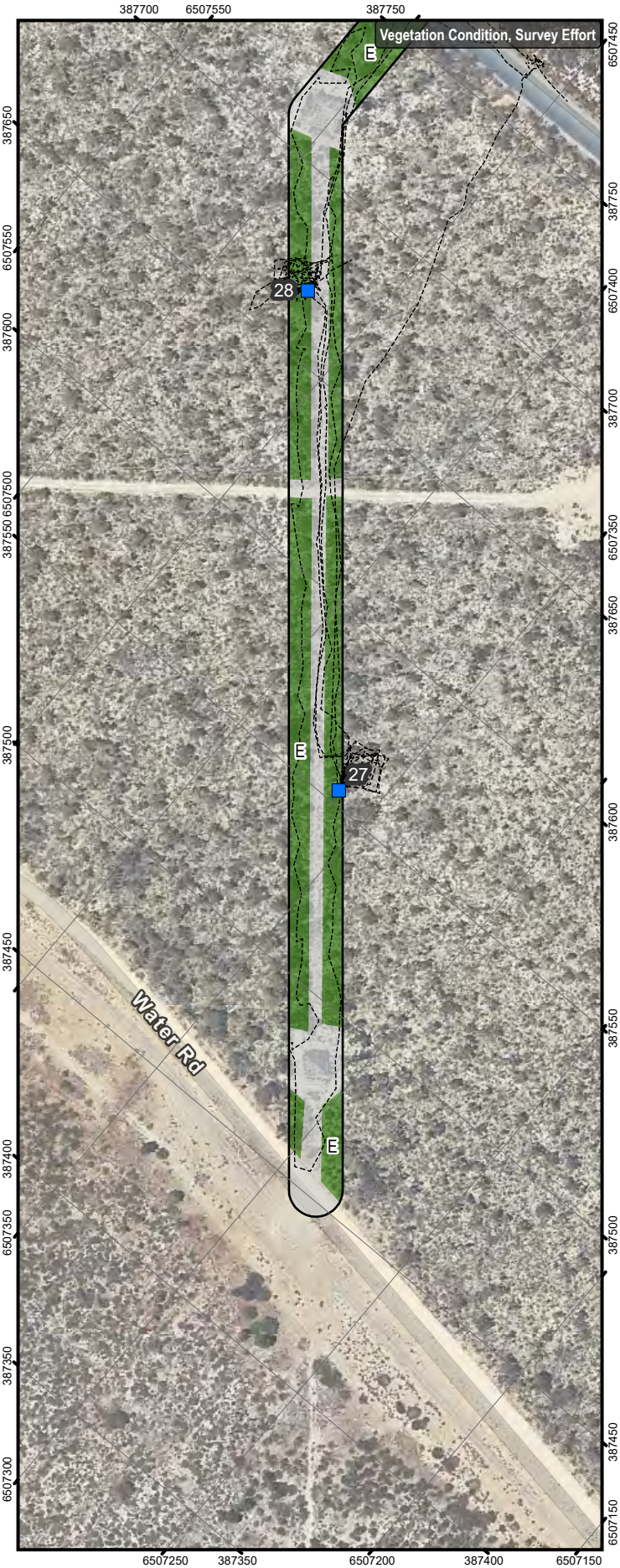
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LEGEND

Survey Area

Vegetation Unit
- BaCpSr
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

Vegetation Condition
- Excellent
- Cleared

Tracklog

Sample Sites
- Quadrat

Vegetation Communities and Condition

WESTERN POWER

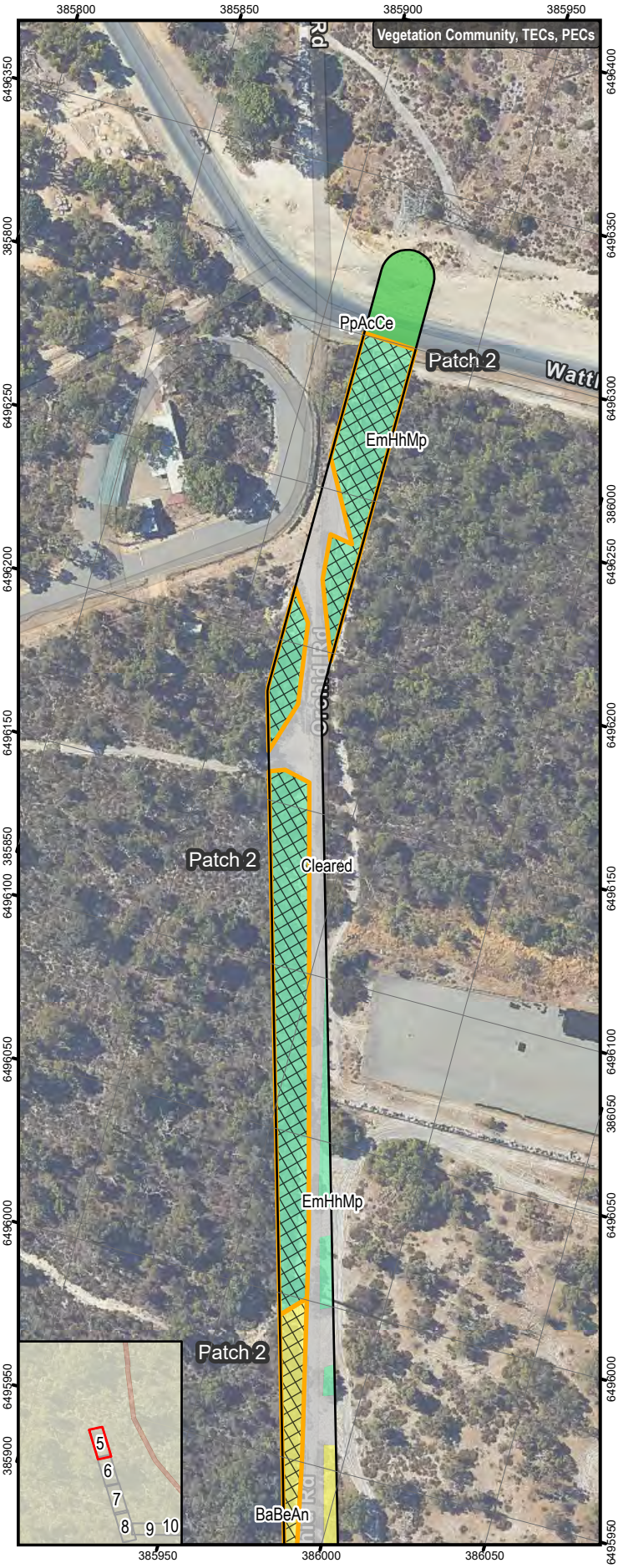
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.4

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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- EmHhMp
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

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

Tracklog

Sample Sites
- Quadrat

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.5

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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- EmHhMp
- Trees
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

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

Tracklog

Sample Sites
- Releve

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

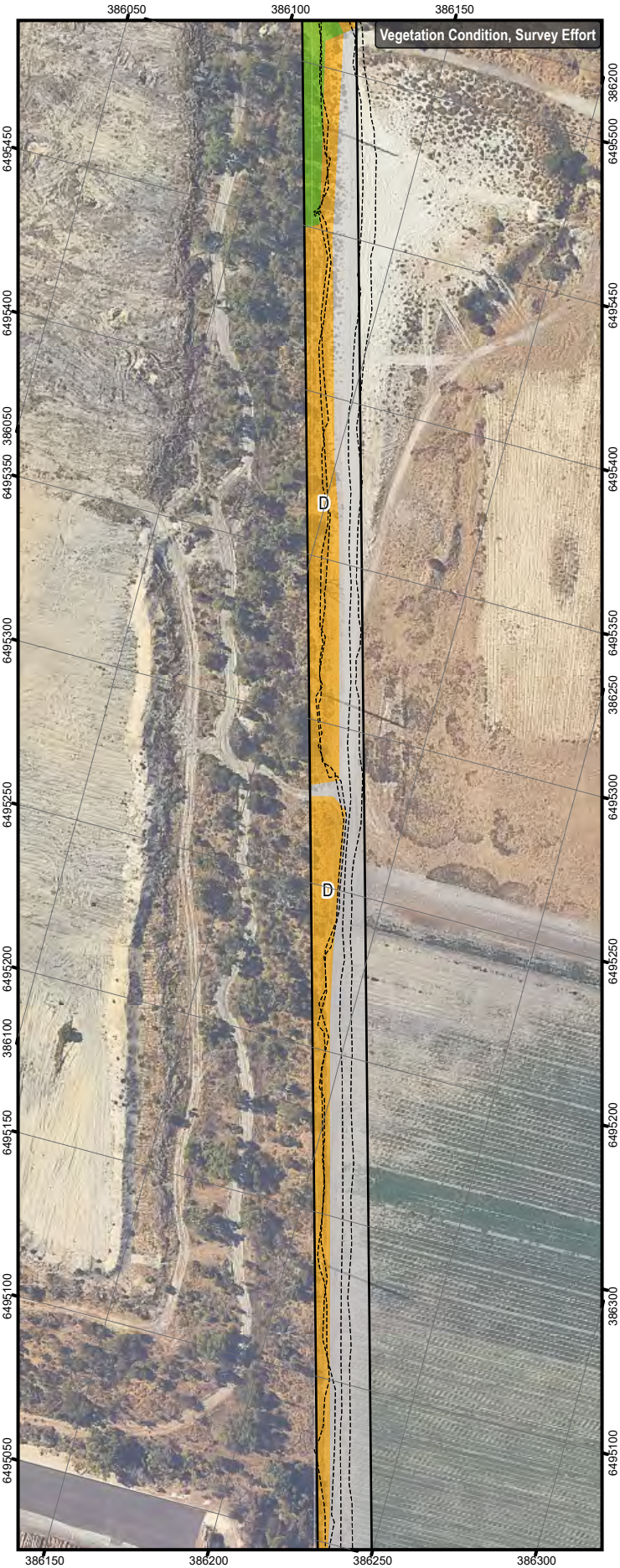
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LEGEND

Survey Area

Vegetation Unit
- EmHhMp
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Very Good
- Degraded
- Cleared

Tracklog

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.7**

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LEGEND

Survey Area

Vegetation Unit
- EmHhMp
- Cleared

Vegetation Condition
- Degraded
- Cleared

Tracklog

Vegetation Communities and Condition

WESTERN POWER

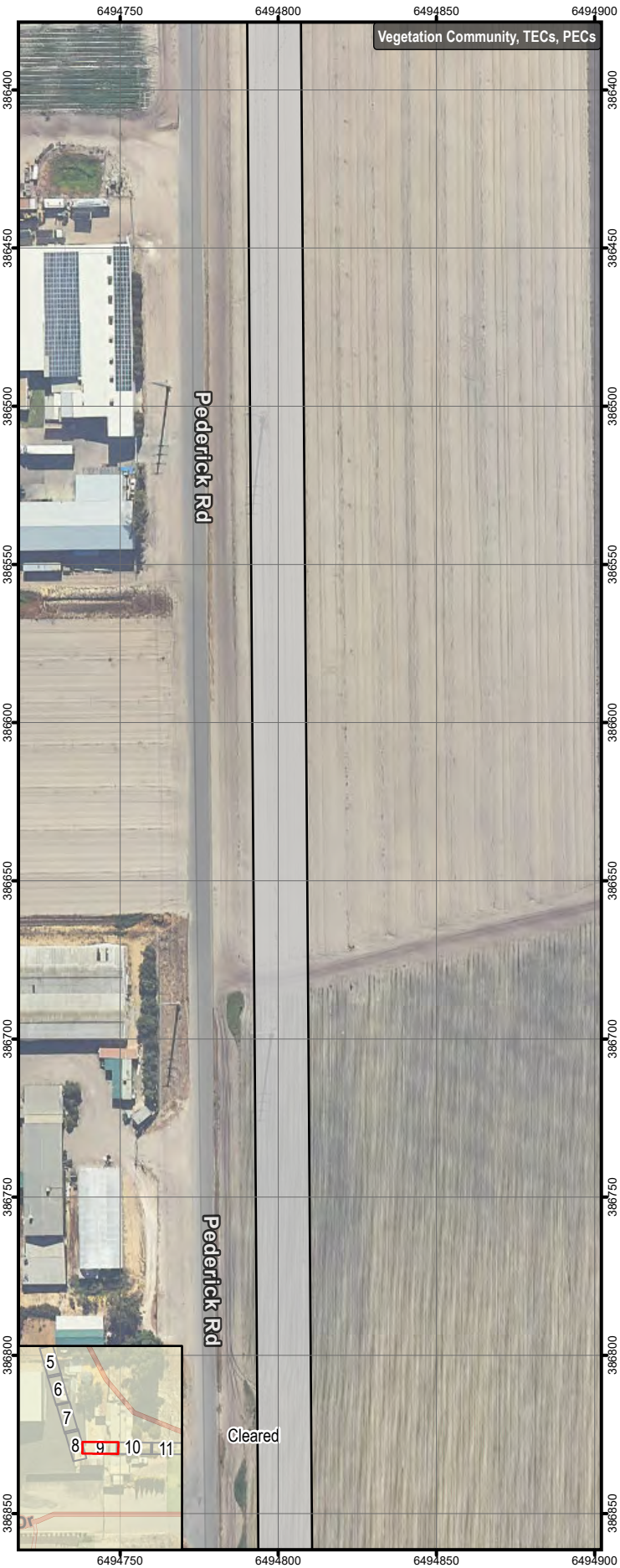
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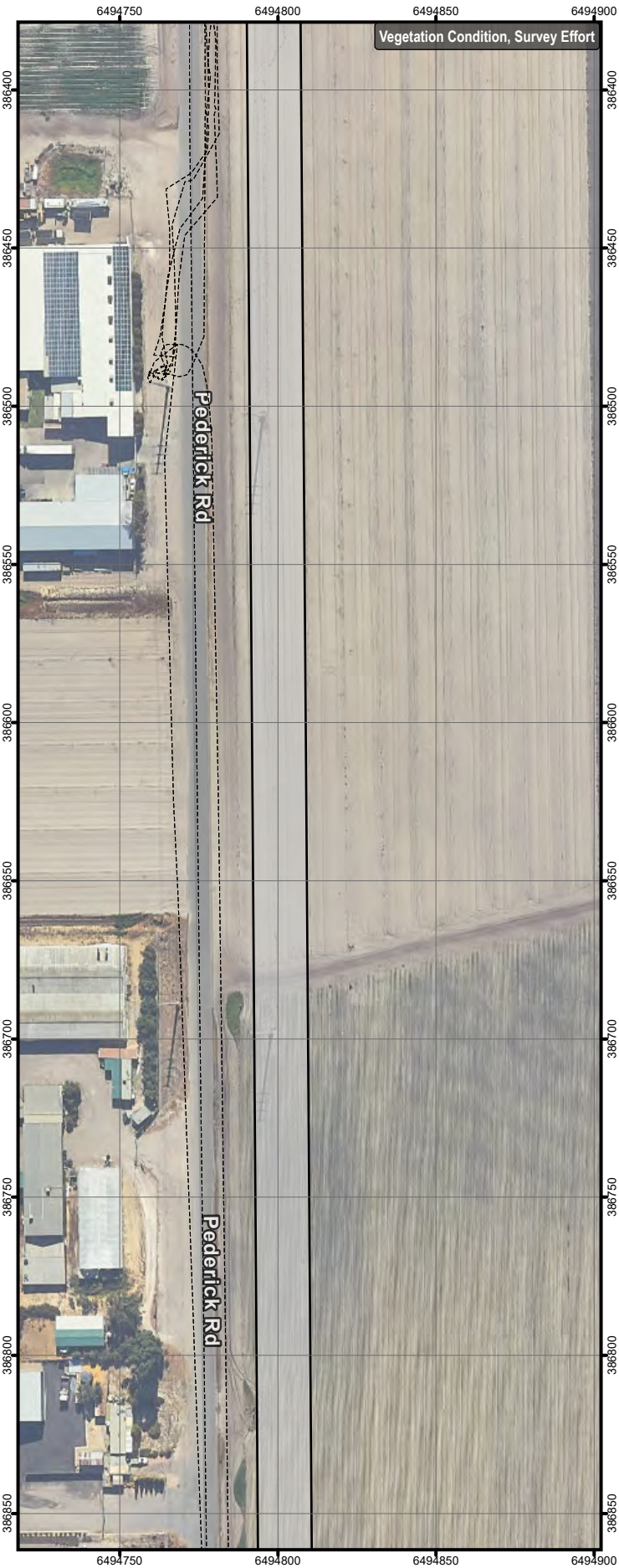
Figure 9.8

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metres

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LEGEND

Survey Area

Vegetation Unit
Cleared

Vegetation Condition
Tracklog
Cleared

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.9**

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LEGEND
Survey Area
Vegetation Unit
Trees
Cleared

Vegetation Condition
Completely Degraded
Cleared
Tracklog

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
9.10

A4 size

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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- Trees
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Very Good
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Quadrat
- Releve

Vegetation Communities and Condition

WESTERN POWER

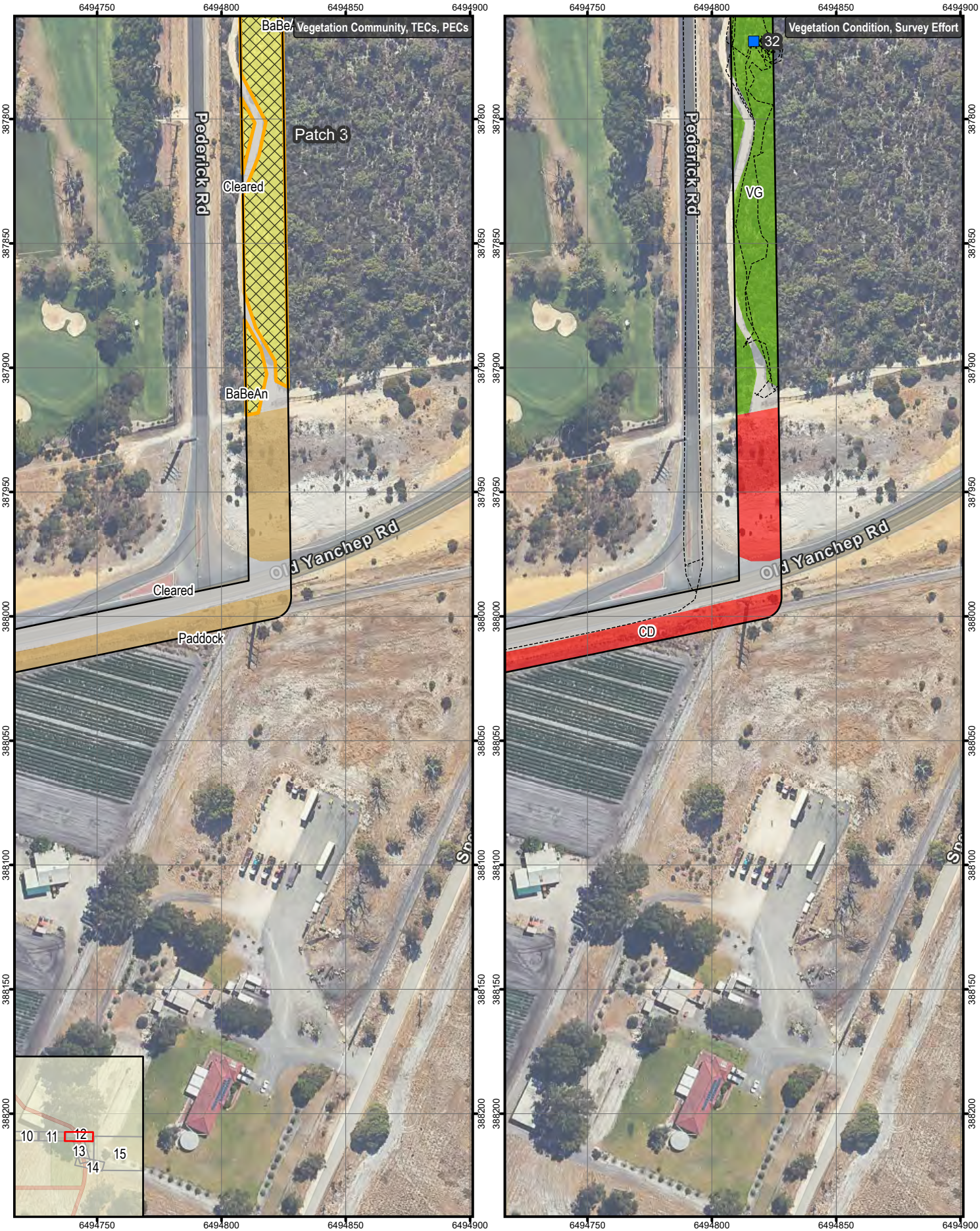
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Figure 9.11

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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- Paddock
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Very Good
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Quadrat

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.12**

Project: L:\Legacy\Projects\606X\60691678_NREP_Biological_Survey\900_CAD_GIS\920_GIS\02_MXD_APRX\60691678_NREP_BiologicalSurvey_WP_2.aprx (wyattk2),
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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- Paddock
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Tracklog

Vegetation Communities and Condition

WESTERN POWER

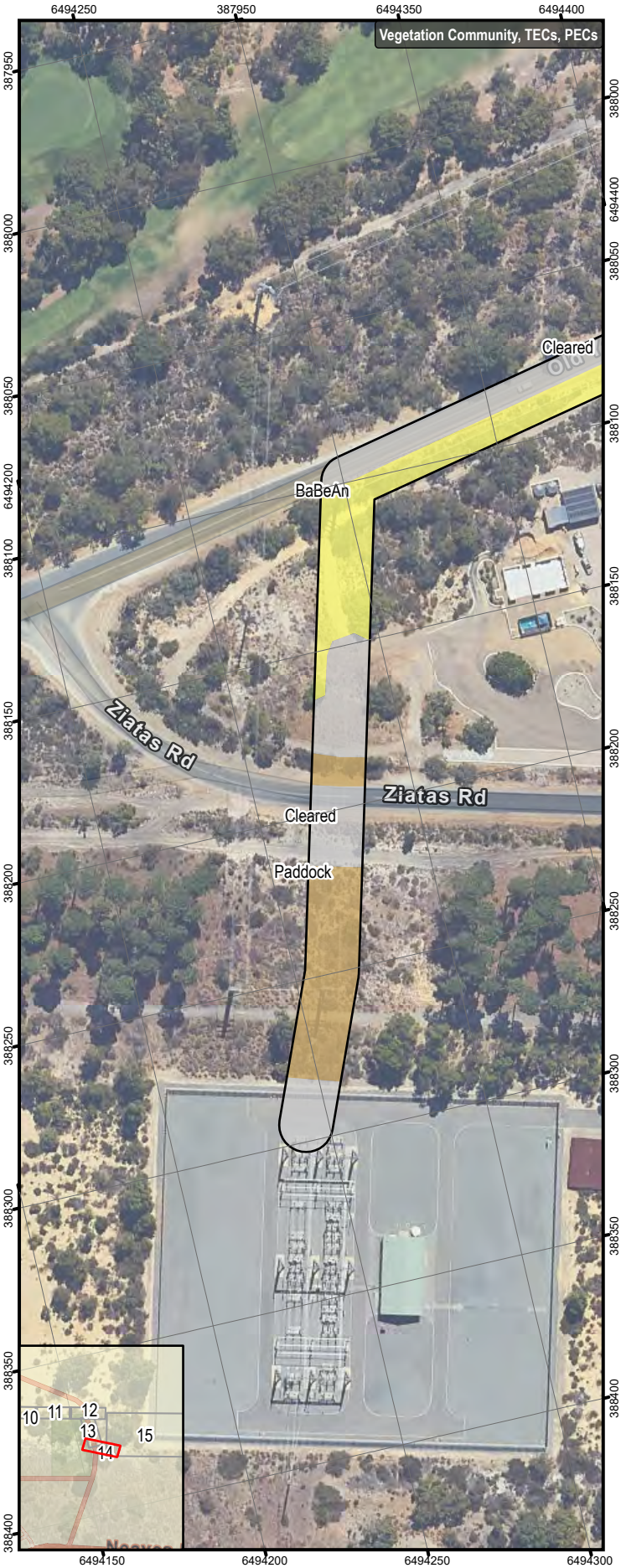
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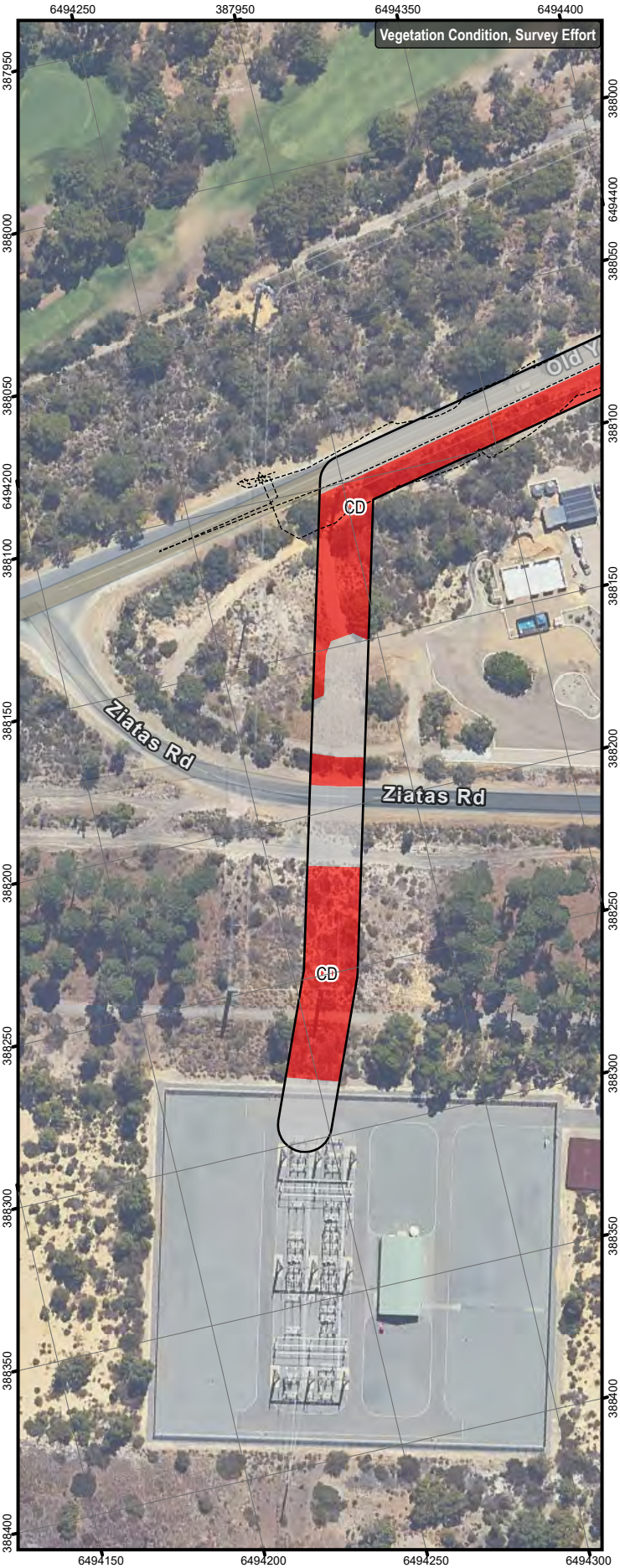
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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- Paddock
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Tracklog

Vegetation Communities and Condition

WESTERN POWER

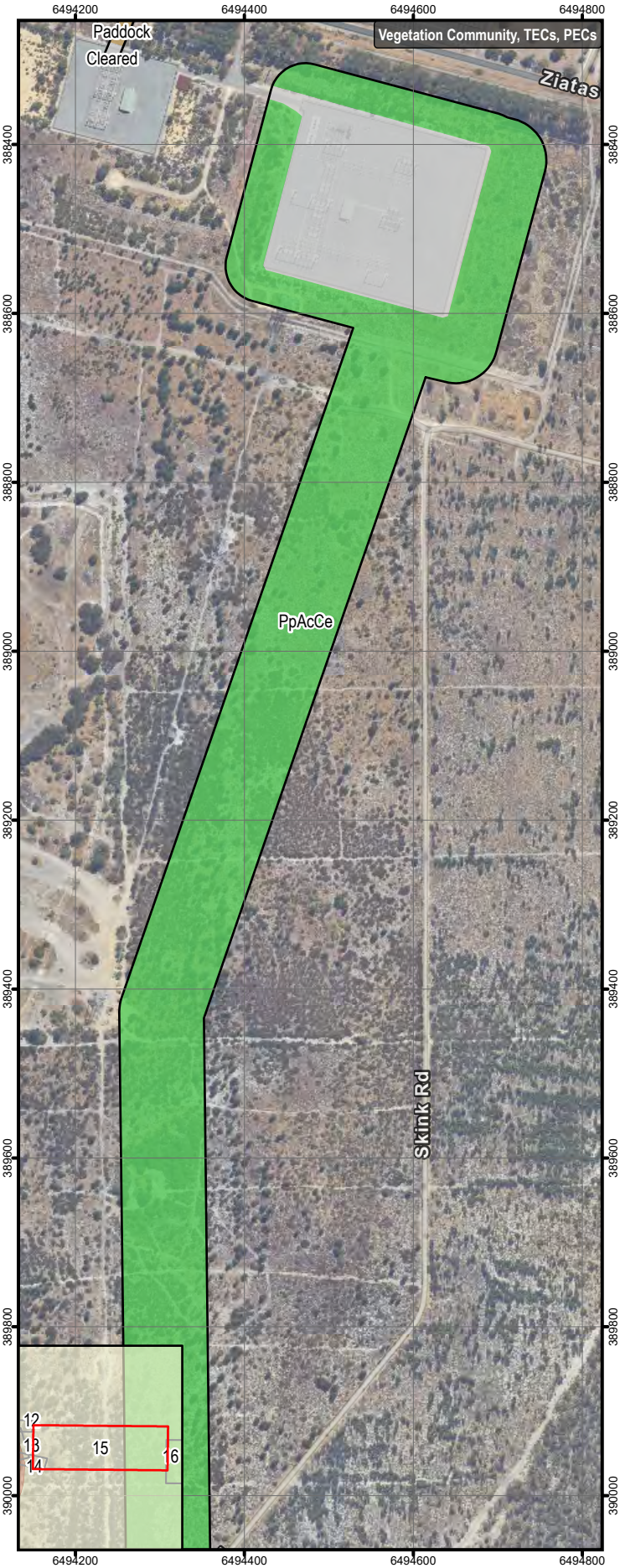
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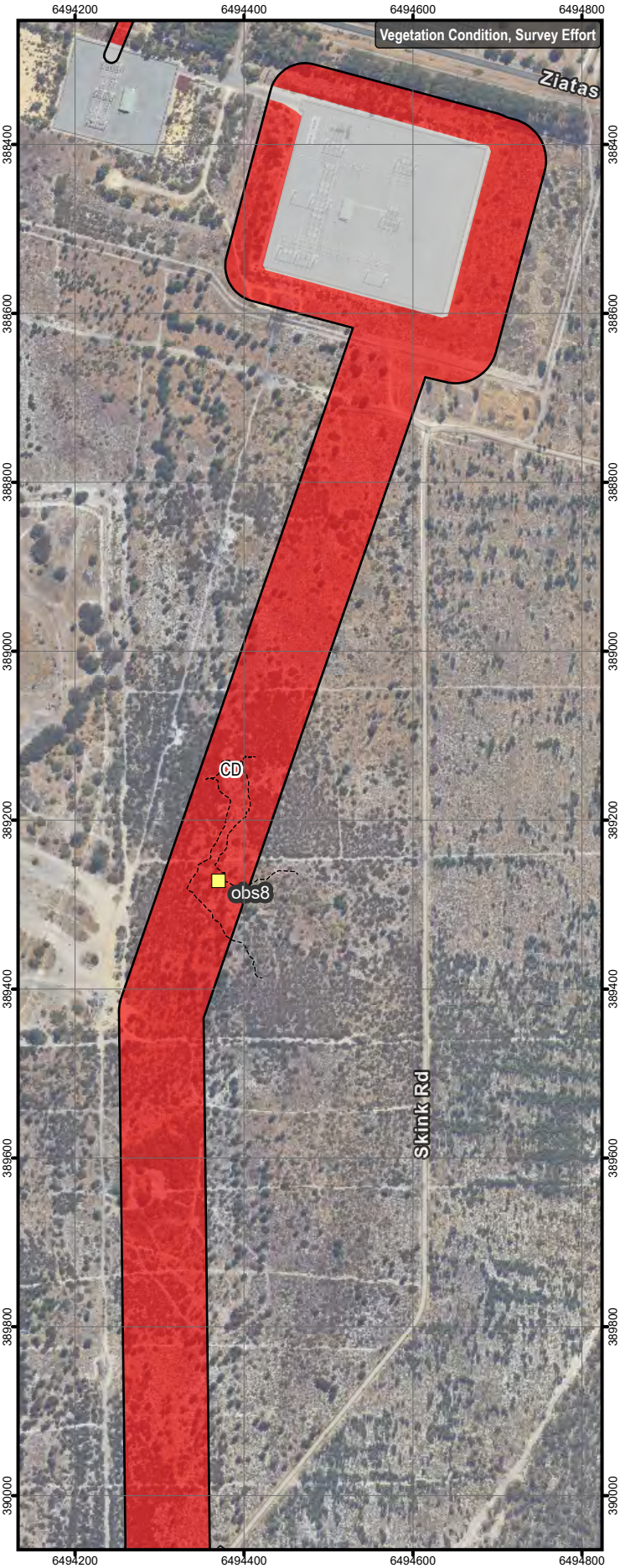
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metres

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LEGEND

Survey Area

Vegetation Unit
- Paddock
- PpAcCe
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Observation Point

Vegetation Communities and Condition

WESTERN POWER

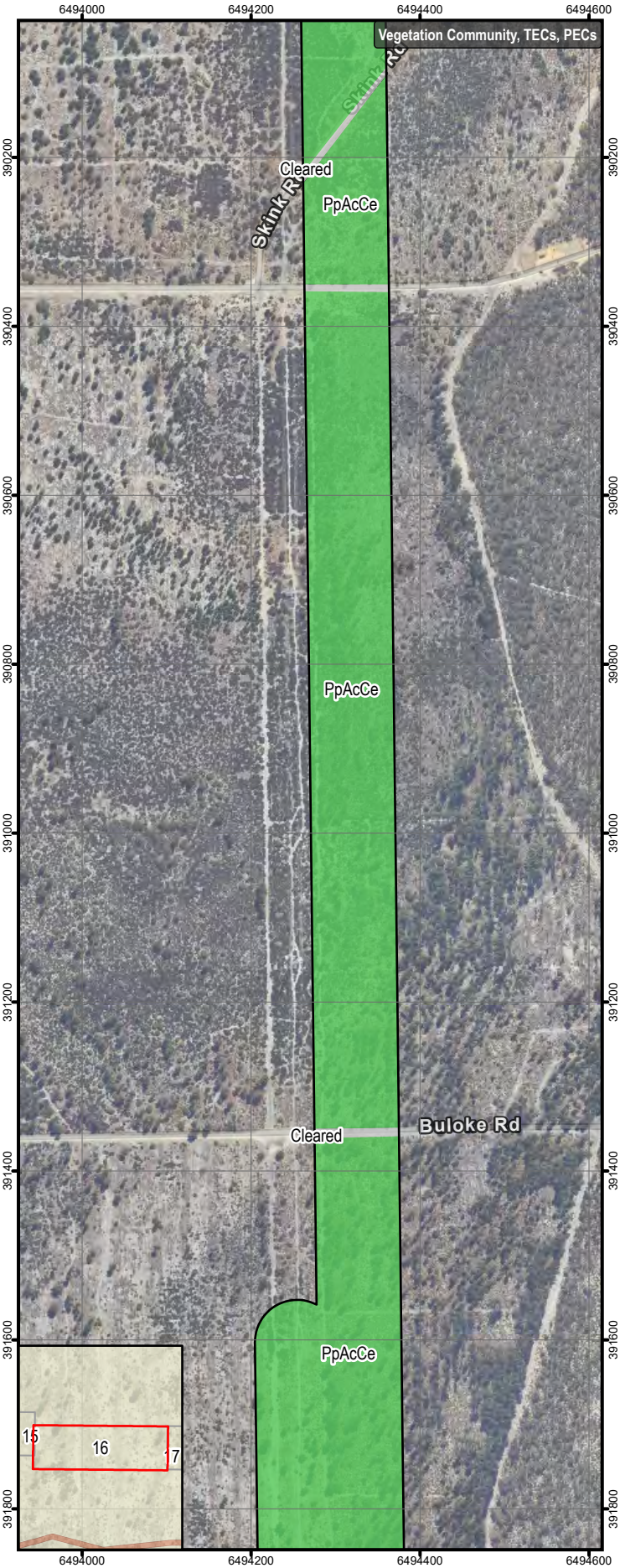
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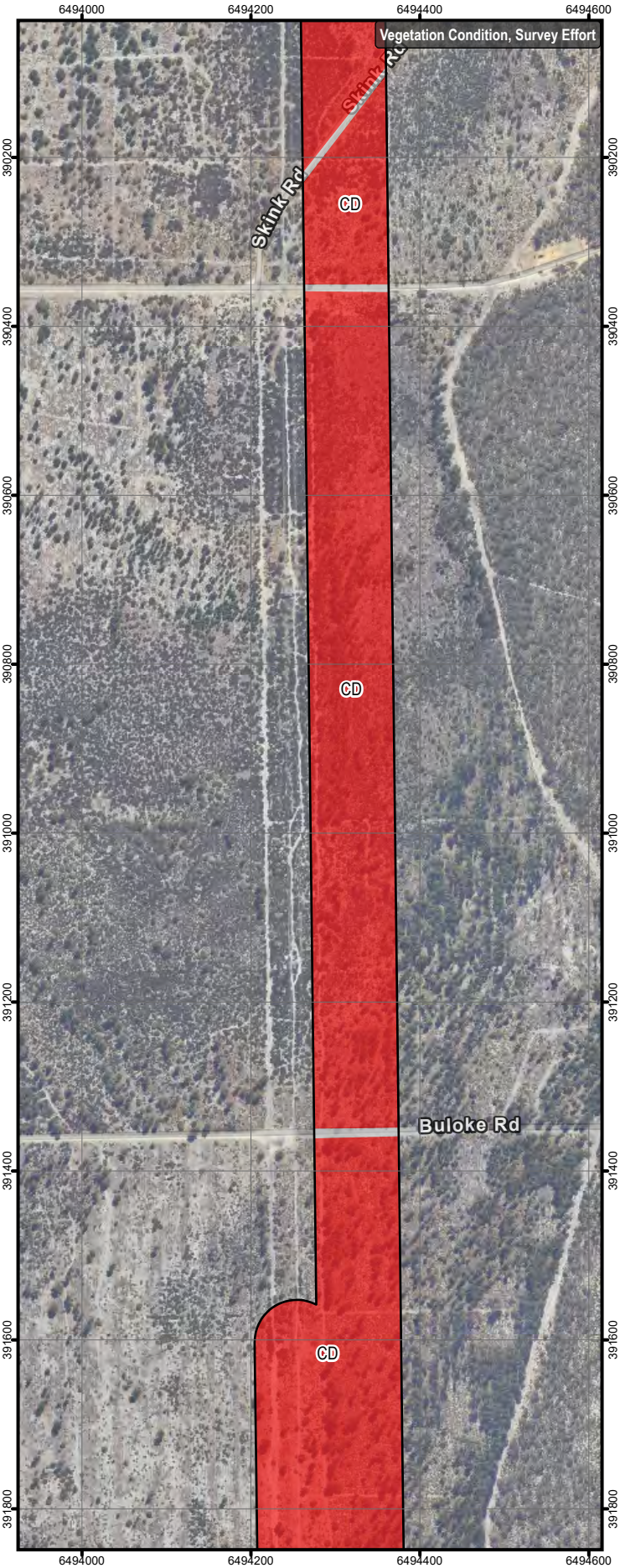
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metres

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LEGEND

Survey Area

Vegetation Unit
- PpAcCe
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Vegetation Communities and Condition

WESTERN POWER

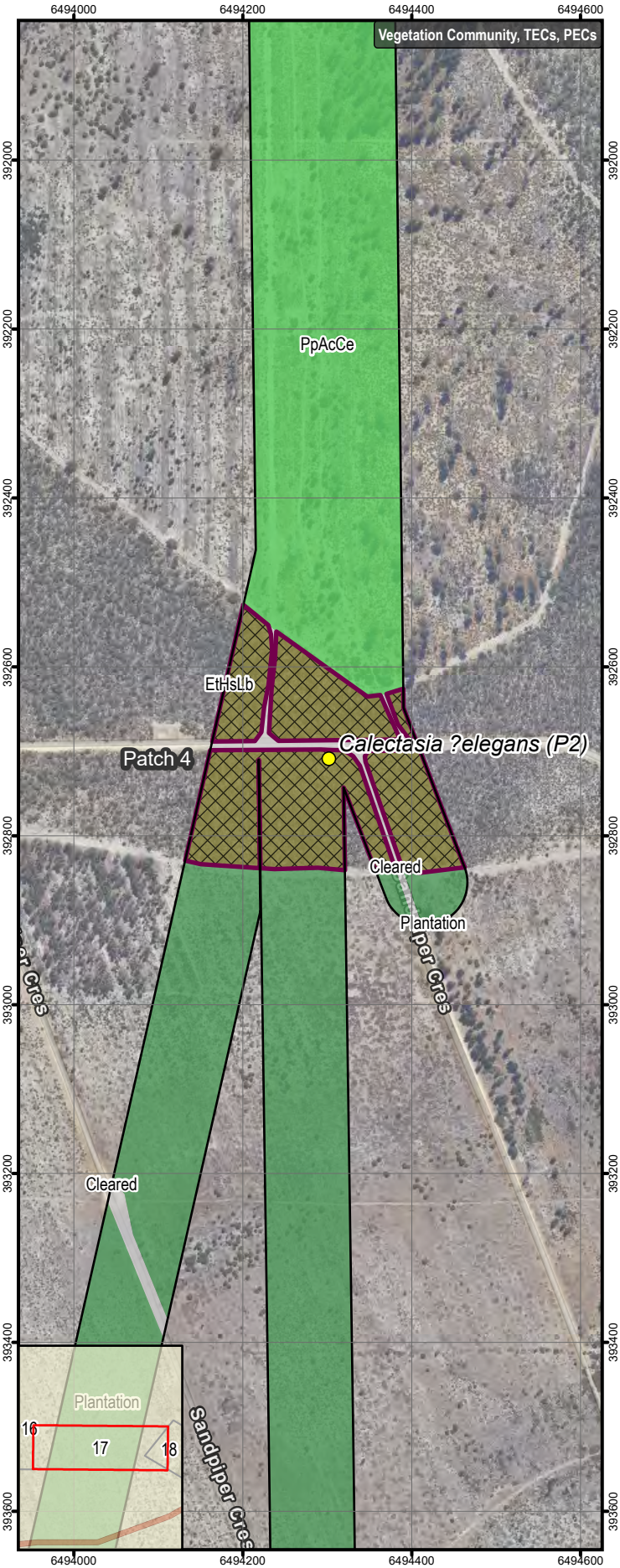
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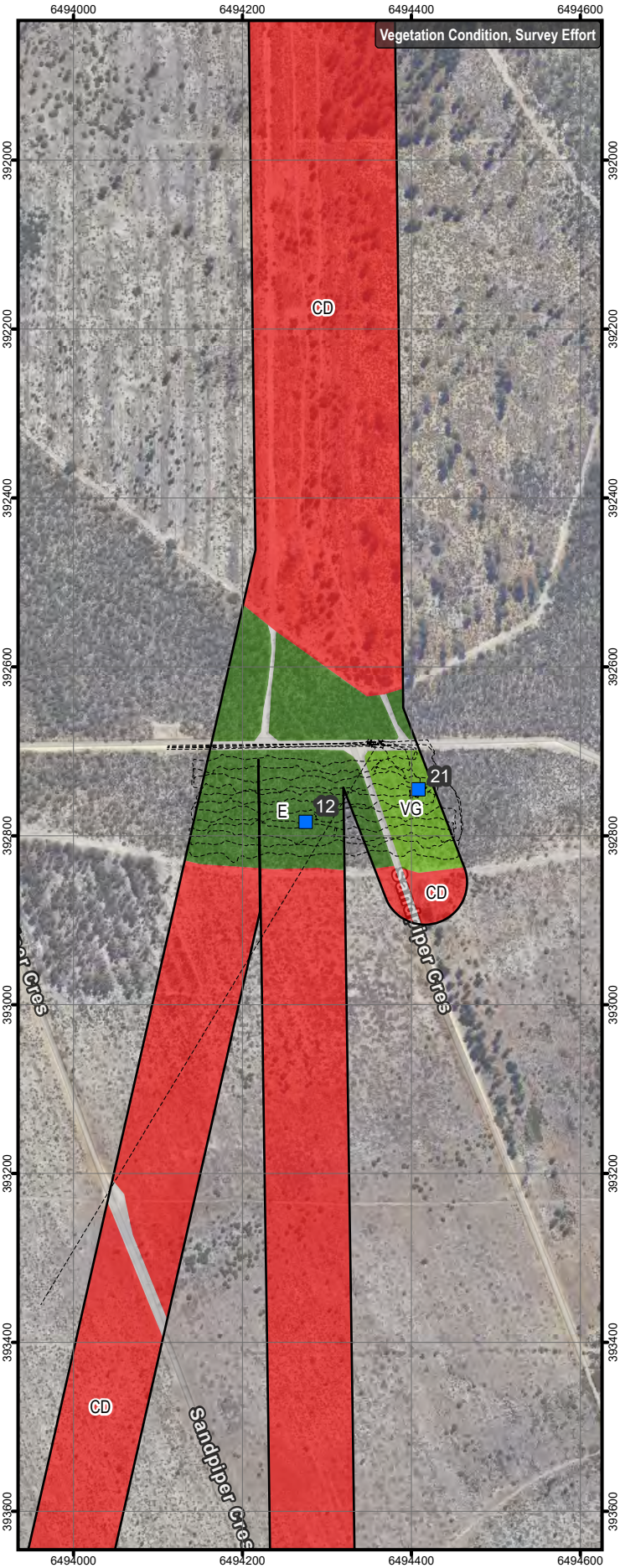
Figure 9.16

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metres

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LEGEND

Survey Area
Significant Flora

Vegetation Unit
EtHsLb
Plantation
PpAcCe
Cleared

EPBC Act listed TECs
TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

Vegetation Condition
Excellent
Very Good
Completely Degraded
Cleared

Tracklog
Sample Sites
Quadrat

Vegetation Communities and Condition

WESTERN POWER

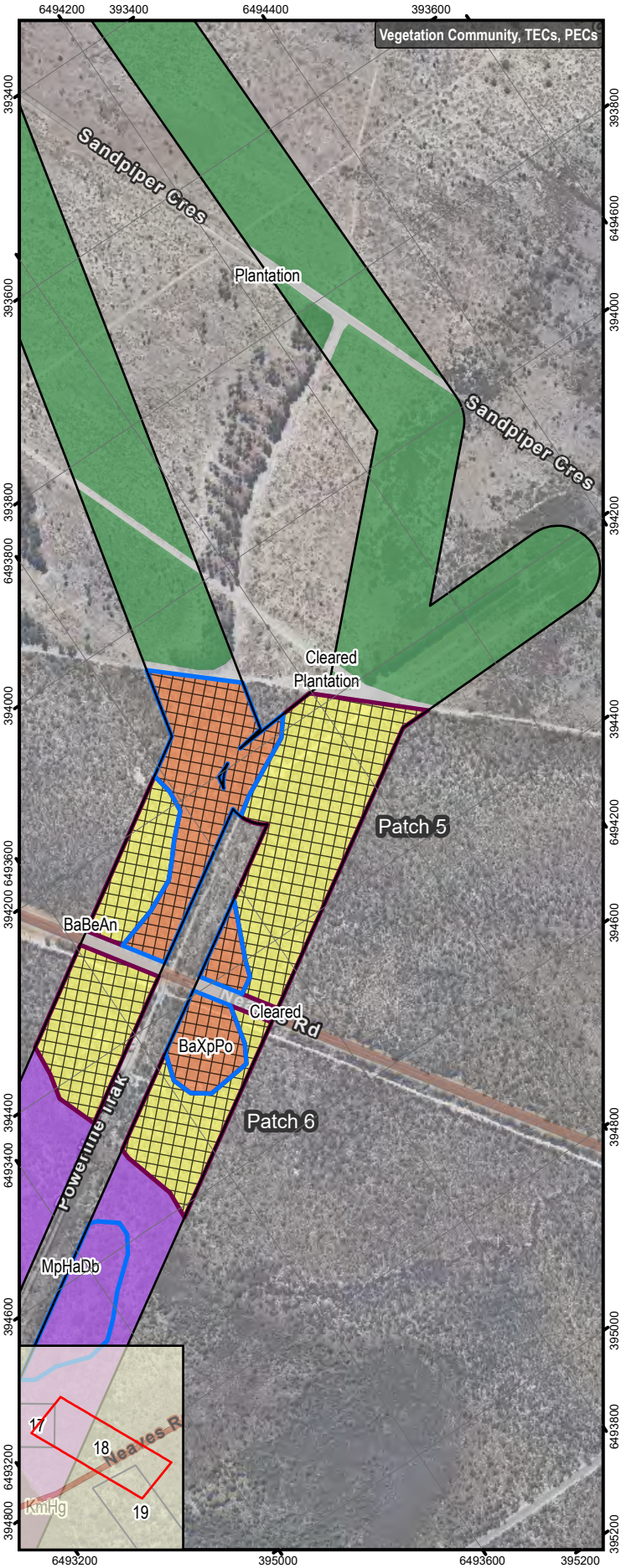
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.17

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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- BaXpPo
- KmHg
- MpHaDb
- Plantation
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c)
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

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

Tracklog

Sample Sites
- Quadrat
- Releve

Vegetation Communities and Condition

WESTERN POWER

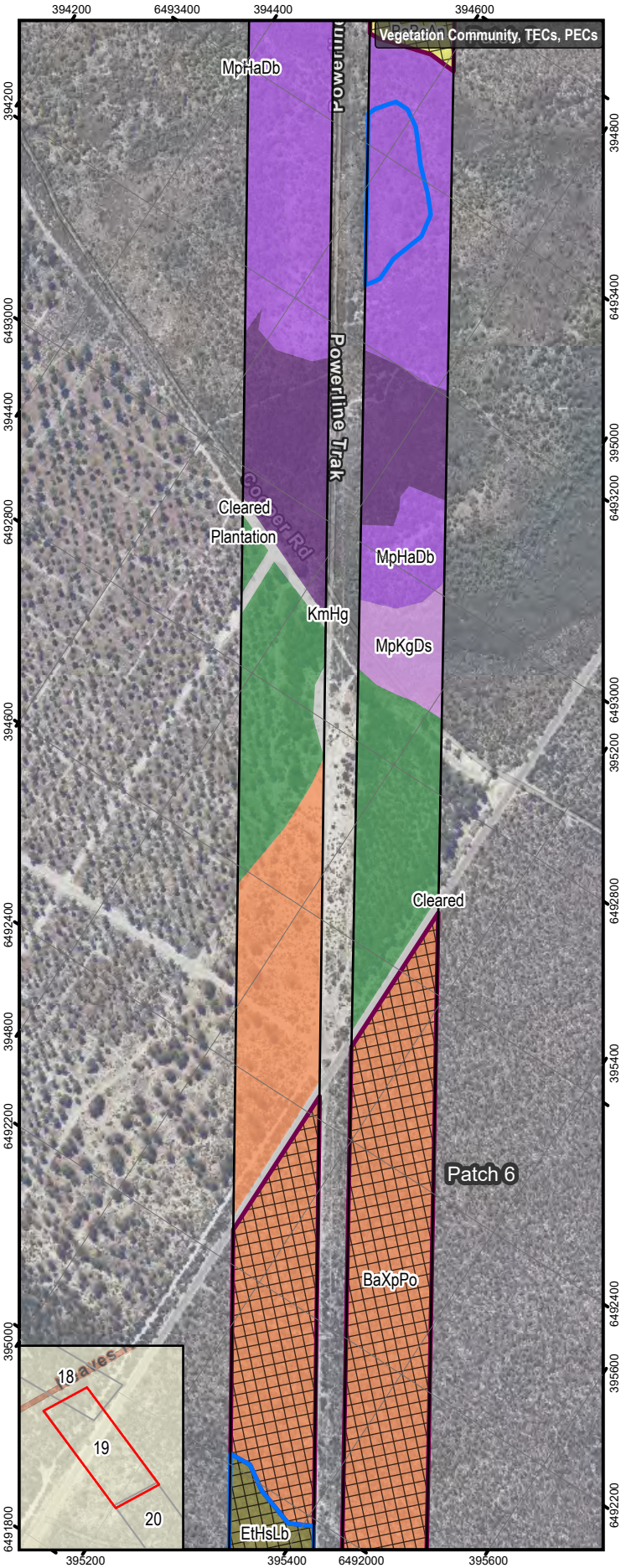
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

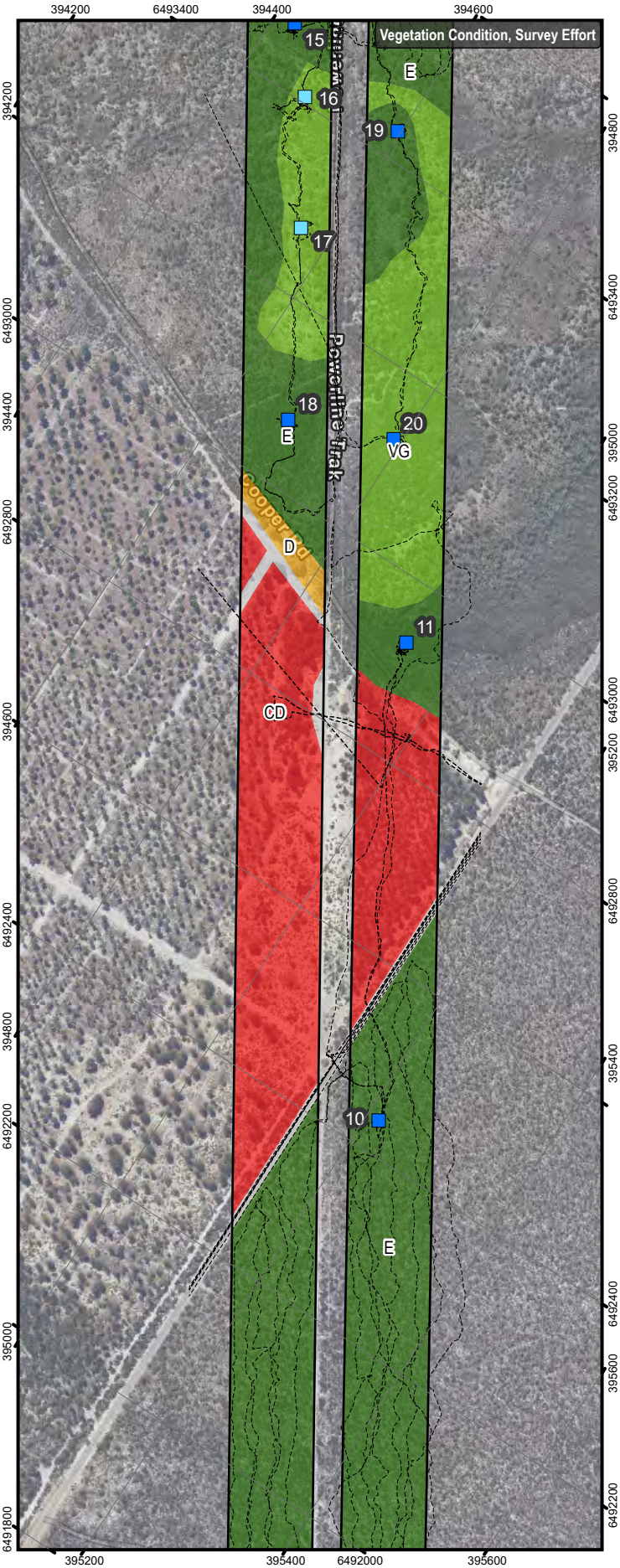
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LEGEND

Survey Area

Vegetation Unit
- BaBeAn
- BaXpPo
- EtHsLb
- KmHg
- MpHaDb
- MpKgDs
- Plantation
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c)
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

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

Tracklog

Sample Sites
- Quadrat
- Releve

Vegetation Communities and Condition

WESTERN POWER

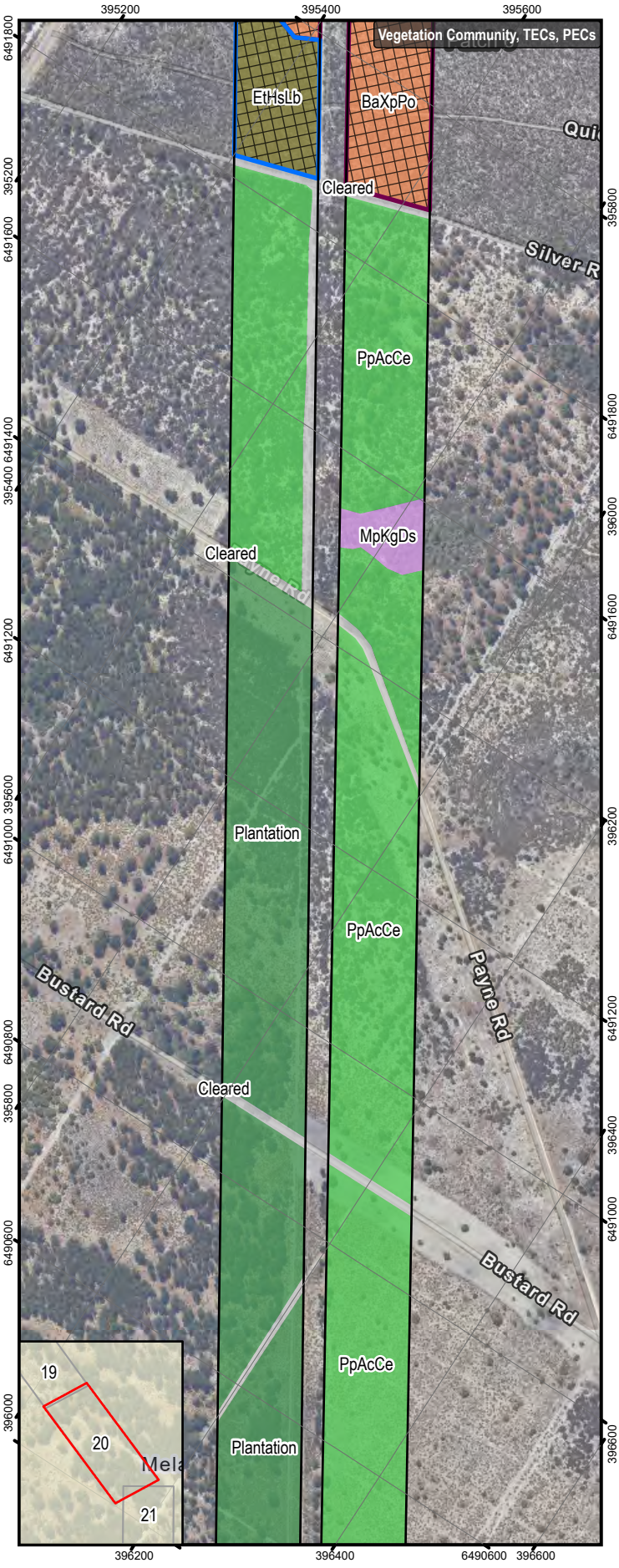
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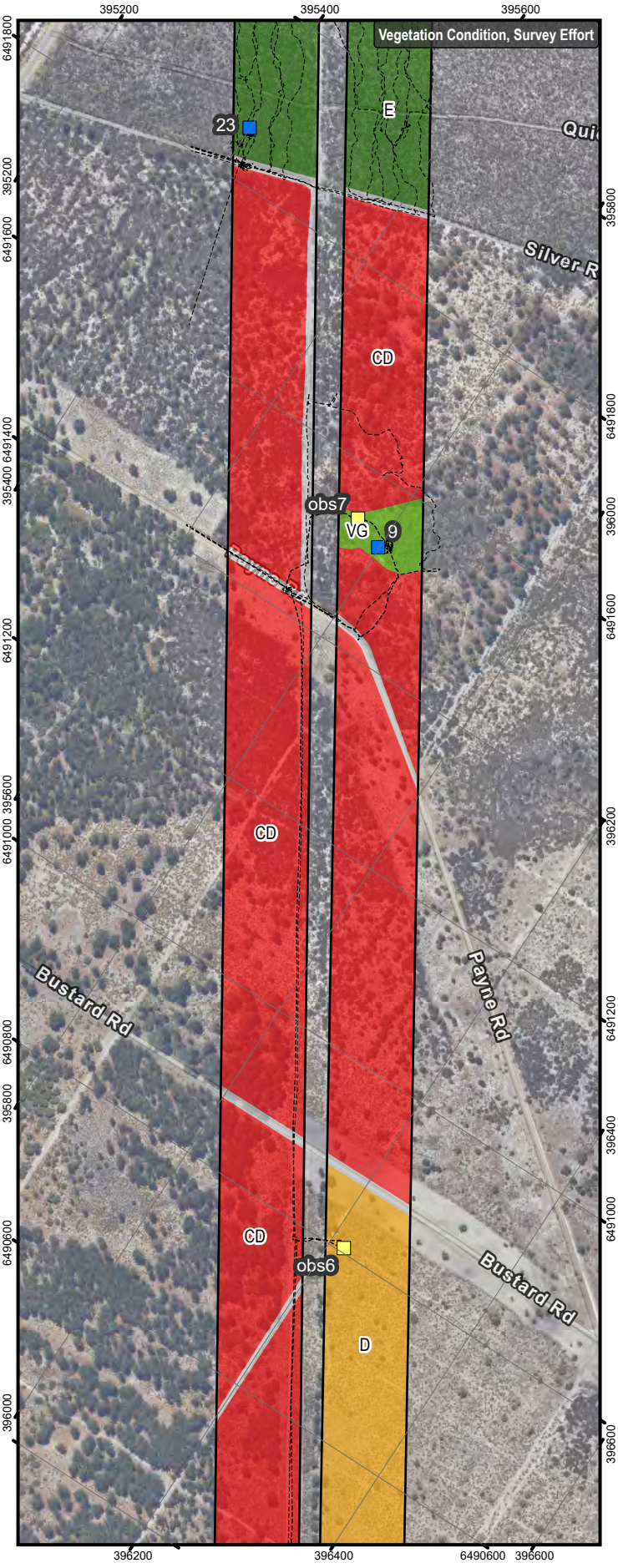
Figure **9.19**

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LEGEND

Survey Area

Vegetation Unit
- BaXpPo
- EtHsLb
- MpKgDs
- Plantation
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Low lying *Banksia attenuata* woodlands or shrublands (floristic community type 21c)
- PEC Swan Coastal Plain *Banksia attenuata-Banksia menziesii* woodlands (floristic community type 23b)

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

Tracklog

Sample Sites
- Observation Point
- Quadrat

Vegetation Communities and Condition

WESTERN POWER

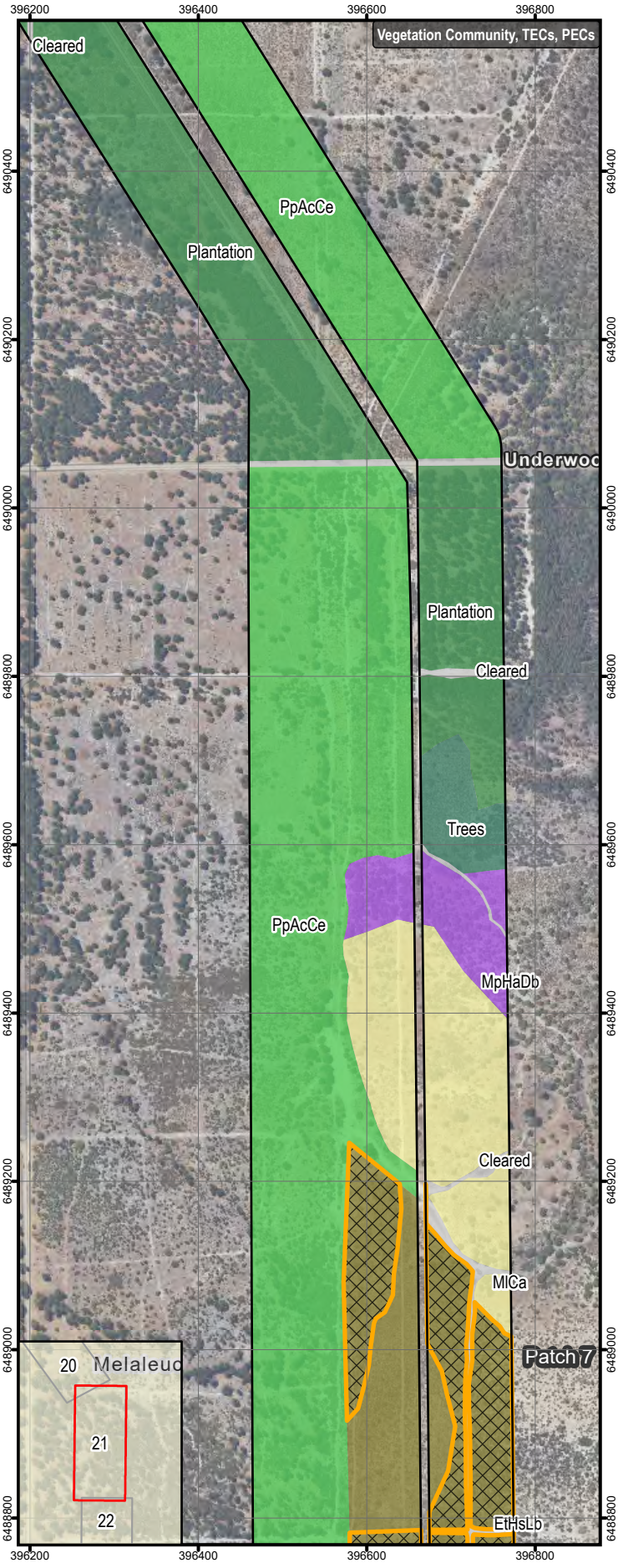
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Figure 9.20

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LEGEND

Survey Area

Vegetation Unit
- EtHsLb
- MlCa
- MpHaDb
- Plantation
- PpAcCe
- Trees
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Good
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Observation Point
- Quadrat
- Releve

Vegetation Communities and Condition

WESTERN POWER

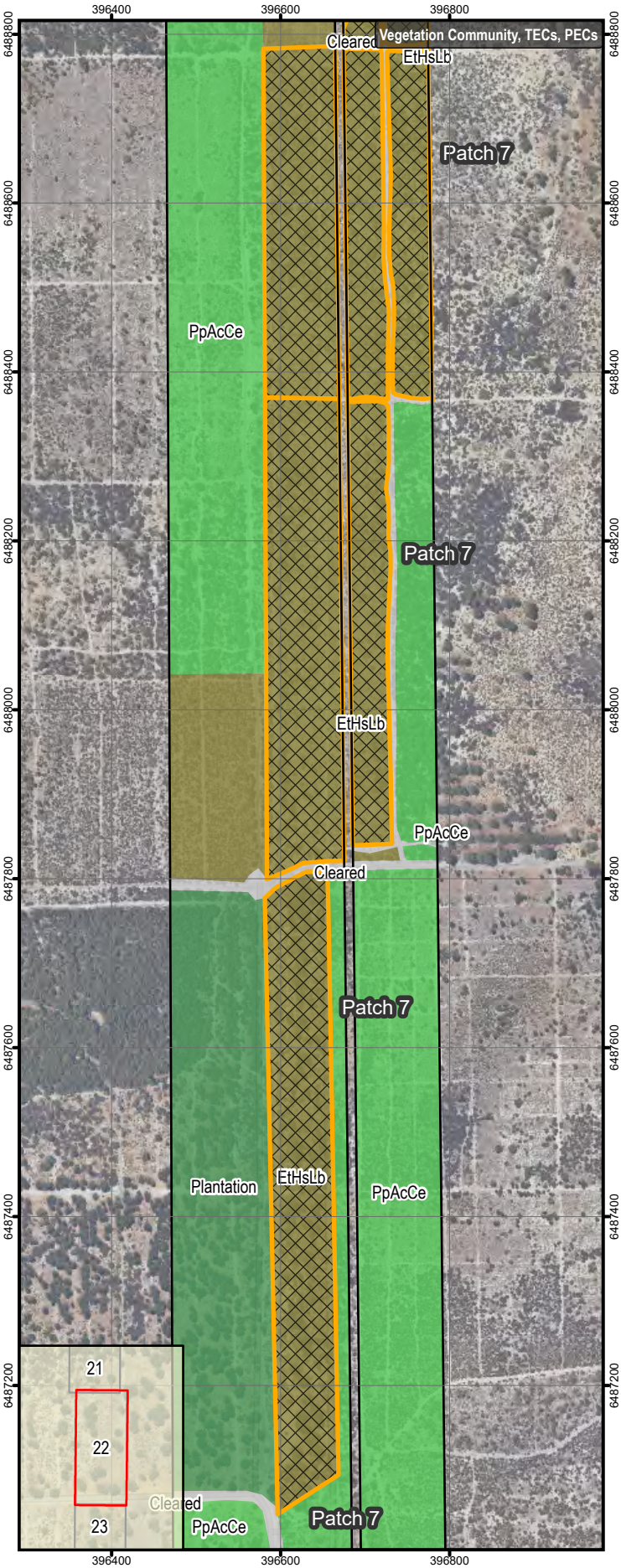
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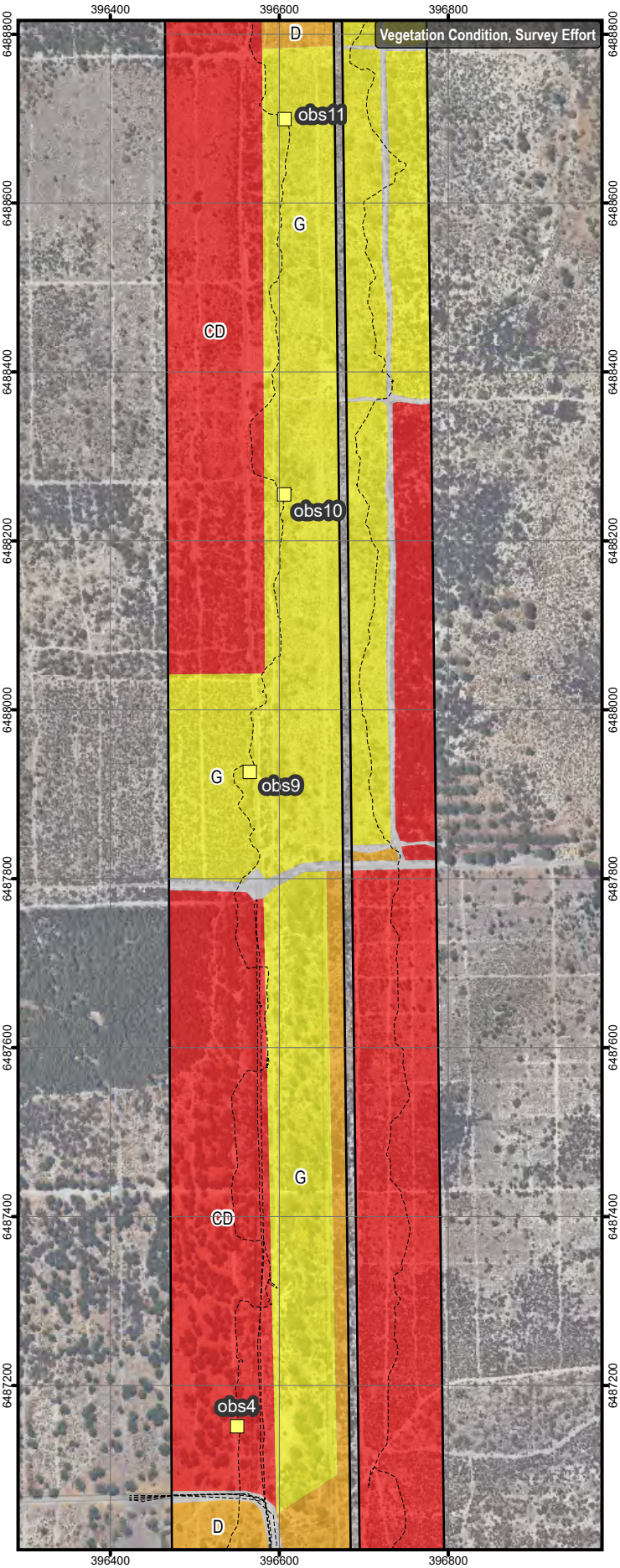
Figure 9.21

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LEGEND

Survey Area

Vegetation Unit
- EtHsLb
- Plantation
- PpAcCe
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Good
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Observation Point

Vegetation Communities and Condition

WESTERN POWER

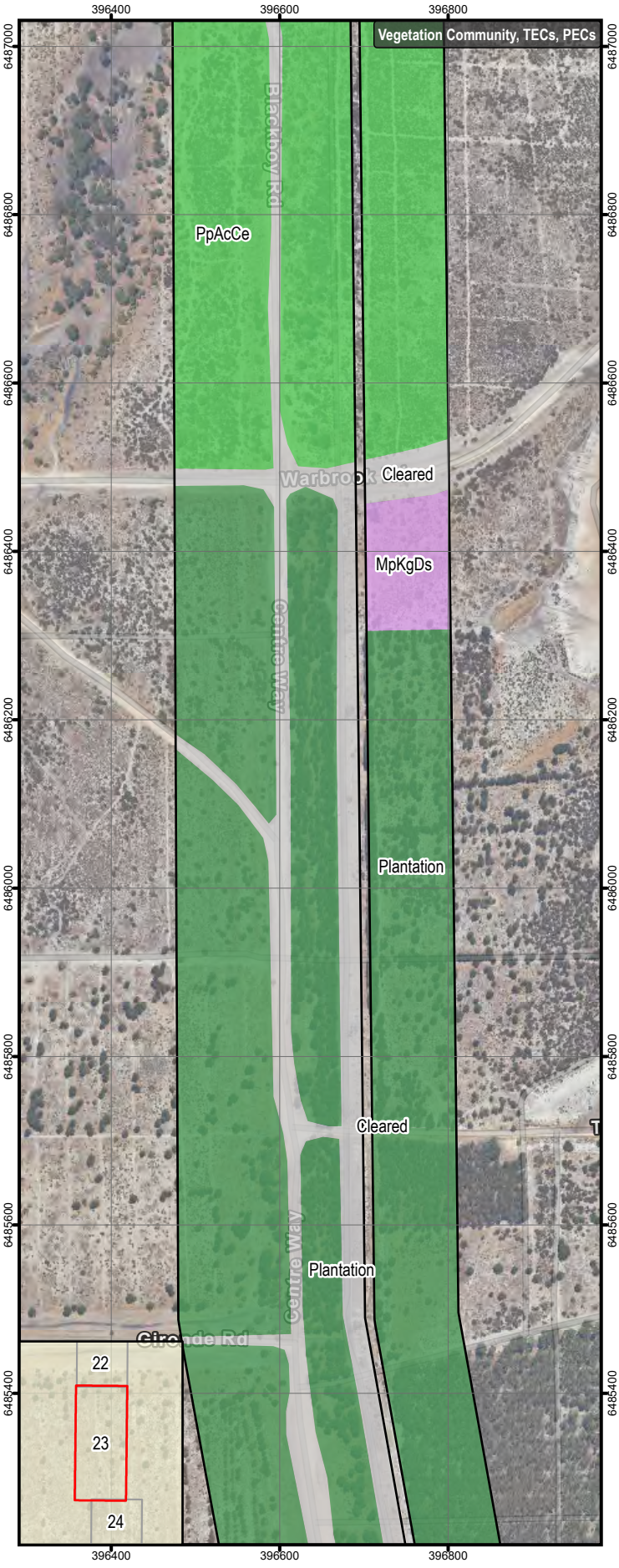
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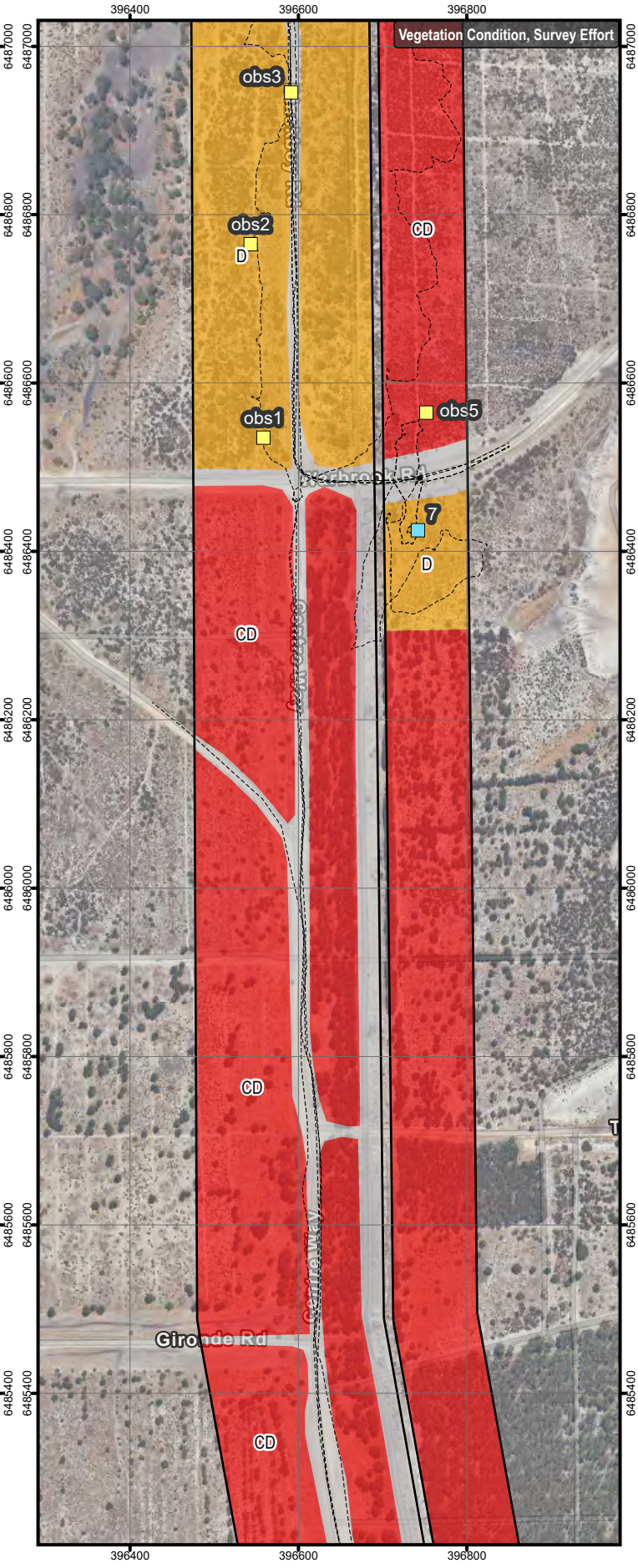
Figure 9.22

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LEGEND

Survey Area

Vegetation Unit
- MpKgDs
- Plantation
- PpAcCe
- Cleared

Vegetation Condition
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Observation Point
- Releve

Vegetation Communities and Condition

WESTERN POWER

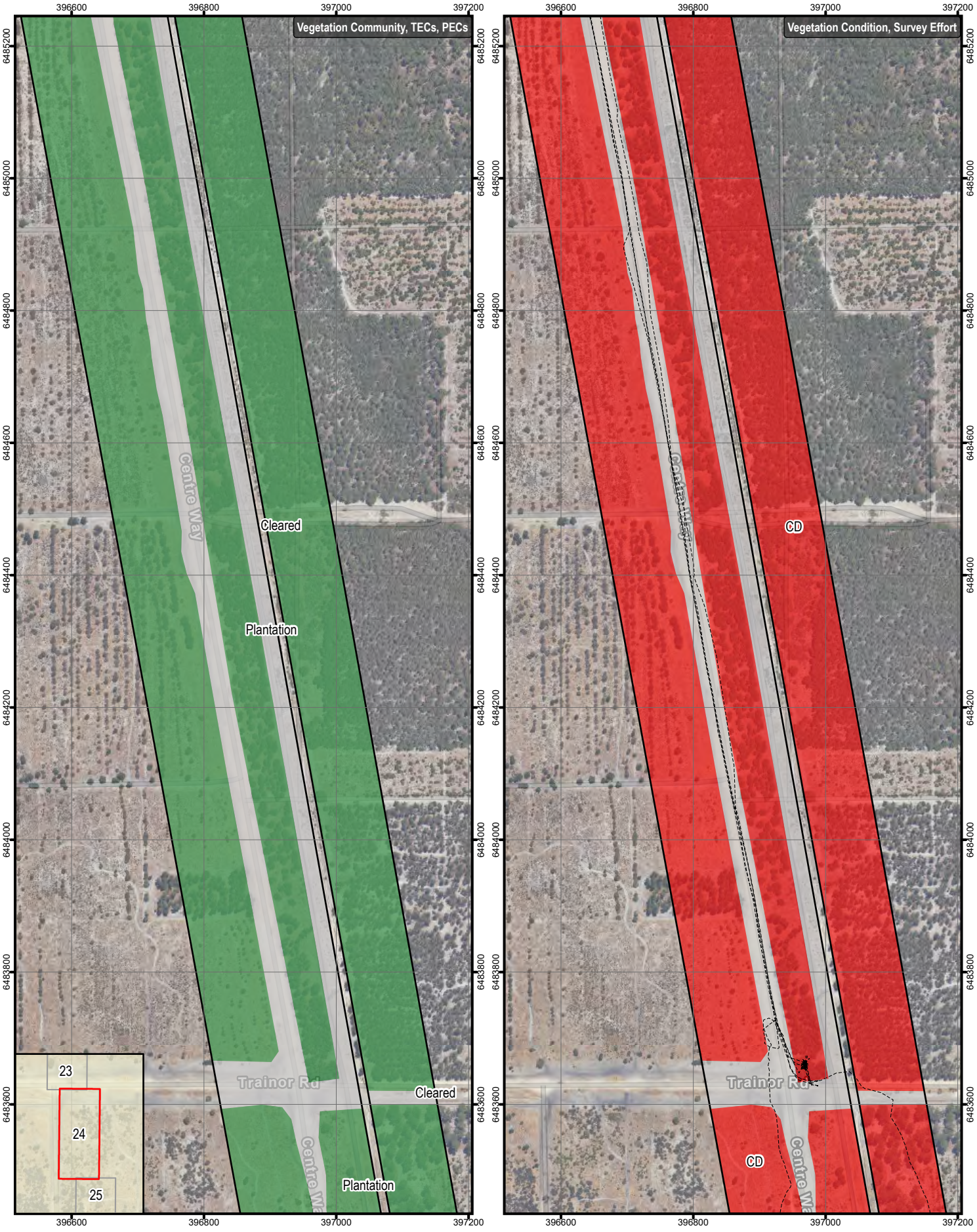
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Figure 9.23

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LEGEND

Survey Area

Vegetation Unit
- Plantation
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared
- Tracklog

Vegetation Communities and Condition

WESTERN POWER

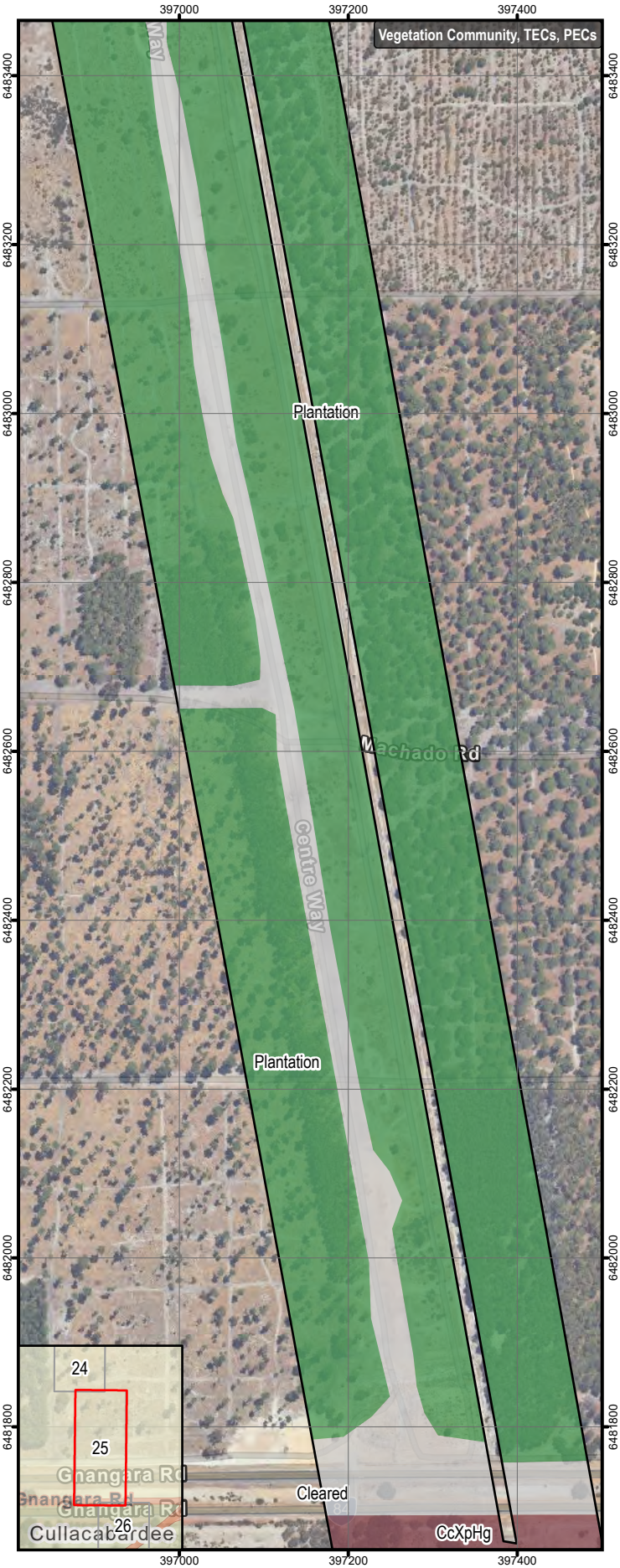
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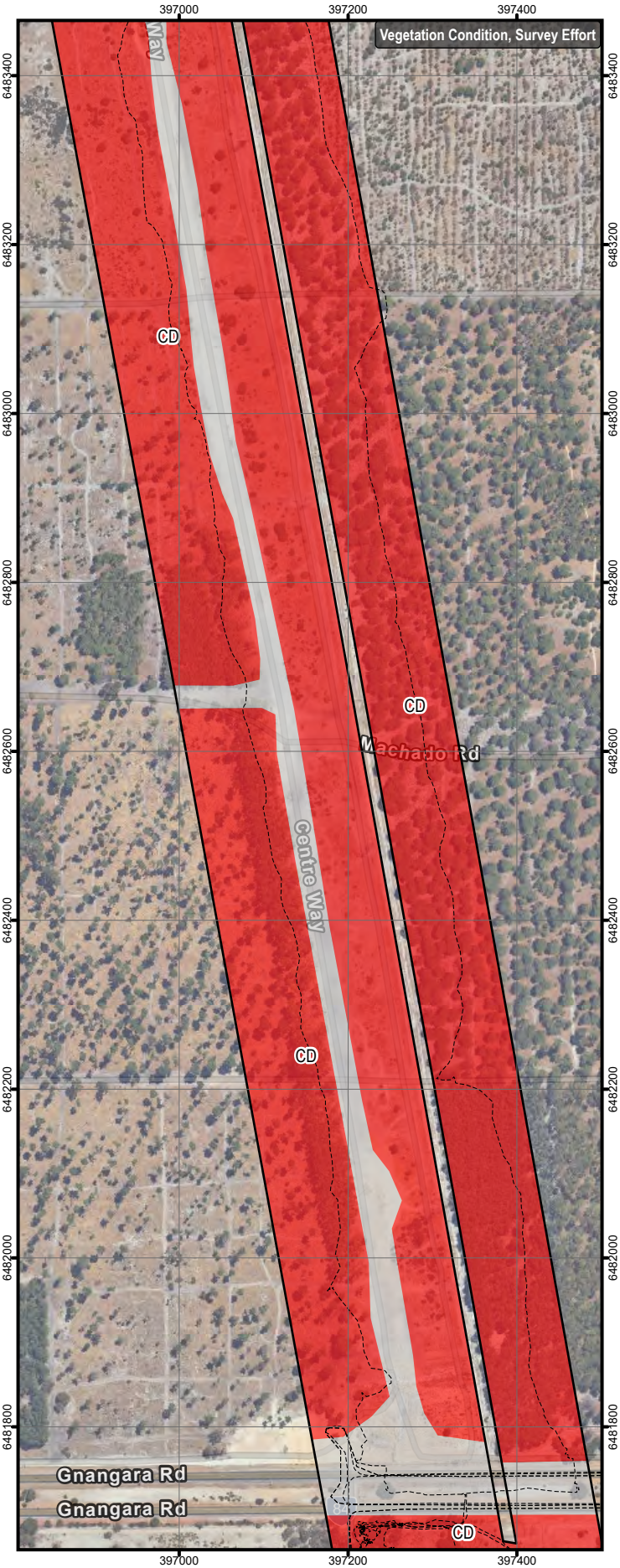
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LEGEND

Survey Area

Vegetation Unit
- CcXpHg
- Plantation
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Tracklog

Vegetation Communities and Condition

WESTERN POWER

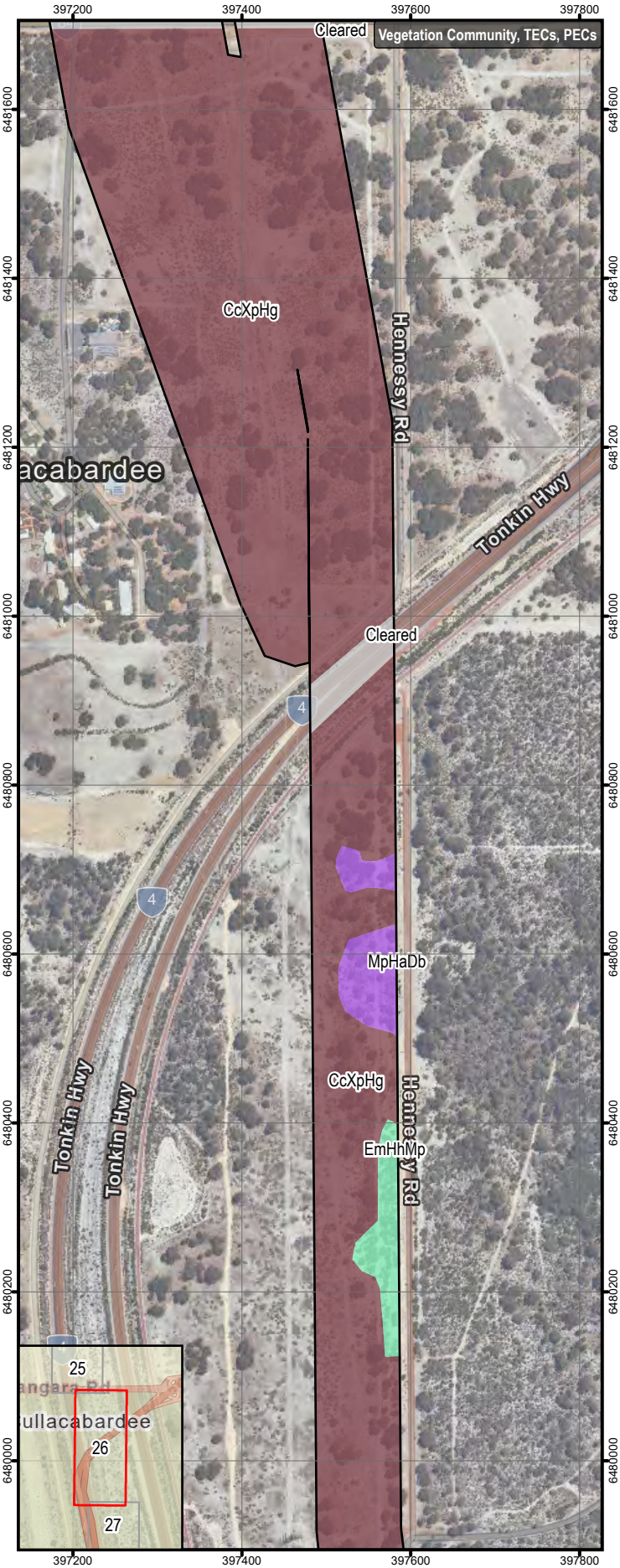
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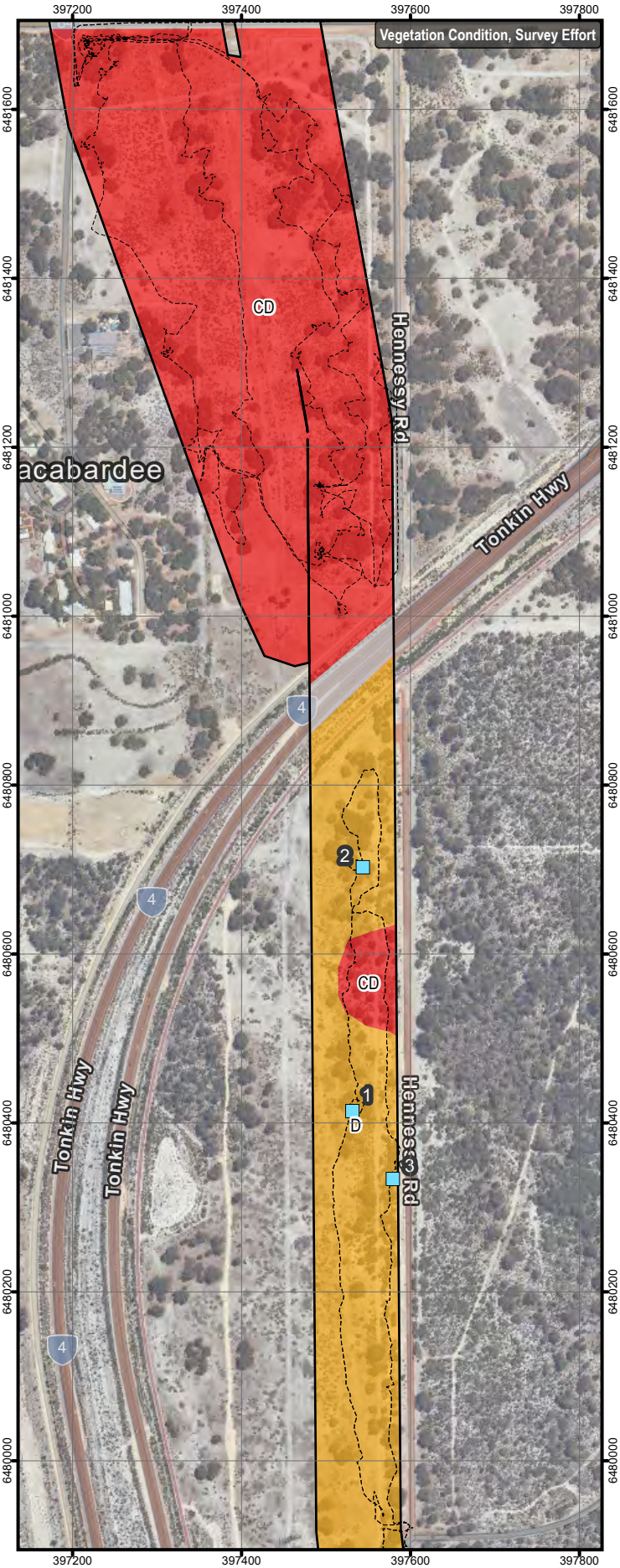
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LEGEND

Survey Area

Vegetation Unit
- CcXpHg
- EmHhMp
- MpHaDb
- Cleared

Vegetation Condition
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Releve

Vegetation Communities and Condition

WESTERN POWER

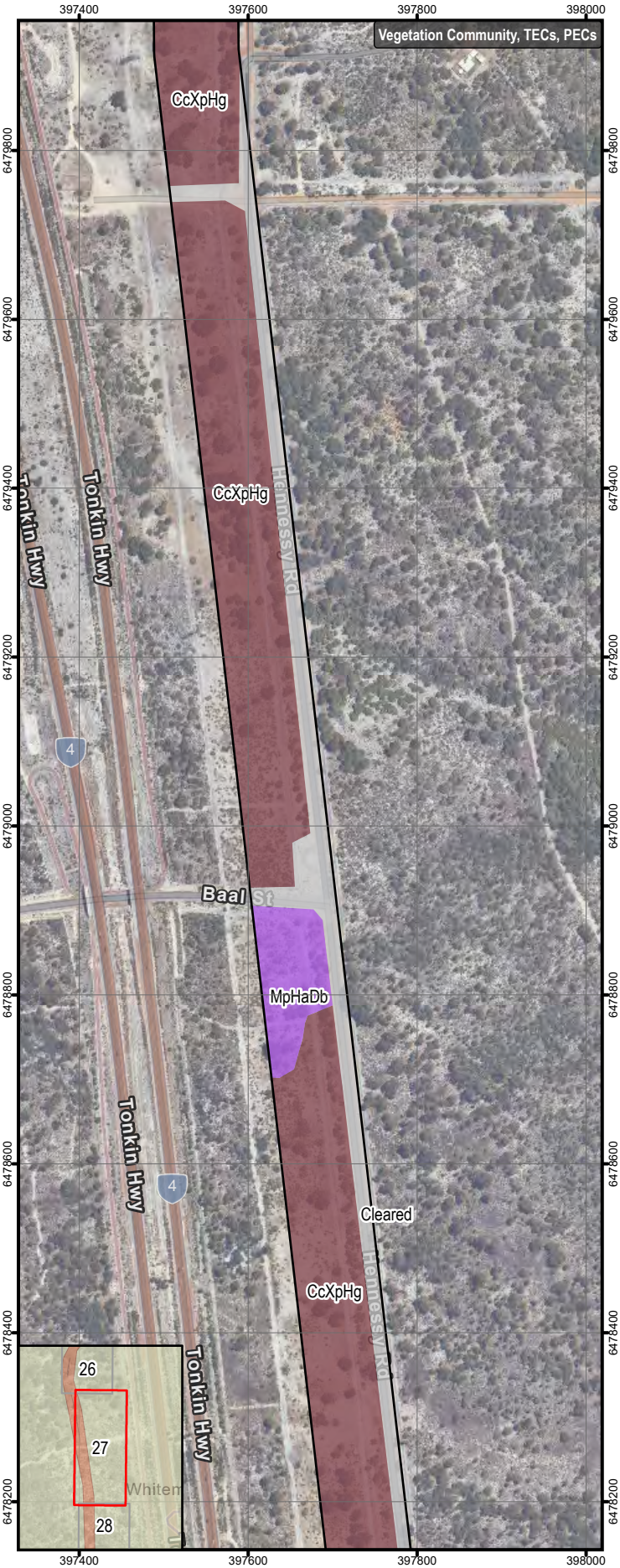
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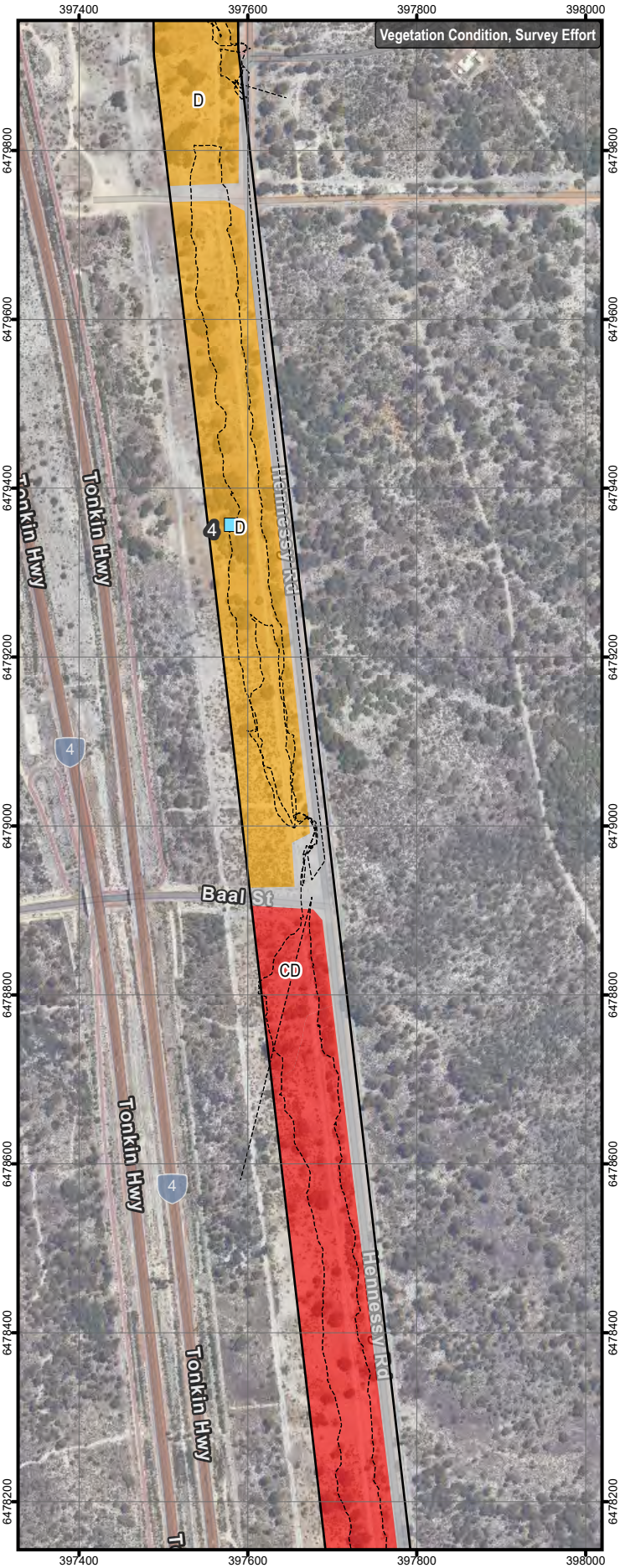
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LEGEND

Survey Area

Vegetation Unit
- CcXpHg
- MpHaDb
- Cleared

Vegetation Condition
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Releve

Vegetation Communities and Condition

WESTERN POWER

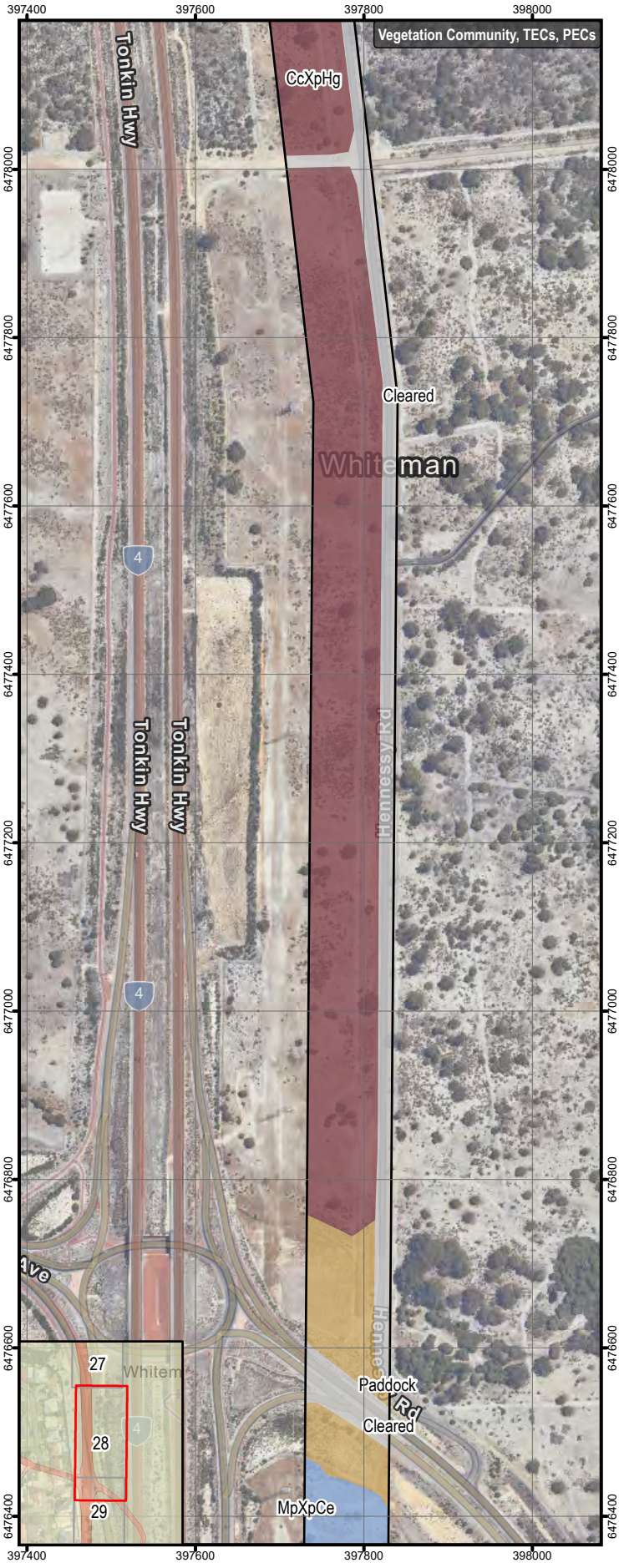
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

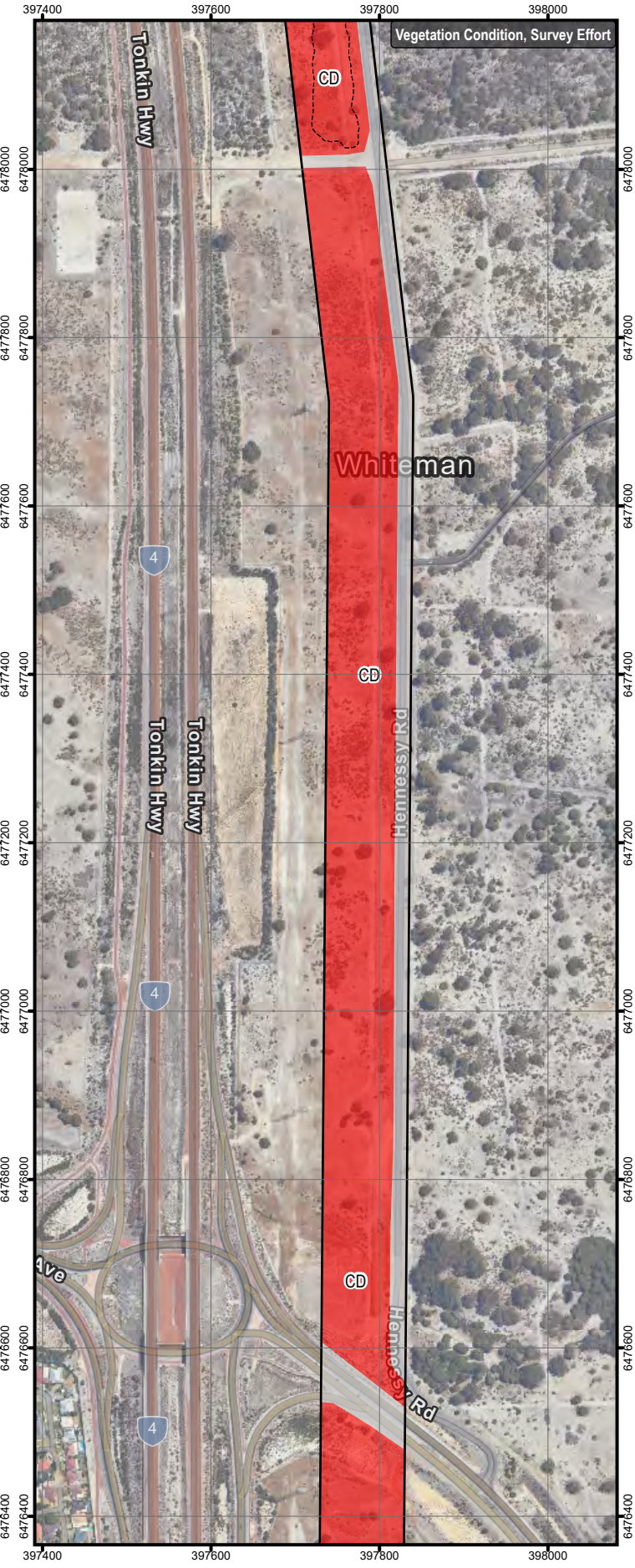
Figure
9.27

A4 size

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LEGEND
- Survey Area
- Vegetation Unit
  - CcXpHg
  - MpXpCe
  - Paddock
  - Cleared
- Vegetation Condition
  - Completely Degraded
  - Cleared
- Tracklog

Vegetation Communities and Condition

WESTERN POWER

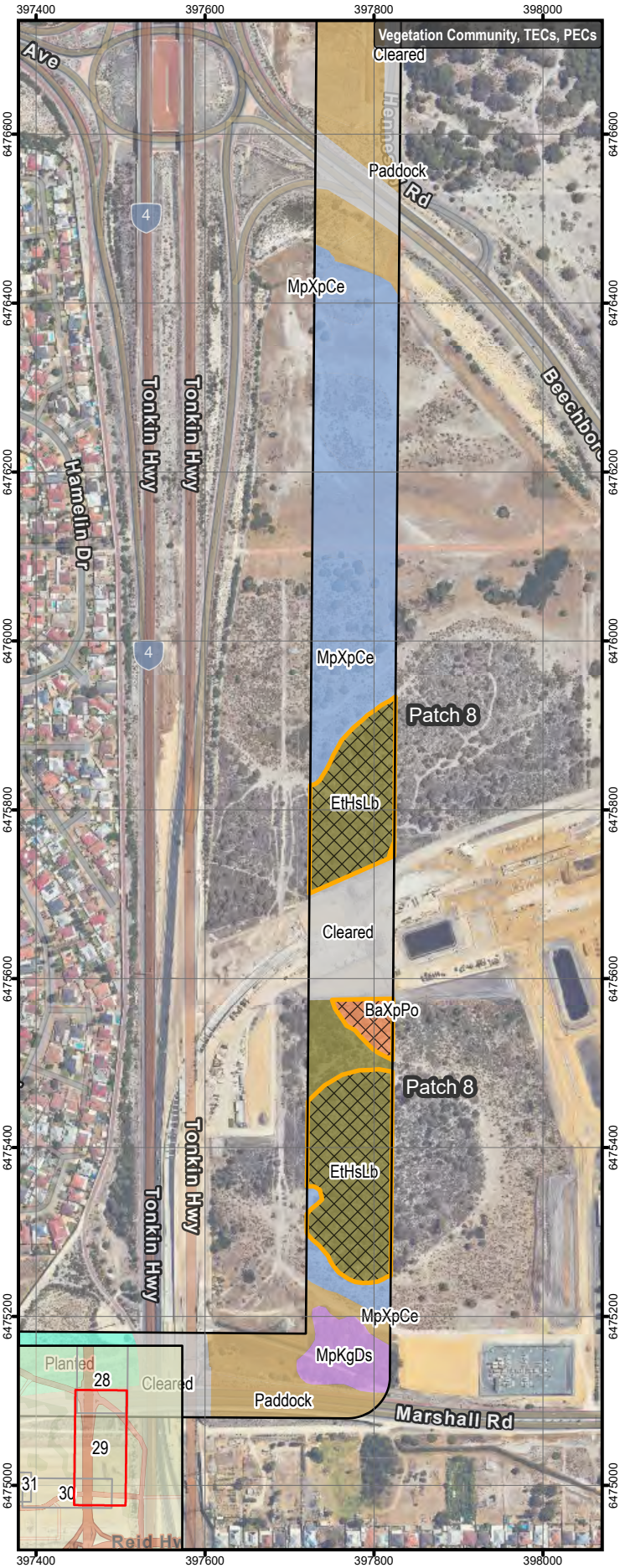
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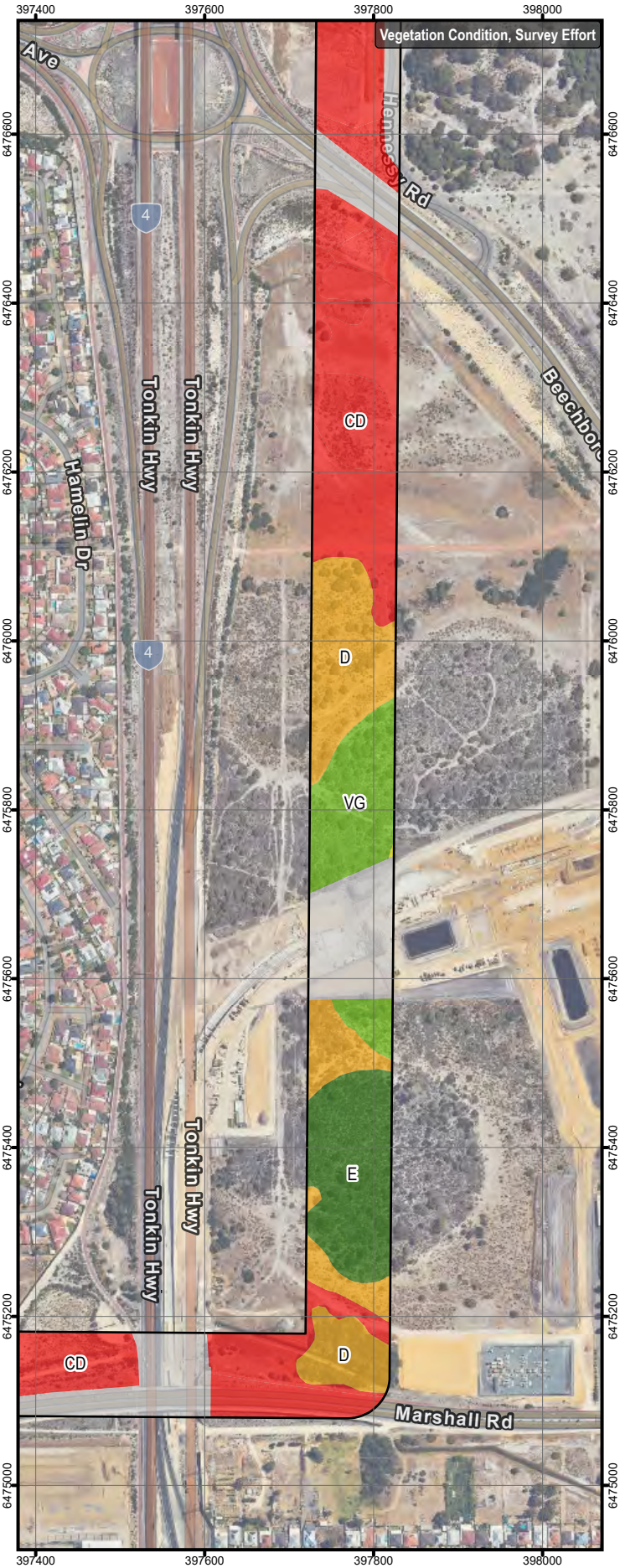
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LEGEND

Survey Area

Vegetation Unit
- BaXpPo
- CcXpHg
- EtHsLb
- MpKgDs
- MpXpCe
- Paddock
- Planted
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

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

Vegetation Communities and Condition

WESTERN POWER

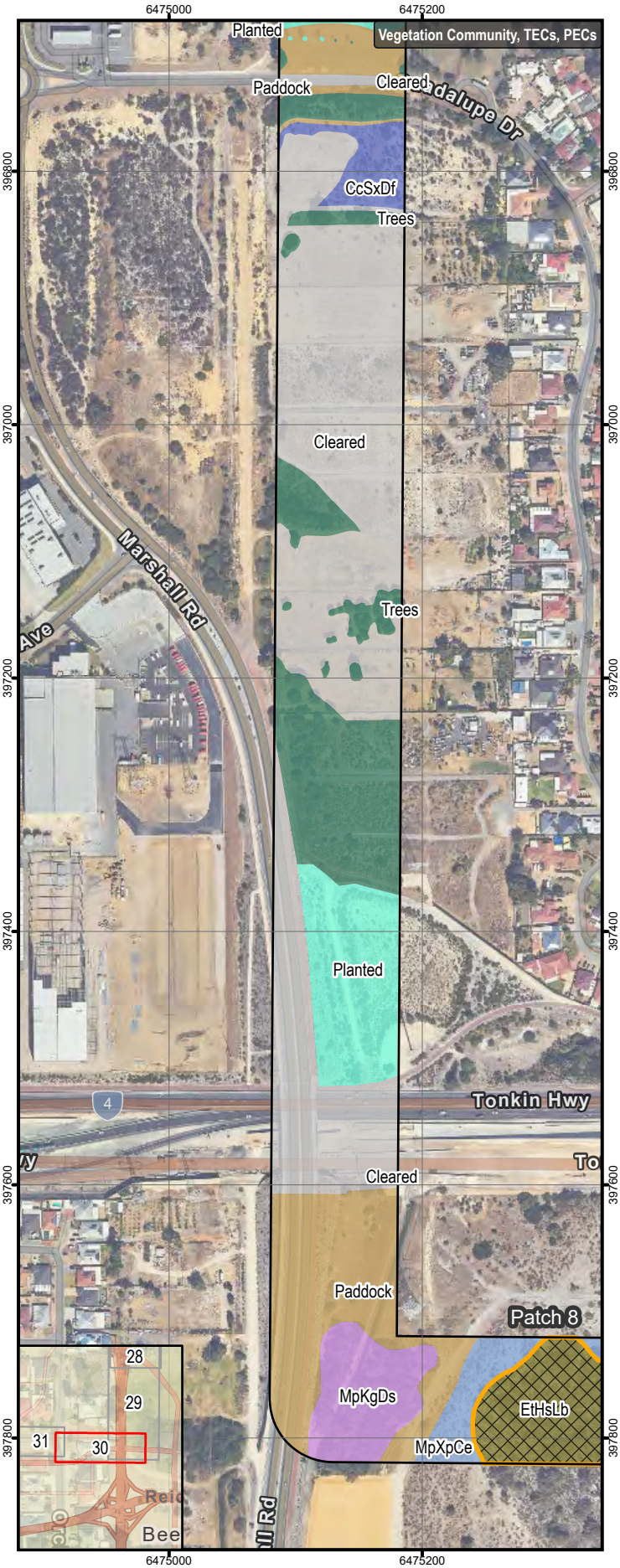
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

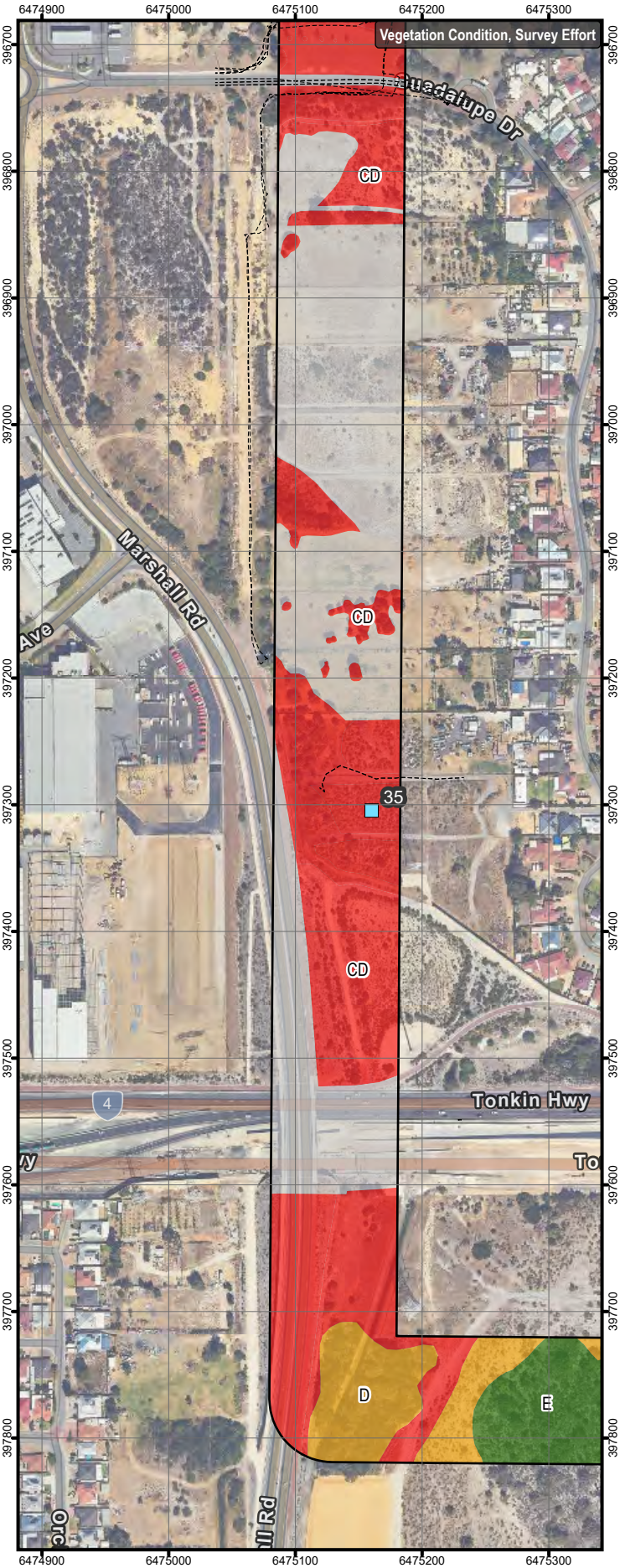
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LEGEND

Survey Area

Vegetation Unit
- CcSxDf
- EtHsLb
- MpKgDs
- MpXpCe
- Paddock
- Planted
- Trees
- Cleared

EPBC Act listed TECs
- TEC Banksia Woodlands of the Swan Coastal Plain

DBCA listed PECs
- PEC Banksia Dominated Woodlands of the Swan Coastal Plain

Vegetation Condition
- Excellent
- Degraded
- Completely Degraded
- Cleared

Tracklog

Sample Sites
- Releve

Vegetation Communities and Condition

WESTERN POWER

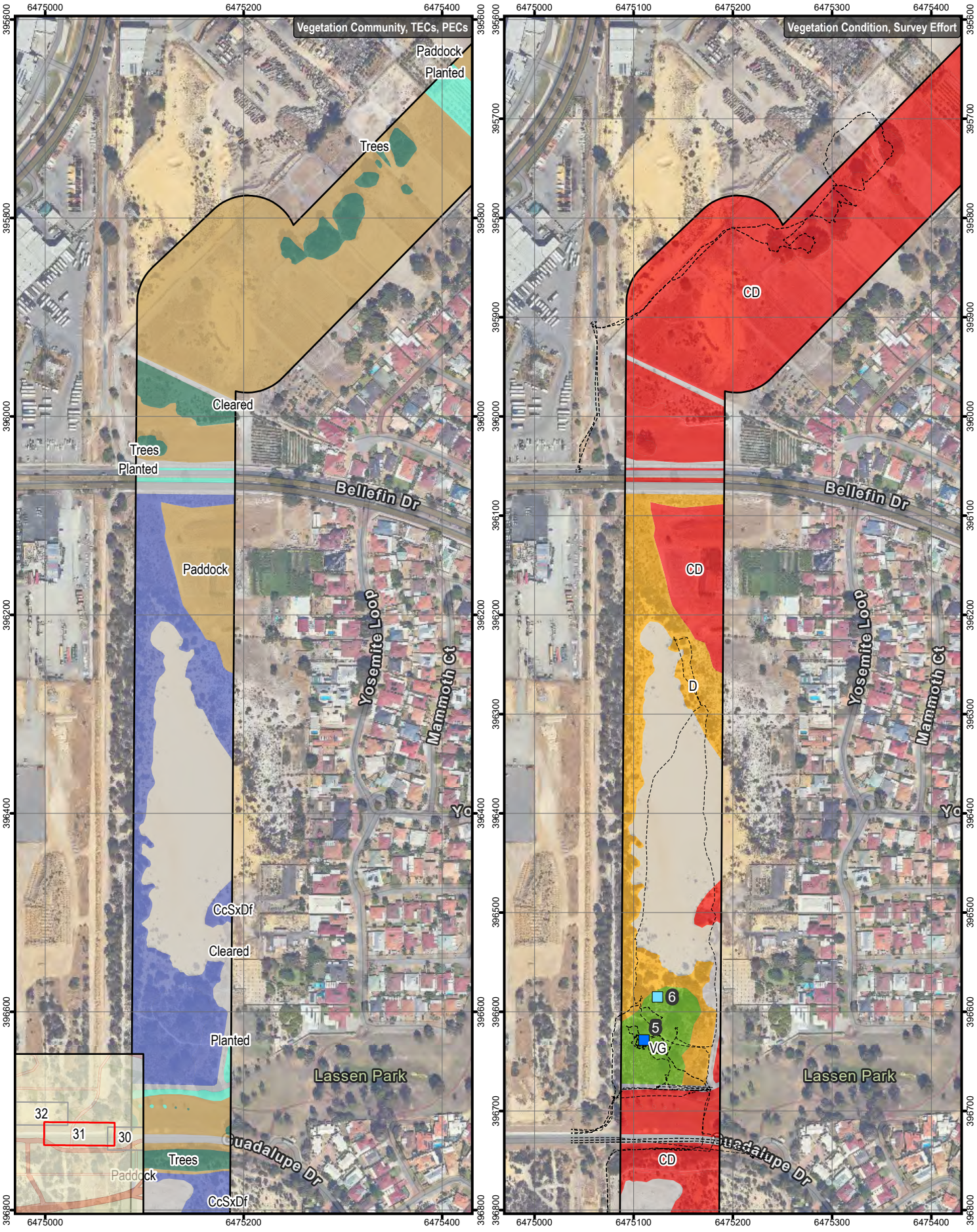
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.30

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LEGEND

Survey Area

Vegetation Unit
- CcSxDf
- Paddock
- Planted
- Trees
- Cleared

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

Tracklog

Sample Sites
- Quadrat
- Releve

Vegetation Communities and Condition

WESTERN POWER

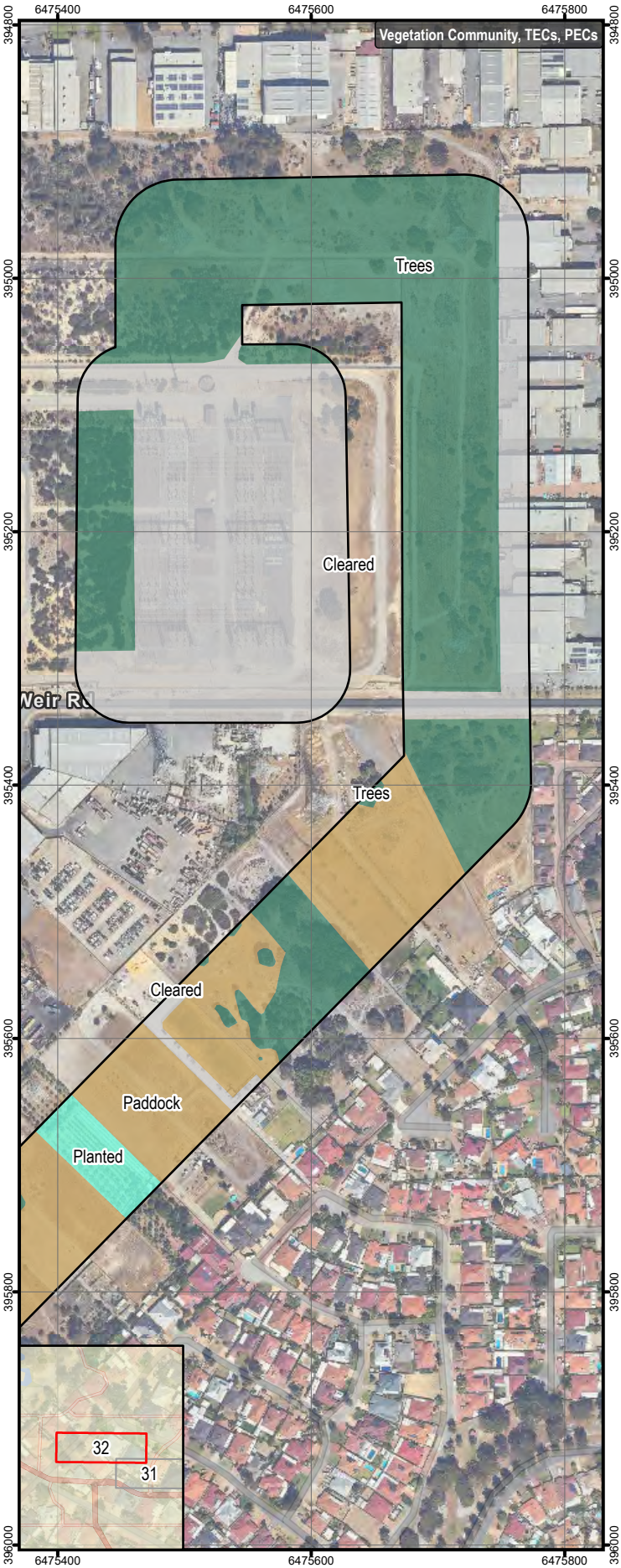
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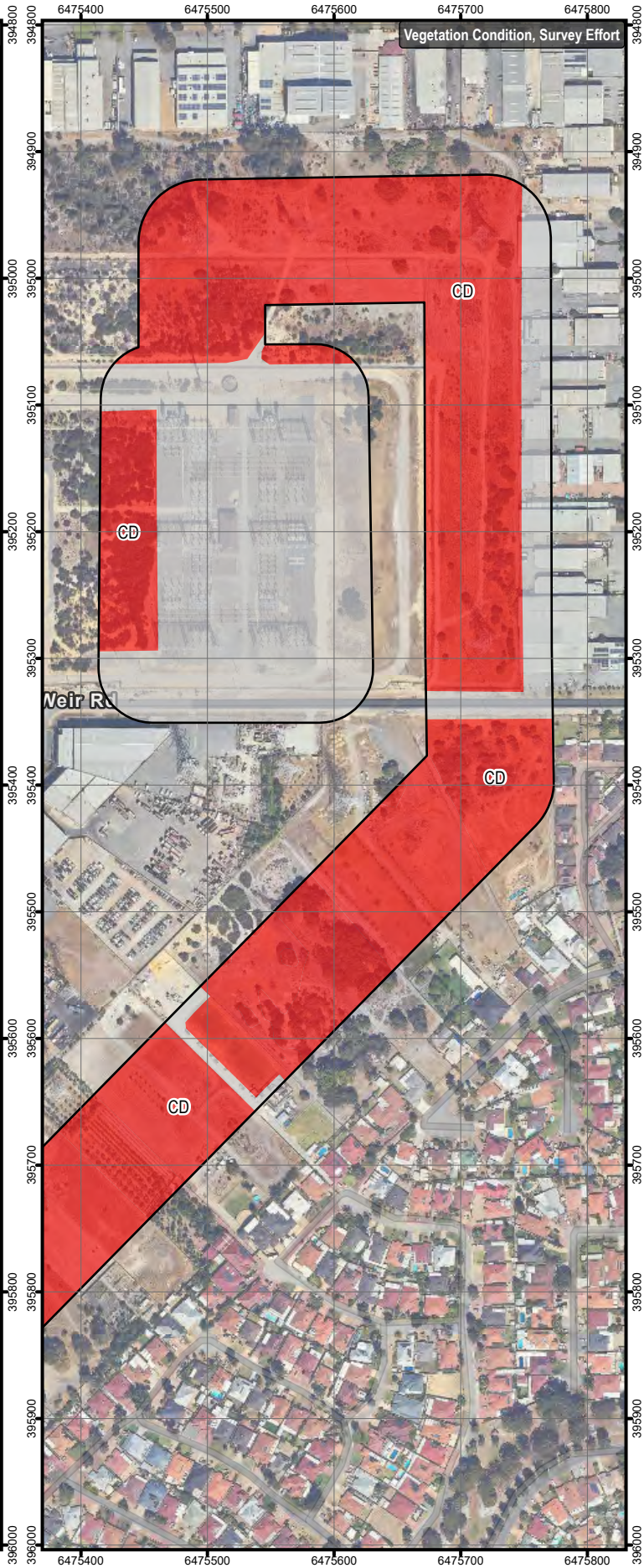
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LEGEND

Survey Area

Vegetation Unit
- Paddock
- Planted
- Trees
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared

Vegetation Communities and Condition

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

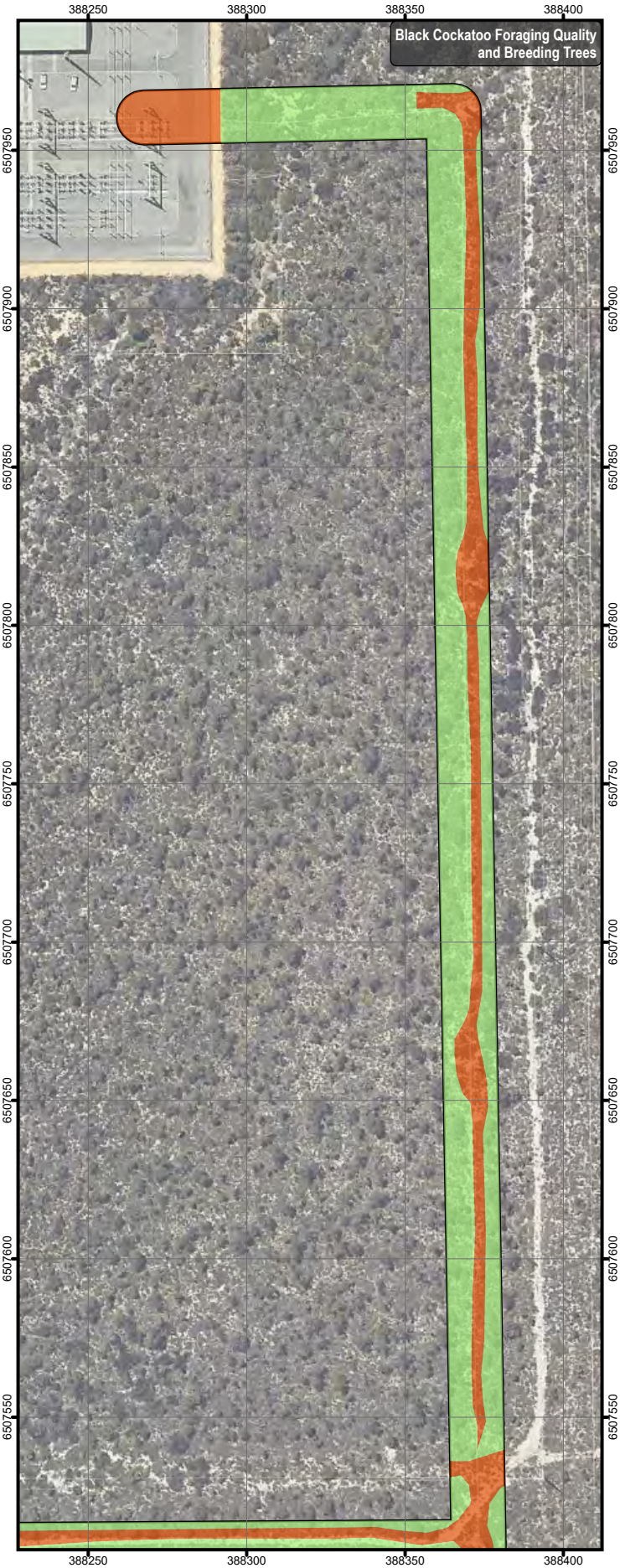
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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

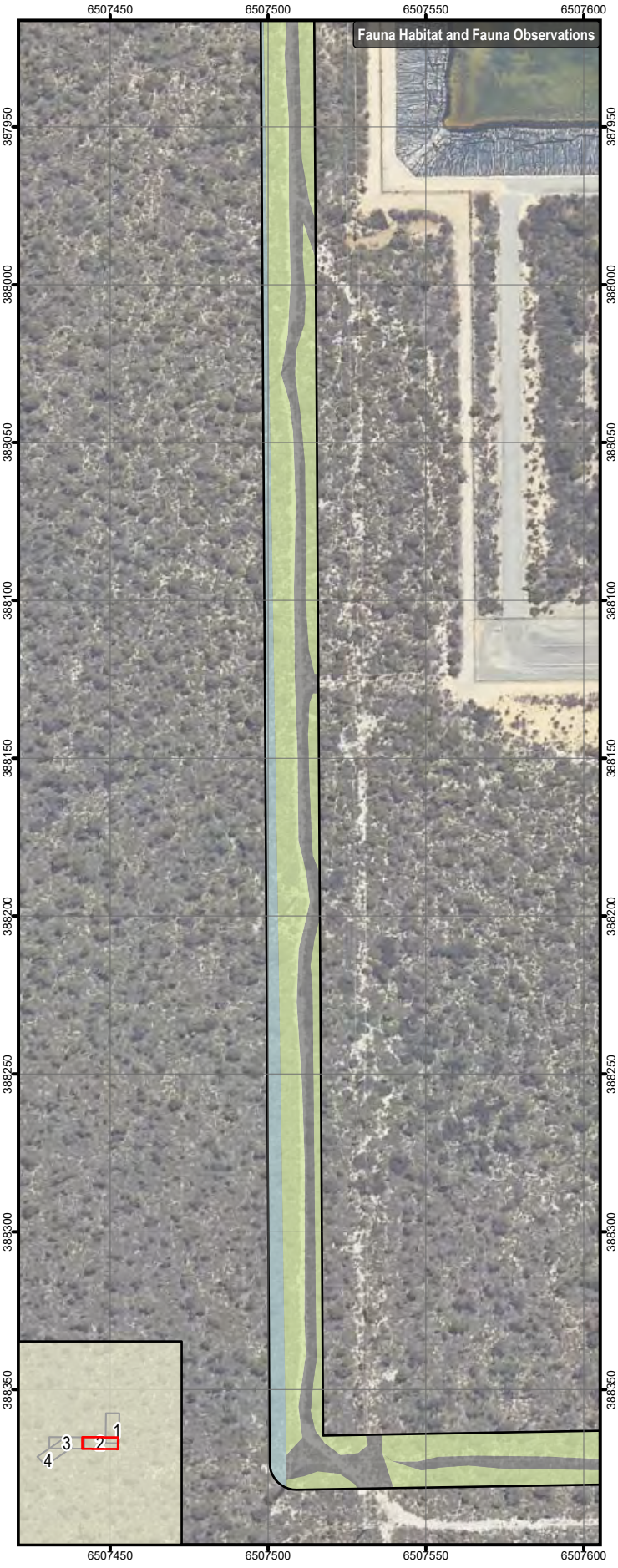
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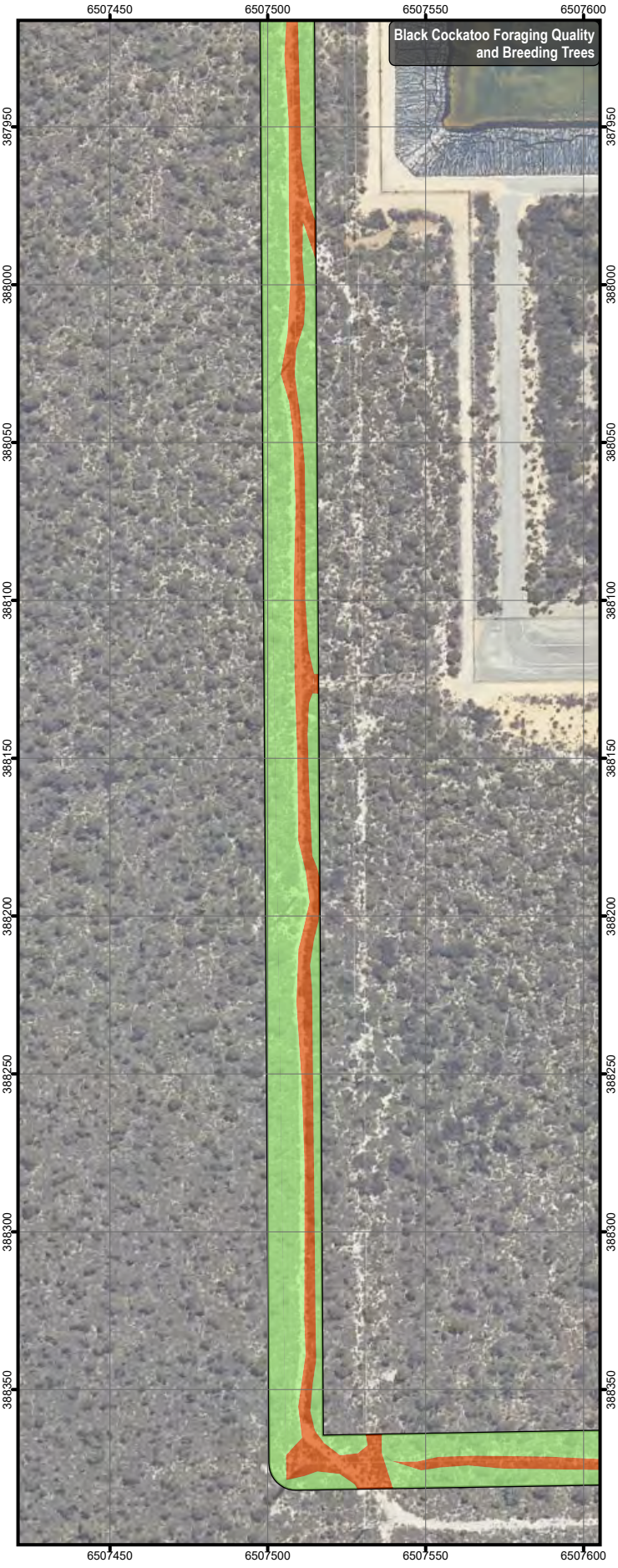
Figure 10.1

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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

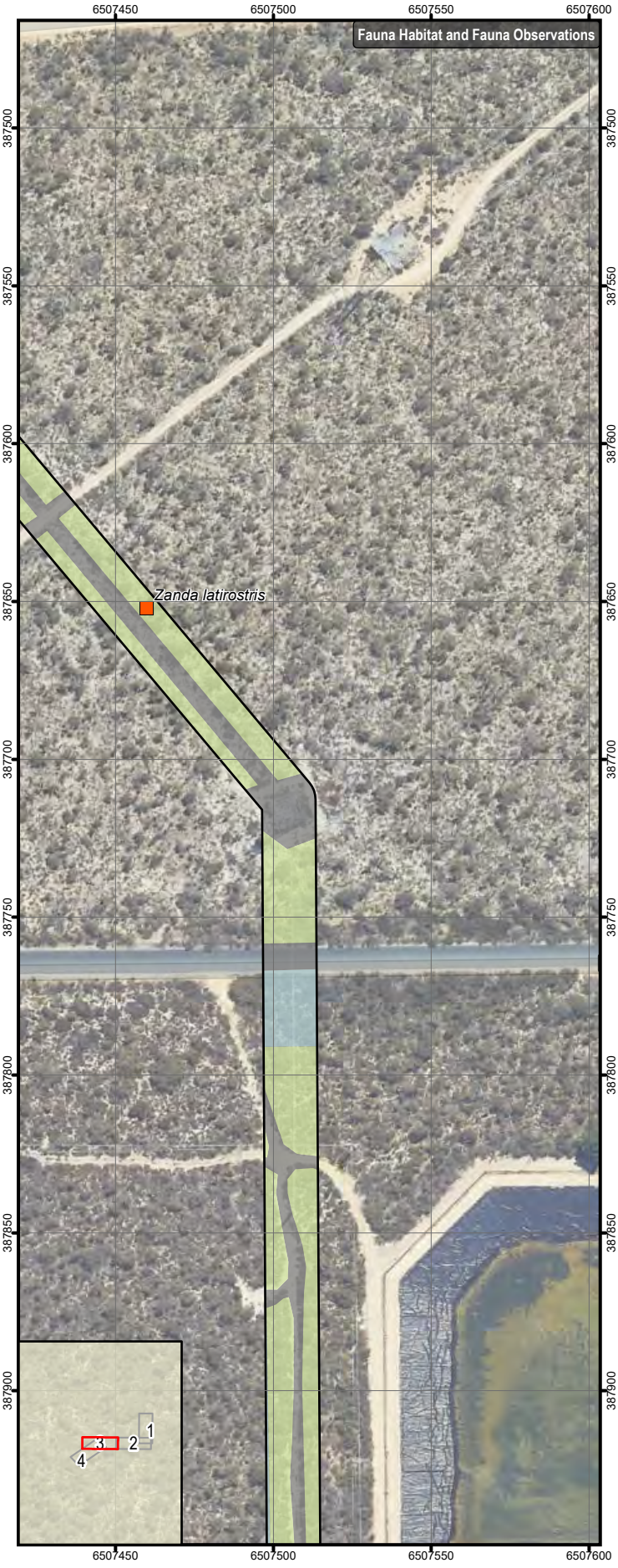
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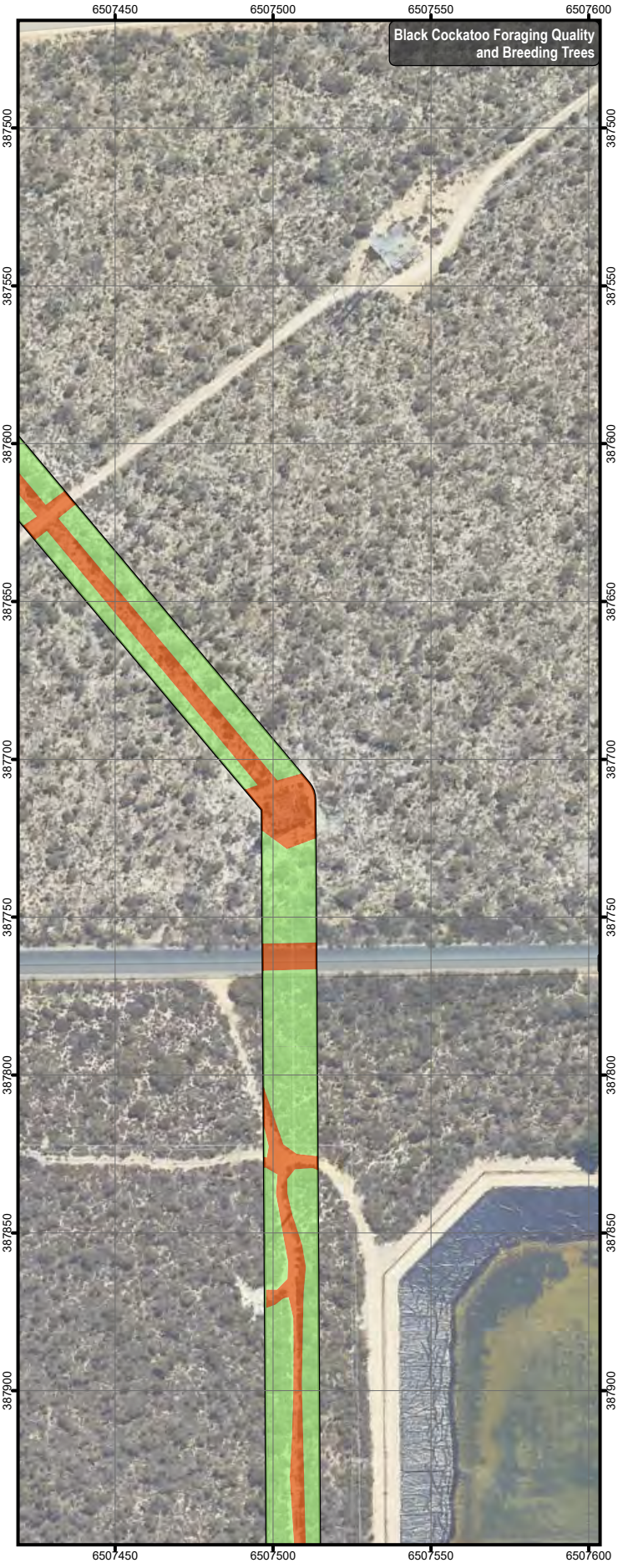
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LEGEND
Survey Area
Fauna Sighting - Conservation Status
Endangered
Fauna Habitat
Adenanthos/Plantation
Banksia Woodlands
Cleared

Black Cockatoo Foraging Quality*
Cleared
High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

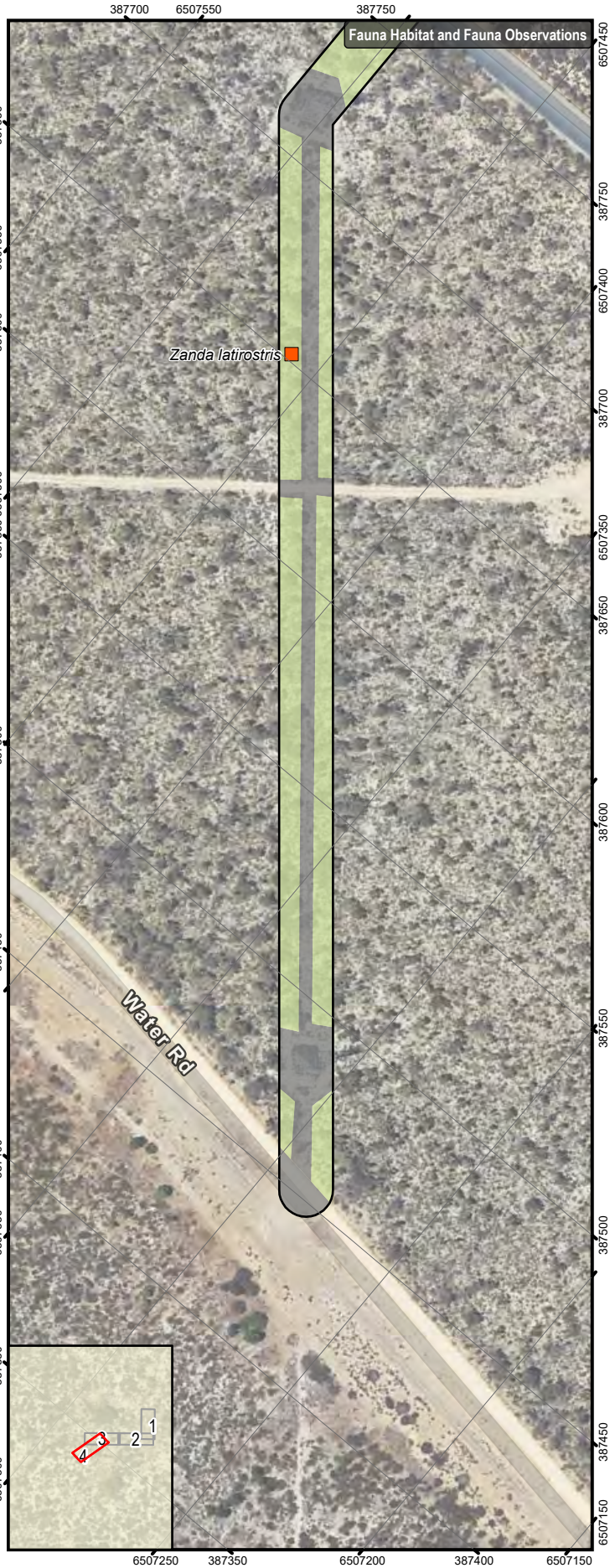
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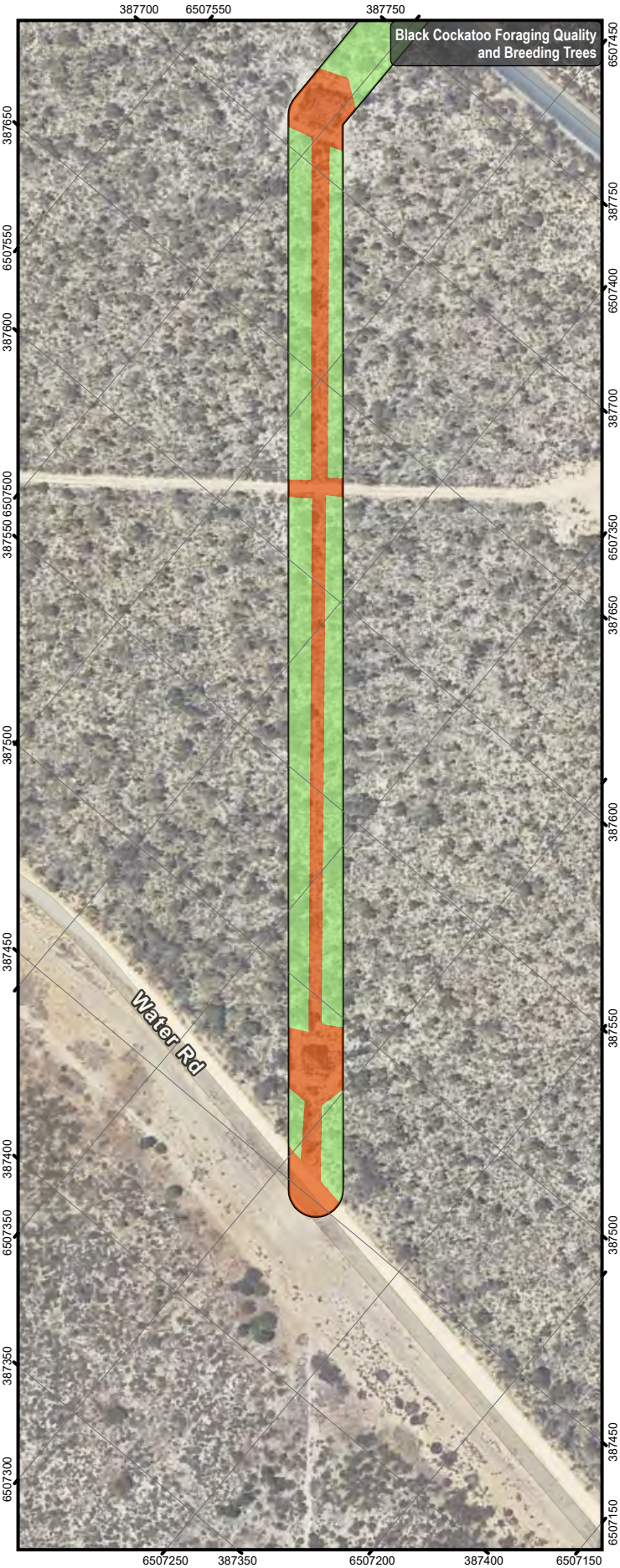
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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- Endangered

Fauna Habitat
- Banksia Woodlands
- Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.4

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Hybrid Reference Layer: Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS

LEGEND
- Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

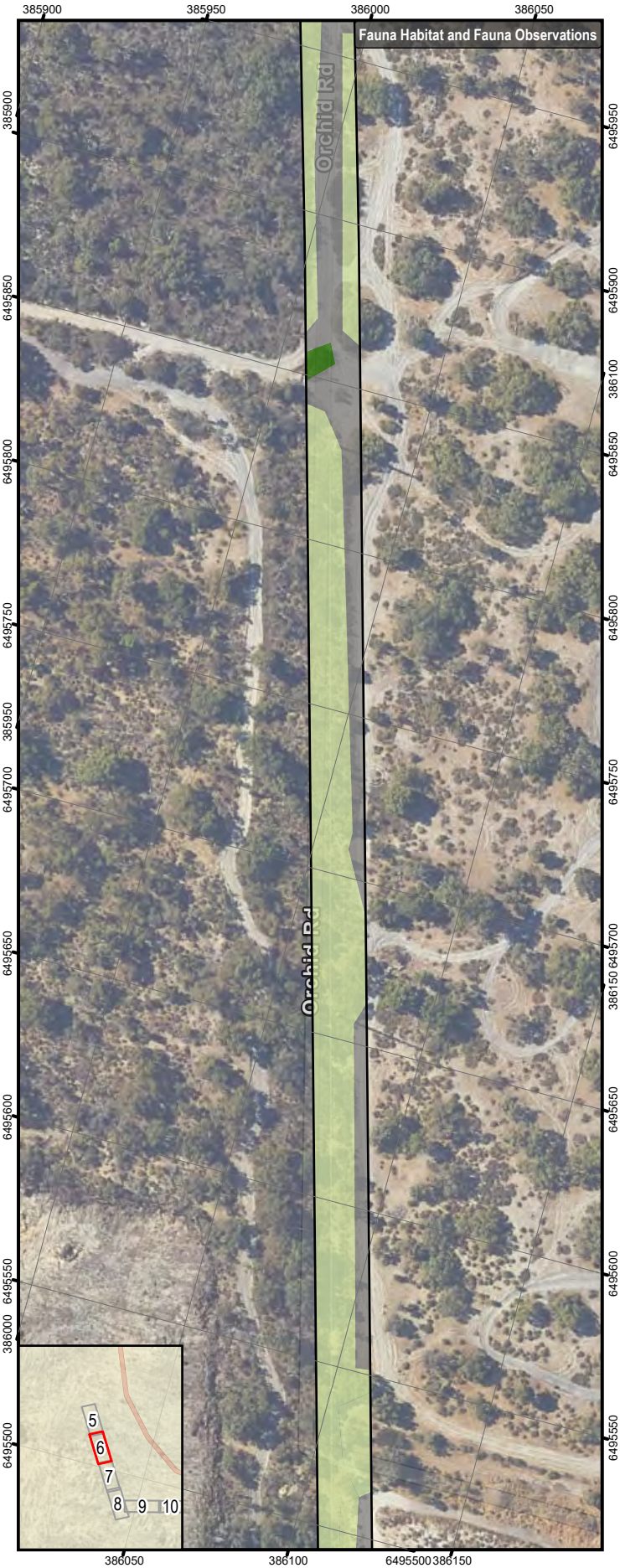
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Figure 10.5

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LEGEND
- Survey Area
- Fauna Habitat
  - Banksia Woodlands
  - Cleared
  - Trees over Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

* Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

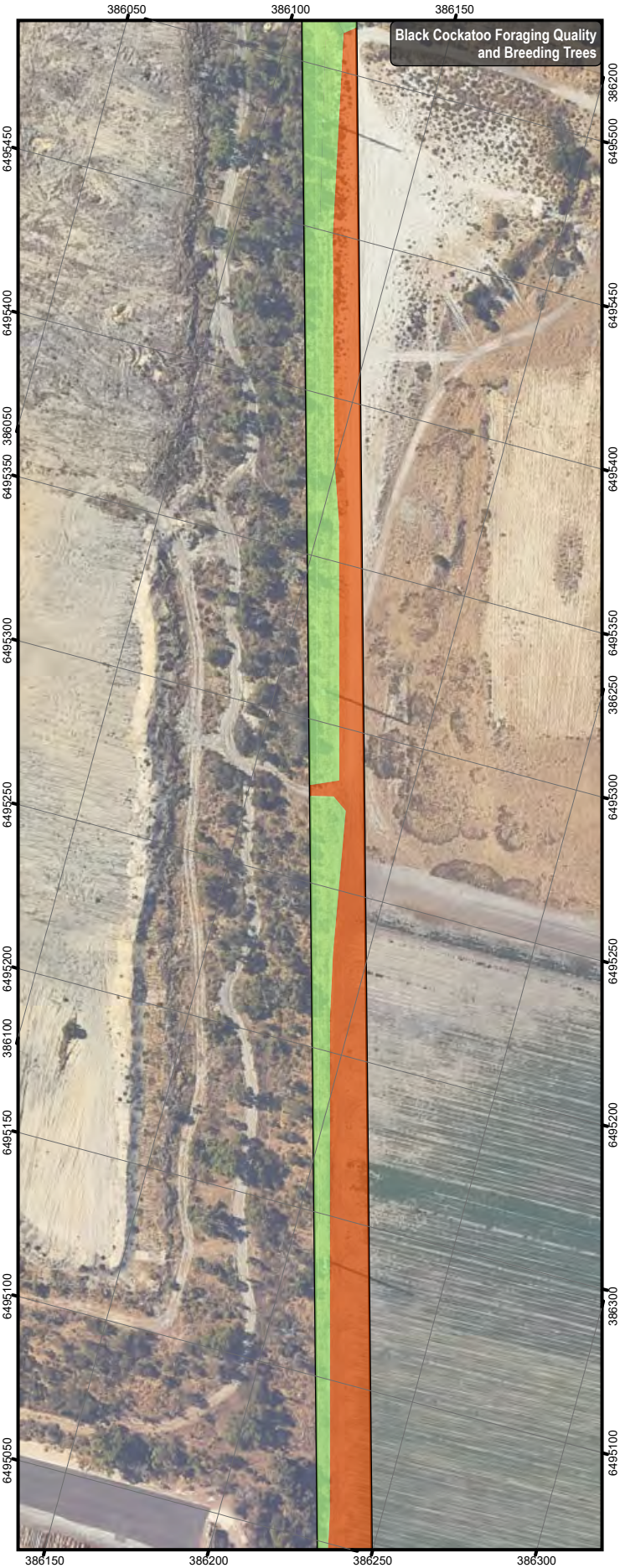
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LEGEND

- Survey Area

Fauna Habitat

- Banksia Woodlands
- Cleared

Black Cockatoo Foraging Quality*

- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.7

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LEGEND

- Survey Area
- Fauna Habitat
  - Banksia Woodlands
  - Cleared

Black Cockatoo Foraging Quality*

- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

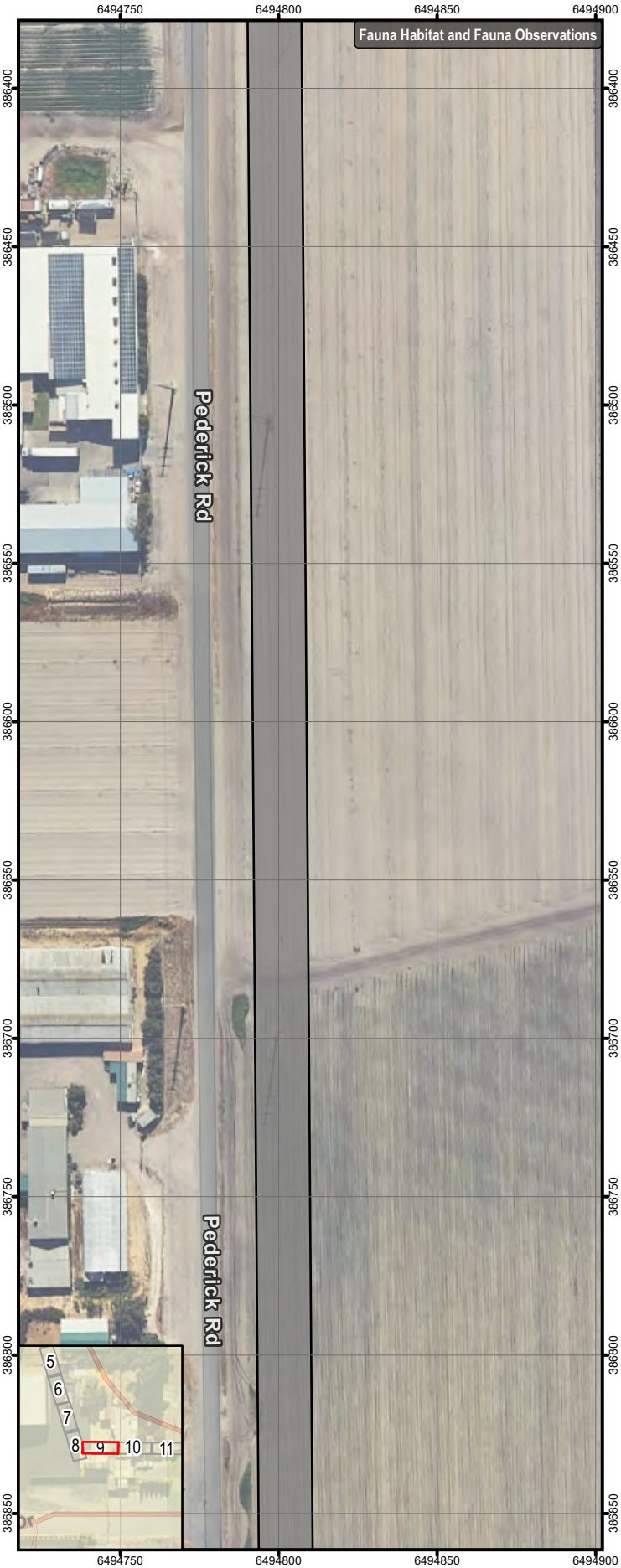
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Figure 10.8

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LEGEND
Survey Area
Fauna Habitat
Cleared

Black Cockatoo Foraging Quality*
Cleared

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

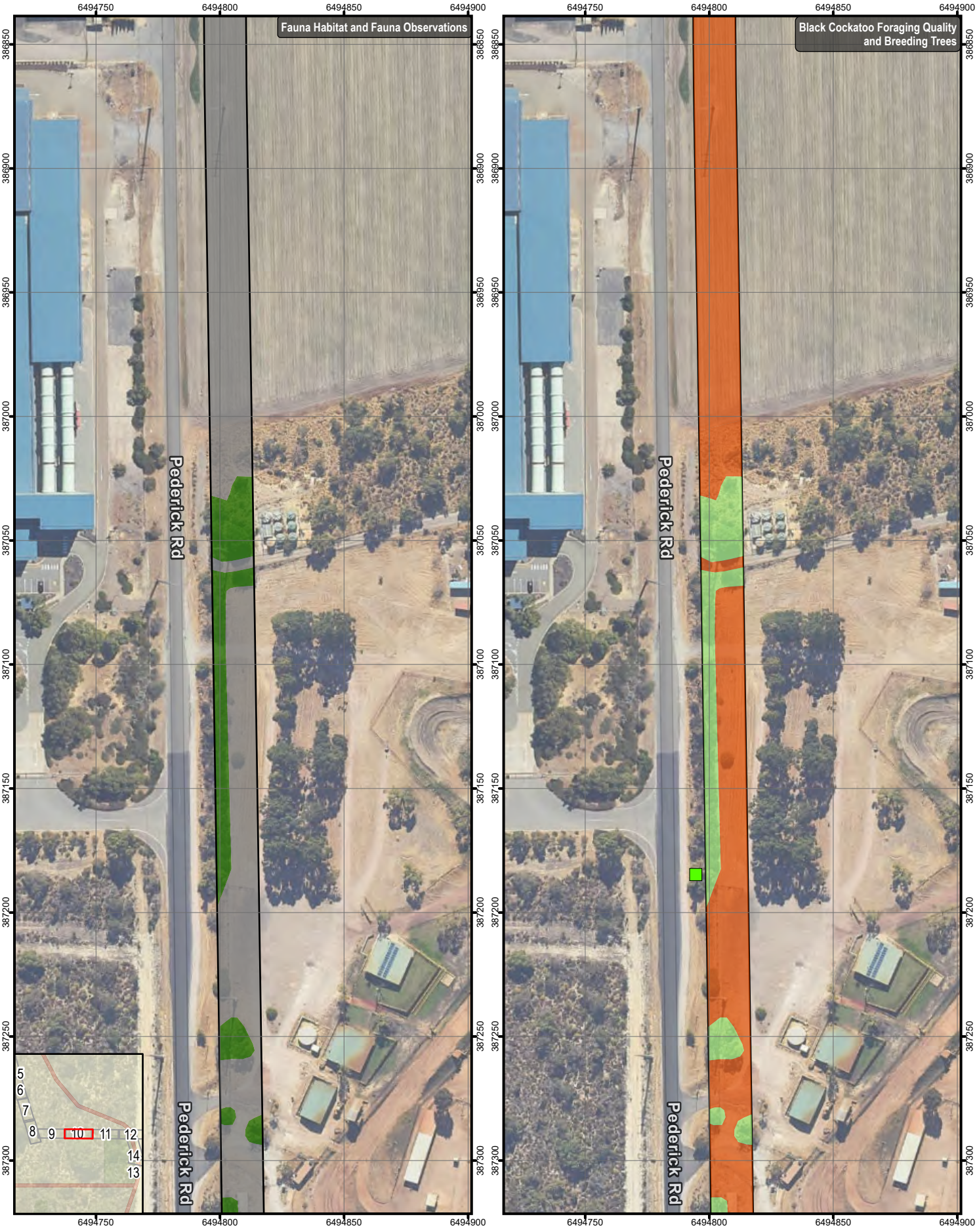
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Figure 10.9

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LEGEND

Survey Area

Fauna Habitat
- Cleared
- Trees over Cleared

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.10

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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- Endangered

Fauna Habitat
- Banksia Woodlands
- Cleared
- Trees over Cleared

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.11

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LEGEND
Survey Area
Fauna Habitat
Banksia Woodlands
Cleared
Trees over Cleared

Black Cockatoo Foraging Quality*
Cleared
High Quality Native Foraging Habitat

* *Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.12

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LEGEND

Survey Area

Fauna Habitat
- Cleared
- Trees over Cleared

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)
- Jarrah (*Eucalyptus marginata*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

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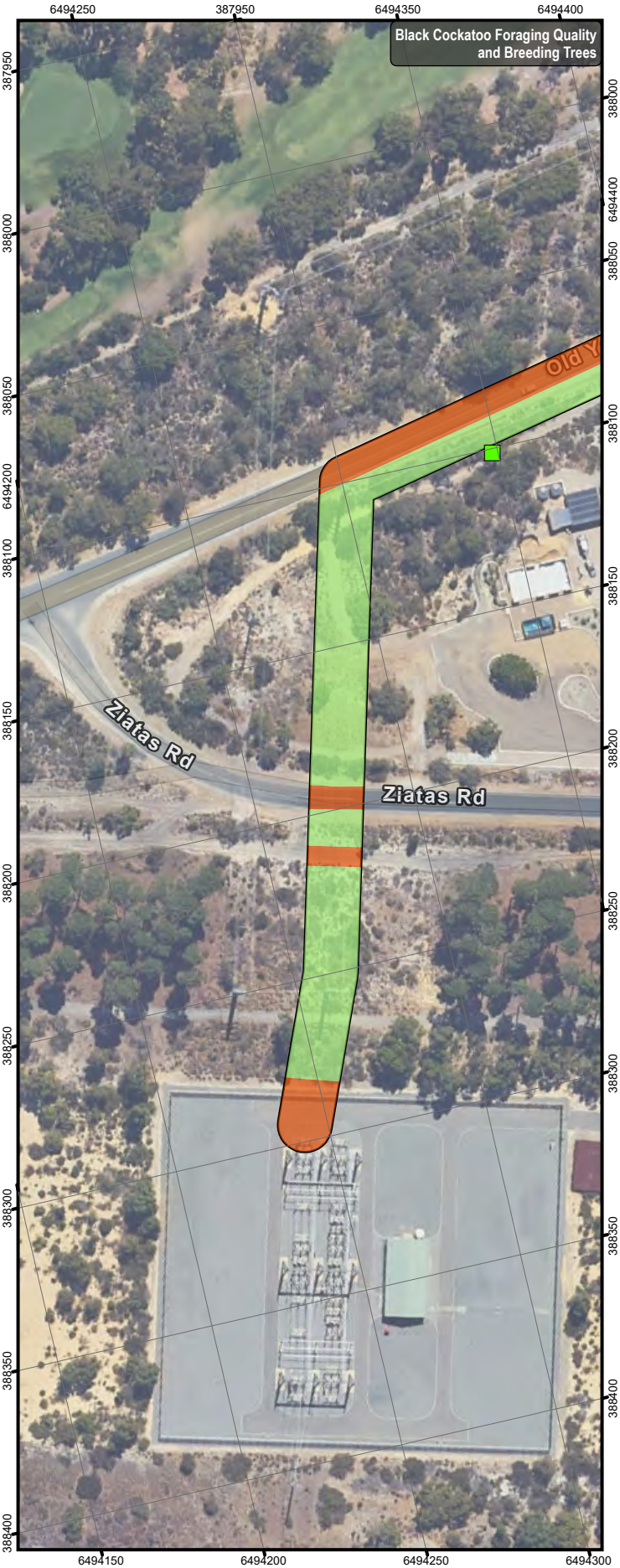
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LEGEND

Survey Area

Fauna Habitat
- Cleared
- Trees over Cleared

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

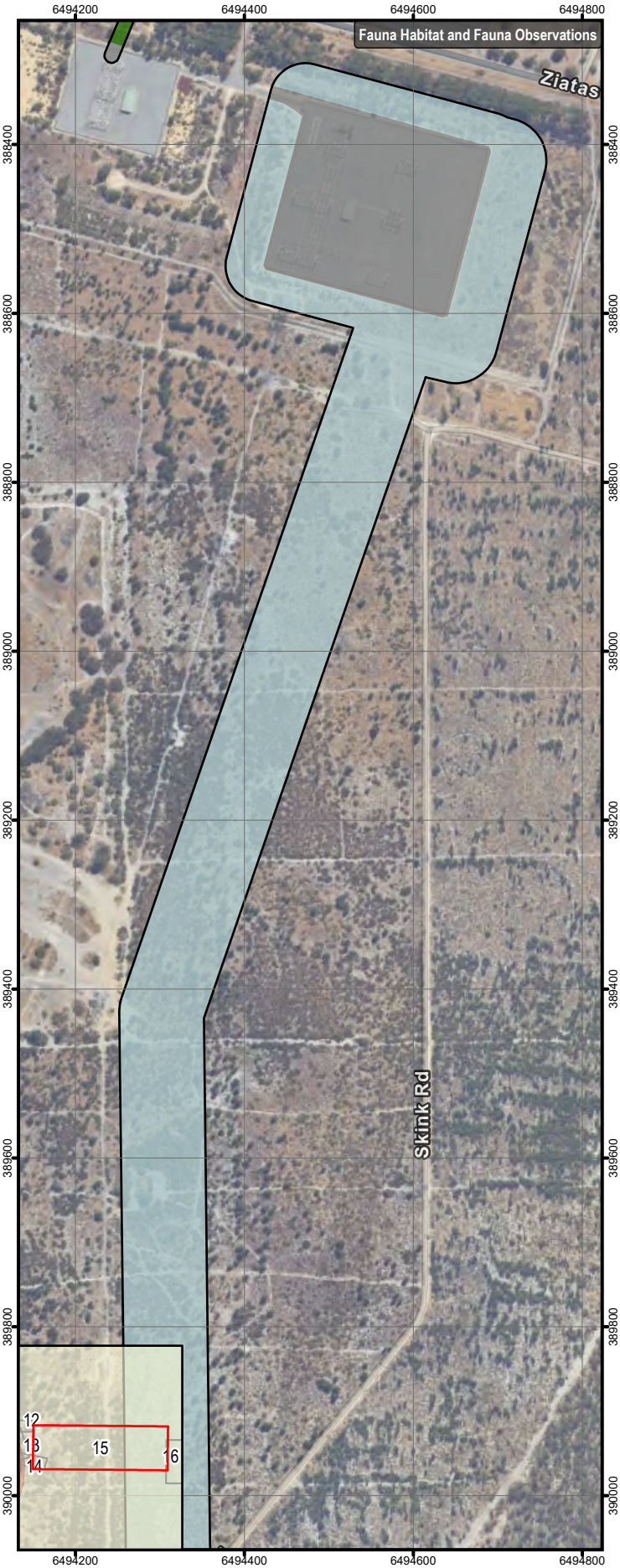
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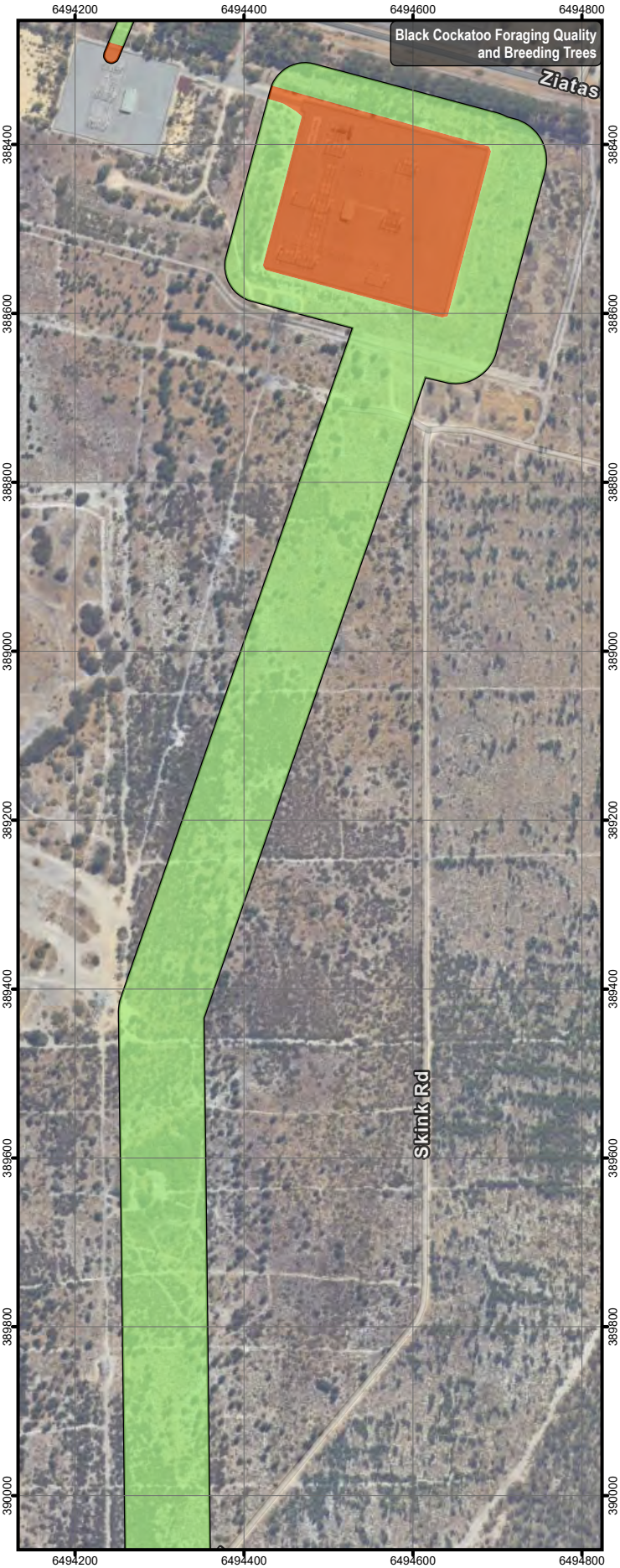
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LEGEND
- Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared
- Trees over Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

* *Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

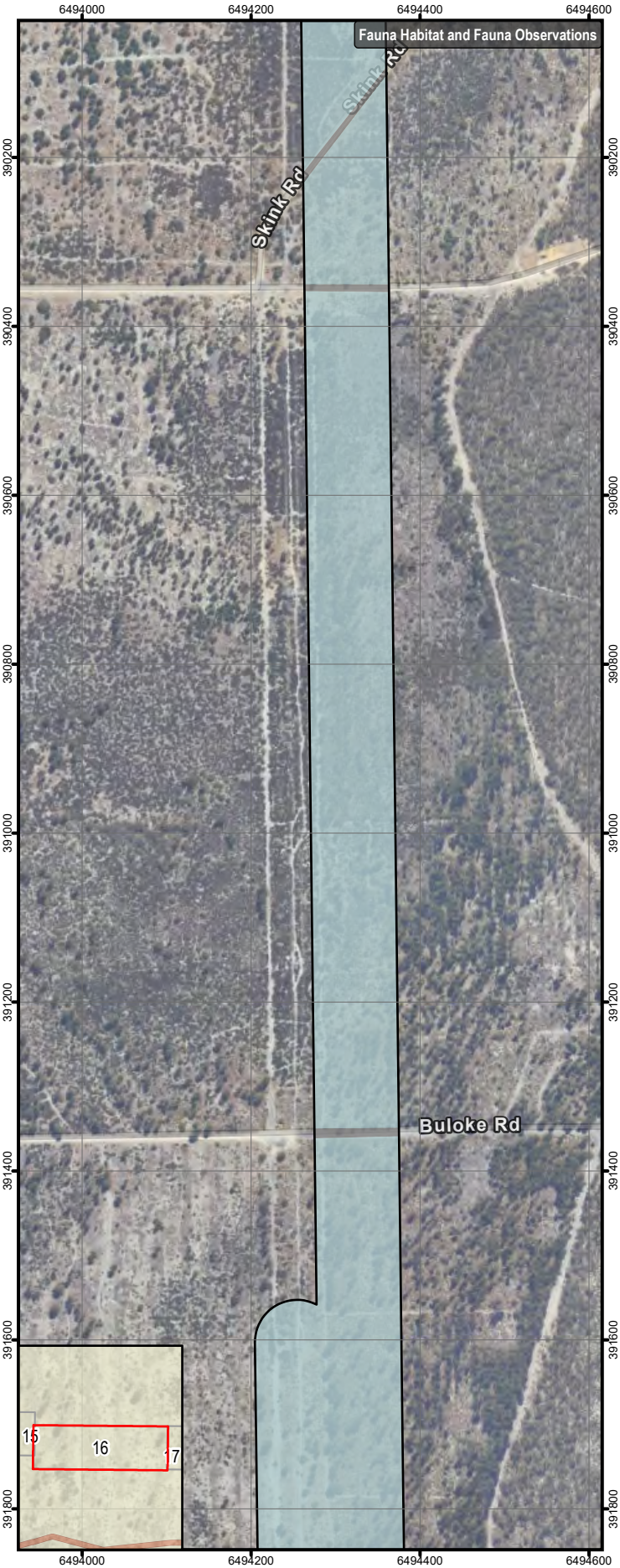
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Figure 10.15

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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

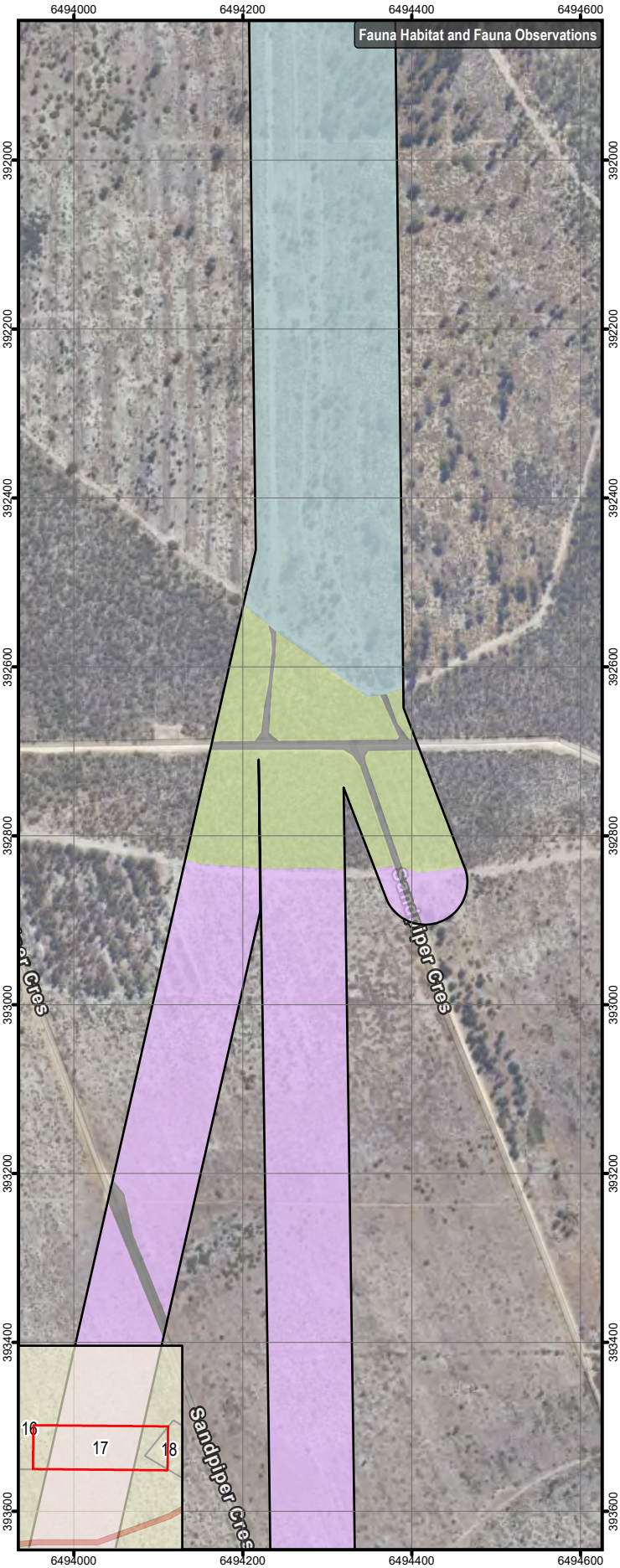
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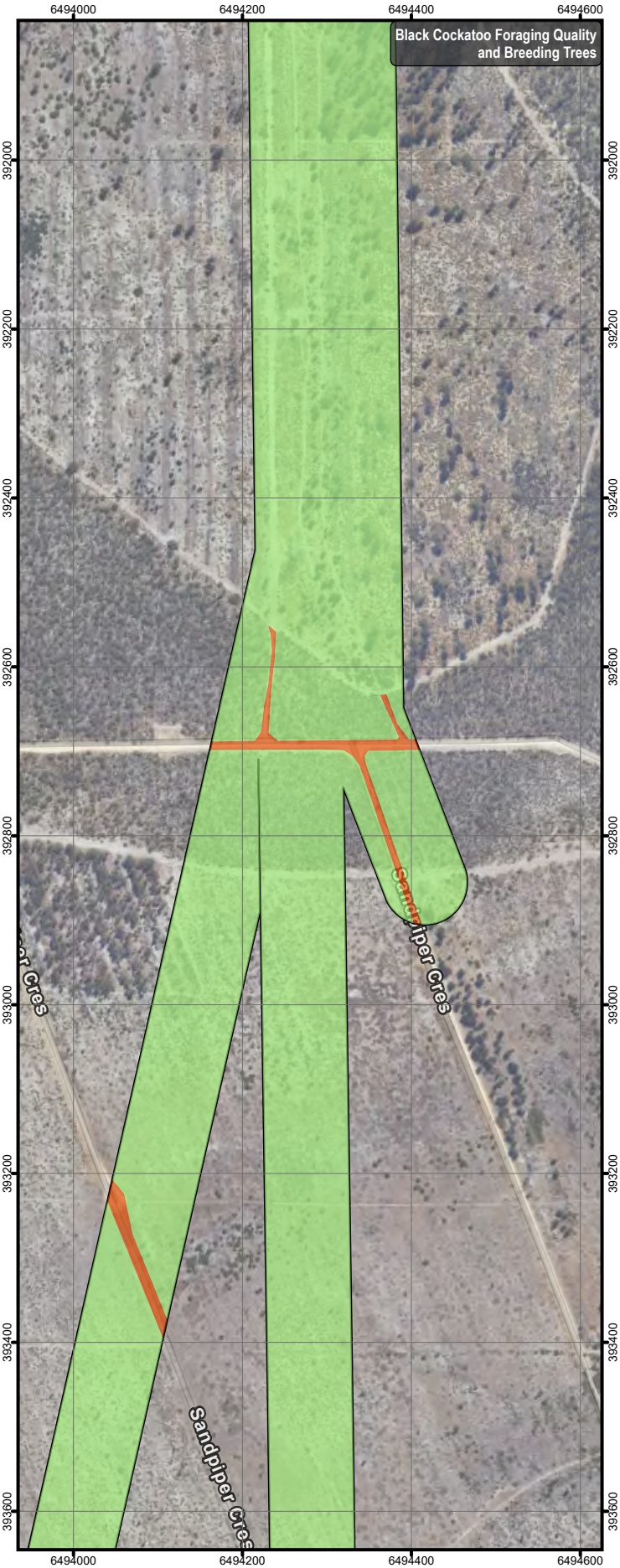
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LEGEND
- Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared
- Plantations

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

* *Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

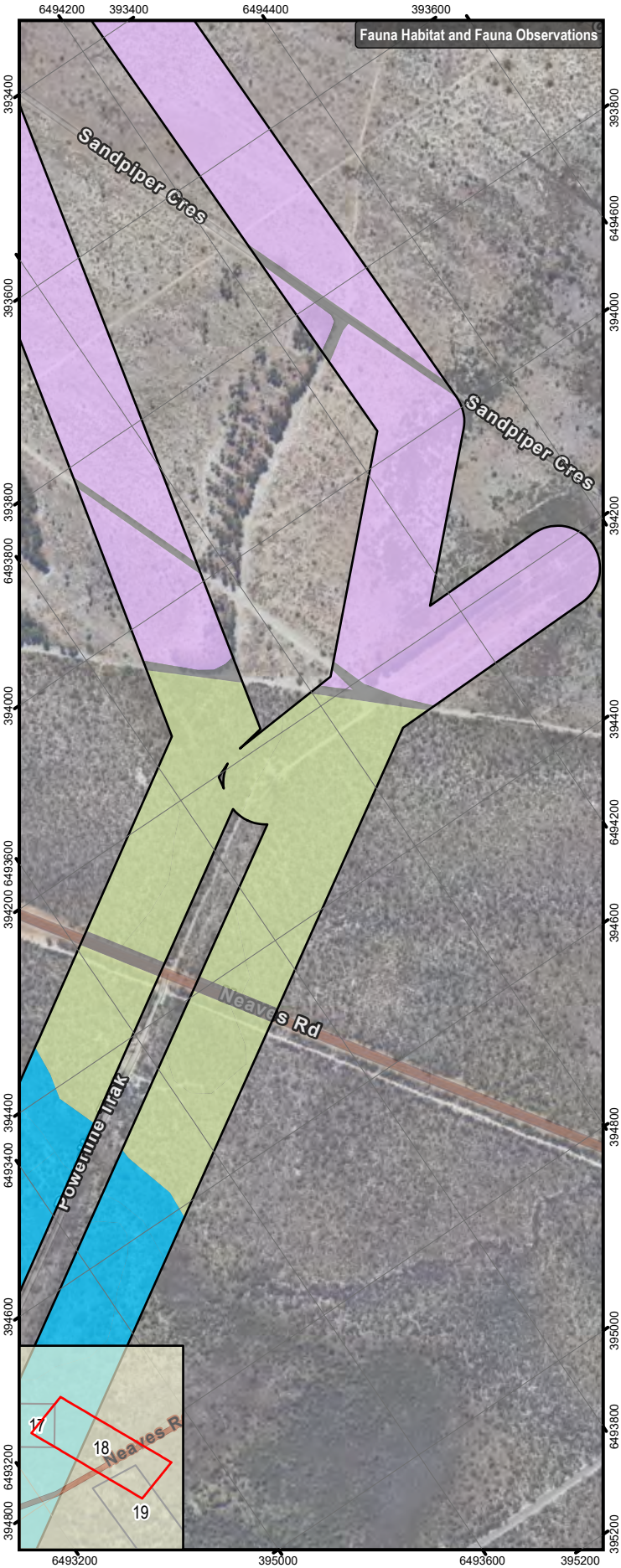
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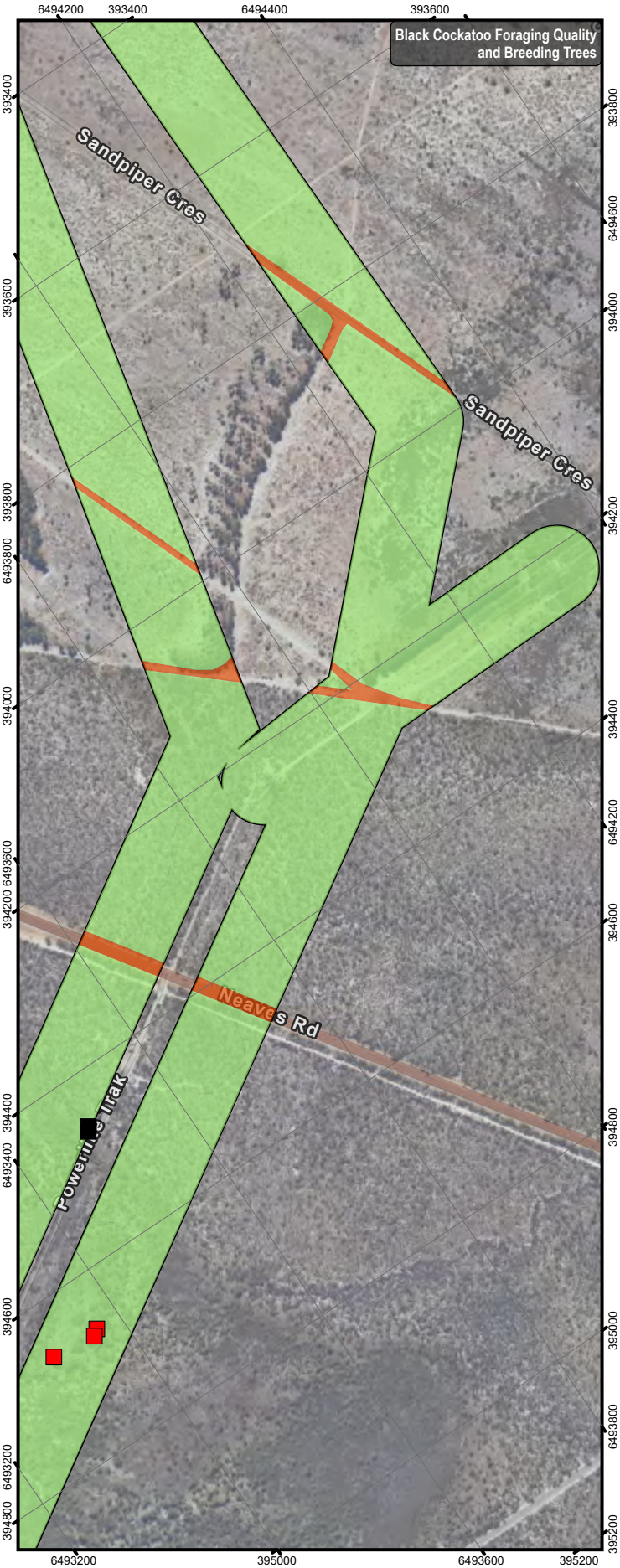
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LEGEND

Survey Area

Fauna Habitat
- Banksia Woodlands
- Cleared
- Plantations
- Wetlands

Black Cockatoo Breeding Trees
- Jarrah (*Eucalyptus marginata*)
- Stag

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

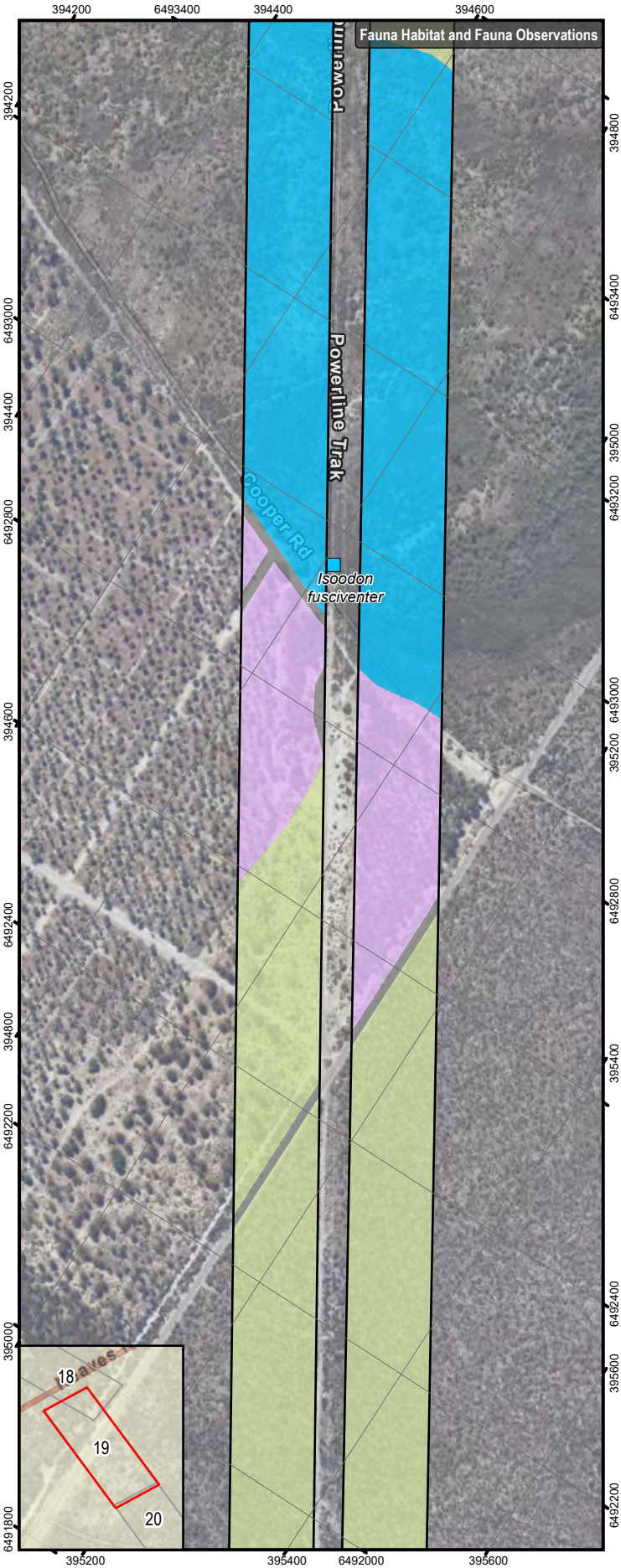
NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

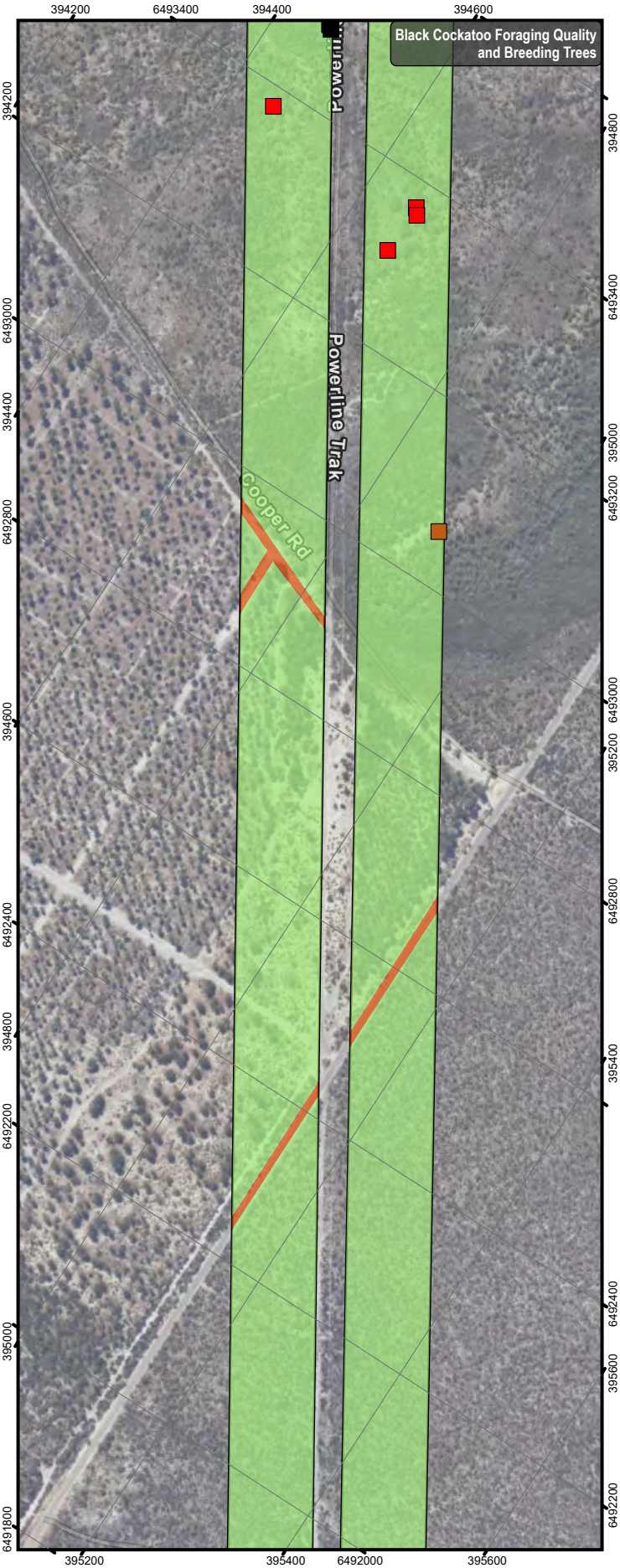
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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- P4

Fauna Habitat
- Banksia Woodlands
- Cleared
- Plantations
- Wetlands

Black Cockatoo Breeding Trees
- Jarrah (*Eucalyptus marginata*)
- Stag
- Other

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

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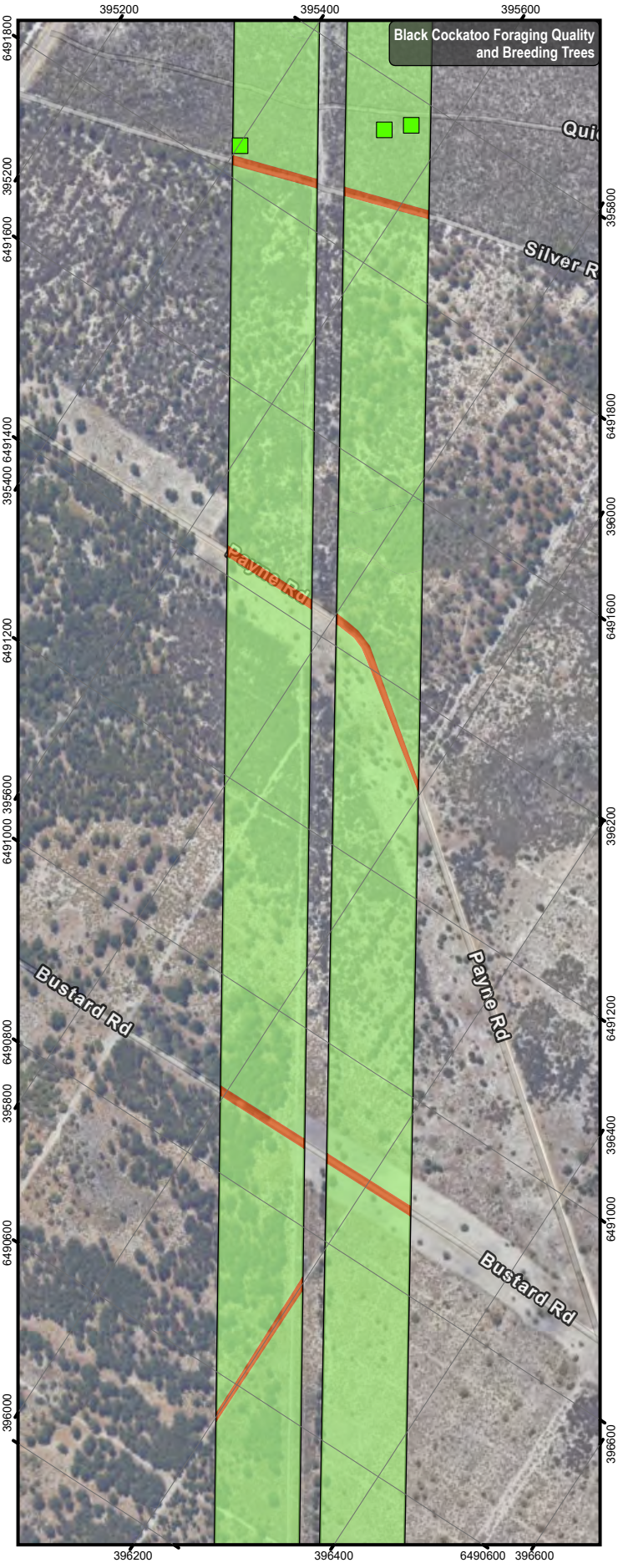
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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared
- Plantations
- Wetlands

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

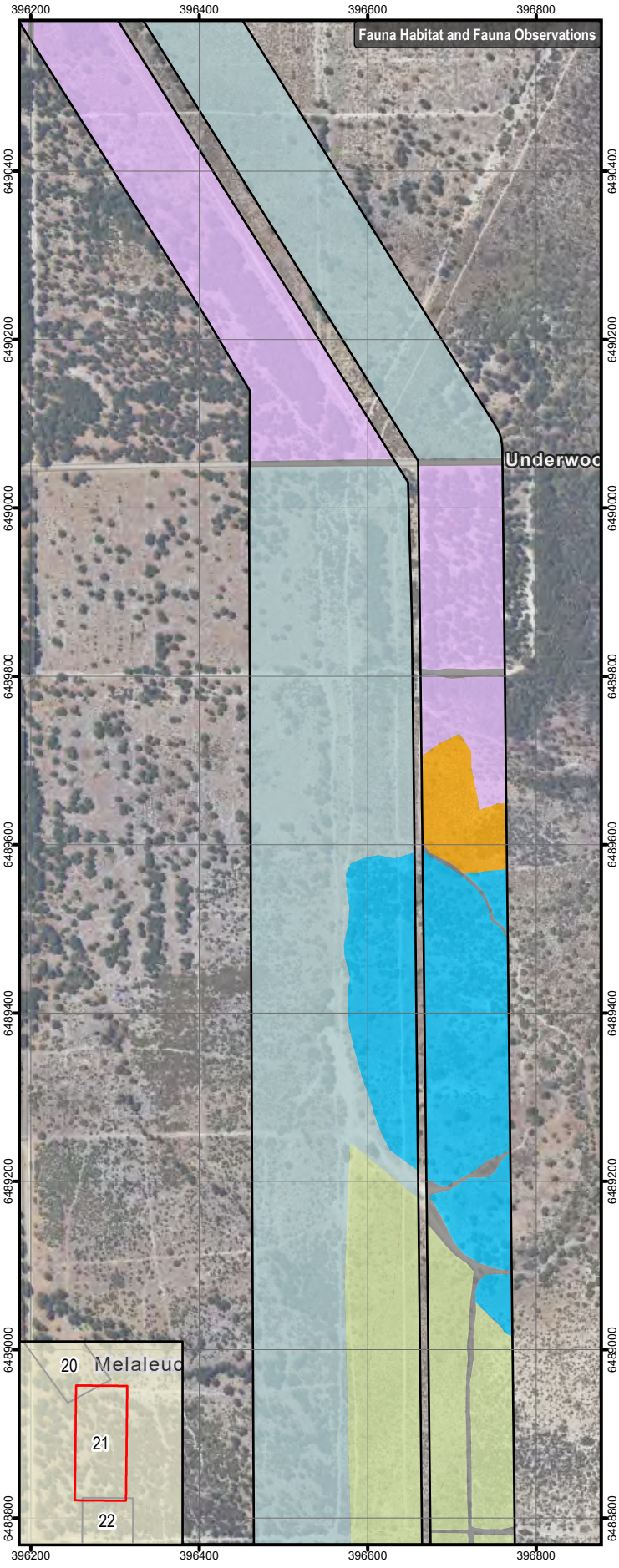
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Figure 10.20

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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared
- Plantations
- Wetlands
- Xanthorrhoea shrubland

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

* *Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

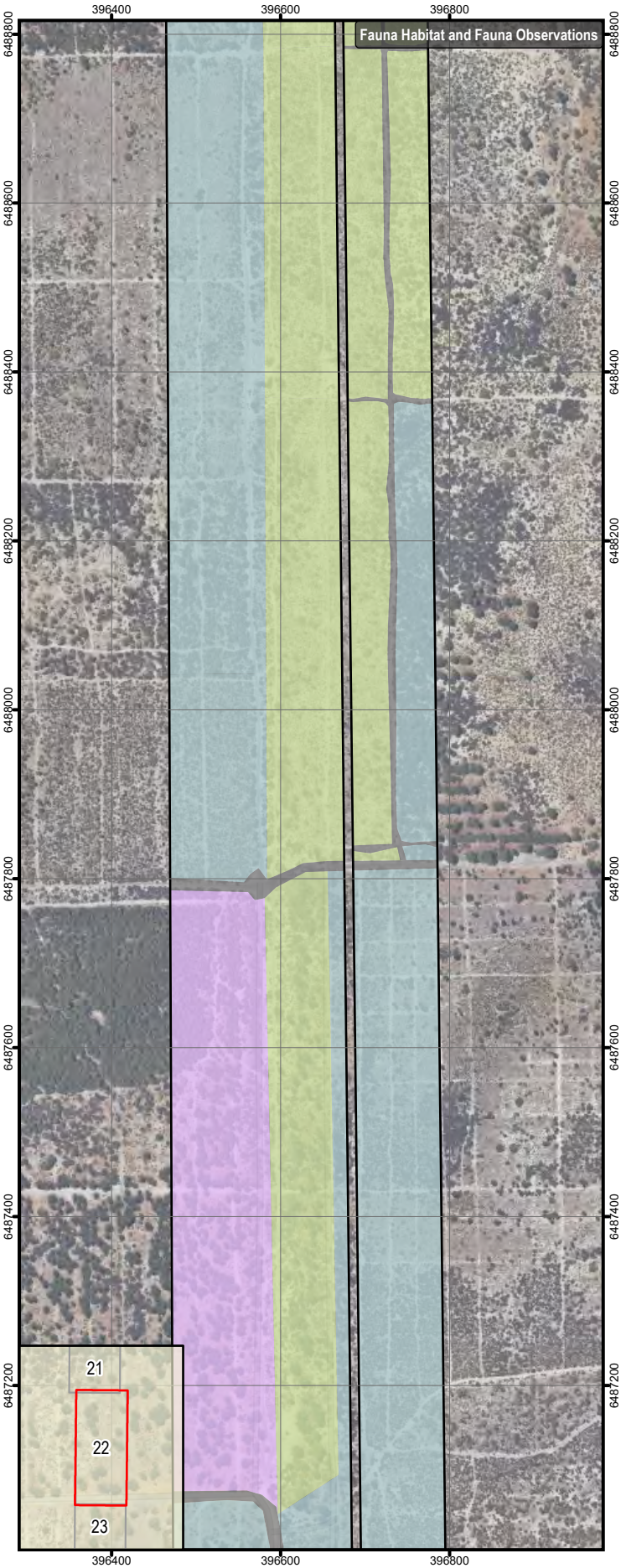
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Figure 10.21

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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodlands
- Cleared
- Plantations

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

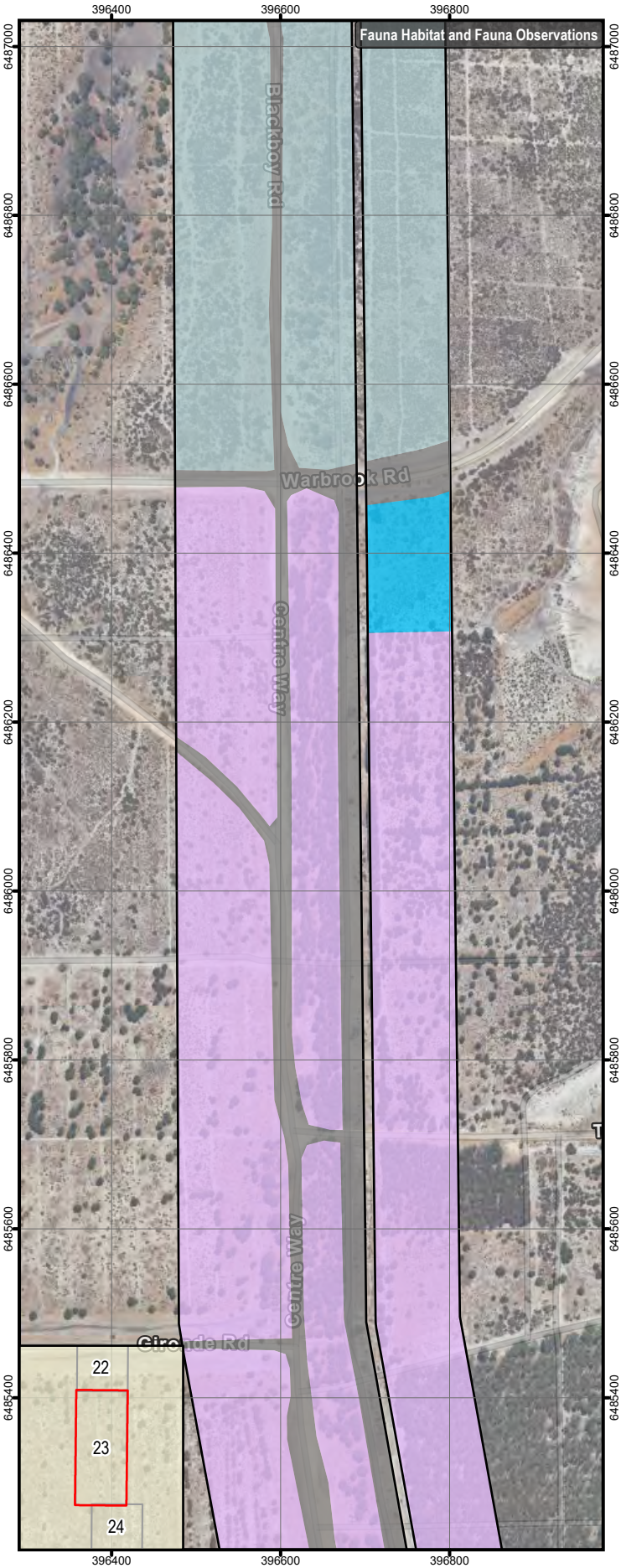
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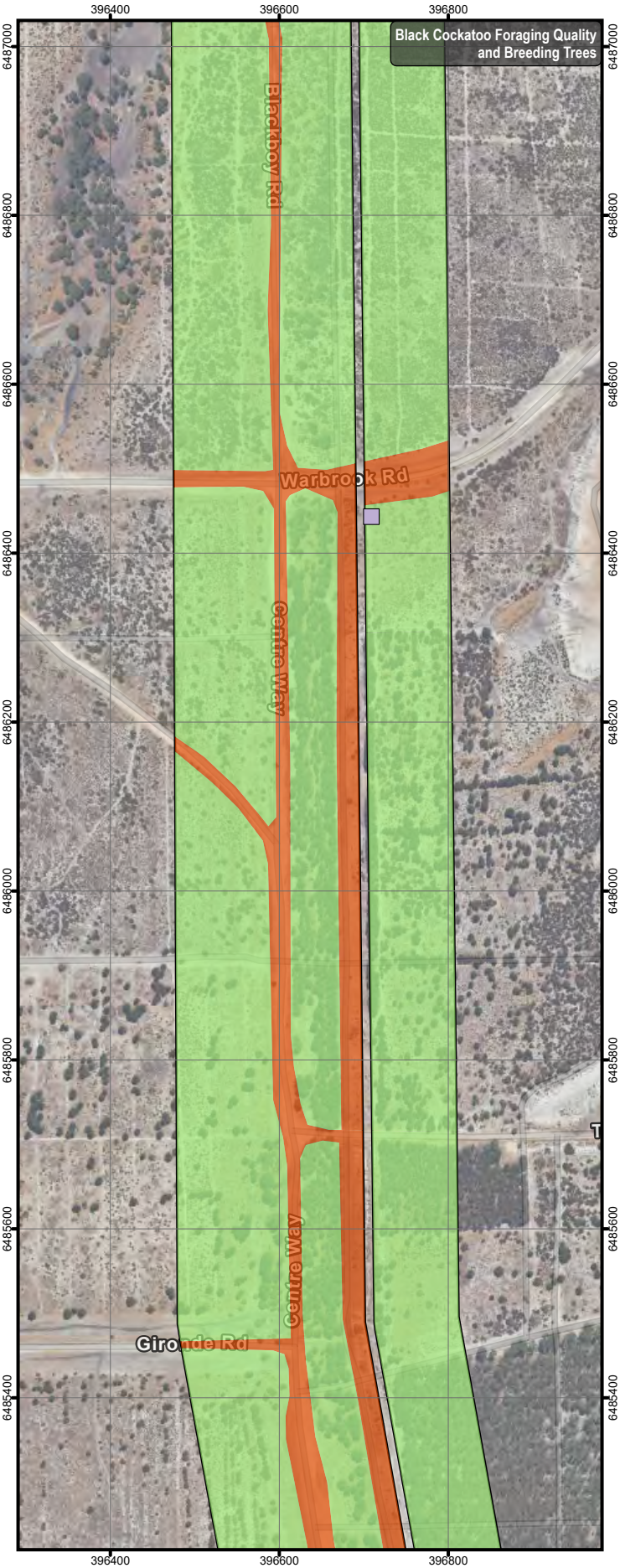
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LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared
- Plantations
- Wetlands

Black Cockatoo Breeding Trees
- Flooded Gum (*Eucalyptus rudis*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

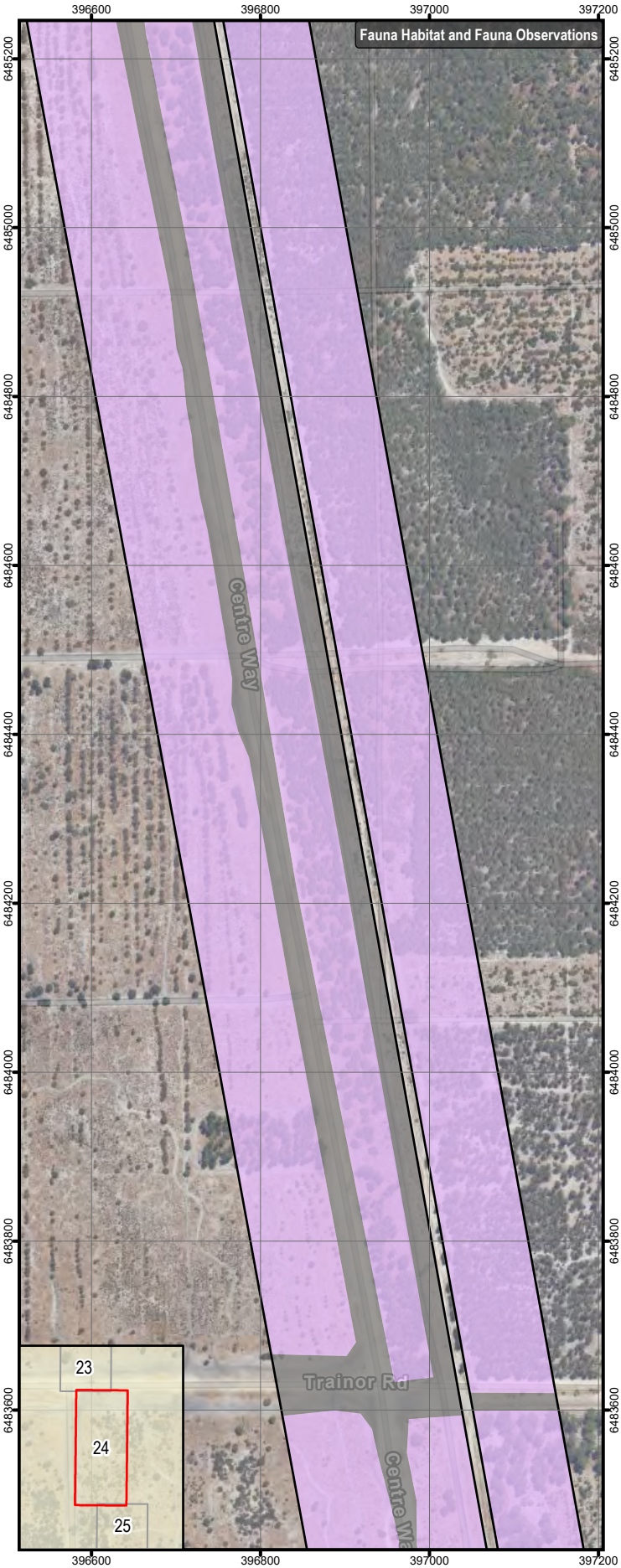
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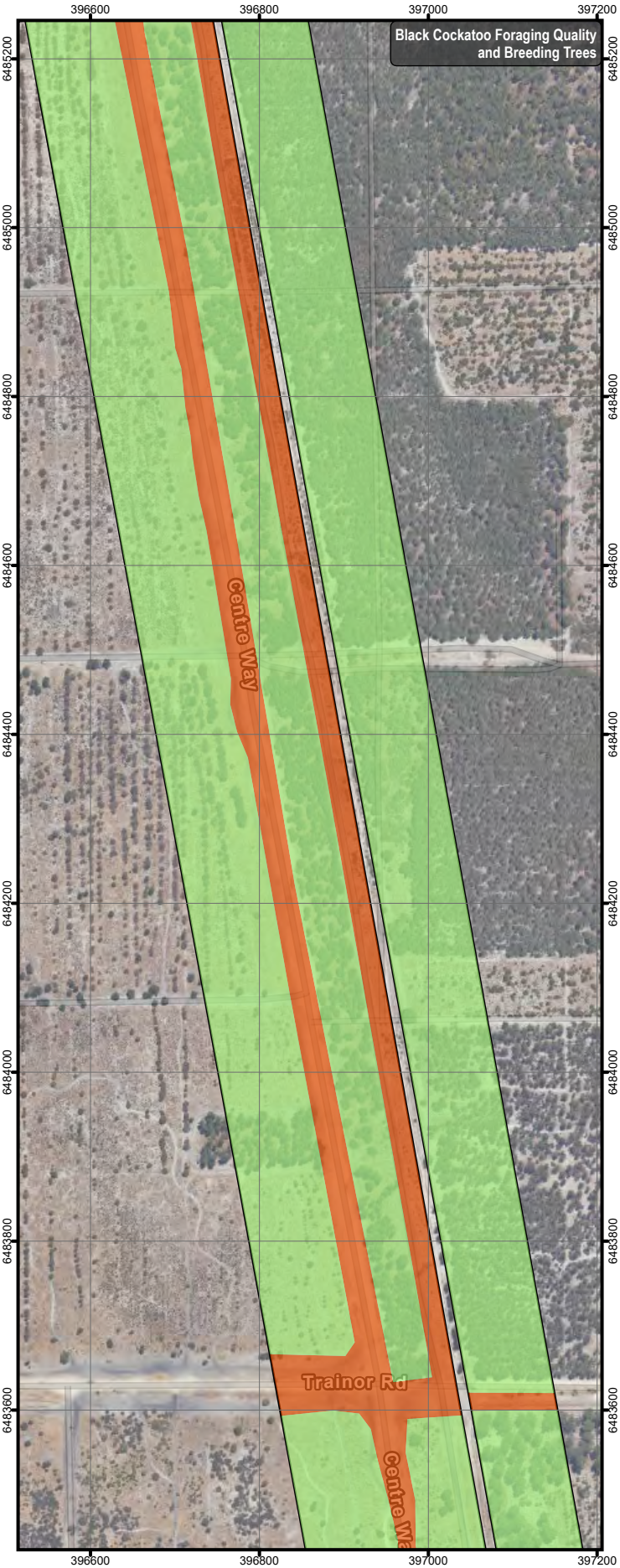
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LEGEND
Survey Area
Fauna Habitat
Cleared
Plantations

Black Cockatoo Foraging Quality*
Cleared
High Quality Native Foraging Habitat

* *Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

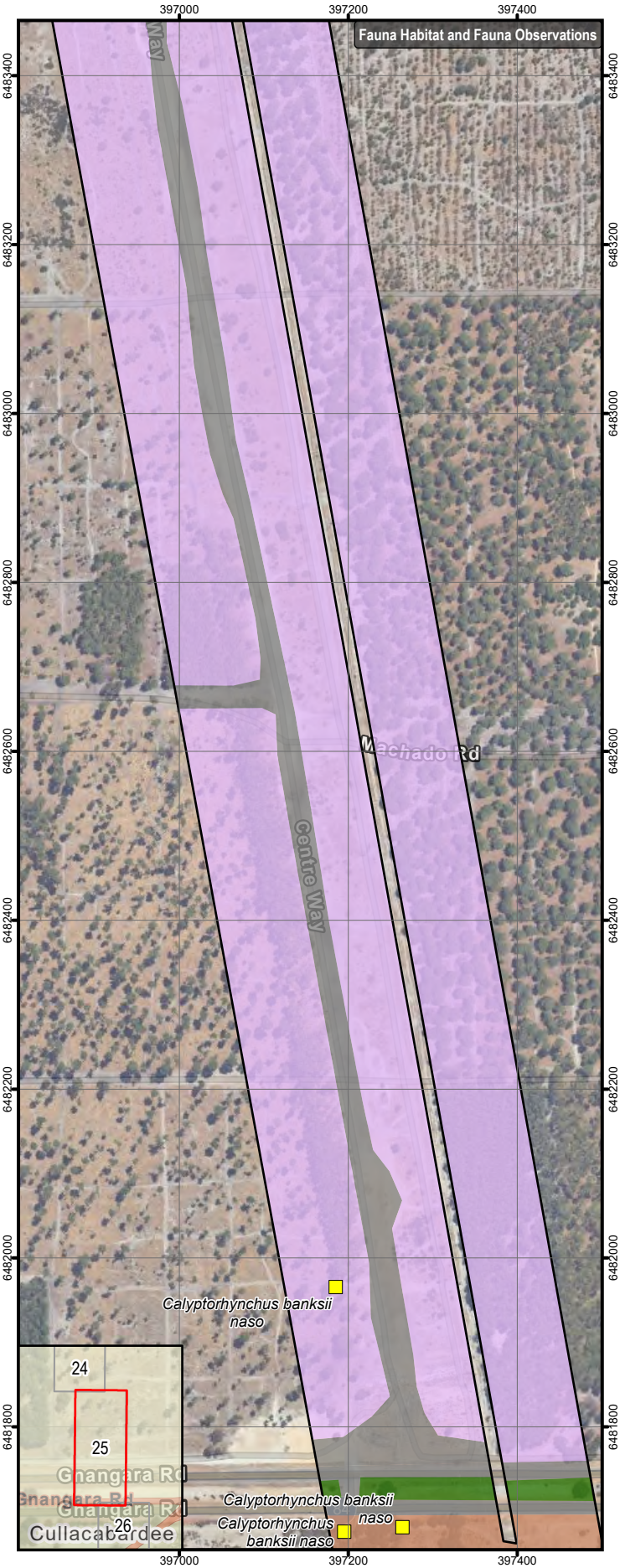
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Figure 10.24

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LEGEND

- Survey Area
- Fauna Sighting - Conservation Status
  - Vulnerable
- Fauna Habitat
  - Cleared
  - Marri Woodlands
  - Plantations
  - Trees over Cleared
- Black Cockatoo Breeding Trees
  - Marri (*Corymbia calophylla*)
- Black Cockatoo Foraging Quality*
  - Cleared
  - High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

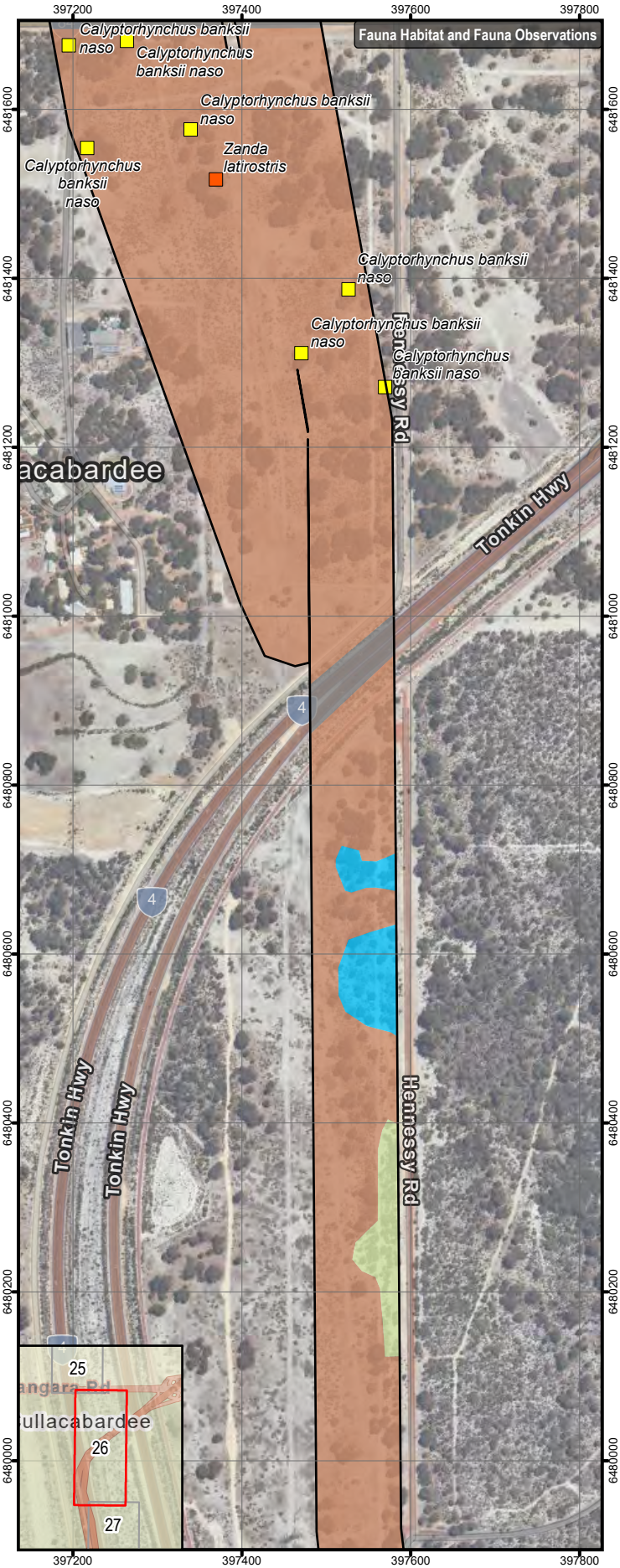
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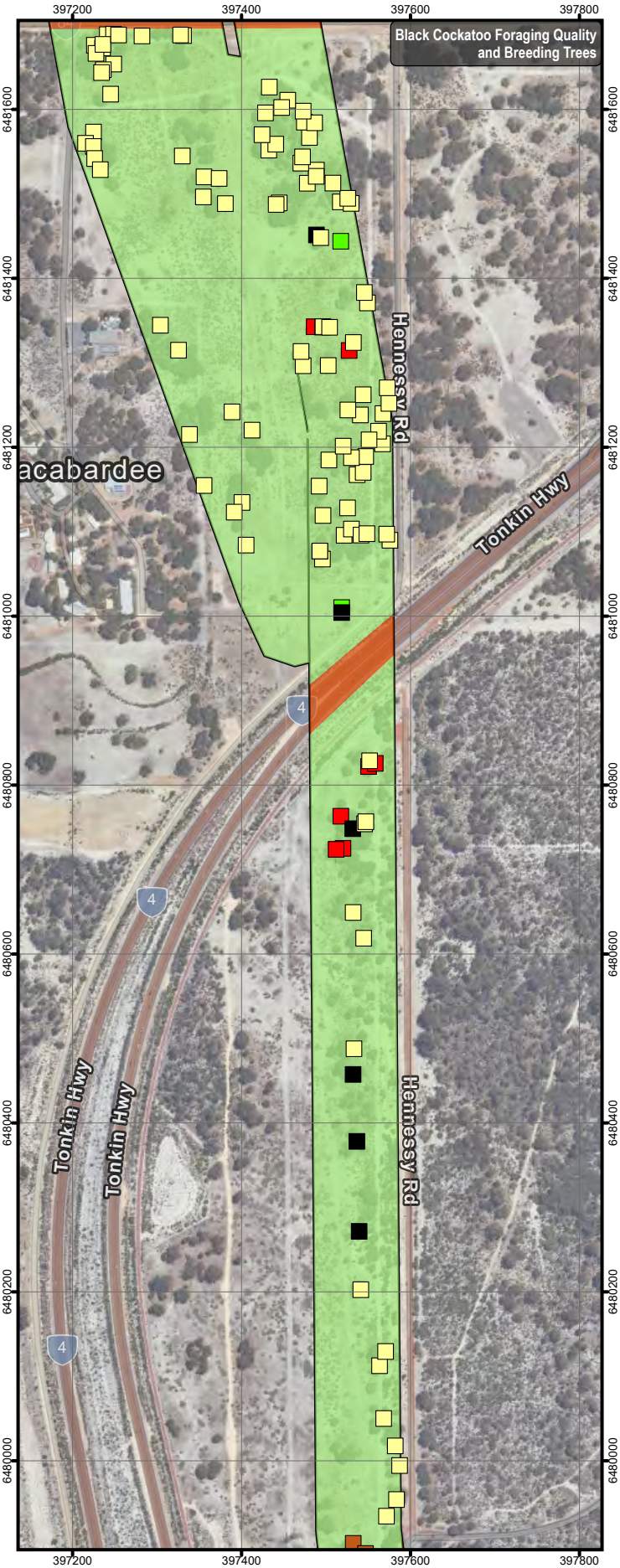
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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- Endangered
- Vulnerable

Fauna Habitat
- Banksia Woodlands
- Cleared
- Marri Woodlands
- Wetlands

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)
- Jarrah (*Eucalyptus marginata*)
- Marri (*Corymbia calophylla*)
- Stag
- Other

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

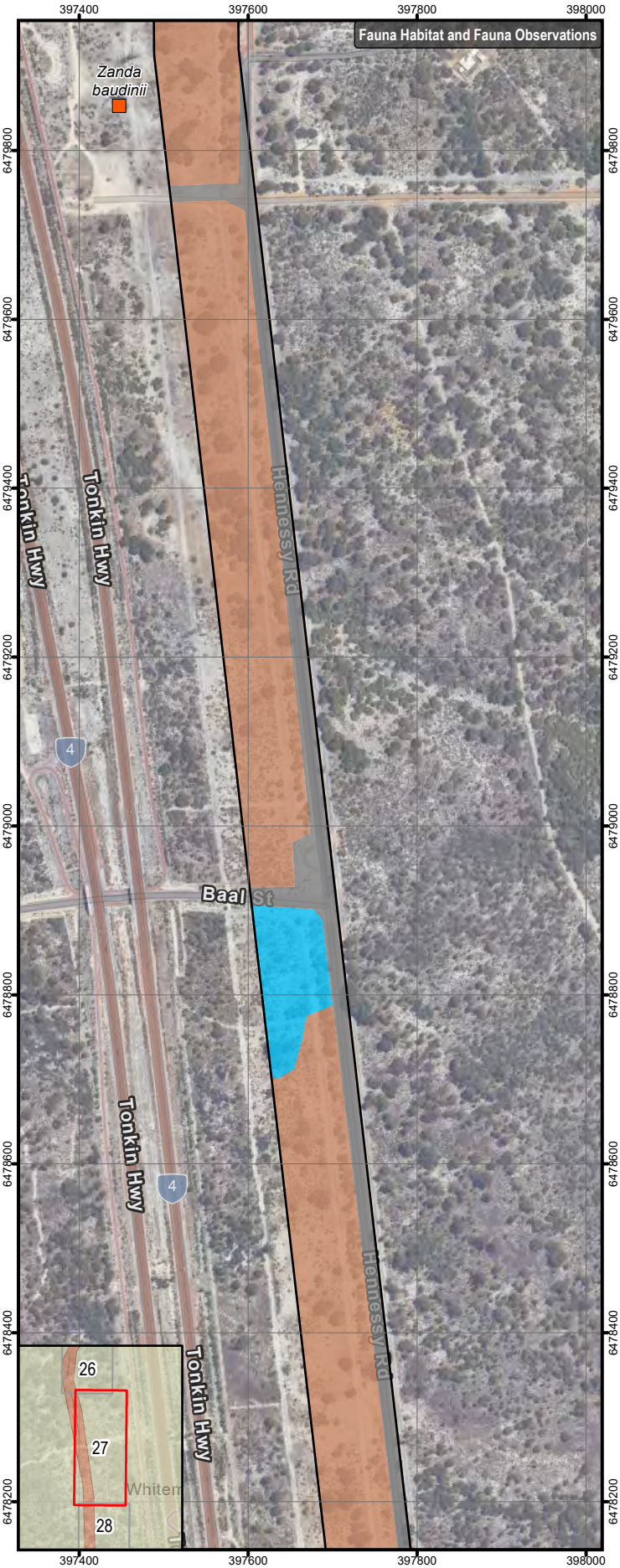
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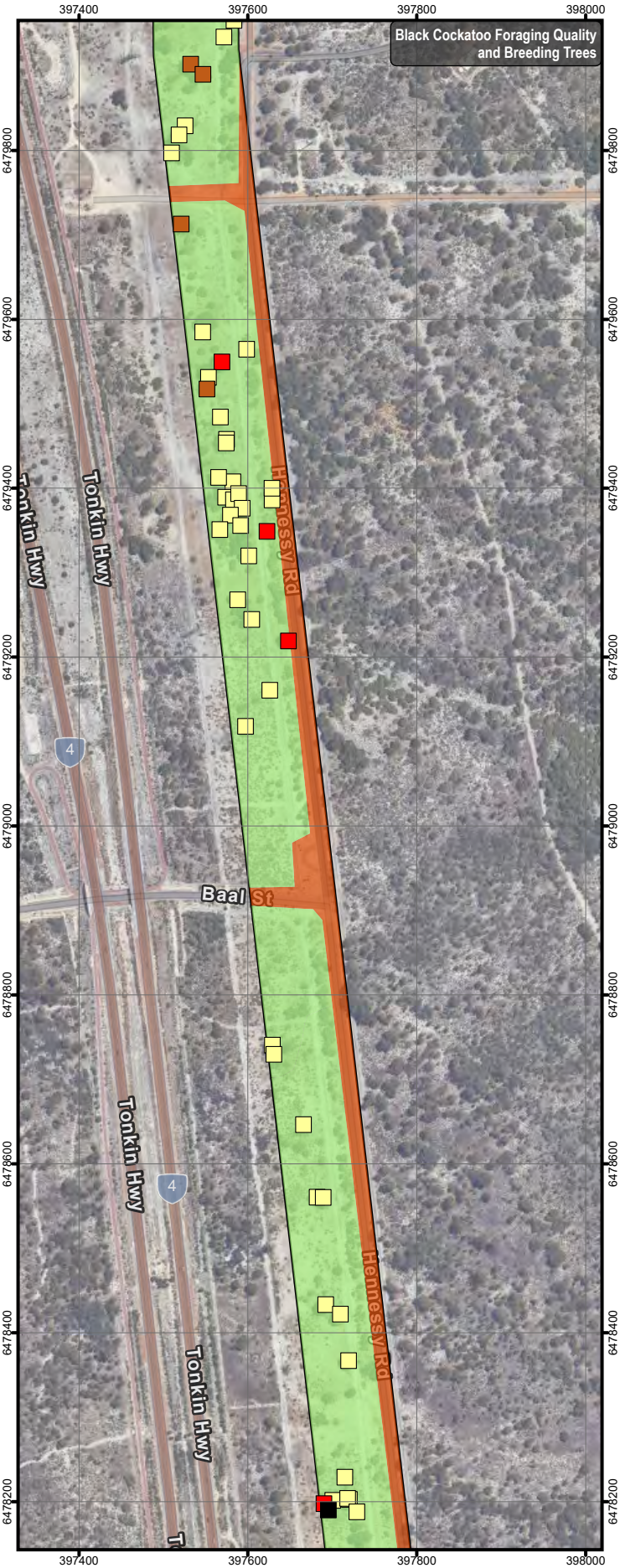
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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- Endangered

Fauna Habitat
- Cleared
- Marri Woodlands
- Wetlands

Black Cockatoo Breeding Trees
- Jarrah (*Eucalyptus marginata*)
- Marri (*Corymbia calophylla*)
- Stag
- Other

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

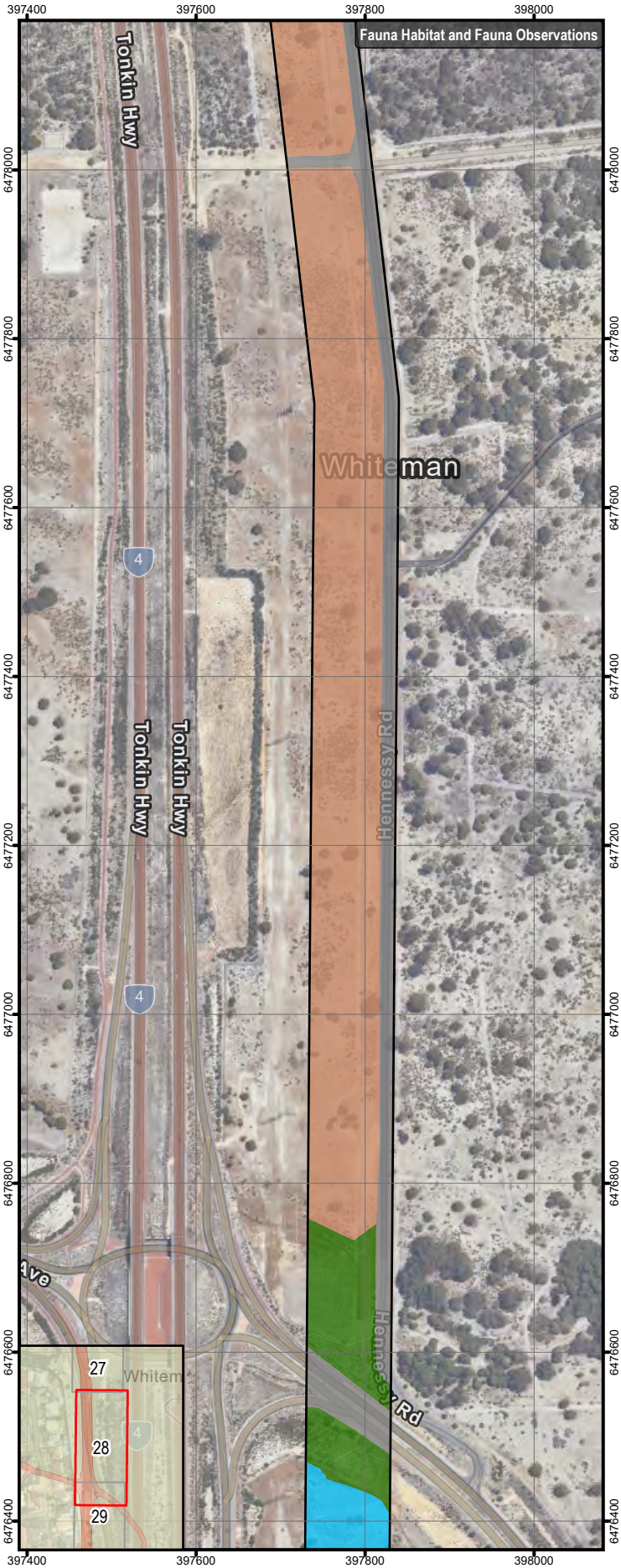
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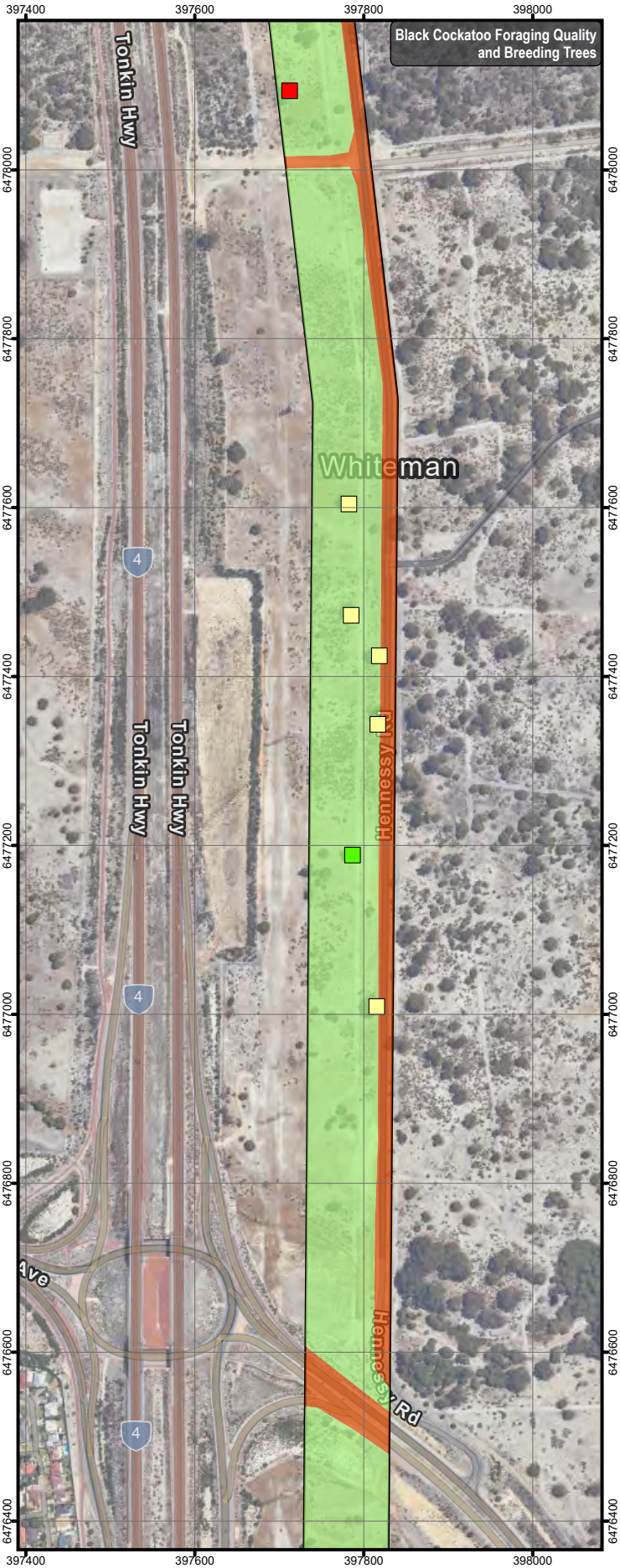
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LEGEND

Survey Area

Fauna Habitat
- Cleared
- Marri Woodlands
- Trees over Cleared
- Wetlands

Black Cockatoo Breeding Trees
- Coastal Blackbutt (*Eucalyptus todtiana*)
- Jarrah (*Eucalyptus marginata*)
- Marri (*Corymbia calophylla*)

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

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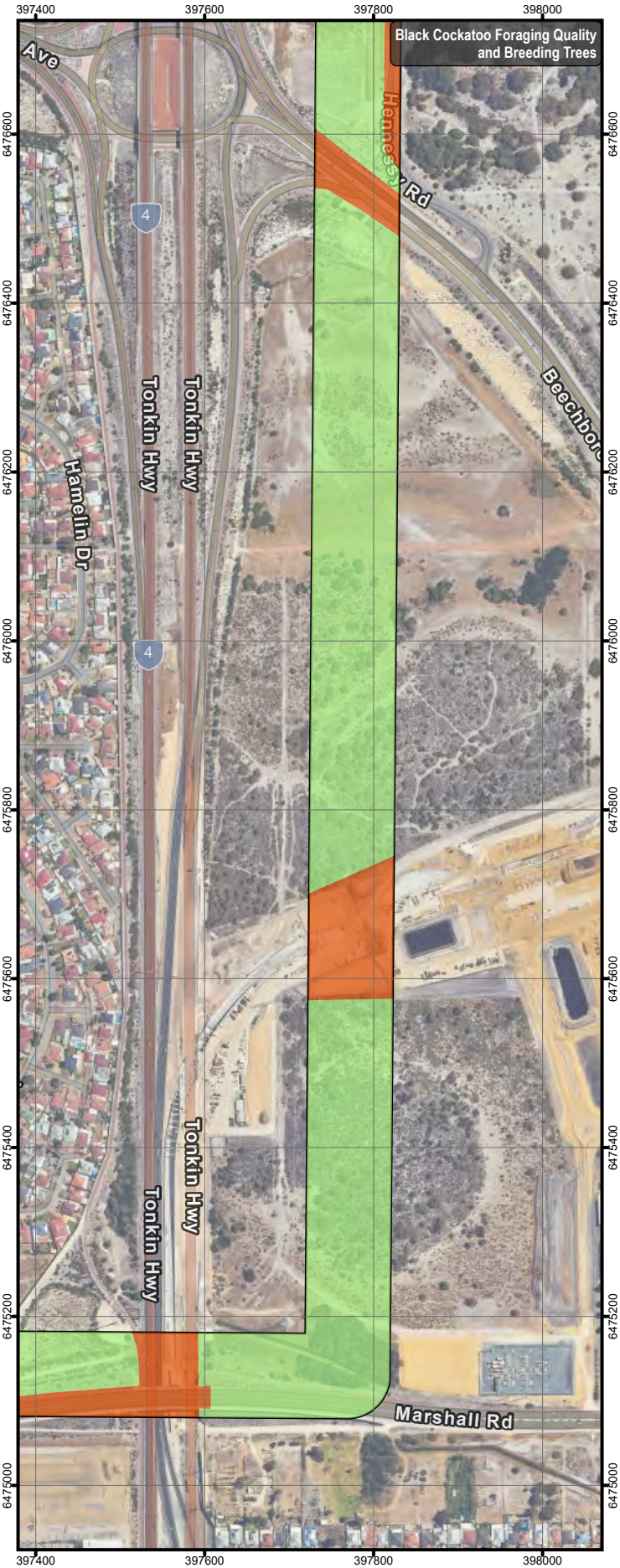
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LEGEND
- Survey Area

Fauna Habitat
- Banksia Woodlands
- Cleared
- Marri Woodlands
- Trees over Cleared
- Wetlands

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

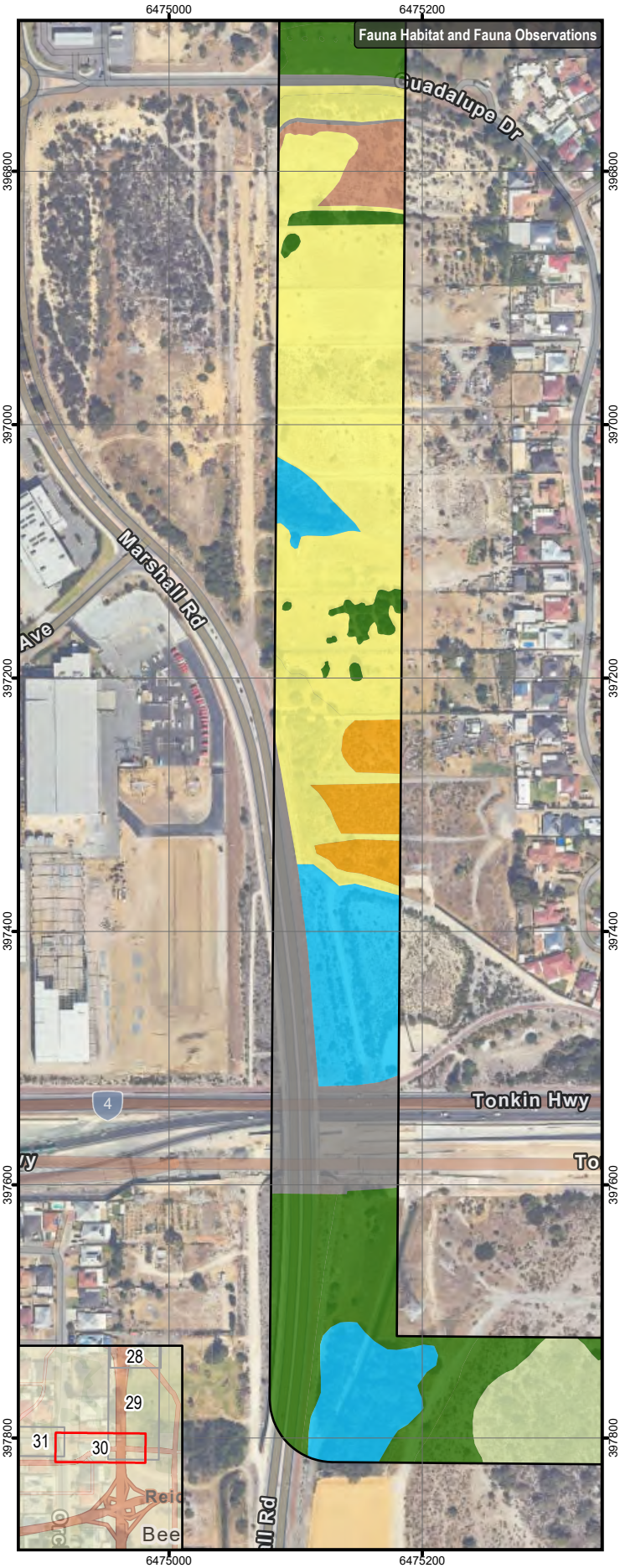
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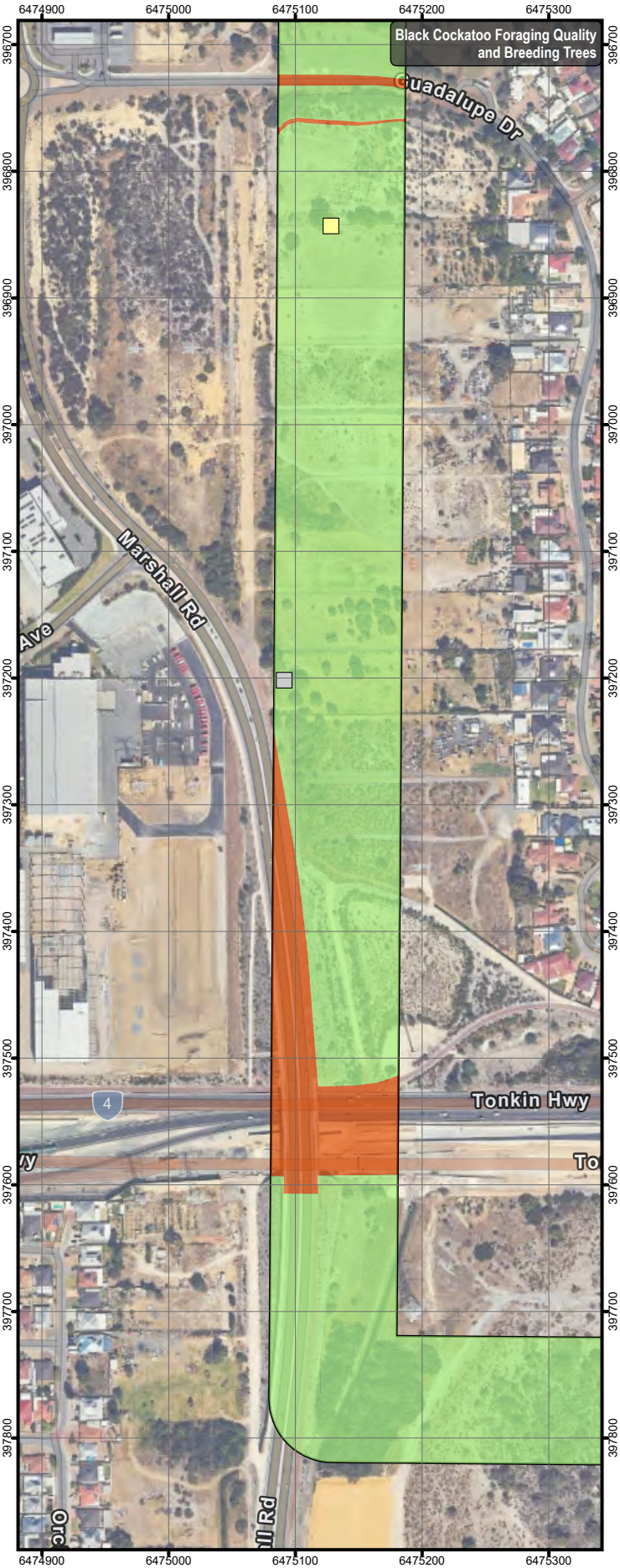
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LEGEND

Survey Area

Fauna Habitat
- Banksia Woodlands
- Cleared
- Marri Woodlands
- Trees over Cleared
- Urban/Residential
- Wetlands
- Xanthorrhoea shrubland

Black Cockatoo Breeding Trees
- Marri (*Corymbia calophylla*)
- Introduced

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

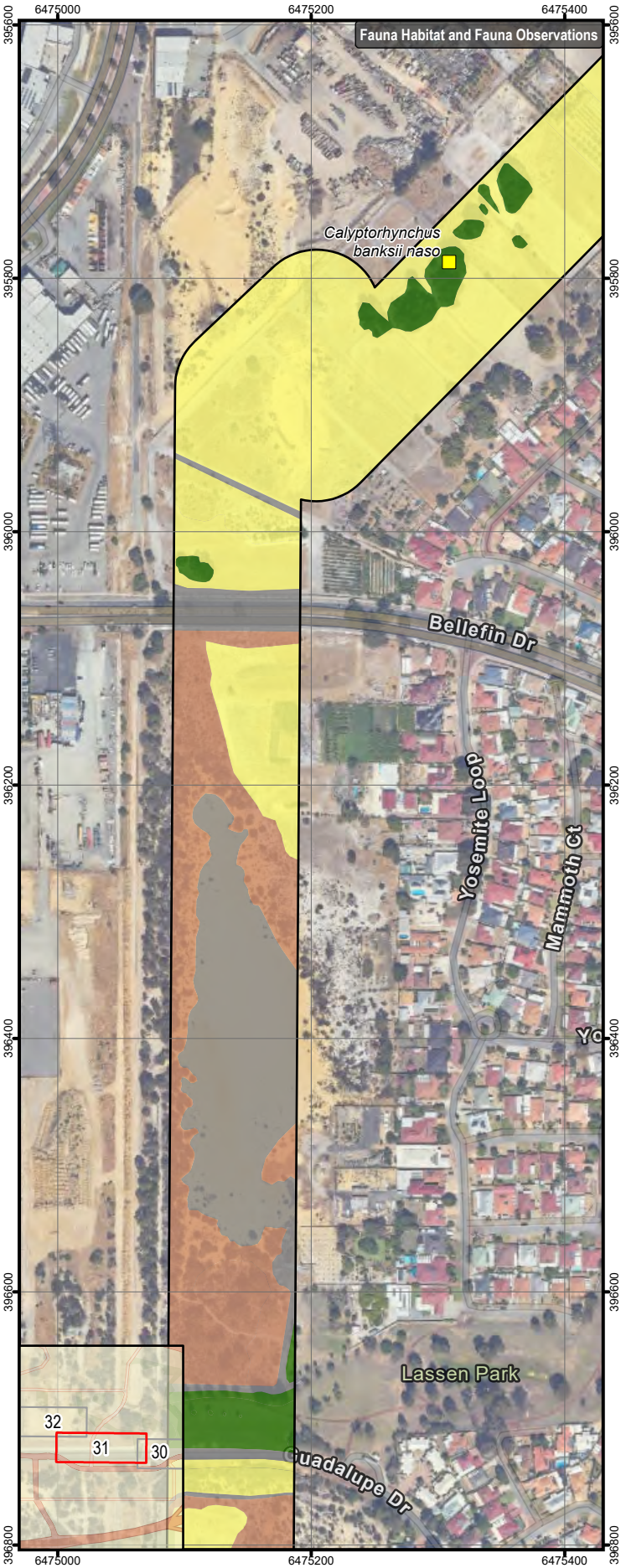
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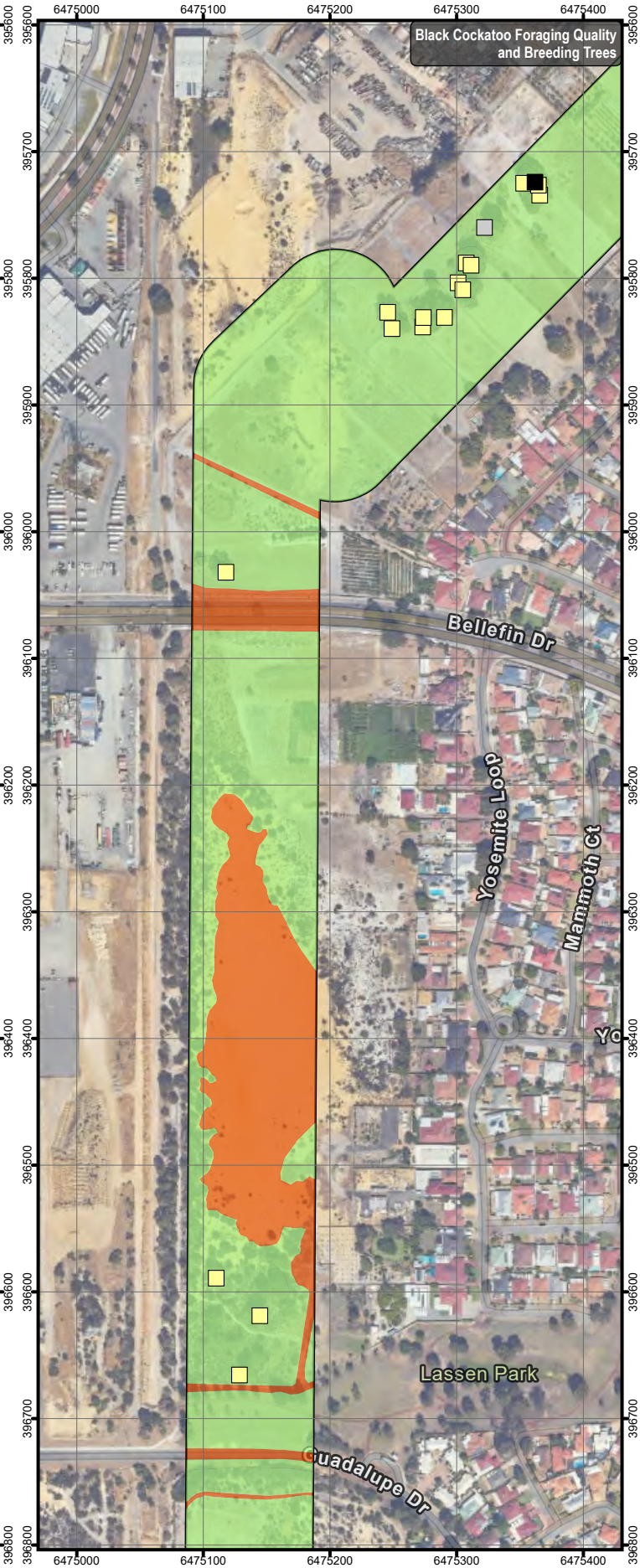
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LEGEND

Survey Area

Fauna Sighting - Conservation Status
- Vulnerable

Fauna Habitat
- Cleared
- Marri Woodlands
- Trees over Cleared
- Urban/Residential

Black Cockatoo Breeding Trees
- Marri (*Corymbia calophylla*)
- Stag
- Introduced

Black Cockatoo Foraging Quality*
- Cleared
- High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

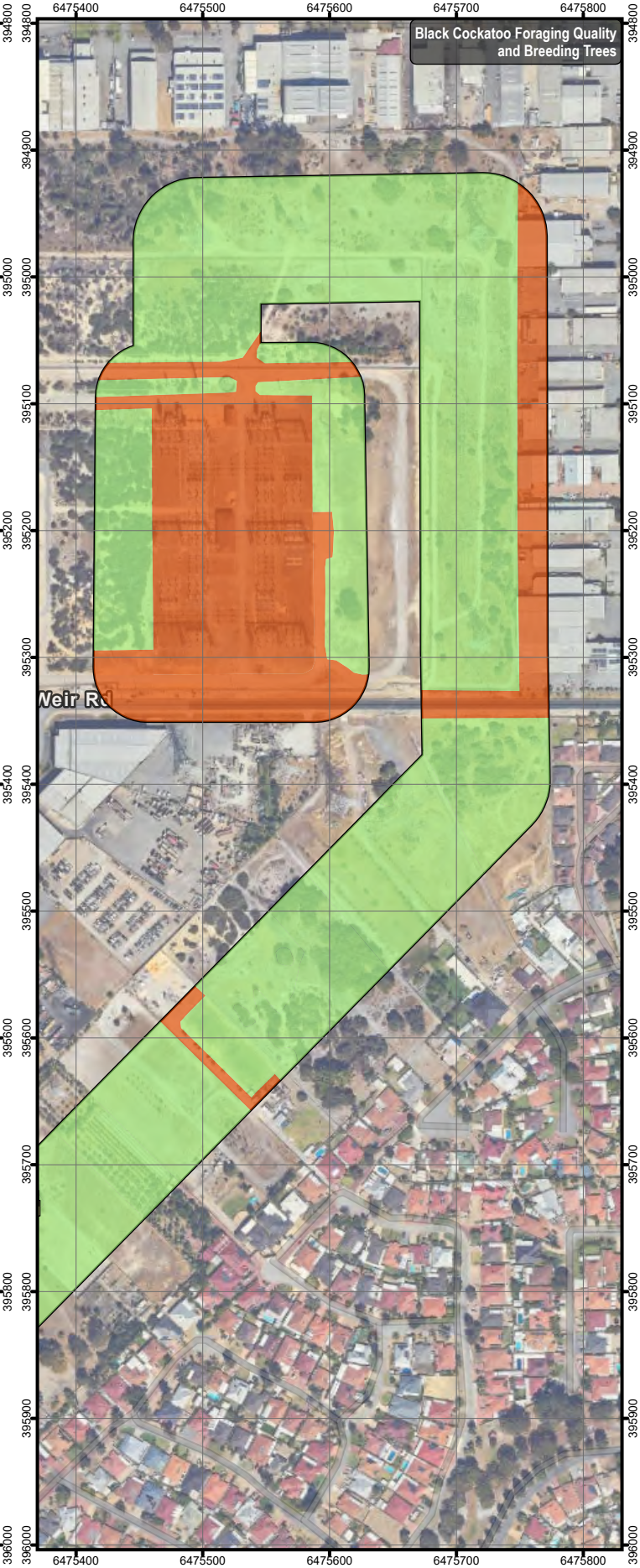
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LEGEND

- Survey Area
- Fauna Habitat
  - Cleared
  - Trees over Cleared
  - Urban/Residential
- Black Cockatoo Breeding Trees
  - Marri (*Corymbia calophylla*)
- Black Cockatoo Foraging Quality*
  - Cleared
  - High Quality Native Foraging Habitat

** Applies to Carnaby's Cockatoo, Red-Tailed Forest Black Cockatoo and Baudin's Black Cockatoo*

Fauna Habitat, Conservation Significant Species and Black Cockatoo Foraging

WESTERN POWER

NT-NBT 330KV LINE, NORTH REGION ENERGY PROGRAM - FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.32

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Appendix A

Flora Desktop Results

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Acacia anomala	Lateritic soils, in shallow sand, loam, clay or gravel that is brown, yellow or grey. It grows, on ridges, slopes, low plains, and hillsides. Jarrah/Marri forest over scrub. The species grow entangled amongst other low shrubs in dense vegetation. grows in low open woodland or forest dominate by Eucalyptus. Understorey heath is dominated by *Grevillea, Dryandra, Hakea and Acacia* species. (DEWHA, 2008a).	V	VU	9	-	1900			0	0	0	1	1	2	Low
Acacia aphylla	Asosciated with laterite and granite outcrops on hillsides, may grow in rock crevices. Soils can be sand, loam, clay or gravel. Grows in open Jarrah and Marri Woodlands or York Gum. (DEWHA,2008b)	V	VU	-	-				0	0	0	0	1	1	Low
Acacia benthamii	Sand/grey sand. Typically on limestone breakaways. Slope above creek. Degraded Tuart open woodland over Banksia low woodland. Can be found in areas of degraded to modified remnant jarrah woodland and weed dominanted areas. Murray, Perth, Rockingham, Subiaco, Swan, Wanneroo.	-	P2	3.62	8.67	2007	2000		0	1	1	0	2	4	Moderate
Acacia oncinophylla subsp. *oncinophylla*	On rocky clay. Granitic soils. With Hakea lissocarpha, Casuarina humilis. Dardanup, Gingin, Kalamunda, Mundaring, Murray, Serpentine-Jarrahdale, Swan, Victoria Plains.	-	P3	9.34	-	1980			0	0	0	0	0	0	Negligible
Alyogyne sp. Great Victoria Desert (D.J. Edinger 6212)	Orange sand on flat plain. Esperance, Kalgoorlie-Boulder, Menzies, Northampton, Swan, Yilgarn.	-	P3	9.05	-	1905			0	0	0	0	1	1	Low
Amanita carneiphylla	On Karrakatta sand, emerging from deep sand. Deeply rooting in sandy soil, solitary or in small scattered groups. Degraded Banksia woodland. Tuart, Banksia, Jarrah. Found near *Jacksonia furcellata* . Deeply rooting in sandy soil, solitary or in small scattered groups.	-	P3	3.12	-	2020			0	1	1	0	2	4	Moderate
Amanita fibrillopes	In sand, with litter. In degraded bushland, nearby *Melaleuca preissiana.*	-	P3	2.73	-	2006			0	1	1	0	2	4	Moderate
Amanita preissii	Sandy soil, deeply in ground. Mixed introduced plants and grasses interspersed with gum trees. Jarrah/Banksia woodland, Eucalyptus.	-	P3	1.63	-	2010			0	1	1	0	2	4	Moderate
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps. Currently known from the Badgingarra, Dandaragan, Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation with species such as *Calothamnus hirsutus, Verticordia densiflora* and *Kunzea recurva* over sedges. (DEC, 2006)	E	VU	-	-				0	0	0	0	2	2	Moderate
Anigozanthos humilis subsp. *chrysanthus*	Slope with white/grey/yellow sand. Bassendean Dune System. *Banksia attenuata* and *Banksia menziesii* low woodland to sparse low woodland over *Calytrix fraseri* (Ellenbrook form), *Verticordia nitens,* and *Beaufortia elegans* sparse mid shrubland over *Alexgeorgea nitens* and *Desmocladus flexuosus* sparse.	-	P4	0.15	-	2014			0	1	1	0	2	4	Moderate
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU	-	-	1987			0	1	0	0	1	2	Low
Anthocercis gracilis	Humus-rich Sandy or loam soils. Steep Granite outcrops along the Darling Scarp (SW and Swan Natural Resource Managament Regions).	V	VU	-	-				0	1	0	0	1	2	Negligible
Austrostipa bronweniae	Calcareous, winter-wet grey-brown sandy-loam or dark brown loam over clay. Plants have been recorded on boundary of sedgeland/herbland.	E	EN	-	-				0	1	0	0	1	2	Low
Austrostipa mundula	Tuart woodland. Species occurs in WA only in small isolated coastal populations from east of Esperance around to north of Perth. The surviving population in the south is in a tiny reserve surrounded by industrial development, and the population in the north is in the urban growth region of Yanchep. - Cambridge, Dundas, Esperance, Fremantle, Jerramungup, Joodnalup and Kwinana.	-	P3	9.27	-	1963			0	0	0	0	0	0	Negligible
Baeckea sp. Limestone (N. Gibson & M.N Lyons 1425)	Flat, sandy soil. Grey sand. Hillside. Limestone. Banksia woodland.	V	P1	7.68	8.22	2021	2017		0	0	1	0	2	3	Low

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Banksia mimica	Grows on flat to gentle slopes in grey and white sand in open woodlands over laterite, sandy loam. In the whicher range, this species grows in closed shrubland with a *Banksia attenuata* overstorey. (DEWHA, 2008c)	E	EN	-	-				0	1	0	0	1	2	Low
Bolboschoenus fluviatilis	Littoral zone, Swan River. Wet dark brown silt. Flood plain. On bank of river in mud. Hillside/seep. Grey wet sand. Two collection sites in reserve. Flooded gum open woodland. Tall trees, with *Eucalyptus rudis* and *Lantana sp.*		P1	4.91	-	2018			0	1	1	0	1	3	Negligible
Byblis gigantea	Sandy places. Sandy-peat swamps. Seasonally wet areas.		P3	7.31	-	1939			0	0	0	0	1	1	Low
Caladenia huegelii	Soil is usually deep grey-white or brown sand, clay loam. Plain. Organic litter. Grey sand over sand. Low forest: *Banksia menziesii, Banksia attenuata.* Occurs in areas of mixed woodland of *E. marginata, C. calophylla, B. ilicifolia, B. attenuata* and scattered *Allocasuarina fraseriana* over dense shrubs (DEC, 2009).	CE	CR	3.09	0.36	2000	2017		0	1	1	1	2	5	High
Calandrinia sp. Bayswater (C. Andrews s.n. 11/1902)	North of Bayswater.		P1	4.94	-	1902			0	1	0	0	0	1	Negligible
Calectasia elegans	Grey sand. Flat plain with deep gray sand. Long unburnt area. On gentle slope above dampland, deep grey quartz sand. Low Banksia Woodland with moderately dense vegetation. With *Banksia attenuata, Banksia menziesii, Stirlingia latifolia*		P2	1.51	0.86	2008	2021		0	1	1	1	1	4	Moderate
Calytrix breviseta subsp. *breviseta*	Sandy clay. Swampy flats. The species is restricted to winter-wet clay flats with low shrubs or Jarrah forest. The swamp starflower is endemic to Western Australia. Although historically recorded at Gosnells and Bellevue, it appears to be confined to the Kenwick area. (DCCEEW, 2022).	E	EN	-	-				0	0	0	0	1	1	Negligible
Carex tereticaulis	Black peaty sand. Watercourse, wet. Organic litter. Grey Bassendean Sand over sand. Dense forest. *Eucalyptus rudis, Melaleuca rhaphiophylla*		P3	5.42	5.46	1999	1999		0	0	0	1	1	2	Negligible
Chamelaucium lullfitzii	White or yellow sand, leaf litter. Plains, hilltops, crests and lower slopes of scarp, rises, road verges. Gingin Wax is endemic to Western Australia and is confined to the Gingin/Chittering area, where it has a range of only 3 km. The six known populations contain a total of approximately 4700 adult plants and 1800 juveniles (TSSC, 2016a).	E	VU	-	-				0	0	0	0	1	1	Negligible
Conospermum densiflorum subsp. *unicephalatum*	Clay soils. Low-lying sandy clay soil areas with surface lateritic gravel, over a range of about 10 km between Gingin and Moora, SW- WA. [last seen 1974 there] (TSSC, 2015).	E	EN	-	-				0	0	0	0	1	1	Negligible
Conospermum undulatum	The Wavy-leaved Smokebush is found in a restricted area between the suburbs of High Wycombe and Martin, in the foothills of the Darling Scarp. The species is found in fragmented remnant bushland on sand and sandy clay soils, often over laterite, on flat or gently sloping sites between the Swan and Canning Rivers. The species is known from Banksia and Jarrah/Marri woodland, with a few records from slightly swampy habitat. (DEC, 2009).	V	VU	9.51	-	1999			0	0	0	0	1	1	Low
Conostylis bracteata	Plain near lake. Grey sand. Sand, limestone. Consolidated sand dunes. Jarrah, Banksia.		P3	8.56	6.53	1997	1997		0	0	0	0	1	1	Low
Cyanicula ixioides subsp. *ixioides*	Laterite, gravel		P4	9.83	-	1913			0	0	0	0	0	0	Negligible
Cyathochaeta teretifolia	Grey sand, sandy clay. Swamps, creek edges. Sandy loam. On seasonally wet slope beside permanent lake. Dark brown loam with poor drainage. One site description: a thin strip at a change in slope where there has probably been seepage, soil has a deep humus layer. Open low woodland. *Melaleuca preissiana* .		P3	0.85	0.69	2008	2007		0	1	1	1	1	4	Moderate
Dampiera triloba	Loamy sand. *Melaleuca preissiana, Corymbia calophylla*		P3	3.72	-	2009			0	0	1	0	1	2	Low

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Darwinia apiculata	Lateritic soils. Shallow, gravely soil over laterite, or open heathland over sandy loams with granite boulders. Hilltops, and slopes, in red clay or gravel soils. (DCCEEW, 2022).	E	EN	-	-				0	0	0	0	1	1	Low
Darwinia foetida	Grey-white sand on swampy, seasonally wet sites. alongside sump land that is land acting as a pit or well where water collects/ found on winter-dampt to wet clay. Moist flat; dark grey sand. Palusplain Multiple Use Wetland. Grey black soil. *M. rhaphiophylla, C. calophylla. A. pulchella* beneath marri, with invasion of blackberry, brazilian peppertrees, weedy grasses. (DEWHA, 2009).	C	EN	8.57	8.58	2010	2007		0	0	1	1	1	3	Moderate
Darwinia pimelioides	Loam, sandy loam. Granite outcrops.		P4	6.65	-	1959			0	0	0	1	0	1	Negligible
Diplolaena andrewsii	Loam, clay. Granite outcrops and hillsides. Occurs in the south-west botanical province, in the Jarrah Forest and swan coastal plain IBRA Regions. (Florabase-C.hollister and K.R. Thiele, 8.12.2020).	E	EN	-	-				0	0	0	0	1	1	Low
Diuris drummondii	Low-lying depressions, swamps. Tall Donkey Orchids are found in low-lying depressions in peaty and sandy clay swamps. Plants are frequently observed standing in several centimetres of water even during the summer flowering period (DCCEEW, 2022).	V	VU	6.65	-	1901			0	0	0	0	1	1	Low
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water. It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps. The bases of the flowering plants are often covered with shallow water (DEWHA, 2008d).	V	VU	-	-				0	0	0	0	1	1	Low
Diuris purdiei	Grows on sand to sandy clay soils in areas subject to winter inundation and amongst native sedges and dense heath. Grey-black sand, moist. Winter-wet swamps. (DEWHA, 2008e)	E	EN	-	-				0	0	0	0	2	2	Low
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter-wet swamps. Grows on bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps, with shady canopy cover. (DEC, 2009a).	E	CR	-	-				0	0	0	0	1	1	Low
Drakaea micrantha	Infertile White-grey sand - Jarrah, common sheoak woodland and forest associated with banksia species. usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed. (DEC 2007).	V	EN	-	-				0	0	0	0	1	1	Low
Drosera occidentalis	Clayey sand soils.		P4	8.99	0.04	1987	1986		0	1	0	1	1	3	Low
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes. In drainage depression on edge of walking track in moist fine loamy sand, seasonally wet. Open shrubland over sedgeland.		P1	1.38	-	2020			0	1	1	0	2	4	Moderate
Drosera x sidjamesii	Peaty sand. Along lake/swamp margins, close to winter high-water line. In drainage depression on edge of walking track in moist fine loamy sand, seasonally wet. Sedgeland.		P1	1.38	-	2020			0	1	1	0	0	2	Negligible
Eleocharis keigheryi	Clay, sandy loam. Sumpland (claypan); clay, grey/brown. Emergent in freshwater: creeks, claypans. Sedges. Grows in small clumps in a substrate of clay or sandy loam. Freshwater creeks and transient waterbodies such as drainage lines, and claypans in water approx. 15 cm deeps. (DEWHA, 2008f).	V	VU	9.61	-	1994			0	0	0	0	0	0	Negligible
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN	-	-				0	0	0	0	1	1	Low
Eryngium pinnatifidum subsp. Palustre (G.J Keighery 13459)	Dampland; grey sand. Melaleuca shrubland.	E	P3	6.19	-	1995			0	0	0	0	2	2	Moderate
Eryngium sp. Subdecumbens (G.J. Keighery 5390)	Swamp. Clay, grey sand. Seasonally wet flats, claypans, swamps.	-	P3	9.06	-	1899			0	0	0	0	2	2	Low

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Eucalyptus argutifolia	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops. Limestone soils. Grey/yellow/brown sand. Completely open and treeless with dense scrubland.	V	VU	5.36	5.52	2006	2018		0	0	1	0	0	1	Negligible
Eucalyptus foecunda subsp. *foecunda*	On low limestone ridge. Shallow sand over limestone. Slopes of hill high in the landscape. Growing on east side of dune. Limestone heath. *Dryandra sessilis, Grevillea thelemanniana, Hakea trifucata, E. falcata/decipiens/gomphocephala*	-	P4	6.93	-	1991			0	0	0	0	1	1	Low
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes. Grows on the slopes of hills in brown loam over laterite as an emergent mallee; in white sand on gentle valley slopes in low *Eucalyptus accedens* woodland over heath; on grey sand and laterite with *Eucalyptus todtiana* ; in grey sandy clay loam on the slopes of a drainage line between two breakaways; and in grey sand and lateritic gravel with *Corymbia calophylla* and *Eucalyptus wandoo* over open low scrub. (TSSC, 2016b).	E	EN	-	-				0	0	0	0	1	1	low
Eucalyptus x *balanites*	Sandy soils with lateritic gravel.	E	CR	-	-				0	0	0	0	0	0	Negligible
Fabronia hampeana	Found on trunk of *Macrozamia.* On private property in depression between limestone outcrops with yellow sand.	-	P2	7.92	7.81	2009	2009		0	0	1	0	0	1	Negligible
Goodenia arthrotricha	Gravel. Granite rocks, slopes. (Grazyna Paczkowska, 1996 - florabase)	E	E	-	-				0	0	0	0	0	0	Negligible
Grevillea althoferorum	Grey sand with gravel. The Grevillea occurs north of Perth and is restricted to two known populations 200 km apart, one south of Eneabba and the other near Bullsbrook. (TSSC, 2016c)	E	E	-	-				0	0	0	0	0	0	Negligible
Grevillea christineae	Often occurs on narrow, weed-infested road verges, natural habitat is moist areas such as drainage lines or outcropping granite. It has been recorded in tall shrubland and low open woodland of *Eucalyptus loxophleba* and *E. wandoo* over open tall shrubs that include *Acacia acuminata, Allocasuarina campestris* , and *Melaleuca radula* , with *Drosera* spp. and *Tribonanthes* spp. understorey. (DEWHA, 2008k).	E	EN	-	-				0	0	0	0	0	0	Negligible
Grevillea corrugata	Gravelly loam. Roadsides.	E	VU	-	-				0	0	0	0	0	0	Negligible
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath (Florabase). Riparian zone and within cleared paddock on low plain. Moist brown/grey sand. Dark brown loam over red sand with limestone, well drained. Shrubland/sedgeland. *E. rudis* low forest over open scrub over very low open sedges	E	CR	3.39	-	2017			0	1	1	0	2	4	Moderate
Grevillea flexuosa	Red-brown sand with laterite and gravel, sand over granite. Grows on sands of granite ridgetop plateau and associated breakaways as well as on hilltops, slopes and gullies (DEWHA, 2008g).	V	VU	-	-				0	0	0	0	0	0	Negligible
Grevillea thelemanniana	Sand, sandy clay. Winter-wet low-lying flats.	C	CR	-	-				0	0	0	0	1	1	low
Guichenotia tuberculata	Sand clay over laterite, sand.	-	P3	8.99	-	1902			0	0	0	0	0	0	Negligible
Haemodorum loratum	Grey or yellow sand, gravel. Lateritic loam. Wandoo woodland.	-	P3	8.49	8.63	1981	1981		0	0	0	1	1	2	Low
Hydrocotyle lemnoides	Swamps.	-	P4	7.31	-	1989			0	0	0	0	2	2	low
Hydrocotyle striata	Winter wet creekline on sandy soil. Light leaf litter on dark brown sandy humic loam. Clay borders of a spring. Seasonally inundated depression within a Mound Spring. Moist, undulating slighty. Black peaty sand. Riparian woodland dominated by *Melaleuca rhaphiophylla* and *Eucalyptus rudis* .	-	P1	1.36	-	2016			0	1	1	0	1	3	Moderate
Hypolaena robusta	White sand. Sandplains. Upper part of the crest of a quite tall dune. Soil light greyish-brown sand with a pale grey surface in places and a thin litter layer elsewhere. Banksia low woodland over scattered shrubland.	-	P4	4.95	-	1999			0	1	0	0	2	3	Moderate
Isopogon autumnalis	Yellow sand. *Banksia attenuata* low open woodland.	-	P3	6.23	-	1991			0	0	0	0	2	2	Moderate

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Jacksonia sericea	Calcareous and sandy soils. Disturbed area. Slope/flat. Dry grey sand over limestone. Organic litter. Grey Bassendean sand. Coastal plain, gentle low slope on yellow sand. Open low woodland with Banksia, mid woodland of *Eucalyptus marginata* subsp. *marginata* over low woodland, tall open shrubland over open/low shrubland.	-	P4	0.13	6.81	2020	1990		0	1	1	1	2	5	High
Johnsonia pubescens subsp. *cygnorum*	Grey-white-yellow sand. Flats, seasonally wet sites. Gently inclined mid slope, white sand. Mid Euc woodland over low woodland over mid open to sparse shrubland.	-	P2	8.71	8.72	2018	2019		0	0	1	1	1	3	Moderate
Lasiopetalum glutinosum subsp. *glutinosum*	Midland Junction, Helena River.	-	P3	8.2	-	1898			0	0	0	1	0	1	Negligible
Lepidosperma rostratum	Associated with Marsh Banksia (*Banksia telmatiaea)* and Hairy Clawflower (*Calothamnus hirsutus),* and gorws in sandy soil among low heath in a winter-wet sawmp. (DEWHA, 2008h).	E	E	-	-				0	0	0	0	1	1	Low
Levenhookia preissii	On margin of swamp. White sand. Peaty sand fringing damp soil, bordering a watercourse.	-	P1	6.23	-	1954			0	0	0	1	1	2	Low
Macarthuria keigheryi	White or grey sand. Slope. Sand dune. Dry grey sand. *Adenanthos cygnorum* shrubland. low-lying winter-wet damp, grey/white sands and grows in open patches with low tree canopy cover among heathland. (DEC, 2009c).	E	E	9.72	-	2001			0	0	0	0	1	1	Low
Marianthus paralius	White sand over limestone. Low coastal cliffs. Well drained white sand. Limestone ridge. Closed low heath.	E	E	9.36	-	2010			0	0	1	0	1	2	Low
Meionectes tenuifolia	Grey clay, reserve and wetland. Tall shrubland with *M. rhaphiophylla, Baumea arthophylla, Triglocia lineare.*	-	P3	5.42	8.35	2007	1995		0	0	1	1	0	2	Negligible
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Limestone hill/ridge. Skeletal white loam over limestone. Shallow brown sand. Hilltop and upper slope. Grey fine sand on limestone outcropping. Tall shrubland, very open shrub mallee, dense scrubland.	E	E	5.82	5.81	2019	2019		0	0	1	0	1	2	Low
Millotia tenuifolia var. *laevis*	Granite or laterite soils.Upper slope with grey sand. Bassendean dune system. Gently inclined low dune. Banksia low woodland over mid woodland/shrubland.	-	P2	1.94	-	2018			0	1	1	1	1	4	Moderate
Myriophyllum echinatum	Clay. Winter-wet flats.	-	P3	7.8	-	1902			0	0	0	1	0	1	Negligible
Netrostylis sp. Chandala (G.J. Keighery 17055)	Mound spring, black peat over clay and humic sand. Dampland with thick leaf litter over dark grey sand. *M. rhaphiophylla* forest over sedges. Corymbia and Melaleuca dampland.	-	P2	1.79	-	2013			0	1	1	1	1	4	Moderate
Paracaleana dixonii	Grey sand over granite. Occurs in small isolated colonies in sandy soils, occasionally over laterite. occurs in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland. Also occurs in low open woodland of Pricklybark over mid to low shrubland of mixed species. Mid sparse to open shrubland of mixed species as well as mid mallee woodland to isolated mallees of *Eucalyptus convenies or mid open shrubland of Allocasuarina campestris* (Hopper & Brown 2006).	E	VU	-	-				0	0	0	0	1	1	Low
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel. Gentle slope at edge of seasonal dampland. Light greyish brown sand with a pale grey (whitish) surface, a thin litter layer over parts. Banksia low open woodland to low woodland over open scrub to closed scrub over open shrubland to open heath over scattered herbs and sedge.	-	P3	5.76	-	1999			0	0	0	1	1	2	Low
Phyllangium palustre	Winter-wet claypans, low-lying seasonal wetlands.	-	P2	9.06	-	1901			0	0	0	1	0	1	Low
Pimelea calcicola	Sand. Coastal limestone ridges. Low hill. Shallow grey sand over massive limestone. Heathland. *Dryandra sessilis* closed heath.	-	P3	4.43	-	1990			0	1	0	0	1	2	Low
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.	-	P3	6.72	-	1963			0	0	0	0	0	0	Negligible

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Poranthera moorokatta	Flat to very slight depression on a broad flat dampland floor. Soil: surface light grey to grey, set clay with some coarse sand, thick white sand cover in some places. Below surface light grey-grey clay with some sand. Some litter in patches around shrub. *M. preissiana* mid woodland over Banksia low woodland, over low open shrubland.		P2	0.06	-	2018			0	1	1	1	2	5	High
Ptilotus pyramidatus	Seasonally inundated flat (floodplain) at an elevation of about 6.5 m above sea level. Pale grey, muddy sand to sandy-mud alluvium of Pinjarra Plain. (Davis & Tauss, 2011).	C	CR	-	-				0	0	0	0	1	1	Low
Schoenus capillifolius	Brown mud. Claypans. Clay pan dry - some mud in deeper sections with live plants.	-	P3	7.97	-	1980			0	0	0	1	0	1	Negligible
Schoenus griffinianus	White sand. Well drained gentle slope. *Banksia attenuata* open low woodland over scrub over sedges.	-	P4	1.23	-	1993			0	1	0	1	2	4	Moderate
Schoenus sp. Waroona (G.J. Keighery 12235)	Clay or sandy clay. Winter-wet flats. Dark brown loam clay over clay. Burnt low heath.	-	P3	7.97	-	1988			0	0	0	1	0	1	Negligible
Stachystemon exilis	Dry flat, grey sand some humus, over humus and sand, well drained. Seasonally damp. Very gently inclined plain, grey sand. Open scrub, Marri open low woodland over scrub, low woodland of Banksia over mid open shrubland.	-	P1	0.06	-	2018			0	1	1	1	2	5	High
Stenanthemum sublineare	Littered white sand. Coastal plain./ Sand plain. Low rise on an undulating plain. Dry, grey sand. Open Banksia low woodland over heath.	-	P2	1.9	-	2005			0	1	1	1	2	5	High
Stylidium longitubum	Sandy clay, clay. Seasonal wetlands. Flat ground. Dark brown clay loam some peat, over clay. Poor drainage, wet during winter/spring. Small winter-wet depressions, winter-wet claypan. Open low scrub. Under and around shrubs. Shrubland.	-	P4	4.32	1.87	1994	2005		0	1	1	1	2	5	High
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Limestone ridge. Brown loamy sand over limestone. Coastal heath and shrubland, open Banksia woodland.	-	P3	9.42	-	2009			0	0	1	0	0	1	Negligible
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Flat with moist grey sand. Winter-wet flat, brown sandy-clay. Sandy flats near winter-wet depressions. Marri and Melaleuca woodland, Melaleuca shrubland.	-	P3	6.23	-	2007			0	0	1	1	1	3	Moderate
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions. Floor of a dampland/wetland complex. Shrubs.	-	P3	4.77	-	2000			0	1	0	1	1	3	Low
Styphelia filifolia	On brown sand on midslopes. Sandy soil. Coastal plain. Dry, littered grey sand. Flat, slope. Dry, white sand. Banksia woodland.	-	P3	1.41	-	2007			0	1	1	1	2	5	High
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses. (DEWHA, 2009).	C	CR	-	-				0	0	0	0	0	0	Negligible
Synaphea sp. Pinjarra Plain (A.S. George 17182)	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	E	E	-	-				0	0	0	0	1	1	Low
Tetratheca pilifera	Gravelly soils. Hill. Brown sandy loam soil. Eucalyptus wandoo woodland over shrubland.	-	P3	3.54	-	2020			0	1	1	1	1	4	Moderate
Thelymitra dedmaniarum	Grows in *Eucalyptus wandoo* and *E. accedens* woodlands on red-brown sandy-loam soil associated with dolerite and granite outcrops. (TSSC, 2016d).	E	CR	-	-				0	0	0	0	0	0	Negligible
Thelymitra stellata	Sand, gravel, lateritic loam. Low heath and scrub in Jarrah woodland, both on ridges and slopes, flats, also on riverbanks and breakaways. Red, brown, yellow, or grey sandy loams or gravel over laterite or gravel. Dry, moist or saline conditions are tolerated. (DEWHA, 2008i).	E	EN	-	-				0	0	0	0	0	0	Negligible
Thelymitra variegata	Sandy clay, sand, laterite. On limestone hills towards the coast. (Paczkowska, 1994).	-	P2	7.86	-	1919			0	1	0	0	0	1	Negligible

Appendix A Flora Desktop Results

Taxon	Habitat	Cons. Code		Distance from Survey Area (km)		Date		PMST	Likelihood Assessment					Total Score	Likelihood
		EPBC Act	BC Act / DBCA	WA Herb	TPFL	WA Herb	TPFL		In Survey Area	Occurs Nearby (5km)	Recent Record (<20 yrs)	Known within LGA	Suitable Habitat (0,1,2)		
Thysanotus brachiatus	Grey sand. Flat plain with deep gray sand. Long unburnt area. On gentle slope above dampland, deep grey quartz sand. Low Banksia woodlnand with moderately dense vegetation. With Banksia attenuata, Banksia menziesii, Stirlingia latifolia.	-	P2	9.05	-	1988			0	0	0	1	1	2	Low
Thysanotus glaucus	White, grey or yellow sand, sandy gravel. Banksia low open woodland.	-	P4	9.24	-	1990			0	0	0	1	1	2	Low
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel. (Paczkowska, 1995). Low roadside on gravel. Gentle slope, sandy lateritic loam over laterite. Low scrub. Eucalyptus wandoo low woodland.	-	P2	8.65	-	1991			0	0	0	1	1	2	Low
Tripterococcus sp. Brachylobus (A.S. George 14234)	Seasonal wetland, flat ground, black fine peaty clay loam sand, poor drainage, wet during winter/spring. Open herbs.	-	P4	4.13	4.13	1994	1994		0	1	0	0	1	2	Low
Trithuria occidentalis	In water, muddy open. Drying pools, muddy claypan. Muddy spots. *Melaleuca* laterite scrub, grows partly submerged on the edge of shallow, winter-wet claypans in very open shrubland of Robin Redbreast Bush (Melaleuca lateritica) and numerous annual herbs. (DEWHA, 2008j).	E	E	7.96	-	1901			0	0	0	1	2	3	Moderate
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions. Gravelly soil. Damp, grey-brown clay-sand-humus. Plain, low lying, flat. Dense tall shrub over sedges. Shrubland. Some emergent Marri, Banksia, Nuytsia.	-	P4	0.02	-	2006			0	1	1	1	2	5	High
Verticordia serrata var. *linearis*	White sand, gravel. On road verge. Open woodland. Growing in association with *Adenanthos cygnorum* .	-	P3	8.99	-	1987			0	0	0	1	1	2	Low

Appendix B

Fauna Desktop Results

Class	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (m) [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
Bird	*Actitis hypoleucos*	Common Sandpiper	The Common Sandpiper utilises a wide range of coastal wetlands and some inland wetlands and is mostly found around muddy margins or rocky shores and rarely on mudflats (DCCEEW, 2023).	IA	MI	1991	2	8189		0	1	0	0	1	Negligible	
Bird	*Apus pacificus*	Fork-tailed Swift	The Fork-tailed Swift occurs over inland plains, sometimes boave foothills or in coastal areas (DCCEEW, 2023).	IA	MI	2009	9	4207	Known	0	1	1	0	2	Low	
Bird	*Botaurus poiciloptilus*	Australasian Bittern	The Australian Bittern occurs mainly in freshwater wetlands and, rarely, estuaries or tidal wetlands. It favours wetlands with tall dense vegetation (DCCEEW, 2023)	EN	E	2003	16	5585	Known	0	1	0	0	1	Negligible	
Bird	*Cacatua pastinator pastinator*	Muir's Corella	Muir's Corella is now confined to small areas from Boyup Brook and Qualeup south to the Perup River, Lake Muir and Perillup (Johnstone, et al 1998).	CD		Unknown	7	6650		0	1	0	0	1	Negligible	
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	They are widespread in Western Australia from the Pilbara region to the south-west. They prefer muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation (Higgins & Davies,1996).	IA	MI	2012	9	6647		0	1	1	1	3	Moderate	
Bird	*Calidris canutus*	Red Knot	In Australia the Red Knot inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	EN & MI	2002	10	6647	Known	0	1	0	0	1	Negligible	
Bird	*Calidris ferruginea*	Curlew Sandpiper	In Western Australia, they are widespread around coastal and sub coastal plains from Cape Arid to the south-west Kimberley. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas and less often recorded inland around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand (Higgins & Davies, 1996).	CR & IA	CR & MI	2005	28	733	Known	0	1	1	1	3	Moderate	
Bird	*Calidris melanotos*	Pectoral Sandpiper	The Pectoral Sandpiper occupies shallow, fresh waters often containing low grass or other small herbs. It is also observed in swamp margins, flooded pastures and saltmarshes. This species breeds in the northern hemisphere and is a regular though uncommon summer visitor to Australia (Pizzey & Knight, 2007).	IA	MI	1992	1	9380		0	1	0	2	3	Moderate	
Bird	*Calidris ruficollis*	Red-necked Stint	The Red-necked Stint is found in coastal sheltered areas and exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI	2011	95	733		0	1	1	0	2	Low	
Bird	*Calidris subminuta*	Long-toed Stint	The Long-toed Stint occurs in freshwater wetlands (DCCEEW, 2023).	IA	MI	1992	3	10038		0	1	0	2	3	Moderate	
Bird	*Calidris tenuirostris*	Great Knot	The Great Knot inhabits sheltered coastal habitats with large intertidal mudflats or sandflats (DEECCW, 2023).	CR & IA	CR & MI	2005	12	6647	Known	0	1	1	0	2	Low	
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia the Streaked Shearwater rarely ventures inland (Knight & Pizzey 2007)	IA	MI	2010	1	571		0	1	1	0	2	Low	
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	The Forest Red-tailed Black Cockatoo inhabits the dense Eucalyptus marginata (Jarrah), E. diversicolor (Karri) and Corymbia calophylla (Marri) forests receiving more than 600mm of annual average rainfall (DAWE, 2022).	VU	VU	2020	199	1371	Known	1	1	1	2	5	Known	
Bird	*Charadrius leschenaultii*	Greater Sand Plover	The Greater Sand Plover has been recorded at beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	VU & MI	2011	2	8176	Known	0	1	1	0	2	Low	
Bird	*Charadrius mongolus*	Lesser Sand Plover	The Lesser Sand Plover typically occurs in open intertidal flats of sheltered bays, lagoons or estuaries (Pizzey & Knight, 2007).	EN & IA	EN & MI	1999	1	16139	Known	0	1	0	0	1	Negligible	
Bird	*Chlidonias leucopterus*	White-winged Black Tern	In Australia, and elsewhere in their non-breeding range, the species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands (DCCEEW, 2023).	IA	MI	1990	1	10038		0	1	0	0	1	Negligible	
Bird	*Dasyornis longirostris*	Western Bristlebird	The Western Bristlebird is restricted to a coastal strip of southern Western Australia from Two Peoples Bay to near East Mount Barren in the eastern end of Fitzgerald River National Park, with a large gap further west of the National Park (Gillfillan et al., 2007).	EN	EN	Unknown	1	11033		0	1	0	0	1	Negligible	
Bird	*Elanus scriptus*	Letter-winged Kite	The Letter-winged Kite prefers open country and grasslands throughout arid and semi-arid regions in Australia. The species is known for sudden populaton increases and will disperse to high rainfall and coastal regions when food is abundent (BirdLife Australia, 2023).	P4		1980	1	6647		0	1	0	1	2	Low	
Bird	*Falco hypoleucos*	Grey Falcon	The Grey Falcon inhabits inland plains, gibber deserts, pastoral lands and timbered watercourses (Pizzey & Knight, 2007).	VU	VU	1929	1	10792		0	1	0	2	3	Moderate	
Bird	*Falco peregrinus*	Peregrine Falcon	The Peregrine Falcon is widespread across Australia and inhabits a variety of habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings (DCCEEW, 2023).	S		2014	94	1064		0	1	1	2	4	High	
Bird	*Glareola maldivarum*	Oriental Pratincole	The Oriental Pratincole inhabits open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and also occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI	1981	1	733		0	1	0	2	3	Moderate	

Class	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (m) [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
Bird	*Ixobrychus dubius*	Australian Little Bittern	The birds are mainly found in freshwater wetlands, where they inhabit dense emergent vegetation of reeds and sedges, and inundated shrub thickets. They are also occasionally found in brackish and saline wetlands such as mangrove swamps, Juncus-dominated salt marsh and the wooded margins of coastal lagoons (Marchant & Higgins, 1991).	P4		2012	8	5774		0	1	1	2	4	High	
Bird	*Ixobrychus flavicollis australis*	Black Bittern (southwest subpop.)	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves (DAWE, 2022).	P2		1987	2	6646		0	1	0	2	3	Moderate	
Bird	*Leipoa ocellata*	Malleefowl	The Malleefowl is found principally in the 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	VU	1981	46	13849	Likely	0	1	0	0	1	Negligible	
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	The Northern Siberian Bar-tailed Godwit occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins & Davies, 1996).	CR (& IA at sp. level)	CR (& MI at sp. level)				Known	0	1	0	0	1	Negligible	
Bird	*Ninox connivens connivens*	Barking Owl	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils (DAWE, 2022).	P3		1902	1	10915		0	1	0	2	3	Moderate	
Bird	*Numenius phaeopus*	Whimbrel	The Whimbrel occurs all along the Australian coast and inhabits estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	IA	MI	1978	1	16967		0	1	0	1	2	Low	
Bird	*Oxyura australis*	Blue-billed Duck	The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with aquatic vegetation. This species of duck is fully aquatic and rarely comes onto land (Marchant & Higgins, 1990)	P4		2013	885	733		0	1	1	0	2	Low	Survey area wetlands are not permanent.
Bird	*Pandion cristatus*	Eastern Osprey	The Osprey inhabits littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands and can also occur over atypical habitats such as heath, woodland or forest when travelling between foraging sites (DAWE, 2022).	IA	MI	2016	18	7546		0	1	1	1	3	Moderate	Atypical habitat for species.
Bird	*Plegadis falcinellus*	Glossy Ibis	The Glossy Ibis occupies well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI	2013	196	733		0	1	1	2	4	High	
Bird	*Pluvialis squatarola*	Grey Plover	The Grey Plover is almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts. It is occasionally found inland (Birdlife Australia, 2023).	IA	MI	2007	93	733		0	1	1	0	2	Low	
Bird	*Psophodes nigrogularis*	Western Whipbird	The Western Whipbird (western mallee), occurs in mallee, often in open mallee vegetation with a dense, tall shrub layer up to 1.5 m tall, and dominated by such species as Hakea, Lambertia, Dryandra or Banksia (DCCEEW, 2023).	EN	E	Unknown	2	15804		0	1	0	2	3	Moderate	
Bird	*Rostratula australis*	Australian Painted Snipe	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca). The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant & Higgins 1993).	EN	EN	2012	2	10306	Known	0	1	1	1	3	Moderate	
Bird	*Sternula nereis nereis*	Australian Fairy Tern	The Fairy Tern is found on isolated sandy inlets and along the coast from Dampier Archipelago, Western Australia, southward to Tasmania and Victoria, and is only vagrant to the east coast. It is most common in Western Australia. The Fairy Tern is found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons. It favours both fresh and saline wetlands and near-coastal terrestrial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2023)	VU	VU	2013	3	16155	Known	0	1	1	1	3	Moderate	

Class	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (m) [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
Bird	*Thinornis rubricollis*	Hooded plover	The Hooded Plover occurs around the southern coast of Australia and Tasmania, and on inland saline wetlands in south-west Western Australia (Marchant & Higgins 1993).	P4	0	1995	2	17129		0	1	0	1	2	Low	
Bird	*Tringa glareola*	Wood Sandpiper	The Wood Sandpiper is a summer migrant to Australia where it is more common in the north although a casual visitor to southern parts. It occupies wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2012).	IA	MI	2008	28	733		0	1	1	1	3	Moderate	
Bird	*Tringa nebularia*	Common Greenshank	The Common Greenshank is found in inland wetlands and sheltered coastal habitats where it forages at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh (DCCEEW, 2023).	IA	MI	2013	148	733	Known	0	1	1	1	3	Moderate	
Bird	*Tringa stagnatilis*	Marsh Sandpiper	The Marsh Sandpiper occupies wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2012).	IA	MI	2011	5	5517	Known	0	1	1	1	3	Moderate	
Bird	*Tyto novaehollandiae novaehollandiae*	Masked Owl (southwest)	From their roost and nest hollows in blocks of quality forest, our Masked Owls range out each night to hunt rodents around farmyards and the chook pens of peri-urban housing (Newton, 2002).	P3	0	2000	3	11901		0	1	0	1	2	Low	
Bird	*Zanda baudinii*	Baudin's Cockatoo	Baudin's Cockatoo occurs in temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *E. diversicolor* (Karri) (DAWE, 2022).	EN	EN	2015	89	476	Known	1	1	1	2	5	Known	
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Carnaby's Cockatoo have a widespread distribution across the Jarrah Forest between Mundaring, Nannup, Hopetoun, Perth and Peel (DAWE, 2022).	EN	EN	2020	7398	0	Known	1	1	1	2	5	Known	
Fish	*Galaxiella nigrostriata*	Blackstriped Dwarf Galaxias	Occupies the same ephemeral habitats as the salamanderfish and, like that species, is also capable of burrowing and aestivating (a state of dormancy similar to hibernation, characterised by inactivity and a lowered metabolic rate) to survive the dry summer (Morgan, et al. 2011).	EN	0	Unknown	1	9088	Known	0	1	1	0	2	Low	
Invertebrate	*Australotomurus morbidus*	Cemetery Springtail	Typical habitats for Australotomurus species are long undisturbed native grasslands and heathland at low and high elevations (DCCEEW, 2023).	P3		1993	5	4115		0	1	0	1	2	Low	
Invertebrate	*Austrosaga spinifer*	Spiny Katydid	This species occurs in Banksia heath and low woodlands. Known records exist in Neerabup National Park (Invertebrate Solutions, 2019).	P2		1982	2	6790		0	1	0	2	3	Moderate	
Invertebrate	*Euoplos inornatus*	Inornate Trapdoor Spider	Euoplos is a spider genus in the family Idiopidae which is found in various geographical locations in Australia. The trapdoor spider species Euoplos inornatus occurs on the eastern edge of the SCP, although most records are from the Darling Scarp and the jarrah forest to the east (Invertebrate Solutions, 2019).	P3		1998	2	14333		0	1	0	2	3	Moderate	
Invertebrate	*Glossurocolletes bilobatus*	a short-tongued bee (southwest)	The bee Leioproctus (Glossurocolletes) bilobatus, is associated with Jarrah/Wandoo Forest nominally to the east of the Swan Coastal Plain (Houston 2018). Leioproctus (Glossurocolletes) bilobatus has so far been collected solely from the yellow flowering pea, Gompholobium aristatum.	P1		1981	1	19366		0	1	0	1	2	Low	
Invertebrate	*Hesperocolletes douglasi*	Douglas' Broad-headed Bee, Rottnest Bee	The geographic range of this species is unknown, with only one extant population known in Pinjar. The population size is also unknown, though it is likely a small population (< 250 mature individuals) as there have only been two individuals ever found, even though there has been intensive searching and targeted surveys (Houston, 2018).	CR		2015	1	10146	Known	0	1	1	2	4	High	
Invertebrate	*Hylaeus globuliferus*	Woolybush Bee	This species is believed to feed on flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Houston, 2018).	P3		1996	10	227		1	1	0	2	4	High	
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	The Swan Coastal Plain Shield-backed Trapdoor spider occurs in remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	139	1267		0	1	1	2	4	High	
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	A short-tongued native bee found in Western Australia, associated with *Goodenia sp* . and *Lechenaultia sp* . (Houston, 2018).	P3		1982	3	110		1	1	0	2	4	High	
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	This small black native bee species is known from the SCP (Kenwick wetlands, Cannington and Forestdale Lake) and near Lithgow in the Blue Mountains of NSW and has an association with *Goodenia filiformis* and *Anthotium junciforme* (Houston, 2018).	EN	CR	2017	4	11524	Known	0	1	1	2	4	High	
Invertebrate	*Neopasiphae simplicior*	a short-tongued bee	This native bee has distribution in Western Australia from north of Geraldton, through the coastal fringe and along the southern coast to Cape Arid National Park. Most available records from the SCP are historical in nature and its current status in the Perth metropolitan area is unknown. This species along with others in the genus are known to use annual plants such as daisies *Asteraceae* and *Goodenieceae* (Houston 2018)	EN		1954	1	17921		0	1	0	2	3	Moderate	

Class	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (m) [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
Invertebrate	*Synemon gratiosa*	Graceful Sunmoth	The Graceful Sun Moth occurs throughout the Swan Coastal Plain and extends north into the Geraldton Sandplains (DEC, 2011). It is associated with two habitat types: 1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant Lomandra maritima. 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread.	P4	0	2019	438	2026		0	1	1	2	4	High	
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	The only reasonably large bivalve in freshwaters of south-west Western Australia. Occurs in greatest abundance in slower flowing waters with stable sediments that are soft enough for burrowing. Salinity tolerance is quite low (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	VU	2020	26	1222	Known	0	1	1	0	2	Low	Survey area wetlands are not permanent
Mammal	*Bettongia lesueur graii*	Boodie (inland)	The habitat of the Burrowing Bettong (inland) ranged from open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	EX	Unknown	1	9810		0	1	0	1	2	Negligible	Extinct species
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Burrows were constructed in many types of soil although loams were favoured. In sandridge deserts the burrows were situated in the damp low-lying areas between dunes. Outcrops of limestone or gypseous rock and rises in salt-lake systems were other favoured habitats (DCCEEW, 2023).	CR	EN	2018	96	1117	Known	0	1	1	2	4	High	
Mammal	*Dasyurus geoffroii*	Chuditch	The Chuditch previously occurred throughout arid and semi arid Australia, but is now restricted to south-west Western Australia. It currently only occurs in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	VU	2022	38	1347	Known	0	1	1	0	2	Low	
Mammal	*Hydromys chrysogaster*	Water-rat, rakali	The Water Rat occurs in the vicinity of permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	41	3837		0	1	1	1	3	Moderate	
Mammal	*Isoodon fusciventer*	Quenda, Southwestern Brown Bandicoot	The Quenda or Southern Brown Bandicoot is found in forest, woodland, heath and shrub communities usually consisting of a combination of sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P5		2020	1214	47		1	1	1	2	5	Known	
Mammal	*Macroderma gigas*	Ghost Bat	The Ghost Bat occurs across much of northern Australia and inhabits rainforest, monsoon and vine thicket, open woodlands and arid areas.	VU	VU				May	0	1	0	0	1	Negligible	
Mammal	*Macrotis lagotis*	Bilby, dalgyte, ninu	In Western Australia, the bilby is now largely restricted to the Gibson, Little Sandy and Great Sandy Deserts, and parts of the Pilbara, Dampierland, Central Kimberley and Ord-Victoria Plains bioregions.	VU	VU	1974	2	7784		0	1	0	0	1	Negligible	
Mammal	*Myrmecobius fasciatus*	Numbat	The Numbat's original habitat varied from Mulga woodland and sandplain to sand dunes dominated by hummock grassland, to eucalypt woodlands and forests.	EN	EN	1974	2	5588		0	1	0	0	1	Negligible	
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	*Notamacropus eugenii derbianus* is a small nocturnal Tammar Wallaby subspecies that is native to south-western Western Australia and five offshore islands. . Tammar Wallabies shelter in dense low vegetation during daylight and move to open grassy areas to feed after dark. They inhabit coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland.	P4		2017	12	2544		0	1	1	2	4	High	
Mammal	*Notamacropus irma*	Western Brush Wallaby	Preferred habitat for Macropus irma is open forest or woodlands with seasonally wet sites and low vegetation. This species is often found in dry schlerophyll forests, such as jarrah, and areas of mallee and heathland scrub.	P4		2018	24	47		1	1	1	2	5	Known	
Mammal	*Petrogale lateralis lateralis*	Black-flanked Rock-wallaby	Extant populations occur in a few locations in the wheatbelt region, Barrow Island, Salisbury Island, Cape Range and Calvert Range, with translocated populations in the Cape Le Grand National Park, Avon Valley National park and Paruna Sanctuary.	EN	VU	2004	4	9810	Known	0	1	1	0	2	Low	
Mammal	*Phascogale tapoatafa wambenger*	South-western Brush-tailed Phascogale	Surviving populations of Southern Brush-tailed Wallaby are largely restricted to forests dominated by jarrah (Eucalyptus marginata).	VU & CD		2018	7	5588		0	1	1	2	4	High	
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	The Western Ringtail Possum is closely associated with Peppermint (Agonis flexuosa) forest and woodland and Tuart (Eucalyptus gomphocephala) with a peppermint mid-story. Further from the coast the species is found in Jarrah (Eucalyptus marginata), Wandoo (Eucalyptus wandoo) and Marri (Corymbia calophylla) forest (Van Dyck & Strahan, 2008).	CR	VU	1958	1	8653	Likely	0	1	0	1	2	Low	
Mammal	*Setonix brachyurus*	Quokka	The Quokka is distributed from Jarrah forest south-east of Perth, extending south through southern Jarrah, Marri and Karri forests onward to the south coast. It is now thought to be absent from the Swan Coastal Plain.	VU	VU				Likley	0	1	0	0	1	Negligible	

Class	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (m) [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
Reptile	*Ctenotus gemmula*	Jewelled Southwest Ctenotus	The Jewelled Ctenotus is endemic to Western Australia. In the Perth region it is uncommon and restricted to the Swan Coastal Plain (Bush et al., 2010). The Jewelled Ctenotus inhabits low vegetation in Banksia woodlands where it shelters in leaf litter under trees and shrubs and abandoned stick-ant nests (Bush et al., 2010).	P3		1999	2	7440		0	1	0	2	3	Moderate	
Reptile	*Lerista lineata*	Perth Slider Lined Skink	The Perth Lined Lerista is an underground dwelling skink, sheltering in leaf litter and upper layers of loose soil. It is typically found at the bases of shrubs, spoil heaps and stick ant nests (Bush et al, 2010). The species inhabits sandy soils supporting Eucalypt/Banksia woodland, coastal heath and low shrubland (Bush et al., 2010; Wilson and Swan, 2010).	P3		1977	7	16605		0	1	0	2	3	Moderate	
Reptile	*Neelaps calonotos*	Black-striped Burrowing Snake	The Black-striped Snake is mostly confined to the Swan Coastal Plain between Mandurah and Lancelin. It takes shelter 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		2017	82	778		0	1	1	2	4	High	
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	The Western Swamp Tortoise has a very small geographic range. The species has only been 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. This species is also found in Mogumber Nature Reserve and, in August 2008, 24 individuals were released in Moore River Nature Reserve (DEC 2008).	CR	CR	2019	113	6836	Known	0	1	1	2	4	High	

Appendix C

Flora Species by Family by Community Matrix

Appendix C Flora by Family by Site by Community Matrix

Family		Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
			13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
Aizoaceae																																														
	*	*Carpobrotus edulis*			x			x	x						x		x						x			x								x			x			x			x	x	
Anarthriaceae																																														
		Lyginia barbata	x	x	x	x				x	x			x							x	x	x	x		x														x						
Apiaceae																																														
		Daucus glochidiatus			x																																									
		Platysace filiformis																																												x
		Xanthosia huegelii						x	x												x																				x					
		Apium annuum																												x																
Araliaceae																																														
		Trachymene pilosa	x	x	x	x	x	x	x	x	x	x			x	x				x	x	x	x	x	x				x	x	x	x	x	x	x	x		x		x	x		x		
Asparagaceae																																														
		Asparagus asparagoides																																							x					
		Laxmannia ramosa subsp. *ramosa*																								x																				
		Laxmannia squarrosa											x													x																				
		Lomandra caespitosa	x		x						x		x										x										x			x									
		Lomandra hermaphrodita	x	x	x		x	x	x	x											x		x		x																				
		Lomandra micrantha subsp. *micrantha*																						x									x			x									
		Lomandra preissii						x					x	x									x						x				x									x			
		Lomandra sonderi		x								x		x							x																								
		Lomandra sp.									x												x																							
		Lomandra spartea																																			x										
		Lomandra suaveolens		x																																										
		Lomandra sericea						x	x																																					
		Sowerbaea laxiflora																															x														
		Thysanotus arbuscula			x																x																									
		Thysanotus manglesianus			x																		x	x									x	x			x					x			
		Thysanotus multiflorus					x		x																																					
		Thysanotus thyrsoideus						x																																						
		Thysanotus triandrus						x																																						
Asphodelaceae																																														
	*	*Trachyandra divaricata*													x					x												x														
Asteraceae																																														
		?Asteraceae sp. 2														x																														
	*	*?Erigeron bonariensis*														x																														
	*	*Arctotheca calendula*		x	x										x	x	x																		x									x		
	*	*Chondrilla juncea*																																												x	
		Craspedia variabilis		x			x														x																								
	*	*Erigeron bonariensis*																																												x	
		Hyalosperma cotula							x																																					
	*	*Hypochaeris glabra*	x	x	x	x	x			x	x	x		x	x	x	x			x	x		x	x		x			x	x	x	x	x	x	x	x	x	x		x	x	x		x		
	*	*Hypochaeris radicata*										x				x																									x					
	*	*Monoculus monstrosus*																																							x					
		Podolepis gracilis										x																																		
		Podotheca chrysantha						x		x						x																														
		Podotheca gnaphalioides	x	x	x			x	x			x			x	x	x					x		x		x			x	x	x	x	x	x	x	x	x		x						
	*	*Senecio vulgaris*																																												x	
		Siloxerus humifusus																																		x	x									
	*	*Sonchus oleraceus*		x		x		x				x			x	x													x					x	x										
	*	*Ursinia anthemoides*	x	x	x	x	x	x	x	x		x		x	x	x	x				x	x	x	x	x	x				x	x	x	x	x	x	x	x		x	x			x		
		Waitzia suaveolens										x											x			x											x								
		Waitzia acuminata	x							x	x												x																						

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
Brassicaceae																																													
	* *Diplotaxis muralis*																																												
	* *Raphanus raphanistrum*																																												x
Campanulaceae																																												
	Isotoma hypocrateriformis							x																																				
	Lobelia heterophylla		x			x	x	x																																				
	* *Wahlenbergia capensis*					x	x	x												x													x											
	Wahlenbergia preissii						x	x																																				
Caryophyllaceae																																												
	* *Petrorhagia dubia*																																										x		
Casuarinaceae																																												
	Allocasuarina fraseriana															x																				x								
	Allocasuarina humilis	x	x				x	x												x																								
Centrolepidaceae																																												
	Centrolepis aristata																													x			x				x								
Chenopodiaceae																									x																				
	Rhagodia baccata																																												
Colchicaceae																																												
	Burchardia congesta	x		x	x	x	x	x		x	x	x								x		x	x	x								x								x				
Crassulaceae																																												
	Crassula colorata			x																					x																				
	Crassula colorata var. *colorata*								x					x		x						x																				x			
	Crassula decumbens var. *decumbens*										x																					x	x	x	x										
Cyperaceae																																													
	Chaetospora curvifolia	x	x																		x		x																						
	Isolepis marginata						x	x		x	x			x	x							x										x	x	x										
	Lepidosperma leptostachyum											x										x																				x			
	Lepidosperma longitudinale																													x					x										
	Lepidosperma pubisquameum					x																						x			x														
	Lepidosperma sp.																																												
	Mesomelaena pseudostygia											x									x																								
	Netrostylis capillaris							x				x								x																								
	Schoenus caespititius						x	x																																				
	Schoenus clandestinus																					x																							
Dasypogonaceae																																												
P2	*Calectasia ?elegans*																																											x	
	Dasypogon bromeliifolius								x		x	x											x	x		x			x			x	x	x	x		x			x				
Dilleniaceae																						x																								
	Hibbertia huegelii																																												
	Hibbertia hypericoides	x	x		x	x	x					x	x							x	x	x	x	x																			x		
	Hibbertia sericosepala									x														x																					
	Hibbertia subvaginata	x		x			x	x	x	x	x					x					x	x	x	x	x			x																
	Hibbertia striata						x	x												x																									
Droseraceae																																													
	Drosera erythrorhiza	x							x	x	x									x		x	x	x								x		x	x		x							
	Drosera glanduligera																													x			x												
	Drosera macrantha	x							x														x	x								x			x									
	Drosera menziesii			x		x	x	x												x		x																							
	Drosera micrantha																					x														x									
Eremaea																																													
	Eremaea pauciflora	x	x						x			x										x	x		x																x				
Ericaceae																																													

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
	Andersonia heterophylla	x																																											
	Brachyloma preissii																			x	x																									
	Conostephium pendulum	x	x		x	x	x	x	x	x	x	x								x				x	x							x													
	Leucopogon polymorphus																				x	x																							
	Leucopogon pulchellus																						x	x											x										
	Leucopogon squarrosus									x																		x						x										
	Lysinema elegans												x																																
	Lysinema pentapetalum																																		x										
	Styphelia conostephioides	x							x	x		x	x									x	x									x													
	Styphelia pallida								x															x																				
	Styphelia tenuiflora									x																																		
	Styphelia xerophylla											x	x									x	x			x									x				x	x				
	Styphelia conostephioides		x	x		x														x	x			x																				
Euphorbiaceae																																													
	* *Euphorbia terracina*				x																																							
	Monotaxis grandiflora						x	x																																				
	Stachystemon axillaris																						x																					
Fabaceae																																													
	Acacia applanata											x	x																																
	Acacia stenoptera																																												
	Acacia browniana			x																																									
	Acacia microbotrya																	x																											x	
	Acacia pulchella	x	x	x		x	x	x	x	x	x		x							x	x	x	x	x	x	x			x		x		x		x	x								x	
	Acacia saligna													x																															
	Acacia barbinervis subsp. *borealis*	x	x	x	x	x		x		x												x																						
	Aotus procumbens																																											x	
	Bossiaea eriocarpa	x	x	x	x	x	x	x	x	x	x	x								x	x	x		x	x			x				x		x										
	Daviesia decurrens						x																																					
	Daviesia divaricata subsp. divaricata												x										x																			x		
	Daviesia physodes																																						x						
	Daviesia triflora		x				x														x																							
	Euchilopsis linearis																															x	x		x					x	x				
	Gastrolobium capitatum									x		x	x											x																					
	Gompholobium pungens																																												x
	Gompholobium tomentosum	x	x	x		x			x	x		x	x							x			x	x	x				x															
	Hardenbergia comptoniana																			x	x																						x	
	Hovea trisperma var. *trisperma*						x	x												x	x																							
	Isotropis cuneifolia subsp. *cuneifolia*	x				x							x								x			x																				
	Jacksonia floribunda	x					x	x	x			x	x									x	x	x	x	x																	x	
	Jacksonia furcellata											x	x									x			x								x	x										
	Jacksonia sternbergiana		x	x	x									x				x		x					x																				
	Kennedia prostrata			x											x																														
	* *Lotus angustissimus*														x																														
	* *Lotus subbiflorus*																																			x	x								
	* *Lupinus cosentinii*																																												x
	* *Ornithopus pinnatus*																															x												x	
	Pultenaea reticulata																																x												
	Acacia huegelii		x	x																																									
Geraniaceae																																													
	* *Erodium botrys*													x	x				x													x													
	Erodium cygnorum																					x																						
	* *Pelargonium capitatum*				x										x				x							x																x	x		

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
Goodeniaceae																																													
	Dampiera alata												x																																
	Dampiera linearis	x		x	x			x														x		x																				
	Lechenaultia biloba									x															x																				
	Lechenaultia floribunda			x		x																																						
	Scaevola calliptera						x	x				x	x																																
	Scaevola canescens						x	x																																				
Haemodoraceae																																													
	Anigozanthos humilis	x					x	x				x										x			x																			
	Anigozanthos manglesii																							x																				
	Conostylis aculeata		x	x		x														x	x																							
	Conostylis aurea											x																																	
	Conostylis candicans											x																																	
	Conostylis juncea					x			x			x											x						x						x										
	Conostylis serrulata						x	x		x	x	x																																	
	Conostylis setigera						x	x				x												x								x			x		x							
	Haemodorum laxum								x			x																																	
	Haemodorum paniculatum					x	x	x																																				
	Haemodorum spicatum				x		x	x																																				
	Phlebocarya ciliata		x	x		x	x	x			x									x													x		x	x		x						
	Phlebocarya filifolia																													x														
Haloragaceae																																													
	Gonocarpus pithyoides																							x	x							x												
Hemerocallidaceae																							x																					
	Arnocrinum preissii									x			x																																
	Caesia micrantha																											x			x	x	x	x										
	Chamaescilla corymbosa							x																																				
	Corynotheca micrantha										x																																	
	Dianella revoluta		x		x																																							
	Tricoryne elatior						x	x			x																																	
Iridaceae																																													
	* *Gladiolus caryophyllaceus*	x	x	x		x		x	x	x	x	x								x	x	x	x	x	x				x	x			x	x				x	x			x			
	Patersonia juncea											x																																	
	Patersonia occidentalis	x	x	x	x	x	x		x	x	x	x		x	x					x	x	x	x	x	x		x	x				x			x		x		x	x				
	* *Romulea flava*														x																														
	* *Romulea rosea*													x	x						x									x															
Lamiaceae																																													
	Calytrix flavescens											x									x																								
	Hemiandra glabra	x							x	x		x										x	x	x																					
Lauraceae																																													
	Cassytha filiformis																																													
	Cassytha glabella		x																			x	x																						
Leucopogon																																													
	Leucopogon squarrosus subsp. *squarrosus*					x																																							
Loganiaceae																																													
	Phyllangium paradoxum						x	x			x												x	x																					
Loranthaceae																																													
	Nuytsia floribunda										x			x	x	x						x																							
Macarthuriaceae																																													
	Macarthuria australis												x																																
Montiaceae																																													
	Calandrinia corrigioloides																								x																				

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
Myrtaceae																																													
	Astartea scoparia												x																			x							x	x	x				
	Beaufortia elegans	x	x	x		x			x	x	x								x				x	x																					
	Calothamnus sanguineus		x																		x																							
	Calytrix flavescens						x													x																								
	Calytrix sp.							x																																					
	Chamelaucium uncinatum																																												x
	Corymbia calophylla											x		x	x	x	x	x																										
	Eucalyptus marginata																			x	x										x				x									
	Eucalyptus rudis																																												x
	Eucalyptus todtiana			x		x						x	x					x	x					x	x																			
	Hypocalymma angustifolium																										x					x	x		x		x	x	x	x	x			
	Hypocalymma robustum	x	x		x	x			x	x	x									x	x	x		x	x						x	x			x				x	x	x		x		
	Kunzea glabrescens																															x					x				x				
	Kunzea micrantha																											x	x			x		x	x										
	Kunzea praestans											x																																	
	Kunzea glabrescens						x	x																																					
	Leptospermum erubescens						x																																						
*	*Leptospermum laevigatum*																		x																	x								
	Melaleuca lateritia																													x														
	Melaleuca preissiana															x														x	x	x	x	x	x	x	x	x	x	x	x		x		
	Melaleuca rhaphiophylla																																			x									
	Melaleuca seriata								x	x												x		x	x						x		x	x									
	Melaleuca sp.						x																																						
	Melaleuca systena																			x																									
	Melaleuca teretifolia																																												x
	Melaleuca trichophylla							x	x	x															x																			
	Pericalymma ellipticum																														x	x									x				
	Regelia ciliata																															x	x	x	x									
	Regelia inops								x																															x	x	x			
	Scholtzia involucrata	x		x		x	x		x	x	x		x									x	x	x	x																			
	Verticordia densiflora												x																																
	Verticordia nitens																						x																					
Orchidaceae																																													
	Caladenia arenicola								x																																				
	Caladenia flava					x			x	x			x		x					x		x	x					x	x	x		x	x		x	x					x				
	Caladenia marginata																															x												
	Diuris magnifica											x																																	
	Elythranthera brunonis																											x		x															
	Eriochilus dilatatus								x																			x																
	Eriochilus sp.																																												
	Microtis media																														x														
	Paracaleana nigrita																														x														
	Pterostylis brevisepala																																												x
	Pterostylis pyramidalis								x																					x														
	Pterostylis recurva																																												x
	Pterostylis sanguinea									x		x																						x		x								
	Pterostylis sp.																															x												
	Pterostylis pyramidalis																												x															
	Pyrorchis nigricans																			x			x																					
Orobanchaceae																																													
*	*Orobanche minor*																																x												

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
	* *Parentucellia latifolia*																													x															
Papaveraceae																																														
	Fumaria capreolata																															x														
Pinaceae																																														
	Pinus pinaster																									x	x			x											x		x		x		
Poaceae																																														
	* *Aira caryophyllea*		x																	x	x																						x			
	* *Aira praecox*																												x			x													
	Aira cupaniana						x																																							
	Aristida contorta																															x														
	Austrostipa compressa		x	x		x	x	x																	x																				
	Austrostipa flavescens																						x	x									x												
	* *Avena barbata*																																											x			
	* *Briza maxima*	x	x	x	x	x					x	x								x	x	x	x		x			x	x	x			x	x		x				x	x	x				
	* *Briza minor*																																			x										
	* *Bromus diandrus*			x																																										
	* *Cenchrus ciliaris*													x					x												x															
	* *Ehrharta calycina*	x	x	x	x							x								x	x	x																			x		x				
	* *Eragrostis curvula*																																													x
	Neurachne alopecuroidea												x																																	
	* *Pentameris airoides*																											x	x			x	x	x		x	x									
	Poaceae sp. 1	x							x													x																			x					
	Poaceae sp. 2											x																													x					
	Tetrarrhena laevis											x																																		
	* *Vulpia muralis*						x																					x	x			x														
Polygalaceae																																														
	?Comesperma sp.																																							x						
	Comesperma calymega						x	x	x																																					
Primulaceae																																														
	* *Lysimachia arvensis*													x					x																											
Proteaceae																																														
	Adenanthos cygnorum	x		x	x					x		x							x	x		x	x	x	x	x	x					x								x		x		x		
	Adenanthos obovatus										x														x		x					x		x	x		x								
	Banksia attenuata	x	x	x	x	x	x	x	x	x	x								x		x	x	x	x	x			x				x		x						x					
	Banksia grandis																x																													
	Banksia ilicifolia																								x							x		x											
	Banksia littoralis																																			x										
	Banksia menziesii		x	x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x																	x				
	Petrophile linearis	x	x	x	x	x	x	x	x	x	x	x								x	x	x	x	x	x									x										
	Petrophile macrostachya							x																																						
	Stirlingia latifolia		x				x	x					x		x				x		x	x	x	x																						
Restionaceae																																														
	Alexgeorgea nitens	x	x	x	x	x	x	x												x	x	x	x	x																						
	Desmocladus flexuosus	x	x	x	x	x		x				x								x				x																	x					
	Dielsia stenostachya																																							x						
	Hypolaena exsulca																			x																							x			
	Chaetanthus aristatus											x												x								x								x					
Rubiaceae																																														
	Opercularia hispidula																							x										x											
	Opercularia vaginata											x																																		
Rutaceae																																														
	Boronia purdieana subsp. *purdieana*			x																				x																						

Appendix C Flora by Family by Site by Community Matrix

Family	Taxon	BaBeAn					BaCpSr		BaXpPo			CcSxDf		CcXpHg		CcXpHg			EmHhMp			EtHsLb						KmHg		MlCa	MpHaDb								MpKgDs				MpXpCe		Opp
		13	30	32	33	34	27	28	10	14	22	5	6	1	4	obs1	obs2	obs3	3	29	31	12	21	23	26	obs5	obs6	18	20	8	2	15	16	17	19	24	25	obs4	7	9	11	obs7	35	obs8	Opp
	Cyanothamnus ramosus subsp. *anethifolius*																					x	x																							
	Philotheca spicata	x					x	x	x		x	x										x	x											x					x						
Solanaceae																																														
	* *Solanum nigrum*																																													x
Stylidiaceae																																													
	Levenhookia pusilla						x	x		x																						x	x							x				
	Levenhookia stipitata																						x																						
	Stylidium ?piliferum										x																																		
	Stylidium affine										x																																		
	Stylidium androsaceum	x								x												x																			x				
	Stylidium brunonianum	x								x	x											x		x	x					x		x			x						x				
	Stylidium calcaratum																											x					x	x										
	Stylidium calcaratum/androsaceum																																												
	Stylidium carnosum							x																																					
	Stylidium diuroides subsp. *diuroides*																							x																						
	Stylidium junceum																							x																						
	Stylidium piliferum						x	x																																					
	Stylidium repens	x		x		x	x		x	x	x									x		x		x								x								x	x				
	Stylidium rigidulum	x																				x																							
	Stylidium scariosum																						x	x																						
Thymeleaceae																																														
	Pimelea sp.							x																																						
Violaceae																																														
	Hybanthus calycinus											x	x																																	
Xanthorrhoeaceae																																													
	Xanthorrhoea gracilis										x																											x				x				
	Xanthorrhoea preissii						x	x	x	x	x	x	x	x	x	x	x	x		x	x	x		x	x		x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Zamiaceae																																														
	Macrozamia riedlei	x			x	x	x													x															x								x		

Appendix D

Floristic Community Type Analysis Results

Appendix D Floristic Community Type Analysis Results

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
BaBeAn	13	Landform	Bassendean	64%	23b	ELE17	FCT 23b • Correct landform – Bassendean Sands • Correct soils – grey sand, mid slope • Species richness comparable (53 spp.) • Key species – 4 of 5 shrubs and 7 of 9 key herbs present
		Richness	47	59%	23b	MELA-6	
		Condition	Excellent	58%	23b	ELE24	
	30	Landform	Spearwood	51%	24	THOM-2	Meets characteristics of both FCT 24 and FCT 23a FCT 24 • Correct landform – Spearwood • Species richness comparable (41.8 spp.) • Only a few key species present. • Does not occur as heath or heath with *E. gomphocephala* FCT 23a • Incorrect landform – Bassendean • Species richness not comparable (62 spp.) • Key species – 3 of 6 shrubs and 3 of 5 herbs present
		Richness	44	49%	23a	Tele01	
		Condition	Very good	49%	23a	WIRR-2	
	32	Landform	Bassendean	51%	21c	FL-6	FCT 23a • Correct landform – Bassendean Sands • Species richness comparable (62 spp.) accounting for condition decline • Key species – 3 of 6 shrubs and 5 of 5 herbs present • Influence from low-lying site north (represented by Pinj14, FCT 22 in Keighery (2012) 21c discounted, does not include typical species, hydrology not accurate, does not occur on low-lying site.
		Richness	47	50%	21c	FL-5	
		Condition	Very good	50%	23a	Jand02	
	34	Landform	Border of Spearwood and Bassendean	53%	23b	ELE17	FCT 23a Shares traits of FCT 23a and FCT 23b • Correct landform – Bassendean Sands (border)
		Richness	41	52%	23a	Pinj14	

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
		Condition	Excellent	49%	21a	Cavs10	• Species richness more comparable to 23b (53 spp.) • Key species – 5 of 6 shrubs and 4 of 5 herbs from FCT 23a, slightly more than key species from FCT 23b 21a was excluded due to the absence of *E. marginata*.
BaCpSr	27	Landform	Bassendean	47%	23a	Light01	FCT 23b • Correct landform – Bassendean Sands • Correct soils – grey sand, mid slope • Species richness comparable (53 spp.) • Key species – 4 of 5 shrubs and 8 of 9 key herbs present
		Richness	62	47%	23b	MPK01	
		Condition	Excellent, recently burnt	46%	23b	SINT-1	
	28	Landform	Bassendean	46%	23b	SINT-1	FCT 23b • Correct landform – Bassendean Sands • Correct soils – grey sand, mid slope • Species richness comparable (53 spp.) • Key species – 3 of 5 shrubs and 6 of 9 key herbs present
		Richness	58	41%	23b	MELA-9	
		Condition	Excellent, recently burnt	41%	23b	RAAF-2	
BaXpPo	10	Landform	Bassendean	64%	23b	ELE17	FCT 23b or a variation thereof • Correct landform – Bassendean Sands • Correct soils – grey sand, lower slope • Species richness somewhat comparable (53 spp.) • Some influence from low-lying area with presence of *Regelia inops* • Key species – 4 of 5 shrubs and 4 of 9 key herbs present • Sites nearby (MELA-7, MELA-8, MP06) represent 23b
		Richness	43	54%	21c	ELE25	
		Condition	Excellent	53%	23b	ELE28	
				53%	23b	zBEER 04	
	14	Landform	Bassendean	50%	23b	ELE17	FCT 21c • Correct landform – Bassendean Sands • Correct soils – grey sand, lower slope • Species richness comparable (40 spp.) • Key species – 9 of 13 shrub and herbs present including 5 not found in 23b. Represents a combination of 21c and 23b on lower slope not quite representative of “low-lying” but not typical of 23b. More key species of 21c are present.
		Richness	42	48%	23b	ELE28	
		Condition	Excellent	46%	21c	ELE25	

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
	22	Landform	Bassendean	52%	23b	ELE28	FCT 21c • Correct landform – Bassendean Sands • Correct soils – grey sand, lower slope • Species richness comparable (40 spp.) • Key species – 7 of 13 shrub and herbs present including 4 not found in 23b. Represents a combination of 21c and 23b on lower slope not quite representative of "low-lying" but not typical of 23b. More key species of 21c are present. Site 22 includes other low-lying species like *Isolepis marginata*.
		Richness	40	51%	21c	ELE25	
		Condition	Excellent	49%	23a	Hurst04	
CcSxDf	5	Landform	Border of Pinjarra and Bassendean	40%	23a	Perth06	Inconclusive FCT 23a and 23b excluded due to dominance of *C. calophylla* and absence of *Banksia* species. Pinjarra Plains poorly represented in Keighery (2012) dataset. Isolation of this vegetation patch likely to influence the analysis.
		Richness	48	42%	23a	Light01	
		Condition	Very good, rubbish, weeds, isolated patch of vegetation in urban area	40%	23b	50	
EmHhMp	29	Landform	Spearwood	52%	21a	Cavs10	FCT21a • Correct landform –Spearwood • Correct soils – grey sand, mid-slope • Species richness comparable (52 spp.) • Key species – includes *E. marginata* as per description, 4 of 4 shrubs and 3 of 5 herbs present.
		Richness	48	52%	21a	HARRY-5	
		Condition	Very good	49%	21a	Cavs11	
EtHsLb	12	Landform	Bassendean	56%	23b	ELE03	FCT 23b • Correct landform – Bassendean Sands • Correct soils – grey sand, mid to upper slope • Species richness comparable (53 spp.) Key species – 4 of 5 shrubs and 8 of 9 key herbs present
		Richness	59	55%	23b	ELE28	
		Condition	Excellent	54%	23b	MELA-6	
	21	Landform	Bassendean	56%	23b	ELE08	FCT 23b • Correct landform – Bassendean Sands
		Richness	48	56%	23b	MP01	

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
		Condition	Very good	54%	23b	ELE28	• Correct soils – grey sand, mid to upper slope • Species richness comparable (53 spp.) • Key species – 4 of 5 shrubs and 4 of 9 key herbs present Diversity influenced by disturbance, could be Dieback.
	23	Landform	Bassendean	55%	23b	SF01	FCT 23b • Correct landform – Bassendean Sands • Correct soils – grey sand, lower slope • Species richness comparable (53 spp.) • Key species – few present, 3 of 5 shrubs and 5 of 9 key herbs present Site situated on lower slope with influences of 21c.
		Richness	51	52%	23b	ELE28	
		Condition	Excellent	52%	23b	MELA-6	
	26	Landform	Bassendean	49%	23b	ELE03	FCT 22/23b hybrid • Landform low lying better suited to 22 • Soils – better suited to 22, low-lying brown sand • Species richness comparable for both (52 spp. for 22 and 53 spp. for 23b) • Key species – includes key species from both, specifically the presence of *B. ilicifolia, Hypocalymma* spp. and *Adenanthos* indicate 22 but these could reflect regeneration post-disturbance. *Eremaea pauciflora* and *Anigozanthos humilis* are more representative of 23b.
		Richness	39	48%	23b	ELE08	
		Condition	Good	46%	23a	Perth06	
KmHg	18	Landform	Bassendean	36%	21c	ELE25	Inconclusive • Landform and position in landscape indicative of 21c or 4 (i.e. seasonal wetlands or low-lying woodlands) • Species richness not comparable to any FCT • Species composition not indicative of any FCT but led to exclusion of FCT 4 with no *M. preissiana* present. No strong correlation to key species of other low-lying FCTs.
		Richness	27	35%	4	ELE32	
		Condition	Excellent	35%	21a	NINE-2	
	20	Landform	Bassendean	26%	21c	FL-6	Inconclusive • Landform and position in landscape indicative of 21c or 5 (i.e. seasonal wetlands on Bassendean Sands) • Species richness not comparable to any FCT, site represents *Kunzea micrantha* thicket.
		Richness	15	25%	28	NEER-6	
		Condition	Very good	24%	5	AUSTB-6	

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
				24%	21a	Cavs02	FCT 21a and 28 excluded due to incorrect landform and absence of key species.
MICa	8	Landform	Bassendean	30%	4	Perth10	FCT 4 • Correct hydrology – damplands • Correct landform – Bassendean Sands • Species richness not comparable (36.9 spp.) however degradation should be taken into account Likely to reflect *M. preissiana* damplands if overstorey had not been historically cleared
		Richness	20	30%	S17	White08	
		Condition	Good	29%	4	WHITE-2	
MpHaDb	15	Landform	Bassendean	48%	22	MELA-5	FCT 22 /4 hybrid • Correct landform – Bassendean Sands, low-lying • Species richness comparable (32.5 spp.) • Key species - Nested between wetland basin and Banksia woodlands.
		Richness	51	44%	23a	BANK-3	
		Condition	Excellent	41%	21a	ELE11	
	19	Landform	Bassendean	42%	4	ELE07	FCT 21c • Correct landform – low-lying, swale between dunes on Bassendean Sands • Species richness comparable (40.5 spp.) • Key species – includes *M. preissiana* and *E. marginata* as per description and 9 of 13 key species present.
		Richness	35	41%	21a	Cas02	
		Condition	Excellent	41%	21c	ELE25	
	25	Landform	Bassendean	50%	4	ELE07	FCT 4 • Correct landform – seasonal wetland on Bassendean Sands • Species richness not comparable (36.9 spp.) noting that the site represents regeneration post-disturbance • Presence of indicator species, *M. preissiana* dominates overstorey (15% cover)
		Richness	18	45%	4	Cas04	
		Condition	Good	42%	4	ELE33	
MpKgDs	9	Landform	Bassendean	39%	4	Low14a	FCT 4 • Correct landform – seasonal wetland on Bassendean Sands • Species richness somewhat comparable (36.9 spp.) noting that this wetland is an isolated occurrence within pine plantation • Presence of indicator species *M. preissiana* dominates overstorey (30% cover)
		Richness	26	38%	4	ELE07	
		Condition	Very good	37%	4	Cas04	

Comm	Quadrat	Sp. Richness	Condition	Similarity	FCT	Site	Outcome
	11	Landform	Bassendean	39%	21a	Low04	FCT 21c • Correct landform – low-lying, swale between dunes on Bassendean Sands • Species richness comparable (40.5 spp.) • Key species – includes *M. preissiana* on wetter sites as per description and 7 of 13 key species present
		Richness	39	39%	21c	Low06b	
		Condition	Excellent	39%	21c	Low07	

Appendix E

Flora Site Data

Appendix E Site Data

Site No: 1R	**Date**: 05/09/2022	**Longitude:** 115.917448	**Latitude** -31.807291
Type: Releve		**Soil Types:** Grey sand - moist	
Topography: Flat		**Surface Water: -**	
Vegetation Type: -		**Vegetation Condition:** Degraded	
Fire: 10+		**Condition Notes:** clearing? grazing, understorey absent, weeds	



Weed (Presence denoted by *)	**Cons. Status**	**Taxon**	**height (cm)**	**% cover**	**Comment**
		Acacia saligna	200	1	
*		*Arctotheca calendula*	5	0.1	
*		*Carpobrotus edulis*	10	4	
*		*Cenchrus ciliaris*	2	5	
		Corymbia calophylla	1000	10	
		Crassula colorata var. *colorata*	5	0.5	FdW220905-4
*		*Erodium botrys*	5	2	FdW220905-2
*		*Hypochaeris glabra*	1	5	

Weed (Presence denoted by *)	Cons. Status	Taxon	height (cm)	% cover	Comment
		Isolepis marginata			FdW220905-3
		Jacksonia sternbergiana	100	1	
*		*Lysimachia arvensis*	5	0.5	
		Nuytsia floribunda	400	5	
		Patersonia occidentalis	30	0.5	
		Podotheca gnaphalioides	10	4	FdW220905-1
*		*Romulea rosea*	5	0.1	
*		*Sonchus oleraceus*	5	0.1	
*		*Trachyandra divaricata*	20	0.5	
		Trachymene pilosa	10	1	FdW220905-5
*		*Ursinia anthemoides*	20	1	
		Xanthorrhoea preissii	150	15	

Site No:2R	**Date**: 05/09/2022	**Longitude:** 115.917610	**Latitude** -31.804688

Type:
Releve

Soil Types:
Grey sand - moist

Topography:
Wetland flat

Surface Water:
bare 75%

Vegetation Type: -

Vegetation Condition:
Degraded

Fire: 10+

Condition Notes:
clearing



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Cenchrus ciliaris*	2	0.5	
*		*Erodium botrys*	1	0.5	
		Eucalyptus marginata	1200	1	
		Hypocalymma robustum	30	0.5	
*		*Hypochaeris glabra*	1	4	
		Melaleuca preissiana	500	60	
*		*Ornithopus pinnatus*	5	0.1	FdW220905-6

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Podotheca gnaphalioides	5	1	
*		*Sonchus oleraceus*	15	0.1	
*		*Trachyandra divaricata*	10	0.5	
		Trachymene pilosa	5	8	
*		*Ursinia anthemoides*	10	1	
		Xanthorrhoea preissii	100	2	

Site No:3R	**Date**: 05/09/2022	**Longitude:** 115.917946	**Latitude** -31.808021

Type:
Releve

Soil Types:
Yellow sand - moist

Topography:
Flat

Surface Water:

Vegetation Type:

Vegetation Condition:
Degraded

Fire: 10+

Condition Notes:
narrow roadside, rubbish





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	200	30	
		Banksia attenuata	400	30	
		Banksia menziesii	400	4	
		Beaufortia elegans	120	1	
*		*Cenchrus ciliaris*	3	0.5	
*		*Erodium botrys*	1	0.5	
		Eucalyptus todtiana	300	4	
*		*Hypochaeris glabra*	1	0.5	
*		*Leptospermum laevigatum*	200	1	
*		*Lysimachia arvensis*	3	0.5	
*		*Pelargonium capitatum*	10	0.1	
		Stirlingia latifolia	50	1	
*		*Trachyandra divaricata*	20	0.5	
		Trachymene pilosa	5	0.5	

Site No:4R	**Date**: 05/09/2022	**Longitude:** 115.9178533	**Latitude** -31.816833

Type:
Releve

Soil Types:
Grey sand - moist

Topography:
Flat

Surface Water:
0% bare

Vegetation Type:

Vegetation Condition:
Degraded

Fire: 10+

Condition Notes:
cleared, no understorey



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		?Asteraceae sp. *2*	2	0.5	FdW220905-7 Not enough material for confident ID
*		*?Erigeron bonariensis*	3	0.5	FdW220905-8 Not enough material for confident ID
*		*Arctotheca calendula*	5	0.1	
		Caladenia flava	10	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Corymbia calophylla	1400	30	
*		*Erodium botrys*	1	0.5	
*		*Hypochaeris glabra*	1	5	
*		*Hypochaeris radicata*	1	0.5	
		Isolepis marginata	2	0.1	
		Kennedia prostrata	2	1	
*		*Lotus angustissimus*	2	0.1	
		Nuytsia floribunda	500	2	
		Patersonia occidentalis	20	1	
*		*Pelargonium capitatum*	10	0.1	
		Podotheca gnaphalioides	10	1	
*		*Romulea flava*	20	0.5	
*		*Romulea rosea*	5	0.1	
*		*Sonchus oleraceus*	5	0.1	
		Stirlingia latifolia	50	1	
		Trachymene pilosa	3	2	
*		*Ursinia anthemoides*	15	8	
		Xanthorrhoea preissii	100	10	

Site No:5Q	**Date**: 03/09/2022	**Longitude:** 115.907350	**Latitude** -31.855051

Type:
Quadrat

Soil Types:
Dark grey sand - moist

Topography:
Flat

Surface Water:
0% bare

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:
rubbish, low weeds





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia stenoptera	20	0.2	FdW220908-16A
		Acacia applanata	20	0.2	FdW220908-16B
		Adenanthos cygnorum	50	0.5	
		Anigozanthos humilis	10	0.1	juvenile, flowering outside quadrat
		Bossiaea eriocarpa	20	0.5	
*		*Briza maxima*	30	0.1	
		Burchardia congesta	20	0.1	Sterile
		Calytrix flavescens			FdW220908-22
		Conostephium pendulum	20	0.5	FdW220908-18
		Conostylis aurea	20	3	
		Conostylis candicans	20	0.1	sterile, old flowering species nearby
		Conostylis juncea	10	0.1	FdW220908-19
		Conostylis serrulata	15	0.1	
		Conostylis setigera	10	0.1	
		Corymbia calophylla	700	25	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Dasypogon bromeliifolius	20	3	
		Desmocladus flexuosus	15	30	FdW220908-21
		Diuris magnifica			
*		*Ehrharta calycina*	80	0.1	
		Eremaea pauciflora	50	1	
		Eucalyptus todtiana	700	8	
		Gastrolobium capitatum	20	1	FdW220908-15
*		*Gladiolus caryophyllaceus*	30	0.1	
		Gompholobium tomentosum	20	0.2	
		Haemodorum laxum	50	0.1	FdW220908-12 many basal leaves
		Haemodorum laxum	80	0.1	
		Hemiandra glabra	30	1	FdW220908-23 linear, sheaths short
		Hibbertia hypericoides	30	1	
		Hybanthus calycinus	20	2	FdW220908-20
		Hypolaena exsulca	20	0.1	
		Jacksonia floribunda	80	1	
		Jacksonia furcellata	100	0.5	
		Kunzea praestans	100	1	FdW220908-17 calyrix purple flwrs large shrub
		Laxmannia squarrosa	10	0.5	FdW220908-10
		Lepidosperma leptostachyum	80	0.1	
		Lomandra caespitosa	10	1	FdW220908-13 flwrs basal
		Lomandra preissii	30	0.5	
		Mesomelaena pseudostygia	30	5	
		Netrostylis capillaris	20	2	
		Opercularia vaginata	15	0.1	
		Patersonia juncea	10	0.1	juvenile
		Patersonia occidentalis	30	1	
		Petrophile linearis	20	0.2	
		Philotheca spicata	100	0.5	
		Pterostylis sanguinea	10	0.1	
		Scaevola calliptera	5	0.1	
		Styphelia conostephioides	80	0.5	FdW220908-14
		Styphelia xerophylla	50	7	FdW220908-11
		Tetrarrhena laevis	10	0.1	Juvenile, sterile
		Xanthorrhoea preissii	100	7	

Site No:6R	**Date**: 08/09/2022	**Longitude:** 115.906892	**Latitude** -31.854924

Type:
Releve

Soil Types:
Yellow sand- moist

Topography:
Sloped

Surface Water:
bare 25%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
rubbish



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia applanata			
		Acacia stenoptera			
		Acacia pulchella			
		Astartea scoparia			
		Caesia micrantha			FdW220908-26
		Caladenia flava			
		Dampiera alata			
		Daviesia divaricata subsp. *divaricata*			FdW220908-25

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Eucalyptus todtiana			
		Gastrolobium capitatum			
		Gompholobium tomentosum			
		Hibbertia hypericoides			
		Hybanthus calycinus			
*		*Hypochaeris glabra*			
		Isotropis cuneifolia subsp. *cuneifolia*			the lobed leaf small pea
		Jacksonia floribunda			
		Jacksonia furcellata			
		Lomandra preissii			
		Lomandra sonderi			
		Lyginia barbata			
		Lysinema elegans			
		Macarthuria australis			FdW220908-24
		Neurachne alopecuroidea			
		Scaevola calliptera			
		Scholtzia involucrata			
		Stirlingia latifolia			
		Styphelia conostephioides			
		Styphelia xerophylla			
*		*Ursinia anthemoides*			
		Verticordia densiflora			
		Xanthorrhoea preissii			

Site No:7R	**Date**: 08/09/2022	**Longitude:** 115.909746	**Latitude** -31.752996

Type:
Releve

Soil Types:
Grey brown sand - moist

Topography:
Flat, low lying

Surface Water:
bare 5%

Vegetation Type: -

Vegetation Condition: Good

Fire: 5-10

Condition Notes:
clearing, rubbish, weeds





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Astartea scoparia	200	10	FdW220908-28
*		*Briza maxima*	20	0.5	
*		*Carpobrotus edulis*	5	10	
		Daviesia physodes	50	3	FdW220908-29
*		*Ehrharta calycina*	20	2	
		Eremaea pauciflora	30	0.5	sterile, unhealthy
*		*Gladiolus caryophyllaceus*	50	0.1	
		Hypocalymma angustifolium	100	2	
*		*Hypochaeris glabra*	2	25	
*		*Hypochaeris radicata*	2	1	
		Lyginia barbata	30	5	
		Melaleuca preissiana	500	6	
*		*Monoculus monstrosus*	20	0.1	FdW220908-27
		Podotheca gnaphalioides	10	0.5	
		Styphelia xerophylla	50	1	
*		*Ursinia anthemoides*	15	5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Astartea scoparia	200	10	FdW220908-28
*		*Briza maxima*	20	0.5	
*		*Carpobrotus edulis*	5	10	
		Daviesia physodes	50	3	FdW220908-29
*		*Ehrharta calycina*	20	2	
		Eremaea pauciflora	30	0.5	sterile, unhealthy
*		*Gladiolus caryophyllaceus*	50	0.1	
		Hypocalymma angustifolium	100	2	
*		*Hypochaeris glabra*	2	25	
*		*Hypochaeris radicata*	2	1	
		Lyginia barbata	30	5	
		Melaleuca preissiana	500	6	
*		*Monoculus monstrosus*	20	0.1	FdW220908-27
		Podotheca gnaphalioides	10	0.5	
		Styphelia xerophylla	50	1	
*		*Ursinia anthemoides*	15	5	

Site No:8Q	Date: 08/09/2022	Longitude: 115.909623	Latitude -31.727370

Type:
Quadrat

Soil Types:
Dark sand w some brown - moist

Topography:
Wetland

Surface Water:
0% bare

Vegetation Type: -

Vegetation Condition:
Good

Fire: 5-10

Condition Notes:
perhaps cleared? hard to tell



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	50	4	
*		*Briza maxima*	10	15	
		Caladenia flava	5	2	
		Centrolepis aristata	3	8	FdW220908-31
		Drosera glanduligera	2	5	FdW220908-32
		Elythranthera brunonis	15	0.01	
*		*Gladiolus caryophyllaceus*	20	0.5	
*		*Hypochaeris glabra*	2	20	
		Lepidosperma longitudinale	50	5	FdW220908-33
		Melaleuca lateritia	80	25	FdW220908-30
		Melaleuca preissiana	500		outside quadrat
*		*Parentucellia latifolia*	5	10	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Phlebocarya filifolia	5	0.1	FdW220908-35
*		*Pinus pinaster*	20	0.1	juvenile
		Podotheca gnaphalioides	10	5	
		Pterostylis pyramidalis	5	0.1	photos 8 sep 12:48
*		*Romulea rosea*	10	1	
		Stylidium brunonianum	3	0.1	Juvenile, sterile
		Trachymene pilosa	1	0.1	
*		*Ursinia anthemoides*	20	5	

Site No:9Q	**Date**: 05/09/2022	**Longitude:** 115.900334	**Latitude** -31.706899

Type:
Quadrat

Soil Types:
Black sand w loam- moist

Topography:
Wetland

Surface Water:
bare 20%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
tracks, rubbish



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	300	10	
* DP		*Asparagus asparagoides*	3	0.1	pest
		Astartea scoparia	200	6	
*		*Briza maxima*	15	0.1	
		Cassytha racemosa	0	0.1	not hairy
		Dasypogon bromeliifolius	10	0.1	
		Dielsia stenostachya	30	60	FdW220908-37
		Eriochilus dilatatus	5	0.1	photos 1355
		Euchilopsis linearis	50	0.5	FdW220908-36
*		*Gladiolus caryophyllaceus*	20	0.1	
		Hypocalymma angustifolium	100	4	
*		*Hypochaeris glabra*	1	2	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Hypolaena exsulca	20	1	
		Melaleuca preissiana	500	30	
		Patersonia occidentalis	30	4	
		Philotheca spicata	50	0.5	
		Phyllangium sp.	1	0.1	FdW220908-40
*		*Pinus pinaster*	20	.	juvenile
		Poaceae sp. *2*	2	0.5	FdW220908-38
		Regelia inops	200	10	
		Stylidium repens	2	0.1	
		Styphelia xerophylla	80	4	
		Trachymene pilosa	2	0.5	
*		*Ursinia anthemoides*	10	1	
		Xanthorrhoea preissii	100	8	
		Xanthosia huegelii	15	0.1	FdW220908-39

Site No:10Q	**Date**: 03/09/2022	**Longitude:** 115.894276	**Latitude** -31.698617

Type:
Quadrat

Soil Types:
Brown to grey sand - moist

Topography:
Flat undulating gentle

Surface Water:
bare 25%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	30	0.1	
		Banksia attenuata	400	12	
		Banksia menziesii	400	5	
		Beaufortia elegans	50	2	
		Bossiaea eriocarpa	10	0.1	FdW220908-44
		Bossiaea eriocarpa	30	0.5	
		Caladenia arenicola	50	0.1	ph 1450
		Caladenia flava	5	0.5	sterile, flowers nearby
		Comesperma calymega	20	0.1	sterile, young ?annual
		Conostephium pendulum	30	1	
		Conostylis juncea	5	0.1	
		Crassula colorata var. *colorata*	2	0.1	
		Dasypogon bromeliifolius	30	5	
		Drosera erythrorhiza	1	4	
		Drosera macrantha	15	0.1	
		Eremaea pauciflora	100	4	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Eriochilus dilatatus	3	0.1	
*		*Gladiolus caryophyllaceus*	20	0.1	
		Gompholobium tomentosum	80	0.2	
		Haemodorum laxum			old dead sterile
		Hemiandra glabra	20	0.1	Sterile
		Hibbertia subvaginata	20	2	
		Hypocalymma robustum	30	0.5	
*		*Hypochaeris glabra*	1	0.5	
		Jacksonia floribunda	100	1	
		Lomandra hermaphrodita	20	0.1	
		Lyginia barbata	30	4	
		Melaleuca seriata	50	8	FdW220908-43
		Melaleuca trichophylla	30	0.5	
		Patersonia occidentalis	30	6	
		Petrophile linearis	20	0.2	
		Philotheca spicata	50	0.5	
		Poaceae sp. *1*	5	0.1	FdW220908-41
		Podotheca chrysantha	5	0.1	FdW220908-42
		Pterostylis pyramidalis	5	0.1	
		Regelia inops	150	2	
		Scholtzia involucrata	20	2	
		Stylidium repens	5	0.1	
		Styphelia conostephioides	20	2	
		Styphelia pallida	20	1	
		Trachymene pilosa	2	1	
*		*Ursinia anthemoides*	20	1	
		Waitzia acuminata	3	0.1	pink and white
		Xanthorrhoea preissii	100	15	

Site No:11Q	**Date**: 05/09/2022	**Longitude:** 115.891367	**Latitude** -31.694150

Type:
Quadrat

Soil Types:
Black heavy soil sand clay - moist

Topography:
Wetland

Surface Water:
Moss, crust

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		?Comesperma sp.	10	0.1	FdW220908-46 Not enough material for confident ID
		Astartea scoparia	150	1	
		Banksia attenuata	300	1	
		Banksia menziesii	200	1	
*		*Briza maxima*	10	0.1	
		Burchardia congesta	20	0.1	Sterile
		Caladenia flava	5	0.2	flowering nearby
		Cassytha glabella	0	0.5	Sterile
		Chamaescilla corymbosa	5	0.1	Sterile
		Crassula colorata var. *colorata*	1	0.1	
		Desmocladus flexuosus	15	4	
		Drosera macrantha	0	0.1	
		Eriochilus sp.	3	0.1	Sterile

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Euchilopsis linearis	20	1	
		Gompholobium tomentosum	20	0.1	
		Hibbertia subvaginata	20	1	
		Hypocalymma angustifolium	60	25	
*		*Hypochaeris glabra*	1	1	
		Kunzea glabrescens	300	18	FdW220908-47
		Lepidosperma leptostachyum	30	0.1	Sterile
		Lepidosperma sp.	20	0.1	Sterile
		Levenhookia pusilla	1	1	FdW220908-45
		Lomandra preissii	30	0.1	Sterile
		Melaleuca preissiana	600	15	
		Patersonia occidentalis	30	4	check rudis, blue
		Pericalymma ellipticum	40	0.5	
		***Phyllangium* sp.**	2	0.5	
		Poaceae sp. *1*	20	0.1	
		Poaceae sp. *1*	5	0.1	
		Pterostylis sanguinea	10	0.1	
		Pultenaea reticulata	150	5	FdW220908-49
		Regelia inops	150	6	
		Stylidium androsaceum	3	0.1	FdW220908-48
		Stylidium brunonianum	20	0.1	FdW220908-50
		Stylidium repens	1	0.1	
		Thysanotus manglesianus	0	0.1	
		Trachymene pilosa	2	2	
		Waitzia acuminata	5	2	
		Xanthorrhoea gracilis	50	0.5	
		Xanthorrhoea preissii	200	8	

Site No:12Q	**Date**: 05/09/2022	**Longitude:** 115.868820	**Latitude** -31.681824

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Sand dune crest

Surface Water:
bare 4%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	150	8	mostly dead
		Acacia barbinervis subsp. *borealis*	20	1	FdW220909-59
		Adenanthos cygnorum	200	8	
		Alexgeorgea nitens	10	0.1	
		Anigozanthos humilis	10	0.1	
		Banksia attenuata	600	2	
		Banksia menziesii	300	5	
		Bossiaea eriocarpa	20	4	
*		*Briza maxima*	20	0.1	dead old
		Burchardia congesta	20	0.5	FdW220909-53
		Caladenia flava	10	1	
		Caladenia flava	20	0.1	photos 9 s3p 10:12
*		*Carpobrotus edulis*	1	0.1	Juvenile
		Cassytha glabella	0	0.2	FdW220909-58

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Crassula colorata var. colorata	1	0.1	
		Cyanothamnus ramosus subsp. *anethifolius*	50	4	FdW220909-55
		Dampiera linearis	5	0.1	
		Drosera erythrorhiza	1	1	
		Drosera menziesii	0	0.5	
		Drosera micrantha	0	0.5	
*		*Ehrharta calycina*	5	0.1	Juvenile, sterile
		Eremaea pauciflora	50	10	
		Erodium cygnorum	2	0.1	FdW220909-57
*		*Gladiolus caryophyllaceus*	20	0.5	
		Hemiandra glabra	20	4	
		Hibbertia huegelii	30	0.5	
		Hibbertia hypericoides	50	1	
		Hibbertia subvaginata	20	4	
		Hypocalymma robustum	50	0.5	
*		*Hypochaeris glabra*	1	0.2	
		Isolepis marginata	2	0.1	
		Jacksonia floribunda	150	1	
		Jacksonia furcellata	200	1	
		Lepidosperma leptostachyum	20	0.1	
		Leucopogon polymorphus	50	2	FdW220909-54
		Lomandra caespitosa	10	0.1	
		Lomandra hermaphrodita	5	0.1	juvenile
		Lomandra preissii	20	0.1	
		Lomandra sp.	10	0.1	Sterile
		Lyginia barbata	30	1	
		Melaleuca seriata	80	4	
		Nuytsia floribunda	250	4	
		Patersonia occidentalis	30	4	
		Petrophile linearis	20	0.1	
		Philotheca spicata	50	0.5	
		Poaceae sp. *1*	5	0.1	
		Schoenus clandestinus	5	0.1	eaten, sterile
		Scholtzia involucrata	20	4	
		Stirlingia latifolia	50	6	
		Stylidium androsaceum	2	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Stylidium brunonianum	2	0.1	
		Stylidium repens	5	0.1	
		Stylidium rigidulum	5	0.1	FdW220909-56
		Styphelia conostephioides	10	0.1	
		Styphelia xerophylla	30	6	
		Thysanotus manglesianus	0	0.1	
		Trachymene pilosa	2	1	
*		*Ursinia anthemoides*	15	1	
		Waitzia acuminata	2	2	
		Xanthorrhoea preissii	50	1	

Site No:13Q	**Date**: 05/09/2022	**Longitude:** 115.885418	**Latitude** -31.6859719

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Undulating sand dunes

Surface Water:
bare 15%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	100	1	
		Acacia barbinervis subsp. *borealis*	20	0.5	
		Adenanthos cygnorum	200	1	
		Alexgeorgea nitens	10	8	
		Allocasuarina humilis	100	8	
		Andersonia heterophylla	20	0.1	FdW220909-61
		Anigozanthos humilis	10	0.1	
		Banksia attenuata	400	20	
		Beaufortia elegans	80	6	
		Bossiaea eriocarpa	30	4	
*		*Briza maxima*	20	6	
		Burchardia congesta	20	0.1	
		Chaetospora curvifolia	10	0.5	
		Conostephium pendulum	50	0.5	conostephium
		Dampiera linearis	30	1	FdW220909-60
		Desmocladus flexuosus	20	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Drosera erythrorhiza	1	1	
		Drosera macrantha	0	0.1	
*		*Ehrharta calycina*	10	0.1	
		Eremaea pauciflora	50	10	
*		*Gladiolus caryophyllaceus*	50	0.2	
		Gompholobium tomentosum	50	0.5	
		Hemiandra glabra	20	1	
		Hibbertia hypericoides	30	4	
		Hibbertia subvaginata	30	6	
		Hypocalymma robustum	50	1	
*		*Hypochaeris glabra*	1	0.5	
		Isotropis cuneifolia subsp. *cuneifolia*	5	0.1	
		Jacksonia floribunda	250	1	
		Lomandra caespitosa	20	0.1	
		Lomandra hermaphrodita	10	0.1	FdW220909-62
		Lyginia barbata	50	8	
		Macrozamia riedlei	200	4	
		Patersonia occidentalis	30	1	
		Petrophile linearis	10	0.1	
		Philotheca spicata	50	0.5	
		Poaceae sp. *1*	5	0.1	
		Podotheca gnaphalioides	5	0.1	
		Scholtzia involucrata	10	2	
		Stylidium androsaceum	2	0.1	
		Stylidium brunonianum	2	0.1	
		Stylidium repens	2	0.1	
		Stylidium rigidulum	5	0.1	
		Styphelia conostephioides	30	4	
		Trachymene pilosa	2	1	
*		*Ursinia anthemoides*	10	1	
		Waitzia acuminata	5	0.5	

Site No:14Q	**Date**: 08/09/2022	**Longitude:** 115.886443	**Latitude** -31.687435

Type:
Quadrant

Soil Types:
Grey sand - dry

Topography:
Undulating sand dunes

Surface Water:
10%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:
rubbish





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	130	4	
		Acacia barbinervis subsp. borealis	20	0.1	
		Adenanthos cygnorum	150	1	
		Banksia attenuata	400	30	
		Banksia menziesii	400	4	
		Beaufortia elegans	130	15	
		Bossiaea eriocarpa	30	4	
		Burchardia congesta	20	0.1	
		Caesia micrantha	20	1	caesia micrantha
		Caladenia flava	5	0.1	
		Conostephium pendulum	30	0.1	
		Conostephium pendulum	30	1	
		Conostylis serrulata	20	0.1	
		Drosera erythrorhiza	1	2	
		Gastrolobium capitatum	50	1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Gladiolus caryophyllaceus*	30	0.5	
		Gompholobium tomentosum	80	2	
		Hemiandra glabra	20	1	
		Hibbertia sericosepala	20	1	FdW220909-63
		Hibbertia subvaginata	30	6	
		Hypocalymma robustum	50	1	
*		*Hypochaeris glabra*	1	0.5	
		Isolepis marginata	2	0.1	
		Lechenaultia biloba	20	0.1	Sterile
		Leucopogon squarrosus	50	1	FdW220909-64
		Levenhookia pusilla	2	0.1	
		Lomandra caespitosa	20	0.1	
		Lomandra sp.	10	0.1	Sterile
		Lyginia barbata	30	1	
		Melaleuca seriata	50	4	
		Melaleuca trichophylla	30	0.5	
		Patersonia occidentalis	30	6	
		Petrophile linearis	30	1	
		Pterostylis sanguinea	10	0.1	sterile
		Scholtzia involucrata	20	6	
		Stylidium androsaceum	2	0.1	
		Stylidium brunonianum	5	0.1	
		Stylidium repens	2	1	
		Styphelia conostephioides	20	8	
		Styphelia tenuiflora	10	0.5	Sterile
		Trachymene pilosa	2	1	
		Waitzia acuminata	2	0.5	
		Xanthorrhoea preissii	200	25	

Site No:15Q	**Date**: 06/10/2022	**Longitude:** 115.886043	**Latitude** -31.6892033

Type:
Quadrat

Soil Types:
Grey sand with organic matter - dry

Topography:
Lower Slope

Surface Water:
0% bare

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	70	0.1	
		Adenanthos obovatus	30	6	
		Banksia attenuata	450	4	
		Banksia ilicifolia	500	10	
		Bossiaea eriocarpa	30	1	
		Burchardia congesta	40	0.5	
		Caladenia flava	20	0.1	
		Cassytha glabella	0	0.1	FdW221006-75
		Chamaescilla corymbosa	5	0.1	
		Conostephium pendulum	40	0.5	
		Conostylis setigera	20	0.1	Sterile

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Conostylis setigera	15	0.1	FdW221006-73
		Crassula decumbens var. *decumbens*	5	0.1	FdW221006-67
		Dasypogon bromeliifolius	30	5	
		Drosera erythrorhiza	1	0.5	
		Drosera macrantha	0	0.1	Sterile
		Euchilopsis linearis	30	2	FdW221006-70
		Gonocarpus pithyoides	15	0.2	FdW221006-74
		Hemiandra glabra	20	0.5	
		Hibbertia subvaginata	15	1	
		Hypocalymma angustifolium	50	5	
		Hypocalymma robustum	50	1	
*		*Hypochaeris glabra*	10	2	
		Hypolaena exsulca	30	0.1	
		Isolepis marginata	5	0.1	
		Kunzea micrantha	200	4	
		Lepidosperma pubisquameum	40	0.5	FdW221006-66
		Levenhookia pusilla	1	0.1	
		Lomandra caespitosa	20	0.1	
		Lomandra micrantha subsp. micrantha	20	0.1	FdW221006-72
		Lomandra preissii	30	0.1	
		Melaleuca preissiana	250	4	
		Melaleuca seriata	50	2	
		Microtis media	20	0.1	
		Paracaleana nigrita	10	0.1	
		Patersonia occidentalis	30	10	
*		*Pentameris airoides*	10	0.5	
		Pericalymma ellipticum	160	0.5	FdW221006-77
		Phlebocarya ciliata	20	4	
		Phyllangium paradoxum	2	1	FdW221006-71
		Podotheca gnaphalioides	15	0.1	FdW221006-76
		Pultenaea reticulata	100	0.5	
		Sowerbaea laxiflora	20	0.1	
		Stylidium brunonianum	2	0.1	
		Stylidium repens	5	0.2	
		Styphelia conostephioides	20	8	FdW221006-78
		Thysanotus manglesianus	0	0.5	FdW221006-69
		Trachymene pilosa	5	1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Ursinia anthemoides*	20	0.5	
		Waitzia suaveolens	10	0.5	
		Xanthorrhoea preissii	200	40	

Site No:16R	**Date**: 03/09/2022	**Longitude:** 115.886643	**Latitude** -31.68981

Type:
Releve

Soil Types:
Black sand with loam- dry

Topography:
Wetland

Surface Water:
bare 20%, moss 40%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
Rubbish, vehicle tracks



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	200	1	
*		*Aira praecox*	10	0.1	FdW221006-79
		Aristida contorta	20	0.1	
		Astartea scoparia	60	0.5	
*		*Briza maxima*	20	1	
		Caladenia flava	5	0.1	
		Caladenia marginata	10	0.1	
*		*Carpobrotus edulis*	2	0.1	Sterile
		Centrolepis aristata	4	0.1	FdW221006-80
		Chamaescilla corymbosa	20	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Crassula decumbens var. *decumbens*	3	0.5	
		Dasypogon bromeliifolius	50	8	
		Drosera glanduligera	2	0.1	
		Euchilopsis linearis	20	0.5	
*		*Fumaria capreolata*	5	0.5	
*		*Gladiolus caryophyllaceus*	60	0.1	
		Hypocalymma angustifolium	50	1	
*		*Hypochaeris glabra*	10	20	
		Isolepis marginata	3	1	
		Jacksonia furcellata	180	0.5	
		Levenhookia pusilla	2	0.5	
		Melaleuca preissiana	400	20	
		Nuytsia floribunda	400	8	
*		*Pentameris airoides*	10	4	
		Pericalymma ellipticum	60	1	
		Podotheca gnaphalioides	10	10	
		Pterostylis sp.	5	0.1	Sterile
		Regelia ciliata	150	4	FdW221006-82
		Siloxerus humifusus	2	0.5	
*		*Sonchus oleraceus*	4	0.1	
		Stylidium calcaratum	10	0.5	
		Thysanotus manglesianus	0	0.1	
		Trachymene pilosa	5	4	
*		*Ursinia anthemoides*	20	4	
*		*Vulpia muralis*	10	1	FdW221006-81
		Waitzia suaveolens	5	2	
		Xanthorrhoea preissii	220	4	

Site No:17R	**Date**: 06/10/2022	**Longitude:** 115.887478	**Latitude** -31.691013

Type:
Releve

Soil Types:
Grey soils with organic matter- dry

Topography:
Wetland

Surface Water:
Bare 20%, moss 20%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
Rubbish, some weeds



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos obovatus	50	1	
*		*Arctotheca calendula*	5	0.1	
		Austrostipa flavescens	10	0.1	
		Banksia attenuata	400	2	
		Banksia ilicifolia	500	5	
*		*Briza maxima*	20	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Chamaescilla corymbosa	20	0.5	
		Crassula decumbens var. *decumbens*	5	1	
		Dasypogon bromeliifolius	30	15	
		Drosera erythrorhiza	1	0.1	
*		*Gladiolus caryophyllaceus*	50	0.1	
*		*Hypochaeris glabra*	10	10	
		Isolepis marginata	3	0.5	
		Jacksonia furcellata	150	1	
		Kunzea micrantha	200	1	
		Leucopogon squarrosus	40	0.5	
		Melaleuca preissiana	500	8	
		Melaleuca seriata	50	1	
		Nuytsia floribunda	300	12	
*		*Orobanche minor*	10	0.1	
*		*Pentameris airoides*	10	1	
		Phlebocarya ciliata	30	2	
		Phyllangium paradoxum	5	0.1	
		Podotheca gnaphalioides	10	15	
		Regelia ciliata	100	1	
		Siloxerus humifusus	2	0.1	
*		*Sonchus oleraceus*	10	0.1	
		Stylidium calcaratum	5	0.5	
		Trachymene pilosa	10	2	
*		*Ursinia anthemoides*	20	4	
*		*Wahlenbergia capensis*	20	0.1	
		Waitzia suaveolens	5	1	
		Xanthorrhoea preissii	200	10	

Site No:18Q	**Date**: 03/09/2022	**Longitude:** 115.888628	**Latitude** -31.692818

Type:
Quadrat

Soil Types:
Grey brown sand - dry

Topography:
Lower Slope/ Wetland

Surface Water:
10% bare

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	100	0.5	
		Adenanthos obovatus	50	0.5	
		Banksia attenuata	500	12	
		Bossiaea eriocarpa	30	0.5	
*		*Briza maxima*	20	1	
		Caladenia flava	5	1	
		Chamaescilla corymbosa	10	4	
		Conostylis juncea	10	0.1	
		Dasypogon bromeliifolius	20	8	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Elythranthera brunonis	30	0.1	
		Eriochilus dilatatus	2	0.1	
		Hibbertia subvaginata	30	0.1	
*		*Hypochaeris glabra*	10	2	
		Kunzea micrantha	300	60	
		Leucopogon squarrosus	20	0.5	
		Lomandra preissii	20	0.1	
		Nuytsia floribunda	500	0.5	
		Patersonia occidentalis	30	0.1	
*		*Pentameris airoides*	10	2	
		Podotheca gnaphalioides	5	0.1	
*		*Sonchus oleraceus*	2	0.1	
		Stylidium calcaratum	10	0.1	
		Trachymene pilosa	3	1	
*		*Vulpia muralis*	20	0.5	
		Waitzia suaveolens	5	0.1	
		Xanthorrhoea preissii	150	10	

Site No:19Q	**Date**: 06/10/2022	**Longitude:** 115.887853	**Latitude** -31.689588

Type:
Quadrat

Soil Types:
Brown grey sand- dry

Topography:
Lower Slope

Surface Water:
10% bare

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	50	0.5	
		Adenanthos obovatus	50	8	
		Bossiaea eriocarpa	20	0.5	
		Caladenia flava	5	0.1	
		Cassytha glabella	0	0.1	
		Chamaescilla corymbosa	5	0.5	
		Conostylis juncea	5	0.5	
		Conostylis setigera	10	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Crassula decumbens var. *decumbens*	2	0.1	
		Dasypogon bromeliifolius	30	12	
		Drosera erythrorhiza	1	1	
		Drosera macrantha	0	0.1	
		Eucalyptus marginata	800	25	
		Euchilopsis linearis	40	2	
		Hemiandra glabra	20	0.1	Sterile
		Hypocalymma angustifolium	50	4	
		Kunzea micrantha	20	0.1	
		Leucopogon pulchellus	50	8	
		Lomandra caespitosa	30	0.1	
		Lomandra micrantha subsp. *micrantha*	15	0.1	
		Lysinema pentapetalum	50	4	FdW221006-85
		Macrozamia riedlei	10	0.1	
		Melaleuca preissiana	500	5	
		Melaleuca seriata	100	2	
		Opercularia hispidula	5	0.1	FdW221006-84
		Patersonia occidentalis	30	4	
		Petrophile linearis	70	1	
		Philotheca spicata	70	0.5	
		Phlebocarya ciliata	30	10	
		Pterostylis sanguinea	5	0.2	
		Regelia ciliata	120	1	
		Stylidium brunonianum	20	0.1	
		Styphelia xerophylla	50	0.5	
		Trachymene pilosa	3	0.1	
		Xanthorrhoea preissii	150	20	

Site No:20Q	**Date**: 06/10/2022	**Longitude:** 115.889871	**Latitude** -31.6923883

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Flat wetland

Surface Water:
5% bare, 10% moss

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Aira praecox*	10	5	
		Apium annuum	2	4	FdW221006-86
*		*Briza maxima*	20	0.1	
		Caladenia flava	10	0.1	
*		*Gladiolus caryophyllaceus*	50	0.1	
		Gompholobium tomentosum	40	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Hypochaeris glabra*	10	50	
		Kunzea micrantha	300	75	
		Lepidosperma pubisquameum	50	15	
*		*Pentameris airoides*	10	15	
		Podotheca gnaphalioides	10	0.1	
		Pterostylis pyramidalis	1	0.5	
		Trachymene pilosa	10	4	
*		*Ursinia anthemoides*	20	0.1	
*		*Vulpia muralis*	10	10	

Site No:21Q	**Date**: 05/10/2022	**Longitude:** 115.868428	**Latitude** -31.680616

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Upper slope, dune crest

Surface Water:
bare 25%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:
no weeds,near powerline. ?dieback



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	150	2	6% dead
		Adenanthos cygnorum	200	10	
		Alexgeorgea nitens	5	0.1	
		Arnocrinum preissii	30	0.2	FdW221007-88
		Austrostipa flavescens	10	0.1	FdW221007-87
		Banksia attenuata	300	4	several dead
		Banksia menziesii	350	6	
		Beaufortia elegans	100	1	
*		*Briza maxima*	10	0.5	
		Burchardia congesta	50	0.5	
		Caladenia flava	5	0.1	
		Cassytha glabella	0	0.5	FdW221007-90

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Chaetospora curvifolia	20	0.1	
		Conostylis juncea	10	0.1	
		Cyanothamnus ramosus subsp. *anethifolius*	100	0.1	FdW221007-91
		Daviesia divaricata subsp. *divaricata*	20	0.1	
		Drosera erythrorhiza	1	0.1	
		Drosera macrantha	0	0.1	sterile
		Eremaea pauciflora	50	2	
*		*Gladiolus caryophyllaceus*	50	0.5	
		Gompholobium tomentosum	30	0.1	
		Hemiandra glabra	30	0.5	
		Hibbertia hypericoides	100	6	
		Hibbertia subvaginata	30	0.5	
*		*Hypochaeris glabra*	2	0.1	
		Jacksonia floribunda	150	2	
		Leucopogon pulchellus	50	4	
		Levenhookia stipitata	2	0.1	
		Lomandra micrantha subsp. micrantha	10	0.1	
		Lyginia barbata	50	6	
		Patersonia occidentalis	30	4	
		Petrophile linearis	30	0.2	
		Philotheca spicata	50	0	direct adjacent
		Phyllangium paradoxum	3	0.1	
		Podotheca chrysantha	10	0.1	FdW221007-93
		Podotheca gnaphalioides	10	0.1	
		Pyrorchis nigricans	1	0.1	
		Scholtzia involucrata	30	1	
		Stachystemon axillaris	30	0.1	FdW221007-92
		Stirlingia latifolia	100	6	
		Stylidium semipartitum	10	0.1	FdW221007-89
		Styphelia conostephioides	30	2	
		Styphelia xerophylla	50	10	
		Thysanotus manglesianus	0	0.5	
		Trachymene pilosa	5	0.5	
*		*Ursinia anthemoides*	10	0.5	
		Verticordia nitens	150	4	
		Waitzia suaveolens	10	1	

Site No:22Q	**Date**: 06/10/2022	**Longitude:** 115.883040	**Latitude** -31.6854433

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Mid slope, sand dunes

Surface Water:
bare 10%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
weeds, could be excellent....



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	100	0.5	
		Adenanthos obovatus	50	1	
		Banksia attenuata	500	20	
		Banksia menziesii	500	5	
		Beaufortia elegans	100	0.5	
		Bossiaea eriocarpa	30	4	
*		*Briza maxima*	10	10	
		Burchardia congesta	50	0.1	
		Conostephium pendulum	50	2	FdW221007-94
		Conostylis serrulata	10	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Crassula decumbens var. *decumbens*	5	0.1	
		Dasypogon bromeliifolius	20	1	
		Drosera erythrorhiza	1	0.1	
*		*Gladiolus caryophyllaceus*	50	0.1	
		Hibbertia subvaginata	20	4	
		Hypocalymma robustum	30	0.1	
*		*Hypochaeris glabra*	5	10	
*		*Hypochaeris radicata*	1	1	
		Isolepis marginata	5	0.1	
		Lomandra sonderi	20	0.1	
		Nuytsia floribunda	500	15	
		Patersonia occidentalis	30	4	
		Petrophile linearis	30	0.2	
		Philotheca spicata	100	1	
		Phlebocarya ciliata	20	0.5	
		Phyllangium paradoxum	3	0.1	
		Podolepis gracilis	20	0.1	FdW221007-96
		Podotheca gnaphalioides	10	0.1	
		Scholtzia involucrata	50	4	
*		*Sonchus oleraceus*	10	0.1	
		Stylidium ?piliferum	2	0.1	FdW221007-97
		Stylidium affine	20	0	FdW221007-98 op adjacent
		Stylidium brunonianum	5	0.1	
		Stylidium repens	2	0.1	
		Trachymene pilosa	5	4	
		Tricoryne elatior	10	0.5	FdW221007-95
*		*Ursinia anthemoides*	10	0.5	
		Waitzia suaveolens	10	0.5	
		Xanthorrhoea gracilis	100	0.1	
		Xanthorrhoea preissii	150	20	

Site No:23Q	**Date**: 08/09/2022	**Longitude:** 115.896155	**Latitude** -31.703843

Type:
Quadrat

Soil Types:
Grey sand - dry

Topography:
Upper slope, sand dune

Surface Water:
bare 25%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	100	1	
		Adenanthos cygnorum	150	10	
		Alexgeorgea nitens	10	0.5	
		Anigozanthos manglesii	20	0.2	
		Austrostipa flavescens	10	0.1	
		Banksia attenuata	400	8	
		Banksia menziesii	400	10	
		Beaufortia elegans	80	1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Beaufortia elegans	80	2	
		Boronia purdieana subsp. *purdieana*	30	1	FdW221007-102
		Bossiaea eriocarpa	30	0.5	
		Burchardia congesta	30	0.1	
		Conostephium pendulum	20	0.5	
		Conostylis setigera	10	0.1	sterile, mostly dead
		Dampiera linearis	10	0.1	
		Dasypogon bromeliifolius	10	1	
		Desmocladus flexuosus	10	1	
		Desmocladus flexuosus	10	0.2	
		Drosera erythrorhiza	1	0.1	
		Drosera macrantha	0	0.1	
		Eucalyptus todtiana	600	15	
		Gastrolobium capitatum	20	0.1	
*		*Gladiolus caryophyllaceus*	30	0.1	
		Gompholobium tomentosum	50	8	
		Gonocarpus pithyoides	20	2	
		Hemiandra glabra	20	12	
		Hibbertia hypericoides	30	0.5	
		Hibbertia sericosepala	30	0.5	FdW221007-100
		Hibbertia subvaginata	30	15	
		Hypocalymma robustum	50	1	
		Hypolaena exsulca	30	0.1	
		Isotropis cuneifolia subsp. *cuneifolia*	5	0.1	
		Jacksonia floribunda	100	0.5	
		Leucopogon pulchellus	30	0.5	
		Lomandra hermaphrodita	10	0.1	
		Melaleuca seriata	80	4	
		Opercularia hispidula	3	0.1	
		Patersonia occidentalis	30	1	
		Petrophile linearis	30	0.5	
		Phyllangium paradoxum	5	0.1	
		Scholtzia involucrata	20	0	on edge
		Stirlingia latifolia	50	1	
		Stylidium brunonianum	10	0.1	
		Stylidium diuroides subsp. *diuroides*	5	0.1	FdW221007-101
		Stylidium junceum	30	0.1	FdW221007-99

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Stylidium repens	1	0.2	
		Stylidium semipartitum	10	0.1	
		Styphelia pallida	20	2	
		Styphelia conostephioides	20	0.5	
		Trachymene pilosa	5	0.5	
*		*Ursinia anthemoides*	5	0.1	
		Xanthorrhoea preissii	100	8	
			5	0.1	FdW221007-103

Site No:24R	**Date**: 07/10/2022	**Longitude:** 115.908576	**Latitude** -31.725060

Type:
Releve

Soil Types:
Dark sand w organic - dry

Topography:
Wetland, flat

Surface Water:
bare 50%

Vegetation Type:

Vegetation Condition:
Good

Fire: 10+

Condition Notes:
clearing, weeds, displacement



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	100	0.5	
		Allocasuarina fraseriana	600	5	
		Banksia littoralis	400	12	
*		*Briza maxima*	10	8	
*		*Briza minor*	10	1	
		Caladenia flava	10	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Carpobrotus edulis*	10	0.5	
		Drosera micrantha	0	0.1	
*		*Hypochaeris glabra*	10	2	
		Kunzea glabrescens	300	10	patches
		Lepidosperma longitudinale	30	1	
*		*Leptospermum laevigatum*	200	0.5	
		Lomandra spartea	20	0.5	FdW221007-104
*		*Lotus subbiflorus*	5	4	
		Melaleuca preissiana	500	12	
		Melaleuca rhaphiophylla	200	0.5	
*		*Pentameris airoides*	10	1	
		Podotheca gnaphalioides	10	0.1	
		Thysanotus manglesianus	0	0.1	
*		*Ursinia anthemoides*	20	2	
		Waitzia suaveolens	10	1	
		Xanthorrhoea preissii	150	10	

Site No:25Q	**Date**: 08/09/2022	**Longitude:** 115.909411	**Latitude** -31.724898

Type:
Quadrat

Soil Types:
Black sand loam - moist

Topography:
Wetland, flat

Surface Water:
bare less than 1%

Vegetation Type:

Vegetation Condition:
Good

Fire: 10+

Condition Notes:
powerlines, tracks, weeds



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos obovatus	50	2	
*		*Briza maxima*	10	1	
		Centrolepis aristata	2	0.1	
		Conostylis setigera	10	0.1	
		Dasypogon bromeliifolius	20	15	
		Drosera erythrorhiza	1	1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Hypocalymma angustifolium	30	0	nearby
*		*Hypochaeris glabra*	10	8	
*		*Lotus subbiflorus*	2	0.1	
		Melaleuca preissiana	500	15	
		Patersonia occidentalis	30	2	
*		*Pentameris airoides*	5	1	
		Phlebocarya ciliata	20	1	
		Podotheca gnaphalioides	10	0.1	
		Pterostylis sanguinea	20	0.1	
		Trachymene pilosa	5	1	
*		*Ursinia anthemoides*	10	2	
		Xanthorrhoea preissii	150	65	

Site No:26Q	**Date**: 07/10/2022	**Longitude:** 115.909523	**Latitude** -31.729576

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Flat

Surface Water:
bare 10%

Vegetation Type:

Vegetation Condition:
Good

Fire: 10+

Condition Notes:
clearing, weeds, powerline



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	120	2	
		Adenanthos cygnorum	20	0.1	
		Adenanthos obovatus	100	1	
		Anigozanthos humilis	10	0.1	
		Austrostipa compressa	10	0.1	
		Banksia attenuata	500	10	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Banksia ilicifolia	100	1	
		Bossiaea eriocarpa	20	1	
*		*Briza maxima*	10	2	
		Calandrinia corrigioloides	2	0.1	FdW221007-108
*		*Carpobrotus edulis*	5	1	
		Conostephium pendulum	20	0.1	
		Crassula colorata	2	0.1	
		Dasypogon bromeliifolius	20	4	
		Eremaea pauciflora	100	4	
		Eucalyptus todtiana	400	15	
*		*Gladiolus caryophyllaceus*	80	0.1	
		Gompholobium tomentosum	20	0.5	
		Gonocarpus pithyoides	20	4	
		Hibbertia subvaginata	20	15	
		Hypocalymma robustum	50	1	
*		*Hypochaeris glabra*	10	2	
		Jacksonia floribunda	150	4	
		Jacksonia furcellata	150	1	
		Laxmannia ramosa subsp. *ramosa*	10	0.1	FdW221007-107
		Laxmannia squarrosa	5	0.1	
		Lechenaultia biloba	10	0.1	sterile
		Lyginia barbata	30	4	
		Melaleuca seriata	80	0.5	
		Melaleuca trichophylla	80	0.5	
		Patersonia occidentalis	20	1	
		Petrophile linearis	30	1	
		Podotheca gnaphalioides	10	1	
		Scholtzia involucrata	30	1	
		Stylidium brunonianum	10	0.1	
*		*Ursinia anthemoides*	10	1	
		Waitzia suaveolens	10	2	
		Xanthorrhoea preissii	150	15	
			5	0.1	FdW221007-106

Site No:27Q	**Date**: 07/11/2022	**Longitude:** 115.815155	**Latitude** -31.563270

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Upper slope

Surface Water:
bare 30%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: <5

Condition Notes:
burnt decently, powerline track nearby





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	5	0.5	Juvenile
		Aira cupaniana	10	0.1	FdW221008-116
		Alexgeorgea nitens	5	0.1	
		Allocasuarina humilis	100	0.5	burnt
		Anigozanthos humilis	20	0.5	
		Austrostipa compressa	50	0.1	
		Banksia attenuata	600	5	
		Banksia menziesii	600	2	
		Bossiaea eriocarpa	10	0.5	
		Burchardia congesta	30	0.5	
		Calytrix flavescens	10	1	
*		*Carpobrotus edulis*	3	0.1	Juvenile, sterile
		Comesperma calymega	10	0.1	
		Conostephium pendulum	20	2	
		Conostylis serrulata	10	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Conostylis setigera	5	0.1	
		Daviesia decurrens	10	0.2	
		Daviesia triflora	50	0.5	Juvenile, sterile
		Drosera menziesii	0	0.1	sterile
		Haemodorum paniculatum	100	0.1	
		Haemodorum spicatum	100	0.1	
		Hibbertia hypericoides	20	1	Juvenile, sterile
		Hibbertia subvaginata	10	2	
		Hibbertia striata	10	0.1	FdW221008-111
		Hovea trisperma var. *trisperma*	20	0.1	
		Isolepis marginata	3	0.1	FdW221008-113
		Jacksonia floribunda	10	1	
		Kunzea glabrescens	150	0.5	dead
		Leptospermum erubescens	20	0.1	
		Levenhookia pusilla	3	0.5	
		Lobelia heterophylla	20	1	
		Lomandra hermaphrodita	10	0.2	
		Lomandra preissii	10	0.2	
		Lomandra sericea	10	0.5	Juvenile, sterile
		Melaleuca sp.	20	2	Juvenile, sterile
		Monotaxis grandiflora	5	0.1	
		Patersonia occidentalis	10	0.5	
		Petrophile linearis	10	0.1	
		Philotheca spicata	20	0.1	Juvenile, sterile
		Phlebocarya ciliata	30	0.5	Juvenile, sterile
		Phyllangium paradoxum	15	0.1	
		Podotheca gnaphalioides	10	0.1	
		Podotheca chrysantha	15	0.1	FdW221008-115
		Scaevola calliptera	10	0.5	
		Scaevola repens	5	5	
		Schoenus caespititius	20	0.1	FdW221008-112
		Scholtzia involucrata	10	0.2	
*		*Sonchus oleraceus*	20	0.1	
		Stirlingia latifolia	10	1	
		Stylidium piliferum	1	0.1	Juvenile, sterile
		Stylidium repens	2	0.1	
		Thysanotus thyrsoideus	10	0.1	FdW221008-109

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Thysanotus triandrus	5	0.1	FdW221008-117
		Trachymene pilosa	5	0.1	
		Tricoryne elatior	15	1	FdW221008-110
*		*Ursinia anthemoides*	10	0.1	
*		*Vulpia muralis*	20	0.1	
*		*Wahlenbergia capensis*	30	0.1	
		Wahlenbergia preissii	20	0.1	FdW221008-114
		Xanthorrhoea preissii	150	4	
		Xanthosia huegelii	5	0.1	
			30	0.1	FdW221008-118

Site No:28Q	**Date**: 07/11/2022	**Longitude:** 115.816375	**Latitude** -31.5622983

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Upper slope

Surface Water:
bare 50%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: <5

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	4	0.1	
		Acacia barbinervis subsp. *borealis*	20	0.1	FdW221008-119
		Acacia barbinervis subsp. *borealis*	20	0.1	FdW221008-120
		Alexgeorgea nitens	3	0.3	
		Allocasuarina humilis	50	0.5	
		Anigozanthos humilis	20	0.1	
		Austrostipa compressa	50	0.1	
		Banksia attenuata	450	4	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Bossiaea eriocarpa	20	0.5	
		Burchardia congesta	30	0.1	
		Calytrix sp.	5	3	Juvenile
*		*Carpobrotus edulis*	5	0.1	
		Comesperma calymega	5	0.1	
		Conostephium pendulum	20	3	
		Conostylis serrulata	15	0.1	
		Conostylis setigera	4	0.1	
		Corynotheca micrantha	15	0.1	
		Dampiera linearis	15	0.2	
		Desmocladus flexuosus	5	0.1	
		Drosera menziesii	0	0.1	
*		*Gladiolus caryophyllaceus*	10	0.3	
		Haemodorum paniculatum	100	0.1	
		Haemodorum spicatum	100	0.1	
		Hibbertia subvaginata	10	0.5	
		Hibbertia striata	10	0.5	
		Hovea trisperma var. *trisperma*	30	0.5	
		Hyalosperma cotula	5	0.1	
		Isolepis marginata	3	0.1	
		Isotoma hypocrateriformis	10	0.1	FdW221008-122
		Jacksonia floribunda	10	1	
		Kunzea glabrescens	10	0.5	FdW221008-123
		Levenhookia pusilla	3	0.1	
		Lobelia heterophylla	15	0.5	
		Lomandra hermaphrodita	10	0.5	
		Lomandra sericea	20	0.1	
		Melaleuca trichophylla	15	4	
		Monotaxis grandiflora	5	0.1	
		Netrostylis capillaris	10	0.1	juvenile
		Petrophile linearis	20	0.2	
		Petrophile macrostachya	30	1	
		Philotheca spicata	20	0.1	
		Phlebocarya ciliata	20	1	
		Phyllangium paradoxum	5	0.1	
		Pimelea sp.	2	0.01	
		Podotheca gnaphalioides	10	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Scaevola calliptera	10	0.1	
		Scaevola repens	5	0.5	
		Schoenus caespititius	20	0.5	
		Stirlingia latifolia	40	0.5	
		Stylidium carnosum	50	0.1	FdW221008-121
		Stylidium piliferum	2	0.1	
		Thysanotus multiflorus	5	0.1	
		Trachymene pilosa	10	1	
		Tricoryne elatior	20	0.1	
*		*Ursinia anthemoides*	10	0.1	
*		*Wahlenbergia capensis*	30	0.1	
		Wahlenbergia preissii	20	0.1	
		Xanthorrhoea preissii	150	5	
		Xanthosia huegelii	5	0.1	

Site No:29Q	**Date**: 07/11/2022	**Longitude:** 115.796780	**Latitude** -31.664545

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Upper slope

Surface Water:
bare 5%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
disturbance species



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	50	0.5	
		Adenanthos cygnorum	300	3	
*		*Aira caryophyllea*	10	0.5	
		Alexgeorgea nitens	10	0.5	
		Allocasuarina humilis	200	2	
		Banksia menziesii	200	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Bossiaea eriocarpa	30	1	
		Brachyloma preissii	80	4	FdW221008-127
*		*Briza maxima*	20	2	
		Burchardia congesta	30	0.1	
		Caladenia flava	5	0.1	
		Calytrix flavescens	30	0.1	
		Conostephium pendulum	50	1	
		Conostylis aculeata	15	0.5	FdW221008-125
		Craspedia variabilis	5	0.5	
		Desmocladus flexuosus	15	10	
		Drosera erythrorhiza	1	0.1	
		Drosera menziesii	0	0.1	
*		*Ehrharta calycina*	100	2	
		Eucalyptus marginata	1200	12	
*		*Gladiolus caryophyllaceus*	50	0.1	
		Gompholobium tomentosum	30	1	
		Hardenbergia comptoniana	0	0.5	
		Hibbertia hypericoides	50	15	
		Hibbertia striata	20	0.1	
		Hovea trisperma var. *trisperma*	20	0.1	
		Hypocalymma robustum	80	2	
*		*Hypochaeris glabra*	5	0.1	
		Hypolaena exsulca	20	0.1	FdW221008-126
		Jacksonia sternbergiana	200	0.5	
		Lomandra hermaphrodita	15	0.1	
		Lomandra sonderi	20	4	
		Lyginia barbata	50	1	
		Macrozamia riedlei	20	0.1	
		Melaleuca systena	30	2	
		Netrostylis capillaris	20	1	
		Patersonia occidentalis	30	3	
		Petrophile linearis	30	0.5	
		Phlebocarya ciliata	20	0.5	
		Pyrorchis nigricans	1	0.5	
		Stylidium repens	2	0.5	
		Styphelia conostephioides	50	0.5	FdW221008-128
		Thysanotus arbuscula	50	0.1	FdW221008-129

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Trachymene pilosa	10	0.5	
*		*Ursinia anthemoides*	10	0.2	
*		*Wahlenbergia capensis*	50	0.3	
		Xanthorrhoea preissii	200	5	
		Xanthosia huegelii	5	0.1	

Site No:30Q	**Date**: 07/11/2022	**Longitude:** 115.797171	**Latitude** -31.665903

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Upper slope

Surface Water:
bare 2%

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:
Weeds, edge



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia huegelii	20	1	FdW221008-131
		Acacia pulchella	50	0.5	
		Acacia barbinervis subsp. *borealis*	30	0.1	
*		*Aira caryophyllea*	10	0.1	
		Alexgeorgea nitens	10	6	
		Allocasuarina humilis	150	2	
*		*Arctotheca calendula*	5	0.1	
		Austrostipa compressa	50	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Banksia attenuata	500	25	
		Banksia menziesii	200	1	
		Beaufortia elegans	100	18	
		Bossiaea eriocarpa	50	1	
*		*Briza maxima*	20	2	
		Calothamnus sanguineus	50	1	FdW221008-130
		Cassytha glabella	0	0.5	
		Chaetospora curvifolia	20	0.5	
		Conostephium pendulum	40	0.5	
		Conostylis aculeata	15	0.5	
		Craspedia variabilis	5	0.5	
		Daviesia triflora	40	0.2	
		Desmocladus flexuosus	10	4	
		Dianella revoluta	40	0.1	
*		*Ehrharta calycina*	100	2	
		Eremaea pauciflora	100	6	
*		*Gladiolus caryophyllaceus*	80	0.1	
		Gompholobium tomentosum	50	1	
		Hibbertia hypericoides	50	1	
		Hypocalymma robustum	50	1	
*		*Hypochaeris glabra*	10	4	
		Jacksonia sternbergiana	300	8	
		Lobelia heterophylla	10	0.1	
		Lomandra hermaphrodita	10	0.1	
		Lomandra sonderi	20	0.1	
		Lomandra suaveolens	5	0.1	FdW221008-132
		Lyginia barbata	50	6	
		Patersonia occidentalis	30	6	
		Petrophile linearis	30	0.5	
		Phlebocarya ciliata	20	1	
		Podotheca gnaphalioides	5	0.1	
*		*Sonchus oleraceus*	20	0.1	
		Stirlingia latifolia	50	0.5	
		Styphelia conostephioides	50	1	
		Trachymene pilosa	20	0.1	
		Trachymene pilosa	10	1	
*		*Ursinia anthemoides*	10	2	

Site No:31R	Date: 08/11/2022	Longitude: 115.798220	Latitude -31.669090

Type:
Quadrat

Soil Types:
Sandy soils - dry

Topography:
Upper slope

Surface Water:
-

Vegetation Type:

Vegetation Condition:
Very good

Fire: 10+

Condition Notes:





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	30	0.5	
*		*Aira caryophyllea*	20	1	
		Alexgeorgea nitens	10	1	
		Banksia attenuata	400	1	
		Banksia menziesii	400	8	
		Bossiaea eriocarpa	30	0.5	
		Brachyloma preissii	30	0.2	
*		*Briza maxima*	30	3	
		Calothamnus sanguineus	100	1	
		Calytrix flavescens	10	0.3	
		Chaetospora curvifolia	20	0.2	
		Conostylis aculeata	10	0.1	
		Daviesia triflora	30	0.2	
*		*Ehrharta calycina*	100	1	
		Eucalyptus marginata	1000	10	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Gladiolus caryophyllaceus*	100	0.1	
		Hardenbergia comptoniana	0	0.1	
		Hibbertia hypericoides	50	35	
		Hibbertia subvaginata	50	0.5	
		Hovea trisperma var. *trisperma*	30	0.1	
		Hypocalymma robustum	50	0.5	
		Isotropis cuneifolia subsp. *cuneifolia*	5	0.1	
		Leucopogon polymorphus	30	0.1	FdW221008-133
		Lyginia barbata	30	1	
		Mesomelaena pseudostygia	50	12	
		Patersonia occidentalis	30	0.5	
		Petrophile linearis	30	0.2	
		Podotheca gnaphalioides	10	0.5	
*		*Romulea rosea*	5	0.1	
		Stirlingia latifolia	30	0.5	
		Styphelia conostephioides	50	0.5	
		Trachymene pilosa	10	0.5	
*		*Ursinia anthemoides*	10	1	
		Xanthorrhoea preissii	200	10	

Site No:32Q	**Date**: 08/11/2022	**Longitude:** 115.815983	**Latitude** -31.676455

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Mid slope

Surface Water:
bare 5%

Vegetation Type:

Vegetation Condition:
Very good to good

Fire: 10+

Condition Notes:
weeds, disturbance opportunist



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia browniana	30	0.1	
		Acacia huegelii	30	0.5	
		Acacia pulchella	30	4	
		Acacia barbinervis subsp. *borealis*	30	0.1	
		Adenanthos cygnorum	300	6	
		Alexgeorgea nitens	10	0.5	
*		*Arctotheca calendula*	10	0.1	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Austrostipa compressa	50	0.1	
		Banksia attenuata	800	18	
		Banksia menziesii	200	10	
		Beaufortia elegans	100	8	
		Boronia purdieana subsp. *purdieana*	50	3	FdW221008-134
		Bossiaea eriocarpa	30	4	
*		*Briza maxima*	20	2	
*		*Bromus diandrus*	10	0.5	
		Burchardia congesta	30	0.1	
*		*Carpobrotus edulis*	10	0.2	
		Conostylis aculeata	30	1	FdW221008-135
		Crassula colorata	2	0.1	
		Dampiera linearis	10	4	
		Daucus glochidiatus	10	0.1	
		Desmocladus flexuosus	30	10	
		Drosera menziesii	0	0.1	
*		*Ehrharta calycina*	100	3	
		Eucalyptus todtiana	400	2	
*		*Gladiolus caryophyllaceus*	100	0.5	
		Gompholobium tomentosum	80	0.5	
		Hibbertia subvaginata	30	0.2	
*		*Hypochaeris glabra*	10	2	
		Jacksonia sternbergiana	200	6	
		Kennedia prostrata	2	0.1	
		Lechenaultia floribunda	30	0.2	
		Lomandra caespitosa	20	0.2	
		Lomandra hermaphrodita	10	0.1	
		Lyginia barbata	30	2	check against restii long white
		Macrozamia riedlei	150	0.5	
		Patersonia occidentalis	30	1	
		Petrophile linearis	30	0.1	
		Phlebocarya ciliata	30	2	
		Podotheca gnaphalioides	10	0.5	
		Scholtzia involucrata	20	0.2	
		Stylidium repens	3	0.1	
		Styphelia conostephioides	50	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Thysanotus arbuscula	30	0.1	
		Thysanotus manglesianus	0	0.1	
		Trachymene pilosa	10	0.1	
*		*Ursinia anthemoides*	10	4	

Site No:33R	**Date**: 08/11/2022	**Longitude:** 115.814719	**Latitude** -31.676479

Type:
Releve

Soil Types:
Brown soil - dry

Topography:
Mid slope

Surface Water:
bare 5%

Vegetation Type:

Vegetation Condition:
Very good

Fire: -

Condition Notes:
weeds



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia barbinervis subsp. *borealis*	30	0.5	
		Adenanthos cygnorum	200	5	
		Alexgeorgea nitens	10	10	
		Banksia attenuata	500	10	
		Banksia menziesii	500	5	
		Bossiaea eriocarpa	30	2	
*		*Briza maxima*	20	10	
		Burchardia congesta	30	0.1	
		Conostephium pendulum	50	1	
		Dampiera linearis	20	0.5	
		Desmocladus flexuosus	20	15	
		Dianella revoluta	50	0.1	
*		*Ehrharta calycina*	100	4	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Euphorbia terracina*	20	0.5	
		Haemodorum spicatum	100	0.1	
		Hibbertia hypericoides	50	2	
		Hypocalymma robustum	50	0.5	
*		*Hypochaeris glabra*	20	15	
		Jacksonia sternbergiana	250	3	
		Lyginia barbata	50	2	
		Macrozamia riedlei	200	0.5	
		Patersonia occidentalis	30	3	
*		*Pelargonium capitatum*	30	0.5	
		Petrophile linearis	50	0.5	
*		*Sonchus oleraceus*	30	0.5	
		Trachymene pilosa	10	1	
*		*Ursinia anthemoides*	20	6	

Site No:34Q	**Date**: 08/11/2022	**Longitude:** 115.814084	**Latitude** -31.676436

Type:
Quadrat

Soil Types:
Brown sand - dry

Topography:
Mid slope

Surface Water:
bare 0%

Vegetation Type:

Vegetation Condition:
Excellent

Fire: 10+

Condition Notes:
weeds, disturbance opportunist



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	30	1	
		Acacia barbinervis subsp. *borealis*	30	0.1	
		Alexgeorgea nitens	10	30	
		Austrostipa compressa	30	0.1	
		Banksia attenuata	600	2	
		Banksia menziesii	500	20	
		Beaufortia elegans	100	4	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Bossiaea eriocarpa	50	1	
*		*Briza maxima*	30	2	
		Burchardia congesta	30	0.1	
		Caladenia flava	5	0.1	
		Conostephium pendulum	30	1	
		Conostylis aculeata	15	0.5	
		Conostylis juncea	15	0.1	
		Craspedia variabilis	5	0.1	
		Desmocladus flexuosus	15	1	
		Drosera menziesii	0	0.1	
		Eucalyptus todtiana	700	5	
*		*Gladiolus caryophyllaceus*	50	0.1	
		Gompholobium tomentosum	30	1	
		Haemodorum paniculatum	100	0.1	
		Hibbertia hypericoides	50	10	
		Hypocalymma robustum	30	0.2	
*		*Hypochaeris glabra*	10	0.2	
		Isotropis cuneifolia subsp. *cuneifolia*	10	0.1	
		Lechenaultia floribunda	30	0.8	FdW221008-136
		Lepidosperma pubisquameum	30	1	
		Leucopogon squarrosus subsp. *squarrosus*	50	2	FdW221008-137
		Lobelia heterophylla	10	0.1	
		Lomandra hermaphrodita	10	0.1	
		Macrozamia riedlei	150	1.5	
		Patersonia occidentalis	50	6	
		Petrophile linearis	30	0.5	
		Phlebocarya ciliata	20	4	
		Scholtzia involucrata	20	1	
		Stylidium repens	5	0.1	
		Styphelia conostephioides	50	0.2	FdW221008-138
		Thysanotus multiflorus	20	0.1	
		Trachymene pilosa	10	0.2	
*		*Ursinia anthemoides*	15	4	
*		*Wahlenbergia capensis*	30	0.1	

Site No:35R	**Date**: 03/09/2022	**Longitude:** 115.914500	**Latitude** -31.854663

Type:
Releve

Soil Types:
Grey sand - dry

Topography:
Low lying

Surface Water:
bare 40%

Vegetation Type:

Vegetation Condition:
Degraded

Fire: 10+

Condition Notes:
clearing, weeds, rubbish



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Aira caryophyllea*	20	10	
*		*Arctotheca calendula*	10	1	
*		*Avena barbata*	100	0.5	
*		*Carpobrotus edulis*	10	15	
*		*Ehrharta calycina*	100	5	
*		*Gladiolus caryophyllaceus*	50	0.5	

Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
*		*Hypochaeris glabra*	10	1	
		Hypolaena exsulca	30	0.5	
		Melaleuca preissiana	400	4	
*		*Pelargonium capitatum*	10	0.1	
*		*Petrorhagia dubia*	20	5	
		Trachymene pilosa	10	1	
*		*Ursinia anthemoides*	20	8	
		Xanthorrhoea preissii	200	50	

Site No: Obs 5	**Date**: 08/09/2022	**Longitude:** 115.909866	**Latitude** -31.751736

Type:
Observation

Soil Types:
Grey sand - moist

Topography:
Flat

Surface Water:
bare 5%

Vegetation Type:

Vegetation Condition:
Degraded to completely degraded

Fire: 10+

Condition Notes:



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Acacia pulchella	30	1	
		Adenanthos cygnorum	250	25	
		Jacksonia floribunda			
*		*Pelargonium capitatum*			
*		*Pinus pinaster*			
		Rhagodia baccata	150	0.5	
		Styphelia xerophylla			
		Weeds	20	80	

Site No: Obs 6	**Date**: 08/09/2022	**Longitude:** 115.904681	**Latitude** -31.713436

Type:
Observation

Soil Types:
Grey sand

Topography:
Undulating

Surface Water:
-

Vegetation Type:

Vegetation Condition:
Degraded

Fire: 5-10

Condition Notes:
Clearing, weeds



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	150	1	
		Adenanthos obovatus	80	8	
		Dasypogon bromeliifolius	20	0.1	
		Hypocalymma angustifolium	50	30	
		Patersonia occidentalis	30	0.5	
*		*Pinus pinaster*	800	1	scattered throughout
		Weeds	10	30	
		Xanthorrhoea preissii	100	5	

Site No: Obs 7	**Date**: 08/09/2022	**Longitude:** 115.899928	**Latitude** -31.706756

Type:
Observation

Soil Types:
Grey dark sand, some brown - moist

Topography:
Lower slope winter wet

Surface Water:

Vegetation Type:

Vegetation Condition:
Good to very good

Fire: -

Condition Notes:
cleared?



Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	250	10	
		Banksia littoralis	300	1	
*		*Pinus pinaster*		5	
		Regelia inops	200	80	
		Xanthorrhoea preissii	100		

Site No: Obs 8	**Date**: 09/09/2022	**Longitude:** 115.831788	**Latitude** -31.680635

Type:
Observation

Topography:
Sand dune top

Surface Water:
bare 10%

Vegetation Type:

Vegetation Condition:
Degraded

Fire: 10+

Condition Notes:
regen, weeds, clearing, rubbish, lacks tree and ground stratum





Weed	Cons. Status	Taxon	height (cm)	% cover	Comment
		Adenanthos cygnorum	200	20	
*		*Carpobrotus edulis*	10	10	
		Corynotheca micrantha	30	0.1	
		Daviesia divaricata subsp. *divaricata*	30	0.1	
*		*Ehrharta calycina*	50	5	
		Hardenbergia comptoniana	0	1	
		Hibbertia hypericoides	50	0.1	
		Hypocalymma robustum	80	2	
		Jacksonia floribunda	200	0.1	
		Macrozamia riedlei	150	1	
		Nuytsia floribunda	200	0.1	
*		*Ornithopus pinnatus*	10	1	
*		*Pelargonium capitatum*	50	5	
*		*Pinus pinaster*	800	10	
		Weeds	5	50	
		Xanthorrhoea preissii	200	1	

About AECOM

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