Prepared for
Western Power
ABN: 18 540 492 861

Clean Energy Link Swan Coastal Plain Flora, Vegetation and Fauna Assessment

25-Jun-2024

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Client: Western Power

ABN: 18 540 492 861

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Table of Contents

Executive Summary i
1.0 Introduction 1
1.1 Background 1
1.2 Location 1
1.3 Objectives 1
2.0 Existing Environment 12
2.1 Climate 12
2.2 Interim Biogeographical Region of Australia Regions 13
2.3 Soil Landscape Mapping 13
2.4 Geology 14
2.5 Vegetation 1
2.6 Conservation Reserves and Environmentally Sensitive Areas 3
2.6.1 Conservation Reserves 3
2.6.2 Bush Forever Sites 3
3.0 Conservation Codes 9
3.1 Flora and Fauna 9
3.2 Vegetation Communities 11
3.3 Biosecurity and Agriculture Management Act 2007 (BAM Act) 12
4.0 Methodology 14
4.1 Desktop Assessment 14
4.2 Flora and Vegetation Survey 15
4.2.1 Vegetation Mapping 16
4.2.2 Banksia Woodlands TEC Mapping 16
4.2.3 Tuart Woodlands TEC Mapping 17
4.2.4 Targeted Flora Searches 18
4.3 Fauna Survey 18
4.4 Targeted Black Cockatoo Survey 19
4.4.1 Breeding Habitat 19
4.4.2 Roosting Habitat 19
4.4.3 Foraging Habitat Potential 20
4.5 Survey Limitations 27
5.0 Desktop Assessment Results 30
5.1 Threatened and Priority Ecological Communities 30
5.2 Significant Flora 30
5.3 Significant Fauna 48
6.0 Padbury-Wangara Results and Discussion 50
6.1 Flora 50
6.1.1 Vegetation Communities 50
6.1.2 Conservation Significant Vegetation 52
6.1.3 Vegetation Condition 58
6.1.4 Conservation Significant Flora 58
6.1.5 Flora Inventory 58
6.2 Fauna 58
6.2.1 Fauna Habitat Assessment 58
6.2.2 Fauna Inventory 61
6.2.3 Conservation Significant Fauna 62
6.3 Targeted Black Cockatoo Survey 64
6.3.1 Foraging 64
6.3.2 Breeding 68
6.3.3 Roosting 71
6.4 Discussion 71
6.4.1 Flora and Vegetation 71
6.4.2 Fauna 72
6.4.3 Targeted Black Cockatoo 75
7.0 Pinjar Terminal Results and Discussion 76

7.1 Flora 76
7.1.1 Vegetation Communities 76
7.1.2 Conservation Significant Vegetation 77
7.1.3 Vegetation Condition 80
7.1.4 Conservation Significant Flora 80
7.1.5 Flora Inventory 80
7.2 Fauna 80
7.2.1 Fauna Habitat Assessment 80
7.2.2 Fauna Inventory 82
7.2.3 Conservation Significant Fauna 82
7.3 Targeted Black Cockatoo Survey 83
7.3.1 Foraging 83
7.3.2 Breeding 85
7.3.3 Roosting 85
7.4 Discussion 85
7.4.1 Flora and Vegetation 85
7.4.2 Fauna 86
7.4.3 Targeted Black Cockatoo 90
8.0 Neerabup Terminal and East Wanneroo Results and Discussion 91
8.1 Flora 91
8.1.1 Vegetation Communities 91
8.1.2 Conservation Significant Vegetation 98
8.1.3 Vegetation Condition 115
8.1.4 Conservation Significant Flora 115
8.1.5 Flora Inventory 115
8.2 Fauna 116
8.2.1 Fauna Habitat Assessment 116
8.2.2 Fauna Inventory 120
8.2.3 Conservation Significant Fauna 121
8.3 Targeted Black Cockatoo Survey 123
8.3.1 Foraging 123
8.3.2 Breeding 129
8.3.3 Roosting 129
8.4 Discussion 131
8.4.1 Flora and Vegetation 131
8.4.2 Fauna 132
8.4.3 Targeted Black Cockatoo 137
9.0 NT-NOR to HBK 132kV Results and Discussion 138
9.1 Flora 138
9.1.1 Vegetation Communities 138
9.1.2 Conservation Significant Vegetation 141
9.1.3 Vegetation Condition 141
9.1.4 Conservation Significant Flora 141
9.1.5 Flora Inventory 141
9.2 Fauna 141
9.2.1 Fauna Habitat Assessment 141
9.2.2 Fauna Inventory 143
9.2.3 Conservation Significant Fauna 144
9.3 Targeted Black Cockatoo Survey 144
9.3.1 Foraging 144
9.3.2 Breeding 148
9.3.3 Roosting 149
9.4 Discussion 149
9.4.1 Flora and Vegetation 149
9.4.2 Fauna 150
9.4.3 Targeted Black Cockatoo 152
10.0 Northern Terminal Results and Discussion 153
10.1 Flora 153

10.1.1 Vegetation Communities 153
10.1.2 Conservation Significant Vegetation 153
10.1.3 Vegetation Condition 157
10.1.4 Conservation Significant Flora 157
10.1.5 Flora Inventory 157
10.2 Fauna 158
10.2.1 Fauna Habitat Assessment 158
10.2.2 Fauna Inventory 161
10.2.3 Conservation Significant Fauna 162
10.3 Targeted Black Cockatoo Survey 163
10.3.1 Foraging 163
10.3.2 Breeding 167
10.3.3 Roosting 167
10.4 Discussion 167
10.4.1 Flora and Vegetation 167
10.4.2 Fauna 168
10.4.3 Targeted Black Cockatoo 171
11.0 Conclusion 172
12.0 References 245

Appendix A
Significant Communities Desktop Assessment A

Appendix B
Flora Desktop Assessment B

Appendix C
Fauna Desktop Assessment C

Appendix D
Species x Survey Area x Community Matrix D

Appendix E
Flora Site Data E

List of Tables

Table 1 Locations of survey areas 1
Table 2 Soil Landscape mapping systems 13
Table 3 Geological systems of the Survey Area 14
Table 4 Beard et al (2013) Vegetation Associations and Percentage Remaining (Govt. of WA, 2019). 1
Table 5 Conservation Reserves intersecting the survey areas. 3
Table 6 Categories of species listed under Schedule 179 of the EPBC Act 9
Table 7 Conservation codes for WA flora and fauna listed under the BC Act (DBCA, 2019) 10
Table 8 Conservation codes for WA flora and fauna as listed By DBCA and endorsed by the Minister for the Environment 11
Table 9 Categories of TECs that are listed under the EPBC Act 11
Table 10 Conservation codes for State listed Ecological Communities 12
Table 11 Categories for Priority Ecological Communities 12
Table 12 Categories of likelihood of occurrence for flora species 14
Table 13 Categories of likelihood of occurrence for fauna species 15
Table 14 Condition categories and thresholds for the Tuart Woodland TEC 17
Table 15 Black Cockatoo foraging quality tool from the Federal guidelines (DAWE, 2022) 21
Table 16 Site context weighting 23
Table 17 Site condition described by BCE. 24
Table 18 Limitations considered for the biological assessment. 27
Table 19 Desktop Assessment Result Summary – Flora 30
Table 20 Significant flora species that were considered likely to occur within the survey areas pre-survey. 31

Table 21	Significant fauna desktop assessment results summary	48
Table 22	Significant fauna species considered to have a 'high' likelihood of occurrence within the survey area.	49
Table 23	WGA vegetation community descriptions and photographs	50
Table 24	Patch 1 Banksia Woodlands TEC Assessment	52
Table 25	Patch 2 Banksia Woodlands TEC Assessment	53
Table 26	Patch 1 Tuart Woodlands TEC assessment	54
Table 27	Patch 2 Tuart Woodlands TEC assessment	55
Table 28	Padbury-Wangara FCT analysis results	57
Table 29	Vegetation condition extent	58
Table 30	Fauna observations within the Padbury-Wangara survey area	61
Table 31	Area (ha) of suitable habitat for significant fauna species within the survey area	63
Table 32	Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)	65
Table 33	Padbury-Wangara refined foraging score calculation (Bamford, 2020)	68
Table 34	Padbury-Wangara foraging habitat extent	68
Table 35	Potential nesting trees	68
Table 36	Suitable nesting tree details including species and hollow dimensions.	69
Table 37	Summary of Padbury-Wangara likelihood of occurrence pre-survey and post-survey	72
Table 38	Fauna species which are known or moderately likely to utilise associated fauna habitat within the Padbury-Wangara survey area.	73
Table 39	Pinjar vegetation community descriptions and photographs	76
Table 40	Pinjar Banksia TEC patch assessment	77
Table 41	Pinjar floristic community type analysis results	79
Table 42	Vegetation condition extent	80
Table 43	Fauna observations within the Pinjar Terminal survey area	82
Table 44	Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)	84
Table 45	Pinjar Terminal refined foraging score calculation (Bamford, 2020)	84
Table 46	Pinjar Terminal foraging habitat extent	85
Table 47	Summary of Pinjar likelihood of occurrence pre-survey and post-survey	86
Table 48	Fauna species and associated fauna habitat within the Pinjar Terminal survey area	88
Table 49	Vegetation community descriptions and photographs	92
Table 50	Patch 4 Banksia TEC Assessment	99
Table 51	Patch 5 Banksia TEC Assessment	100
Table 52	Patch 6 Banksia TEC Assessment	101
Table 53	Patch 7 Banksia TEC Assessment	102
Table 54	Patch 8 Banksia TEC Assessment	103
Table 55	Patch 9 Banksia TEC Assessment	104
Table 56	Patch 10 Banksia TEC Assessment	105
Table 57	Patch 11 Banksia TEC Assessment	106
Table 58	Patch 3 Tuart Woodlands TEC assessment	107
Table 59	Patch 5 Tuart Woodlands TEC assessment	108
Table 60	Patch 4 Tuart Woodlands TEC assessment	110
Table 61	Neerabup Terminal and NBT Group floristic community type analysis results	113
Table 62	Vegetation condition extent	115
Table 63	Fauna observations within the Neerabup Terminal and NBT Group survey area	120
Table 64	Total area (ha) of suitable habitat for significant fauna species known or likely to occur within the survey area.	122
Table 65	Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)	124
Table 66	Neerabup and East Wanneroo Terminal refined foraging score calculation (Bamford, 2020)	127
Table 67	Neerabup and East Wanneroo BCE foraging habitat extent	127
Table 68	Potential nesting trees from Neerabup Terminal and East Wanneroo	129
Table 69	Potentially suitable nesting tree hollow details	130
Table 70	Summary of Neerabup Terminal and NBT Group likelihood of occurrence pre-survey and post-survey	132

Table 71	Fauna species and associated fauna habitat within the Neerabup Terminal and East Wanneroo survey area	134
Table 72	NT-NOR to HBK 132kV vegetation community descriptions and photographs	139
Table 73	Vegetation condition extent	141
Table 74	Fauna observations in the NT-NOR to HBK 132kV Line survey area	143
Table 75	Total area (ha) of suitable habitat for significant fauna species within the survey area	144
Table 76	Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)	145
Table 77	NT-NOR TO HBK 132KV Terminal refined foraging score calculation (Bamford, 2020)	147
Table 78	NT-NOR TO HBK 132KV Terminal foraging habitat extent	148
Table 79	Potential nesting trees within the survey area	148
Table 80	Potentially suitable nesting tree hollow details	149
Table 81	Summary of NT-NOR TO HBK 132KV likelihood of occurrence pre-survey and post-survey	150
Table 82	Fauna species and associated fauna habitat within the NT-NOR to HBK 132kV survey area	151
Table 83	Northern Terminal vegetation community descriptions and photographs	154
Table 84	Floristic community type analysis results for Northern	156
Table 85	Vegetation condition extent	157
Table 86	Fauna observations within the Northern survey area	161
Table 87	Total area (ha) of suitable habitat for significant fauna species within the survey area	162
Table 88	Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)	164
Table 89	Norther Terminal refined foraging score calculations (Bamford, 2020) and extent.	166
Table 90	Northern Terminal foraging habitat extent	166
Table 91	Potential nesting trees within the survey area	167
Table 92	Summary of Northern Terminal likelihood of occurrence pre-survey and post-survey	167
Table 93	Fauna species likely to occur and associated fauna habitat within the Northern Terminal survey area.	169

List of Figures

Figure 1	Survey Area	2
Figure 2	Rainfall data from Wanneroo Station (Station Number 009105) and temperature data from Pearce RAAF WA (Station Number 009053) (BOM, 2023).	12
Figure 3	Soil Landscape Mapping	15
Figure 4	Geology	16
Figure 5	Vegetation Associations	2
Figure 6	Conservation Reserves	4
Figure 7	Significant Flora, Fauna and Communities Results	33
Figure 8	Vegetation Communities, Condition, Significant Flora	174
Figure 9	Significant Fauna and Fauna Habitats	198
Figure 10	Black Cockatoo Foraging and Breeding Habitat	221

List of Plates

Plate 1	Tuart Woodlands Patch 1	54
Plate 2	Tuart Woodlands Patch 2	56
Plate 3	Banksia Woodland Habitat	59
Plate 4	Eucalyptus Woodland Habitat	59
Plate 5	Mixed Shrubland Habitat	60
Plate 6	Trees Over Cleared Habitat	61
Plate 7	Typical conical-shaped Quenda digging - foraging evidence	63
Plate 8	Carnaby's Cockatoos seen foraging on a *Banksia grandis* in the survey area.	67
Plate 9	Hollow on potentially suitable nesting tree ID84 Tuart (*Eucalyptus gomphocephala*)	69
Plate 10	Hollows recorded on potentially suitable nesting tree ID54 Tuart (*Eucalyptus gomphocephala*)	70

Plate 11	Banksia Woodland Habitat	81
Plate 12	Typical Conical-Shaped Quenda Digging - Foraging Evidence	83
Plate 13	Tuart Woodlands Patch 3	107
Plate 14	Tuart Woodlands Patch 4	109
Plate 15	Historically cleared areas within Neerabup Terminal: 2010 to current	109
Plate 16	Tuart Woodlands Patch 5	111
Plate 17	Banksia Woodland Habitat	116
Plate 18	Adenanthos/Plantation	117
Plate 19	Pine Plantation Habitat	117
Plate 20	Eucalyptus Woodland Habitat	118
Plate 21	Melaleuca Woodland Habitat	118
Plate 22	Mixed Shrubland Habitat	119
Plate 23	Quenda foraging evidence	123
Plate 24	Carnaby's Cockatoos foraging within the survey area.	128
Plate 25	Forest Red-tailed Black Cockatoos foraging within the survey area	128
Plate 26	Hollow recorded on potentially suitable nesting tree ID 593 - Stag	130
Plate 27	Eucalyptus Woodland Habitat	142
Plate 28	Carnaby's Cockatoo foraging within the survey area	148
Plate 29	Left: Hollow recorded on potentially suitable nesting tree ID 291 - Stag Right: Hollow recorded on potentially suitable nesting tree ID 507 - Jarrah (*Eucalyptus marginata*)	149
Plate 30	Eucalyptus Woodland Habitat	158
Plate 31	Mixed Shrubland Habitat	159
Plate 32	Trees Over Cleared Habitat	160
Plate 33	Typical conical-shaped Quenda digging - foraging evidence	162
Plate 34	Forest Red-tailed Black Cockatoo Foraging Evidence	163

Executive Summary

AECOM Australia Pty Ltd (AECOM) was engaged by Western Power to undertake a spring flora, vegetation, fauna and black cockatoo assessment for defined linear corridors within the Perth Metropolitan Region on the Swan Coastal Plain (SCP). This Project is referred to as the Clean Energy Link (CEL). The five sites include: Padbury - Wangara, Pinjar Terminal, Neerabup Terminal and East Wanneroo, NT-NOR to HBK 132kV Line and Northern Terminal.

A summary of the Padbury - Wangara results is presented below:

- One patch of -Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community (Tuart Woodlands TEC) listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and as Priority 3 by Department of Biodiversity, Conservation and Attractions (DBCA). The patch extends for 0.54 ha.
- No significant flora listed under the EPBC Act or the *Biodiversity Conservation Act 2016* (BC Act) or by DBCA were recorded during the survey.
- Three conservation significant fauna species were recorded during the survey, including two bird species and one mammal species:
    - Carnaby's Cockatoo (*Zanda latirostris)* listed as Endangered under the EPBC Act and the *Biodiversity Conservation Act 2016* (BC Act)
    - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)* listed as Vulnerable under the EPBC Act and BC Act
    - Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA.

A summary of the Pinjar Terminal results is presented below:

- No significant flora listed under the EPBC Act, BC Act or by DBCA were recorded during the survey.
- Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands TEC) listed as Endangered under the EPBC Act and as Priority 3 by DBCA, mapped for 14.75 ha.
- One conservation significant fauna species was recorded during the survey, Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.

A summary of the Neerabup Terminal and East Wanneroo results are presented below:

- Eight patches of Banksia Woodlands TEC were confirmed and mapped for 15.13 ha. In most instances, this TEC is synonymous with a Priority 3 Ecological Community (PEC) unless assessment through Floristic Community Type analysis determines otherwise.
- One patch of Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain TEC was mapped within the survey area for 1.71 ha.
- One Priority 3 PEC listed by the DBCA (2023) was confirmed to occur through FCT analysis, FCT 21c – Low lying Banksia attenuata woodlands or shrublands, mapped for 0.6 ha.
- One Priority 4 species, *Jacksonia sericea,* was collected and formal identification confirmed at the WA Herbarium. One individual was recorded within the survey area, with a second individual recorded in a quadrat adjacent to the survey area.
- A sample of *Calectasia* sp. was collected and may represent the Priority 2 species *C. elegans.* The record was more than 800m from the survey area therefore no further verification is required at this time.
- Three conservation significant fauna species were recorded during the survey:
    - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

A summary of the NT-NOR to HBK 132KV results are presented below:

-
- No significant flora listed under the EPBC Act or the BC Act or by DBCA were recorded during the survey.
- Three conservation significant fauna species were recorded during the survey:
  - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
  - Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

A summary of the Northern Terminal results is presented below:

- No significant flora listed under the EPBC Act or the BC Act or by DBCA were recorded during the survey.
- No significant vegetation communities were recorded in the survey area.
- Two conservation significant fauna species were recorded during the survey:
  - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.

The survey was undertaken by experienced personnel during the ideal detection period for significant flora. Survey effort was considered satisfactory, and no access issues were encountered that affected the outcome of the results.

1.0 Introduction

1.1 Background

In support for the WA state decarbonisation goal, and in line with Western Power's corporate strategy, an investment for North Region strategy titled Clean Energy Link Program (CELP) was created to conduct scoping phase activities for future works.

AECOM Australia Pty Ltd (AECOM) was engaged to undertake spring flora, vegetation, fauna, and black cockatoo assessment to be used to analyse options for new line routes. The details outlined in this report are in relation to the spring surveys conducted for five discreet survey areas within the Swan Coastal Plain (SCP) between Malaga and Pinjar (the survey areas). These areas and the Western Power shapefiles they represent is outlined in Table 1.

1.2 Location

The survey area represents multiple discreet corridors extending between Malaga and Pinjar within the SCP. The southern portion of the survey area is located approximately 14km north/northeast of the Perth Central Business District (CBD) and extends north to Pinjar Terminal, located approximately 55km north of the Perth CBD. The survey areas intersect the Cities of Wanneroo, Joondalup and Swan (Figure 1). The locations are presented in the Table below (Table 1).

Table 1 Locations of survey areas

Survey areas	Area (ha)	Location	Associated Figure
Padbury-Wangara	31.26	Along Whitfords Ave	Figure 1.2
Pinjar Terminal	16.58	East of Perry Rd	Figure 1.3
Neerabup Terminal and East Wanneroo	204.98	North of Gnangara Rd, South of Skink Rd. This comprises six survey areas including: • Neerabup Terminal • NBT-WGA 81 • NBT-WGA 81 STR 49-60 • NBT MUL Option 1 via Lenore Rd • NBT MUL Option 2 via Badgerup • NT-NBT 330kV Clearing Shapefile	Figure 1.4
NT-NOR to HBK 132kV	119.00	Along Drumpellier Dr	Figure 1.5
Northern Terminal	25.78	North of Beach Rd, South of Vale St	Figure 1.6

1.3 Objectives

The purpose of the flora, vegetation, fauna, and black cockatoo assessment was to define the environmental values present within the survey area. 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.
- Technical report and data package.

This document represents the final technical report covering the desktop assessment, literature review and field surveys for the five areas within the SCP.

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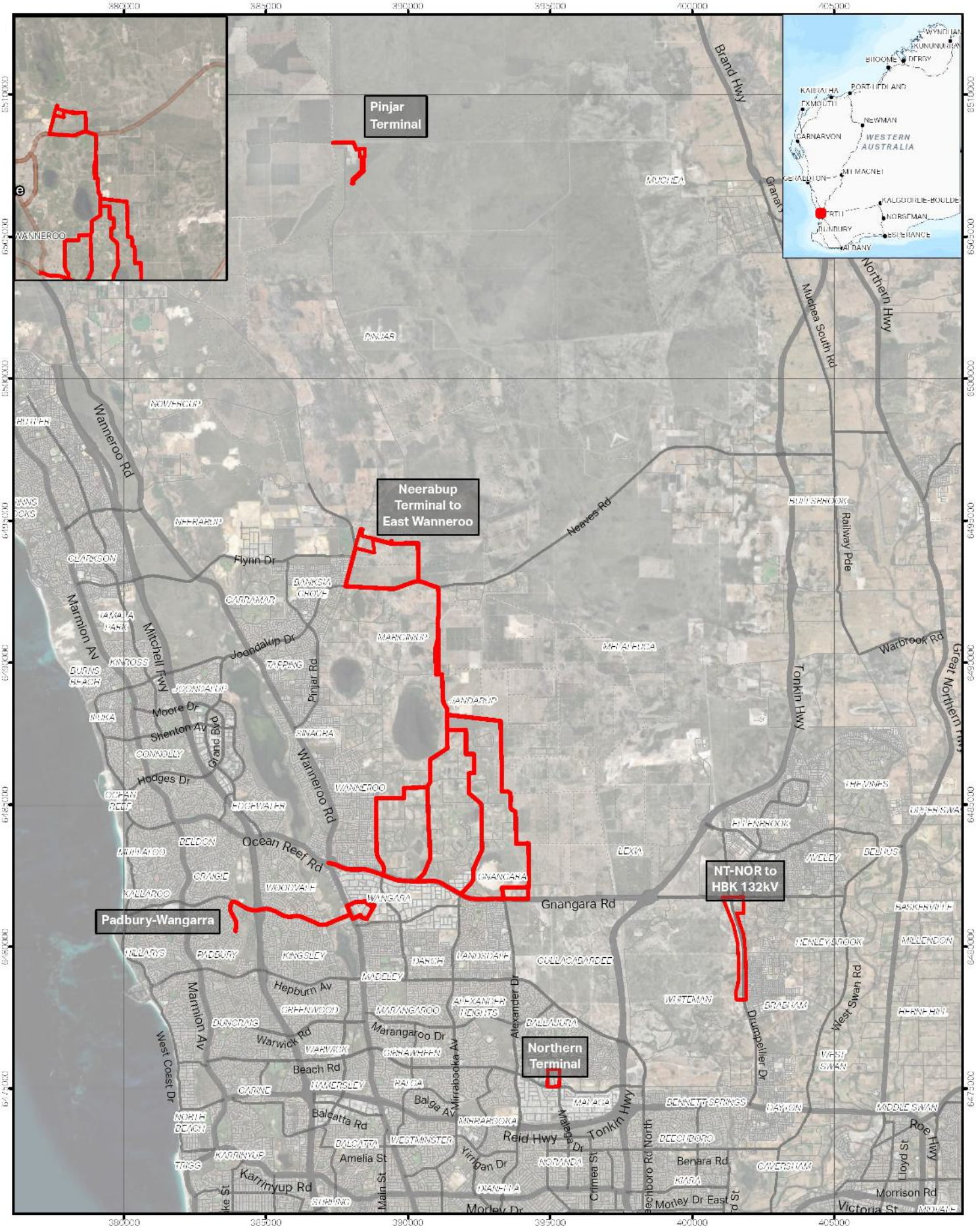

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GDA2020/MGA ZONE 50

LEGEND

Survey Area

Survey Area - All

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.1**

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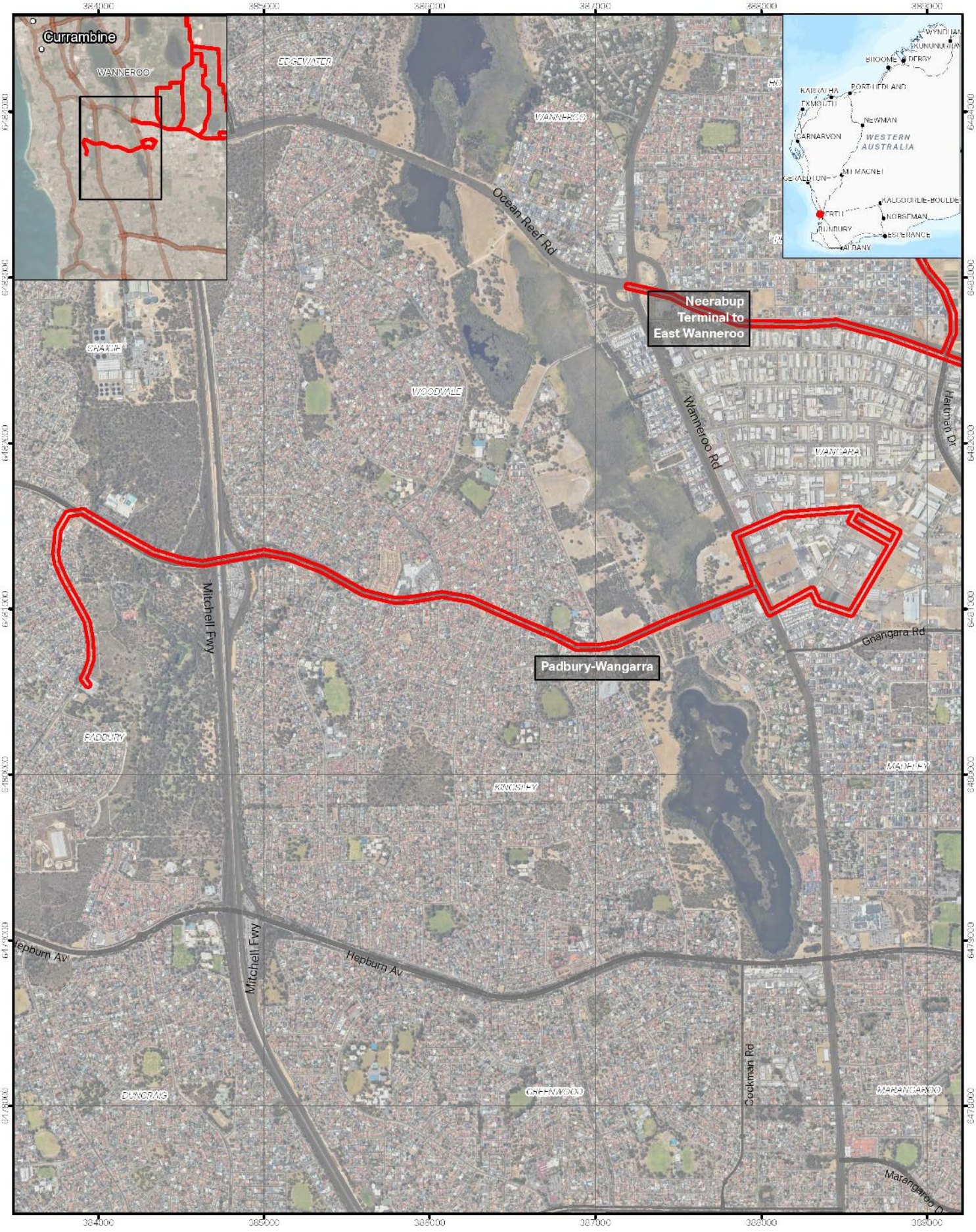

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GDA2020 MGA ZONE 50

LEGEND

Survey Area

Survey Area - Padbury - Wangarra

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CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.2**

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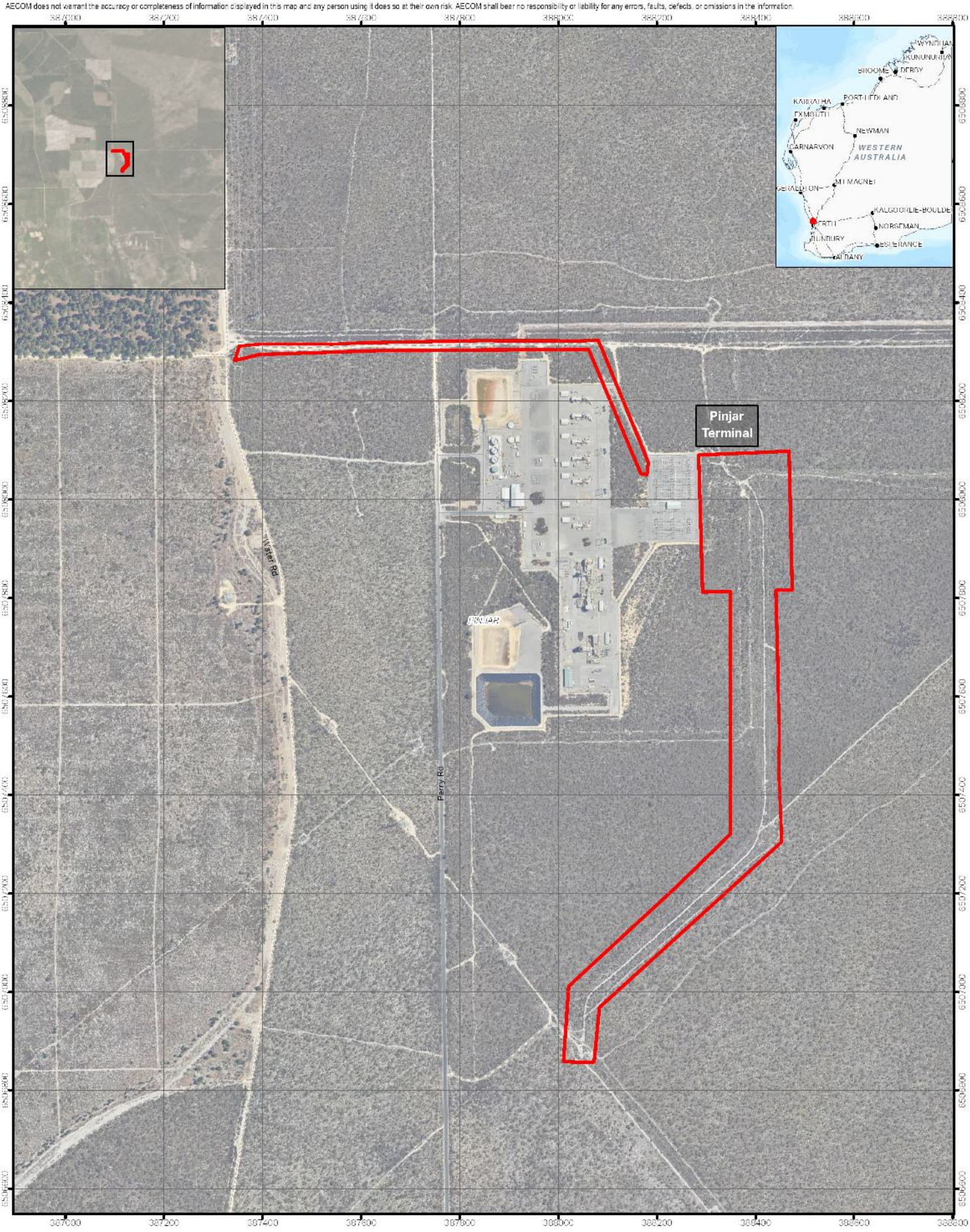

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LEGEND

Survey Area

Survey Area - Pinjar Terminal

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CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.3**

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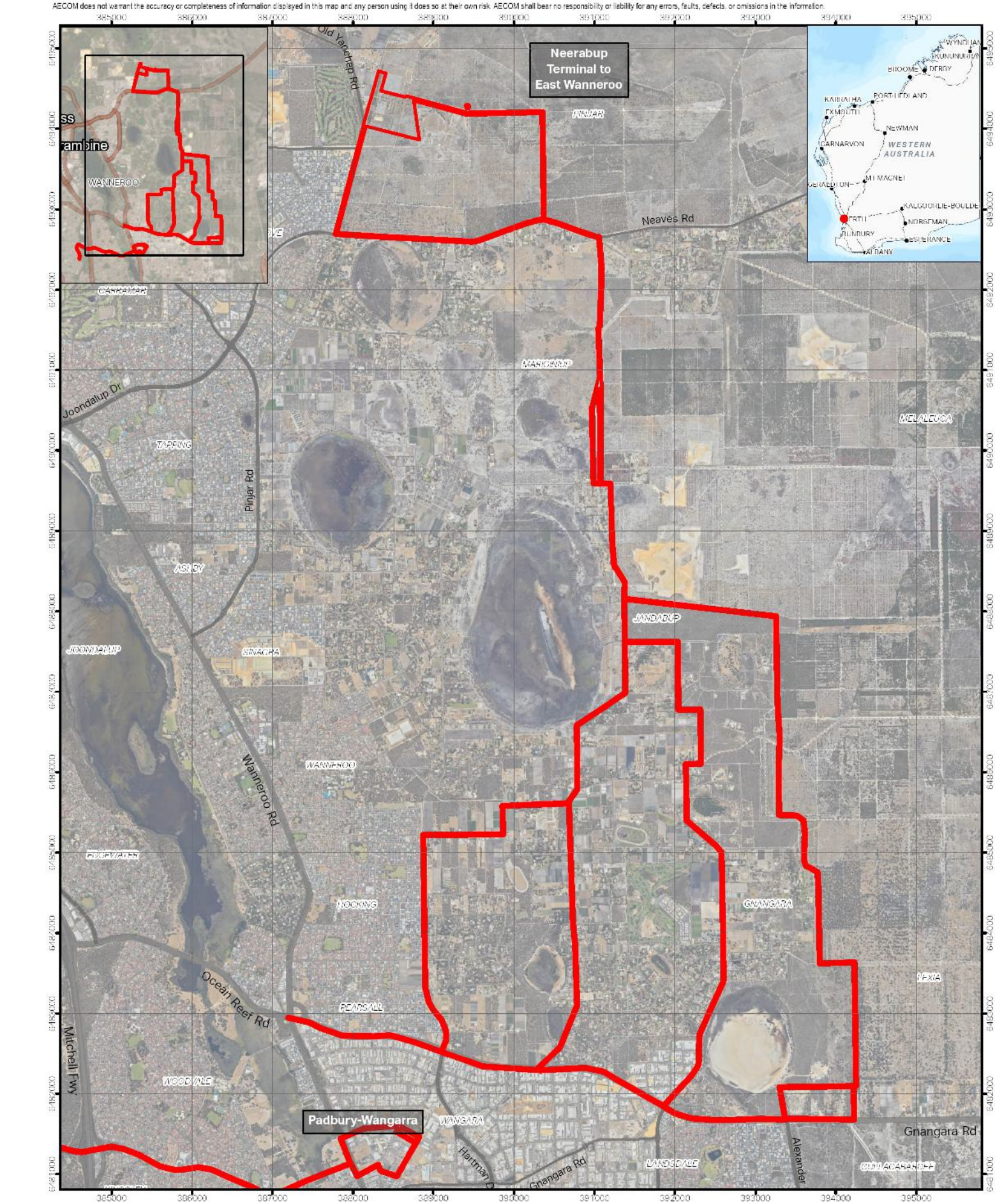

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LEGEND
Survey Area

Survey Area - Neerabup Terminal and East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.4**

A4 size

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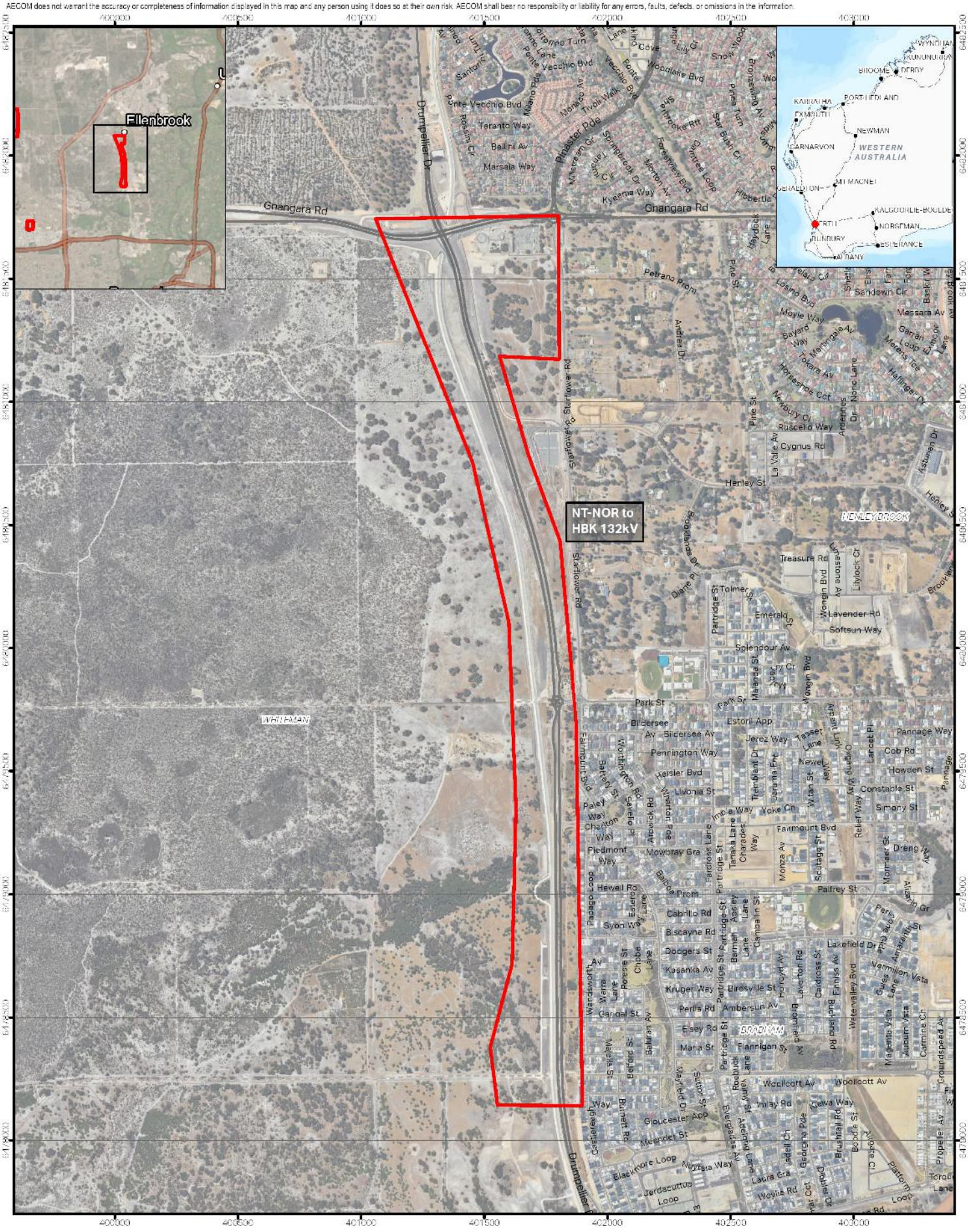

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CDA2020 MGA ZONE 50

LEGEND

Survey Area

Survey Area - NT-NOR to HBK 132kB

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.5**

A4 size

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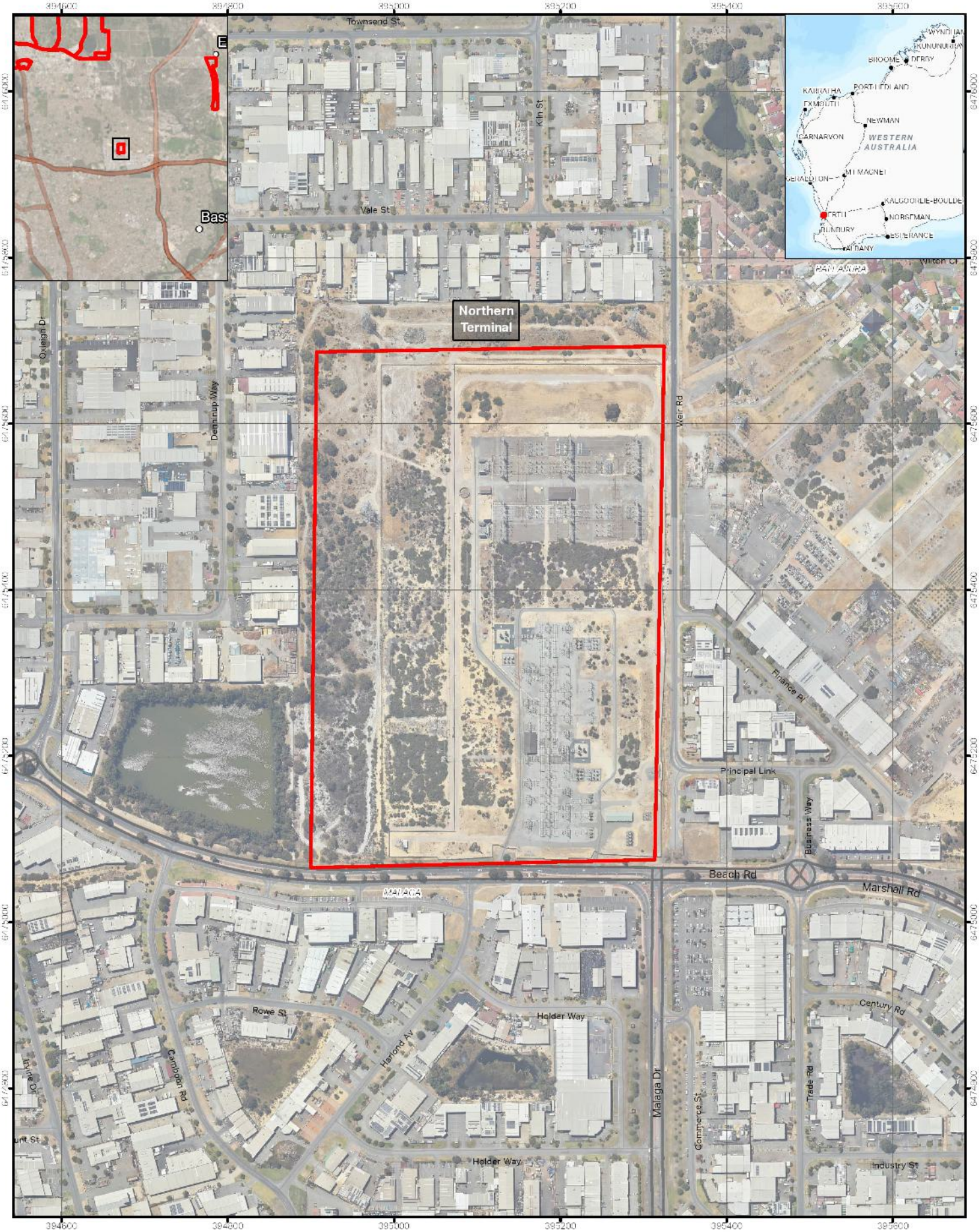

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metres
CDA2020 MGA ZONE 50

LEGEND
Survey Area

Survey Area - Northern Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.6**

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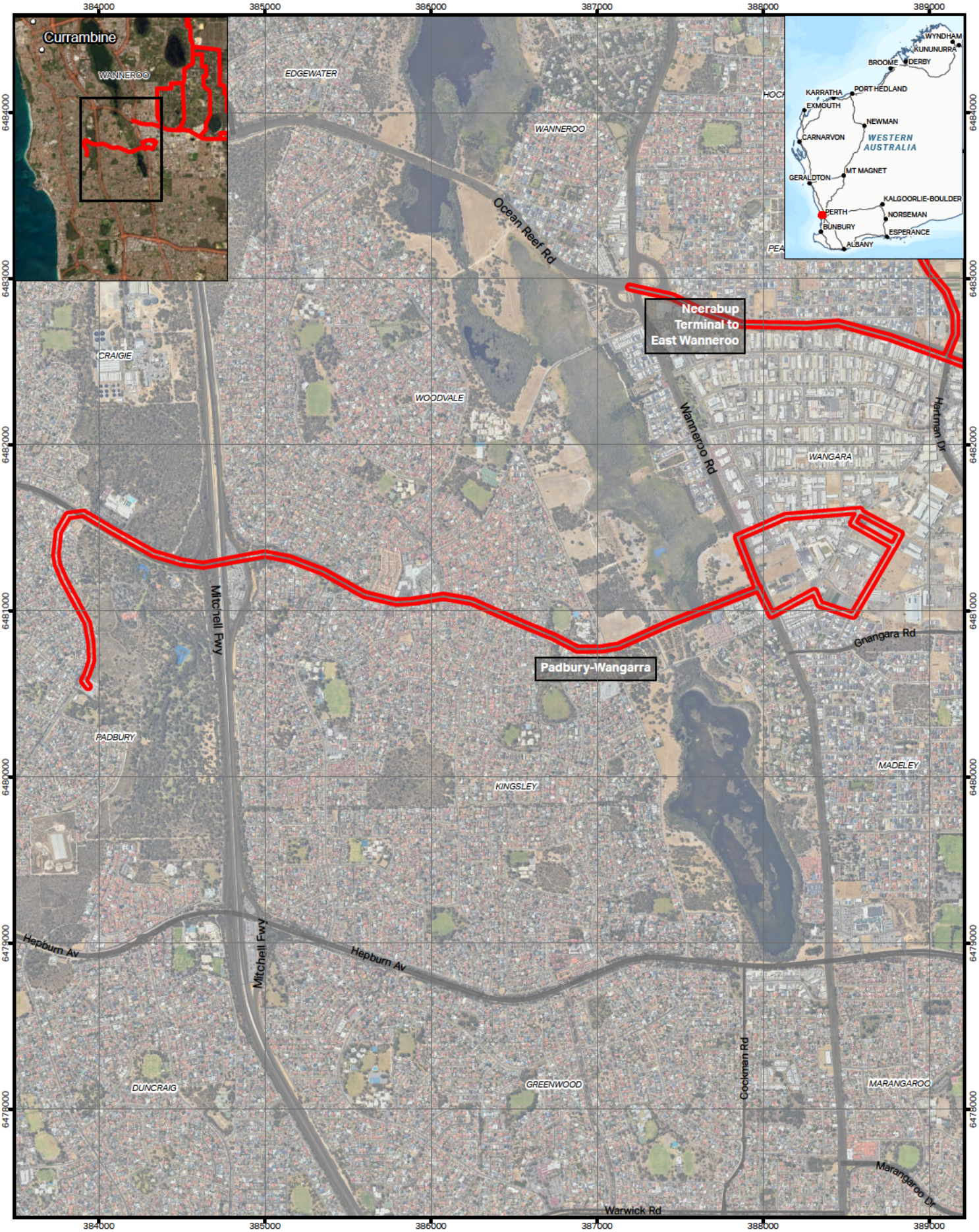

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LEGEND

Survey Area

Survey Area - Padbury - Wangarra

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.2**

A4 size

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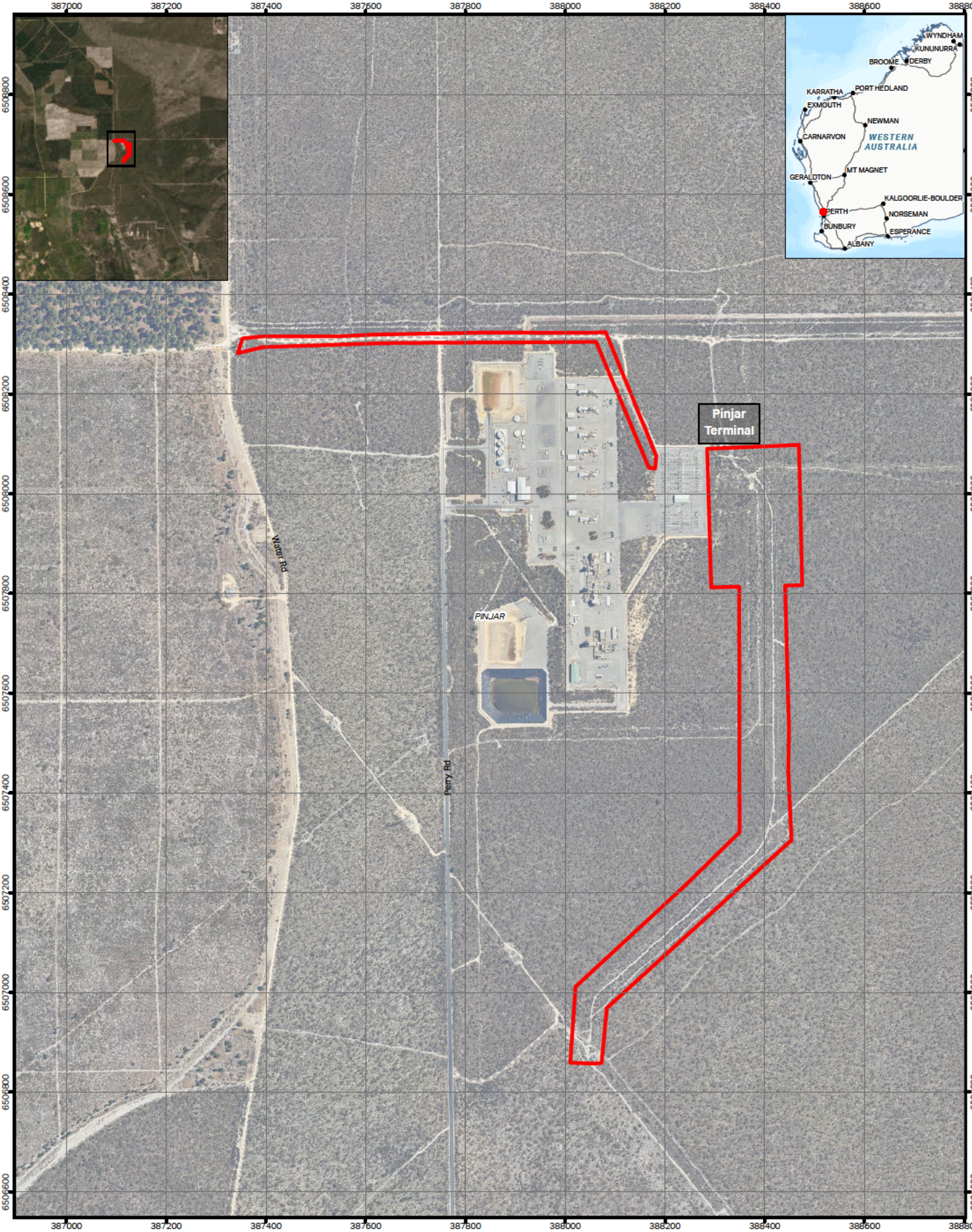

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LEGEND

Survey Area

Survey Area - Pinjar Terminal

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.3**

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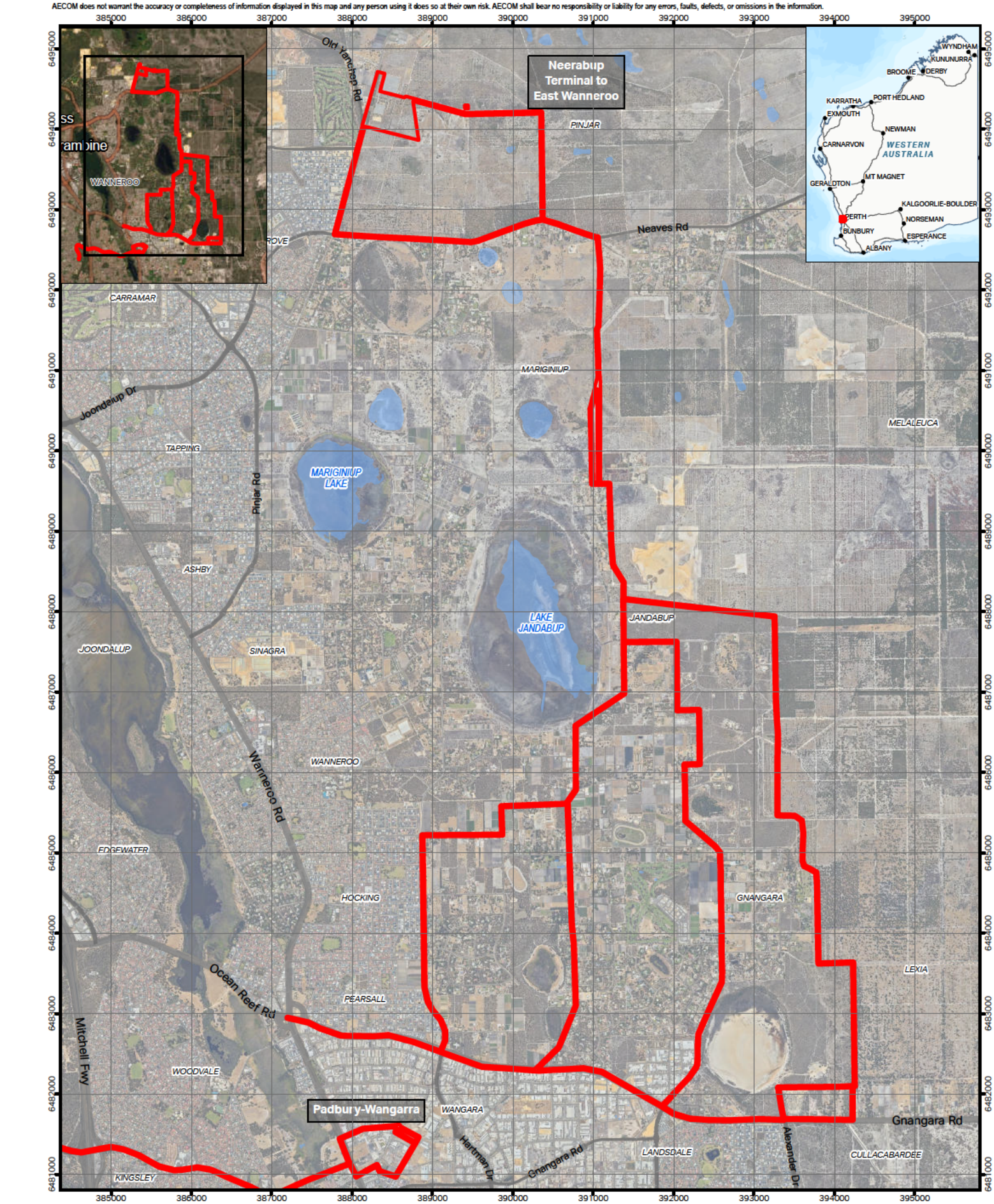

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LEGEND

Survey Area

Survey Area - Neerabup Terminal and East Wanneroo

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.4**

A4 size

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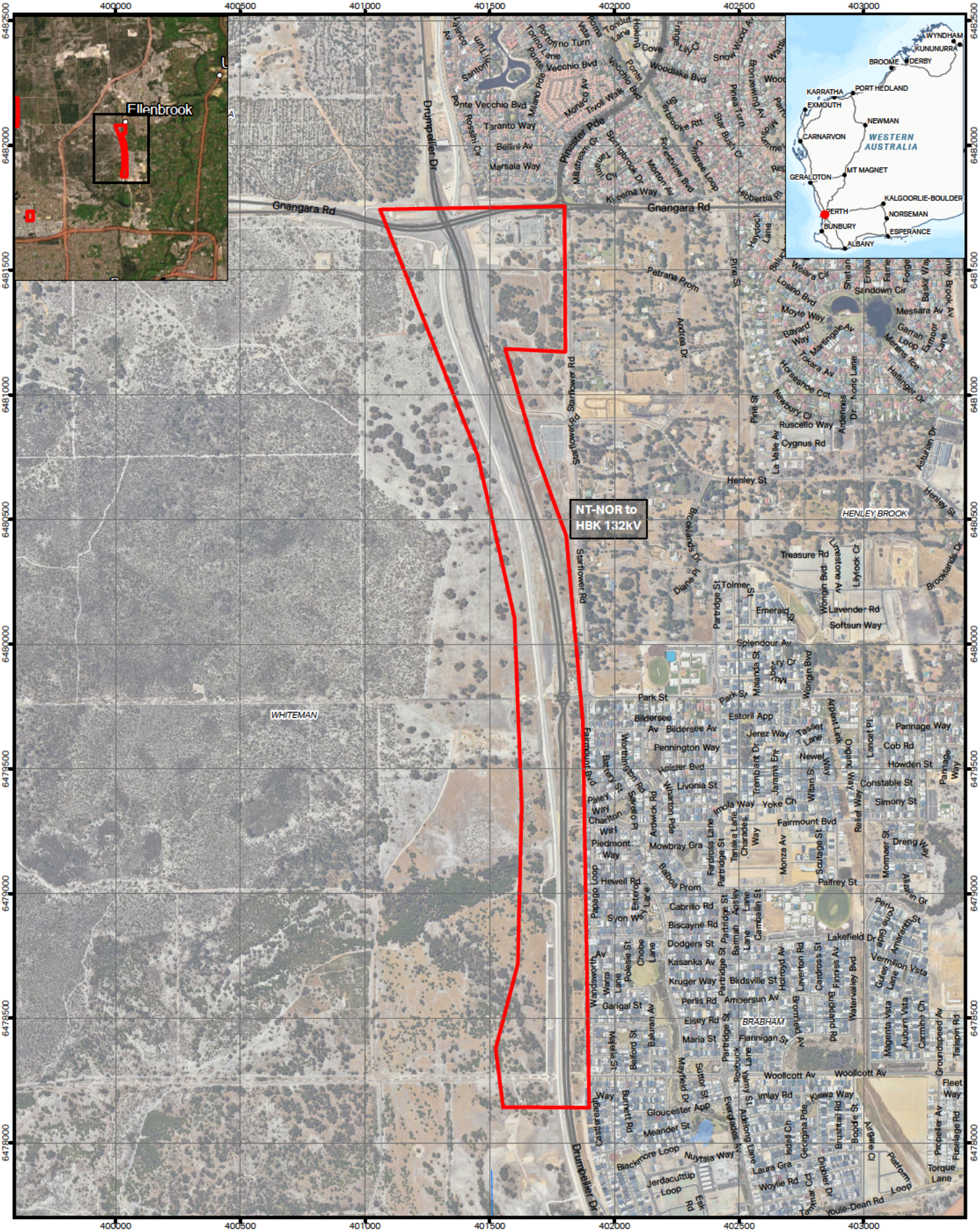
NT-NOR to HBK 132kV
Ellenbrook
WYNDHAM
KUNUNURRA
BROOME
DERBY
KARRATHA
PORT HEDLAND
EXMOUTH
NEWMAN
CARNARVON
WESTERN AUSTRALIA
MT MAGNET
GERALDTON
KALGOORLIE-BOULDER
PERTH
NORSEMAN
BUNBURY
ESPERANCE
ALBANY
Gnangara Rd
Drumpellier Dr
Pinnaster Pde
Starflower Rd
Petrana Prom
Andras Dr
Henley St
HENLEY BROOK
Brooklands Dr
Treasure Rd
Cygnus Rd
Softsun Way
Lavender Rd
Park St
WHITEMAN
Bildersee Av
Pennington Way
Livonia St
Fairmount Blvd
Constable St
Simony St
Howden St
Cob Rd
Pannage Way
Estoril App
Jerez Way
Palfrey St
Cabrillo Rd
Biscayne Rd
Dodgers St
Kasanka Av
Kruger Way
Perlis Rd
Amherst Av
Elsey Rd
BRABHAM
Maria St
Flannigan St
Woollcott Av
Imlay Rd
Kiewa Way
Gloucester App
Meander St
Blackmore Loop
Nuytsia Way
Jerdacuttup Loop
Youle-Dean Rd
Lakefield Dr
Vermilion Vista
Magenta Vista
Auburn Vista
Carmine Ch
Groundspeed Av
Talisman Rd
Fleet Way
Torque Lane
Propeller Av
Fuselage Rd
Platform Loop
Dibbler Dr
Laura Gra
Georgina Pde
Brushtail Rd
Boodie St
Avgas Cl
Woylie Rd
Tammar Crt
Imlay Rd
Sutton St
Mayfield Dr
Bartlett Rd
Belford St
Wandsworth Av
Garigal St
Chobe Lane
Polesie St
Partridge St
Fairmount Blvd
Starflower Rd
Drumpellier Dr
Gnangara Rd
Ponte Vecchio Blvd
Taranto Way
Bellini Av
Marsala Way
Woodlake Blvd
Tivoli Walk
Monaco Av
Milano Pde
Torino Lane
Portofino Turn
Santorini Lane
Valinco Av
Rosalin Cir
Sandstrom Dr
Millstream Gr
Tarawa Cl
Forestview Blvd
Merton Av
Kiyeema Way
Cypress Loop
Star Bush Cl
Pinara Turn
Sylvabrooke Rtt
Hibbertia Pl
Haydock Lane
Welara Cir
Losano Blvd
Moyle Way
Bayard Way
Martingale Av
Tokara Av
Horseshoe Cct
Newbury Cir
Ruscello Way
La Valle Av
Pine St
Ardennes Dr
Horic Lane
Sendown Cir
Messara Av
Garran Loop
Exmoor Lane
Merams Tce
Haflinger Dr
Asturian Dr
Henley St
Treasure Rd
Limestone Av
Lilylock Cr
Wongin Blvd
Lavender Rd
Softsun Way
Splendour Av
Tolmer St
Emerald St
Diana Pl
Partridge St
Park St
Mianda St
Mundaring Cr
Wongin Blvd
Bildersee Av
Estoril App
Jerez Way
Tasset Lane
Airpeat Link
Lancet Pl
Pannage Way
Cob Rd
Howden St
Constable St
Simony St
Relief Way
Yoke Ch
Newel Way
Wiran St
Trembant Dr
Jarrahs Dr
Pennington Way
Bildersee Av
Worthington Rd
Barney St
Fairmount Blvd
Livonia St
Heicter Blvd
Wharton Pde
Ardwick Rd
Savage Pl
Paley Way
Chanton Way
Piedmont Way
Mowbray Gra
Imola Way
Tanaka Lane
Charades Way
Fairmount Blvd
Monza Av
Soutage St
Fairbridge St
Partridge St
Hewell Rd
Papago Loop
Estoril Lane
Syon Ws
Cabrillo Rd
Biscayne Rd
Dodgers St
Kasanka Av
Kruger Way
Perlis Rd
Amherst Av
Elsey Rd

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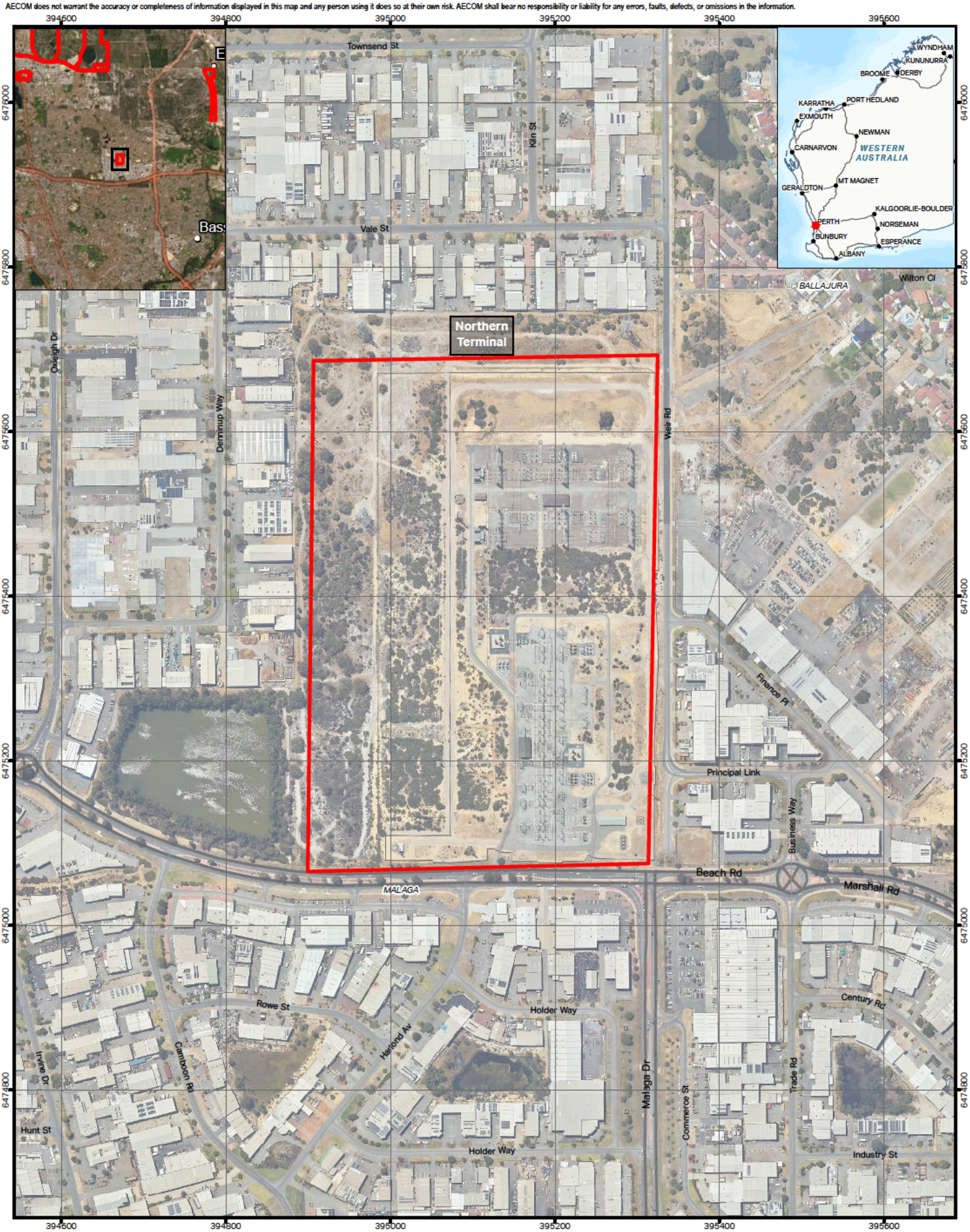

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0 50 100 metres

GDA2020 MGA ZONE 50

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LEGEND

Survey Area

Survey Area - Northern Terminal

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **1.6**

A4 size

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Layout: G60713462_Fig1_NREP_South_SurveyArea_A4P_v1, Last exported: 20/05/2024 10:08 AM

2.0 Existing Environment

2.1 Climate

All survey areas occur north of the Perth CBD within the Perth Metropolitan Region. 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 Wanneroo Station (Station Number 009105), located approximately 5.5km from the centre of the Survey Area (Gnangara Lake). Temperature data was obtained from Pearce RAAF WA (Station Number 009053), located approximately 18.7km from Gnangara Lake. These stations represent the closest mid-point to all survey areas, thus representing average conditions across all areas. The long-term rainfall and temperature data is compared against data from November 2023 to December 2022 in Figure 2 (BOM, 2023), to determine if climatic conditions posed a constraint to the survey.

The survey was undertaken across multiple days, from 16 to 20 of October and 6 to 8 of November in 2023. This followed a year of below average rainfall, with a total of 550.2 mm recorded, 241.2mm less than the long-term average of 791.4 mm. Rainfall was particularly low across the late spring and summer months (October to February). Lower than average rainfall did not appear to affect the germination of annual species, with ample present during the field survey which were confidently identified in the field or at the herbarium.

Maximum temperatures were higher for eight of the ten months, relative to the long-term average prior to the survey. Minimum temperatures varied less from the long-term average, with three months experiencing lower than average minimum temperatures. For both months of the field survey, as well as the month prior to the survey, both minimum and maximum temperatures exceeded the long-term 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, however as habitat assessments were conducted this does not have a significant impact on the survey efforts.

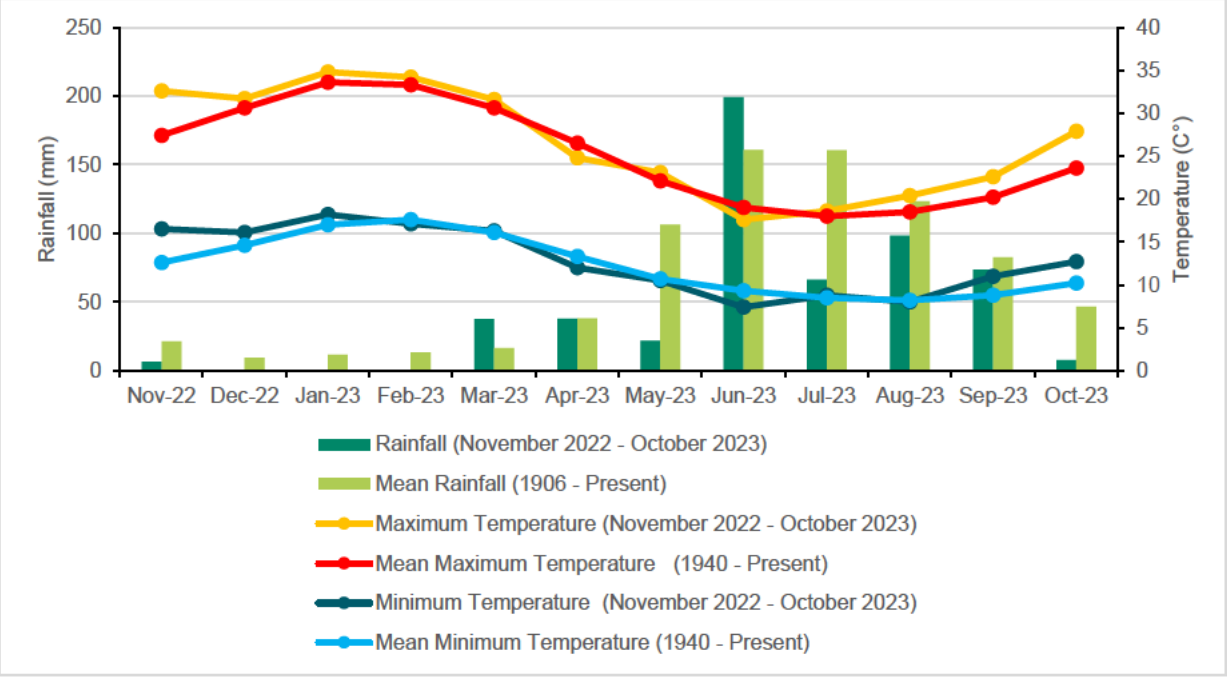

Figure 2 Rainfall data from Wanneroo Station (Station Number 009105) and temperature data from Pearce RAAF WA (Station Number 009053) (BOM, 2023).

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 is situated within the Swan Coastal Plain IBRA Region.

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. Extensive clearing has occurred on the Swan Coastal Plain for urban and agricultural development.

The Swan Coastal Plain subregion, described by Mitchell et al. (2002), is a low-lying coastal plain covered with woodlands dominated by Banksia or Tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperbark in swampy areas. The area includes a complex series of seasonal wetlands and includes Rottnest, Carnac and Garden Islands. Land use is predominantly cultivation, conservation, urban and rural residential. The area contains a number of rare features including Holocene dunes and wetlands and a large number of threatened species and ecological communities.

2.3 Soil Landscape Mapping

The survey is situated across four land systems. A depiction of the soil landscape of the survey areas can be found in Figure 3 and Table 2.

Table 2 Soil Landscape mapping systems

Soil System	Description	Padbury-Wangara	Neerabup Terminal and East Wanneroo	NT-NOR to HBK 132kV	Northern Terminal	Pinjar Terminal
Spearwood System	Sand dunes and plains on yellow deep sands, pale deep sands and yellow/brown shallow sands.	Occurs across the majority of the west of survey area	Small patch intersects land system	NA	NA	NA
Quindalup System	Coastal dunes of the Swan Coastal Plain, with calcareous deep sands and yellow sands with coastal scrub.	Intersects with western most portion of survey area	NA	NA	NA	NA
Bassendean System	Sand dunes and sandplains with pale deep sand, semi-wet and wet soils with Banksia-Paperbark woodlands and mixed heathlands.	NA	Occurs across majority or all of the survey area			
Pinjarra System	Poorly drained coastal plain with variable alluvial and aeolian soils. Vegetation is variable and includes Jarrah, Marri, Paperbark, Sheoak and Flooded Gum.	NA	NA	NA	Intersects with southern extent of survey area	NA

2.4 Geology

The survey area is situated across five geological systems. These are described below in Table 3. A depiction of the soil landscape of the survey areas can be found in Figure 4.

Table 3 Geological systems of the Survey Area

Code	Description	Padbury-Wangara	Neerabup Terminal and East Wanneroo	NT-NOR to HBK 132kV	Northern Terminal	Pinjar Terminal
Qpb	Quartz sand, fixed dunes		X	X	X	X
Qrw	Swamp and lacustrine deposits-peat, peaty sand and clay	X	X	X		
Qpcs	Predominantly quartz sand	X	X			
Qpck	Predominantly calcarenite and kankar	X				
Qrs	Eolian and beach lime sand, slightly lithified	X				

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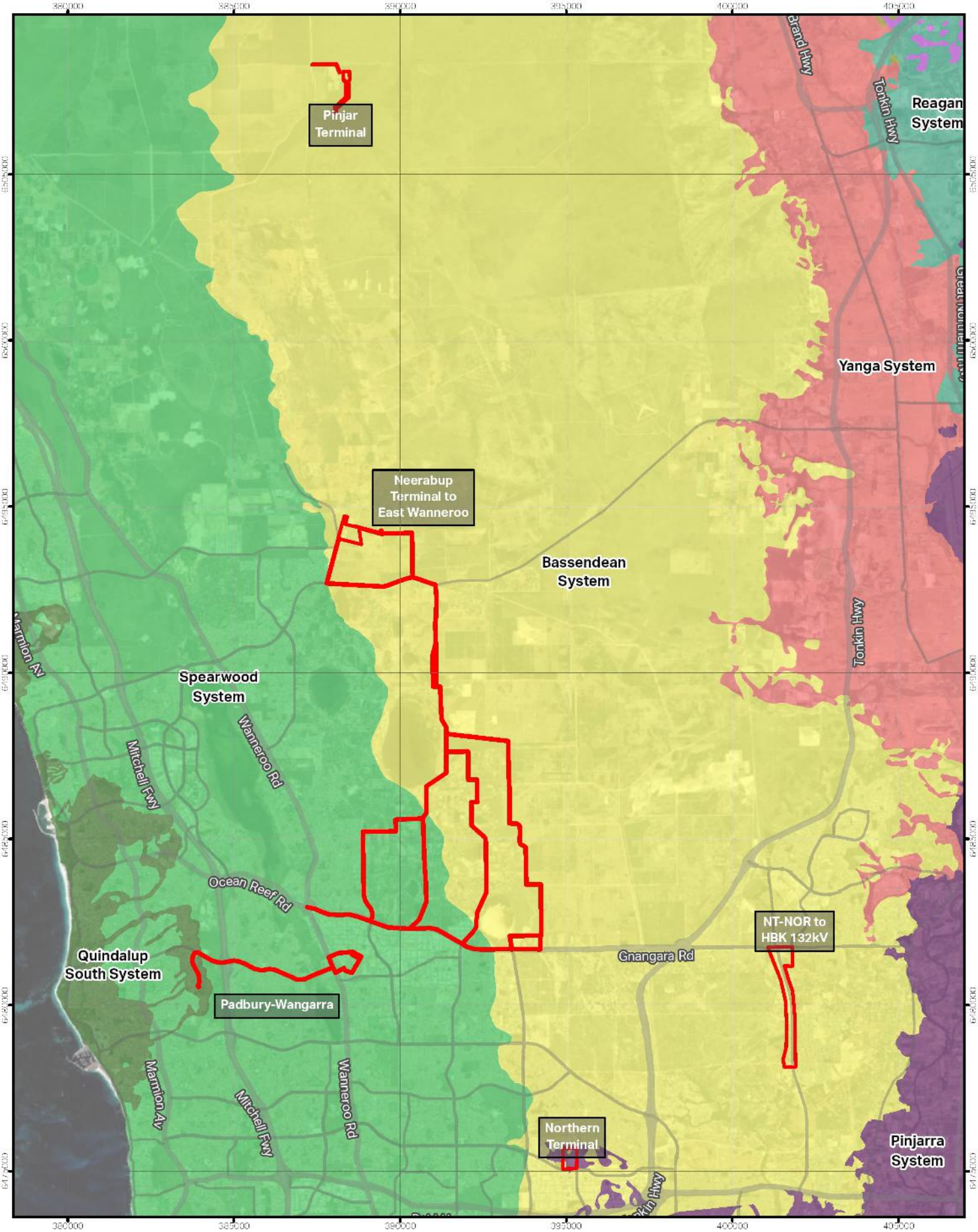

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CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- Soil Landscape Mapping - Systems (DPIRD-064)
  - Bassendean System
  - Coonambidgee System
  - Mogumber System
  - Pinjarra System
  - Quindalup South System
  - Reagan System
  - Spearwood System
  - Yanga System

Land Systems

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **3**

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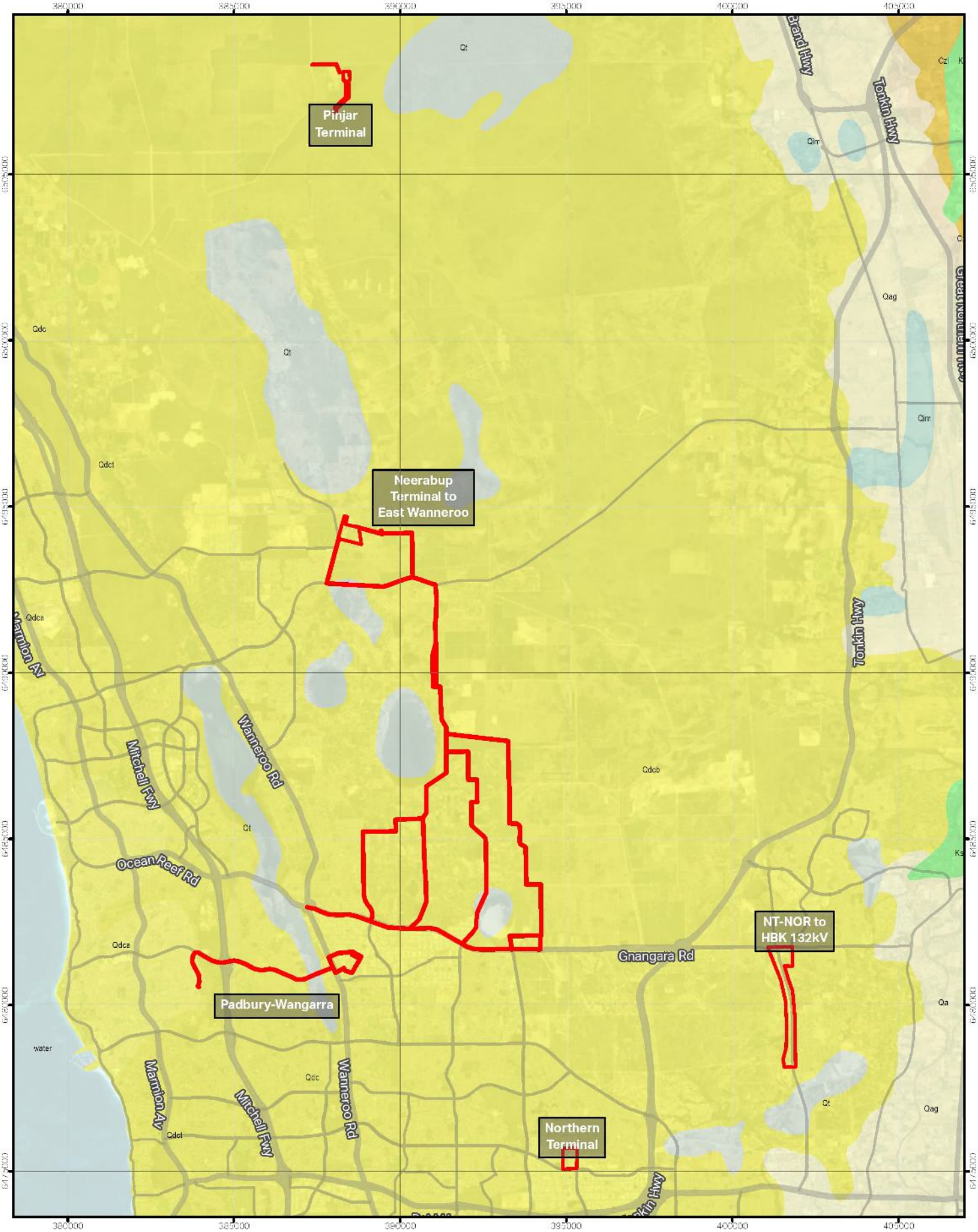

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km
GDA2020 MGA ZONE 50

LEGEND

Survey Area

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

water

QUATERNARY
Qa
Qag
Qdc
Qdca
Qdcb
Qdct
Qim
Qt

CENOZOIC
Czl
Czs

CRETACEOUS
Ksco

Geology and Soils

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
4

A4 size

2.5 Vegetation

Beard et al. (2013) mapping is used to determine the current extent of remnant vegetation remaining when compared to pre-European vegetation extent. The survey areas span eight Vegetation Associations within three Local Government Areas (LGAs), described below in Table 4 and depicted in Figure 5.

Table 4 Beard et al (2013) Vegetation Associations and Percentage Remaining (Govt. of WA, 2019).

Vegetation Association	Description	Percentage Remaining (%)				
		WA	SCP	City of Wanneroo	City of Joondalup	City of Swan
Padbury-Wangara						
6	Medium woodland; tuart & jarrah	23.72	23.72	21.94	14.24	
37	Shrublands; Teatree thicket	62.92	34.61	47.60	51.58	
998	Medium woodland; tuart	36.25	36.35	60.13	9.62	
1007	Mosaic: Shrublands; *Acacia lasiocarpa* & *Melaleuca acerosa* heath / Shrublands; *Acacia rostellifera* & *Acacia cyclops* thicket	68.05	68.68	59.94	8.03	
Pinjar Terminal						
949	Low woodland; banksia	56.42	57.28	46.30		
Neerabup Terminal and East Wanneroo						
949	Low woodland; banksia	56.42	57.28	46.30		
6	Medium woodland; tuart & jarrah	23.72	23.72	21.94		
1001	Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina	22.05	22.05	22.71		
126	Bare areas; freshwater lakes	40.72	23.61	36.24		
NT-NOR to HBK 132kV						
1018	Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low Forest; Teatree / Low woodland; *Casuarina obesa*	17.39	17.39			16.42
1001	Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina	22.05	22.05			26.18
Northern Terminal						
1001	Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina	22.05	22.05			26.18

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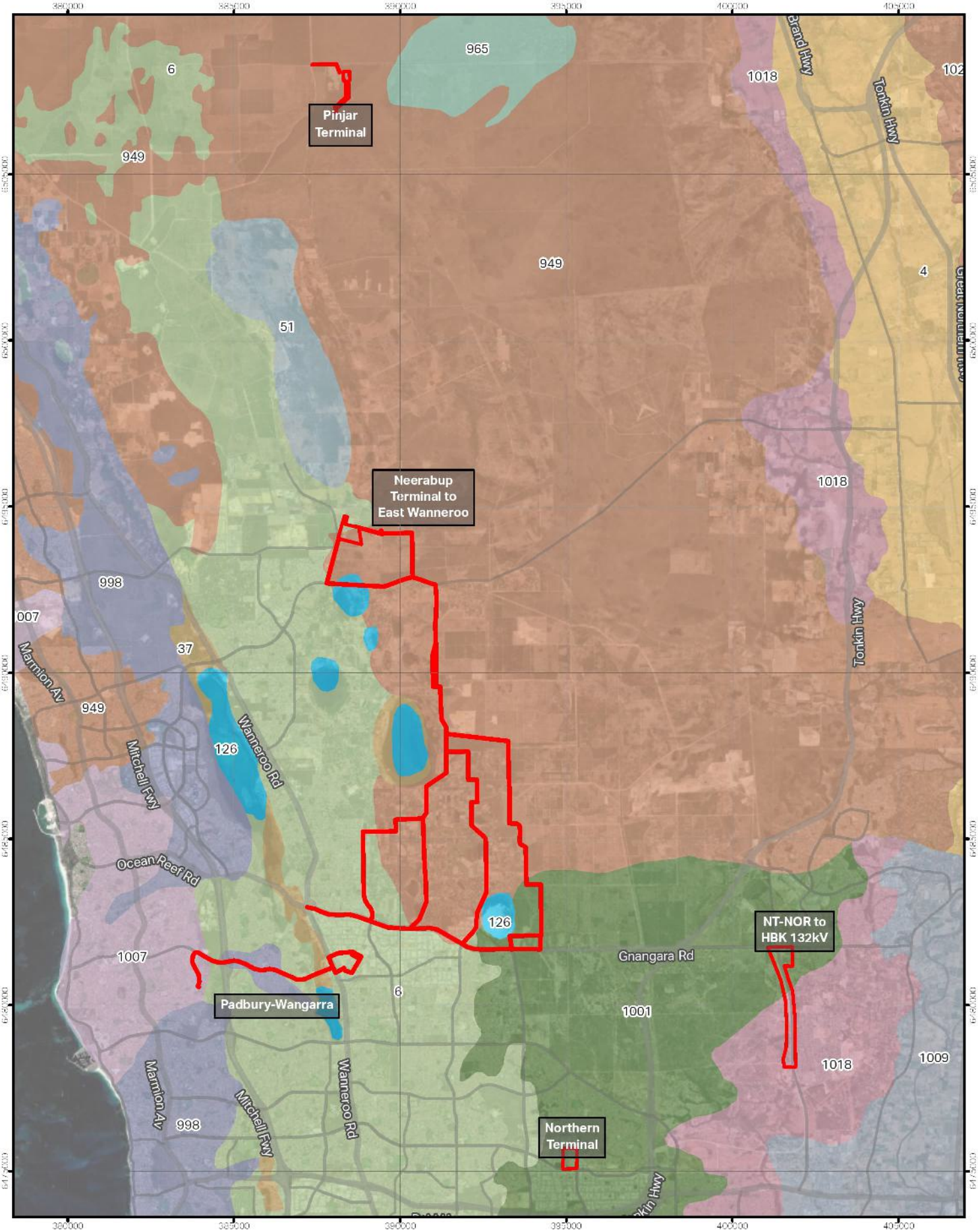

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GDA2020/MGA ZONE 50

LEGEND

- Survey Area
- *Only those Intersecting Survey Areas shown in legend*
- 949,Low woodland or open low woodland,Other acacia, banksia, peppermint, cypress pine, casuarina. York gum Acacia spp., Banksia spp., Agonis flexuosa. Callitris spp., Allocasuarina spp., Eucalyptus loxophleba.
- 6,Woodland southwest Jarrah, marri and wandoo Eucalyptus marginata. Corymbia calophylla, E. wandoo.
- 37,Thicket,Wattle, casuarina and teatree acacia-allocasuarina-melaleuca alliance.
- 126,Freshwater lake,
- 998,Woodland southwest Jarrah, marri and wandoo Eucalyptus marginata. Corymbia calophylla, E. wandoo.
- 1001,Low forest, woodland or low woodland with scattered trees,Jarrah, banksia or casuarina Eucalyptus marginata. Banksia spp., Allocasuarina spp.
- 1007,Scrub-heath / Thicket.
- 1018,Woodland / Low woodland / Low forest or Woodland,

Pre-European Vegetation

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **5**

A4 size

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2.6 Conservation Reserves and Environmentally Sensitive Areas

2.6.1 Conservation Reserves

Approximately 104.15 ha of the survey areas occurs within the Class A Gnangara-Moore River State Forest, located on crown land. This State Forest is vested under the Conservation Commission of Western Australia. A further 0.64 ha of the survey areas intersects the gazetted Class A Jandabup Nature Reserve, for the purpose of conservation of flora and fauna, located on crown land. Approximately 0.34 ha of land is classified as Crown Freehold (department managed).

The conservation reserves and the percent of each survey area that they intersect is presented in Table 5 and depicted in Figure 6.

Table 5 Conservation Reserves intersecting the survey areas.

Survey Area	Conservation Reserve Intersected	Area (ha)	Percentage of Survey Area (%)
Neerabup Terminal and East Wanneroo	Gnangara-Moore River State Forest	99.30	48.44
	Jandabup Nature Reserve	0.64	0.31
Pinjar Terminal	Gnangara-Moore River State Forest	4.85	29.25
Padbury-Wangara	Un-named Crown Freehold land – Represents Bush Forever Site 303.	0.34	1.09

2.6.2 Bush Forever Sites

There are nine Bush Forever Sites that intersect the survey areas (Figure 6). They are listed below:

- Neerabup: Site 193, 463, 327, 326, 324.
- Pinjar: Site 280.
- NT-NOR: Site 304.
- PADBURY - WANGARA: Site 303, 299.

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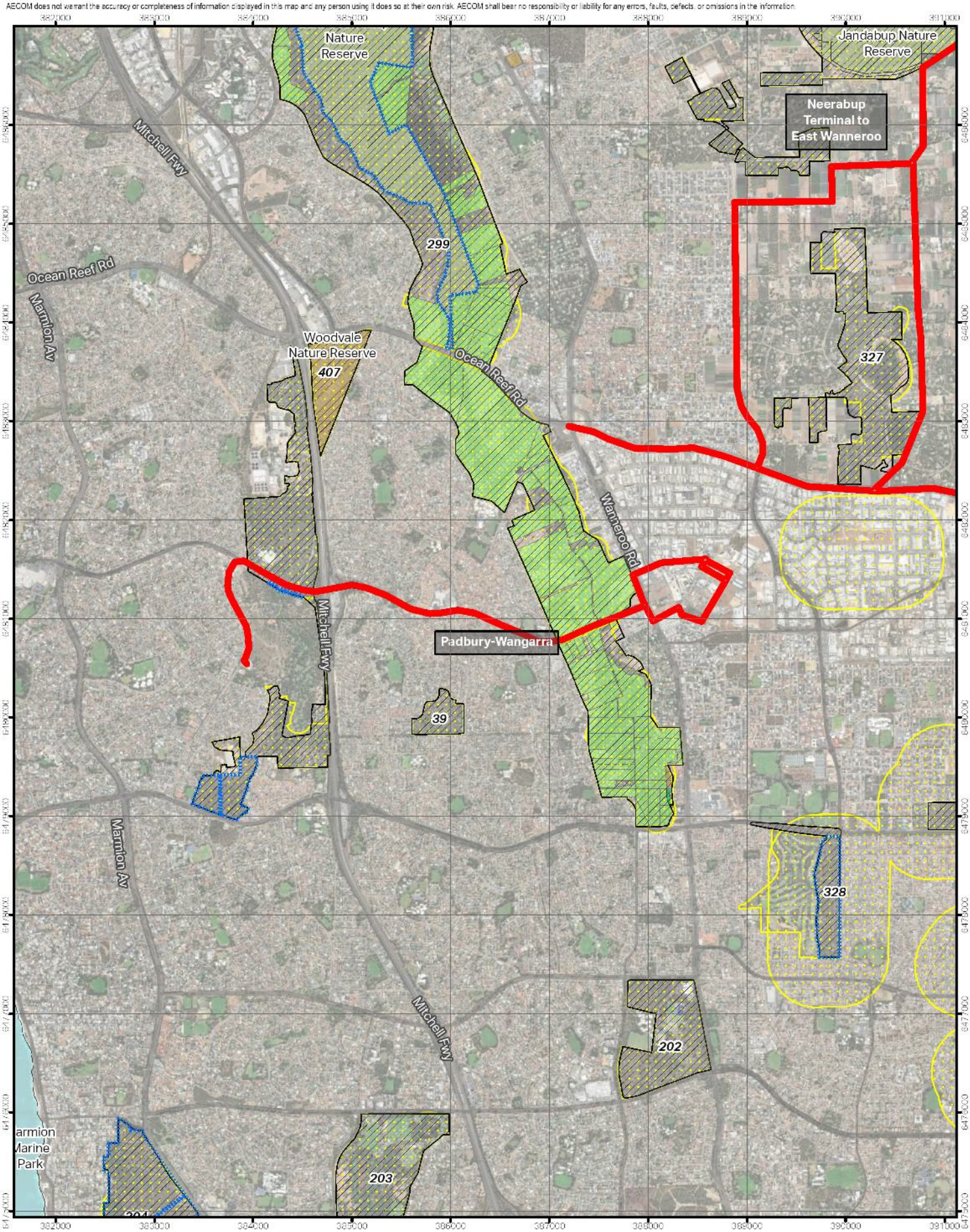

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LEGEND

- Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- Nature Reserve
- Conservation Park
- Section 5(1)(h) Reserve
- Marine Park
- Crown Freehold - Dept Managed
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Bush Forever Areas - 2000 (DPLH-019)
- A Class Reserve

Conservation Reserves, Bush Forever Sites and ESAs

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CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **6.1**

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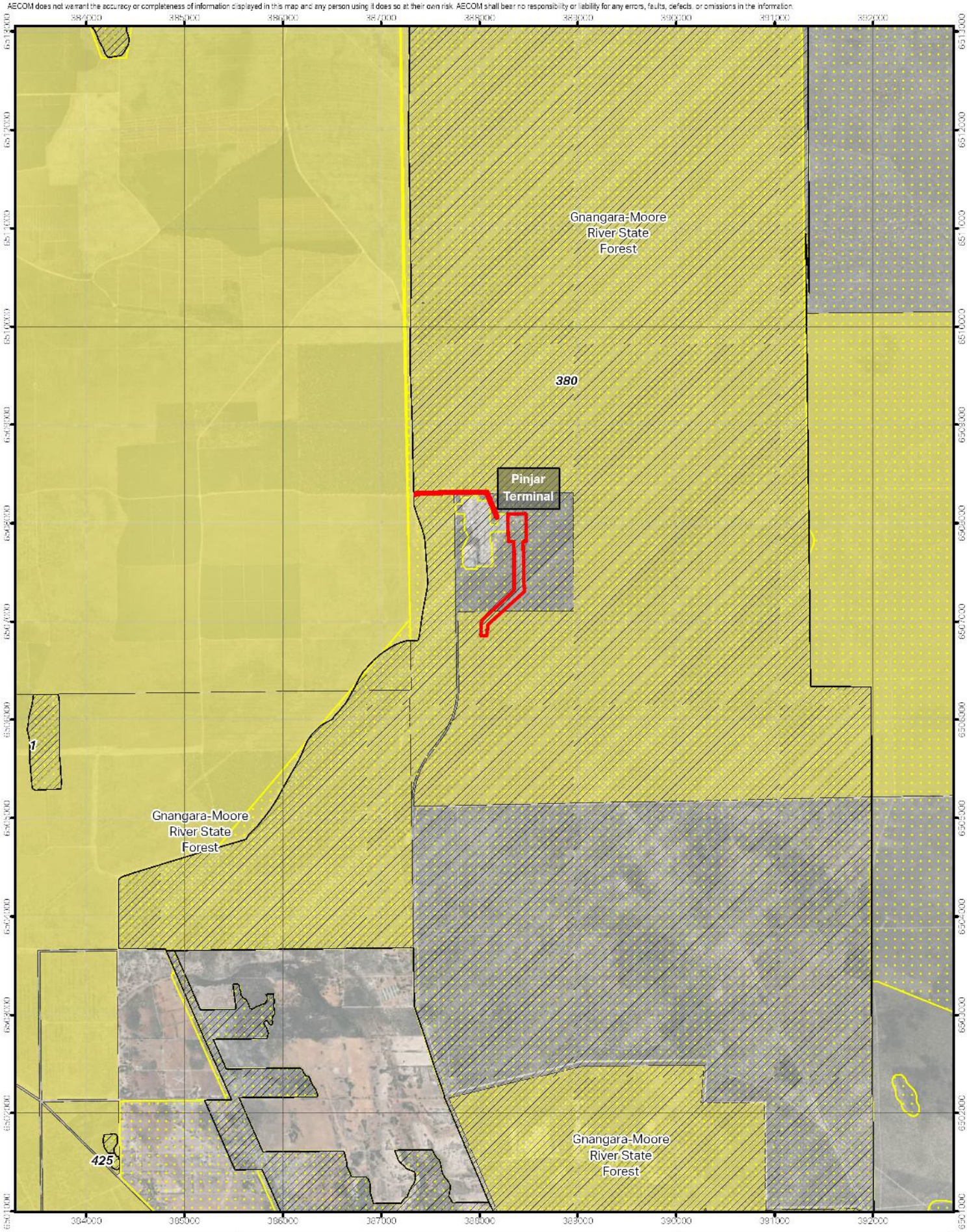

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LEGEND

- Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- State Forest
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Bush Forever Areas - 2000 (DPLH-019)

Conservation Reserves, Bush Forever Sites and ESAs

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CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **6.2**

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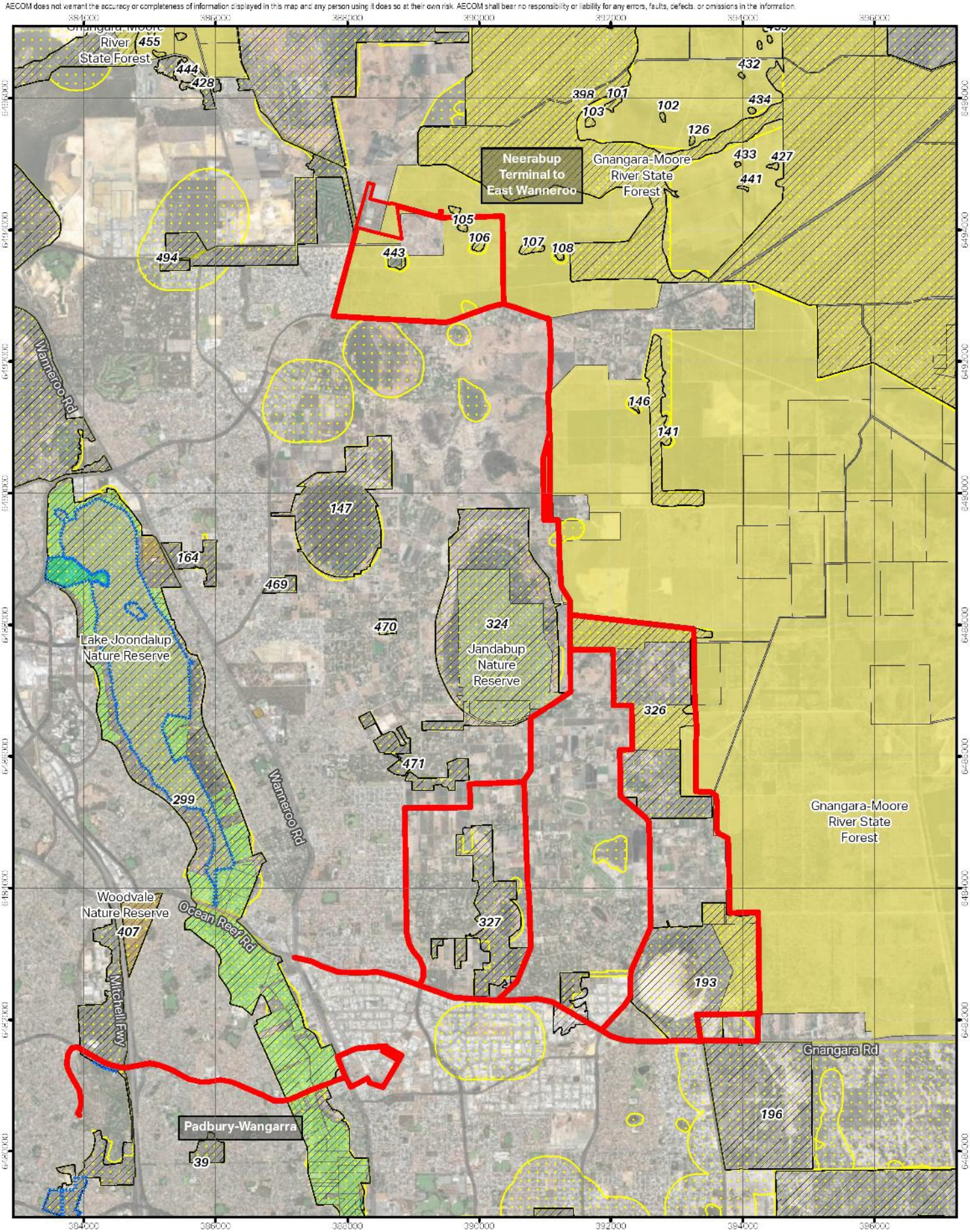

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LEGEND

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

Conservation Reserves, Bush Forever Sites and ESAs

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **6.3**

A4 size

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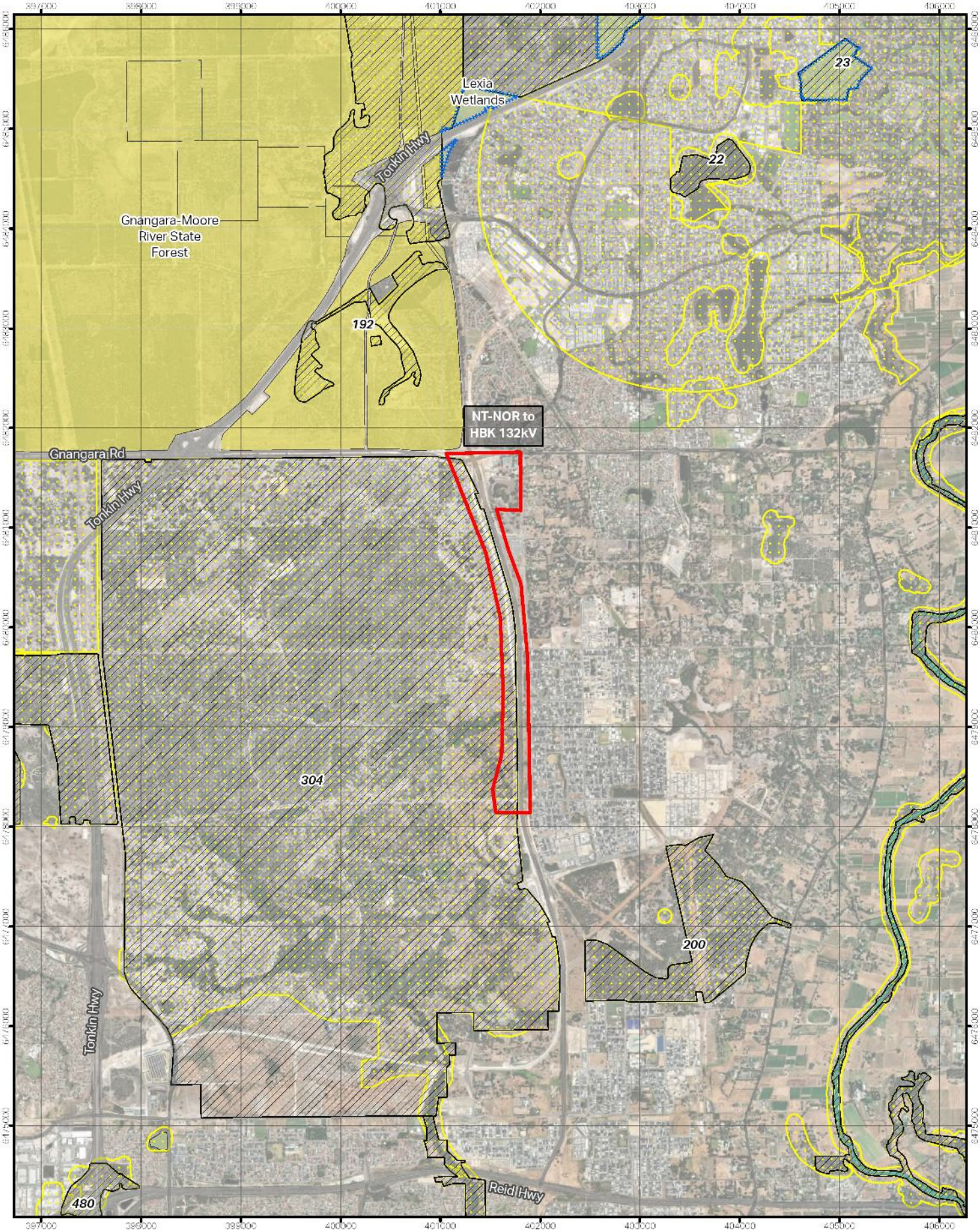

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LEGEND

- Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
  - Nature Reserve
  - State Forest
  - SCRM Act - River Reserve
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Bush Forever Areas - 2000 (DPLH-019)
- A Class Reserve

Conservation Reserves, Bush Forever Sites and ESAs

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **6.4**

A4 size

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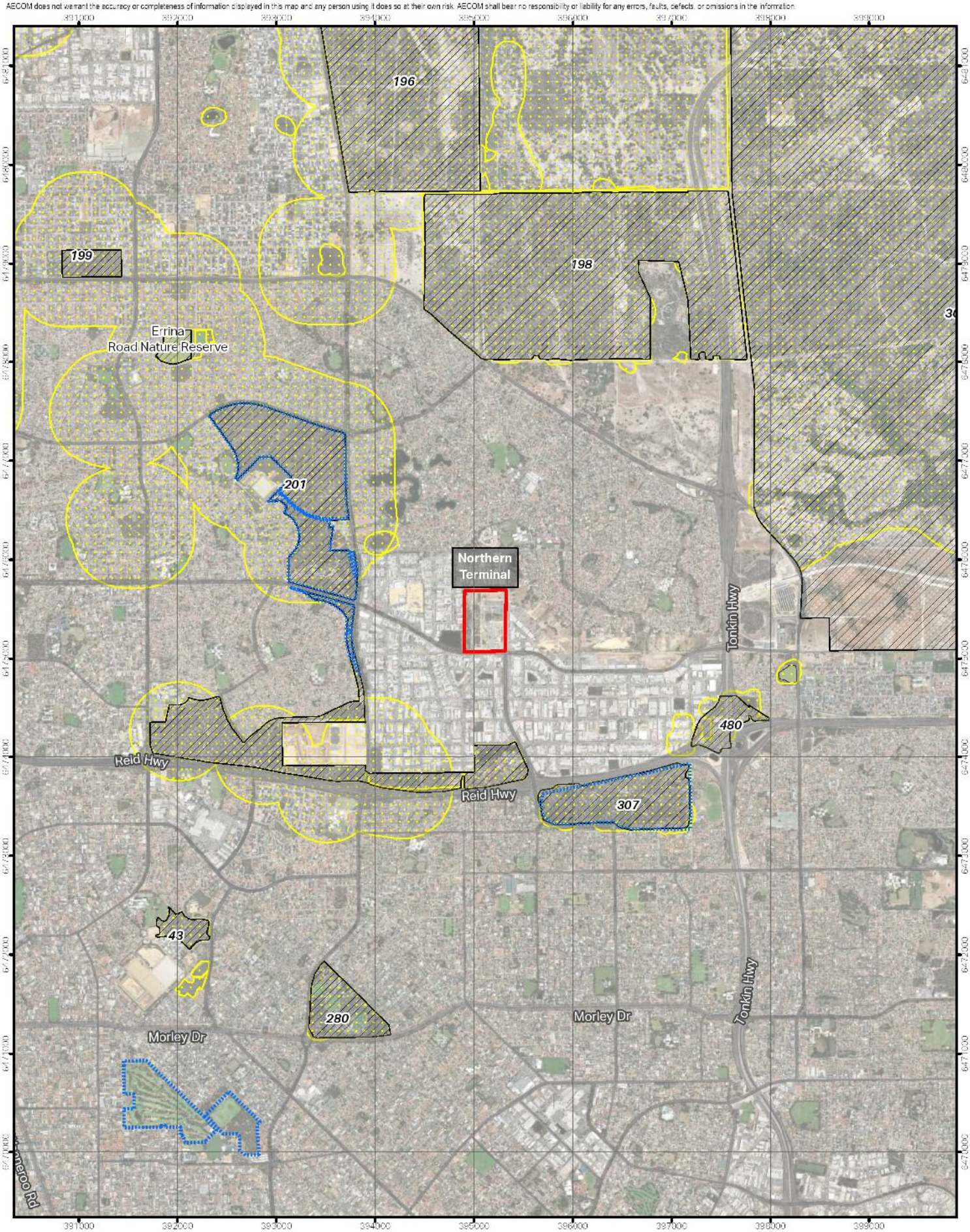

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LEGEND

- Survey Area
- DBCA - Legislated Lands and Waters (DBCA-011)
- Nature Reserve
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Bush Forever Areas - 2000 (DPLH-019)
- A Class Reserve

Conservation Reserves, Bush Forever Sites and ESAs

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **6.5**

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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 and Biodiversity Conservation Act 1999* (EPBC Act) and are categorised as outlined in Table 6.

Table 6 Categories of species listed under Schedule 179 of the EPBC Act

Code	Category
Ex	**Extinct Taxa** A species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild Taxa** A specie which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered Taxa** A specie which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered Taxa** A specie which is not critically endangered, and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable Taxa** A specie which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent Taxa** A specie which at a particular time if, at that time: the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered the following subparagraphs are satisfied: • the species is a species of fish, • the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised the plan of management is in force under a law of the Commonwealth or of a State or Territory cessation of the plan of management would adversely affect the conservation status of the species.
Mi	**Migratory Taxa** The EPBC Act also requires the compilation of a list of migratory species that are recognised under international treaties including the: • Japan Australia Migratory Bird Agreement 1981 (JAMBA) • China Australia Migratory Bird Agreement 1998 (CAMBA) • Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA) • Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals). All migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as a MNES under the EPBC Act.
Ma	**Marine Taxa** A specie 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 7.

Table 7 Conservation codes for WA flora and fauna listed under the BC Act (DBCA, 2019)

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

Species that have not yet been adequately surveyed to warrant being listed under the BC Act, or are otherwise data deficient, are added to a Priority List as Priority 1, 2 or 3 by the state minister for Environment. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are listed as Priority 4. Categories and definitions of Priority Flora and Fauna species are provided in Table 8.

Table 8 Conservation codes for WA flora and fauna as listed By DBCA and endorsed by the Minister for the Environment

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

3.2 Vegetation Communities

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

Communities can be classified as Threatened Ecological Communities (TECs) under the EPBC Act. Categories of EPBC Act listed TECs are described in Table 9.

Table 9 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 10.

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 11.

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

Table 10 Conservation codes for State listed Ecological Communities

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

Table 11 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 (BAM Act)

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 (DP), 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, fauna and vegetation communities. Desktop database searches were requested from the following government databases (including a 10 km radius):

- DBCA Threatened Species and Communities database including Threatened and Priority flora, communities, and Threatened and Priority fauna.
- Western Australian Herbarium (WAH, 1998) records
- EPBC Act Protected Matters Search Tool (PMST)
- BirdLife Australia Black Cockatoo data.

Additional sources utilised included the following reports:

- AECOM, 2016. Ellenbrook Bus Rapid Transit Biological Assessment. Unpublished report prepared for Public Transport Authority of Western Australia.
- AECOM, 2022a. Scar 4 – Flora, Vegetation and Black Cockatoo Assessment. Unpublished report prepared for Western Power.
- AECOM, 2022b. North Region Energy Program - Flora, Vegetation and Fauna Assessment. Unpublished report prepared for Western Power.
- RPS, 2020. Detailed flora and vegetation assessment – METRONET Morley-Ellenbrook Line. Unpublished report prepared for Public Transport Authority of Western Australia.

Significant flora and fauna species likelihood of occurrence was assessed systematically using a point-based system which takes into account proximity (defined as less than 5 km) and date of known records (defined as less than 20 years old), presence within the Local Government Area (LGA) and habitat suitability (Table 12 and Table 13).

Due to the overlapping nature of some survey areas, a centre point was taken to calculate the distance from the Neerabup Terminal and NBT Group and the nearest DBCA records.

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

Table 12 Categories of likelihood of occurrence for flora species

Likelihood of Occurrence	Score	Definition
Known	6	Species is known to occur in the survey area.
High (Likely)	5	Not known to occur in the survey area however there are records nearby and suitable habitat for the species is known or likely to be present within the survey area.
Moderate (Possible)	4 (if suitable habitat is known to be, or likely to be present) 3 (if suitable habitat may be present within the survey area)	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).

Likelihood of Occurrence	Score	Definition
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 13 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 Survey

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 Cassandra House (collection permit FB62000118-2) assisted by Environmental Scientist Nina Sergeev (collection permit FB62000544) and Graduate Environmental Scientists Deborah Robinson and Beau Eaton. Cassandra has over 8 years' experience undertaking flora and vegetation assessments. Cassandra completed a Bachelor of Science in Conservation Biology and Environmental Science and a Master of Science in Conservation Biology.

The survey was undertaken across multiple days in October (16/10-20/10) and November (6/11-17/11) in 2023. Floristic data was collected from 16 quadrats, 21 Relevés, and multiple observation points as well as 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 Keighery (2012) SCP dataset was used for the Floristic Community Type (FCT) analysis. The survey data was reconciled with this dataset and analysis was undertaken using Primer-e.

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 (Government of WA, 2000).

FCT analysis was undertaken using methods recommended by DBCA. That is, one quadrat was incorporated into the dataset at a time, and a resemblance matrix was produced. For a dataset of this size, finding the SCP quadrats it most closely resembles seems a reasonable method of inferring FCTs. Some issues that are constantly encountered with inferring FCTs include:

- Survey effort is not comparable between a single visit for Projects and multi-seasonal and ongoing survey effort.
- Nomenclature of the 2012 Keighery and 1994 Gibson dataset have been superseded. It is often times not possible to accurately align species with their former phrase names. Some have split into multiple species; others have been grouped together. This includes complexes such as *Thysanotus patersonii/manglesianus, Hibbertia hypericoides, Hemiandra incana,* to name a few.
- The validity of original clustering and grouping method is dubious. Often a quadrat will resemble a variety of FCTs within a supergroup.
- FCTs are mapped at a larger scale compared to project datasets.
- New FCTs are not considered, one is therefore forced to select the nearest neighbour / closest resemblance which may or may not be accurate.

Furthermore, in some instances it is not accurate to extrapolate the inferred FCT from the point data across an entire community. This again represents a scale issue.

4.2.2 Banksia Woodlands TEC Mapping

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.

4.2.3 Tuart Woodlands TEC Mapping

The Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC was assessed using the Approved Conservation Advice (DEE, 2019). All mature Tuart trees with a Diameter at Breast Height (DBH) of 15 cm or more were captured with a hand-held GPS unit. A 5 m canopy buffer was applied, followed by the 30 m buffer that depicts the edge of a discreet patch. Each patch was represented by at least one relevé or quadrat to inform the condition assessment.

Each patch was assessed against the key diagnostic characteristics:

- Occurs on the Swan Coastal Plain Bioregion, Western Australia.
- Primarily occurs on the Spearwood and Quindalup dune systems but can on Bassendean dunes and Pinjarra Plain. Can occur on banks of rivers and wetlands.
- Presence of at least two living established *E. gomphocephala* trees in uppermost canopy layer, although they may co-occur with trees of other species. There is a gap of no more than 60 m between the outer edges of the canopies of adjacent Tuart trees (single-stemmed or mallee growth form).
- Occurs as woodland or forest, open forest, woodland, open woodland and various mallee forms.
- Other canopy or sub-canopy species may be present including *Agonis flexuosa, Banksia grandis, Banksia attenuata, Eucalyptus marginata, Corymbia calophylla, Banksia menziesii* and *Banksia prionotes*.

The condition and size thresholds pertain to patches smaller than 5 ha, outlined in Table 14.

Table 14 Condition categories and thresholds for the Tuart Woodland TEC

Patch Size	≥2 ha <5 ha	≥0.5 ha <2 ha
Biotic Thresholds		
Very high condition ≥80 % of all understorey^ vegetation cover is native# Or At least 12 native understorey^ species per 0.01 ha (10x10 m)	Medium sized patches with very high condition understorey. Considered TEC	Smaller patches with very high condition understorey. Considered TEC
High condition ≥60 % of all understorey^ vegetation cover is native# Or At least 8 native understorey^ species per 0.01 ha (10x10 m)	Medium sized patches with high condition understorey. Considered TEC	Smaller patches with high condition understorey. AND That either: have an important landscape role (≤100 m to native vegetation)* OR have a habitat role (≥2 very large trees per 0.5 ha)* OR show regeneration (≥15 seedlings and/or saplings per 0.5 ha)* Considered TEC
Moderate condition ≥50 % of all understorey^ vegetation cover is native# Or	Smaller patches with high condition understorey.	Not the TEC but may be a focus for local protection or restoration

Patch Size	≥2 ha <5 ha	≥0.5 ha <2 ha
Biotic Thresholds		
At least 4 native understorey^ species per 0.01 ha (10x10 m)	AND That either: have an important landscape role (≤100 m to native vegetation)* OR have a habitat role (≥2 very large trees per 0.5 ha)* OR show regeneration (≥15 seedlings and/or saplings per 0.5 ha)* Considered TEC	
Poor Has minimal or no native cover and species richness. That is: <50 % of all understorey^ vegetation cover is native# And Less than 4 native understorey^ species per 0.01 ha (10x10 m)	Not the TEC but may be a focus for local protection or restoration	Not the TEC but may be a focus for local protection or restoration

4.2.4 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.

4.3 Fauna Survey

A basic fauna survey was conducted in accordance with *Technical Guidance – Terrestrial Fauna Surveys* (EPA, 2020). The fauna survey was conducted in conjunction with the detailed flora and vegetation survey in October and November 2023. Conducting the two surveys concurrently enabled consistent and clear mapping of the fauna habitats and vegetation communities.

Fauna habitats were assessed for specific habitat components, including consideration of structural diversity and refuge opportunities for fauna, to determine the potential for these habitats to support conservation significant species. Eighteen detailed habitat assessments were completed throughout the survey area. The fauna habitat assessments include:

- location
- general habitat description
- habitat condition and disturbance types
- dominant / characteristic flora species and vegetation layers

- presence and abundance of key habitat features such as large mature trees, small and large hollows, fallen logs, course and fine litter, decorticating bark, bare ground, grass, stones and boulders, rock crevices, soil cracks, vines, dense shrubs, water bodies etc.
- presence of fauna and secondary signs (e.g. scats, diggings, tracks, burrows, eggshells, bones, feathers, etc.)
- connectivity of habitat.

The fauna survey primarily focused on mapping of fauna habitat and searching for the evidence of presence of conservation significant fauna. Other data recorded included observations (direct and indirect) of fauna species present. This can include distinctive calls, scats, tracks and diggings. All observations were made between daylight hours of 0700 and 1700. Attention was given to searching for conservation significant species identified in the desktop assessment as having the potential to occur in the area. Nomenclature adheres to the Checklist of Terrestrial Vertebrates of Western Australia (WAM, 2023).

4.4 Targeted Black Cockatoo Survey

The survey targeted all three Threatened Western Australian black cockatoo species which are Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest-Red-tailed Black Cockatoo. Breeding, foraging and roosting assessments were completed in the survey areas. Methodologies for these assessments have been developed based on the current EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (DAWE, 2022).

4.4.1 Breeding Habitat

Breeding habitat was assessed by quantifying the number of trees that have the potential to form hollows (based on their diameter at breast height [DBH]), and those with potentially suitable hollows). Any hollow forming native eucalypts with a DBH > 500 mm was assessed, their location, species, and hollow presence were recorded.

Potential breeding trees are categorised as follows:

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

Hollows are considered potentially suitable when the entrance hole is above a size of 10 cm in diameter and the hollow appears to continue inwards to reach a hollow with a base size greater than 30 cm. Tree hollow presence and suitability is assessed from ground level with the use of binoculars. Suitability and utilisation by black cockatoos cannot always be assessed adequately at ground level, and hence the Precautionary Principle is used where appropriate.

4.4.2 Roosting Habitat

An assessment of roosting habitat was conducted during the field surveys. This includes consideration of preferred roosting habitat and features such as water sources, tall trees, specific tree species as defined in the Referral Guidelines.

4.4.3 Foraging Habitat Potential

Two foraging habitat scoring methods were applied including the DAWE (2022) scoring tool and the more detailed BCE (2020) scoring tool. Both tools consider native vegetation, proximity of known breeding, roosting and foraging habitat, and field observations such as foraging evidence.

The DAWE (2022) Referral Guideline scoring tool defines one foraging score for an entire survey area. All areas of vegetation that support suitable foraging species (defined in Table 15), are automatically assigned a score of 10. Following this, several detractors are considered to inform the final score. Survey areas that do not support any of these, are considered to have no foraging value. Plant disease was assessed during the vegetation and flora assessment. All notable signs of disease were recorded, and the impact of the disease was assessed. If the disease impacts over 50% of the preferred food or plant species, deductions were taken from the foraging score.

Table 15 Black Cockatoo foraging quality tool from the Federal guidelines (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**	

The Bamford Consulting Ecologists (BCE, 2020) scoring tool considered the prevalence of suitable favoured foraging species, referred to as site condition, and site context and species stocking rate. This enables the differentiation between areas of vegetation that represent high quality foraging habitat based on potential actual use now and in the future.

Site condition is outlined in Table 17 and is the starting point. Any areas that score higher than '2' will then be further assessed for site context and species stocking rate. Site context is a function of site size, availability of nearby habitat and the availability of nearby breeding areas (Table 16). For this assessment, 'local area' is defined as within a 15 km radius of survey area. This is greater than the maximum distance of 12 km known to be flown by Carnaby's Black-Cockatoo when feeding chicks in the nest. For linear corridors this may over-value some areas.

Table 16 Site context weighting

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

Next, a species stocking rate score is applied. Species stocking rate is described as "the usage and/or density of a species at a particular site" in the offsets guide. Assignation of the species density score (0 or 1) is based on the Black-Cockatoo species being either abundant (score of 1) or not abundant (score of 0).

BCE tool scoring is transposed into one of the following categories:

- 0: None.
- 1: Negligible.
- 2: Low.
- 3: Low to Moderate.
- 4-6: Moderate.
- 7: Moderate to High.
- 8-10: High

Table 17 Site condition described by BCE.

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

Site Score	Description of Vegetation Values		
	Carnaby's Black Cockatoo	Baudin's Black Cockatoo	Forest Red-tailed Black Cockatoo
3	Low to Moderate foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have 10-20% projected foliage cover; • Woodland with tree banksias 5-20% projected foliage cover; • Eucalypt Woodland/Mallee of small-fruited species; • Eucalypt Woodland with Marri < 10% projected foliage cover	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri) 5-20% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri and Jarrah) 5-20% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).
4	Moderate foraging value. Examples: • Woodland/low forest with tree banksias (of key species B. attenuata and B. menziesii) 20-40% projected foliage cover; • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 20-40% projected foliage cover; • Eucalypt Woodland/Forest with Marri 20-40% projected foliage cover.	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths. • Eucalypt Woodland/Forest with diverse, healthy understorey and known food trees (especially Marri) 10-20% projected foliage cover. • Orchards with highly desirable food sources (e.g. apples, pears, some stone fruits).	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with 40-60% projected foliage cover.

Site Score	Description of Vegetation Values		
	Carnaby's Black Cockatoo	Baudin's Black Cockatoo	Forest Red-tailed Black Cockatoo
5	Moderate to High foraging value. Examples: • Banksia Low Forest (of key species B. attenuata and B. menziesii) with 40-60% projected foliage cover; • Banksia Low Forest (of key species B. attenuata and B. menziesii) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Pine plantations with trees more than 10 years old (but see pine note below in moderation section).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths.	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths. • Sheoak Forest with > 60% projected foliage cover.
6	High foraging value. Example: Banksia Low Forest (of key species B. attenuata and B. menziesii) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).

Vegetation structural class terminology follows Keighery (1994).

4.5 Survey Limitations

Limitations of the survey are discussed in Table 18. No limitations were identified that would influence the outcome of the flora, vegetation and black cockatoo surveys.

Table 18 Limitations considered for the biological assessment.

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) and Gibson et al (1994) Swan Coastal Plain data was used for FCT analysis. Additional reports for the surrounding area were also used to inform the assessment, including: • AECOM, 2016. Ellenbrook Bus Rapid Transit Biological Assessment. Unpublished report prepared for Public Transport Authority of Western Australia. • AECOM, 2022a. Scar 4 – Flora, Vegetation and Black Cockatoo Assessment. Unpublished report prepared for Western Power. • AECOM, 2022b. North Region Energy Program - Flora, Vegetation and Fauna Assessment. Unpublished report prepared for Western Power. • RPS, 2020. Detailed flora and vegetation assessment – METRONET Morley-Ellenbrook Line. Unpublished report prepared for Public Transport Authority of Western Australia.	**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 field surveys were led by ecologist Cassandra House who has more than 8 years' experience conducting surveys of similar scope.	**Nil** The survey was conducted by Zoologist Hannah Spanswick (3+ years' experience) and ecologist Cassandra House (8 years' experience).

Limitation	Flora and Vegetation	Fauna and Black Cockatoo
Proportion of flora/fauna identified, recorded and/or collected (based on sampling, timing and intensity)	**Nil** Floristic data was collected from 16 quadrats, 21 Relevés, and observation points. All species not recorded in quadrats were collected and recorded opportunistically. Some tracklogs were lost during the Program due to technical issues. The areas walked is therefore under-represented on Figure 8.	**Nil** The fauna survey search effort was distributed effectively to provide a representative assessment of fauna 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** Survey effort focussed on areas of remnant native vegetation in 'Good' or better condition. Several vegetation communities are represented by less than three quadrats. These are largely Completely Degraded or Degraded vegetation including 'Trees', Pine Regrowth, and 'CcMpEr' (each more than 5 hectares). The lack of representation was justified in the absence of native understorey species. Further, some vegetation communities were better able to be represented using unbounded Relevés to accommodate "slivers" and smaller patches. Some patches of significant vegetation (TECs) are represented by one quadrat due to the relatively small size of the area present within the survey area.	**Nil** Fauna habitats were described based on 21 fauna habitat assessments. All areas were accessible or able to be assessed from the edge. All breeding habitat (i.e. trees with DBH >500 mm) was able to be recorded. Eight potentially suitable hollows were assessed from the ground only, with suitability dependent on the ability to see the hollow entrance. Further assessment of these hollows may be required to meet regulatory requirements.
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 woodland near Malaga-Ellenbrook Train station 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 as part of ongoing monitoring for the Malaga-Ellenbrook train (2021-2024).	**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. This may have limited the ability of the survey to capture black cockatoo breeding tree data within private properties.
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.	**Nil** 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).

Limitation	Flora and Vegetation	Fauna and Black Cockatoo
Disturbances (e.g. fire, flood, accidental human intervention) which affected results of the survey	**Minor** Native vegetation within the Neerabup survey area throughout Gnangara State Forest was burnt following the survey. Post-survey floristic composition will reflect natural succession rather than results presented here. The historical land use of the pine plantation within the Neerabup survey area 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 Results

5.1 Threatened and Priority Ecological Communities

Twenty-four significant communities were identified in the desktop assessment. This included 16 listed under the EPBC Act, 13 listed under the BC Act and 11 listed by DBCA. Note that at the State level numerous TECs and PECs can be representative of a single EPBC Act-listed community.

The comprehensive desktop study is presented in Appendix A The communities most pertinent to this Project are:

- Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands TEC) listed as Endangered under the EPBC Act and Priority 3 by DBCA; and
- Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain (Tuart Woodlands TEC) listed as Critically Endangered under the EPBC Act and Priority 3 by DBCA.

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

5.2 Significant Flora

A systematic review of significant flora records and their preferred habitat has determined the likelihood of Threatened and Priority flora species occurring within each survey area. These results are summarised in Table 19. The Priority 3 *Styphelia filifolia* is known in the Neerabup survey area. No other significant flora are known to occur within any of the survey areas.

Significant flora species which have a 'high' likelihood of occurrence are outlined in Table 20. The comprehensive desktop assessment is presented in Appendix B and results displayed in Figure 7.

Table 19 Desktop Assessment Result Summary – Flora

Survey Area	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Neerabup Terminal and East Wanneroo	1	9	19	24	33	86
Padbury-Wangara	0	7	26	27	20	81
Northern Terminal	0	10	24	33	33	100
Pinjar Terminal	0	0	18	13	35	66
NT-NOR to HBK 132kV line	0	3	31	47	23	104

Table 20 Significant flora species that were considered likely to occur within the survey areas pre-survey.

Taxon	Cons. Code[1]		Habitat
	BC Act / DBCA	EPBC Act	
Neerabup Terminal and East Wanneroo			
Anigozanthos humilis subsp. *chrysanthus*	P4		Grey or yellow sand.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1		Known from North of Perth only within 100km of coast. Found in Banksia woodland on sand over limestone.
Calectasia elegans	P1		Between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in Banksia menziesii and B. attenuata woodland (Barrett, R and Barret, M, 2015).
Conostylis bracteata	P3		Sand, limestone. Consolidated sand dunes.
Cyathochaeta teretifolia	P3		Brown, grey sand. Sandy clay. Swamps, creek edges. Jarrah forest, SCP.
Dampiera triloba	P3		Loamy sand (WAH, 2024).
Jacksonia sericea	P4		Calcareous and sandy soils.
Poranthera moorokatta	P2		The species is known from two locations: Kings Park and Ellenbrook. In Kings Park it was recorded on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high leaf litter cover (Barret, 2012). In Ellenbrook it was recorded in a shallow dampland on mixed grey-white sand with scattered leaf litter (Barret, 2012).
Stenanthemum sublineare	P2		Littered white sand. Coastal plain.
Styphelia filifolia	P3		Sandy soils of the coastal plain, usually in banksia or Jarrah woodland and low-lying situations (Hislop, M, Puente-Lelievre, C, 2017).
Verticordia lindleyi subsp. *lindleyi*	P4		Sand, sandy clay. Winter-wet depressions.
Padbury - Wangara			
Acacia benthamii	P2		Typically, on limestone breakaways.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	P1		Grey sand, yellow sand with limestone outcropping, hills.
Caladenia huegelii	CR	CE	Grey or brown sand, clay loam.

Taxon	Cons. Code[1]		Habitat
	BC Act / DBCA	EPBC Act	
Dampiera triloba	P3		Loamy sand (WA Herbarium, 2023).
Drosera patens	P1		Sandy soils. Margins of winter-wet depressions, swamps and lakes.
Jacksonia sericea	P4		Limestone/ limestone outcrops in heath and sandy soils in coastal areas. Sometimes on fixed dunes and slopes of hills (DCCEEW, 2023).
Styphelia filifolia	P4		Calcareous and sandy soils
Northern Terminal			
Caladenia huegelii	CR	CE	Grey or brown sand, clay loam.
Drosera patens	P3		Seasonally wet drainage lines and margins of permanent water sources, flat ground. Grey sand with clay, poor drainage (WA Herbarium 2023).
Drosera x *sidjamesii*	P1		Sandy soils. Margins of winter-wet depressions, swamps and lakes.
Jacksonia sericea	P1		Peaty sand. Along lake margins, close to winter high-water line.
Netrostylis sp. Chandala (G.J. Keighery 17055)	P4		Calcareous and sandy soils
Poranthera moorokatta	P2		Dampland with thick leaf litter over dark grey sand (WA Herbarium, 2023)
Stachystemon exilis	P2		Very gently inclined plain, white silica sand in open spaces between shrubs, not in shaded areas or in areas of high litter cover (WA Herbarium, 2023)
Stylidium longitubum	P1		On grey sand, seasonally damp (WA Herbarium, 2023)
Verticordia lindleyi subsp. *lindleyi*	P4		Sandy clay, clay, seasonal wetlands
NT-NOR to HBK 132kV			
Anigozanthos humilis subsp. *chrysanthus*	P4		Grey or yellow sand.
Hydrocotyle striata	P1		Open, low-lying Banksia woodland (Hislop, M & Davies, R, 2020).
Stylidium longitubum	P4		Sand, sandy clay. Winter-wet depressions.

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LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Vulnerable
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Flora and Communities Desktop Results: Padbury-Wangarra

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.1**

A4 size

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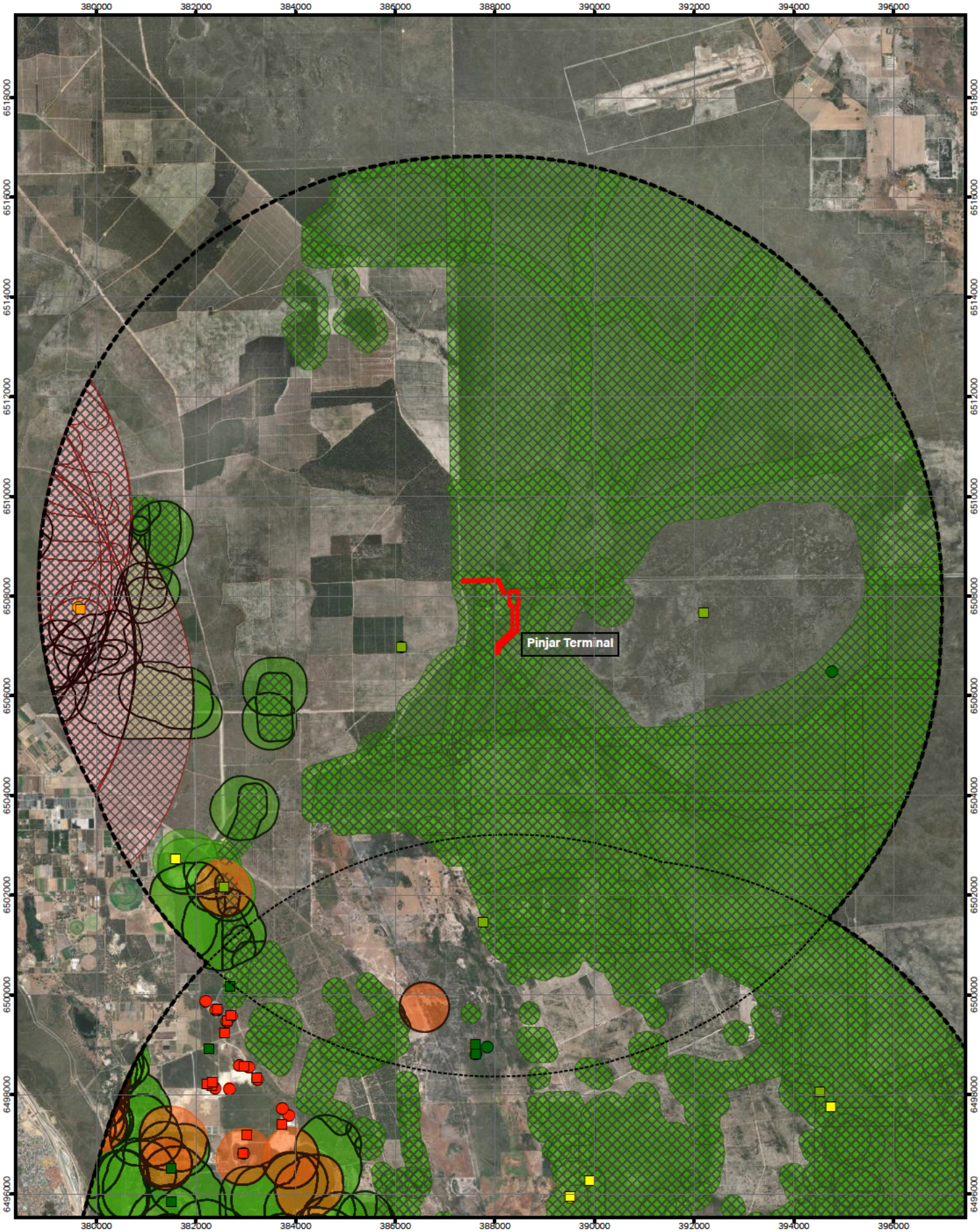

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GDA2020 MGA ZONE 50

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Service Layer Credits: World Imagery: Earthstar Geographics,Hybrid Reference Layer: Esri, TomTom, Garmin, FAO, NOAA, USGS

LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered

Conservation Significant Flora and Communities Desktop Results: Pinjar Terminal

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.2**

A4 size

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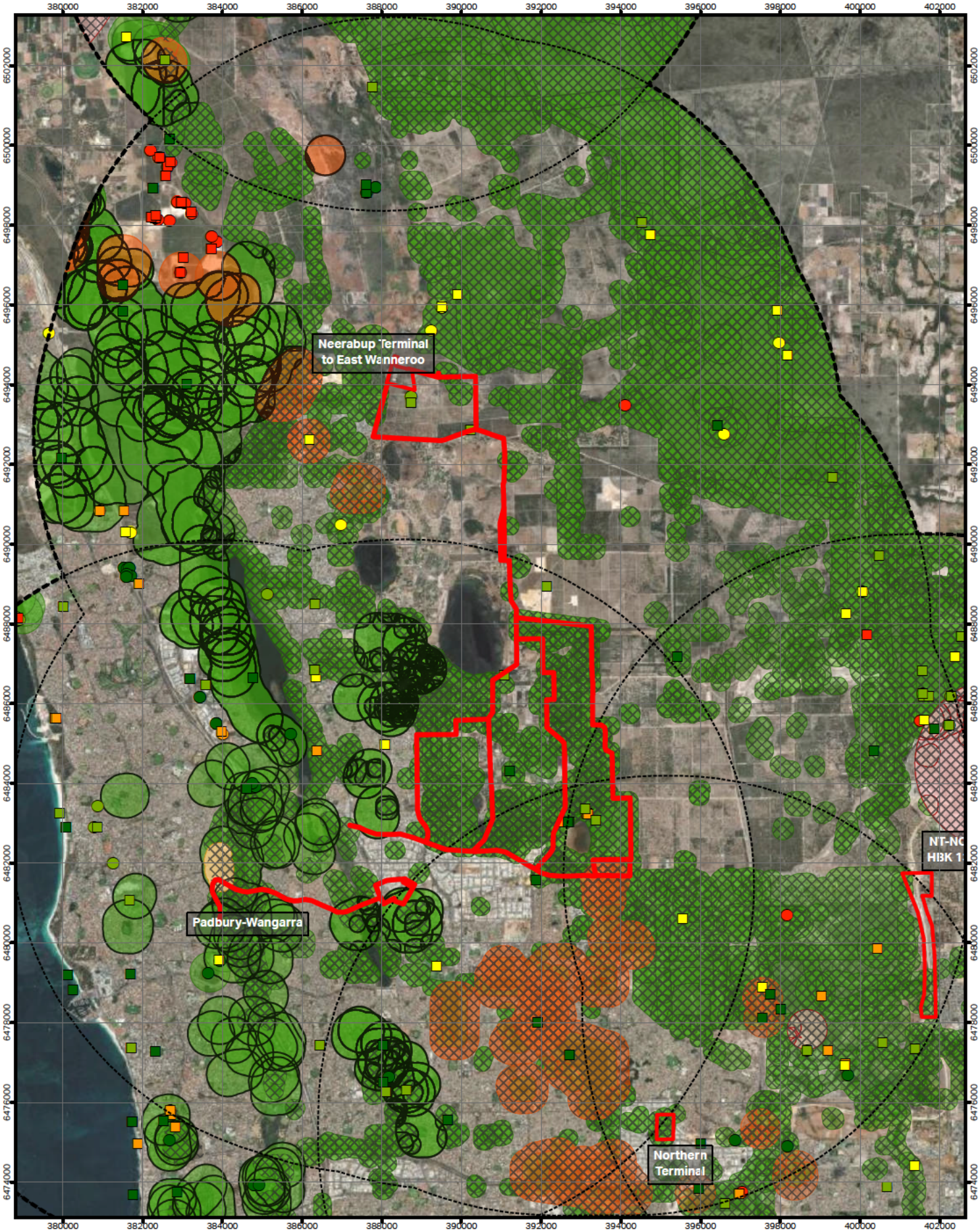

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Service Layer Credits: World Imagery: Earthstar Geographics,Hybrid Reference Layer: Esri, TomTom, Garmin, FAO, NOAA, USGS

LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Vulnerable
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered

Conservation Significant Flora and Communities Desktop Results: Neerabup Terminal to East Wanneroo

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.3**

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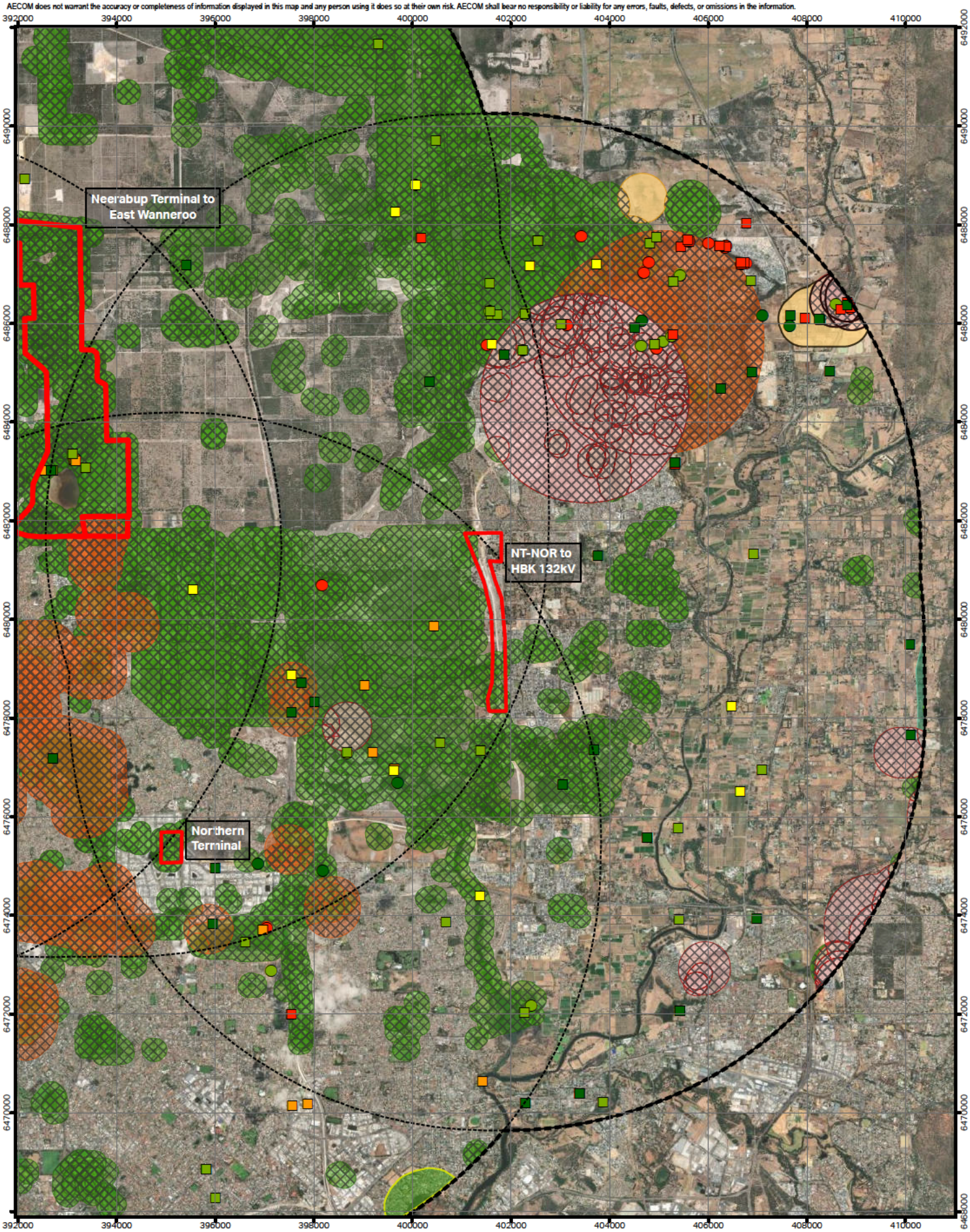

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LEGEND

- Survey Area
- 8.5km Buffer Survey Area

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

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

TEC / PEC (State Listed)
- Critically Endangered
- Endangered
- Vulnerable
- Priority 3
- Priority 4

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

Conservation Significant Flora and Communities Desktop Results: NT-NOR to HBK 132kV

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.4**

A4 size

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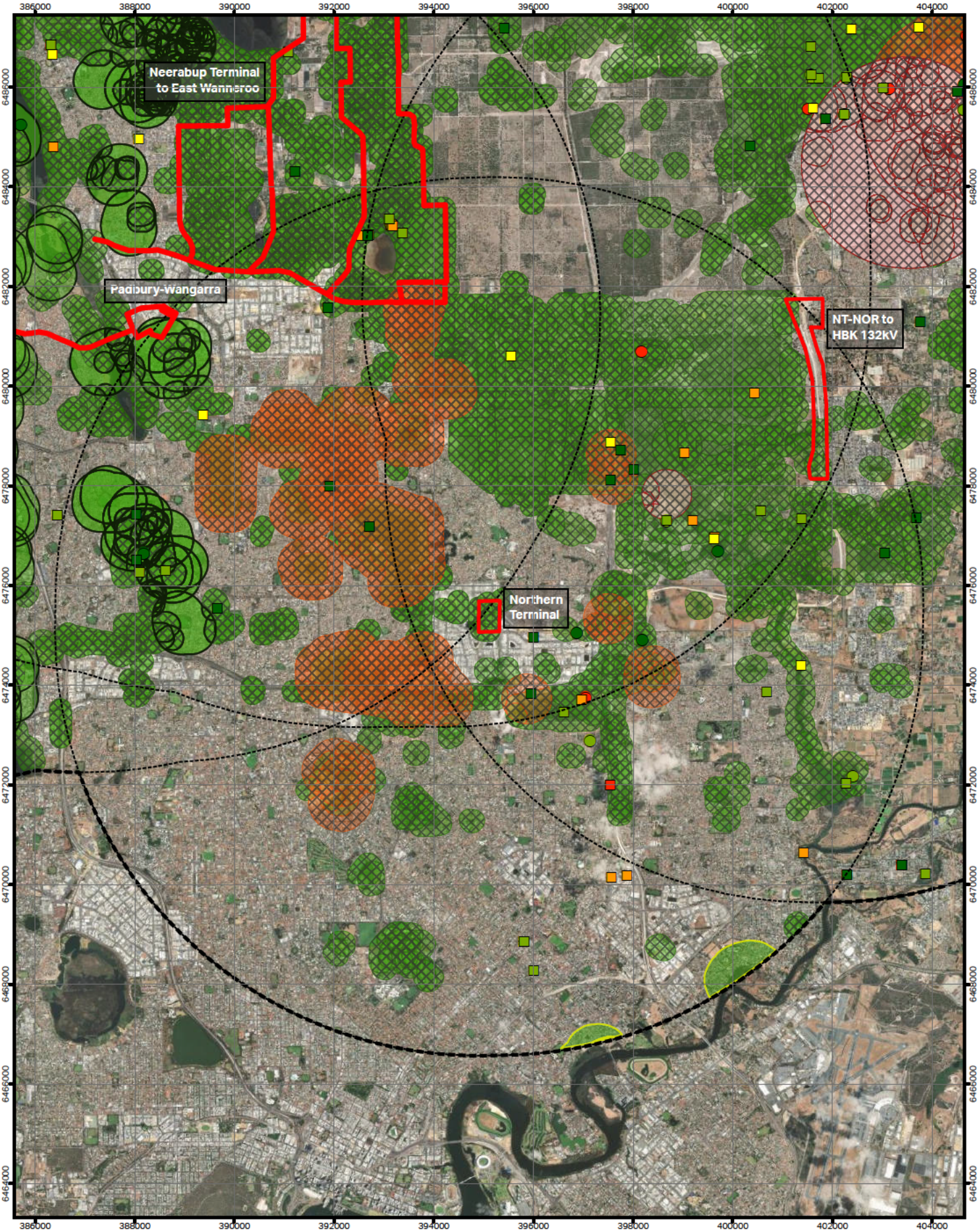

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Service Layer Credits: World Imagery: Earthstar Geographics|Hybrid Reference Layer: Esri, TomTom, Garmin, FAO, NOAA, USGS

LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Flora and Communities Desktop Results: Northern Terminal

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 7a.5

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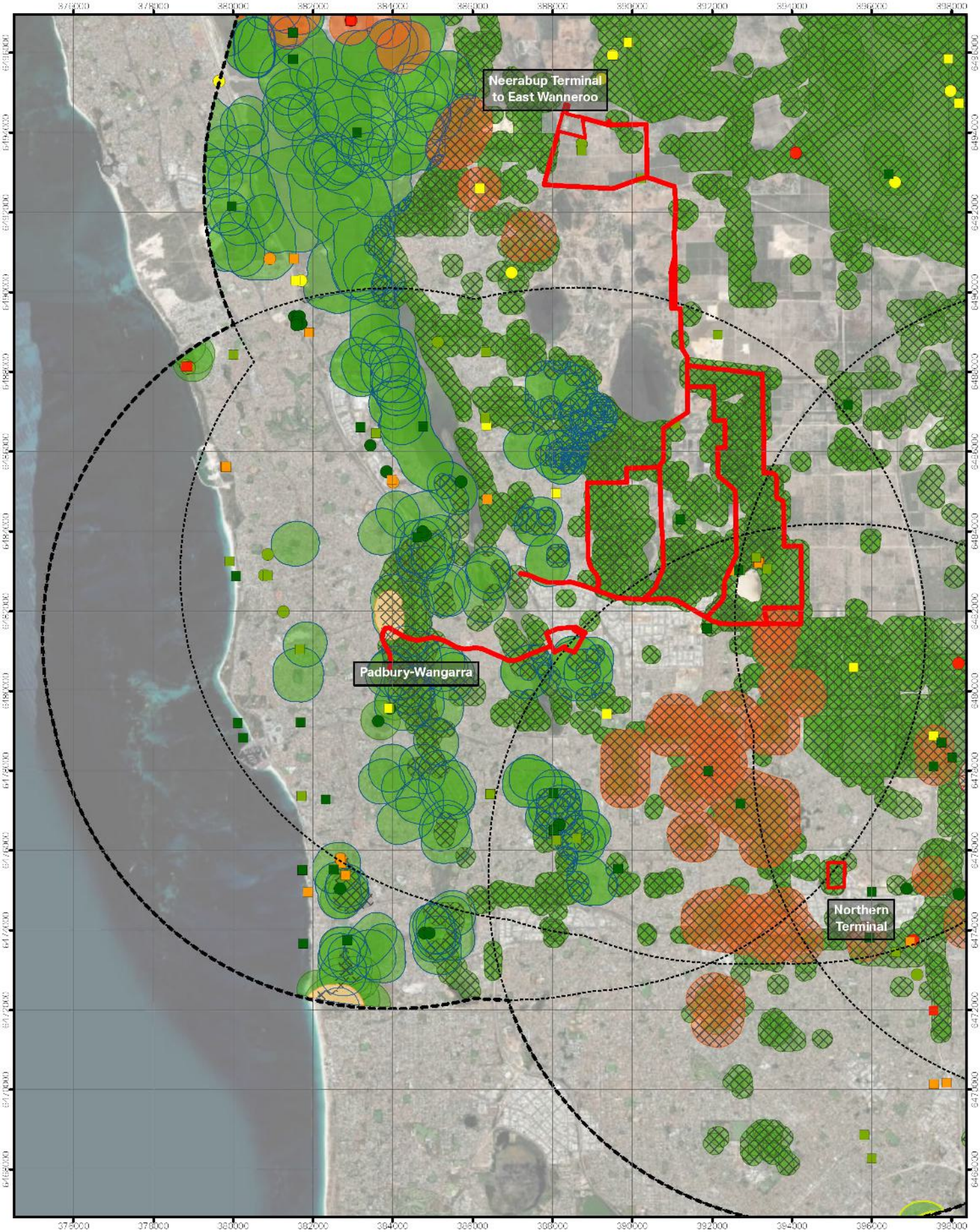

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km
CDA2020 MGA ZONE 50

LEGEND

Survey Area
8.5km Buffer Survey Area
WA Herbarium database (WAHERB)
Threatened
P1
P2
P3
P4

Threatened and Priority Flora database (TPFL)
Threatened
P1
P2
P3
P4
TEC / PEC (State Listed)
Critically Endangered
Endangered
Vulnerable
Priority 3
TEC / PEC (Federally Listed)
Critically Endangered
Endangered
Vulnerable

Conservation Significant Flora and Communities Desktop Results: Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
7a.1

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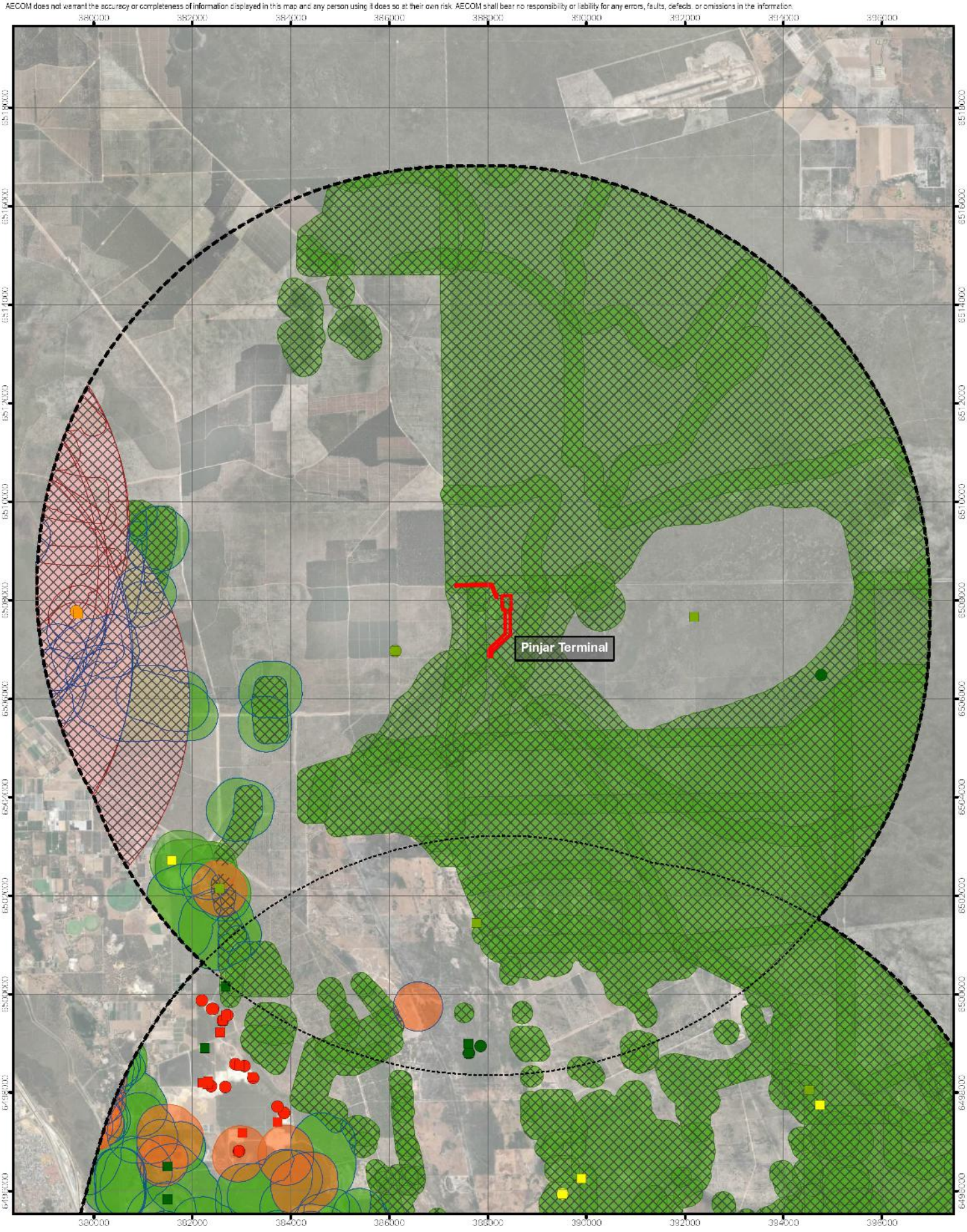

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km
CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P1
- P2
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered

Conservation Significant Flora and Communities Desktop Results: Pinjar Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.2**

A4 size

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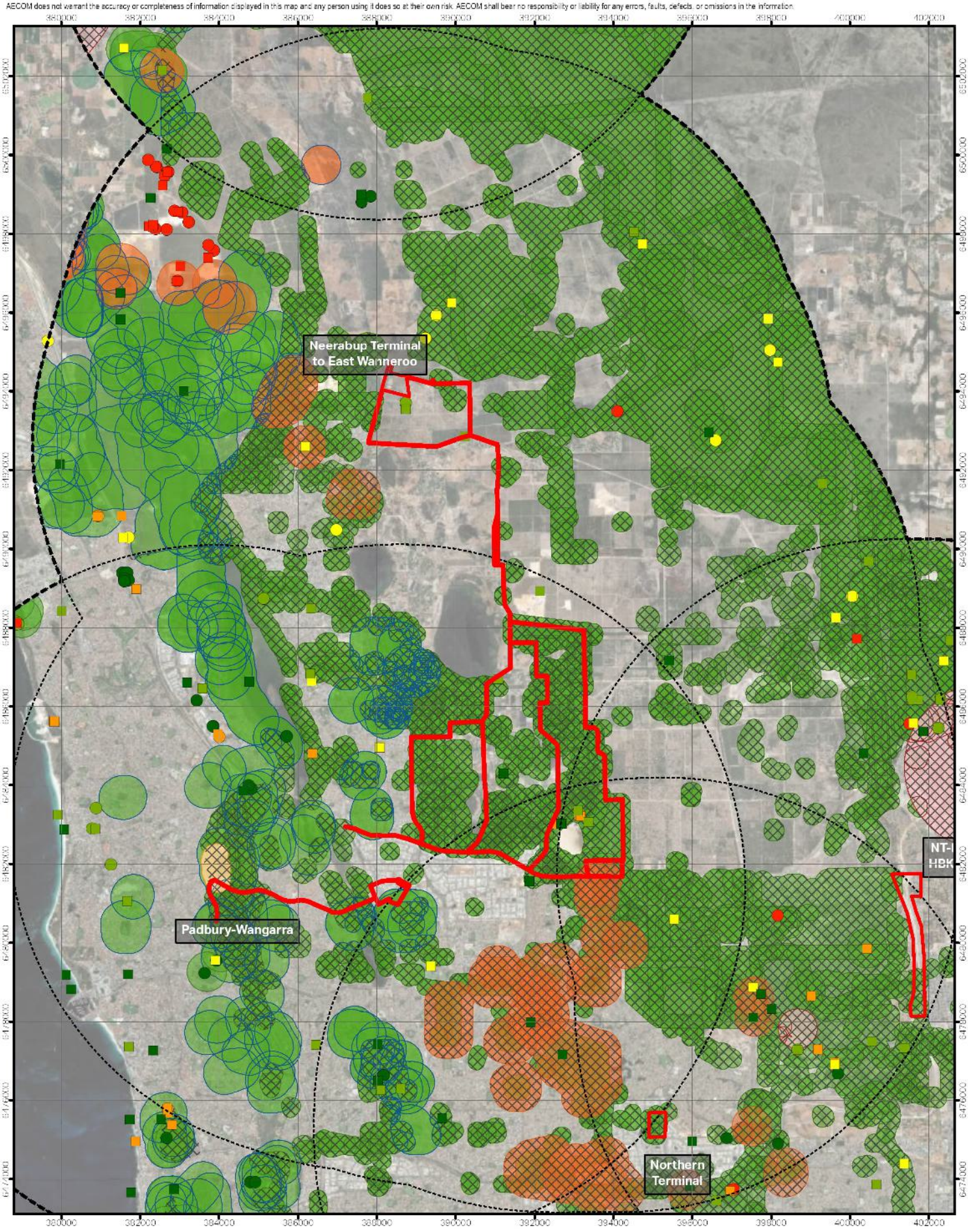

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km
CDA2020 MGA ZONE 50

LEGEND

Survey Area
8.5km Buffer Survey Area
WA Herbarium database (WAHERB)
Threatened
P1
P2
P3
P4
Threatened and Priority Flora database (TPFL)
Threatened
P1
P2
P3
P4
TEC / PEC (State Listed)
Critically Endangered
Endangered
Vulnerable
Priority 3
TEC / PEC (Federally Listed)
Critically Endangered
Endangered

Conservation Significant Flora and Communities Desktop Results: Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.3**

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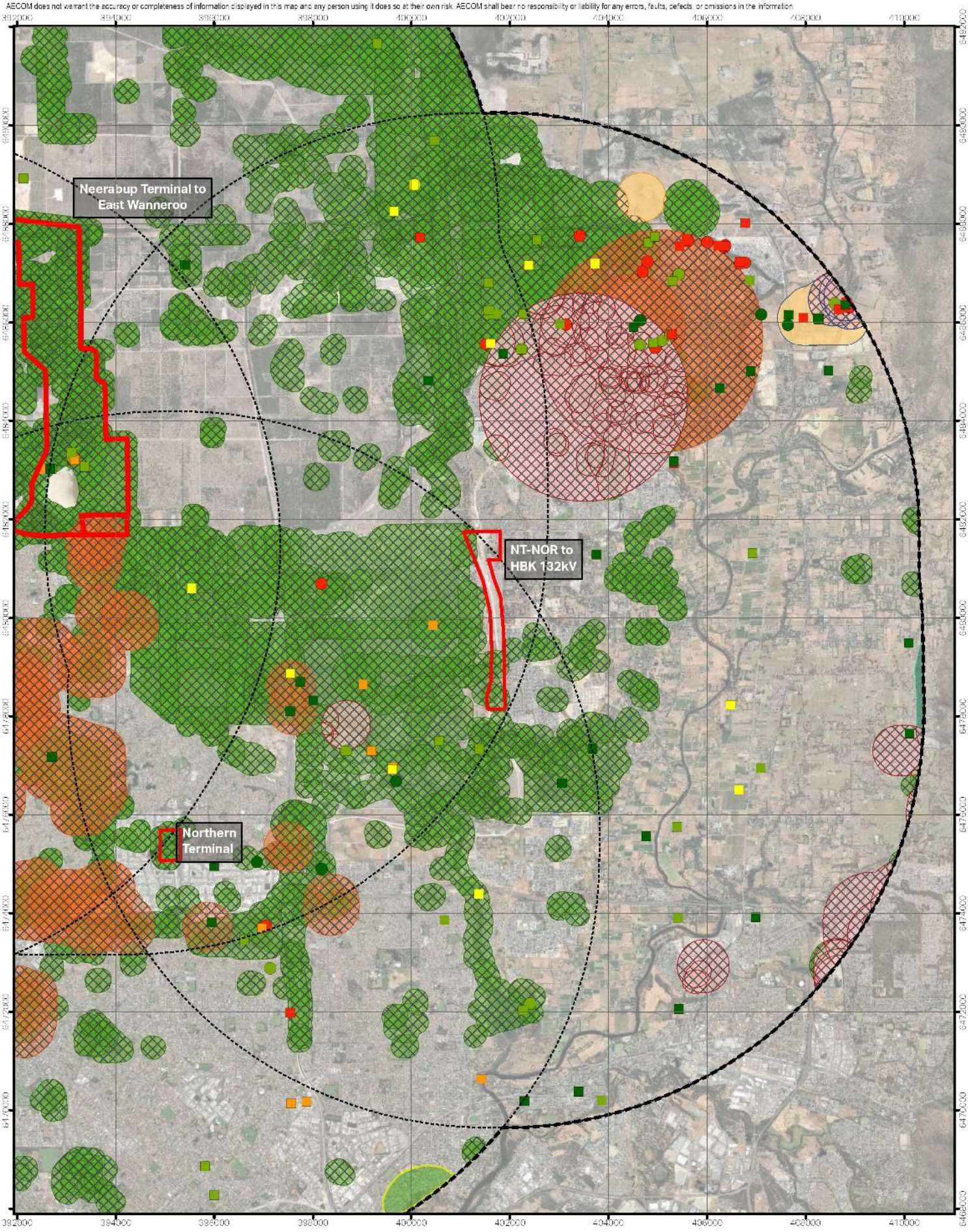

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km
CDA2020 MGA ZONE 50

LEGEND

Survey Area
8.5km Buffer Survey Area
WA Herbarium database (WAHERB)
Threatened
P1
P2
P3
P4

Threatened and Priority Flora database (TPFL)
Threatened
P2
P3
P4
TEC / PEC (State Listed)
Critically Endangered
Endangered
Vulnerable
Priority 3
Priority 4
TEC / PEC (Federally Listed)
Critically Endangered
Endangered
Vulnerable

Conservation Significant Flora and Communities Desktop Results: NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure
7a.4

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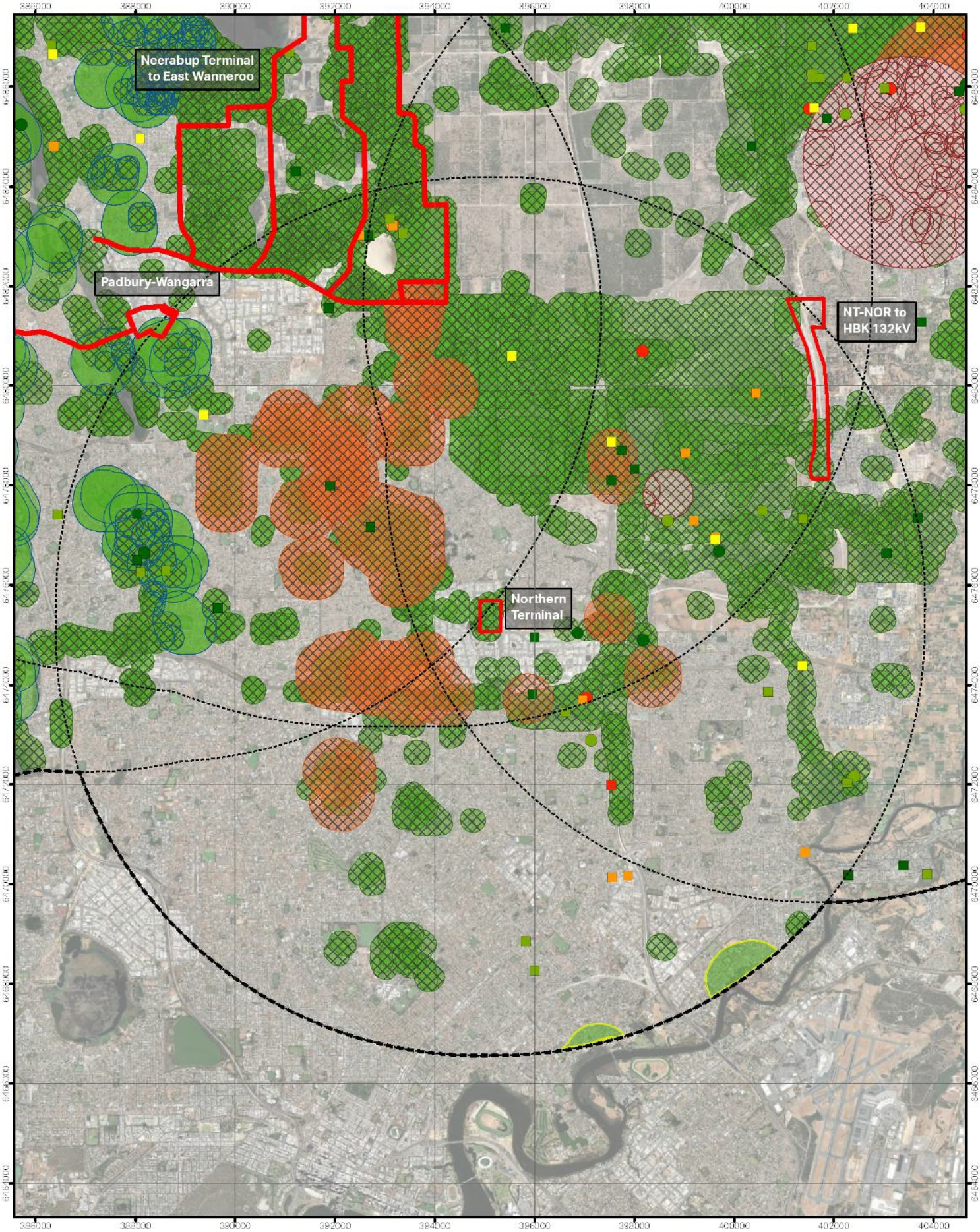

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km
CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area

WA Herbarium database (WAHERB)

- Threatened
- P1
- P2
- P3
- P4

Threatened and Priority Flora database (TPFL)

- Threatened
- P3
- P4

TEC / PEC (State Listed)

- Critically Endangered
- Endangered
- Priority 3

TEC / PEC (Federally Listed)

- Critically Endangered
- Endangered
- Vulnerable

Conservation Significant Flora and Communities Desktop Results: Northern Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7a.5**

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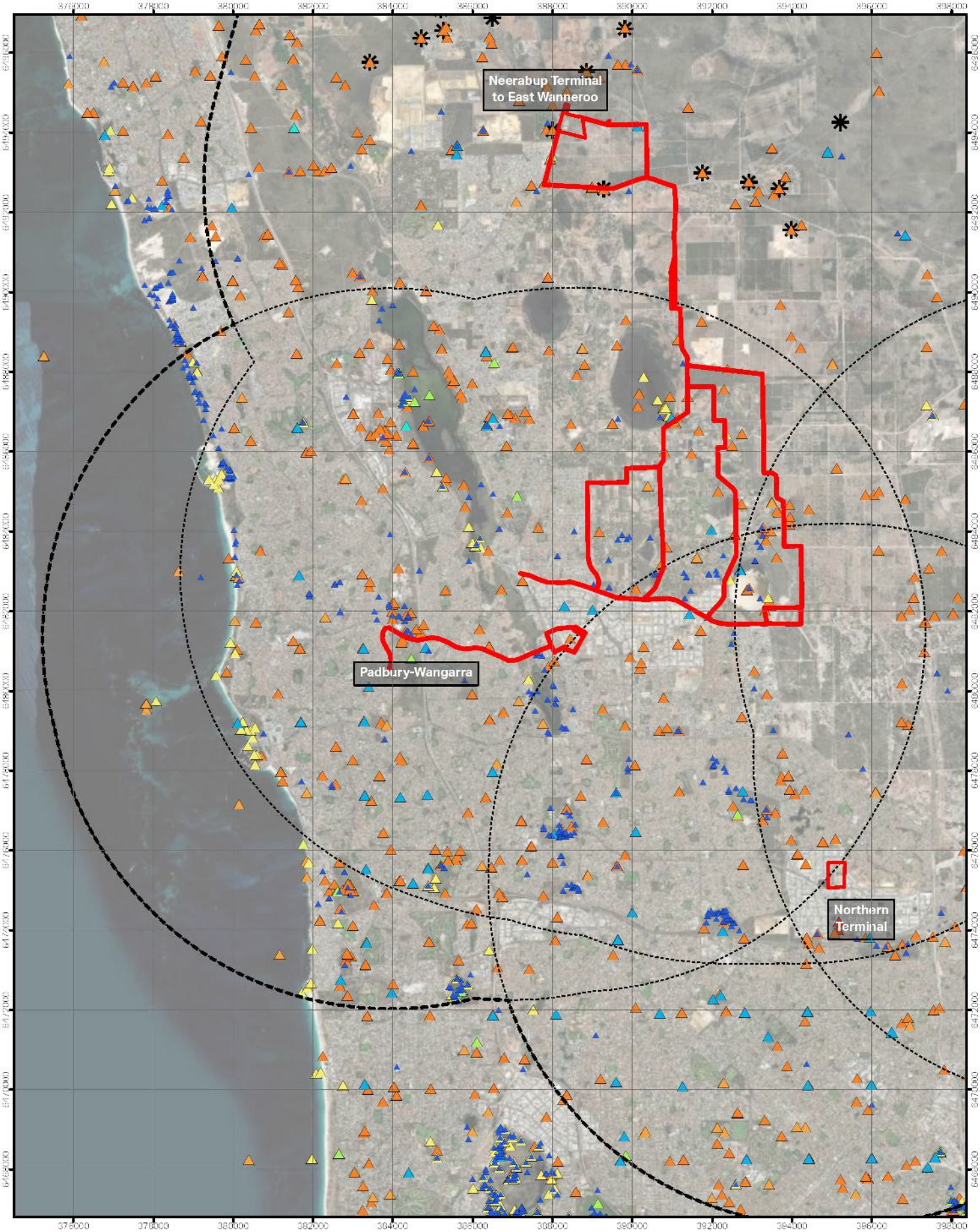

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km
CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area
- Black Cockatoo Roosting Sites

Threatened Fauna database (DBCA)

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

Conservation Significant Fauna Desktop Results: Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7b.1**

A4 size

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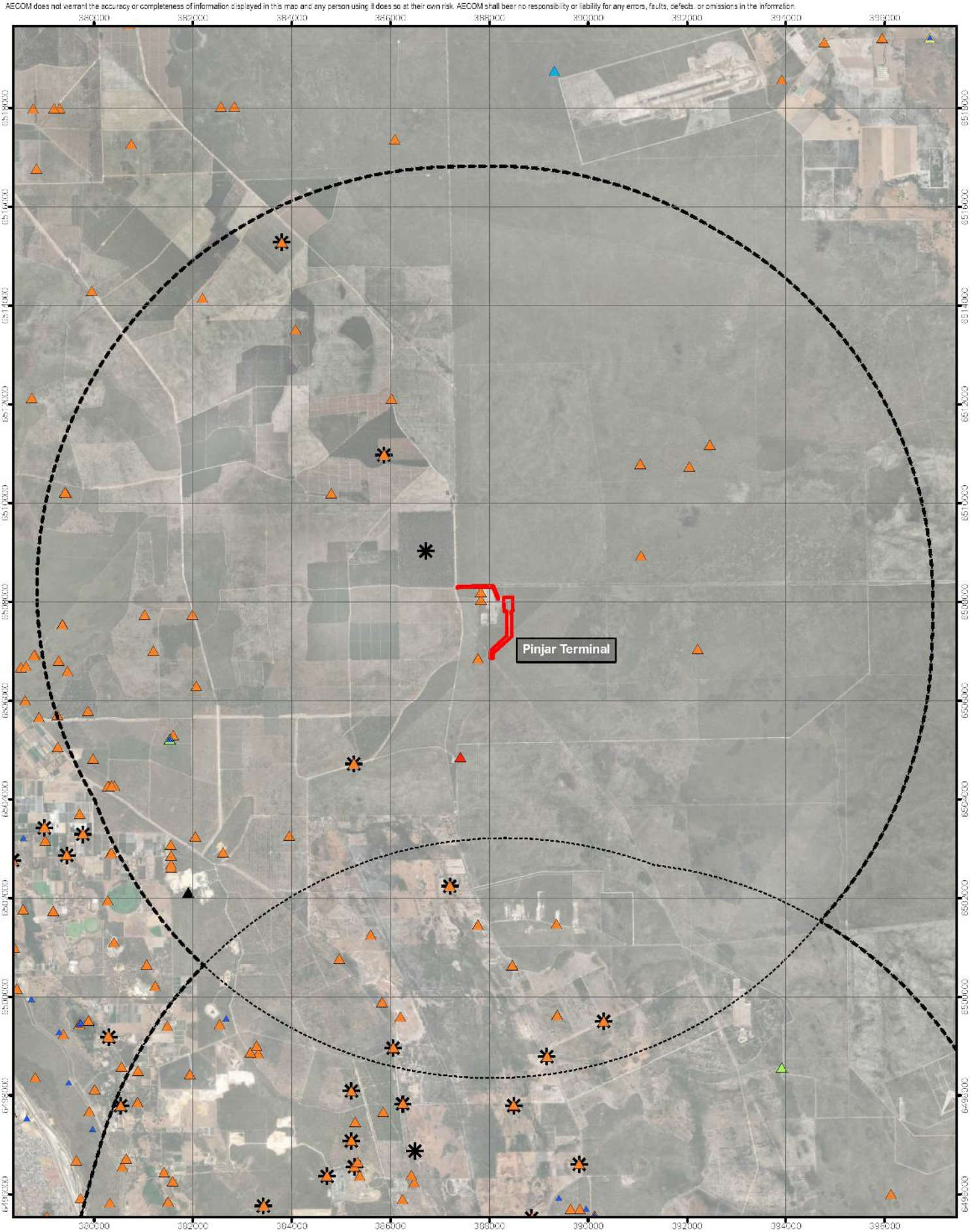

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km
GDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area
- Black Cockatoo Roosting Sites

Threatened Fauna database (DBCA)

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

Conservation Significant Fauna Desktop Results: Pinjar Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7b.2**

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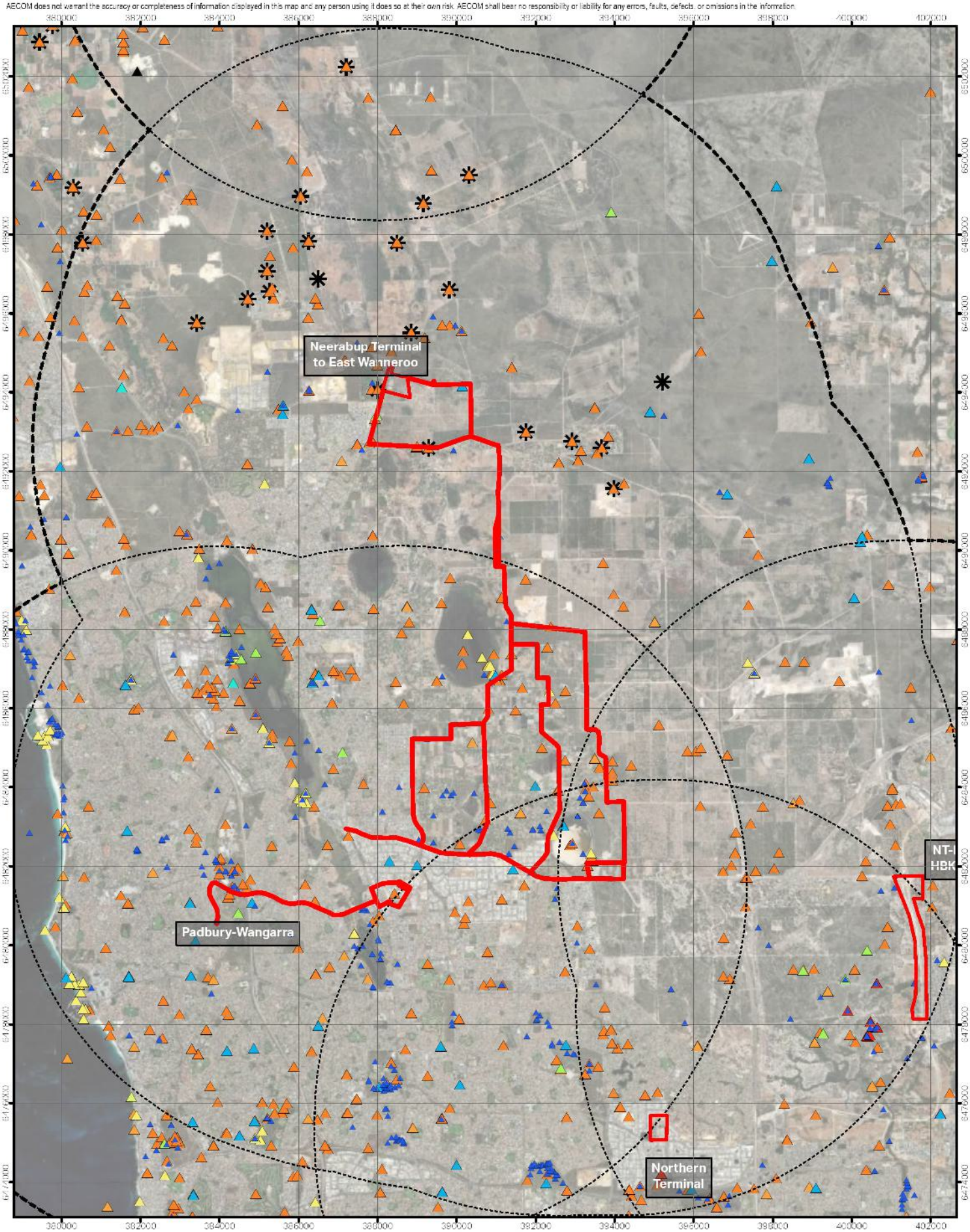

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km
CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area
- Black Cockatoo Roosting Sites

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: Neerabup Terminal to East

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7b.3**

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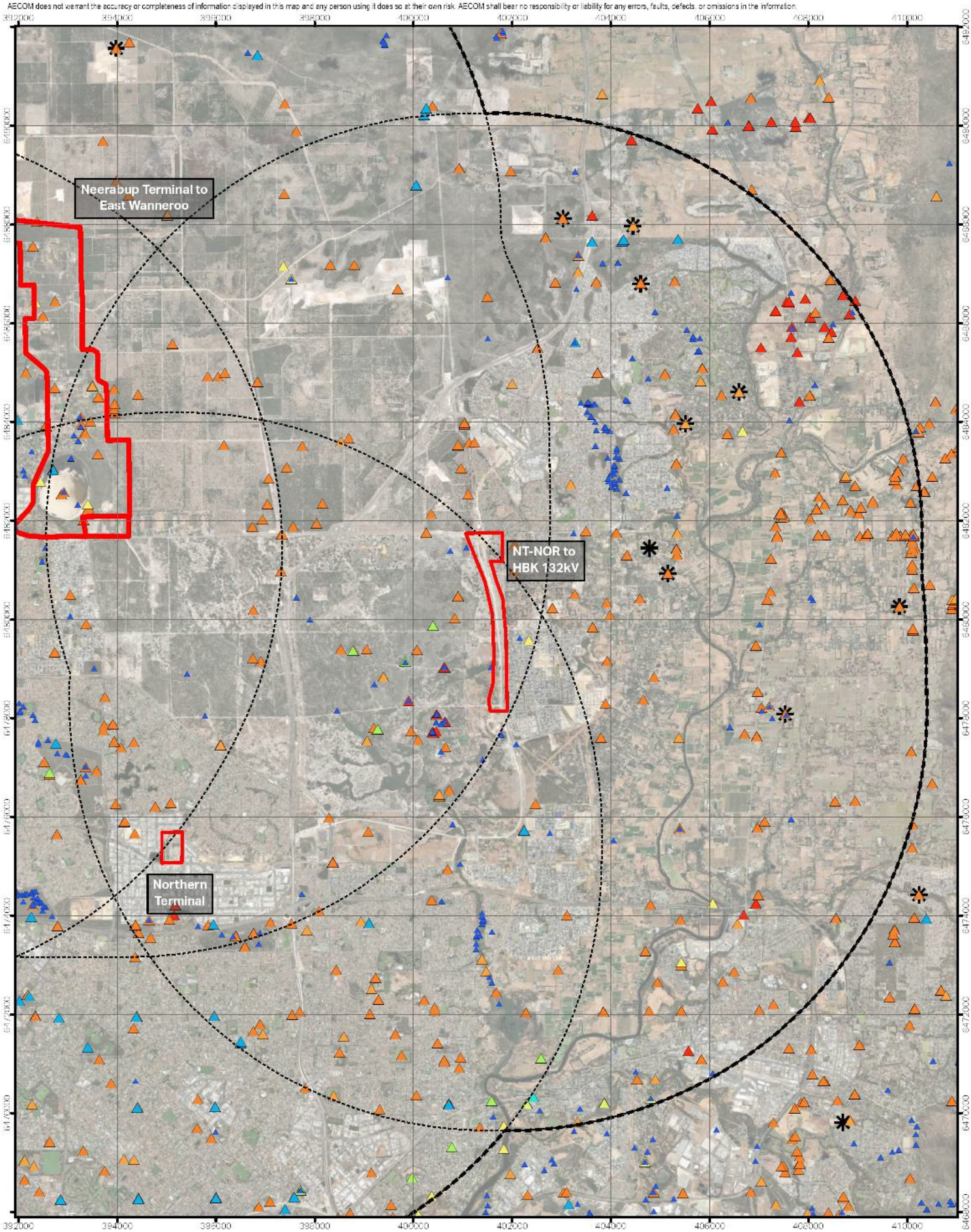

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0 1 2
km
CDA2020 MGA ZONE 50

LEGEND

- Survey Area
- 8.5km Buffer Survey Area
- Black Cockatoo Roosting Sites

Threatened Fauna database (DBCA)

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

Conservation Significant Fauna Desktop Results: NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7b.4**

A4 size

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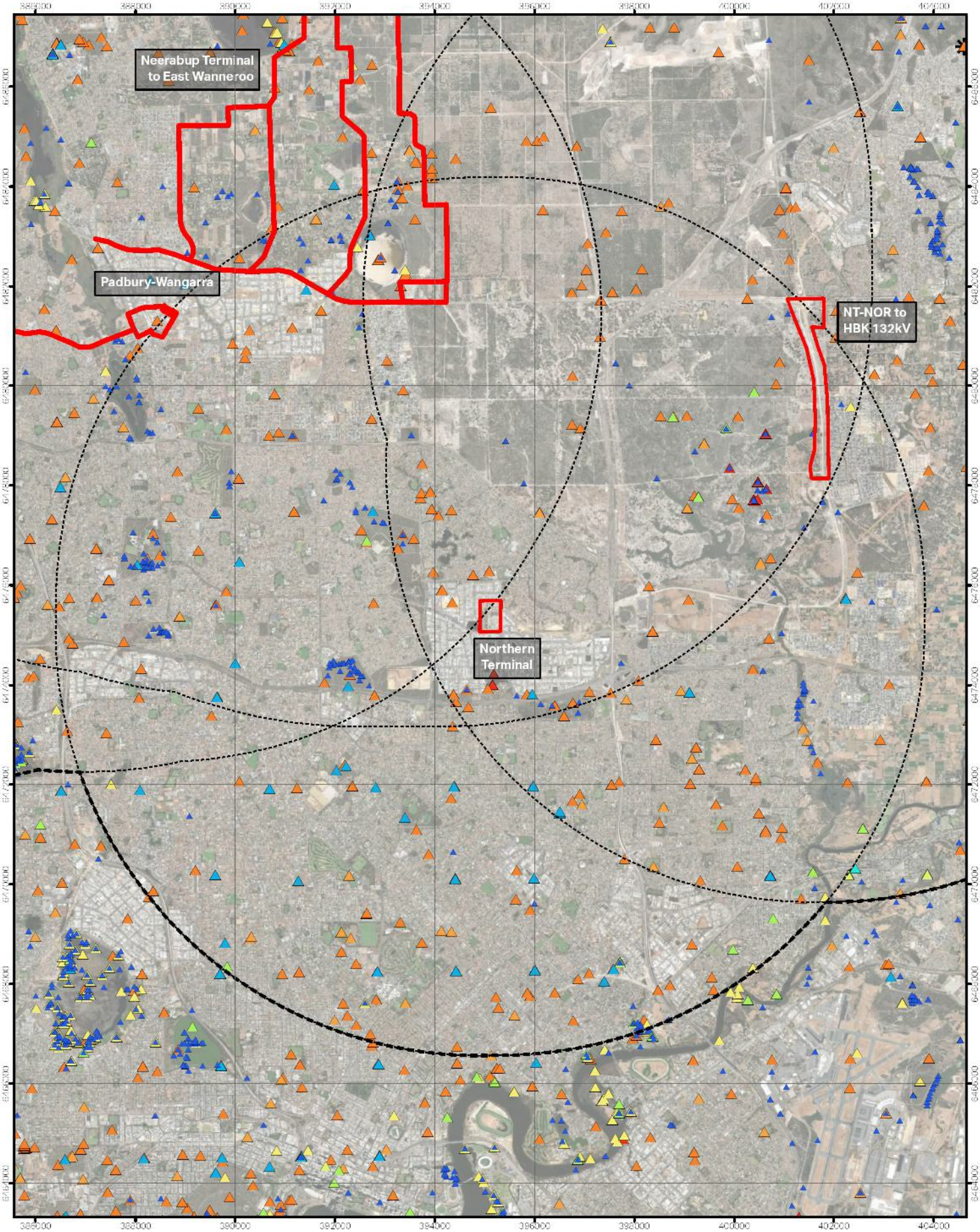

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CDA2020 MGA ZONE 50

LEGEND

- Survey Area
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- Migratory Species
- Conservation Dependant
- Specially Protected
- Priority 2
- Priority 3
- Priority 4

Conservation Significant Fauna Desktop Results: Northern Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **7b.5**

A4 size

5.3 Significant Fauna

Between 71 to 79 significant fauna species were identified to potentially occur for the survey areas. 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. The results of the desktop assessments completed for the survey areas are included in Table 21. Species with a 'high' likelihood of occurrence are presented in Table 22. and the results are mapped in Figure 7. The comprehensive desktop results are presented in Appendix C and mapped in Figure 7.

Table 21 Significant fauna desktop assessment results summary

Survey Area	Likelihood of Each Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Padbury - Wangara	0	6	12	39	22	79
Pinjar Terminal	0	6	8	32	30	76
Neerabup Terminal and East Wanneroo	0	4	3	22	42	71
NT-NOR to HBK 132kV Line	0	3	9	36	28	76
Northern Terminal	0	2	14	33	29	78

Table 22 Significant fauna species considered to have a 'high' likelihood of occurrence within the survey area.

Scientific Name	Common Name	Conservation status		Ecology	Padbury - Wangara	Pinjar Terminal	Neerabup Terminal and East Wanneroo	NT-NOR to HBK 132 JKv Line	Northern Terminal
		BC Act /DBCA[1]	EPBC Act[2]						
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	V	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	High	High	High	High	High
Idiosoma sigillatum	Swan Coastal Plain Shield-backed Trapdoor Spider	P3		Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	High	High	High		
Isoodon fusciventer	Quenda, Southern Brown Bandicoot	P4		Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	High	High	High		
Neelaps calonotos	Black-striped Snake	P3		Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	High	High	High		
Zanda baudinii	Baudin's Cockatoo	EN	E	Temperate forest and woodland dominated by *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *E. diversicolor* (karri) (TSSC, 2018).	High	High		High	
Zanda latirostris	Carnaby's Cockatoo	EN	E	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	High	High	High	High	High

1. BC Conservation status codes: VU Vulnerable, EN Endangered P1-5 Priority Species, OS Other Specially Protected.
2. EPBC Conservation status codes: V Vulnerable, E Endangered.

6.0 Padbury-Wangara Results and Discussion

6.1 Flora

6.1.1 Vegetation Communities

Five native vegetation communities were defined and mapped including:

- Banksia Woodlands BaAbAb for (0.15 ha, 1%),
- Banksia Woodlands BaAlTe (0.58 ha, 2%),
- Tuart Woodlands EgHcPp (1.12 ha, 4%),
- Callitris Woodland CpMsLo (0.48 ha, 2%),
- Trees (0.61 ha, 0.6%).

Non-native communities included Paddock (2.26 ha) and Cleared (20.97 ha).

Vegetation community descriptions are presented in Table 23 and mapped on Figure 8.

Table 23 WGA vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation		
BaAbAb *Banksia attenuata* Woodland *Banksia attenuata* and *Callitris preissii* woodland over *Acacia blakelyi, Melaleuca huegelii, *Grevillea preissii* open shrubland over **Avena barbata, *Bromus diandrus* and *Austrostipa flavescens* grassland. Recorded on white-grey sand on a gentle slope.	Survey effort: CHR04 Native species richness: 5 Weed species richness: 9 Condition: Degraded Extent: 0.15 ha	
BaAlTe *Banksia attenuata* Woodland *Banksia attenuata* and *Banksia grandis* woodland over *Acacia lasiocarpa* var. *lasiocarpa, Xanthorrhoea preissii, Daviesia divaricata* subsp. *divaricate* open shrubland over *Tricoryne elatior, *Euphorbia terracina* and *Conostylis setigera* forbland. Recorded on white sand on a flat landform.	Survey effort: CHQ16 Native species richness: 8 Weed species richness: 8 Condition: Good Extent: 0.58 ha	

Description	Additional Details	Photograph
EgHcPp Tuart Woodland *Eucalyptus gomphocephala*, *Corymbia calophylla* and *Melaleuca huegelii* open woodlands over *Hibbertia cuneiformis* and *Acacia saligna* sparse shrubland over *Poa porphyroclados*, **Ehrharta calycina* and **Avena barbata* grassland. Represents the Tuart Woodlands TEC. Recorded on brown sandy loam soils on a gentle slope.	Survey effort: CHQ05 Native species richness: 7 Weed species richness: 12 Condition: Completely Degraded to Good Extent: 1.12 ha	
CpMsLo Callitris Woodland *Callitris preissii* low open woodland over *Melaleuca seriata, Acacia lasiocarpa var. sedifolia* and *Rhagodia baccata* sparse shrubland over **Lagurus ovatus*, **Cynodon dactylon* and **Ehrharta calycina* open grassland. Recorded on white sand on a flat landform.	Survey effort: CHQ05 Native species richness: 8 Weed species richness: 9 Condition: Degraded to Good Extent: 0.48 ha	
Trees Scattered native species including but not limited to *Eucalyptus, Banksia, Acacia, Xanthorrhoea* and *Melaleuca* species. Recorded on a variety of soil types.	Survey effort: observations only Area: 0.61 ha	N/A
Non-native Communities		
Paddock Largely comprised of common pasture weeds, with occasional native species Recorded on a variety of soil types.	Survey effort: observations only Area: 2.26 ha	N/A

6.1.2 Conservation Significant Vegetation

6.1.2.1 Banksia Woodlands TEC Assessment

Two patches of Banksia Woodlands were assessed against the key diagnostic characteristics outlined in the DEE (2016) Conservation Advice.

Banksia Woodlands Patch 1 is mapped for 0.15 ha within the survey area and was considered Good, which does not meet the key diagnostic characteristics to be considered representative of the federally protected ecological community. The patch does not extend beyond the survey area, with the closest remnant native vegetation more than 30 m away. The patch assessment is presented in Table 24 below.

Table 24 Patch 1 Banksia Woodlands TEC Assessment

<table>
<tr><td>ID</td><td>Patch 1</td></tr>
<tr><td>Date</td><td>CHR04 scored on 17-Oct-23</td></tr>
<tr><td>Location</td><td>On the Swan Coastal Plain, on the Spearwood System.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaAbAb, a Banksia woodland dominated by B. attenuata</td></tr>
<tr><td>Structure</td><td>Represents a 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">CHR04</th></tr>
<tr><th>Ht (cm)</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>600</td><td>45</td></tr>
<tr><td>C. preissii</td><td>400</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHR04</th></tr>
<tr><td>Cover (%)</td><td>32.2</td></tr>
<tr><td>Diversity total</td><td>3</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHR04</th></tr>
<tr><td>Cover (%)</td><td>7.4</td></tr>
<tr><td>Dominant species</td><td>*Avena barbata</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>White-grey sand</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.15 ha. Does not extend beyond survey area.</td></tr>
<tr><td>Summary</td><td>The patch does not meet the condition and size thresholds to be considered representative of the Commonwealth listed TEC.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Patch 2 does not meet the key characteristics, size and condition threshold to be considered representative of the federally protected ecological community. The Banksia Woodlands Patch 2 is mapped for 0.58 ha within the survey area and is in Good condition. Woodlands that are in Good condition require a minimum extent of 2 ha to be considered representative of the TEC. The patch is surrounded by Tuart Woodland and is disconnected (by more than 30 m) from patches of Banksia Woodland.

The patch assessment is presented in Table 25.

Table 25 Patch 2 Banksia Woodlands TEC Assessment

<table>
<tr><td>ID</td><td>Patch 2</td></tr>
<tr><td>Date</td><td>CHQ16 scored on 17-Oct-23</td></tr>
<tr><td>Location</td><td>On the Swan Coastal Plain, on the Spearwood System.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaAlTe, a Banksia woodland dominated by B. attenuata and B. grandis</td></tr>
<tr><td>Structure</td><td>Represents a 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">CHQ16</th></tr>
<tr><th>Ht (cm)</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>700</td><td>25</td></tr>
<tr><td>B. grandis</td><td>800</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHQ16</th></tr>
<tr><td>Cover (%)</td><td>16.7</td></tr>
<tr><td>Diversity</td><td>6</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHQ16</th></tr>
<tr><td>Cover (%)</td><td>5.3</td></tr>
<tr><td>Dominant species</td><td>*Euphorbia terracina</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>White-grey sand</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.58 ha</td></tr>
<tr><td>Summary</td><td>Native diversity is not comparable with the mean species richness for the closest matching FCT, with only eight recorded of the mean 55.2 native species (FCT 28). The patch does not meet the condition and size thresholds to be considered representative of the Commonwealth listed TEC.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

6.1.2.2 Tuart Woodlands TEC Assessment

There are two patches of Tuart Woodlands in the Padbury-Wangara survey area. One patch (Patch 2) meets the key diagnostic characteristics in accordance with the DEE (2019) Conservation Advice and is mapped for 0.78 ha. Both Patches are discussed below.

Patch 1 is located to the east of Mitchell Freeway and north of Whitfords Avenue and consists of minimal remnant vegetation (two native species) mixed with planted introduced Eucalyptus trees. The area is in Degraded condition and is 0.43 ha representing the edge of a larger patch that extends approximately 2 ha.

The minimum size threshold for Degraded vegetation is 5 ha, as such, the patch does not meet the key diagnostic characteristics for the federally protected ecological community. The assessment is presented in Table 26.

Table 26 Patch 1 Tuart Woodlands TEC assessment

Patch identification and location	The patch is located to the east of Mitchell Freeway, north of Whitfords Avenue and south of a residential area.
Key diagnostic characteristics	Yes • Occurs on Swan Coastal Plain. • Occurs on the Spearwood System. • Four mature (DBH >500 mm) *E. gomphocephala* trees were counted in the portion of the patch. • Patch 1 occurs as an open woodland. • Minimal native understorey was present, indicative of historical disturbance. • Planted introduced eucalyptus trees were also recorded within the patch.
Species richness	Two native understorey species were observed: *Melaleuca huegelii* and *Acacia saligna*
Condition	Poor condition (DEE, 2019). The vegetation condition is mapped as Degraded.
Size	0.43 ha
Variety within patch	The patch is small, segregated from other mature Tuart trees by more than 60 m, and has minimal variety within it. It consists of mature Tuart trees over two native shrub species and cleared / common pasture weeds.
Additional information	The patch is disconnected from other Tuart Woodland patches due to the large freeway and urban development.

Plate 1 Tuart Woodlands Patch 1

Patch 2

Patch 2 represents a large area of Tuart Forest that extends north and south of Whitfords Avenue, west of Mitchell Freeway, and west of Gibson Avenue. The total area of Patch 2 within the survey area is 0.54 ha, representing part of a larger patch more than 30 ha. The total patch size is greater than 5 ha, therefore condition thresholds are not applicable.

An assessment against the key diagnostic characteristics was undertaken, and condition was determined using a quadrat to further support the patch assessment. The patch meets the key diagnostic characteristics for the federally protected ecological community. The assessment is presented in Table 27 and Figure 8.

Table 27 Patch 2 Tuart Woodlands TEC assessment

Patch identification and location	Remnant native vegetation north and south of Whitfords Avenue and west of Mitchell Freeway, and west of Gibson Avenue. The patch is represented by CHQ05 scored on 17 October 2023.
Key diagnostic characteristics	Yes • Occurs on Swan Coastal Plain. • Occurs on both the Quindalup South system and the Spearwood System. • More than 32 mature (DBH >500 mm) *E. gomphocephala* trees were counted which represents a small portion of the larger patch continuing outside the survey area. • Patch 1 occurs as an open woodland. • Includes native understorey species that vary in density reflective of level of disturbance.
Species richness	Key indicators for the condition thresholds are outlined in the table below. **Parameter** / **CHQ05** Proportion of understorey foliage that is native / 23.7% Native species richness / 7
Condition	Moderated condition (DEE, 2019). Mapped as Good condition.
Size	Within survey area: 1.63 ha Total: over 30 ha
Variety within patch	The patch is open woodland, with some minor variation in the density of understorey shrubs, particularly *Acacia saligna, Hibbertia cuneiformis* and *Melaleuca huegelii*. The variation is attributed to historical disturbance, with common introduced weeds displacing many smaller herbs and annual native species. Vegetation condition was mapped as Good with weeds displacing native understorey species and the extensive clearing in the area has further limited biodiversity. Native understorey is entirely absent near the edge. The patch represents the southern edge of Tuart Woodlands protected in Bush Forever Site 303.
Additional information e.g. buffer, connectedness, land use history	Although intersected by Whitfords Avenue and residential developments, the patch is large and represents an important local refuge for native flora and fauna. The patch condition is anticipated to be in better condition further from the edge.

Plate 2 Tuart Woodlands Patch 2

6.1.2.3 State-Listed Ecological Communities

No state-listed TEC or PEC were confirmed to occur. One FCT was able to be confidently inferred, FCT 28 Spearwood *B. attenuata* or *B. attenuata-Eucalyptus* woodland. This FCT was confirmed for CHQ16 (see Table 28). The similarity was relatively low (28% using Keighery data), and the group clustering was ambiguous. This was attributed to the degradation of the vegetation.

FCT 28 is associated with the Banksia Woodlands TEC. As discussed in Section 6.1.3.1, the Banksia Woodlands patch was too small and too degraded to meet the size and conditions thresholds for the federally protected ecological community.

No FCT was confidently inferred for CHQ05. There was some correlation to FCT 25 Southern Swan Coastal Plain *Eucalyptus gomphocephala - Agonis flexuosa* woodlands which represents a PEC. Similarity was low and results from Gibson and Keighery data was ambiguous. The quadrat is missing a key indicator species for FCT 25 (*Agonis flexuosa*). The other FCT inferred was FCT 24 Scattered heath with Tuart. This seems unlikely due to the absence of key species such as *Calothamnus quadrifidus*, *Chaetospora curvifolia* (previously *Schoenus curvifolius*), and *Banksia sessilis*.

Table 28 Padbury-Wangara FCT analysis results

Quadrat	Gibson (1994)				Keighery (2012)				Final Determination
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
CHQ16	27	28	YAN-6	Broadly clustering with FCT 18 and 19.	30	24	cool 08	Broadly clustering with FCT 19 and 29a.	FCT28 Spearwood *B. attenuata* or *B. attenuata-Eucalyptus* woodland. Suits description and confirms similarity. Low similarity is likely due to the disturbed and isolated nature of the vegetation patch, which is located next to a road, cleared land and a pathway. Weeds are also abundant. Known to be associated with Banksia Woodlands TEC, however, does not represent a PEC or TEC as explained in Section 6.1.2.1.
	26	28	WOODV-2		30	25	much04		
	23	28b	WOODV-1		28	28	WOODV-2		
CHQ05	32	24	TRIG-6	Broadly clustering with FCTs 11 and 19.	37	s11	m6402	Broadly clustering with FCTs s11, s15, 30a2 and 29b	Indeterminate Does not represent FCT24 Scattered health with Tuart. Is missing key species such as *Calothamnus quadrifidus, Chaetospora curvifolia* (previously *Schoenus curvifolius*), and *Banksia sessilis*. Low similarity to all FCTs likely relates to high presence of weeds and low abundance of native understorey species due to historical disturbance.
	29	25	C71-4		34	24	xbeer01		
	28	24	NEER-1		34	24	star01		

6.1.3 Vegetation Condition

The survey area comprises 2.95 ha of native vegetation. The majority of this was in Completely Degraded condition. A high level of weed invasion was present which is expected in a highly developed area on the Swan Coastal Plain.

Cleared areas represent areas devoid of native vegetation and are not included in percentage calculations below. Vegetation condition is mapped on Figure 8 and extent of each category is presented in Table 29 below.

Table 29 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Completely Degraded	0.65	22%
Degraded	0.63	21%
Good	1.67	57%
Total	**2.95**	**100%**
Cleared	26.12	

6.1.4 Conservation Significant Flora

No significant flora species were recorded in the Padbury-Wangara survey area.

6.1.5 Flora Inventory

A total of 69 flora species from 27 families were recorded. The total includes 39 (56.6%) locally native species and 30 (43.5%) introduced or naturalised weed species. No weed species listed as Weeds of National Significance (WONS) or listed as Declared Pests under the BAM Act were recorded.

Families with the highest representation are Myrtaceae (11 native taxa), Fabaceae (four native taxa), and Asparagaceae (four native taxa).

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

6.2 Fauna

6.2.1 Fauna Habitat Assessment

Four fauna habitats representing native vegetation were mapped, including Banksia Woodland, Eucalyptus Woodland, Mixed Shrubland and Trees Over Cleared. Trees Over Cleared (4.82 ha, 16.6% of the survey area) and Mixed Shrubland (1.41 ha, 4.8%) were the two most dominant habitat types. Fauna habitat types and suitability for significant fauna species is described below and mapped in Figure 9.

Cleared represents 23.23 ha and is devoid of vegetation.

6.2.1.1 Banksia Woodland

The Banksia Woodland habitat is mapped for 0.74 ha (3% of the survey area) occurs as isolated occurrences in two locations along Whitfords Avenue. It is characterised by an overstorey of *Banksia attenuata, Banksia grandis*, and *Callitris preissii* over mixed shrublands and grasslands of variable density. Shrub species included *Acacia lasiocarpa var. lasiocarpa, Daviesia divaricata subsp. divaricata, Hibbertia hypericoides* and *Melaleuca huegelii*. A grassy understorey was common throughout.

Microhabitat features such as logs and rocks are limited in their abundance, attributed to the restricted size. Coarse litter is abundant, whilst fine leaf litter is sparse and bare ground is common throughout.

Plate 3 Banksia Woodland Habitat

6.2.1.2 Eucalyptus Woodland

The Eucalyptus Woodland habitat extends for 1.12 ha (4% of the survey area) and represents the edge of a larger area of remnant native vegetation. Areas of larger remnant native vegetation provides an important refuge for fauna species within the surrounding developed area. The Eucalyptus Woodland habitat consists of large mature trees, primarily Tuart *Eucalyptus gomphocephala* and Marri *Corymbia calophylla* over a variable understorey species.

Coarse leaf litter is abundant through the habitat, providing excellent shelter and foraging habitat which may be utilised by species such as the Quenda *Isoodon fusciventer* and the Black-striped Snake *Neelaps calonotos.* Large logs (>30cm) were infrequent while small logs were abundant.

The Eucalyptus Woodland habitat represents suitable roosting, foraging and breeding habitat for Black Cockatoo species due to the presence of mature tall trees and proximity of a water source.

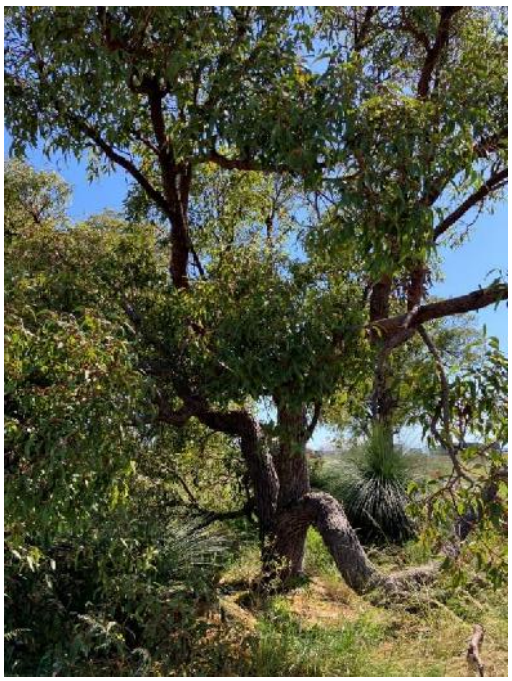

Plate 4 Eucalyptus Woodland Habitat

6.2.1.3 Mixed Shrubland

The Mixed Shrubland habitat extends for 1.84 ha (5% of the survey area), occurring sporadically throughout the survey area and varying in size. Composition alters, but it provides a unique ecological niche within the survey area for smaller animals such as birds and reptiles due to a higher plant density generally observed compared to more open habitats such as a Eucalyptus Woodland. Densely branched shrubs provide greater protection from predation when foraging and nesting. The habitat includes isolated planted shrubs, as well as remnant native vegetation shrublands. Species included *Acacia saligna, Calothamnus quadrifidus, Callistemon phoenicus* and various *Melaleuca* species.

Smaller logs occur throughout the habitat type, but large logs and rocks were rarely observed. Grasses were abundant, with coarse leaf litter occurring occasionally.

Plate 5 Mixed Shrubland Habitat

6.2.1.4 Trees Over Cleared

The Trees Over Cleared habitat type is the most abundant habitat type. It extends for 2.13 ha (7% of the survey area) and consists of planted street trees along with isolated native trees over grasses and weeds. There is minimal variation and limited microhabitats throughout the habitat type. Leaf litter is infrequent, with minimal logs and fallen branches present. The habitat would primarily be used by invertebrates and flighted species such as birds and microbats that shelter, breed and forage in the mature trees.

Plate 6 Trees Over Cleared Habitat

6.2.2 Fauna Inventory

A total of 15 vertebrate fauna species were recorded during the field survey. This comprised of 11 bird, three mammal and one reptile species. A complete inventory of fauna species recorded within the survey area is provided in Table 30.

One introduced species was recorded, the European Rabbit *Oryctolagus cuniculus*, listed as a Declared Pest (s22(2)) under the BAM Act. The species is common throughout Western Australia.

Table 30 Fauna observations within the Padbury-Wangara survey area

Class	Scientific Name	Common Name	Method
Mammal	*Isoodon fusciventer*	Quenda	Foraging evidence
Mammal	*Macropus fuliginosus melanops*	Western Grey Kangaroo	Seen. Scats observed
Mammal	*Oryctolagus cuniculus*	European Rabbit	Seen
Bird	*Rhipidura leucophrys*	Willie Wagtail	Seen and heard
Bird	*Eolophus roseicapilla*	Galah	Seen and heard
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Foraging evidence
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Seen and heard. Foraging evidence
Bird	*Falco cenchroides*	Nankeen Kestrel	Seen
Bird	*Phylidonyris longirostris*	New Holland Honeyeater	Seen and heard
Bird	*Spilopelia senegalensis*	Laughing Dove	Seen and heard

Class	Scientific Name	Common Name	Method
Bird	*Threskiornis molucca*	Australian White Ibis	Seen
Bird	*Anthochaera carunculata*	Red Wattlebird	Seen and heard
Bird	*Trichoglossus moluccanus*	Rainbow Lorikeet	Seen and heard
Bird	*Cacatua sanguinea*	Little Corella	Seen and heard
Reptile	*Tiliqua rugosa rugosa*	Bobtail/Shingleback Lizard	Seen

6.2.3 Conservation Significant Fauna

Three conservation significant fauna species were recorded including two bird species and one mammal species:

- Carnaby's Cockatoo (*Zanda latirostris)* listed as Endangered under the EPBC Act and BC Act
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)* listed as Vulnerable under the EPBC Act and BC Act
- Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA.

Carnaby's Cockatoos were seen and heard during the survey. Foraging evidence was recorded for the Forest Red-tailed Black Cockatoo. Quenda presence was recorded via distinct foraging evidence (Plate 7). Evidence of conservation significant species is mapped in Figure 9.

Fauna habitat is considered suitable for another four conservation significant fauna species, assessed as moderately likely to occur post-survey:

- Baudin's Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act and BC Act
- Peregrine Falcon (*Falco peregrinus*) listed as Other Specially Protected Fauna under the BC Act
- Black-striped Snake (*Neelaps calonotos*) listed as Priority 3 by DBCA
- Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) listed as Priority 3 by DBCA

Habitat descriptions and conservation significant species likely to utilise this habitat is defined in Table 31.

Plate 7 Typical conical-shaped Quenda digging - foraging evidence

Table 31 Area (ha) of suitable habitat for significant fauna species within the survey area

Species	Area of Suitable Habitat (ha)				Total (ha)
	Eucalyptus Woodland	Banksia Woodland	Trees Over Cleared	Mixed Shrubland	
Carnaby's Cockatoo (*Zanda latirostris*)	1.12	0.74	2.13		6.68
Baudin's Cockatoo (*Zanda baudinii*)	1.12		2.13		5.94
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	1.12		2.13		5.94
Peregrine Falcon (*Falco peregrinus*)	1.12	0.74	2.13	1.84	8.09
Quenda (*Isoodon fusciventer*)	1.12	0.74		1.84	3.27
Black-striped Snake (*Neelaps calonotos*)	1.12	0.74		1.84	3.27
Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*)		0.74			0.74

6.3 Targeted Black Cockatoo Survey

6.3.1 Foraging

The survey area has been assessed as a score of 10 ‘High-quality foraging habitat’ for both the Carnaby’s Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the Commonwealth Black Cockatoo Referral Guidelines foraging tool (DAWE, 2022) (Table 32). No subtractions were made for these two species. The survey area has been assessed as a score of 8 for Baudin’s Cockatoo due to an absence of foraging evidence during the survey.

The survey area contains mature Banksia Woodlands and Eucalyptus Woodlands, with suitable foraging species including multiple proteaceous species, Marri *Corymbia calophylla* and Tuart *Eucalyptus gomphocephala* trees.

Table 32 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**	

The refined foraging habitat value using the BCE (2020) method considered known breeding and roosting sites, and the characteristics associated with each fauna habitat type. The following factors influenced the results:

- There is a confirmed white-tailed Black Cockatoo (Baudin's or Carnaby's) roosting site less than 200 m south of the survey area (DBCA, 2023c).
- The survey area is less than 2 km from the buffer zone of a confirmed breeding site (DBCA, 2023c).
- There is 13,250 ha of native vegetation within 15 km of the survey area. Native vegetation within the survey area (2.95 ha) represents 0.01% of the available foraging habitat therefore species context is rated as 0.
- Carnaby's Cockatoos were observed resting and foraging in *Banksia grandis* within the survey area, as well as flying over (Plate 8).
- Foraging evidence was identified for Forest Red-Tailed Black Cockatoos within the survey area, with individuals also heard calling.

Plate 8 Carnaby's Cockatoos seen foraging on a *Banksia grandis* in the survey area.

The Banksia Woodland represents 'Moderate to High' Carnaby's Cockatoo foraging habitat. This represents a site condition score of 6 and a stocking score of 1 attributed to the presence of favourable foraging species and foraging evidence. This same fauna habitat represents 'Low' foraging habitat for Baudin's Cockatoo and Forest Red-tailed Black Cockatoo due to the lack of preferred foraging species such as *Eucalyptus marginata*, *Eucalyptus todtiana* or *Corymbia calophylla*.

The Eucalyptus Woodland fauna habitat represented 'Moderate' quality for the three Cockatoos with site scores of 3 and 4 and stocking rate of 1 for Carnaby's and Forest Red-tailed Black Cockatoos. The score was influenced by the abundance of suitable foraging species such as *Corymbia calophylla*, *Eucalyptus gomphocephala* and *Banksia grandis* and presence of foraging evidence.

The Mixed Shrubland habitat scored a 1 and 2 for the three Cockatoos, representing 'Negligible' and 'Low' quality lacking suitable foraging species.

The Trees over Cleared represented 'Low' quality for Carnaby's representing open woodland of small-fruited Eucalypt species. It was considered 'Low to Moderate' for Baudin's and Forest Red-tailed Black Cockatoo with a total score of 3 for Baudin's and 4 for Forest Red-tailed Black Cockatoos due to foraging evidence being present.

The low values reflect the absence or low abundance of foraging species present resulting in lower site condition scores and lower site context scores.

Foraging habitat scores for each habitat type are shown in Table 33 and mapped in Figure 10.

Table 33 Padbury-Wangara refined foraging score calculation (Bamford, 2020)

Habitat Type	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo	Extent (ha)
Mixed Shrubland	2	1	1	1.84
Banksia Woodlands	7	2	2	0.73
Eucalyptus Woodland	4	4	5	1.12
Trees Over Cleared	2	3	4	2.13

Table 34 Padbury-Wangara foraging habitat extent

Foraging Habitat Quality	Carnaby's Cockatoo (ha)	Baudin's Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
1: Negligible	0	1.84	1.84
2: Low	3.97	0.74	0.74
4-6: Moderate	1.86	3.25	3.25
7: Moderate to High	0	0	0
8-10: High.	0	0	0
Total	5.83	5.83	5.83

6.3.2 Breeding

A total of 103 potential nesting trees with a suitable DBH (>500 mm) were recorded within and adjacent to the survey area (Table 35, Figure 10). The majority were Tuart (*Eucalyptus gomphocephala*) and Marri (*Corymbia calophylla*) trees.

Two suitable nesting trees (Tuart) were identified supporting five potentially suitable nest hollows (Plate 9, Plate 10). One of these hollows is currently occupied by Little Corellas and one may be too small to be suitable, however this is unable to be determined from ground-level observations. This assessment is limited to observations made from the ground.

Table 35 Potential nesting trees

Tree Species	Total Trees with DBH >500 mm
Tuart (*Eucalyptus gomphocephala*)	47
Marri (*Corymbia calophylla*)	29
Jarrah (*Eucalyptus marginata*)	5
Other	6
Introduced	16
Total	**103**

Table 36 Suitable nesting tree details including species and hollow dimensions.

ID	Species	Hollow Entrance (Depth x Width)	Height Above Ground (m)	Hollow Angle	Facing	Hollow Type	Evidence of Use
54	Tuart (*Eucalyptus gomphocephala*)	15 x 15 cm	12	Vertical	North-west	Trunk	Chew Marks
		10 x 10 cm	8	Vertical	South-west	Branch	None
		20 x 20 cm	18	Vertical	North-west	Trunk	Chew Marks
		10 x 10 cm	8	Vertical	South	Trunk	Chew Marks
84	Tuart (*Eucalyptus gomphocephala*)	15 x 15 cm	8	Vertical	North-west	Trunk	Chew Marks

Plate 9 Hollow on potentially suitable nesting tree ID84 Tuart (*Eucalyptus gomphocephala*)

Plate 10 Hollows recorded on potentially suitable nesting tree ID54 Tuart (*Eucalyptus gomphocephala*)

6.3.3 Roosting

Sixty-nine confirmed white-tailed Black Cockatoo and Forest Red-tailed Black Cockatoo roosting sites occur within 15 km of the survey area. Seven of these occur within 5 km and one within 1 km of the survey area (DBCA, 2023c).

No roosting sites were observed within the survey area. There is a water source within 2 km of the survey area, foraging habitat is present in the local area and there are mature Eucalypt trees present. The Eucalyptus Woodland fauna habitat would therefore provide suitable roosting habitat. There is a known roosting site within Pinnaroo Valley Memorial Park, adjacent to the survey area.

6.4 Discussion

6.4.1 Flora and Vegetation

Native vegetation was mapped for 2.95ha of the survey area, representing 10% of the total area. The survey area intersects with Bush Forever Sites 299 and 303. Site 299 Yellagonga Regional Park represents Tamala Limestone and holocene swamp deposits on Spearwood and Quindalup dune systems (Govt. of WA, 2000). It comprises mostly Banksia and Jarrah woodlands, Marri woodlands and Tuart woodlands and is part of a recognised Greenway (Govt. of WA, 2000). Site 303 Whitfords Avenue Bushland represents Spearwood and Quindalup dunes and includes limestone ridges and vegetated uplands. It comprises Tuart woodlands and Banksia woodlands with emergent Jarrah trees (Govt. of WA, 2000).

Four native vegetation communities and three modified communities were mapped two Banksia Woodlands communities BaAbAb (0.15 ha, 0.5%) and BaAlTe (0.58 ha, 2%), one Tuart Woodland EgHcPp (1.12 ha, 3.9%) and one Callitris Woodland CpMsLo (0.48 ha, 1.6%). patch met the requirements presented in the Conservation Advice. Each patch represents isolated occurrences that are less than 2 ha, supported low native diversity, and therefore did not meet the condition and size thresholds.

Tuart Woodlands TEC was anticipated to occur, as a known occurrence is mapped within this area. One patch of Tuart Woodlands TEC was confirmed. It extends for 0.50 ha within the survey area, representing the edge of a larger patch estimated at more than 30 ha. This patch represents Bush Forever Site 303 which is mapped as more than 75% Very Good to Good and 25% Degraded (Govt of WA, 2000). The vegetation within the survey area is part of the 25% of mapped Degraded vegetation. It is adjacent to native vegetation for 50% of the edge (north) and a major road (Whitfords Avenue). The vegetation continues on the south side of Whitfords Avenue. The patch is within the highly developed and cleared urban area of Perth and provides an important refuge for native flora and fauna species.

All native vegetation was close to roads and urban development. Historical impacts from these including clearing and introduction and spread of weeds have resulted in a reduction in flora diversity and absence of suitable habitat for significant flora species. Flora diversity equally represented native and weed species (39 native compared to 30 weed species). A biological survey completed nearby along Mitchell Freeway found 217 flora species (145 native compared to 72 weed species) within 42.2 ha (Astron, 2020). Flora diversity is comparable given the smaller size of the survey area.

No significant flora species were recorded. This was expected, as the desktop assessment did not identify any species considered to have a high likelihood of occurrence, and large parts of the survey area were historically disturbed.

All areas of native vegetation were traversed on foot during the ideal detection period for target significant species. Further, all species that were not recorded in sample sites were sampled opportunistically. No suitable habitat was identified for most species given the degradation of the area and proximity to development. As such, all species considered to have a moderate likelihood of occurrence were downgraded to a low likelihood post-survey. Table 37 provides a summary of pre-survey and post-survey likelihood of occurrence for species identified as potentially occurring within the survey area.

Table 37 Summary of Padbury-Wangara likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	0	34	27	21	82
Post-survey	0	0	0	34	48	82

6.4.2 Fauna

Fifteen fauna species were recorded during the field survey. This included eleven birds, three mammals and one reptile. Three significant fauna species were recorded including two bird species and one mammal species:

- Carnaby's Cockatoo (*Zanda latirostris)* listed as Endangered under the EPBC Act and BC Act
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)* listed as Vulnerable under the EPBC Act and BC Act
- Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA.

Following the survey, a post-survey likelihood desktop assessment was completed. Details of all the conservation significant species considered to have a high or known post-survey likelihood and their associated habitats is presented in Table 38. Those which have been downgraded from a high likelihood due to the post-survey assessment are also discussed.

Four native fauna habitats were defined and mapped for the survey area based on the results of the field assessment. These habitats include Banksia Woodland, Eucalyptus Woodland, Trees Over Cleared and Mixed Shrubland.

The significant fauna species are most likely to utilise Eucalyptus Woodland and Banksia Woodland areas where native understorey density was higher, generally associated with vegetation condition of 'Good' or better.

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Table 38 Fauna species which are known or moderately likely to utilise associated fauna habitat within the Padbury-Wangara survey area.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Carnaby's Cockatoo (*Zanda latirostris*)	E (EPBC Act) EN (BC Act)	Uncleared or remnant native Eucalypt woodlands containing Salmon gum and Wandoo, and in shrubland or Kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	There are 9264 records on the DBCA database, the closest record is 0.08 km away from the survey area and was most recently sighted in 2020.	High	Known	This species was observed foraging in Banksia trees within the survey area. It is likely to use the Eucalyptus Woodland, Banksia Woodland and Trees Over Cleared habitat types for foraging and roosting within the survey area. These habitats are found outside of and directly adjacent to the survey area.
Baudin's Cockatoo (*Zanda baudinii*)	E (EPBC Act) EN (BC Act)	Temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *E. diversicolor* (Karri) (TSSC, 2018).	There are 136 records on the DBCA database, the closest record is 7.51 km away from the survey area and was most recently sighted in 2015.	High	Moderate	This species may use the Eucalyptus Woodland, Banksia Woodland and Trees Over Cleared habitat types within the survey area. This habitat is found outside of and directly adjacent to the survey area.
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V (EPBC Act) VU (BC Act)	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	There are 363 records on the DBCA database, the closest record is 1.2 km away from the survey area and was most recently sighted in 2020.	High	Known	This species is likely to use the Eucalyptus Woodland, Banksia Woodland and Trees Over Cleared habitat types within the survey area. Foraging evidence for the Forest Red-tailed Black Cockatoo was also recorded within the survey area. These habitats are found outside of and directly adjacent to the survey area.
Quenda (*Isoodon fusciventer*)	P4	Forest, woodland, heath, and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008). The presence of accumulated coarse leaf litter is suitable foraging habitat for the Quenda.	There are over 1588 records within 10 km of the survey area, with the closest record occurring at 0.04 km. The most recent of these was recorded in 2021.	High	High	This species is likely to use Eucalyptus Woodland, Mixed Shrubland and Banksia Woodland habitats within the survey area. These habitats are found outside of and directly adjacent to the survey area.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
		Quenda foraging activity was observed throughout these habitat types.				
Black-striped Snake (*Neelaps calonotos*) listed as Priority 3 by DBCA	P3	Restricted to sandy coastal strip near Perth, WA between Mandurah and Cataby, with isolated populations north, near Eneabba and Dongara. Dunes and vegetated sand plains with heaths and Eucalyptus/Banksia woodlands are preferred habitats (Wilson and Swan 2023).	There are 97 records on the DBCA database, the closest record is 0.61 km away from the survey area. The most recent record is in 2017.	High	Moderate	Dense leaf litter which is known to occur in sandy Banksia Woodlands of the survey area (Bush et al., 2010) is the preferred habitat type of this species. This species may utilise areas where native understorey density in Banksia Woodlands and Eucalyptus Woodlands was higher, generally associated with vegetation condition of 'Good' or better. These habitats are found outside of and directly adjacent to the survey area.
Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*)	P3	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	There are 124 records on the DBCA database, the closest record is 0.24 km away from the survey area. The most recent record is in 2019.	High	Moderate	This species may utilise areas where native understorey density in Banksia Woodlands was higher, generally associated with vegetation condition of 'Good' or better. This habitat is found outside of and directly adjacent to the survey area.
Peregrine Falcon (*Falco peregrinus*)	OS	Utilises most habitat types, from forests to urban areas. The greatest influence on presence is the abundance of prey and secure nest sites (Birdlife Australia, 2024).	There are 109 records on the DBCA database, with the closest record 0.54 km away from the survey area. The most recent record is 2014.	Moderate	Moderate	The species may utilise the area for hunting, particularly the Eucalyptus Woodland and Banksia Woodland habitats. Breeding is unlikely, as suitably high buildings are not present within the survey area. The suitable habitat types are not limited to the survey area.

6.4.3 Targeted Black Cockatoo

The survey area is within the known range for the three threatened Black Cockatoo species. Both the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) and Carnaby's Cockatoo (*Zanda latirostris*) were observed foraging and resting within the survey area. There were 103 potential nesting trees with a suitable DBH (>500 mm) identified with the survey area. Two potentially suitable nesting trees were identified, which have multiple hollows with a potentially suitable entrance size for black cockatoos. Presently, this survey area is not within the known breeding range of any of the black cockatoo species.

The survey area scored a foraging habitat score of 10 for both the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the DAWE 2022 guidelines. The survey area has been assessed as a score of 8 for Baudin's Cockatoo, due to an absence of foraging evidence during the survey. The BCE (2020) scoring method defined the area as supporting Negligible to High foraging quality. This quality is primarily associated with the Banksia Woodland and Eucalyptus Woodland habitat types, which includes suitable foraging species such as *Banksia attenuata*, *Banksia menziesii, Eucalyptus gomphocephala* and *Eucalyptus todtiana*. A permanent water source presence nearby, confirmed sighting during the survey, and extent of suitable foraging habitat in the vicinity all contributed to the foraging score. The small size and reduced quality of the foraging habitat within the survey area limited the overall quality score for Forest Red-tailed Black Cockatoos, with higher quality foraging habitat occurring outside the survey area. The small patch of Banksia Woodlands was observed to be well utilised by Carnaby's Cockatoos, with a small flock observed foraging on *Banksia grandis* during the survey. This patch was rated as High quality for the species.

The trees within the survey area are unlikely to be utilised as a roosting site. The entire survey area corridor incorporates busy metropolitan roads and crosses a Freeway. Alternative roosting sites would be present further from infrastructure and potentially light pollution further from the survey area. A large roosting site for black cockatoos is known to occur in the Tuart Woodland within Pinnaroo Valley Memorial Park, which is directly adjacent to the survey area.

The local area supports both urban and conservation land use. It is situated on the edge of a significant corridor of native vegetation which includes Craigie Bushland. The native vegetation in the vicinity is in better condition, protected in Bush Forever Sites 299 and 303 that support favoured foraging species in higher abundance compared to that found in the survey area.

7.0 Pinjar Terminal Results and Discussion

7.1 Flora

7.1.1 Vegetation Communities

One native Banksia Woodland community, BaAcCc was defined and mapped for 14.75 ha (89%). The remaining 1.82 ha represents cleared areas devoid of vegetation. Vegetation community descriptions are presented in Table 39 and mapped on Figure 8.

Table 39 Pinjar vegetation community descriptions and photographs

Description	Additional Details	Photograph
Native Vegetation		
BaAcCc *Banksia attenuata* Woodland *Banksia attenuata and Banksia menziesii* woodland over *Adenanthos cygnorum* subsp. *cygnorum, Xanthorrhoea preissii, Kunzea glabrescens* open shrubland over *Conostylis candicans, Patersonia occidentalis* and *Lomandra sericea* forbland. Represents the Banksia Woodlands TEC. It was located on white sandy soil on gently undulating terrain.	Survey effort: NSR05, CHQ06, CHQ07 supplemented by AECOM (2022b) Q12 situated 200 m from survey area. Species richness: 55 species Condition: Very Good to Excellent Extent: 14.75 ha	

7.1.2 Conservation Significant Vegetation

One TEC listed under the EPBC Act was verified to occur. No communities listed under the BC Act were identified in the survey area.

One patch of Banksia Woodland TEC (Patch 3) was assessed against the key diagnostic characteristics outlined in the DEE (2016) Conservation Advice. The patch 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 14.75 ha in the survey area.

One Priority 3 PEC was also identified through FCT analysis, FCT 23b Swan Coastal Plain *B. attenuata-B. menziesii* woodlands. This FCT represent a component of the Banksia Woodlands TEC. Similarity was high when comparing against Gibson and Keighery data varying between 43-47% across CHQ06 and CHQ07 (Table 41). Clustering further supported the inferred FCT23b. FCT23b is inferred for all Banksia Woodlands within the survey area and represents the federally listed Banksia Woodlands TEC.

The patch assessment is presented in Table 40 below.

Table 40 Pinjar Banksia TEC patch assessment

<table>
<tr><td>ID</td><td>Patch 3</td></tr>
<tr><td>Date</td><td>CH06, CHQ07, NSR05 scored on 18-Oct-23</td></tr>
<tr><td>Location</td><td>On the Swan Coastal Plain, on the Bassendean System.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaAcCc, a Banksia woodland dominated by B. attenuata and B. menziesii.</td></tr>
<tr><td>Structure</td><td>Represents a 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">CHQ06</th><th colspan="2">CHQ07</th><th colspan="2">NSR05</th></tr>
<tr><th>Ht (cm)</th><th>Cover</th><th>Ht (cm)</th><th>Cover</th><th>Ht (cm)</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>1000</td><td>40</td><td>700</td><td>30</td><td>350</td><td>7</td></tr>
<tr><td>B. menziesii</td><td>850</td><td>10</td><td>500</td><td>4</td><td>-</td><td>-</td></tr>
<tr><td>Allocasuarina humilis</td><td>160</td><td>8</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHQ06</th><th>CHQ07</th><th>NSR05</th></tr>
<tr><td>Cover (%)</td><td>76.8</td><td>58.6</td><td>57.2</td></tr>
<tr><td>Diversity total</td><td>36</td><td>36</td><td>17</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHQ06</th><th>CHQ07</th><th>NSR05</th></tr>
<tr><td>Cover (%)</td><td>0.1</td><td>0.1</td><td>0.2</td></tr>
<tr><td>Dominant species</td><td>*Gladiolus caryophyllaceus</td><td>*Gladiolus caryophyllaceus</td><td>No clear dominant</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>White-grey sand</td></tr>
<tr><td>Landform</td><td>Undulating sandy terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 14.75 ha
Estimated total extent: >1,000 ha</td></tr>
<tr><td>Summary</td><td>The patch meets the condition and size thresholds to be considered representative of the Commonwealth listed TEC.</td></tr>
</table>

Photograph	

Table 41 Pinjar floristic community type analysis results

Quadrat	Gibson (1994)				Keighery (2012)			Final Determination	
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
CHQ06	43	23b	YAN-19	Broadly clustering with FCT 23a and 23b (super group 3).	44	12	MP04	Broadly clustering with FCT 23b and 23c (super group 3).	**FCT 23b** • Correct landform: Bassendean system • Soils: white-grey sand • Key species: 13 of 19 typical species present
	42	21a	NINE-2		43	23b	YAN-19		
	39	23b	MILT-3		43	21c	ELE25		
CHQ07	49	21a	NINE-2	Broadly clustering with FCT 23a and 23b (super group 3).	52	21a	NINE-2	Broadly clustering with FCT 23b S (super group 3).	**FCT 23b** • Correct landform: Bassendean system • Soils: white-grey sand • Key species: 10 of 19 typical species present
	45	23b	ELDO-1		47	23b	ELE28		
	43	23b	YAN-19		46	23b	ELE08		

7.1.3 Vegetation Condition

Areas of native vegetation were mostly in Excellent condition (12.48 ha, 85%). Minor weed invasion was present which is expected on the Swan Coastal Plain, particularly where parcels of vegetation have been dissected by tracks. 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.

Cleared areas represent areas devoid of vegetation and are not included in percentage calculations below. Vegetation condition is mapped on Figure 8 and extent of each category is presented in Table 42 below.

Table 42 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Excellent	12.48	85%
Very Good	2.27	15%
Total	**14.75**	**100%**
Cleared	1.82	

7.1.4 Conservation Significant Flora

No significant flora species were recorded in the Pinjar survey area.

7.1.5 Flora Inventory

A total of 55 flora species from 27 families were recorded. The total includes 53 (96%) locally native species and two (4%) introduced or naturalised weed species. No weed species listed as Weeds of National Significance (WONS) or listed as Declared Pests under the BAM Act were recorded.

Families with the highest representation are Myrtaceae (6 native taxa), Proteaceae (six native taxa), and Goodeniaceae (four native taxa).

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

7.2 Fauna

7.2.1 Fauna Habitat Assessment

One fauna habitat was mapped, described below and mapped in Figure 9. Cleared areas are mapped for occurs over 1.82 ha and comprising 11% of the survey area. Tracks and scats were sporadically observed along the cleared tracks that provides connectivity between areas of native vegetation. Predatory species such as foxes, hawks or falcons may take advantage of these spaces for hunting smaller species.

Banksia Woodland was mapped for 14.75 ha, comprising 89% of the survey area. It is characterised by an overstorey of *Banksia attenuata*, *Banksia menziesii, Nuytsia floribunda* and *Eucalyptus todtiana* over predominantly Proteaceous and Myrtaceous shrubs of variable density and height.

This habitat type contains occasional large logs (>30cm in diameter) and abundant small logs (<10cm). Vines are not present. Small hollows were observed in mature trees. Rocks occur sporadically on the deep grey sands typical of the Swan Coastal Plain. Coarse and fine leaf litter was abundant, fine leaf litter is common and areas of bare ground was rare.

Plate 11 Banksia Woodland Habitat

7.2.2 Fauna Inventory

A total of 13 vertebrate fauna species were recorded during the field survey. This comprised of seven bird, three mammal and three reptile species. A complete inventory of fauna species recorded within the survey area is provided in Table 43.

One introduced species was recorded, the European Rabbit *Oryctolagus cuniculus*, which is listed as a Declared Pest (s22(2)) under the BAM Act.

Table 43 Fauna observations within the Pinjar Terminal survey area

Class	Scientific Name	Common Name	Observation Method
Mammal	*Isoodon fusciventer*	Quenda	Foraging evidence
Mammal	*Macropus fuliginosus melanops*	Western Grey Kangaroo	Seen, tracks and scats recorded
Mammal	*Vulpes vulpes*	Red Fox	Seen
Bird	*Phylidonyris longirostris*	New Holland Honeyeater	Seen
Bird	*Colluricincla harmonica*	Grey Shrike-thrush	Seen and heard
Bird	*Phylidonyris niger*	White-cheeked Honeyeater	Seen and heard
Bird	*Lichmera indistincta*	Brown Honeyeater	Seen and heard
Bird	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	Seen
Bird	*Malurus splendens*	Splendid Fairy-wren	Seen and heard
Bird	*Accipiter fasciatus*	Brown Goshawk	Seen and heard
Reptile	*Pseudonaja affinis*	Dugite	Seen
Reptile	*Tiliqua occipitalis*	Blue tongue	Seen
Reptile	*Tiliqua rugosa rugosa*	Bobtail/Shingleback Lizard	Seen

7.2.3 Conservation Significant Fauna

One conservation significant fauna species was recorded during the survey, Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA. Distinct foraging evidence was observed (Plate 12), mapped in Figure 9.

An additional three species are considered to have a high potential to occur within the survey area due to the presence of suitable habitat and recent records within the surrounding area. These include:

- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act
- Black-striped Snake (*Neelaps calonotos*) listed as Priority 3 by DBCA
- Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) listed as Priority 3 by DBCA

Plate 12 Typical Conical-Shaped Quenda Digging - Foraging Evidence

7.3 Targeted Black Cockatoo Survey

7.3.1 Foraging

The survey area has been assessed as a score of 8 ‘High-quality foraging habitat’ for Carnaby’s Cockatoo in accordance with the Commonwealth Black Cockatoo Referral Guidelines foraging tool (DAWE, 2022) (Table 44). The survey area contains mature Banksia Woodlands, with suitable foraging species including multiple proteaceous species and one subtraction was relevant due to a lack of foraging evidence.

No evidence of any of the three Threatened Black Cockatoo species were observed during the survey. No suitable breeding trees, foraging evidence or hollows were recorded.

Table 44 Black Cockatoo Foraging Habitat Assessment (DAWE, 2022)

Starting score		Carnaby's Cockatoo (*Zanda latirostris*)	
		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.**	
Attribute	Sub-tractions	Context adjustor (attributes reducing functionality of foraging habitat).	
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	☒
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	☐
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	☐
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	☐
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	☐
		8	

Table 45 Pinjar Terminal refined foraging score calculation (Bamford, 2020)

Habitat Type	Carnaby's Cockatoo	Extent (ha)
Banksia Woodlands	6	14.75

Table 46 Pinjar Terminal foraging habitat extent

Foraging Habitat Quality	Carnaby's Cockatoo (ha)
1: Negligible	0
2: Low	0
4-6: Moderate	14.75
7: Moderate to High	0
Total	14.75

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

- There is a confirmed white-tailed Black Cockatoo roosting site less than 400 m west of the survey area (DBCA, 2023c).
- The survey area is 15 km from the buffer zone of a confirmed breeding area (DBCA, 2023c).
- There is suitable foraging habitat adjacent to the survey area. Native vegetation within the survey area represents <0.1% of the available foraging habitat within a 15 km radius. Site context is therefore 0.
- No evidence of foraging, or potential nesting trees were observed. Stocking rate was therefore 0.

The Banksia Woodland fauna habitat areas scored 6 for Carnaby's Cockatoo according to the BCE (2020) scoring tool representing 'Moderate' Quality. This is attributed to the condition of the vegetation and the number of Proteaceous foraging species present.

No score was given for Baudin's Cockatoo or Forest Red-tailed Black Cockatoo as the survey area falls outside their known range. Foraging habitat is mapped in Figure 10.

7.3.2 Breeding

No breeding habitat was observed within the survey area.

7.3.3 Roosting

No roosting sites were observed within the survey area. There are no tall trees or riparian vegetation within 2 km of the survey area, therefore roosting is unlikely. There are 32 confirmed roosting sites for white-tailed Black Cockatoos and Forest Red-tailed Black Cockatoos within 15 km from the survey area.

7.4 Discussion

7.4.1 Flora and Vegetation

The survey area is situated within Gnangara State Forest and Bush Forever Site 280. This Site is characterised by a mixture of *Eucalyptus* and *Banksia* woodlands. The survey area is intersected by a powerline and associated access track.

The vegetation was mapped as Banksia Woodland, extending 14.75

One Priority 3 PEC listed by the DBCA (2023) was confirmed, supported by FCT analysis. FCT23b northern *Banksia attenuata – B. menziesii* woodlands was considered likely to occur. This FCT represents Banksia woodlands generally restricted to the Bassendean system, with subgroup b having lower species richness than the other subgroups and a significantly lower mean weed frequency, reflecting the more extensive intact *Banksia* woodlands that occur north of Perth (Gibson et al. 1993).

Flora diversity was considered average with 53 species recorded. The diversity is typical of FCT23b (54.8 species per 10x10 m quadrat). Diversity is comparable to a nearby biological survey undertaken for the SCAR 4 Project (AECOM, 2022a) recorded 145 flora species from a long linear corridor encompassing eight vegetation communities. No significant flora species were recorded. Approximately 25% of the survey area has been subjected to targeted flora searches previously (AECOM, 2022a) and no significant flora species were recorded at that time within or near the survey

area. Following the two survey events, 17 of the 18 species with a moderate likelihood have been reduced to low or negligible (Table 47). These all represent perennial species that would have been detectable at the time of the surveys.

One species, *Poranthera moorokatta* (P2), was investigated further to determine its post-survey likelihood. *P. moorokatta* is an inconspicuous annual herb that may have been overlooked. The species was described in 2012 at which time it was known from two locations: Kings Park and Ellenbrook. In Kings Park it was recorded on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high leaf litter cover (Barret, 2012). In Ellenbrook it was recorded in a shallow dampland on mixed grey-white sand with scattered leaf litter (Barret, 2012).

The Banksia Woodlands in the survey area supports 'open spaces between shrubs' and therefore represents suitable habitat. This annual species is 16-47 mm tall, flowers late September to early November and is often confused with the common *P. microphylla* (Barret, 2012). The Ellenbrook population is 17 km from the survey area situated low in the landscape. The Pinjar survey area is on a sand dune, more than 15 km from a known location and has been surveyed twice (partially). The species was therefore reduced to having a 'Low' likelihood.

Table 47 Summary of Pinjar likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	0	18	13	35	66
Post-survey	0	0	0	18	48	66

7.4.2 Fauna

Thirteen vertebrate fauna species were recorded during the field survey. This included seven birds, three mammals and three reptile species. Foraging evidence of the Priority 4 Quenda (*Isoodon fusciventer*) was recorded at three locations within the survey area. This species was considered likely to occur in the desktop study, with 1588 DBCA records known from the vicinity and the habitat present is typical Quenda habitat as described below.

All native vegetation was mapped as Banksia Woodland fauna habitat. This habitat represented an overstorey of Banksia species over a diverse native sclerophyllous understorey over herbs and scattered grasses. This habitat provides ideal refuge and foraging habitat for common fauna species. It is highly connected, with 90% of the perimeter buffered by intact native vegetation. This high connectivity supports fauna movement into and through the survey area.

Following the survey, a post-survey likelihood desktop assessment was completed. Details of all the conservation significant species considered to have a high or known post-survey likelihood and their associated habitats is presented in Table 48. Those which have been downgraded from a high likelihood due to the post-survey assessment are also discussed.

The Banksia Woodlands habitat is considered suitable habitat for Quenda (*Isoodon fusciventer*), Carnaby's Cockatoos (*Zanda latirostris*), the Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*), and Black-striped Snake (*Neelaps calonotos*).

The accumulated coarse leaf litter provides shelter for lizards to dig small burrows, suitable hunting habitat for many birds of prey, and shelter and foraging habitat for small mammals like Priority listed Quenda and Black-striped Snake (*Neelaps calonotos*). The Black-striped Snake is known to prefer sheltering and foraging within leaf litter in Banksia Woodlands in sandy soil (Bush et al., 2010). The sandy soil and presence of leaf litter are also a key habitat component for the Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*).

The larger trees present within the Banksia Woodlands provide nesting, perching and roosting locations for various bird species. These trees are also suitable foraging species for Carnaby's Cockatoo which was observed foraging in *Banksia* trees within the survey area.

Table 48 Fauna species and associated fauna habitat within the Pinjar Terminal survey area

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Fauna species likely to utilise fauna habitat within the Pinjar Terminal survey area						
Carnaby's Cockatoo (*Zanda latirostris*)	E (EPBC Act) EN (BC Act)	Uncleared or remnant native Eucalypt woodlands containing Salmon gum and Wandoo, and in shrubland or Kwongan heathland dominated by Hakea, Dryandra, Banksia, and Grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in Pine plantations (DCCEEW, 2023)	There are 9264 records on the DBCA database, the closest record is 0.12 km away from the survey area. The most recent record is in 2020.	High	High	This species is likely to use the Banksia Woodland habitats within the survey area. This habitat can also be found outside, and surrounding, the survey area.
Quenda (*Isoodon fusciventer*)	P4	Forest, woodland, heath, and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008). The presence of accumulated coarse leaf litter is suitable foraging habitat for the Quenda. Quenda foraging activity was observed throughout these habitat types.	There are 1588 records on the DBCA database, the closest record is 9.09 km away from the survey. The most recent record is in 2021.	High	Known	This species is likely to use the Banksia Woodland habitats within the survey area. This habitat can also be found outside, and surrounding, the survey area.
Black-striped Snake (*Neelaps calonotos*) listed as Priority 3 by DBCA	P3	Restricted to sandy coastal strip near Perth, WA between Mandurah and Cataby, with isolated populations north, near Eneabba and Dongara. Dunes and vegetated sand plains with heaths and Eucalyptus/Banksia woodlands are preferred habitats (Wilson and Swan 2023).	There are 97 records on the DBCA database, the closest record is 12.37 km away from the survey area. The most recent record is in 2017.	High	High	Dense leaf litter which is known to occur in Banksia Woodlands of the survey area (Bush et al., 2010) is also the preferred habitat type of this species. This species may utilise areas where native understorey density in Banksia Woodlands was higher, generally associated with vegetation condition of 'Good' or better. Banksia woodland habitat is also found outside, the survey area.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*)	P3	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	There are 124 records on the DBCA database, the closest record is 14.46 km away from the survey area. The most recent record is in 2019.	High	High	This species is likely to use the Banksia Woodland habitats within the survey area. This habitat can also be found outside, and surrounding, the survey area.
Fauna species unlikely to utilise fauna habitat within the Pinjar Terminal survey area						
Baudin's Cockatoo (*Zanda baudinii*)	E (EPBC Act) EN (BC Act)	Temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) *and E. diversicolor* (Karri) (TSSC, 2018).	There are 136 records on the DBCA database, the closest record is 20.79 km away from the survey area. The most recent record is in 2015.	High	Low	This species is unlikely to use the Banksia Woodland habitats within the survey area. This habitat can also be found outside, and surrounding, the survey area.
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V (EPBC Act) VU (BC Act)	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	There are 363 records on the DBCA database, the closest record is 16.93 km away from the survey area. The most recent record is in 2020.	High	Low	This species is unlikely to use Banksia Woodland habitats within the survey area. This habitat can also be found outside, and surrounding, the survey area.

7.4.3 Targeted Black Cockatoo

The survey area is within the known range for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo species. No foraging evidence or breeding habitat was recorded, and no Cockatoos were observed flying or heard 'calling' during the field survey.

The survey area has a DAWE (2022) foraging habitat score of 8 for Carnaby's Cockatoo. One detractor was relevant, a lack of foraging evidence, and the survey area represents intact vegetation. There was no evidence of Dieback observed during the survey. These observations are limited to assessing Banksia condition which was noted to be healthy.

The BCE (2020) score for Banksia Woodlands is considered 'Moderate' quality (score of 6) for Carnaby's Cockatoo. This is associated with the presence of suitable foraging species such as *Banksia attenuata*, *Banksia menziesii,* and *Eucalyptus todtiana*. The known occurrence of multiple roosting sites within 15 km of the survey area, and extent of suitable foraging habitat in the vicinity all contributed to the foraging score.

Black Cockatoo species prefer to roost in tall trees high in the landscape. No such trees were present in the survey area therefore roosting is considered unlikely.

8.0 Neerabup Terminal and East Wanneroo Results and Discussion

8.1 Flora

8.1.1 Vegetation Communities

Native vegetation was mapped for 77.09 ha represented by 12 vegetation communities. Non-native vegetation represented Planted vegetation (Pine and street trees), mapped for 15.07 ha and Cleared mapped for 109.50 ha. The vegetation is summarised below and presented in detail in Table 49 and mapped in Figure 8:

- five Banksia Woodlands
  - BaAcDf: low-lying *Banksia attenuata* woodland, represents the federal TEC and a Priority 3 PEC (FCT 21c)
  - BaAhDf: high diversity *Banksia attenuata* woodland recorded in Wanneroo adjacent to Lake Gnangara, represents the federal TEC
  - BaRcGt: a low-diversity *Banksia attenuata-Banksia menziesii* woodland isolated to Neerabup Terminal, represents the federal TEC
  - BmAcPo: remnant *Banksia menziesii* woodland occurring in an isolated location in Gnangara State Forest, represents the federal TEC.
  - BmEpLi: remnant *Banksia menziesii* woodland occurring in an isolated location in Gnangara State Forest, with a denser understorey than BmAcPo and also epresenting the federal TEC.
- two Eucalypt Woodlands
  - CcXpDf: diverse Marri woodland adjacent to Banksia Woodland and pine plantation throughout Gnangara State Forest
  - EgGlCe: a Tuart Woodland limited to Neerabup Terminal
- three Melaleuca Woodlands representing riparian vegetation
  - MpHaDb: isolated remnant wetland community.
  - MpHaEc: diverse *Melaleuca preissiana* woodlands community.
  - MpXpDb: disturbed wetland community, surrounded by development and historically disturbed.
- disturbed native vegetation
  - PpAcCe: Pine plantation regrowth with variable native understorey component.
  - Trees: parkland cleared with stands or isolated native trees and/or shrubs.

Two non-native areas:

- Planted: **Pinus pinaster* plantations and planted street trees/shrubs
- Cleared: devoid of any species

Table 49 Vegetation community descriptions and photographs

Description	Additional Detail	Photograph
Banksia Woodlands		
BaAcDf *Banksia attenuata, Banksia menziesii* and *Nuytsia floribunda* low open woodland over *Adenanthos cygnorum, Macrozamia fraseri* and *Gompholobium tomentosum* mid open shrubland over *Desmocladus flexuosus, Patersonia occidentalis* and *Corynotheca micrantha* low forbland. Represents Banksia Woodland TEC and FCT 21C PEC. Associated with surface water hydrology, adjacent to Jandabup Lake and provides important ecological functions including erosion control and prevention of sedimentation for the Lake. It was located on grey-white sandy soil on gently sloping terrain.	Survey effort: CHQ10 Native species richness: 28 Weed species richness: 4 Area: 0.85 ha, represents 1% of vegetation Condition: Very Good to Excellent	
BaAhDf *Banksia attenuata, B. menziesii* and *Eucalyptus todtiana* low open woodland over *Allocasuarina humilis, Calytrix flavescens* and *Eremaea pauciflora* var. *pauciflora* low shrubland over *Desmocladus flexuosus, Patersonia occidentalis* and **Ursinia anthemoides* low open forbland. Represents Banksia Woodland TEC. It was located on white sandy soil on flat terrain.	Survey effort: CHQ14, CHQ15 Native species richness: 48 Weed species richness: 10 Area: 2.27 ha, represents 3% of vegetation Condition: Degraded to Excellent	

Description	Additional Detail	Photograph
BaRcGt *Banksia attenuata, B. menziesii* and *Eucalyptus rudis* open woodland over *Regelia ciliata, Kunzea glabrescens* and *Gompholobium tomentosum* shrubland over *Ficinia nodosa* and *Lyginia imerbis* sedgeland Represents Banksia Woodlands TEC. It was located on white sandy soil on undulating terrain. Relevé completed in the 0.6 ha of Excellent vegetation.	Survey effort: CHR07 Native species richness: 14 Weed species richness: 3 Area: 3.03 ha, represents 4% of vegetation Condition: Good to Excellent	
BmAcPo *Banksia menziesii* and *Banksia attenuata* low open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Regelia ciliata* and *Acacia pulchella* open shrubland over *Patersonia occidentalis, *Carpobrotus edulis* and *Dampiera linearis* forbland. Represents Banksia Woodland TEC. It was located on white-grey sandy soil on flat terrain.	Survey effort: NSR08 Native species richness: 19 Weed species richness: 7 Area: 0.1 ha, represents <1% of vegetation Condition: Very Good	

Description	Additional Detail	Photograph
BmEpLi *Banksia menziesii, Banksia attenuata, Allocasuarina fraseriana* low open woodland over *Eremaea purpurea, Hibbertia hypercoides* and *Macrozamia fraseri* open shrubland over *Lyginia imerbis, Lepidosperma leptostachyum* and *Mesomelaena pseudostygia* sedgeland. Represents Banksia Woodland TEC. It was located on white sandy soil on gently undulating terrain.	Survey effort: CHQ11, CHQ12 and CHQ13 Native species richness: 68 Weed species richness: 7 Area: 8.88 ha, represents 11% of vegetation Condition: Excellent	
Eucalypt Woodlands		
CcXpDf *Corymbia calophylla, Eucalyptus marginata* and *Banksia attenuata* open woodland over *Xanthorrhoea preissii, Jacksonia floribunda* and *Leucopogon pulchellus* shrubland over *Desmocladus flexuosus, Lomandra micrantha* and *Dasypogon bromeliifolius* forbland. It was located on grey sandy soil on flat terrain. Under-represented with only one relevé completed.	Survey effort: CHR10 Native species richness: 20 Weed species richness: 4 Area: 3.30 ha, represents 4% of vegetation Condition: Very Good to Excellent	

Description	Additional Detail	Photograph
EgGlCe *Eucalyptus gomphocephala, Eucalyptus rudis* and *Banksia grandis* open woodland over *Gastrolobium linearifolium, Kunzea glabrescens* and *Xanthorrhoea preissii* over **Carpobrotus edulis, *Disa bracteata* and **Euphorbia terracina* sparse forbland. It was located on grey sandy soil on flat terrain.	Survey effort: CHQ08, NSR06, CHR06 Native species richness: 28 Weed species richness: 14 Area: 1.37 ha, represents 2% of vegetation Condition: Degraded and Very Good	
Wetland		
MpHaDb *Melaleuca preissiana* and **Pinus pinaster* woodlands over *Hypocalymma angustifolium, Kunzea glabrescens* and **Acacia longifolia* subsp. *longifolia* shrubland over *Dasypogon bromeliifolius, Dianella revoluta* and **Carpobrotus edulis* forbland. Represents a degraded isolated wetland. Could be representative of other wetlands mapped in survey area but difficult to tell due to degradation. Represents riparian vegetation. It was located on white-grey sandy soil on sloped terrain.	Survey effort: NSR09 Native species richness: 8 Weed species richness: 8 Area: 0.58 ha, represents 1% of vegetation Condition: Good	

Description	Additional Detail	Photograph
MpHaEc *Melaleuca preissiana* woodlands over *Hypocalymma angustifolium, Kunzea glabrescens* and *Jacksonia furcellata* shrubland over **Ehrharta calycina* and *Microlaena stipoides* grassland. Represents riparian vegetation situated on the edge of a basin that is likely to be winter-wet. Has an association with surface and/or groundwater hydrology. It was located on grey sandy soil on sloped terrain.	Survey effort: CHQ09 Native species richness: 10 Weed species richness: 6 Area: 0.12 ha, represents <1% of vegetation Condition: Very Good	
MpXpDb *Melaleuca preissiana open woodland* over *Xanthorrhoea preissii, Banksia dallanneyi* and *Beaufortia elegans* open shrubland over *Dasypogon bromeliifolius, Desmocladus fasciculatus* and *Patersonia occidentalis* closed forbland. Likely represents remnant native vegetation in an ephemeral wetland, although it is not mapped as a known geomorphic wetland. It was located on grey sandy soil on low flat terrain.	Survey effort: CHR09 Native species richness: 12 Weed species richness: 3 Area: 0.38 ha, represents <1% of vegetation Condition: Excellent	
Disturbed Native Vegetation		
Trees	Survey effort: observations only	

Description	Additional Detail	Photograph
Scattered native species including but not limited to *Eucalyptus, Banksia, Acacia, Xanthorrhoea* and *Melaleuca* species. Soil type and terrain varied throughout the survey area.	Area: 8.13 ha, represents 11% of vegetation Condition: Completely Degraded	
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. Includes isolated occurrences of common native species *E. todtiana, E. marginata, Acacia pulchella, Hemiandra pungens, Lechenaultia floribunda, Jacksonia furcellata.* Located on grey-white sandy soil with terrain varying throughout the survey area.	Survey effort: CHR08, NSR07 Native species richness: 22 Weed species richness: 15 Area: 48.08 ha, represents 62% of vegetation Condition: Completely Degraded and Degraded	
Non-Native Vegetation		
Planted Dominated by **Pinus pinaster* or planted street trees/shrubs. Soil type and terrain varied throughout the survey area.	Survey effort: observations only Area: 15.07 ha	N/A

8.1.2 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 15.13 ha, shown in Figure 8. Detailed assessments are provided below.

Three patches of Tuart Woodlands TEC were assessed against the key diagnostic characteristics outlined in the DEE (2019) Conservation Advice. One of these represents the federally protected ecological community, mapped for 1.71 ha. Detailed assessments are provided below.

8.1.2.1 Banksia Woodlands TEC Assessments

Patch 4 (Table 50) represents Banksia Woodlands located on Hawkins Road, on the edge of Jandabup Nature Reserve. The patch is 0.60 ha within the survey area and is part of a larger patch greater than 4 ha. It is in Excellent condition, represents the federal TEC and FCT 21c – a Priority 3 PEC.

Patch 5 (Table 51) represents Banksia Woodlands located in Gnangara State Forest east of Lake Gnangara. The patch is 2.26 ha as part of a larger patch approximately 100 ha. It is in Good to Excellent condition, represents the federal TEC and FCT 23a.

Patch 6 (Table 52) represents Banksia Woodlands within Neerabup Terminal in Wanneroo. The patch is 3.03 ha within the survey area and is not part of a larger patch. It is in Good to Excellent condition. No FCT was inferred for this patch. It represents the federal TEC.

Patch 7 (Table 53) represents regenerated native vegetation in Gnangara State Forest. The patch is 0.10 ha within the survey area and is part of a larger patch greater than 10 ha. It is in Very Good condition. No FCT was inferred for this patch. It represents the federal TEC.

Patch 8 (Table 54) represents Banksia Woodlands within Gnangara State Forest south of Neaves Road. The patch extends for 0.72 ha within the survey area and is part of a larger patch greater than 17 ha. It is in Excellent condition and represents FCT 23a. It represents the federal TEC.

Patch 9 (Table 55) represents Banksia Woodland within Gnangara State Forest, north of Gnangara Road. The patch extends 8.16 ha and is part of a larger, greater than 200 ha patch. It is in Excellent condition and represents FCT 23a. It represents the federal TEC.

Patch 10 (Table 56) and Patch 11 (Table 57) represent Banksia Woodlands that extend from the road verge within the survey area (largely Degraded) into private property. Patch assessments are based on observations made from the edge as any accessible areas were Degraded and not representative of the values of the patch observed within the property. In both cases, the Banksia Woodland outside the survey area was considered in Very Good condition. The patches represent areas of 0.17 ha and 0.09 ha within the survey area respectively and are part of larger patches more than 5 ha. This assumes that inaccessible vegetation is in similar condition and of similar diversity. These patches represent the federal TEC.

Table 50 Patch 4 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 4</td></tr>
<tr><td>Date</td><td>CHQ10, scored on 20-Oct-23</td></tr>
<tr><td>Location</td><td>On Hawkins Road, on the edge of Jandabup Nature Reserve.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaAcDf, described in Section 8.1.1</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">CHQ10</th></tr>
<tr><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>800</td><td>40</td></tr>
<tr><td>B. menziesii</td><td>700</td><td>15</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHQ10</th></tr>
<tr><td>Cover (%)</td><td>86.7</td></tr>
<tr><td>Diversity total</td><td>25</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHQ10</th></tr>
<tr><td>Cover (%)</td><td>6.3</td></tr>
<tr><td>Dominant species</td><td>*Briza maxima</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>Grey sand</td></tr>
<tr><td>Landform</td><td>Undulating terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.60 ha
Estimated total extent: 4.08 ha</td></tr>
<tr><td>Summary</td><td>This patch connects to other native vegetation, is mapped as Excellent condition and extends beyond the survey area boundary for over 4 ha. The patch meets the condition and size thresholds to be considered representative of the Commonwealth listed TEC.
It represents FCT 21c, a Priority 3 Ecological Community.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 51 Patch 5 Banksia TEC Assessment

ID	Patch 5
Date	Quadrats CHQ14 scored on 6-Nov-23, CHQ15 scored on 8-Nov-23
Location	Gnangara State Forest, to the east of Lake Gnangara.
Patch vegetation description	Represents BaAhDf, described in Section 8.1.1
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	Low Banksia cover in CHQ15 is attributed to Quadrat placement rather than a reflection of Banksia absence.

Species	CHQ14		CHQ15	
	Ht	Cover	Ht	Cover
B. attenuata	600	4	800	15
B. menziesii	500	3.5	-	-
E. todtiana	250	2	-	-

Native understorey present (%) and diversity

Excludes trees.

Species	CHQ14	CHQ15
Cover (%)	89.3	107.9
Diversity total	30	27

Weed cover (%) and dominant weed species

Species	CHQ14	CHQ15
Cover (%)	11.2	10.9
Dominant species	**Pentameris airoides*	**Ursinia anthemoides*

Soil type and colour	White sand
Landform	Undulating terrain
Size of patch	Within survey area: 2.26 ha Estimated total extent: >100 ha
Summary	The patch within the survey area represents the edge of a patch in Excellent condition. Within the survey area vegetation is mapped as Degraded, Good and Very Good with a small area along the northern edge mapped as Excellent. Adjacent vegetation outside the survey area is in Excellent condition and part of a large, connected area of native vegetation surrounding Lake Gnangara.
Photograph	

Table 52 Patch 6 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 6</td></tr>
<tr><td>Date</td><td>Relevé CHR07 scored on 19-Oct-23</td></tr>
<tr><td>Location</td><td>Inside the fenced area within Neerabup Terminal.</td></tr>
<tr><td>Patch vegetation description</td><td>Represents BaRcGt – described in Section 8.1.1</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">CHR07</th></tr>
<tr><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>500</td><td>7</td></tr>
<tr><td>B. menziesii</td><td>400</td><td>5</td></tr>
<tr><td>E. rudis</td><td>800</td><td>3</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHR07</th></tr>
<tr><td>Cover (%)</td><td>36.7</td></tr>
<tr><td>Diversity total</td><td>11</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHR07</th></tr>
<tr><td>Cover (%)</td><td>0.7</td></tr>
<tr><td>Dominant species</td><td>*Carpobrotus edulis</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>White sand</td></tr>
<tr><td>Landform</td><td>Gently undulating terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 3.03 ha</td></tr>
<tr><td>Summary</td><td>Banksia Woodland is isolated to within the Neerabup Terminal, disconnected from other areas of native vegetation by industrial development and internal roads.
Vegetation condition varied from Good to Excellent representing historical disturbance and partial clearing.
Patch meets size and condition thresholds.
Represents natural regeneration, as Landgate aerial imagery shows the vegetation was absent in 2010 (Plate 15).
.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 53 Patch 7 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 7</td></tr>
<tr><td>Date</td><td>NSR08 scored on 20-Oct-23</td></tr>
<tr><td>Location</td><td>South of Neaves Road, west of Buloke Road in Gnangara State Forest</td></tr>
<tr><td>Patch vegetation description</td><td>BmAcPo – described in Section 8.1.1</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">NSR08</th></tr>
<tr><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>600</td><td>4</td></tr>
<tr><td>B. menziesii</td><td>400</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>NSR08</th></tr>
<tr><td>Cover (%)</td><td>24.7</td></tr>
<tr><td>Diversity total</td><td>17</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>NSR08</th></tr>
<tr><td>Cover (%)</td><td>0.9</td></tr>
<tr><td>Dominant species</td><td>No dominant</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>Grey sand</td></tr>
<tr><td>Landform</td><td>Undulating terrain</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.10 ha
Estimated total extent: >10 ha</td></tr>
<tr><td>Summary</td><td>Banksia Woodlands mapped as Very Good condition. Represents part of a larger patch that is connected to native vegetation. Intersected by various tracks and fence lines.
Patch meets size and condition thresholds.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 54 Patch 8 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 8</td></tr>
<tr><td>Date</td><td>Quadrat CHQ11 scored on 20-Oct-23</td></tr>
<tr><td>Location</td><td>Gnangara State Forest, south of Neaves Road.</td></tr>
<tr><td>Patch vegetation description</td><td>BmEpLi – described in Section 8.1.1</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">CHQ11</th></tr>
<tr><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>650</td><td>3</td></tr>
<tr><td>B. menziesii</td><td>750</td><td>12</td></tr>
<tr><td>Allocasuarina fraseriana</td><td>800</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHQ11</th></tr>
<tr><td>Cover (%)</td><td>20.8</td></tr>
<tr><td>Diversity total</td><td>21</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHQ11</th></tr>
<tr><td>Cover (%)</td><td>2.4</td></tr>
<tr><td>Dominant species</td><td>* Pentameris airoides</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>Grey sand</td></tr>
<tr><td>Landform</td><td>Flat</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.72 ha
Estimated total extent: >17 ha</td></tr>
<tr><td>Summary</td><td>Banksia Woodland in Excellent condition with high connectivity to areas of native vegetation. Patch represents FCT 23a. Some weeds were present. Patch meets size and condition thresholds.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 55 Patch 9 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 9</td></tr>
<tr><td>Date</td><td>Quadrats CHQ12 on 20-Oct-23, CHQ13 on 6-Nov-23</td></tr>
<tr><td>Location</td><td>Gnangara State Forest, north of Gnangara Road.</td></tr>
<tr><td>Patch vegetation description</td><td>BmEpLi – described in Section 8.1.1</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">CHQ12</th><th colspan="2">CHQ13</th></tr>
<tr><th>Ht</th><th>Cover</th><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>700</td><td>10</td><td>800</td><td>6</td></tr>
<tr><td>B. menziesii</td><td>500</td><td>5</td><td>700</td><td>3</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Excludes trees.
<table>
<tr><th>Species</th><th>CHQ12</th><th>CHQ13</th></tr>
<tr><td>Cover (%)</td><td>50.8</td><td>61.4</td></tr>
<tr><td>Diversity total</td><td>46</td><td>38</td></tr>
</table>
</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>
<table>
<tr><th>Species</th><th>CHQ12</th><th>CHQ13</th></tr>
<tr><td>Cover (%)</td><td>1.5</td><td>1.2</td></tr>
<tr><td>Dominant species</td><td>No dominant</td><td>*Ursinia anthemoides</td></tr>
</table>
</td></tr>
<tr><td>Soil type and colour</td><td>White-grey sand</td></tr>
<tr><td>Landform</td><td>Gentle slopes, undulating terrain.</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 8.16 ha
Estimated total extent: >200 ha</td></tr>
<tr><td>Summary</td><td>Patch meets size and condition thresholds.
This patch is part of a large area of Banksia Woodland in Gnangara State Forest in Excellent condition. Diversity was high. Patch represents FCT 23a.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 56 Patch 10 Banksia TEC Assessment

<table>
<tr><td>ID</td><td>Patch 10</td></tr>
<tr><td>Date</td><td>No sample site, patch observed from the edge.</td></tr>
<tr><td>Location</td><td>Located on Badgerup Road, south of Ashby Street and north of Jambanis Road.</td></tr>
<tr><td>Patch vegetation description</td><td>BaAcDf</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>
<table>
<tr><th rowspan="2">Species</th><th colspan="2">Opportunistic Estimate</th></tr>
<tr><th>Ht</th><th>Cover</th></tr>
<tr><td>B. attenuata</td><td>600</td><td>10</td></tr>
<tr><td>B. menziesii</td><td>500</td><td>5</td></tr>
<tr><td>E. marginata</td><td>300</td><td>5</td></tr>
</table>
</td></tr>
<tr><td>Native understorey present (%) and diversity</td><td>Unable to be verified by quadrat data.</td></tr>
<tr><td>Weed cover (%) and dominant weed species</td><td>Unable to be verified by quadrat data.</td></tr>
<tr><td>Soil type and colour</td><td>White/grey sand</td></tr>
<tr><td>Landform</td><td>Flat</td></tr>
<tr><td>Size of patch</td><td>Within survey area: 0.17 ha
Estimated total extent: >5 ha</td></tr>
<tr><td>Summary</td><td>The assessment relied on observations made from the edge. Visual observation determined a condition rating of ‘Very Good’ is applicable. The patch represents part of a larger area greater than 2 ha. As such, the patch is considered representative of the federally listed TEC.</td></tr>
<tr><td>Photograph</td><td> </td></tr>
</table>

Table 57 Patch 11 Banksia TEC Assessment

ID	Patch 11
Date	No sample site, patch observed from the edge.
Location	Located on the corner of Lenore Road and Mary Street, Wanneroo, WA.
Patch vegetation description	BaAcDf
Structure	Low open woodland
Tree Data incl. height, canopy percent cover and dominance	<table><tr><th rowspan="2">Species</th><th colspan="2">Opportunistic Estimate</th></tr><tr><th>Ht</th><th>Cover</th></tr><tr><td>*B. attenuata*</td><td>500</td><td>20</td></tr><tr><td>*B. menziesii*</td><td>400</td><td>15</td></tr></table>
Native understorey present (%) and diversity	Unable to be verified by quadrat data.
Weed cover (%) and dominant weed species	Unable to be verified by quadrat data.
Soil type and colour	White-grey sand
Landform	Flat
Size of patch	Within survey area: 0.09 ha Estimated total extent: >5 ha
Summary	The assessment relied on observations made from the edge. Visual observation determined a condition rating of 'Good' or potentially higher is applicable. The patch represents part of a larger area greater than 2 ha. As such, the patch is considered representative of the federally listed TEC.
Photograph	

8.1.2.2 Tuart Woodlands TEC Assessment

The three Tuart Woodland patches, including two verified as the Tuart Woodland TEC (Patch 4 and 5) are described below.

Patch 3

Patch 3 is located adjacent to Old Yanchep Road and the Neerabup Terminal and consists of minimal remnant vegetation with a limited understorey. The area is in Degraded condition, with only one native understorey species present. As the size of Patch 3 is greater than 0.5 ha but less than 5 ha in total, patch size condition thresholds apply. The patch does not meet the key diagnostic characteristics for the federally protected ecological community due to its small size and lack of a native understorey. The assessment is presented Table 58.

Table 58 Patch 3 Tuart Woodlands TEC assessment

Patch identification and location	The patch is located to the east of Old Yanchep Road, and west of Neerabup Terminal.
Key diagnostic characteristics	Yes • Occurs on Swan Coastal Plain. • Occurs on the Bassendean System. • Six mature (DBH >500 mm) *E. gomphocephala* trees were counted. • Patch 3 occurs as an open woodland. • Minimal native understorey was present, indicative of disturbance.
Species richness	Key indicators for the condition thresholds are outlined in the table below. Parameter / CHR06 Proportion of understorey foliage that is native / 22.2% Native species richness / 2
Condition	Poor condition (DEE, 2019) and Degraded (Keighery, 1994).
Size	0.68 ha
Variety within patch	The patch is small and has minimal variety within it. It consists of mature Tuart trees over one native shrub species and cleared / common pasture weeds.
Additional information e.g. buffer, connectedness, land use history	The patch is disconnected from other Tuart Woodland patches due to historical clearing. One native understorey species was observed: *Xanthorrhoea preissii*

Plate 13 Tuart Woodlands Patch 3

Patch 4

Patch 4 represents an area of Tuart Woodland east of Neerabup Terminal. The total area of Patch 4 is 1.71 ha and is restricted to the survey area. Condition thresholds are applicable. An assessment against the key diagnostic characteristics was undertaken, and condition was determined using quadrat data. The quadrat data indicates that the patch is somewhere between Very high and high condition with 12 native understorey species, but not more than 80% of the understorey is represented by native species.

In accordance with the condition and size thresholds, the patch would have to represent high condition understorey and either have an important landscape role, a habitat role, or show regeneration. This particular patch supports two mature Tuart trees with a DBH greater than 50 cm. As such, it meets the key diagnostic characteristics for the federally protected ecological community. The assessment is presented in Table 59 and mapped in Figure 8.

Table 59 Patch 5 Tuart Woodlands TEC assessment

<table>
<tr><td>Patch identification and location</td><td>Located to the east of Neerabup Terminal. The patch is represented by CHQ08.</td></tr>
<tr><td>Key diagnostic characteristics</td><td>Yes
Occurs on Swan Coastal Plain.
Occurs on the Bassendean System.
More than 37 mature (DBH >500 mm) E. gomphocephala trees were counted within the survey area.
Patch 4 occurs as an open woodland.
Includes native understorey species that vary in density reflective of level of disturbance.</td></tr>
<tr><td>Species richness</td><td>Key indicators for the condition thresholds are outlined in the table below.<table><tr><th>Parameter</th><th>CHQ08</th></tr><tr><td>Proportion of understorey foliage that is native</td><td>63.2%</td></tr><tr><td>Native species richness</td><td>12</td></tr></table></td></tr>
<tr><td>Condition</td><td>High condition (DEE, 2019).
Mapped as Very Good condition.</td></tr>
<tr><td>Size</td><td>Within survey area: 1.71 ha excluding non-native vegetation.
Does not extend beyond the survey area.</td></tr>
<tr><td>Variety within patch</td><td>The patch is open woodland, with minor variation in the density of understorey shrubs attributed to historical disturbance. Common introduced weeds have displaced native herbs.</td></tr>
<tr><td>Additional information e.g. buffer, connectedness, land use history</td><td>The patch represents rehabilitated land. Landgate aerial imagery shows the vegetation was absent in 2010 (Plate 15). It is disconnected from other patches of Tuart Woodland.</td></tr>
</table>

Plate 14 Tuart Woodlands Patch 4

Plate 15 Historically cleared areas within Neerabup Terminal: 2010 to current

Patch 5

Patch 5 represents Tuart Woodland east of Ziatas Road, west of Neerabup Terminal. The total area of Patch 5 (excluding non-native vegetation mapped as Cleared or Planted) is 1.63 ha and it does not extend beyond the survey area. Condition thresholds are applicable.

An assessment against the key diagnostic characteristics was undertaken, and condition was determined using a quadrat and additional observational points. Patches that are <2ha representing 'High' condition will have to have:

- an important landscape role <100 m from native vegetation
- OR have a habitat role with more than 2 large trees per 0.5 ha
- OR show regeneration with more than 15 seedlings or saplings per 0.5 ha.

Patch 5 represents an isolated linear occurrence of a stand of *Eucalyptus gomphocephala* trees surrounded by Pine, the power station, and cleared areas. It does not have an important landscape role, or a habitat role. The area supports a suite of trees that are all similar age, between a sapling and adult tree with DBH approximately 15- 20 cm. No new recruits were recorded. The southern half of the Tuart TEC is mapped as Degraded, reflecting the lack of native understorey and regular pruning under powerlines.

Based on the above, this patch is not considered representative of the Tuart Woodlands TEC.

The assessment is presented in Table 27 and Figure 8.

Table 60 Patch 4 Tuart Woodlands TEC assessment

<table>
<tr><td>Patch identification and location</td><td>The patch is located to the east of Ziatas Road, and west of Neerabup Terminal. The patch is represented by NSR06, scored on 19-Oct-2023.</td></tr>
<tr><td>Key diagnostic characteristics</td><td>Yes
Occurs on Swan Coastal Plain.
Occurs on the Bassendean System.
Patch 5 occurs as an open woodland.
Includes native understorey species in the top half of the Tuart TEC.</td></tr>
<tr><td>Species richness</td><td>Key indicators for the condition thresholds are outlined in the table below.<table><tr><th>Parameter</th><th>NSR06</th></tr><tr><td>Proportion of understorey foliage that is native</td><td>66.7%</td></tr><tr><td>Native species richness</td><td>17</td></tr></table></td></tr>
<tr><td>Condition</td><td>More than 60% is native and there are 17 native species. The condition is considered 'High' (DEE, 2019) and Very Good (Keighery, 1994). The southern end of the Patch is mapped as Degraded.</td></tr>
<tr><td>Size</td><td>Within survey area: 1.63 ha.
Does not extend outside the survey area.</td></tr>
<tr><td>Variety within patch</td><td>The patch is open woodland, with understorey varying in response to historical disturbance. Common introduced weeds displacing many smaller herbs and annual native species.</td></tr>
<tr><td>Additional information e.g. buffer, connectedness, land use history</td><td>The patch represents rehabilitated vegetation following clearing in 2010 (Plate 15). It is disconnected from other areas of native vegetation by roads, clearing for plantations and industrial development.</td></tr>
</table>

Plate 16 Tuart Woodlands Patch 5

8.1.2.3 State-Listed Ecological Communities

Three PECs are confirmed within the survey area including:

- FCT 21c Low lying Banksia attenuata woodlands or shrublands (Priority 3) mapped as Patch 4 Banksia Woodland TEC for 0.60 ha.
- Banksia Dominated Woodlands of the Swan Coastal Plain (Priority 3), synonymous with the Banksia Woodlands TEC where no other listed TEC or PEC associated with an FCT is inferred. This PEC is mapped for 15.13 ha.
- Tuart Woodlands and Forests of the Swan Coastal Plain (Priority 3), synonymous with the Tuart Woodlands TEC where no other listed TEC or PEC associated with an FCT is inferred. This PEC is mapped for 1.71 ha.

Analysis results confidently inferred three FCTs for seven of the eight quadrats analysed. One quadrat was inconclusive. A brief description of each is presented below. The comprehensive results for each quadrat, including similarity percentage, cluster dendrogram results and justification for the inferred FCT, is presented in Table 61.

FCT 21c Low lying *Banksia attenuata* Woodlands or Shrublands

This FCT was inferred for quadrat CHQ10. This quadrat is situated in a low-lying area, potentially winter-wet, and includes an overstorey of *M. preissiana* outside of the quadrat. Species richness is comparable, with an average of 32 spp. compared to 40 spp. in Gibson data. Similarity to FCT 21c was moderate, with 41%. It is likely that this would improve with more scoring events as the FCT is associated with water availability. Edge effects from the road may have also influenced diversity. The quadrat was in Excellent condition vegetation.

FCT 21c represents a Priority 3 Ecological Community.

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

Five quadrats represent FCT 23a (11, 12, 13, 14 and 15). These quadrats are situated in various patches of Banksia Woodland along the edge of Gnangara State Forest in Wanneroo. Species richness was comparable (30-53 spp. compared to 52 spp. in the Gibson data). The variation in species richness is a reflection of the degradation of the vegetation associated with proximity to development and weed incursion. Numerous key species were present, and similarity was relatively high (40% to 49%).

FCT23a is not listed as a PEC or TEC and is therefore representative of the Priority 3 Banksia Dominated Woodlands of the Swan Coastal Plain.

FCT 5 *M. preissiana* Damplands

This FCT was inferred for quadrat CHQ09. This quadrat is in a wetland basin with an overstorey of *M. preissiana* as part of an open woodland to forest community. The area is disturbed caused by weed invasion typical of many wetland communities on the Swan Coastal Plain. Wetlands often require multiple scoring events to capture all species present and can be particularly driven by rainfall events. This contributed to low similarity (23%) to the Keighery data and incomparable species richness (10 native spp. compared to average 38.4 spp. in SCP dataset).

FCT 5 does not represent a TEC or PEC but does represent riparian vegetation.

Table 61 Neerabup Terminal and NBT Group floristic community type analysis results

Quadrat	Gibson (1994)				Keighery (2012)				Final Determination
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
CHQ08	23	6	card11	Clustering with FCT 6.	24	6	card11	Clustering with FCT 6.	Indeterminate. Low similarity to FCT 6, which is described in Gibson et al. (1994) as 'Weed dominated wetlands on heavy soils. This is not a suitable match, as the community is not a wetland and does not contain *Hypocalymma angustifolium.* The match is likely suggested due to a high presence of weeds and reduced condition.
	22	6	card4		22	6	card4		
	21	6	TWIN-1		22	6	TWIN-1		
CHQ09	23	5	AUSTB-4	Broadly clustering with FCTs 10b, 15 and 14.	28	11	hymus01	Clustering with FCT 14, s07 and s17.	FCT 5, low similarity. The Gibson et al (1994) community description of *Melaleuca preissiana* dominated wetlands with an open understorey is suitable. The mapped community has a sparse understorey below *Melaleuca preissiana*, with a high abundance of weeds likely resulting in the low similarity.
	22	11	hymus01		24	4	perth10		
	21	28	TRIG-4		24	21c	MODO-2		
CHQ10	41	21c	FL-5	Clustered with FCT 21a. Outlier of group with FCT 21c and 20c.	41	21a	Cavs10	Outlier of a group including FCTs 23c and 25	FCT 21c, confidently inferred, moderate similarity. Gibson et al (1994) description states that this community is dominated by *Banksia attenuata* and *B. menziesii* and often occurs in wetter areas. This site within the survey area was present next to a wetland and included species characteristic of the community.
	40	21c	FL-6		40	21c	FL-5		
	37	23a	WIRR-2		39	23a	WIRR-2		
CHQ11	37	23a	hurst03	Outlier, broadly clustering with FCTs 22 and 3b.	41	23b	SF01	Outlier of FCT 23c group	FCT 23a, confidently inferred, moderate similarity. Described as *Banksia attenuata-B. menziesii* woodlands (Gibson et al. 1994). The community description, landform and location are a suitable match.
	36	23a	WARB-3		40	23a	WHITE-1		
	36	23a	WHITE-1		38	23b	BNR03		
CHQ12	54	28	BULL-11	Clustered with FCT 28.	50	28	BULL-11	Clustered with FCT 23c	FCT 23a, confidently inferred, moderate similarity.

Quadrat	Gibson (1994)				Keighery (2012)				Final Determination
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
	46	23a	BULL-3		49	23a	perth04		Described as *Banksia attenuata-B. menziesii* woodlands (Gibson et al. 1994). The community description, landform and location are a suitable match.
	45	23b	SINT-1		48	23a	perth08		
CHQ13	48	28	BULL-11	Clustered with FCT 20a.	49	23a	perth08	Outlier of a group including FCTs 23b and s09	FCT 23a, confidently inferred, moderate similarity. Described as *Banksia attenuata-B. menziesii* woodlands (Gibson et al. 1994). The community description, landform and location are a suitable match.
	46	23a	WIRR-1		46	23a	Tele01		
	45	20a	KOON-1		46	20a	KOON-1		
CHQ14	40	20a	KOON-1	Clustered with FCTs 28, 21c and 20c.	51	23b	ELE24	Clustered with FCT 23a.	FCT 23a is suitable, confidently inferred, moderate similarity. Described as *Banksia attenuata-B. menziesii* woodlands (Gibson et al. 1994). The community description, landform and location are a suitable match.
	40	24	THOM-2		43	23a	perth04		
	40	23a	hurst03		43	23a	Tele01		
CHQ15	37	28	KING-2	Outlier. Broadly clustering with FCTs 3b and 22.	44	23a	gnan03	Clustered with FCT 23c and outlier of a group containing 28.	FCT 23a, confidently inferred, moderate similarity. Described as *Banksia attenuata-B. menziesii* woodlands (Gibson et al. 1994). The community description, landform and location are a suitable match.
	35	24	THOM-2		38	23a	Tele01		
	34	21c	FL-5		38	28	KING-2		

8.1.3 Vegetation Condition

Native vegetation was largely Degraded condition (44.60 ha the Swan Coastal Plain. The majority of the survey area follows existing road, track and powerline corridors, with some deviations into areas of intact native vegetation i.e. near Jandabup Lake and in Gnangara State Forest.

Vegetation in Excellent condition was mapped along the edge of intact native vegetation protected as part of Bush Forever Site 326, represented by quadrats CHQ12 and CHQ13, and in isolated occurrences throughout Gnangara State Forest.

Cleared areas represent areas devoid of vegetation (buildings, firebreaks, roads) and are not included in percentage calculations below. Vegetation condition is mapped on Figure 8 and extent of each category is presented in Table 62.

Table 62 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Excellent	13.85	18
Very Good	2.25	3
Good	4.19	5
Degraded	44.60	58
Completely Degraded	12.20	16
Total	**77.09**	**100**
Cleared	124.56	

8.1.4 Conservation Significant Flora

A Priority 4 species *Jacksonia sericea* was collected (CH231108-168) in CHQ15. The sample was submitted to the WAH for formal identification (M. Hislop ACC/10546/E). Mike confirmed the identification and advised the following:

> "*Jacksonia sericea and J. calcicola intergrade to a significant extent in the N Perth suburbs and in its vegetative parts a case could be made for either species in this case. The bright orange standard however is better for the former species*."

Jacksonia sericea was recorded at two locations including in CHQ15 outside the survey area and opportunistically along Gnangara Road within the survey area, shown on Figure 8.

An unknown species, *Calectasia* sp. was collected in the survey area (CH231106-156). The sample was submitted to the WAH for formal identification (M. Hislop ACC/10690/E). Mike has advised whilst this specimen is more likely to be *C. narragarra*, photographs of the root system are needed to verify whether the specimen represents the Priority 2 species *C. elegans*.

This species was recorded within a quadrat (CHQ14) at one location within Banksia Woodland north of Gnangara Road. The location is outside the survey area, mapped on Figure 8.

8.1.5 Flora Inventory

A total of 178 flora species were recorded including and 144 native and 34 weed species. Native species were best represented by Myrtaceae (31 species) and Fabaceae (12 species), followed by Asparagaceae (nine species), and Proteaceae (nine species). One weed listed as a Declared Pest under the BAM Act was recorded, **Asparagus asparagoides*. It was identified within a relevé (NSR08), within a Banksia Woodland community. No species listed as a Weed of National Significance (WONS) were recorded.

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

8.2 Fauna

8.2.1 Fauna Habitat Assessment

Seven fauna habitats representing native vegetation were mapped, including Banksia Woodland, Adenanthos/Plantation, Pine Plantation, Eucalyptus Woodland, Melaleuca Woodland, Trees Over Cleared and Mixed Shrubland. Adenanthos/Plantation (56.61 ha, 27.6%) and Trees Over Cleared (34.65 ha, 16.9%) were the two most dominant habitat types. Fauna habitat types and suitability for significant fauna species is described below and mapped in Figure 9.

8.2.1.1 Banksia Woodland

The Banksia Woodland habitat is abundant throughout the survey area, primarily occurring through the Gnangara State Forest and totalling 15.14 ha (7.5% of the survey area). Overstorey plant species within the community include *Banksia attenuata, Banksia menziesii*, *Eucalyptus todtiana, Eucalyptus rudis, Allocasuarina fraseriana* and *Nuytsia floribunda*. Shrub species included *Acacia pulchella, Acacia sessilis, Adenanthos cygnorum* subsp. *cygnorum, Hibbertia hypericoides, Eremaea purpurea* and *Gompholobium tomentosum* among many others. The density and composition of these shrubs vary throughout the habitat type, with areas in better condition and further from disturbance likely to have greater diversity and foliage cover.

Large logs (>30cm in diameter) are found throughout the Banksia Woodlands habitat type, with small logs (<10cm) occurring more frequently. Bare ground is common, with coarse leaf litter also abundant. The sandy soil in combination with the abundant coarse leaf litter provide suitable habitat for the Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum* (listed as Priority 3 by DBCA). The Black-striped Snake *Neelaps calonotos* (listed as Priority 3 by DBCA) and the Quenda *Isoodon fusciventer* (listed as Priority 4 by DBCA) would utilise denser areas of understorey for shelter.

Within the Banksia Woodlands habitat type, numerous plant species provide suitable foraging habitat for the three black cockatoo species. Sporadic Eucalyptus trees within the habitat type have the potential to contain hollows which may be suitable for breeding, however these are limited in number.

Plate 17 Banksia Woodland Habitat

8.2.1.2 Adenanthos/Plantation

The Adenanthos/Plantation habitat type is the most abundant throughout the survey area (48.08 ha, 23.8% of the survey area). It consists of isolated pine trees (*Pinus pinaster*) over native regrowth. Regrowth species include Woollybush (*Adenanthos cygnorum var. cygnorum*), Grasstree (*Xanthorrhoea preissii*) and *Macrozamia fraseri*. The habitat type varies in shrub density, with minimal leaf litter present throughout. As the habitat is primarily open, it provides little variety in terms of microhabitats for conservation significant fauna species.

Plate 18 Adenanthos/Plantation

8.2.1.3 Pine Plantation

The Pine (*Pinus pinaster*) plantation habitat is found throughout Gnangara State Forest, with a total of 2.97 ha (1.5% of the survey area). Fine leaf litter occurs consistently throughout, with coarse leaf litter sparse. No understorey is present and large logs are common. The Pine trees provide suitable foraging habitat for Carnaby's Cockatoo but are otherwise limited in their suitability of use for both common and conservation significant fauna species.

Plate 19 Pine Plantation Habitat

8.2.1.4 Eucalyptus Woodland

The Eucalyptus Woodland habitat extends for 4.67 ha (2.3%) within the survey area, extending beyond the survey area boundary. The Eucalyptus Woodland habitat consists of large mature trees, primarily Marri *Corymbia calophylla* and Jarrah *Eucalyptus marginata.*

The habitat has a variable understorey of herbs, sedges, shrubs and grasses, influenced by past disturbances. The ground is covered with thick leaf litter, which offers shelter and food for animals like the Quenda *Isoodon fusciventer* and the Black-striped Snake *Neelaps calonotos*. There are few large logs present, but many small logs and branches are present throughout. The tall trees are used by various birds for foraging, roosting and breeding, including the three threatened species: Carnaby's Cockatoo, Forest Red-tailed Black Cockatoos and Baudin's Cockatoo. Roosting habitat is confirmed within and near the survey area (Black Cockatoo Roosting Sites - Buffered [DBCA-064]).

Plate 20 Eucalyptus Woodland Habitat

8.2.1.5 Melaleuca Woodland

The Melaleuca Woodland habitat consists of remnant native vegetation, dominated by *Melaleuca preissiana* with a variable understorey. The shrub species included within this habitat type include tall shrubs such as *Kunzea glabrescens*, *Jacksonia furcellata* and *Xanthorrhoea preissii*. Ground cover, herb and sedge species vary in their density, including *Dianella revoluta*, *Patersonia occidentalis* and *Dasypogon bromeliifolius*. These low plants, particularly in high density, provide suitable habitat for Quenda to forage and shelter in. Other habitat features include sporadic small logs and occasional coarse leaf litter. The overall habitat type extends for 1.08 ha (0.5% of the survey area), limited to small, isolated pockets spread throughout the survey area.

Plate 21 Melaleuca Woodland Habitat

8.2.1.6 Trees Over Cleared

This is the third-most dominant habitat in the survey area, occurring over 11.66 ha and comprising 5.8% of the survey area. The understorey is comprised mostly of weedy grasses and herbs, with sporadic native shrubs occurring. Plant species which occur within the Trees Over Cleared habitat include isolated trees of *Eucalyptus* and *Banksia* species. Shrubs present primarily include sporadic clusters of *Acacia* and *Adenanthos.*

This habitat consists of sparse bushes and solitary large trees that often serve as a refuge within the surrounding cleared areas for animals such as birds and kangaroos. Hollows and large logs are sparse, with small logs more common throughout. Coarse leaf litter is present under bushes or trees, with grasses covering most of the area. The grasses and the leaf litter offer foraging and shelter opportunities for Quenda, whilst suitable foraging species may be utilised by the three black cockatoo species.

8.2.1.7 Mixed Shrubland

The Mixed Shrubland habitat is restricted in size but provides an ecological niche for smaller animals such as birds and reptiles. It consists of isolated native shrubs as well as planted shrubs in gardens or along the roadside and extends for 8.58 ha (4.3% of the survey area).

Scattered small logs are present, whilst coarse leaf litter and grasses are abundant throughout. The grass and coarse leaf litter provide excellent foraging and shelter for the Quenda *Isoodon fusciventer*.

Plate 22 Mixed Shrubland Habitat

8.2.2 Fauna Inventory

A total of 37 vertebrate fauna species were recorded during the field survey. This comprised of 28 bird, four mammal and five reptile species. A complete inventory of fauna species recorded within the survey area is provided in Table 63.

Two introduced species were recorded, both of which are listed under the BAM Act:

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

Table 63 Fauna observations within the Neerabup Terminal and NBT Group survey area

Class	Scientific Name	Common Name	Method
Mammal	*Felis catus*	Feral Cat	Tracks
Mammal	*Isoodon fusciventer*	Quenda	Foraging evidence
Mammal	*Macropus fuliginosus melanops*	Western Grey Kangaroo	Seen
Mammal	*Oryctolagus cuniculus*	European Rabbit	Scats
Mammal	*Equus caballus*	Horse	Seen
Mammal	*Canis lupus familiaris*	Dog	Seen
Bird	*Dacelo novaeguineae*	Laughing Kookaburra	Seen and heard
Bird	*Lichmera indistincta*	Brown Honeyeater	Seen and heard
Bird	*Barnardius zonarius*	Australian Ringneck	Seen and heard
Bird	*Anthochaera carunculata*	Red Wattlebird	Seen and heard
Bird	*Malurus splendens*	Splendid Fairywren	Seen and heard
Bird	*Phylidonyris novaehollandiae*	New Holland Honeyeater	Seen and heard
Bird	*Smicrornis brevirostris*	Weebil	Seen and heard
Bird	*Falco longipennis*	Australian Hobby	Seen and heard
Bird	*Pachycephala rufiventris*	Rufous Whistler	Seen and heard
Bird	*Sericornis maculatus*	Spotted Scrubwren	Seen and heard
Bird	*Rhipidura albiscapa*	Grey Fantail	Seen and heard
Bird	*Colluricincla harmonica*	Grey Shrikethrush	Seen and heard
Bird	*Gymnorhina tibicen*	Australian Magpie	Seen and heard
Bird	*Zosterops lateralis*	Silvereye	Seen and heard
Bird	*Artamus cyanopterus*	Dusky Woodswallow	Seen
Bird	*Rhipidura leucophrys*	Willie Wagtail	Seen and heard
Bird	*Falco cenchroides*	Nankeen Kestrel	Seen
Bird	*Geophaps plumifera*	Spinifex Pigeon	Seen and heard
Bird	*Sericornis maculatus*	Spotted Scrubwren	Seen and heard
Bird	*Artamus cinereus*	Black-faced Woodswallow	Seen and heard
Bird	*Eolophus roseicapilla*	Galah	Seen and heard
Bird	*Falco berigora*	Brown Falcon	Seen
Bird	*Corvus coronoides*	Australian Raven	Seen and heard

Class	Scientific Name	Common Name	Method
Bird	*Cracticus torquatus*	Grey Butcherbird	Seen and heard
Bird	*Trichoglossus moluccanus*	Rainbow Lorikeet	Seen and heard
Bird	*Dromaius novaehollandiae*	Emu	Seen
Bird	*Calyptorhynchus banksia naso*	Forest Red-tailed Black Cockatoo	Seen and heard. Foraging evidence
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Seen and heard. Foraging evidence
Reptile	*Varanus gouldii*	Gould's Monitor	Seen
Reptile	*Pseudonaja affinis*	Dugite	Seen. Tracks also observed
Reptile	*Notechis scutatus*	Tiger Snake	Seen
Reptile	*Tiliqua rugosa rugosa*	Bobtail/Shingleback Lizard	Seen
Reptile	*Ctenotus fallens*	West Coast Laterite Ctenotus	Seen

8.2.3 Conservation Significant Fauna

Three conservation significant fauna species were recorded during the survey:

- Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

Quenda were recorded via distinct foraging evidence (Plate 12). Evidence of conservation significant species is mapped in Figure 9.

An additional six species are considered to have the potential to occur within the survey area due to the presence of suitable habitat and recent records within the surrounding area. The total area (ha) of suitable habitat for these species which occurs within the survey area is included in Table 64 below.

Table 64 Total area (ha) of suitable habitat for significant fauna species known or likely to occur within the survey area.

Species	Cons. Status[1]	Area of Suitable Habitat (ha)							Total (ha)
		Eucalyptus Woodland	Melaleuca Woodland	Adenanthos /Plantation	Pine Plantation	Banksia Woodland	Trees Over Cleared	Mixed Shrubland	
Carnaby's Cockatoo (*Zanda latirostris*)	E	4.67		48.08	2.97	15.14	11.66		82.51
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V	4.67				15.14	11.66		31.46
Quenda (*Isoodon fusciventer*)	P4	4.67	1.08	48.08	2.97	15.14		8.58	80.51
Black-striped Snake (*Neelaps calonotos*)	P3	4.67				15.14			19.80
Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*)	P3			48.08		15.14			63.22
Native Bee (*Hylaeus globuliferus*)	P3			48.08		15.14			63.22
A short-tongued Bee (*Leioproctus contrarius*)	P3					15.14			15.14
Graceful Sun Moth (*Synemon gratiosa*)	P4					15.14			15.14

1. E Endangered, V Vulnerable, P Priority

Plate 23 Quenda foraging evidence

8.3 Targeted Black Cockatoo Survey

8.3.1 Foraging

The survey area has been assessed as a score of 10 ‘High-quality foraging habitat’ for both the Carnaby’s Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the Commonwealth Black Cockatoo Referral Guidelines foraging tool (DAWE, 2022) (Table 32). No subtractions were made for these two species. The survey area has been assessed as a score of 8 for Baudin’s Cockatoo, due to an absence of foraging evidence during the survey.

The survey area contains mature Banksia Woodlands and Eucalyptus Woodlands, with suitable foraging species including Proteaceous species, Marri *Corymbia calophylla* and Tuart *Eucalyptus gomphocephala* trees.

Table 65 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)*	
10		**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.	☐
Total score		**8**		**10**		**10**	

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

- There are three confirmed white-tailed and Forest Red-tailed Black Cockatoo roosting sites less than 3 km from the survey area (DBCA, 2023c).
- The survey area is approximately 5 km from the buffer zone of a confirmed Black Cockatoo breeding area (DBCA, 2023c).
- Vegetation in the survey area represents 0.26% of native vegetation within 15 km where local breeding is known/likely. Site context score is therefore 1.

Carnaby's Cockatoo foraging habitat ranged from 'Moderate to High' (score of 7) down to 'None' (score of 0). The presence of favourable foraging species affected the site condition, with Banksia Woodland and Pine Plantation scoring 5, while other habitats scored according to the presence of Eucalypt trees. Foraging evidence was recorded therefore 1 context point was added.

Forest Red-tailed Black Cockatoo foraging habitat ranged from 'Moderate' (score of 6) to 'None' (score of 0). The Eucalyptus Woodland supported suitable foraging species with a site condition score of 4. One context score and one stocking rate score was added to result in the 'Moderate' quality. All other habitats had a site condition score of 2 or less.

Foraging habitat quality for Baudin's Cockatoo was similar to the Forest Red-tailed Black Cockatoo. The Eucalyptus Woodland was rated as 4 for site condition and 1 for context. No stocking rate score was added. This fauna habitat is therefore considered 'Moderate' quality. This reduction is due to a lack of foraging evidence and direct observations within the survey area.

The foraging habitat type, it's corresponding Bamford (2020) rating and the habitat's extent, (ha) is presented for each Black Cockatoo species in Table 66. The foraging habitat quality and extent is presented in Table 67 and mapped in Figure 10.

Table 66 Neerabup and East Wanneroo Terminal refined foraging score calculation (Bamford, 2020)

Habitat Type	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo	Extent (ha)
Adenanthos/Plantation	6	2	2	48.08
Banksia Woodlands	7	2	1	15.13
Eucalyptus Woodland	5	5	6	4.67
Melaleuca Woodland	2	2	2	1.07
Mixed Shrubland	1	1	1	8.58
Pine Plantation	7	1	1	2.97
Trees over Cleared	1	1	1	11.66
Cleared	0	0	0	109.51

Table 67 Neerabup and East Wanneroo BCE foraging habitat extent

Foraging Habitat Quality	Carnaby's Cockatoo (ha)	Baudin's Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
1: Negligible	20.03	23.08	2.08
2: Low	1.08	64.21	64.21
4-6: Moderate	52.84	4.67	4.67
7: Moderate to High	18.2		
Total	**91.96**	**91.96**	**91.96**

Plate 24 Carnaby's Cockatoos foraging within the survey area.

Plate 25 Forest Red-tailed Black Cockatoos foraging within the survey area

8.3.2 Breeding

A total of 118 potential nesting trees with a suitable DBH (>500 mm) were recorded within and directly adjacent to the survey area (Table 68, Figure 10). The majority consisted of Introduced (planted) species and those identified as 'Other', which are trees where species are not confidently able to be determined in the field and are often also introduced. Potential nesting trees are defined by DAWE (2022) as "*trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH*".

One suitable nesting tree was identified, a stag with a large hollow. No active Black Cockatoo breeding activity or nesting was observed during the field survey. This assessment is limited to observations made from the ground.

Table 68 Potential nesting trees from Neerabup Terminal and East Wanneroo

Tree Species	Total Trees Per Survey Area				Grand Total
	NBT MUL 1 via Lenore Rd	NBT MUL 2 - via Badgerup Rd	NBT-WGA 81	Neerabup Terminal	
Coastal Blackbutt (*Eucalyptus todtiana*)			8		8
Introduced	6		20		26
Jarrah (*E. marginata*)	3		24		27
Marri (*Corymbia calophylla*)			14		14
Other		12	19		31
Stag		2 (1 suitable hollow)	2		4
Tuart (*E. gomphocephala*)			5	3	8
Grand Total	**9**	**14**	**92**	**3**	**118**

8.3.3 Roosting

No roosting sites were observed within the survey area. The Eucalyptus Woodland fauna habitat represents suitable roosting habitat. One hundred and fifteen confirmed white-tailed Black Cockatoo and Forest Red-tailed Black Cockatoo roosting sites are known to occur within 15 km of the survey area from Birdlife Data provided by DBCA. Three of these sites occur within 3 km of the survey area (DBCA, 2023c).

Plate 26 Hollow recorded on potentially suitable nesting tree ID 593 - Stag

Table 69 Potentially suitable nesting tree hollow details

ID	Species	Hollow Entrance (Depth x Width)	Height Above Ground (m)	Hollow Angle	Facing	Hollow Type	Evidence of Use
291	Stag	25 x 25 cm	4	Vertical	East	Trunk	Chew Marks

8.4 Discussion

8.4.1 Flora and Vegetation

The survey area intersects with five Bush Forever Sites, one State Forest and one Nature Reserve. The survey area represents several linear corridors that travel in a largely north south direction and follows existing infrastructure corridors including roads, tracks, and powerline corridors. The eastern most corridor traverses the Gnangara State Forest, while the central and western lines capture more urbanised areas with heavily fragmented patches of vegetation that were generally degraded. Within the Gnangara State Forest, large areas represented natural regeneration following a history of Pine plantations. Natural succession is in early stages and weed invasion including scattered Pine trees have led to degradation. These areas were largely mapped as Degraded.

Ten vegetation communities were defined and mapped. The large number of vegetation communities reflect the length of the linear corridor as well as the impact of historical disturbance and isolation. The vegetation communities include five Banksia Woodlands, two Eucalypt Woodlands, three Melaleuca Woodlands, and two disturbed communities.

The five Banksia Woodlands are typical of the northern Swan Coastal Plain, occurring on gently undulating terrain on deep white-grey sandy soils. All areas mapped as Banksia Woodlands represent the Banksia Woodlands TEC listed as Endangered under the EPBC Act. The Woodlands generally represented edges of larger patches that extended beyond the survey area. Many of these were protected in Bush Forever and/or Nature Reserve. The Banksia Woodlands varied in condition depending on how severe weed invasion had affected native species diversity. In general, patches that represented larger areas of intact native vegetation were in better condition than the smaller fragmented patches that had low connectivity to other patches.

The majority of the Banksia Woodlands TEC represents the Priority 3 Banksia Dominated Woodlands of the Swan Coastal Plain, except one Patch. Patch 4 represents FCT 21c Low-lying *Banksia attenuata* Woodlands or Shrublands. This PEC was identified in the desktop study and was mapped adjacent to Jandabup Lake. The community provides important ecological functions that support Lake Jandabup including erosion control, sedimentation, and provides an important refuge for fauna species that use the Lake.

Two Patches of Tuart Woodlands TEC were confirmed to occur, restricted to the northern end of the survey area adjacent to Neerabup Terminal. Both patches represent stands of mature trees that are largely disconnected from one another by clearing and were planted as part of rehabilitation efforts. Condition varied and affected the density of native species. Weed invasion and historical disturbance has reduced the condition of both patches with only a small pocket of Excellent vegetation remaining.

Three wetland communities were mapped, all representing Melaleuca Woodlands ranging from Good condition to Excellent condition. Wetlands often are subject to rapid weed invasion as surface water encourages weed seed deposition. The drying climate and historical droughts are also likely to have an impact although this is difficult to measure. All wetland communities provide important refuge in a highly fragmented landscape. These wetlands represent 1.08 ha.

Flora diversity was considered moderate, with 178 species recorded, including 144 native and 34 weed species. This is comparable to the SCAR 4 Project survey (AECOM, 2022a) where 145 native species were recorded. The length of the corridors and diversity of vegetation communities encountered contributed to the high diversity despite representing largely Degraded vegetation.

One Priority 4 species, *Jacksonia sericea,* was collected and formal identification confirmed at the WA Herbarium. It was recorded at two locations including one outside the survey area near Lake Wangara, and once along the road south of the Lake within the survey area. There are seven WA Herbarium locations within 5 km and 15 records within 10 km of the survey area. Majority of records describe the species as locally common.

A sample of *Calectasia* sp. was collected for identification but was unable to be confirmed to species level as photographs of the root system are required. It is likely to represent the common species *C. narragarra*, but the Priority 2 species *C. elegans* cannot be excluded without the roots being identified. Ten DBCA records were found in proximity to the survey area, with the closest identified 1.04 km away. Suitable habitat is present for the species, with the habitat described as unburnt *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).

There is a 'known' record of *Styphelia filifolia* in the survey area. It is evident following a review of its location that it is unlikely to be present. The record is dated 2007, with habitat described as 'Banksia woodland' and is situated in what now represents a cleared area, surrounded on either side by pine plantation and a road. Twenty-two significant flora species were considered to have a 'known', 'high' or 'moderate' likelihood of occurring prior to the survey (Table 70). Of these, 20 species were downgraded to 'low' following the completion of the field survey. These species would have been detectable at the time of the survey, yet they were not recorded. All areas of intact native vegetation were traversed on foot to conduct targeted searches. Further, the degradation observed across large areas meant habitat was unlikely to be suitable for many species.

Poranthera moorokatta (P2) was considered to have a 'High' likelihood to occur prior to the survey. The species was described in 2012 at which time it was known from two locations: Kings Park and Ellenbrook. In Kings Park it was recorded on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high leaf litter cover (Barret, 2012). In Ellenbrook it was recorded in a shallow dampland on mixed grey-white sand with scattered leaf litter (Barret, 2012). There are five records located along or near the Tonkin Highway between Reid Highway and Neaves Road including one record from 2018. Detection periods were September and October months.

The survey was undertaken in November 2024. This may have been too late for detecting this 4 cm tall annual herb. Furthermore, rainfall likely affects germination and population size. At this time, it cannot be confidently reduced to 'Low' and remains to have a 'Moderate' likelihood of occurring. Suitable habitat would be the Banksia Woodlands BaAhDf near Lake Gnangara and BmEpLi associated with Bush Forever 326.

Table 70 Summary of Neerabup Terminal and NBT Group likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	1	10	11	6	26	55
Post-survey	1	0	1	20	33	55

8.4.2 Fauna

Thirty-seven vertebrate fauna species were recorded during the field survey. This included 28 birds, four mammals and five reptile species. Three conservation significant fauna species were recorded during the survey:

- Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

The local area supports both urban, agriculture and conservation land use. It is situated on the edge of a significant north-south corridor of native vegetation which includes Gnangara Moore River State Forest.

Seven native fauna habitats were defined and mapped within the survey area including Banksia Woodland, Adenanthos/Plantation, Pine Plantation, Eucalyptus Woodland, Melaleuca Woodland, Trees Over Cleared and Mixed Shrubland.

The Banksia Woodlands fauna habitat covers 7.8% (15.94 ha) of the survey area. It has the potential to support eight significant fauna species that could benefit from the combination of native woodlands and a diverse native understorey on sandy soil. Black Cockatoos can find food and nesting sites in the Banksia, Jarrah and Marri trees.

Eucalyptus Woodlands (4.86 ha, 2.4%) represents suitable habitat for Black Cockatoos, Black-striped Snake, and Quenda. The Eucalyptus Woodlands were open in nature with a sparse tree canopy, with

dominant species consisting of *Eucalyptus marginata* and *Corymbia calophylla.* The open vegetation is ideal for hunting and the presence of Jarrah and Marri could be utilised by the species for temporary roosting.

Mixed Shrubland provides suitable habitat for small marsupials and species that can utilise low-lying and dense shrubs for shelter. Quenda and Black-striped Snakes are known to inhabit low shrubland habitats, particularly those that are unburnt and dense. This habitat allows for high levels of nesting and foraging for small marsupial and reptile species (Haby et al., 2013).

Melaleuca Woodlands represent ephemeral Paperbark (*Melaleuca preissiana)* wetlands, with *Kunzea glabrescens* dominated shrub and mixed heath patches. Wetland migratory birds may utilise this habitat when inundated, however likelihood remains low due to the small size of these areas within the survey area. Quenda may also utilise the edges of this habitat type, as well as typically inundated areas that become seasonally dry.

Trees over Cleared represents scattered native species in paddocks. Tree species may include *Eucalyptus, Banksia* and *Acacia.* This habitat presents foraging and roosting habitat for avian species including listed species such as Black Cockatoos.

Following the survey, a post-survey likelihood desktop assessment was completed. Details of all the conservation significant species considered to have a high or known post-survey likelihood and their associated habitats is presented in Table 71. Those which have been downgraded from a high likelihood due to the post-survey assessment are also discussed. To verify the presence of the invertebrate species a targeted Short-range Endemic survey would be required, which was not completed at this time.

Table 71 Fauna species and associated fauna habitat within the Neerabup Terminal and East Wanneroo survey area

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Carnaby's Cockatoo (*Zanda latirostris*)	E (EPBC Act) EN (BC Act)	Uncleared or remnant native Eucalypt woodlands containing Salmon gum and Wandoo, and in shrubland or Kwongan heathland dominated by Hakea, dryandra, Banksia, and Grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in Pine plantations (DCCEEW, 2023)	There are 3009 records on the DBCA database, the closest record is 0.01 km away from the survey area. The most recent record is in 2020.	Known	Known	This species is likely to use Eucalyptus Woodland, Pine plantations, Trees over Cleared and Banksia Woodland habitats within the survey area. These habitats are also found outside and directly adjacent to the survey area.
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V (EPBC Act) VU (BC Act)	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	There are 71 records on the DBCA database, the closest record is 0.20 km away from the survey area The most recent record is in 2020.	High	Known	This species is likely to use Eucalyptus Woodland, Pine Plantations, Trees over Cleared and Banksia Woodland habitats within the survey area. Some of these habitats are also found outside, directly adjacent to the survey area.
Quenda (*Isoodon fusciventer*)	P4	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008). The presence of accumulated coarse leaf litter is suitable foraging habitat for the Quenda. Quenda foraging activity was observed throughout these habitat types.	There are 629 records on the DBCA database, the closest record is 0.01 km away from the survey area. The most recent record is in 2020.	Known	Known	This species is likely to use Eucalyptus Woodland, Pine Plantations, Melaleuca Woodland, Mixed Shrubland and Banksia Woodland habitats within the survey area. Some of these habitats are also found outside, directly adjacent to the survey area.
Black-striped Snake (*Neelaps calonotos*) listed as Priority 3 by DBCA	P3	Restricted to sandy coastal strip near Perth, WA between Mandurah and Cataby, with isolated populations north, near Eneabba and Dongara. Dunes and vegetated sand plains with heaths and Eucalyptus/Banksia woodlands are preferred habitats (Wilson and Swan 2023).	There are 67 records on the DBCA database, the closest record is 0.08 km away from the survey area. The most recent record is in 2017.	High	Moderate	Dense leaf litter which is known to occur in Banksia Woodlands of the survey area is the preferred habitat type of this species (Bush et al., 2010). It may also utilise the Eucalyptus Woodland and Mixed Shrubland habitats.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
						This species may utilise areas where native understorey density was higher, generally associated with vegetation condition of 'Good' or better. These habitats are also found outside of and adjacent to the survey area.
Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*)	P3	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	There are 70 records on the DBCA database, the closest record is 0.16 km away from the survey area. The most recent record is in 2019.	High	Moderate	This species may utilise areas where native understorey density in Banksia Woodlands was higher, generally associated with vegetation condition of 'Good' or better. Banksia woodland habitat is also found just outside of the survey area.
Native Bee (*Hylaeus globuliferus*)	P3	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	There are ten records in the vicinity of Neerabup, with the closest 2.71 km away and the most recent in 1996.	High	Moderate	The Adenanthos/Plantation fauna habitat represents a mixed habitat of Woollybush (*Adenanthos cygnorum var. cygnorum*) regrowth and *Pinus pinaster** trees. This habitat dominated the survey area, occupying 56.61 ha or 27.6% of the land. This habitat type may be utilised by the Woollybush Bee (*Hylaeus globuliferus*), which feeds on the nectar of Woollybush flowers (Houston, 2018). Woollybush (*Adenanthos cygnorum* var. *cygnorum)* was also observed within the Banksia

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
						Woodlands, as a result the Woollybush Bee would also likely reside within the habitat type (Western Wildlife, 2009).
A short-tongued bee (*Leioproctus contrarius*)	P3	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	There are 3 records in the vicinity of Neerabup, with the closest 0.06 km away and the most recent in 1982.	High	Moderate	The Banksia Woodland fauna habitat includes *Lechenaultia floribunda*, which is associated heavily with the short-tongued bee species *Leioproctus contrarius* (South Metro Connect, 2011). The species is therefore considered moderately likely to utilise the Banksia Woodland habitat type.
Graceful Sun Moth (*Synemon gratiosa*)	P4	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima*, the preferred habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	There are 397 records in the vicinity of Neerabup, with the closest 0.17 km away and the most recent in 2019.	High	Moderate	Multiple sterile *Lomandra sp.* individuals were recorded within the Banksia Woodlands. As these individuals were unable to be identified to species level, the species *Lomandra hermaphrodita* may be present within the survey area. The Graceful Sun moth (*Synemon gratiosa)* is associated with Banksia woodland where the known host plant *L. hermaphrodita* is widespread (DEC, 2011). The Graceful Sun moth may therefore utilise the Banksia Woodland habitat within the survey area.

8.4.3 Targeted Black Cockatoo

The survey area is within the known range for the three Threatened Black Cockatoo species. The Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) and Carnaby's Cockatoo (*Zanda latirostris*) were observed foraging and resting within the survey area. There were 118 potential nesting trees identified with the survey area. Only one suitable nesting tree was identified, representing a stag (unidentifiable dead tree) with a hollow that could accommodate Black Cockatoo breeding. The hollow was vertical, with an entrance over 25 cm in diameter and located on the roadside verge in Badgerup Road.

The survey area scored a foraging habitat score of 10 for both the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the DAWE 2022 guidelines. The survey area has been assessed as a score of 8 for Baudin's Cockatoo in the absence of foraging evidence recorded during the survey acting as a detractor.

At a fauna habitat level, the BCE score varied from 1 'Negligible' to 8 'High'. The value was largely influenced by the abundance of desirable foraging species present and the fragmentation that has occurred in the local area. Native vegetation in the survey area represents approximately 1-5% of available foraging habitat, particularly for Forest Red-tailed Black Cockatoo and Baudin's Cockatoo who do not feed on Pine trees.

The Moderate to High foraging qualities for all three Black Cockatoo species are associated with the Banksia Woodland and Eucalyptus Woodland habitat types. These fauna habitats include suitable foraging species such as *Banksia attenuata*, *Banksia menziesii, Corymbia calophylla, Eucalyptus marginata* and *Eucalyptus todtiana*. The known occurrence of a roosting site within 3 km of the survey area, permanent water source presence nearby, confirmed sighting during the survey, and extent of suitable foraging habitat in the vicinity all contributed to the foraging score.

9.0 NT-NOR to HBK 132kV Results and Discussion

The NT-NOR to HBK 132kV survey area is along Drumpellier Drive and includes the west side (Whiteman Park) and a small corridor on the east side of this major road. Large parts of the survey area are currently inaccessible due to the development of the Morley-Ellenbrook railway corridor.

Numerous surveys have been undertaken within this corridor including:

- RPS, 2020. Detailed flora and vegetation assessment – METRONET Morley-Ellenbrook Line. This survey represented a two-season vegetation survey where permanent quadrats were scored twice, and multiple targeted searches were undertaken to maximise detection of significant flora species. The report supported the Morley-Ellenbrook Project submission to EPA under Part IV of the *Environment Protection Act 1986*.
- AECOM, 2016. Ellenbrook Bus Rapid Transit Biological Assessment. This report represents a single survey event where vegetation was recorded at defined non-permanent quadrats during Spring 2015.
- Woodman, 2020. Banksia Woodland Community Assessment – Patch 5. Verification of FCT analysis and Banksia Woodland TEC Assessment.

The results present a compilation of existing data that was verified through a site visit in Spring 2024. Areas that were accessible were visited and the existing mapping verified. Where necessary, mapping was updated to reflect current condition and native vegetation extent.

9.1 Flora

9.1.1 Vegetation Communities

Four native vegetation communities were defined and mapped including:

- Two Banksia Woodland communities BaBmSiPo and BaBmBiXp
- One *Corymbia* Woodland which dominated the survey area.
- Trees over paddock weeds.

Native vegetation was mapped for 43.58 ha. The remaining 75.42 ha is mapped as cleared and is devoid of vegetation.

Vegetation community descriptions are presented in Table 72 and mapped on Figure 8.

Table 72 NT-NOR to HBK 132kV vegetation community descriptions and photographs

Description	Additional Details	Photograph
BaBmSiPo *Banksia attenuata* Woodland *Banksia attenuata* and *B. menziesii* low woodland over a mixed low shrubland including *Scholtzia involucrata, Eremaea pauciflora* var. *pauciflora, Hibbertia hypericoides* and *Calytrix angulata* over *Patersonia occidentalis* var. *occidentalis* sparse forbland. Represents the Banksia Woodlands TEC. Situated on a dune crest with grey sandy soils.	RPS survey effort: METQ08, METQ09 Extent: 0.20 ha Condition: Very Good	
BaBmBiXp *Banksia attenuata* Woodland *Banksia attenuata, B. menziesii* and *B. ilicifolia* low woodland over *Xanthorrhoea preissii* mid open shrubland over *Scholtzia involucrata* low sparse shrubland over an open to closed rushland/forbland. Situated on white-grey sandy soil on low flat terrain.	RPS survey effort: PTAR02, PTAR04 Extent: 1.34 ha Condition: Completely Degraded to Degraded	

Description	Additional Details	Photograph
CcMpXp *Corymbia calophylla* Woodland *Corymbia calophylla* mid open forest to mid closed forest over *Melaleuca preissiana* low isolated trees to low Woodland over *Xanthorrhoea preissii* isolated shrubs to mid open shrubland over *Dielsia stenostachya* rushland with a mixed exotic open grassland. Located on grey sandy soil on low flats and slopes.	RPS survey effort: METQ01, METQ11, METQ06, METQ17, PTAQ21, PTAQ15 Extent: 37.23 ha Condition: Completely Degraded to Good	
Trees Isolated native trees and shrubs over weeds.	Survey effort: observation points Extent: 4.80 ha Condition: Completely Degraded	No photo available.

9.1.2 Conservation Significant Vegetation

9.1.2.1 Banksia Woodlands TEC Assessment

One patch of Banksia Woodlands TEC was assessed by RPS and considered representative of the federally protected ecological community. The Banksia Woodlands TEC is mapped for 0.20 ha in the survey area as the community BaBmSiPo. FCT 23a was inferred for this Patch (Woodman, 2020) therefore this TEC is represented by the synonymous Priority 3 PEC at the State level.

A second patch, recognised as Patch 12 (RPS, 2020) was originally classified as the Banksia Woodlands TEC. The vegetation east of Drumpellier Drive is now separated from the Whiteman Park vegetation by more than 30 m and is therefore not considered part of the federally protected ecological community.

On the west side of Drumpellier Drive there is a stand of Banksia trees mapped as Completely Degraded. Due to degradation and segregation from vegetation in Good or better condition, it is not considered representative of the Banksia Woodlands TEC.

9.1.3 Vegetation Condition

Areas of native vegetation were mostly Completely Degraded or Degraded condition. Significant weed invasion was present which is expected on the Swan Coastal Plain, particularly where parcels of vegetation have been dissected by roads and development. Whiteman Park has a history of grazing where large areas along the west side of Drumpellier Drive remain cow paddocks.

Cleared areas represent areas devoid of vegetation and are not included in percentage calculations below.

Vegetation condition is mapped on Figure 8 and extent of each category is presented in Table 73 below.

Table 73 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Very Good	0.20	0%
Good	2.06	5%
Degraded	19.65	45%
Completely Degraded	21.67	50%
Total	**43.58**	**100%**
Cleared	75.42	

9.1.4 Conservation Significant Flora

No significant flora species were recorded in the survey area.

9.1.5 Flora Inventory

The vegetation mapping relied on existing information published by RPS (2020) and AECOM (2016). It would be inaccurate to represent floristic diversity from these surveys as boundaries differ.

9.2 Fauna

9.2.1 Fauna Habitat Assessment

Five fauna habitats representing native vegetation were mapped, including Banksia Woodland, Melaleuca Woodland, Eucalyptus Woodland, Mixed Shrubland and Trees Over Cleared. Fauna habitat types and suitability for significant fauna species is described below and mapped in Figure 9.

9.2.1.1 Banksia Woodland

The Banksia Woodland habitat occurs at three locations along Drumpellier Drive and totalling 1.55 ha (1.3% of the survey area). It is characterised by a variable understorey of low shrublands and grasslands, with higher density in the northernmost patch. Overstorey plant species within the community include *Banksia attenuata, Banksia menziesii*, and *Eucalyptus todtiana*. Shrubs range from low-lying to tall, with density varying across the landscape. Shrub species included *Scholtzia involucrata, Eremaea pauciflora* var*. pauciflora, Hibbertia hypericoides,* and *Calytrix angulata* among others.

This habitat type represents edges of larger areas that extend beyond the survey area where condition is potentially better. It has few logs and rocks as microhabitats. Grass is common, with abundant bare ground. The shrubby understorey varies in density, along with coarse leaf litter. Small reptiles and mammals like the Quenda (Priority 4) and Black-striped Snake (Priority 3), which live in Banksia Woodlands, may forage in the coarse litter. This habitat type has large trees like Banksias and Eucalyptus, which are suitable for birds to feed and perch on. Carnaby's Cockatoo (Endangered) and Forest Red-tailed Black Cockatoo (Vulnerable) were seen foraging in the survey area.

9.2.1.2 Eucalyptus Woodland

The Eucalyptus Woodland habitat extends for 36.24 ha representing 30.5% of the survey area. Similar to the Banksia Woodland, this habitat extends beyond the survey area boundary. This habitat type is large and offers refuge for wildlife in the urbanised landscape. The overstorey includes Marri *Corymbia calophylla,* Jarrah *Eucalyptus marginata* and Paperbark *Melaleuca preissiana*. The understorey varies in density and species but largely represents paddocks with common weedy grasses and herbs. There is plenty of coarse leaf litter ideal for shelter and foraging for the *Quenda Isoodon fusciventer*. Large logs are scarce, but small logs and vines are common. The mature trees are suitable habitat for the Carnaby's Cockatoo, Forest Red-tailed Black Cockatoos and Baudin's Cockatoo.

Plate 27 Eucalyptus Woodland Habitat

9.2.1.3 Mixed Shrubland

The Mixed Shrubland habitat includes open native shrubland and planted shrubs mapped for 0.26 ha, representing 0.2% of the survey area. There are small logs which occur sporadically throughout the habitat type. Grasses were abundant, with coarse leaf litter occurring occasionally. The leaf litter and grassy understorey provide suitable foraging habitat and shelter for the Quenda *Isoodon fusciventer*.

9.2.1.4 Melaleuca Woodland

The Melaleuca Woodland habitat consists of *Melaleuca preissiana* overstorey in paddocks, mapped for 0.99 ha representing 0.8% of the survey area. It is limited to small pockets representing the edge of larger patches of vegetation that extend beyond the survey area. There are small logs which occur sporadically throughout the habitat type. Grasses were abundant, with coarse leaf litter occurring occasionally.

9.2.1.5 Trees Over Cleared

The Trees Over Cleared habitat type is mapped for 4.54 ha representing 4% of the survey area. It consists of planted street trees and isolated native trees over common weedy grasses and herbs. There is minimal variation and limited microhabitats throughout the habitat type. Leaf litter is infrequent, with minimal logs and fallen branches present. The habitat provides refuge and foraging habitat for invertebrates including native bees, and flighted species such as birds and microbats.

9.2.2 Fauna Inventory

A total of 21 vertebrate fauna species were recorded during the field survey. This comprised of 17 bird, three mammal and one reptile species. A complete inventory of fauna species recorded within the survey area is provided in Table 74.

One introduced species was recorded, the European Rabbit *Oryctolagus cuniculus*, which is listed under the BAM Act as a Declared Pest (s22(2)).

Table 74 Fauna observations in the NT-NOR to HBK 132kV Line survey area

Class	Scientific Name	Common Name	Method
Mammal	*Isoodon fusciventer*	Quenda	Seen. Foraging evidence
Mammal	*Macropus fuliginosus melanops*	Western Grey Kangaroo	Scats
Mammal	*Oryctolagus cuniculus*	European Rabbit	Tracks
Bird	*Barnardius zonarius*	Australian Ringneck	Seen and heard
Bird	*Spilopelia senegalensis*	Laughing Dove	Seen
Bird	*Cacatua pastinator*	Western Corella	Seen and heard
Bird	*Gymnorhina tibicen*	Australian Magpie	Seen and heard
Bird	*Anthochaera carunculata*	Red Wattlebird	Seen and heard
Bird	*Rhipidura leucophrys*	Willie Wagtail	Seen and heard
Bird	*Pachycephala rufiventris*	Rufous Whistler	Seen and heard
Bird	*Cracticus torquatus*	Grey Butcherbird	Seen
Bird	*Smicrornis brevirostris*	Weebil	Seen
Bird	*Zosterops lateralis*	Silvereye	Seen
Bird	*Purpureicephalus spurius*	Red capped parrot	Seen and heard
Bird	*Eolophus roseicapilla*	Galah	Seen and heard
Bird	*Hirundo neoxena*	Welcome Swallow	Seen
Bird	*Falco cenchroides*	Nankeen Kestrel	Seen
Bird	*Merops ornatus*	Rainbow Bee eater	Seen and heard

Class	Scientific Name	Common Name	Method
Bird	*Calyptorhynchus banksia naso*	Forest Red-tailed Black Cockatoo	Seen. Foraging evidence
Bird	*Zanda latirostris*	Carnaby's Black Cockatoo	Seen and heard. Foraging evidence
Reptile	*Varanus tristis*	Black-headed Monitor	Seen

9.2.3 Conservation Significant Fauna

Three conservation significant fauna species were recorded during the survey:

- Carnaby's Cockatoo (*Zanda latirostris)* listed as Endangered under the EPBC Act and BC Act
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)* listed as Vulnerable under the EPBC Act and BC Act
- Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA.

Carnaby's Cockatoos and Forest Red-tailed Black Cockatoo were seen and heard during the survey. Foraging evidence was recorded for Quenda and the Forest Red-tailed Black Cockatoo. Evidence of conservation significant species is mapped in Figure 9.

Four additional significant fauna species are likely to utilise the fauna habitats within the survey area. The total area (ha) of suitable habitat for these species which occurs within the survey area is included in Table 75 below.

Table 75 Total area (ha) of suitable habitat for significant fauna species within the survey area

Species	Area of Suitable Habitat (ha)					Total (ha)
	Eucalyptus Woodland	Banksia Woodland	Melaleuca Woodland	Trees Over Cleared	Mixed Shrubland	
Carnaby's Cockatoo (*Zanda latirostris*)	36.24	1.55	-	4.54	-	42.32
Baudin's Cockatoo (*Zanda baudinii)*	36.24	1.55	-	4.54	-	42.32
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	36.24	1.55	-	4.54	-	42.32
Quenda (*Isoodon fusciventer*)	36.24	1.55	0.99	-	0.26	39.04

9.3 Targeted Black Cockatoo Survey

9.3.1 Foraging

The survey area has been assessed as a score of 10 'High-quality foraging habitat' for both the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the Commonwealth Black Cockatoo Referral Guidelines foraging tool (DAWE, 2022) (Table 76). No subtractions were made for these two species. The survey area has been assessed as a score of 8 for Baudin's Cockatoo due to an absence of foraging evidence during the survey.

The survey area contains mature Banksia Woodlands and Eucalyptus Woodlands with suitable foraging species including multiple Proteaceous species, Marri *Corymbia calophylla* and Jarrah *Eucalyptus marginata* trees.

Table 76 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**	

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

- There are five confirmed white-tailed and Forest Red-tailed Black Cockatoo roosting sites less than 2.5 km from the survey area (DBCA, 2023c).
- The survey area is approximately 20 km from the buffer zone of two confirmed Black Cockatoo breeding areas (DBCA, 2023c).
- There is suitable foraging habitat adjacent to the survey area. The survey area represents 0.26% of available foraging habitat where breeding is likely and within 15 km therefore site context scores 1 where relevant.

Carnaby's Cockatoos were observed resting and foraging in Marri *Corymbia calophylla* within the survey area. Forest Red-tailed Black Cockatoos were observed flying over as well as foraging evidence (Plate 28).

The Banksia Woodland fauna habitat was considered 'Moderate to High' and 'Moderate' based on the density of suitable Banksia foraging species.

Areas that were Degraded had a lower site condition score (3 or 4) with a site context score and stocking rate of 1.

This same habitat was 'Low' for Baudin's and Forest Red-tailed Black Cockatoo in the absence of suitable foraging species.

The Eucalyptus Woodland fauna habitat was predominantly *Corymbia calophylla* and *Melaleuca preissiana* trees. Site context and stocking rate added two points for Carnaby's and Forest Red-tailed Black Cockatoos.

This habitat type varied depending on condition for Carnaby's, from 'Low' to 'Moderate'.

It was rated as 'Moderate' for Baudin's, and 'Moderate to High' for Forest Red-tailed Black Cockatoos.

The Trees over Cleared and Mixed Shrubland habitat was mapped as Completely Degraded and considered 'Low' for Carnaby's,

and 'Moderate' for Forest Red-tailed Black Cockatoos and Baudin's Cockatoo. The score was largely influenced by site condition in the absence of dense favourable foraging species.

The Melaleuca Woodland represents 'Negligible' quality habitat for all three species in the absence of suitable foraging species.

Foraging habitat for each habitat type is shown in Table 78 and it is mapped in Figure 10.

Table 77 NT-NOR TO HBK 132KV Terminal refined foraging score calculation (Bamford, 2020)

Habitat Type	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo	Extent (ha)
Banksia Woodlands	5	2	2	1.55
Eucalyptus Woodland	5	4	7	36.24
Melaleuca Woodland	1	1	1	0.99
Mixed Shrubland	2	2	2	0.26
Trees over Cleared	2	4	4	4.54
Cleared	0	0	0	75.42

Table 78 NT-NOR TO HBK 132KV Terminal foraging habitat extent

Foraging Habitat Quality	Carnaby's Cockatoo (ha)	Baudin's Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
1: Negligible.	0.99	0.99	0.99
2: Low	4.80	1.55	1.81
4-6: Moderate		40.78	4.54
7: Moderate to High	37.78		36.23
Total	**43.58**	**43.58**	**43.58**

Plate 28 Carnaby's Cockatoo foraging within the survey area

9.3.2 Breeding

A total of 351 potential nesting trees were recorded within the survey area (Table 79, Figure 10). The majority consisted of Marri (*Corymbia calophylla*) trees.

Two suitable nesting trees were recorded (Table 80 and Plate 29) with suitable hollows that could facilitate Black Cockatoo breeding. This included a Jarrah tree with a spout hollow, and a stag also with a spout hollow. The stag hollow was occupied by a beehive. This assessment is limited to observations made from the ground only.

Table 79 Potential nesting trees within the survey area

Tree Species	Total Trees with DBH >500 mm
Tuart (*Eucalyptus gomphocephala*)	1
Marri (*Corymbia calophylla*)	302
Jarrah (*Eucalyptus marginata*)	8
Coastal Blackbutt (*Eucalyptus todtiana*)	2
Stag	36
Introduced	2
Grand Total	**351**

Table 80 Potentially suitable nesting tree hollow details

ID	Species	Hollow Entrance (Depth x Width)	Height Above Ground (m)	Hollow Angle	Facing	Hollow Type	Evidence of Use
291	Stag	30 x 30 cm	12	Horizontal	West	Spout	None, occupied by bees.
507	Jarrah (*Eucalyptus marginata*)	20 x 20 cm	12	Horizontal	North	Spout	None

Plate 29 Left: Hollow recorded on potentially suitable nesting tree ID 291 - Stag
Right: Hollow recorded on potentially suitable nesting tree ID 507 - Jarrah (*Eucalyptus marginata*)

9.3.3 Roosting

No roosting sites were observed within the survey area. Sixty-seven confirmed white-tailed Black Cockatoo and Forest Red-tailed Black Cockatoo roosting sites are known to occur within 15 km of the survey area from Birdlife Data provided by DBCA. Twelve of these occur within 5 km and five within 2.5 km of the survey area (DBCA, 2023c). The Trees over Cleared and Eucalyptus Woodland would provide suitable roosting habitat.

9.4 Discussion

9.4.1 Flora and Vegetation

The survey area represents a wide linear corridor that follows Drumpellier Drive in a north-south trajectory. It includes the east side of Drumpellier Drive which adjoins urban development and has been disconnected from the vegetation on the west side. The west side represents Whiteman Park and Bush Forever Site 304. This area, although representing a Reserve, is currently used for cattle grazing and encompasses the Morley-Ellenbrook Rail Corridor which is currently under construction.

Access to the area was restricted due to ongoing Rail works. The current survey verified the RPS (2020) flora and vegetation assessment undertaken to support the Morley-Ellenbrook Public Environment Review documentation submitted to EPA. This mapping was refined and updated to reflect current conditions excluding the clearing footprint and refining trees in paddocks.

All areas of native vegetation have been historically disturbed from grazing, urban development, and altered hydrology. Large parts of the area are low-lying and winter-wet and therefore represent ideal grazing country where grasses grow prolifically. Weeds have displaced most native understorey species, leading to the majority of the area being mapped as Completely Degraded and Degraded. Historically the wetlands in Whiteman Park suffer from significant weed invasion including the Declared pest **Zantedeschia aethiopica* (Arum Lily) (RPS, 2020).

Native vegetation represents five vegetation communities, mapped for 57.98 ha. The remaining 59.74 ha is cleared. Vegetation is largely reduced to a native overstorey over hardy native shrubs and common pasture weeds.

Table 81 Summary of NT-NOR TO HBK 132KV likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	3	31	47	23	104
Post-survey	0	0	0	34	70	104

9.4.2 Fauna

Twenty-one vertebrate fauna species were recorded during the field survey. This included 17 birds, three mammals and one reptile species. Three conservation significant fauna species were recorded during the survey:

- Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
- Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

Five native fauna habitats were defined and mapped for the survey area based on the results of the field assessment. These habitats include Banksia Woodland, Eucalyptus Woodland, Melaleuca Woodland, Trees Over Cleared and Mixed Shrubland. All fauna habitats were reduced to a native overstorey with a predominantly weedy understorey.

Following the survey, a post-survey likelihood desktop assessment was completed. Details of all the conservation significant species considered to have a high or known post-survey likelihood and their associated habitats is presented in Table 82.

The Banksia Woodlands and Eucalyptus Woodland habitats are considered the most suitable habitat for Quenda (*Isoodon fusciventer*), Carnaby's Cockatoos (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*), and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*). Large parts of the survey area are disconnected from remnant native vegetation and have been disturbed.

These significant fauna species may utilise areas where native understorey density was higher, generally associated with vegetation condition of 'Good' or better.

Table 82 Fauna species and associated fauna habitat within the NT-NOR to HBK 132kV survey area

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Carnaby's Cockatoo (*Zanda latirostris*)	E (EPBC Act) EN (BC Act)	Uncleared or remnant native Eucalypt woodlands containing Salmon gum and Wandoo, and in shrubland or Kwongan heathland dominated by Hakea, Dryandra, *Banksia* and *Grevillea* species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in Pine plantations (DCCEEW, 2023)	There are 9264 records on the DBCA database, the closest record is 0.29 km away from the survey area. The most recent record is in 2020.	High	Known	This species is likely to use Eucalyptus Woodland, Trees Over Cleared, and Banksia Woodland habitats within the survey area. These habitats are also found outside, directly adjacent to the survey area.
Baudin's Cockatoo (*Zanda baudinii*)	E (EPBC Act) EN (BC Act)	Temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *E. diversicolor* (Karri) (TSSC, 2018).	There are 136 records on the DBCA database, the closest record is 0.70 km away from the survey area. The most recent record is in 2015.	High	High	This species is likely to use Eucalyptus Woodland, Trees Over Cleared, and Banksia Woodland habitats within the survey area. These habitats are also found outside, directly adjacent to the survey area.
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V (EPBC Act) VU (BC Act)	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	There are 363 records on the DBCA database, the closest record is 2.00 km away from the survey area. The most recent record is in 2020.	High	Known	This species is likely to use Eucalyptus Woodland, Trees Over Cleared, and Banksia Woodland habitats within the survey area. These habitats are also found outside, directly adjacent to the survey area.
Quenda (*Isoodon fusciventer*)	P4	Forest, woodland, heath, and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	There are over 1588 records within 10 km of the survey area, with the closest record occurring at 0.06 km. The most recent of these was recorded in 2021.	High	Known	This species is likely to use Eucalyptus Woodland, Melaleuca Woodland, Mixed Shrubland and Banksia Woodland habitats within the survey area. The presence of accumulated coarse leaf litter is suitable foraging habitat for the Quenda. Quenda foraging activity was observed throughout these habitat types. These habitats are also found outside, directly adjacent to the survey area.

9.4.3 Targeted Black Cockatoo

The survey area is within the known range for the three threatened Black Cockatoo species. Both the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) and Carnaby's Cockatoo (*Zanda latirostris*) were observed foraging and resting within the survey area. There were 118 potential nesting trees recorded, including two suitable nesting trees. The suitable nesting trees include a stag and a Jarrah tree, both with spout hollows. There was no evidence of current use, but they could be utilised for nesting in the future.

The survey area scored a foraging habitat score of 10 for both the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo in accordance with the DAWE 2022 guidelines. The survey area has been assessed as a score of 8 for Baudin's Cockatoo due to an absence of foraging evidence during the survey.

Foraging scores were largely attributed to the variable site condition score, influenced by the *Banksia Corymbia calophylla* and *Eucalyptus marginata* overstorey. This includes potential breeding trees and two trees with suitable hollows. For Carnaby's the Banksia Woodlands would be the preferred habitat, rated as 'Moderate to High'. For Forest Red-tailed Black Cockatoos, the Trees over Cleared and Eucalyptus Woodlands would be the preferred habitat, also scoring 'Moderate to High'.

Foraging quality for Baudin's Cockatoo was largely Moderate. The species prefer to forage on Marri (*Corymbia calophylla*), which is present in the survey area. Due to a lack of sightings and foraging evidence the score meant no stocking rate score was included and breeding is unlikely with breeding likely to occur on the southern Swan Coastal Plain (DAWE, 2022).

There are large areas of remnant native vegetation in Good or better condition protected within Whiteman Park and Gnangara State Forest which would provide similar foraging habitat as what was captured in the survey area.

10.0 Northern Terminal Results and Discussion

10.1 Flora

10.1.1 Vegetation Communities

Two intact and one modified native vegetation community was defined and mapped including:

- Eucalypt Woodland CcXpEc
- Low-lying Eucalypt Woodland ErAcCc which represents a winter-wet area
- Trees representing a modified community.

The native vegetation communities were mapped for 12.21 ha, representing 47% of the survey area. The remaining 13.57 ha was mapped as Cleared and was devoid of native vegetation. Vegetation community descriptions are presented in Table 83 and mapped on Figure 8.

10.1.2 Conservation Significant Vegetation

No TECs or PECs were identified in the survey area.

FCT analysis results were ambiguous with no strong similarity for Quadrats CHQ01 and CHQ02. This outcome reflects the isolated nature and degradation of vegetation within the survey area. Numerous key species were missing, and no strong similarity was noted for any one particular FCT.

Quadrat CHQ03 had a weak affiliation with FCT 4 *Melaleuca preissiana* Damplands. This is inferred with low confidence with 29% as the highest similarity and then only for the Gibson data.

Results for the FCT analysis are presented in Table 84) including similarity percentages and cluster dendrogram results.

Table 83 Northern Terminal vegetation community descriptions and photographs

Description	Additional Details	Photograph
CcXpEc *Corymbia calophylla* Woodland *Corymbia calophylla* and *Nuytsia floribunda* tall open woodland over *Xanthorrhoea preissii, Conostephium pendulum* and *Petrophile linearis* low sparse shrubland over **Ehrharta calycina* and **Pentameris airoides* open grassland. Situated on grey- white sandy soil on flat terrain.	Survey effort: CHQ02 Native species richness: 10 Weed species richness: 3 Condition: Completely Degraded to Very Good Extent: 1.52 ha	
ErAcCc *Eucalyptus rudis* Woodland *Eucalyptus rudis, Melaleuca preissiana and Callitris pyramidalis* tall open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata, Taxandria linearifolia* low closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata* and *Tricoryne tenella* sparse forbland. Situated on grey sandy soil on low flat terrain. Represents low-lying terrain which may be winter-wet.	Survey effort: CHQ01, CHQ03, CHR01, NSR01, NSR02, NSR03, NSR04 Native species richness: 38 Weed species richness: 23 Condition: Completely Degraded to Excellent Extent: 9.82 ha	

Description	Additional Details	Photograph
Trees Isolated native trees and shrubs over weeds. Situated on grey- white sandy soil on flat terrain.	Survey effort: Observation points Condition: Completely Degraded Extent: 0.87 ha	

Table 84 Floristic community type analysis results for Northern

Quadrat	Gibson (1994)				Keighery (2012)			Final Determination	
	% Similar	FCT	Site	Dendrogram	% Similar	FCT	Site	Dendrogram	
CHQ01	27	28	NEER-6	Broadly clustering with FCT 20b and 6.	30	21c	FL-6	Clustering with FCT 6.	Indeterminate. FCT21c low lying *B. attenuata* woodlands or shrublands is not a good fit. It is dominated by a mix of *Melaleuca preissiana*, *B. attenuata*, *B. menziesii* according to the Gibson et al. (1994) description. The mapped community lacks the key *Banksia* species and is therefore not considered to represent this FCT. The low similarity to multiple FCTs likely relates to the high level of disturbance.
	27	21c	DEJONG-c		29	24	bold13		
	25	21c	FL-6		28	21c	DEJONG02		
CHQ02	22	21a	PLINE-3	Broadly clustering with FCTs 15 and 10b. Outlier of a large group.	25	21c	ELE29	Outlier of a large group, clustering with FCTs s10, s08.	Indeterminate. FCT21a central *B. attenuata-Eucalyptus marginata* woodlands is not a good fit. It is dominated by a mix of *E. marginata* and *B. attenuata* according to the Gibson et al. (1994) description. The mapped community lacks the key *Banksia* and *Eucalyptus* species and is therefore not considered to represent this FCT. The low similarity to multiple FCTs likely relates to the high level of disturbance.
	21	21a	MILT-6		24	21c	ELE27		
	20	24	THOM-2		24	22	MR11		
CHQ03	29	4	PLINE-4	Broadly clustering with FCTs 22 and 14.	35	s02	ELE06	Outlier of a group including FCTs 6, s20, and s01	FCT 4, low similarity, unable to infer FCT with confidence. Vegetation present was a mix of wetland and woodland. FCT4 vegetation description is suitable. Low similarity may be influenced by quadrat location (ecotone potentially), historical disturbance, or survey effort (single scoring event, time of year, time spent searching).
	24	4	MELA-1		31	21a	Cavs02		
	23	21c	FL-5		31	4	perth10		

10.1.3 Vegetation Condition

The survey area included 13.37 ha of native vegetation which was largely Degraded (4.91 ha, 19%) and Completely Degraded (2.34 ha, 9%). Degradation was a result of fragmentation, clearing for the existing substations, numerous tracks, and the exacerbated edge effects. The native vegetation is completely isolated from other areas of remnant vegetation, thereby exacerbating lower diversity. This power station was historically cleared (1960s) for construction of the substation infrastructure.

Cleared areas represent areas devoid of vegetation and are not included in percentage calculations below. Vegetation condition is mapped on Figure 8 and extent of each category is presented in Table 85 below.

Table 85 Vegetation condition extent

Condition Rating	Extent (ha)	Percent of Total Area
Completely Degraded	2.34	19
Degraded	4.91	40
Good	3.02	25
Very Good	0.85	7
Excellent	1.09	9
Total	**12.21**	**100**
Cleared	13.57	

10.1.4 Conservation Significant Flora

No significant flora species were recorded in the Northern Terminal survey area.

10.1.5 Flora Inventory

A total of 70 flora species from 31 families were recorded. The total includes 46 (65.7%) locally native species and 24 (34.3%) introduced or naturalised weed species. No weed species listed as Weeds of National Significance (WONS) or listed as Declared Pests under the BAM Act were recorded.

Families with the highest representation are Myrtaceae (29 native taxa), Poaceae (17 native taxa), and Fabaceae (12 native taxa).

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

10.2 Fauna

10.2.1 Fauna Habitat Assessment

10.2.1.1 Eucalyptus Woodland

The Eucalyptus Woodland habitat extends for 11.33 ha within the survey area. This habitat type is the largest within the survey area and acts as a refuge for wildlife from the surrounding urbanised landscape. The main trees are Marri *Corymbia calophylla,* Flooded Gum *Eucalyptus rudis* and *Melaleuca preissiana*, some of which contain small hollows. Historical disturbance has impacted the abundance of a shrubby understorey, which varies in density throughout. Coarse leaf litter, sedges and grasses are abundant which are ideal for shelter and foraging for animals like the Quenda *Isoodon fusciventer*. Vines and small logs are abundant, whilst large logs are infrequent. The mature trees are suitable habitat for the three threatened species: Carnaby's Cockatoo, Forest Red-tailed Black Cockatoos and Baudin's Cockatoo.

Plate 30 Eucalyptus Woodland Habitat

10.2.1.2 Mixed Shrubland

The Mixed Shrubland habitat includes isolated planted shrubs, as well as remnant native shrubland vegetation. It is in a degraded condition and extends for 0.73 ha, limited to small pockets throughout the survey area.

There are small logs which occur sporadically throughout the habitat type. Grasses were abundant, with coarse leaf litter occurring occasionally.

Plate 31 Mixed Shrubland Habitat

10.2.1.3 Trees Over Cleared

The Trees Over Cleared habitat type is the second-most abundant habitat type, other than Cleared. It extends for 0.14 ha and consists of isolated native trees over grasses and weeds. Habitat quality is poor, as there is minimal variation and limited microhabitats throughout the habitat type. Leaf litter is infrequent, with minimal logs and fallen branches present. The habitat is primarily likely to be used by invertebrates and flighted species, such as birds and microbats. The mature trees may provide shelter, breeding and foraging for many species.

Plate 32 Trees Over Cleared Habitat

10.2.2 Fauna Inventory

A total of 16 vertebrate fauna species were recorded during the field survey. This comprised of nine bird, six mammal and one reptile species. A complete inventory of fauna species recorded within the survey area is provided in Table 86.

Two introduced species were recorded, both of which are listed under the BAM Act:

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

Table 86 Fauna observations within the Northern survey area

Class	Scientific Name	Common Name	Method
Mammal	*Felis catus*	Feral Cat	Seen and heard
Mammal	*Isoodon fusciventer*	Quenda	Foraging evidence
Mammal	*Macropus fuliginosus melanops*	Western Grey Kangaroo	Bones
Mammal	*Oryctolagus cuniculus*	European Rabbit	Seen. Foraging evidence
Mammal	*Tachyglossus aculeatus*	Short-beaked Echidna	Scats
Mammal	*Vulpes vulpes*	Red Fox	Seen
Bird	*Phylidonyris niger*	White-cheeked Honeyeater	Seen and heard
Bird	*Lichmera indistincta*	Brown Honeyeater	Seen and heard
Bird	*Merops ornatus*	Rainbow Bee-eater	Seen
Bird	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Seen
Bird	*Spilopelia chinensis*	Spotted Dove	Seen
Bird	*Pachycephala rufiventris*	Rufous Whistler	Seen
Bird	*Rhipidura albiscapa*	Grey Fantail	Seen
Bird	*Gavicalis virescens*	Singing Honeyeater	Seen and heard
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Foraging evidence
Reptile	*Pseudonaja affinis*	Dugite	Seen

10.2.3 Conservation Significant Fauna

Distinct foraging evidence was recorded for two significant fauna species, Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA, and Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act(Plate 33, Plate 34). Evidence of conservation significant species is mapped in Figure 9.

The Baudin's Cockatoo and Forest Red-tailed Black Cockatoo are also considered likely to utilise habitat in the survey area. total area (ha) of suitable habitat for these species which occurs within the survey area is included in Table 87.

Plate 33 Typical conical-shaped Quenda digging - foraging evidence

Table 87 Total area (ha) of suitable habitat for significant fauna species within the survey area

Species	Area of Suitable Habitat (ha)			
	Eucalyptus Woodland	Trees Over Cleared	Mixed Shrubland	Total (ha)
Carnaby's Cockatoo (*Zanda latirostris*)	11.34	0.14	-	11.48
Baudin's Cockatoo (*Zanda baudinii)*	11.34	0.14	-	11.48
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	11.34	0.14	-	11.48
Quenda (*Isoodon fusciventer*)	11.34	-	0.73	12.07

Plate 34 Forest Red-tailed Black Cockatoo Foraging Evidence

10.3 Targeted Black Cockatoo Survey

10.3.1 Foraging

The survey area has been assessed as a score of 10 ‘High-quality foraging habitat’ for the Forest Red-tailed Black Cockatoo in accordance with the Commonwealth Black Cockatoo Referral Guidelines foraging tool (DAWE, 2022) (Table 32). No subtractions were made for this species. The survey area has been assessed as a score of 8 for both the Carnaby’s Cockatoo and Baudin’s Cockatoo due to an absence of foraging evidence during the survey.

The survey area contains mature Banksia Woodlands and Eucalyptus Woodlands, with suitable foraging species including multiple proteaceous species, Marri *Corymbia calophylla* and Tuart *Eucalyptus gomphocephala* trees.

Table 88 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		**8**		**10**	

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

- There are three confirmed white-tailed and Forest Red-tailed Black Cockatoo roosting sites less than 3 km from the survey area (DBCA, 2023c).
- The survey area is outside the mapped distribution of breeding for Baudin's Cockatoo and Carnaby's Cockatoo.
- There are 4,444 records of Carnaby's Cockatoo within 15 km of the survey area. There was foraging evidence for the Forest Red-tailed Black Cockatoo within the survey area. Stocking rate for these two species was scored at 1.
- There is suitable foraging habitat within 15 km of the survey area, however the immediately surrounding area is largely developed and cleared. Native vegetation within the survey area represents 0.1-1% of the available foraging habitat within a 15 km radius.

The Eucalyptus Woodland fauna habitat was split into two components for scoring, relating to the dominant overstorey species. Carnaby's Cockatoo and Forest-Red-tailed Black Cockatoo foraging habitat was rated as 'Moderate' (scoring 4, 5 or 6) for the Eucalyptus Woodland habitat that supported Marri *Corymbia calophylla* tree species.

Areas dominated by Flooded Gum *Eucalyptus rudis* scored a 2, representing 'Low' quality habitat.

Trees Over Cleared was rated as 'Negligible'.

Baudin's Cockatoo foraging habitat was largely 'Low', with small areas mapped as 'Low to Moderate' and 'Moderate' where Marri trees dominated. Similar to the Carnaby's Cockatoo, this reflects the dominant tree overstorey species.

Foraging habitat areas and the Bamford (2020) rating for each habitat quality type is shown in Table 89, Table 90 and Figure 10.

Table 89 Norther Terminal refined foraging score calculations (Bamford, 2020) and extent.

Habitat Type	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo	Extent (ha)
Eucalyptus Woodlands	3	3	3	11.34
Mixed Shrubland	1	1	1	0.73
Trees Over Cleared	1	1	1	0.14
Cleared	0	0	0	13.57

Table 90 Northern Terminal foraging habitat extent

Foraging Habitat Quality	Carnaby's Cockatoo (ha)	Baudin's Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
1: Negligible.	0.14	0.14	0.14
2: Low.	9.81	9.81	9.81
3: Low to Moderate.	-	0.67	-
4-6: Moderate.	1.52	1.52	1.52
Total	**11.47**	**12.14**	**11.47**

10.3.2 Breeding

A total of 33 potential nesting trees were recorded within the survey area (Table 91, Figure 10). This included Flooded Gum (*Eucalyptus rudis*), Marri (*Corymbia calophylla*) and 'Other' trees.

No suitable nesting trees were identified.

Table 91 Potential nesting trees within the survey area

Tree Species	Total Trees with DBH >500 mm
Flooded Gum (*Eucalyptus rudis*)	17
Marri (*Corymbia calophylla*)	12
Other	4
Grand Total	**33**

10.3.3 Roosting

No roosting sites were observed within the survey area. The Eucalyptus Woodland fauna habitat type could provide suitable roosting habitat.

One hundred and fifteen confirmed white-tailed Black Cockatoo and Forest Red-tailed Black Cockatoo roosting sites are known to occur within 15 km of the survey area from Birdlife Data provided by DBCA. Three of these sites occur within 3 km of the survey area (DBCA, 2023c).

10.4 Discussion

10.4.1 Flora and Vegetation

The Northern survey area is characterised by fragmented remnant native vegetation in a highly developed landscape. It includes an area that is fenced as part of the power terminal. Vegetation within the fenced area represented regenerated vegetation comprised largely of hardy perennial disturbance opportunist species and weeds. Two native Eucalyptus Woodlands were mapped including CcXpEc for 1.52 ha and ErAcCc for 9.81 ha. No TECs or PECs were anticipated to occur, and none were identified.

Flora diversity was considered high with 70 species recorded, including 46 native and 24 weed species within 12.21 ha. The species diversity is likely a reflection of survey effort (three quadrats and five relevés). This survey effort was implemented to capture the variation in vegetation observed, likely a result of regrowth and fragmentation due to historical clearing.

No significant flora species were known to occur, and none were recorded. Ten flora species had a 'high' likelihood of occurring due to the proximity and date of known records. All of these were downgraded to 'low' following the survey due to the degradation and isolation of habitat. All areas were traversed on foot during the ideal detection period and no significant flora was recorded. Table 92 provides a summary of pre-survey and post-survey likelihood of occurrence for species identified as potentially occurring within the survey area.

Table 92 Summary of Northern Terminal likelihood of occurrence pre-survey and post-survey

Likelihood	Number of Species Identified					
	Known	High Likelihood	Moderate Likelihood	Low Likelihood	Negligible Likelihood	Total
Pre-survey	0	10	24	33	32	99
Post-survey	0	0	0	34	65	99

10.4.2 Fauna

Sixteen vertebrate fauna species were recorded during the field survey. This included nine birds, six mammals and one reptile species. Two conservation significant fauna species were recorded during the survey:

- Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.

Three native fauna habitats were defined and mapped for the survey area based on the results of the field assessment. These habitats include Eucalyptus Woodland, Trees Over Cleared and Mixed Shrubland.

As a fence is present around two-thirds of the survey area and the surrounding area is heavily developed, the movement of most conservation significant fauna species will be limited. The fauna habitats are fragmented and degraded throughout, with large areas of road base tracks and infrastructure dividing it. The Eucalyptus Woodland fauna habitat is the most intact, with mature trees present as well as a variable native understorey.

The Eucalyptus Woodland habitat is considered the most suitable habitat for Quenda (*Isoodon* fusciventer), Carnaby's Cockatoos (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*), and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*). These significant fauna species may utilise areas where native understorey density was higher, generally associated with vegetation condition of 'Good' or better.

Following the survey, a post-survey likelihood desktop assessment was completed. Details of all the conservation significant species considered to have a high or known post-survey likelihood and their associated habitats is presented in Table 93.

Table 93 Fauna species likely to occur and associated fauna habitat within the Northern Terminal survey area.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
Carnaby's Cockatoo (*Zanda latirostris*)	E (EPBC Act) EN (BC Act)	Uncleared or remnant native Eucalypt woodlands containing Salmon gum and Wandoo, and in shrubland or Kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in Pine plantations (DCCEEW, 2023).	There are 9264 records on the DBCA database, the closest record is 0.65 km away from the survey area (2020).	High	High	All three species are likely to use the Eucalyptus Woodland and Trees Over Cleared habitats within the survey area. The Eucalyptus Woodland habitat does not occur directly adjacent to the survey area. The closest large patch of remnant bushland is approximately 1 km to the west. Isolated trees along a waterway are also located approximately 500m to the east.
Baudin's Cockatoo (*Zanda baudinii*)	E (EPBC Act) EN (BC Act)	Temperate forest and woodland dominated by *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *E. diversicolor* (Karri) (TSSC, 2018).	There are 136 records on the DBCA database, the closest record is 0.64 km away from the survey area (2015).	High	High	
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	V (EPBC Act) VU (BC Act)	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolor* (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	There are 363 records on the DBCA database, the closest record is 2.26 km away from the survey area (2.26).	High	Known	
Quenda (*Isoodon fusciventer*)	P4	Forest, woodland, heath, and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	There are over 1589 records within 10 km of the survey area, with the closest record occurring at 0.06 km. The most recent of these was recorded in 2021.	Moderate	Known	This species is likely to use Eucalyptus Woodland, and Mixed Shrubland habitats within the survey area. The presence of accumulated coarse leaf litter is suitable foraging habitat for the Quenda.

Species	Conservation code (EPBC/State WA)	Habitat	Number of DBCA Records and Distance	Pre survey likelihood of occurrence	Post survey likelihood of occurrence	Discussion
						Quenda foraging activity was observed throughout these habitat types. These habitats are also found outside the survey area, but not directly adjacent to it due to development.

10.4.3 Targeted Black Cockatoo

The survey area is within the known range for the three threatened Black Cockatoo species. Foraging evidence was recorded for the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) within the survey area. There were 33 potential nesting trees with a suitable DBH (>500 mm) identified with the survey area. No potentially suitable nesting trees were identified.

The survey area scored a foraging habitat score of 10 for the Forest Red-tailed Black Cockatoo in accordance with the DAWE 2022 guidelines. The survey area has been assessed as a score of 8 for Baudin's Cockatoo and Carnaby's Cockatoo, due to an absence of foraging evidence during the survey. The BCE (2020) scoring method defined the area as supporting Negligible to Moderate foraging quality. The Moderate foraging quality is associated with the Eucalyptus Woodland habitat type, which includes suitable foraging species such as *Corymbia calophylla, Eucalyptus marginata* and *Eucalyptus todtiana*. The known occurrence of three roosting sites within 3 km of the survey area, permanent water source presence nearby, confirmed foraging evidence during the survey, and extent of suitable foraging habitat in the vicinity all contributed to the foraging score.

11.0 Conclusion

AECOM Australia Pty Ltd (AECOM) was engaged by Western Power to undertake a spring flora, vegetation, fauna and black cockatoo assessment for defined linear corridors within the Perth Metropolitan Region on the Swan Coastal Plain (SCP). This Project is referred to as the Clean Energy Link (CEL). The five sites include: Padbury - Wangara, Pinjar Terminal, Neerabup Terminal and East Wanneroo, NT-NOR to HBK 132kV Line and Northern Terminal.

A summary of the Padbury-Wangara results is presented below:

- One patch of -Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community (Tuart Woodlands TEC) listed as Critically Endangered under the EPBC Act and as Priority 3 by DBCA. The patch extends for 0.54 ha.
- No significant flora listed under the EPBC Act or the BC Act or by DBCA were recorded during the survey.
- Three conservation significant fauna species were recorded during the survey, including two bird species and one mammal species:
  - Carnaby's Cockatoo (*Zanda latirostris)* listed as Endangered under the EPBC Act and the BC Act
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso)* listed as Vulnerable under the EPBC Act and BC Act
  - Quenda (*Isoodon fusciventer)* listed as Priority 4 by DBCA.

A summary of the Pinjar Terminal results is presented below:

- No significant flora listed under the EPBC Act, BC Act or by DBCA were recorded during the survey.
- Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands TEC) listed as Endangered under the EPBC Act and as Priority 3 by DBCA, mapped for 14.75 ha.
- One conservation significant fauna species was recorded during the survey, Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.

A summary of the Neerabup Terminal and East Wanneroo results are presented below:

- Eight patches of Banksia Woodlands TEC were confirmed and mapped for 15.13 ha. This TEC is synonymous with a Priority 3 Ecological Community (PEC) unless otherwise assessed.
- One patch of Tuart (*Eucalyptus* gomphocephala) Woodlands and Forests of the Swan Coastal Plain TEC was mapped within the survey area for 1.71 ha.
- One Priority 3 PEC listed by the DBCA (2023) was confirmed to occur through FCT analysis, FCT 21c – Low lying Banksia attenuata woodlands or shrublands, mapped for 0.60 ha.
- One Priority 4 species, *Jacksonia sericea,* was collected and formal identification confirmed at the WA Herbarium. 1 individual was recorded within the survey area, with a second individual recorded in a quadrat adjacent to the survey area.
- A sample of *Calectasia* sp. was collected for identification but was unable to be confirmed and could potentially represent the Priority 2 *C. narragarra* species. This individual was recorded outside the survey area.
- Three conservation significant fauna species were recorded during the survey:
  - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
  - Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

A summary of the NT-NOR to HBK 132KV results are presented below:

- quadrat and relevé data produced by RPS (2020) and reviewed by Woodman (2020).
- No significant flora listed under the EPBC Act or the BC Act or by DBCA were recorded during the survey.
- Three conservation significant fauna species were recorded during the survey:
  - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.
  - Carnaby's Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

A summary of the Northern Terminal results are presented below:

- No significant flora listed under the EPBC Act or the *Biodiversity Conservation Act 2016* (BC Act) or by DBCA were recorded during the survey.
- No significant vegetation communities were recorded in the survey area.
- Two conservation significant fauna species were recorded during the survey:
  - Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
  - Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act.

The survey was undertaken by experienced personnel, during the ideal detection period for significant flora. Survey effort was considered satisfactory, and no access issues were encountered that affected the outcome of the results.

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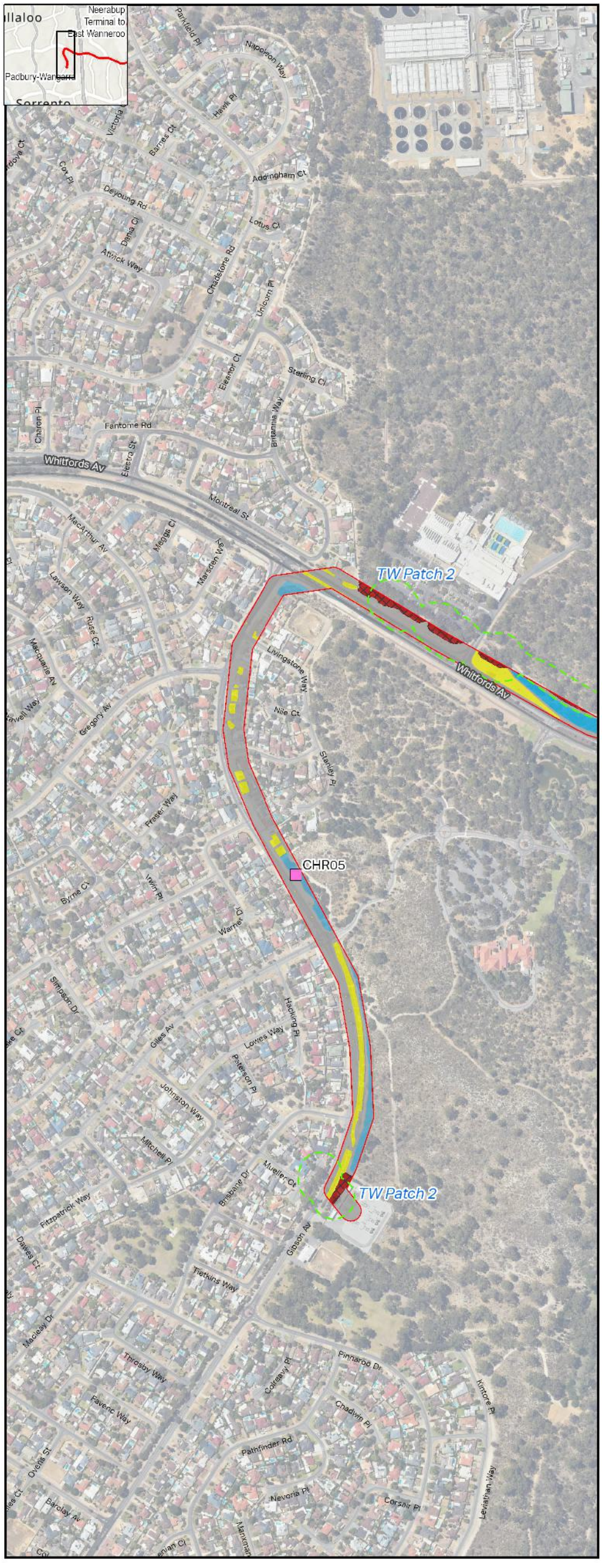

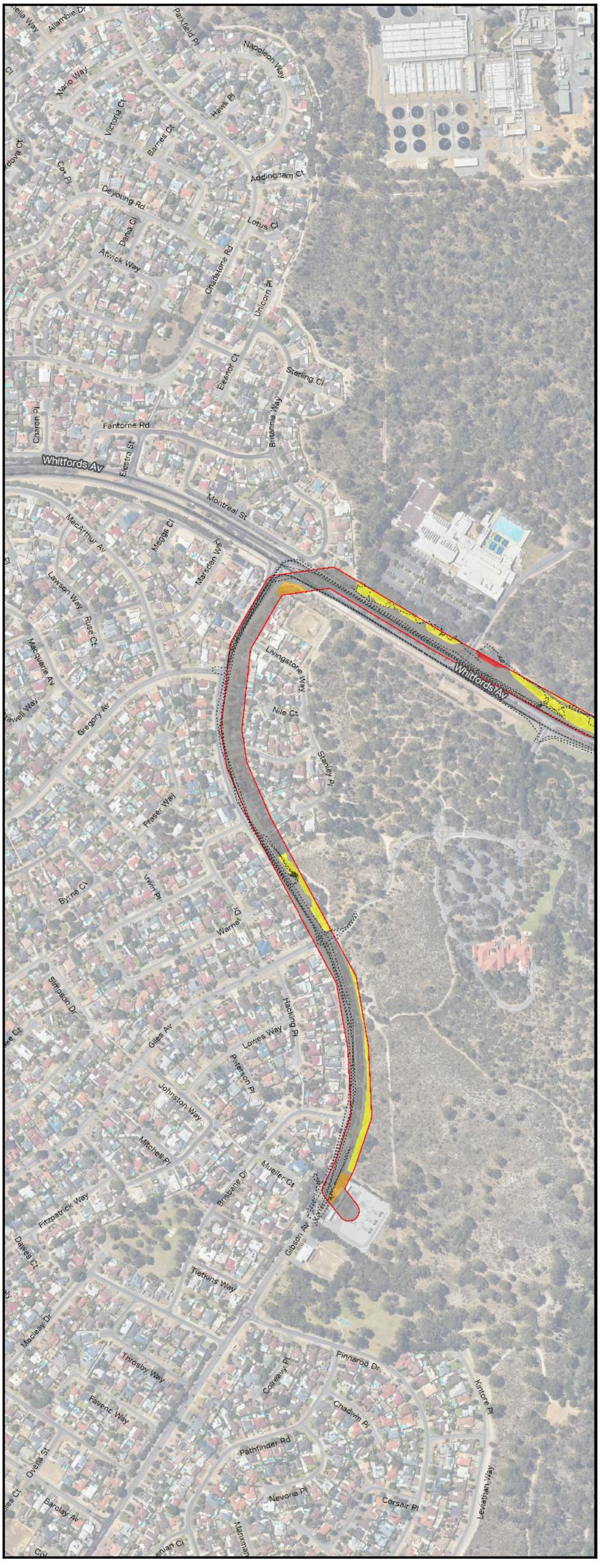

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

Survey Area

Sample Sites

Relevé

Tracklog

TEC Tuart Woodlands and Forests of the Swan Coastal Plain Buffer

TEC

TEC Tuart Woodlands and Forests of the Swan Coastal Plain

Vegetation Community

BaAlTe

CpMsLo

EgHcPp

Planted

Cleared

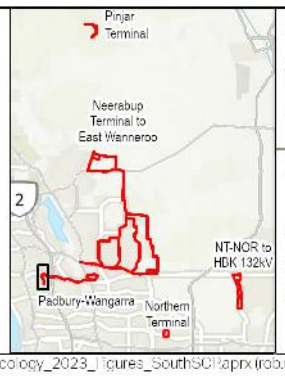
Vegetation Condition

Good

Degraded

Completely Degraded

Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Padbury-Wangarra*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.1**

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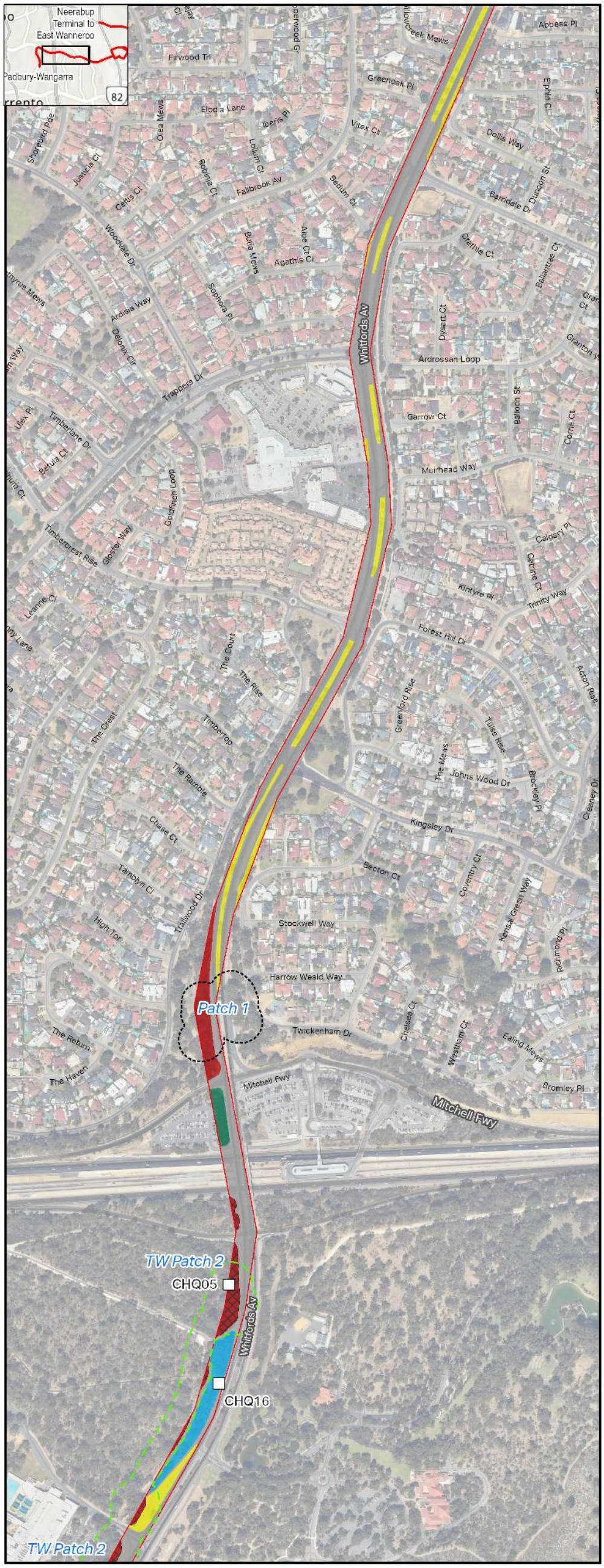

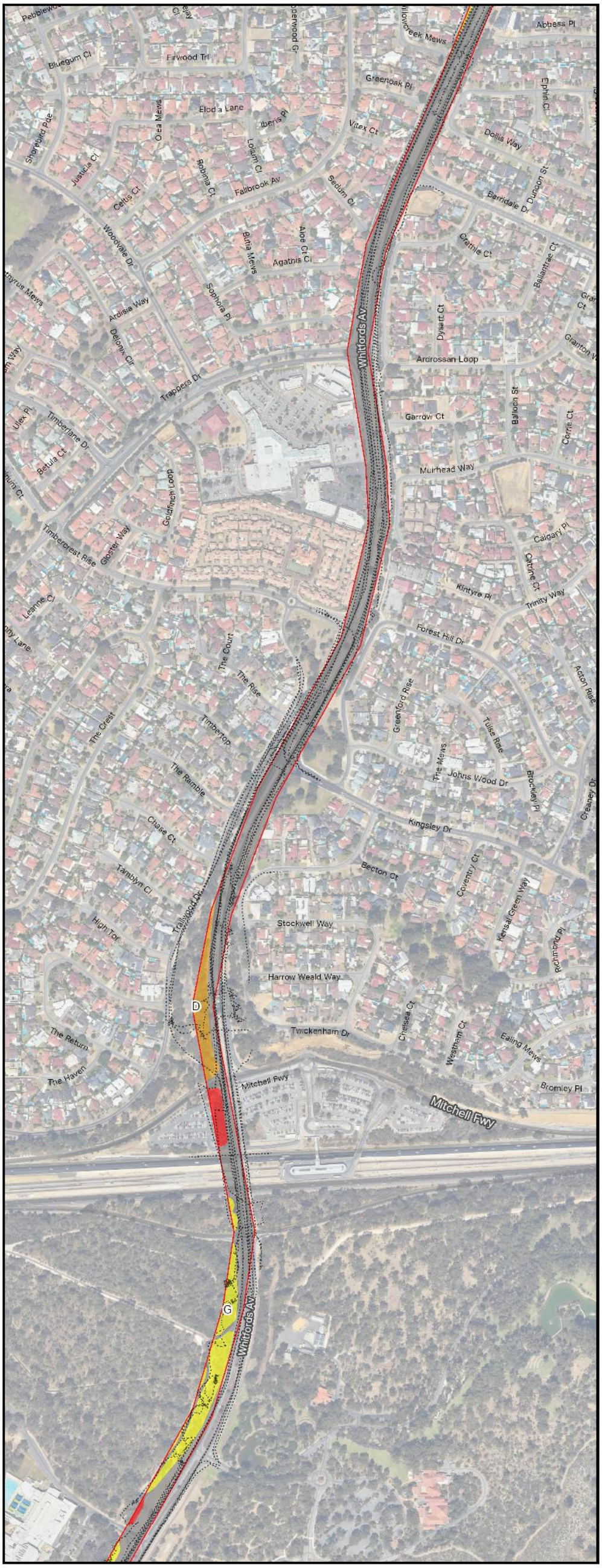

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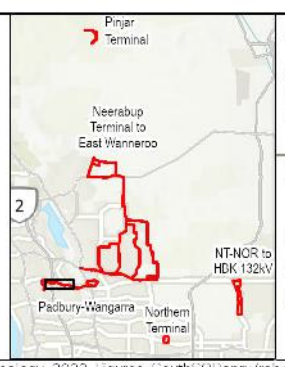
0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

- Survey Area
- Sample Sites
  - Quadrat
  - Tracklog
- TEC Tuart Woodlands and Forests of the Swan Coastal Plain Buffer
- TEC
- Not a TEC
- TEC Tuart Woodlands and Forests of the Swan Coastal Plain
- Vegetation Community
  - BaAbAb
  - BaAlTe
  - EgHcPp
  - Planted
- Trees
- Cleared
- Vegetation Condition
  - Good
  - Degraded
  - Completely Degraded
  - Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Padbury-Wangarra*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.2**

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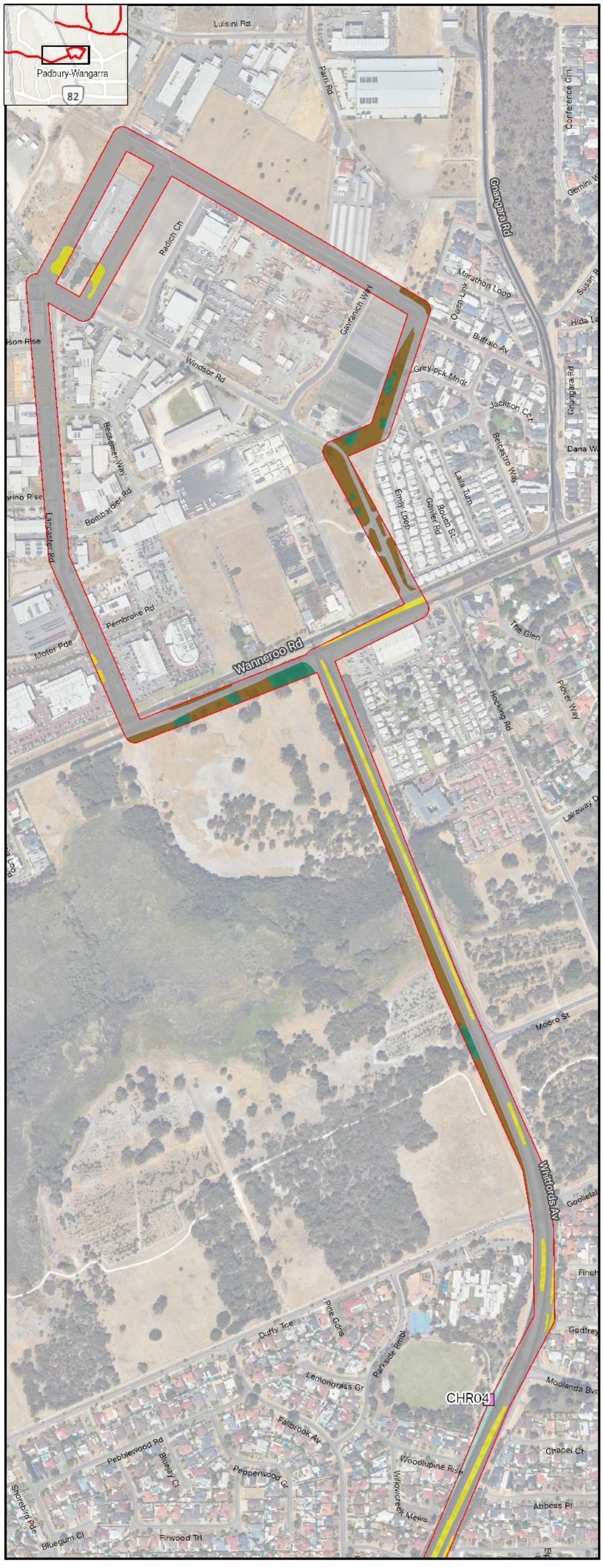
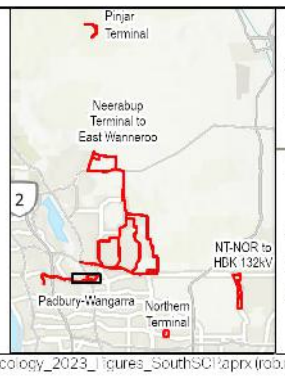


AECOM Delivering a better world	LEGEND
PROJECT ID 60713462 CREATED BY ROB.MCGREGOR	Survey Area
DATE MODIFIED 13 JUN 2024 APPROVED BY C. HOUSE	Sample Sites
0 50 100 150 200 metres	Relevé
1:7,500 (when printed at A4)	Tracklog
GDA2020 MGA ZONE 50	Vegetation Community
	BaAbAb
	Planted
	Trees
	Cleared
	Paddock
	Vegetation Condition
	Good
	Completely Degraded
	Cleared



Vegetation Communities, Significant Flora and Survey Effort:
Padbury-Wangarra

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 8.3

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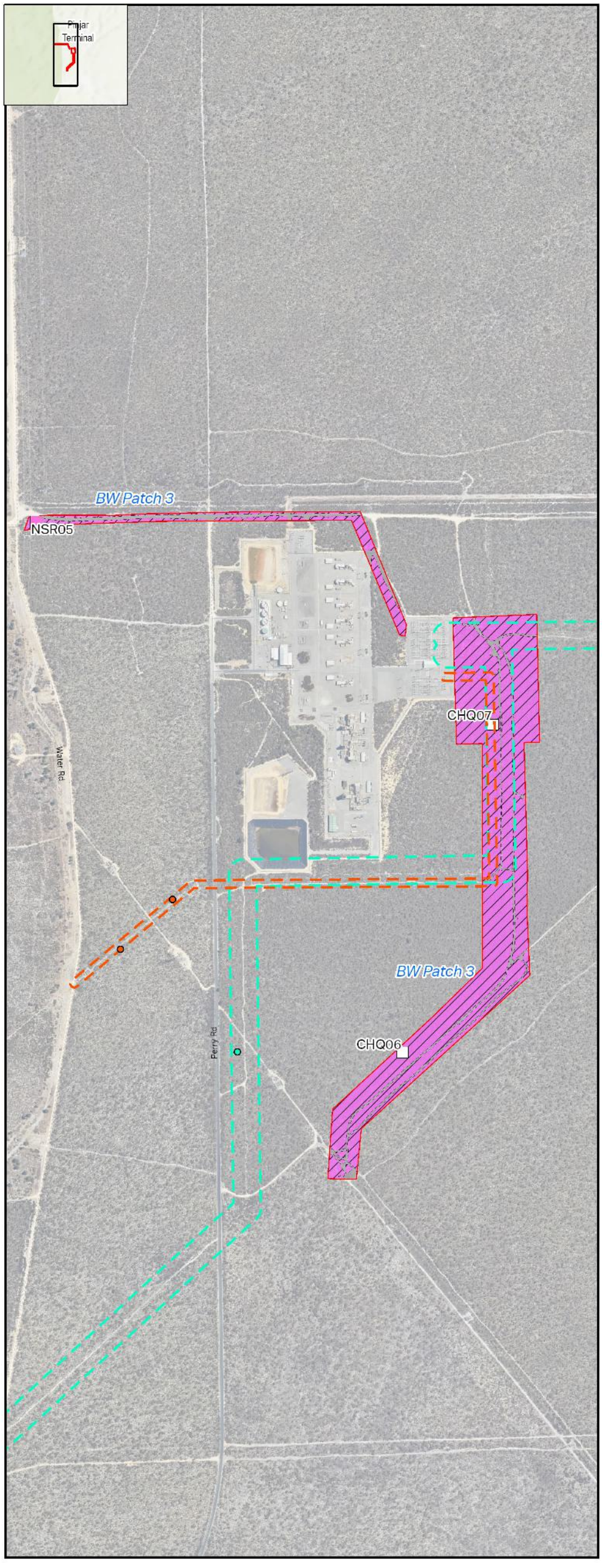

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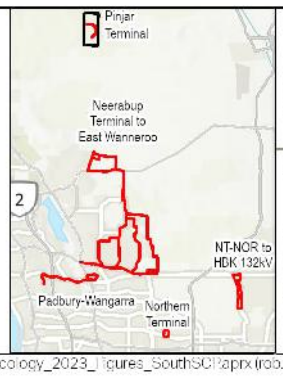
metres

GDA2020 MGA ZONE 50

Data: AECOM; Roads and Railways: © Main Roads WA (accessed 2024) and Landgate (2010); Aerial Imagery: Maxar World Imagery, Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), TomTom, 2012; Topographic Maps: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community; Vegetation Condition: Landgate (2010); Vegetation Community: Landgate (2010); Survey Area: AECOM (2002a) Scar 4: AECOM (2002a); Survey Area: AECOM (2022b) NREP: AECOM (2022b); Sample Sites: AECOM (2002a) Scar 4: AECOM (2002a); Sample Sites: AECOM (2022b) NREP: AECOM (2022b); WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain: Landgate (2010); Sample Sites: Quadrat: AECOM (2022b); Sample Sites: Relevé: AECOM (2022b); Sample Sites: Tracklog: AECOM (2022b)

LEGEND

- Survey Area
- Sample Sites
  - Quadrat
  - Relevé
  - Tracklog
- WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain
- Vegetation Community
  - BaAcCc
  - Cleared
- Vegetation Condition
  - Excellent
  - Very Good
  - Cleared
- Sample Sites: AECOM (2002a) Scar 4
- Survey Area: AECOM (2002a) Scar 4
- Sample Sites: AECOM (2022b) NREP
- Survey Area: AECOM (2022b) NREP



Vegetation Communities, Significant Flora and Survey Effort: *Pinjar Terminal*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.4**

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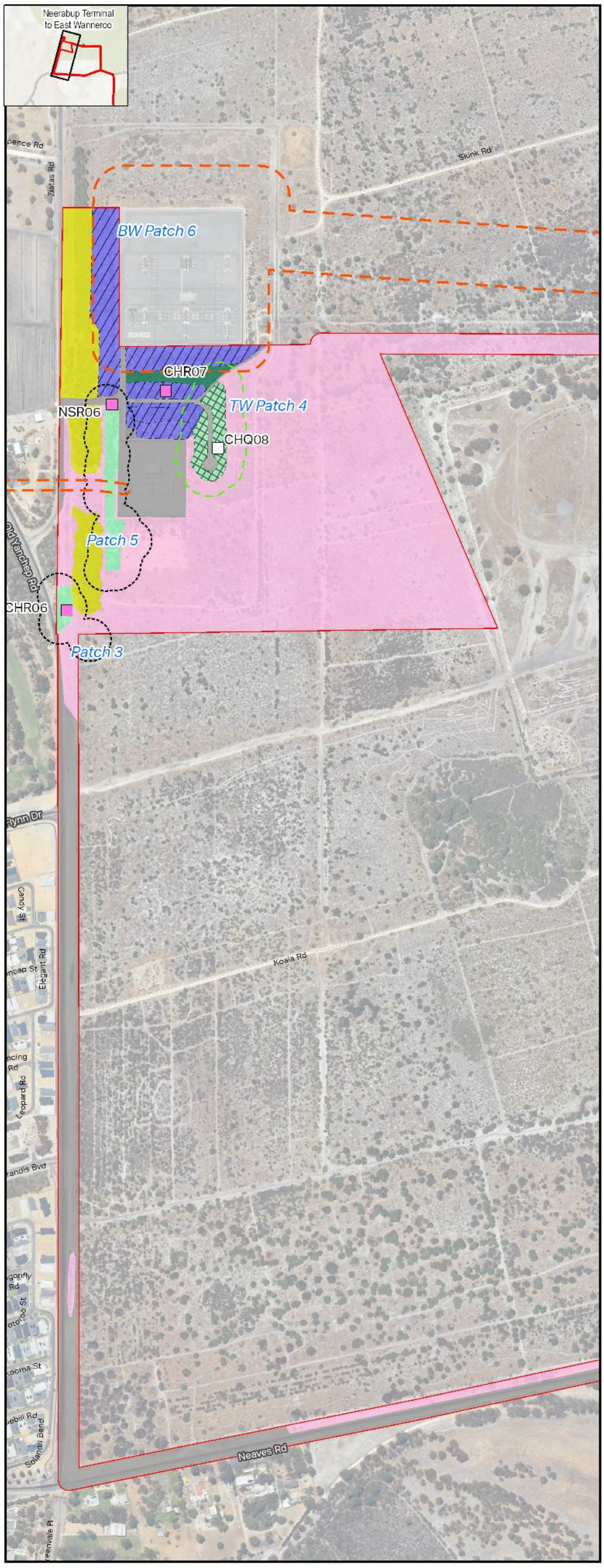

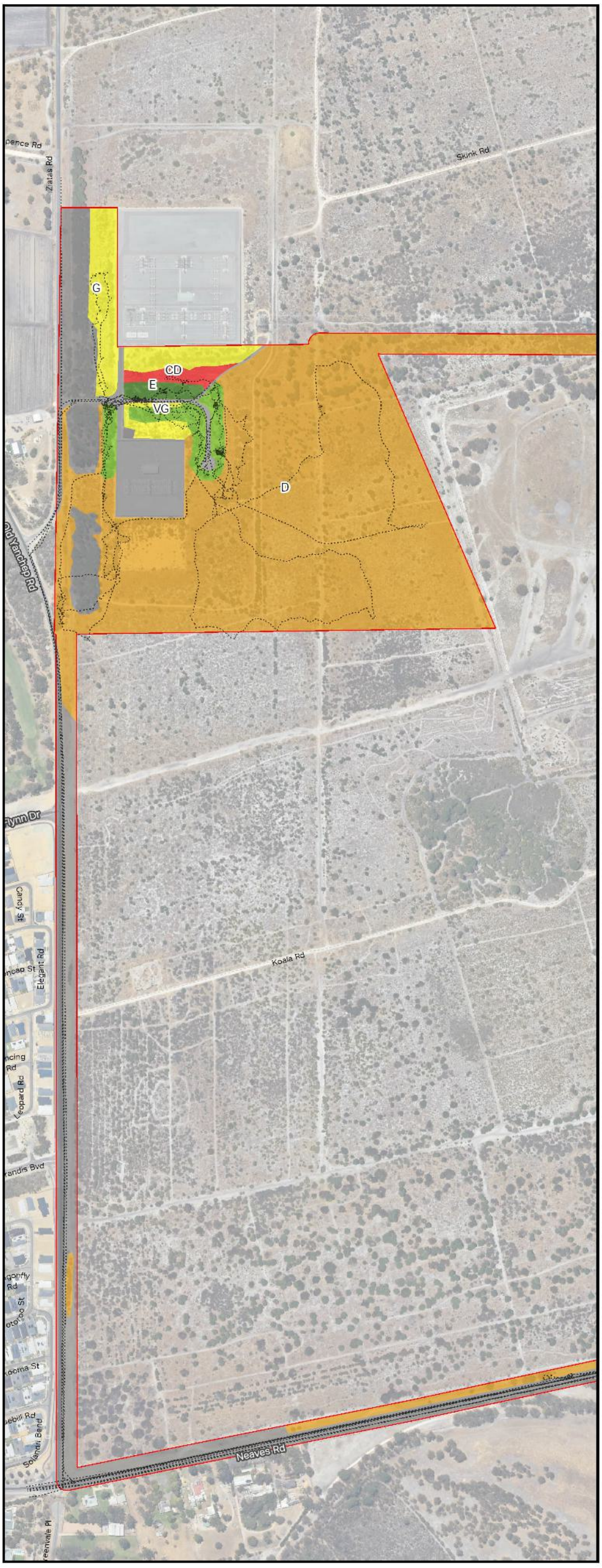

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

Survey Area

Sample Sites
- Quadrat
- Relevé
- Tracklog

TEC Tuart Woodlands and Forests of the Swan Coastal Plain Buffer
- TEC
- Not a TEC

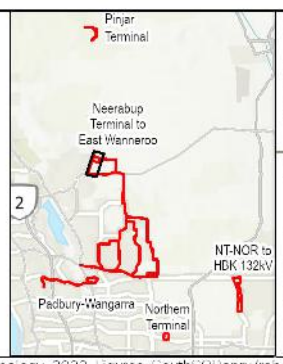
TEC Tuart Woodlands and Forests of the Swan Coastal Plain

WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BaRcGt
- EgGlCe
- PpAcCe
- Planted
- Trees
- Cleared

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

Survey Area:
- AECOM (2022b)
- NREP



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.5**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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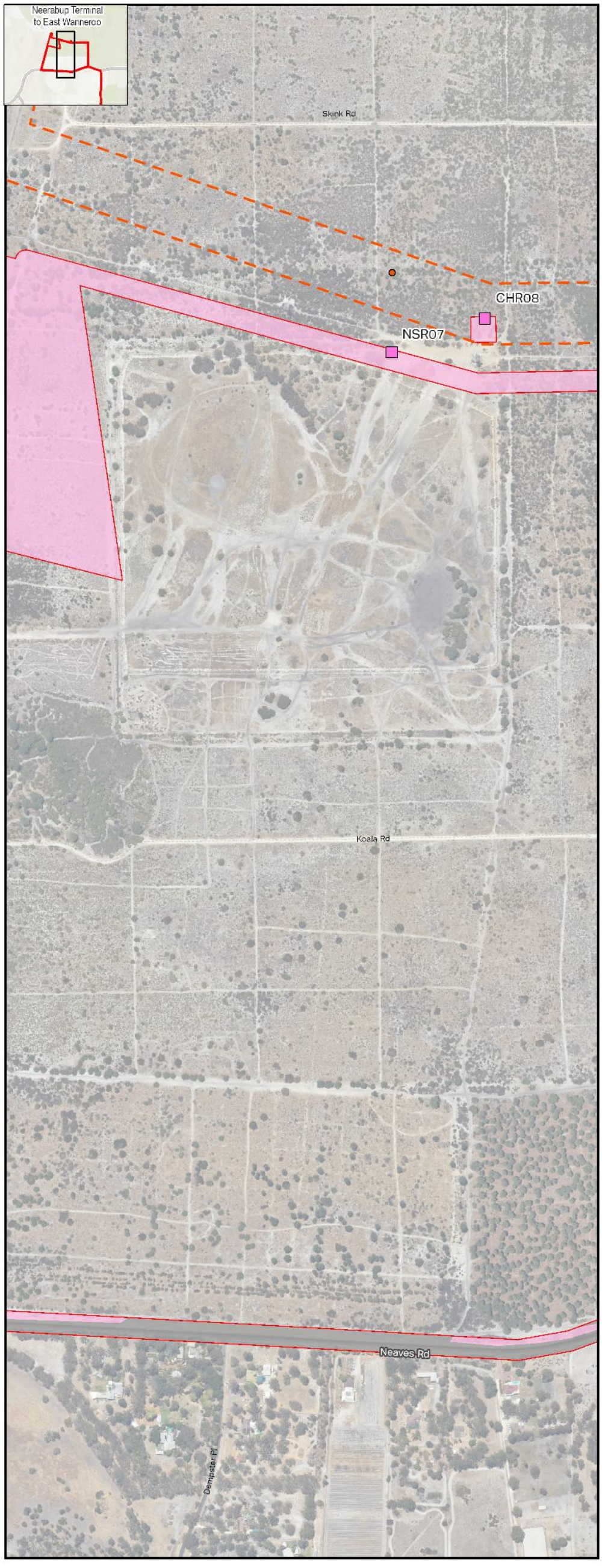

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(when printed at A4)

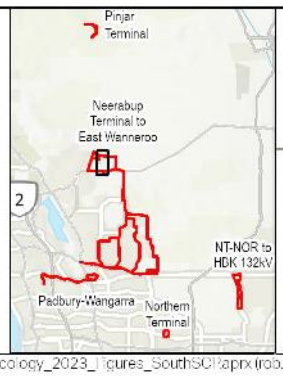
0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

Survey Area
Sample Sites
Relevé
Tracklog
Vegetation Community
PpAcCe
Cleared

Vegetation Condition
Degraded
Cleared
Sample Sites:
AECOM (2022b)
NREP
Survey Area:
AECOM (2022b)
NREP



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.6**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

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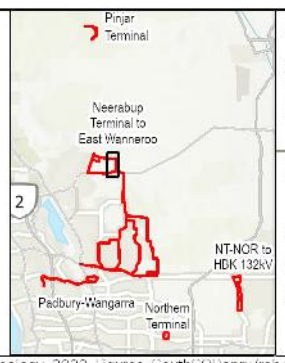
LEGEND
- Survey Area
- Tracklog

Vegetation Community
- PpAcCe
- Cleared

Vegetation Condition
- Degraded
- Cleared

Survey Area:
- AECOM (2022b)
- NREP



Vegetation Communities, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.7**

A4 size

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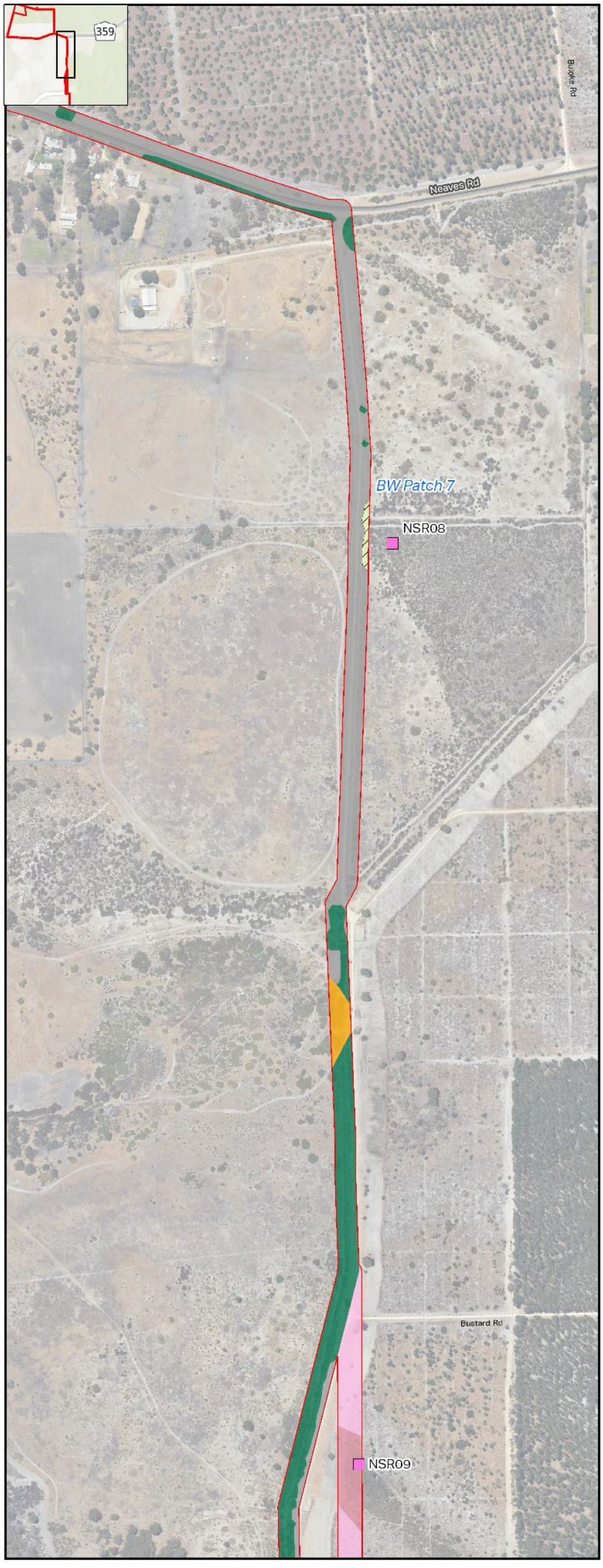

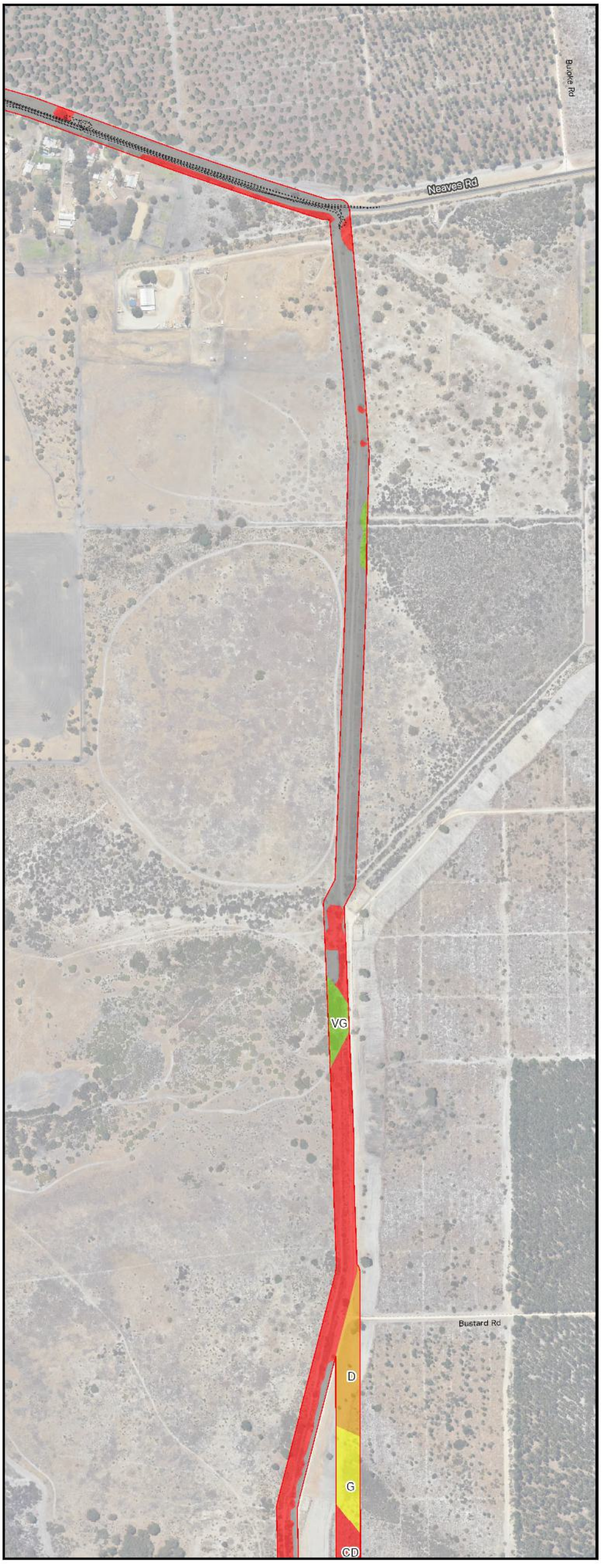

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LEGEND

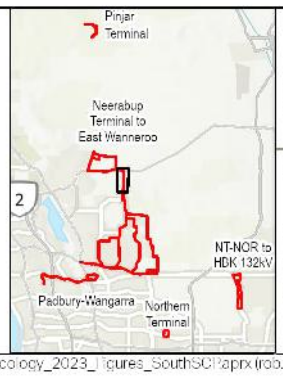
Survey Area

Sample Sites
- Relevé
- Tracklog

WA PEC, EPBC TEC
- Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BmAcPo
- CcXpDf
- MpHaDb
- PpAcCe
- Trees
- Cleared

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



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.8**

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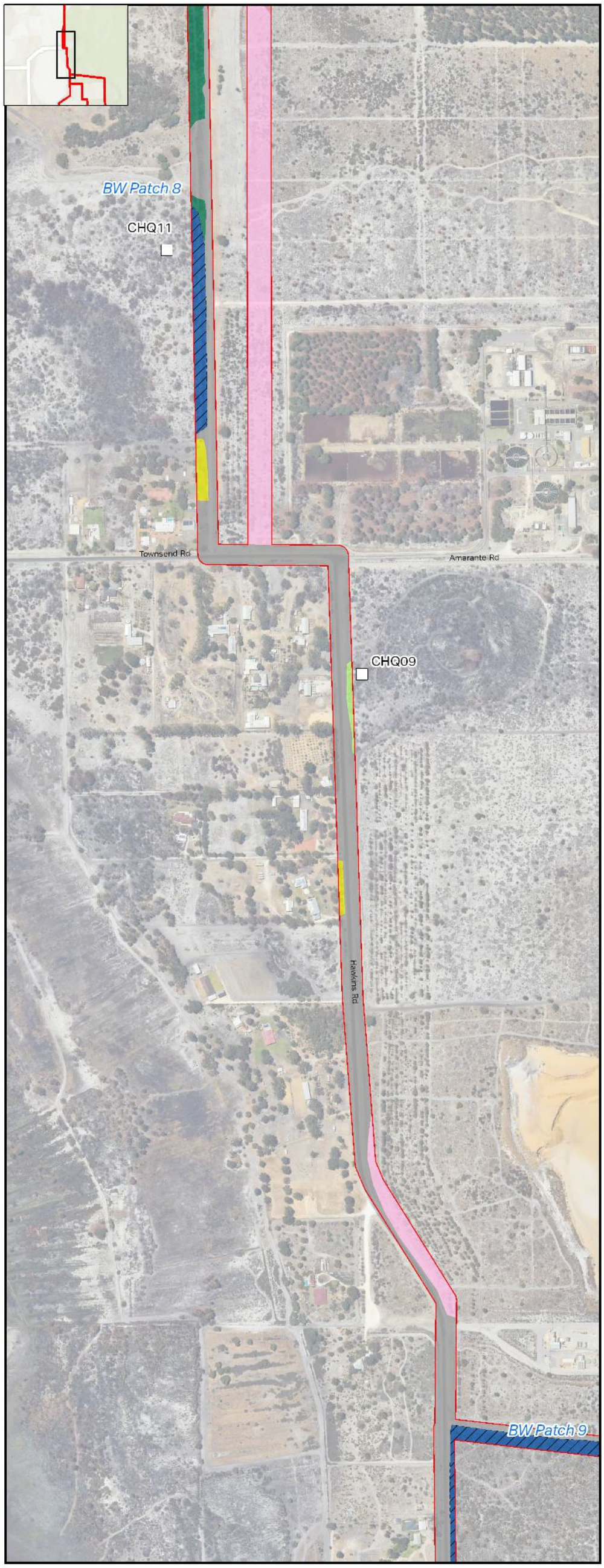

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0 50 100 150 200
metres

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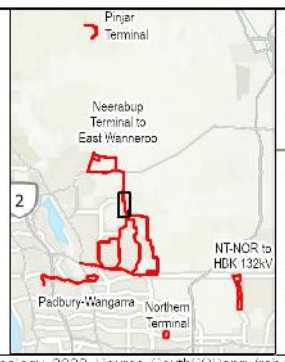
LEGEND

Survey Area

Sample Sites
- Quadrat
- Tracklog
- WA PEC, EPBC TEC: Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BmEpLi
- MpHaDb
- MpHaEc
- PpAcCe
- Planted
- Trees
- Cleared

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



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.9**

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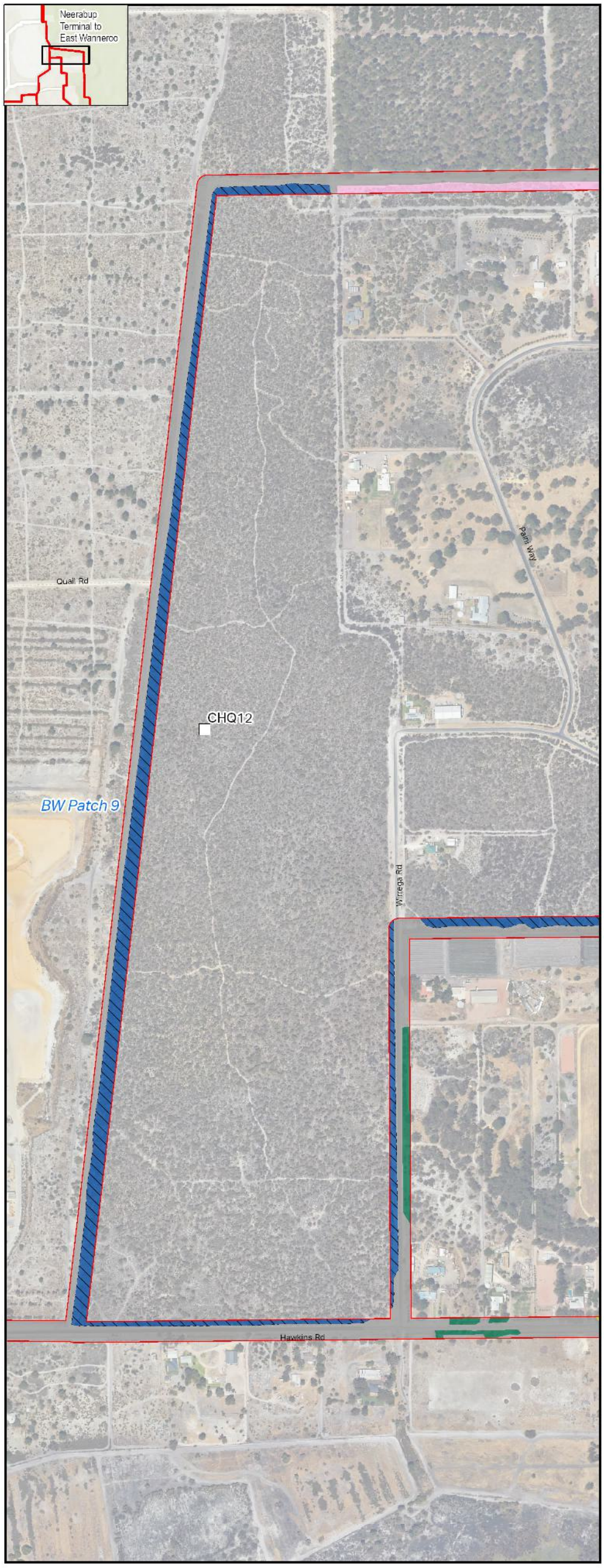

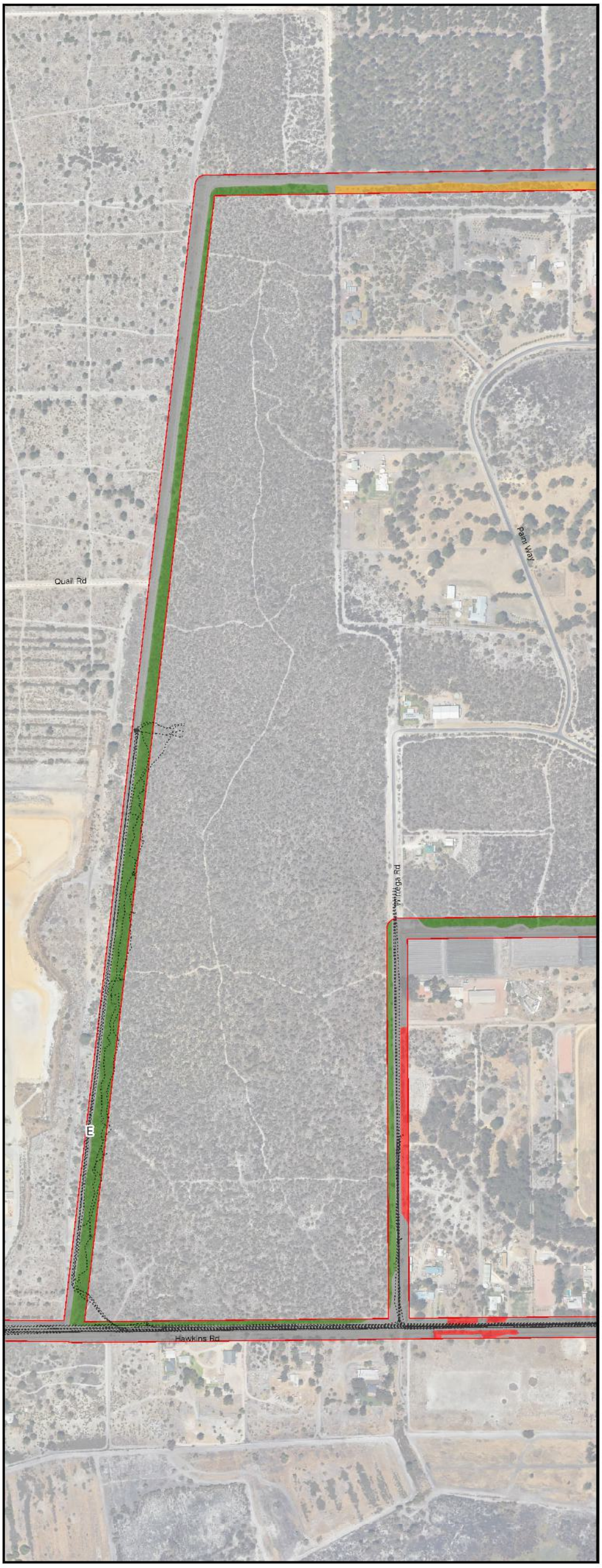

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

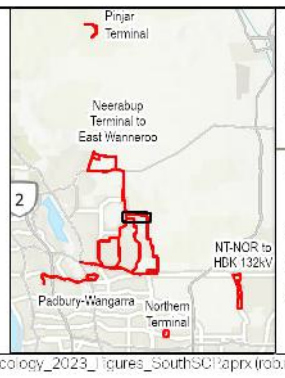
LEGEND

Survey Area

Sample Sites
- Quadrat
- Tracklog
- WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BmEpLi
- PpAcCe
- Planted
- Trees
- Cleared

Vegetation Condition
- Excellent
- Degraded
- Completely Degraded
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.10**

A4 size

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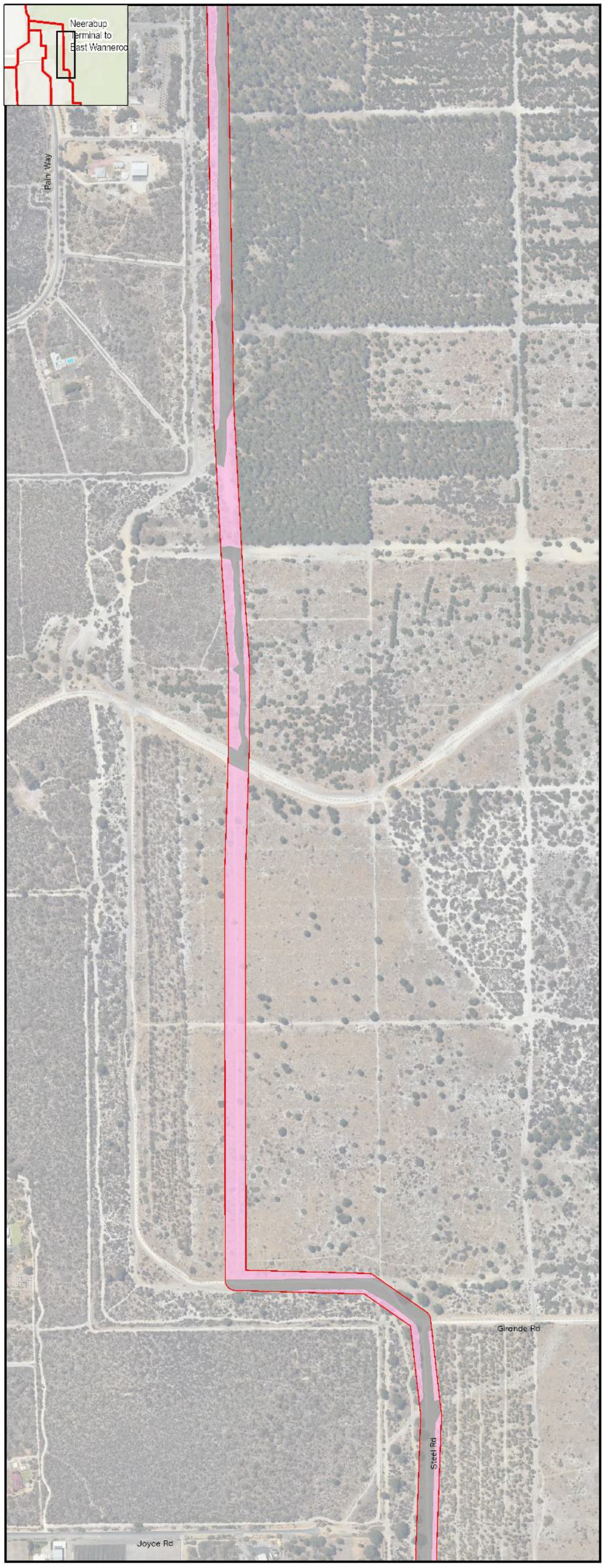

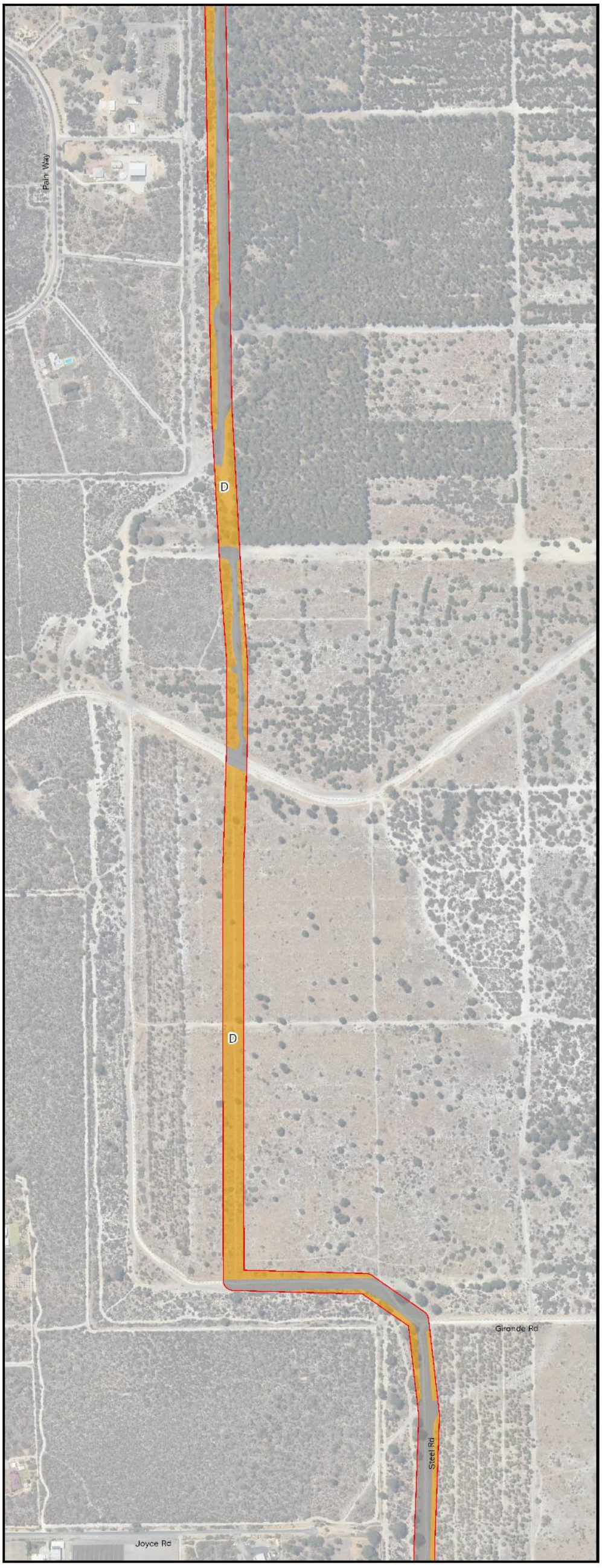

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0 50 100 150 200 metres

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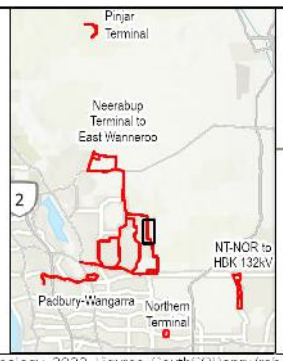
LEGEND
- Survey Area

Vegetation Community
- PpAcCe
- Cleared

Vegetation Condition
- Degraded
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort:
Neerabup Terminal to East Wanneroo

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.11**

A4 size

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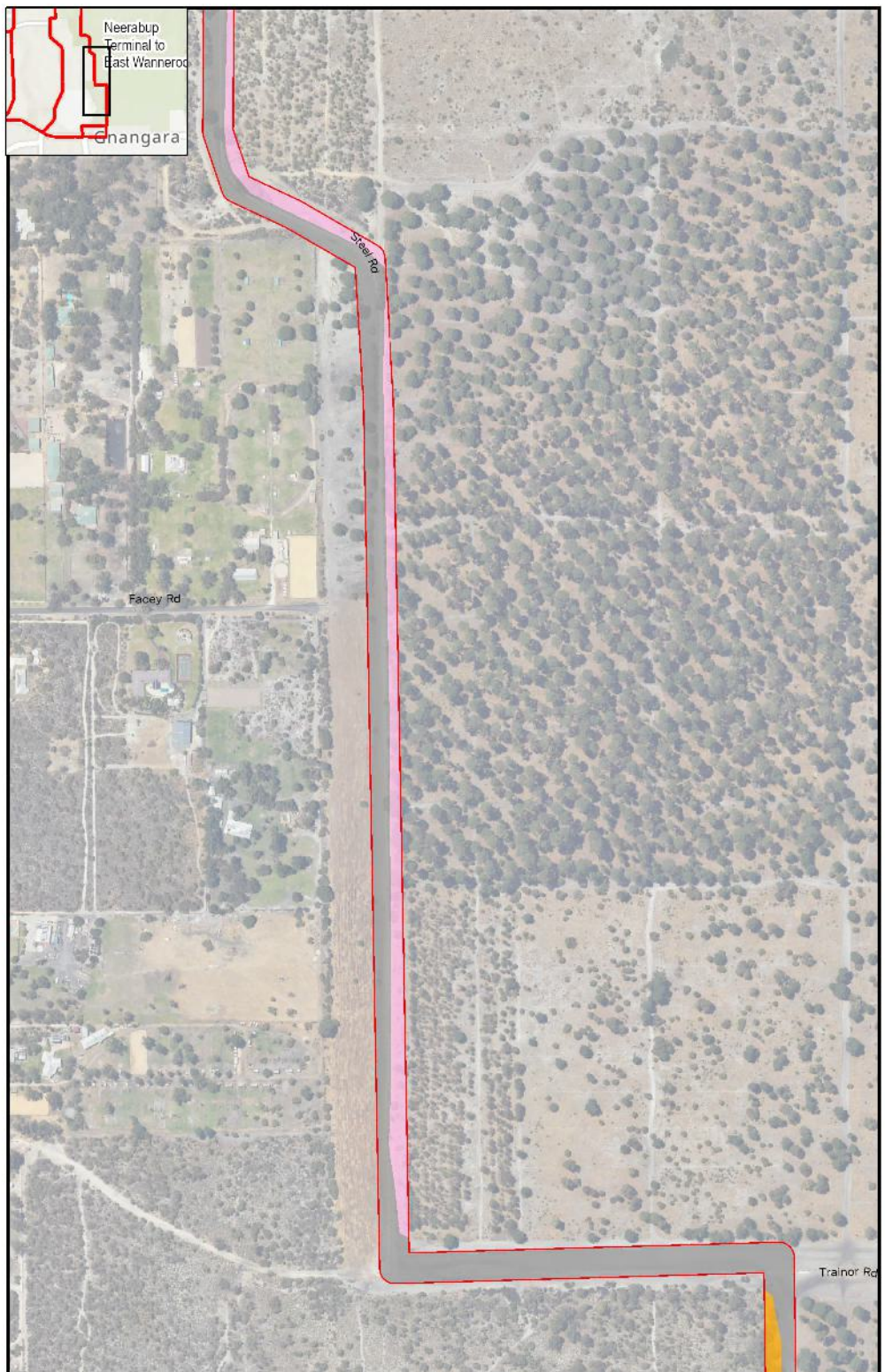

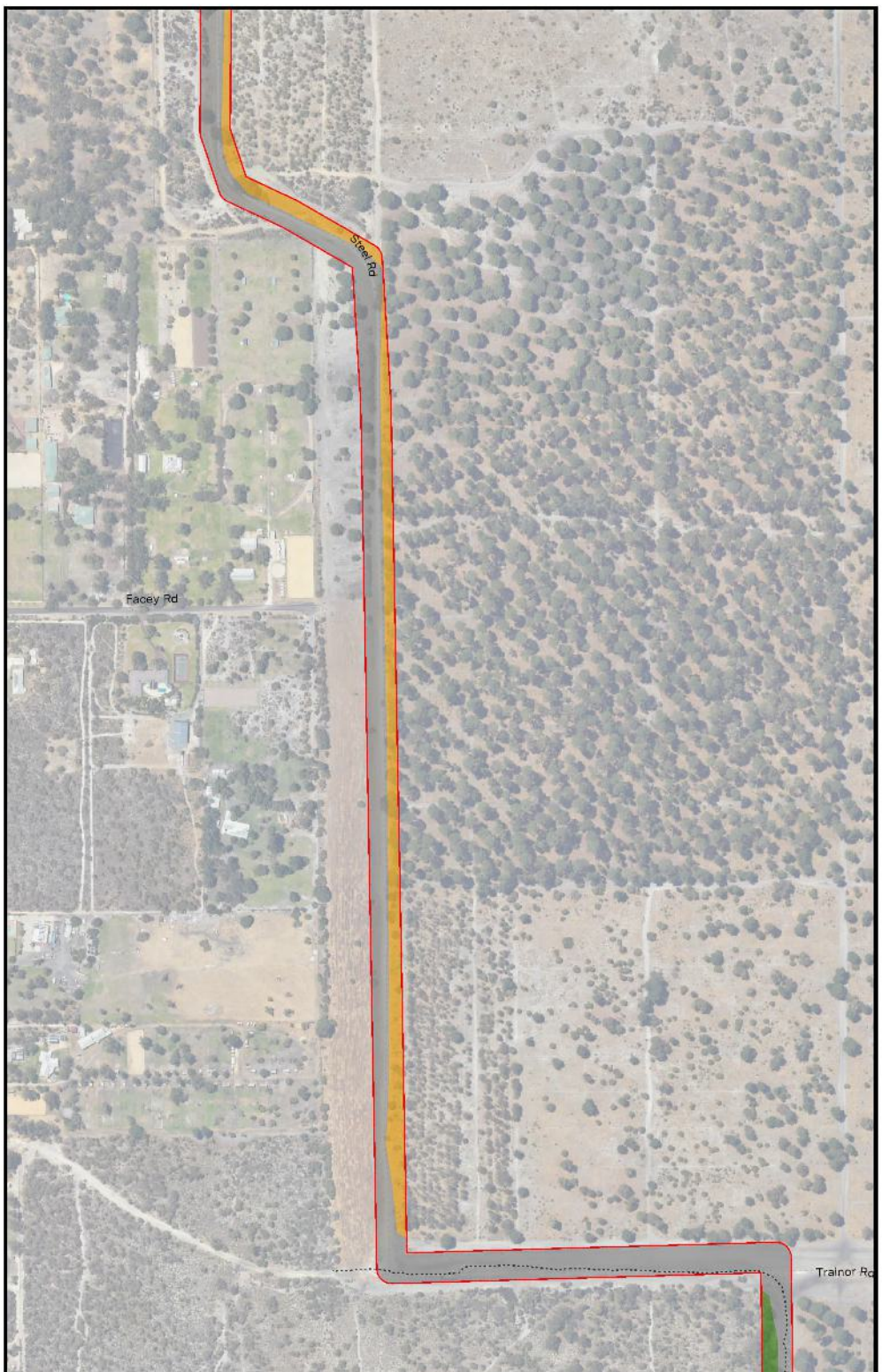

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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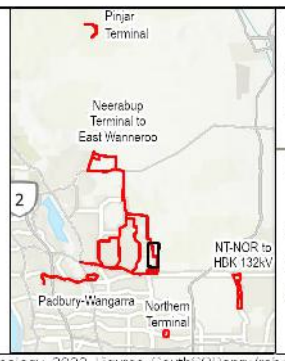
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, World Topographic Map Esri, Garmin, Foursquare, FAO, METI/NASA, USGS World Imagery/Maxar World Hillshade Esri, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, NASA, NGA, USGS, WMS

LEGEND

- Survey Area
- Significant Flora
  - *Calectasia* sp. (potential P2)
- Sample Sites
  - Quadrat
  - Tracklog
- Vegetation Community
  - CcXpDf
  - PpAcCe
  - Cleared
- Vegetation Condition
  - Excellent
  - Degraded
  - Completely Degraded
  - Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.12**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
Layout: G60713462_Fig8_NRLP_South_VegCommCond_A3P_v1, Last exported: 20/05/2024 12:48 PM

A4 size

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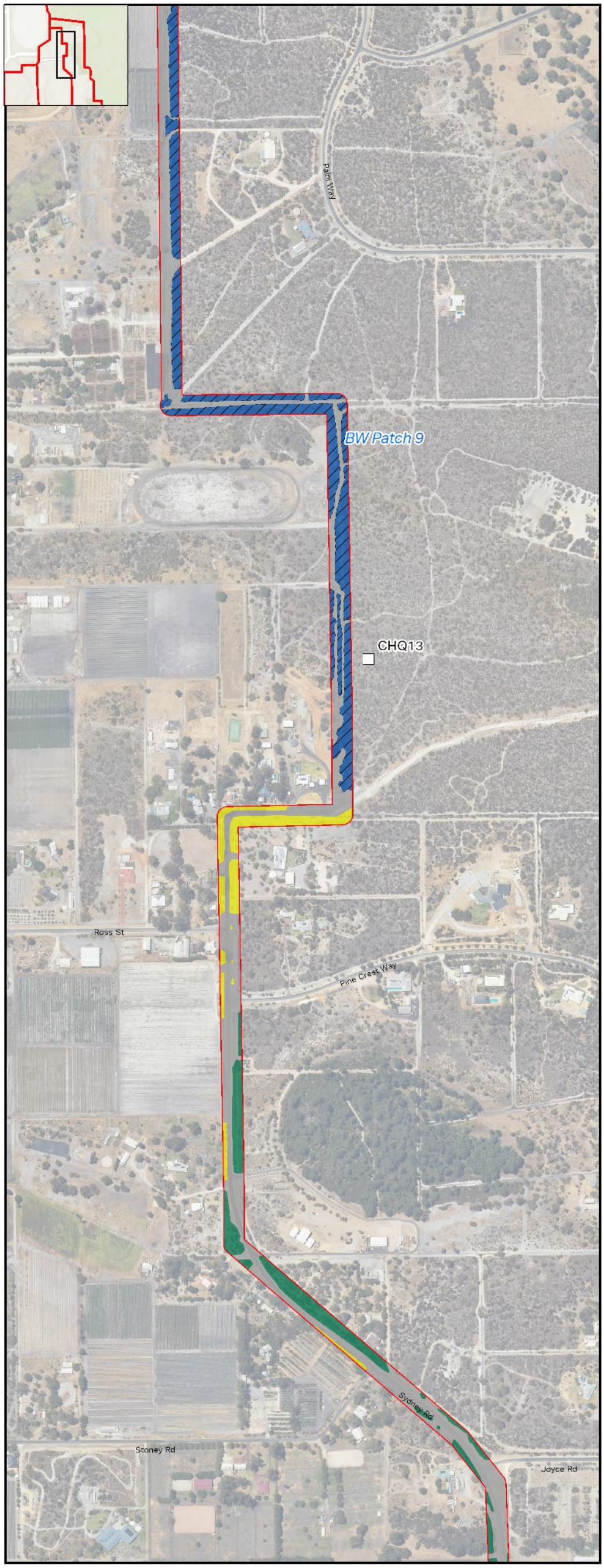

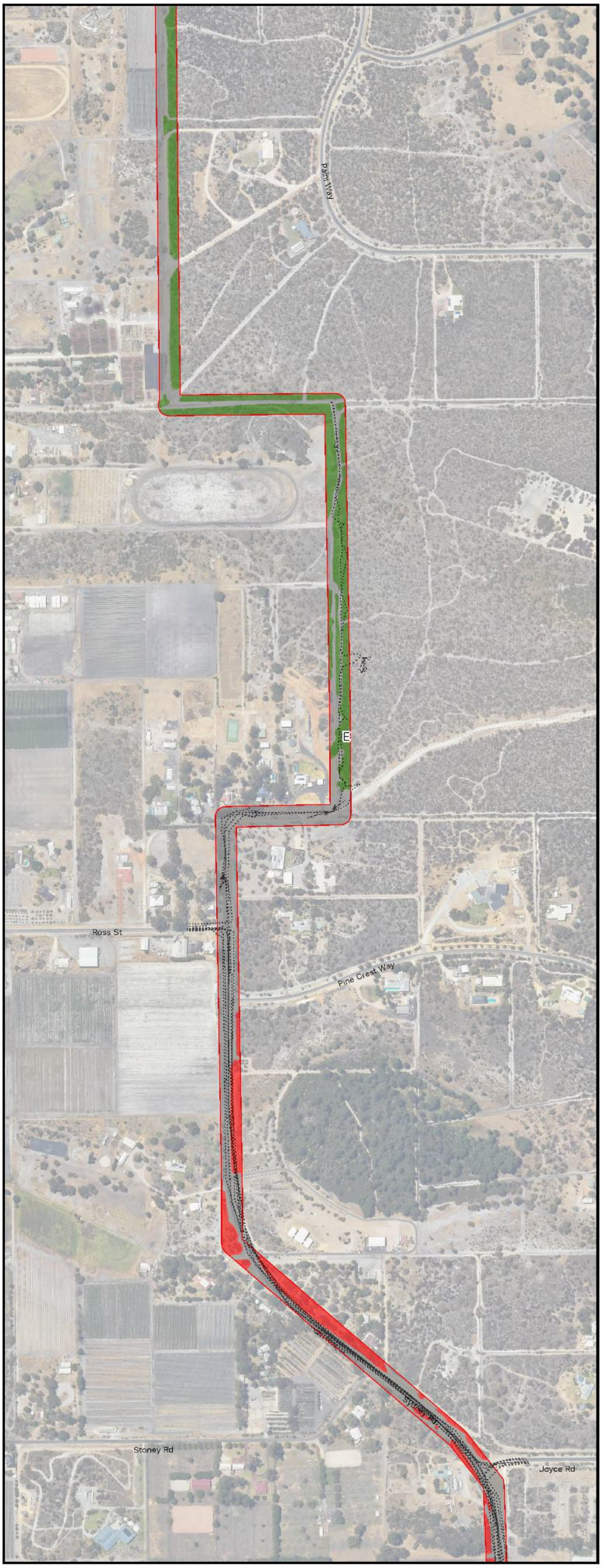

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DATE MODIFIED	13 JUN 2024	APPROVED BY	C. HOUSE

N
1:7,500
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DATA SOURCES: Base data is Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2019)
Service Layer Credits: World Hillshade: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
World Topographic Map: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Imagery: Esri, Maxar, Earthstar Geographics, and the GIS User Community
World Hillshade: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012
World Topographic Map: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Imagery: Esri, Maxar, Earthstar Geographics, and the GIS User Community

LEGEND

Survey Area

Sample Sites
- Quadrat
- Tracklog
- WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BmEpLi

- Planted
- Trees
- Cleared

Vegetation Condition
- Excellent
- Completely Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.13**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
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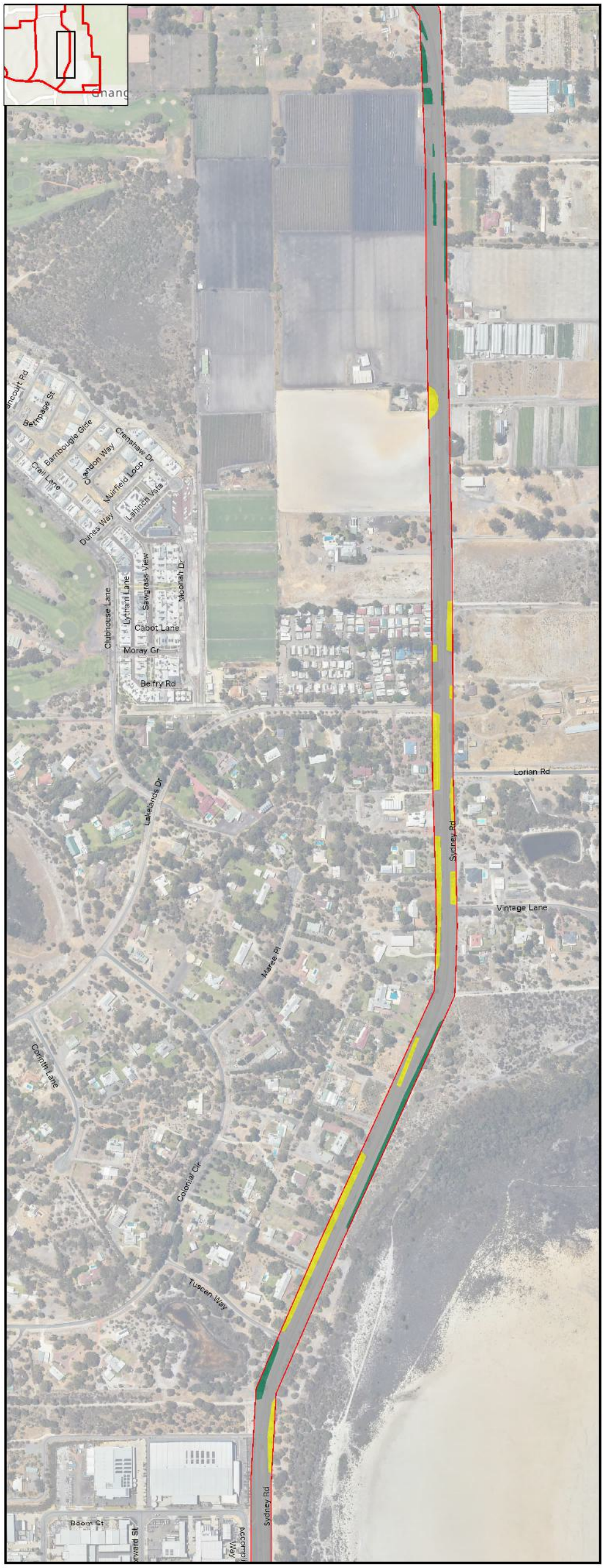

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N
1:7,500
(when printed at A4)

0 50 100 150 200
metres

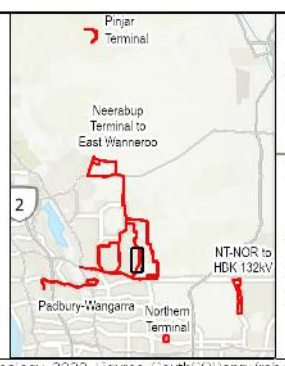
GDA2020 MGA ZONE 50

(c) AECOM (HERE Base Data (c) Based on information supply displayed and with the permission of the Western Australian Land Information Authority (trading as Landgate) 2010)
Sources: Esri, DeLorme, World Hillshade, Esri, DLORME, World Topographic Map Esri, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, World Topographic Map Esri, TomTom, Garmin, FoursquareWOF, METI/NASA, USGS, World Imagery, WorldHillshade Esri, Geoscience Australia, NASA, MGA, USGS/WMS

LEGEND
- Survey Area
- Tracklog

Vegetation Community
- Planted
- Trees
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.14**

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1:7,500 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

DA A SOURCES Base data sourced from Landgate and Western Australian Land Information Authority (Landgate) (2016)
Vegetation Communities, Condition, Significant Flora and Survey Effort: Neerabup Terminal to East Wanneroo (AECOM,

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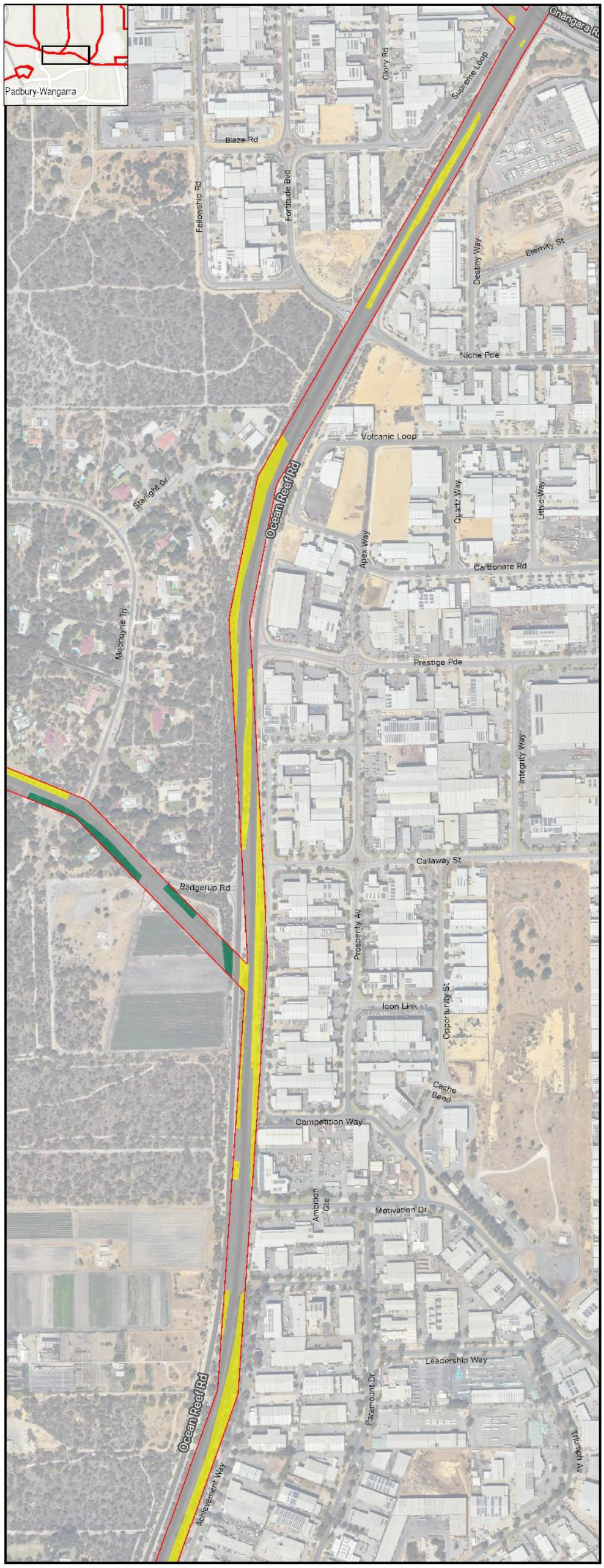

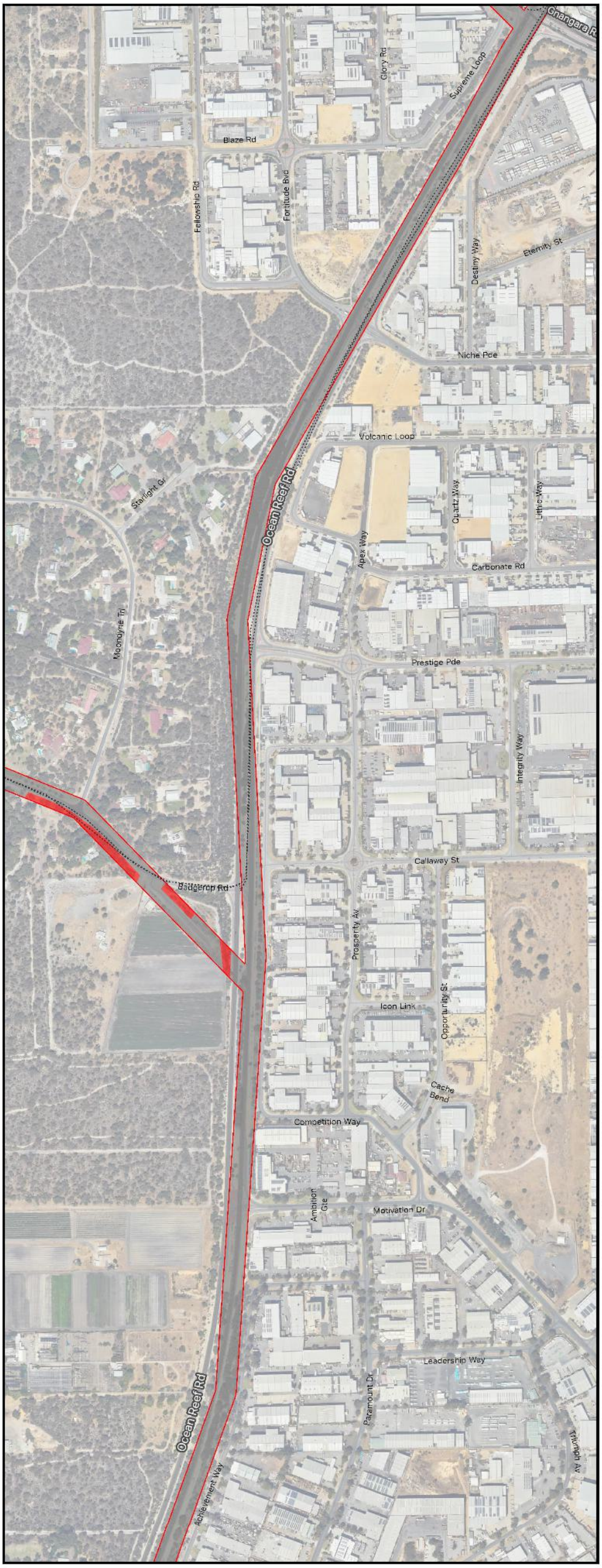

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0 50 100 150 200
metres

1:7,500
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GDA2020 MGA ZONE 50

DA A 60404045 Base data is Based on information provided and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).
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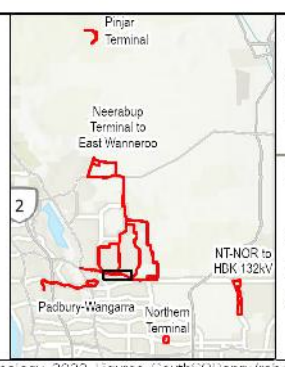
LEGEND
- Survey Area
- Tracklog

Vegetation Community
- Planted
- Trees
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.16**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLI_Ecology_2023\900_CAD_GIS\920_GIS_NRLI\02_MXD_APRX\60713462_NRLI_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
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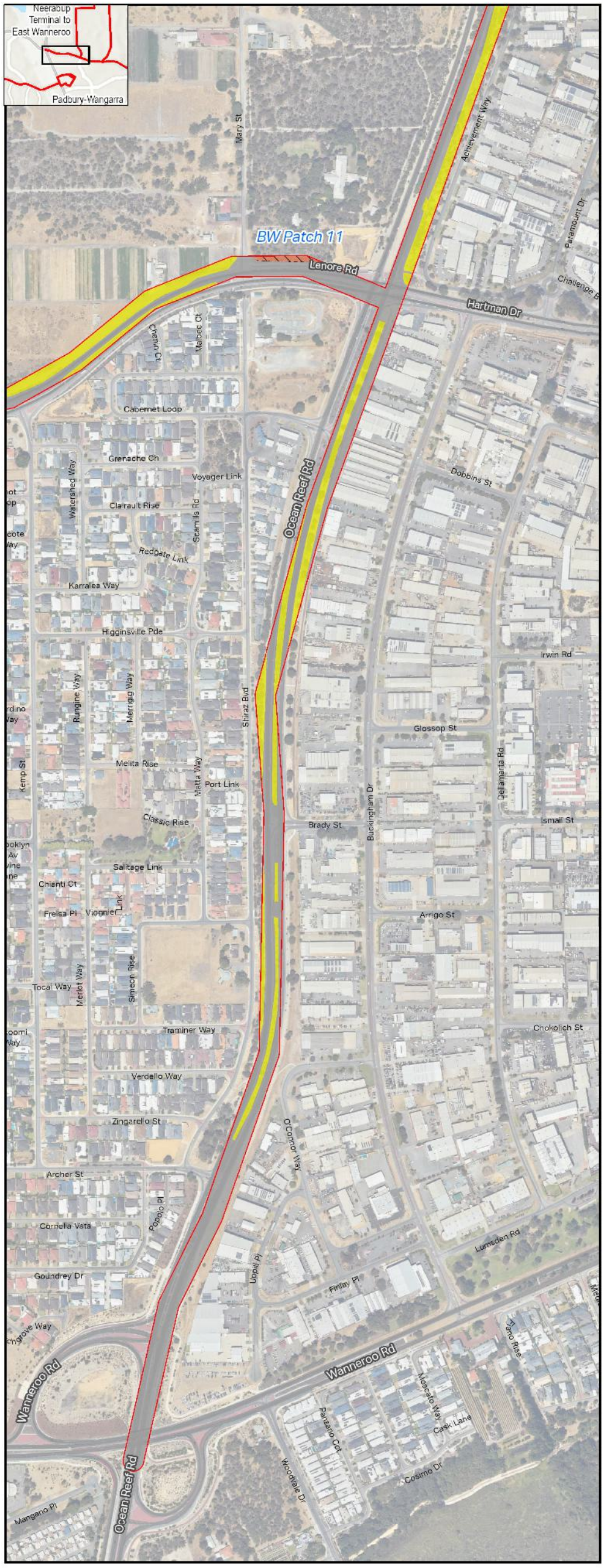

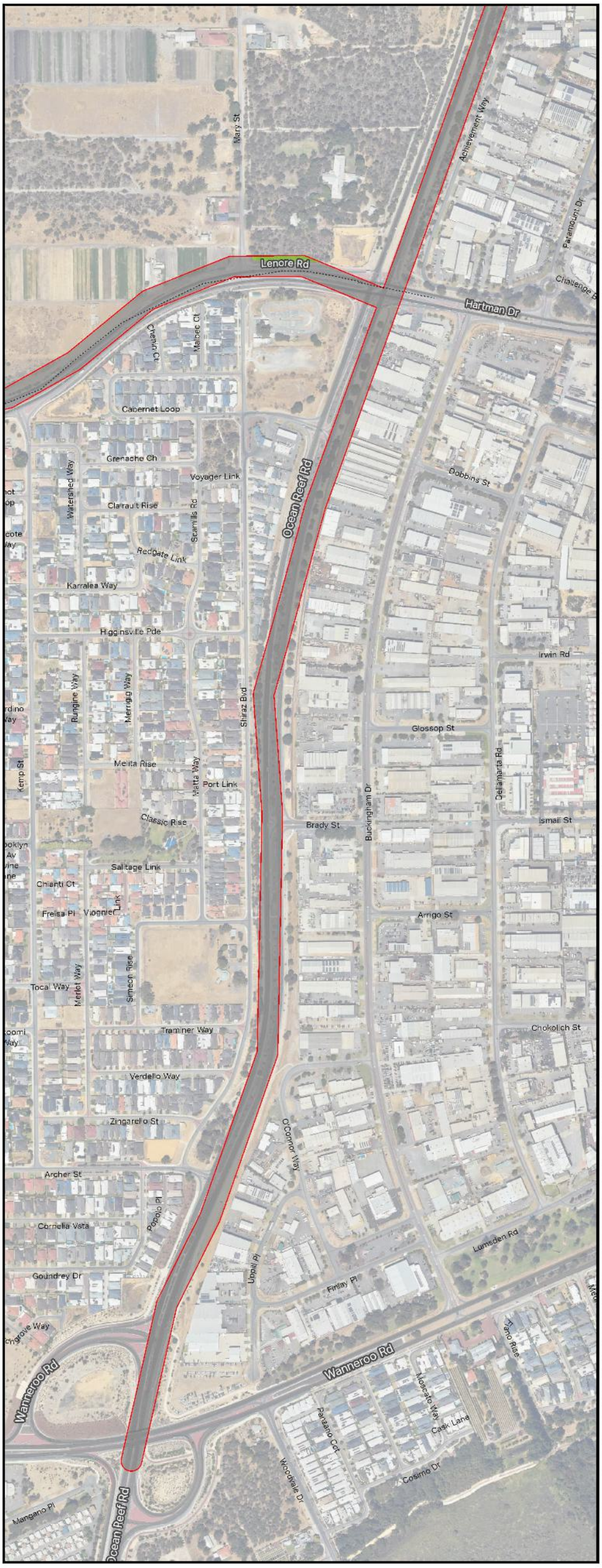

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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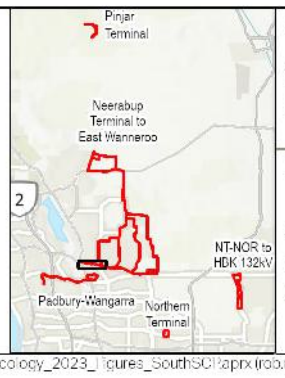
Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, FAO, METI/NASA, USGS, World Imagery/MapServer, Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Esri, HERE, Garmin, FAO, METI/NASA, USGS, World Topographic Map, Esri, TomTom, Garmin, FAO, METI/NASA, USGS, World Imagery/MapServer, Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, NASA, MGA, USGS, WMS

LEGEND

- Survey Area
- Tracklog
- WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BaAcDf
- Planted
- Cleared

Vegetation Condition
- Very Good
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.17**

Project: \\wa.aecomnet.com\ifs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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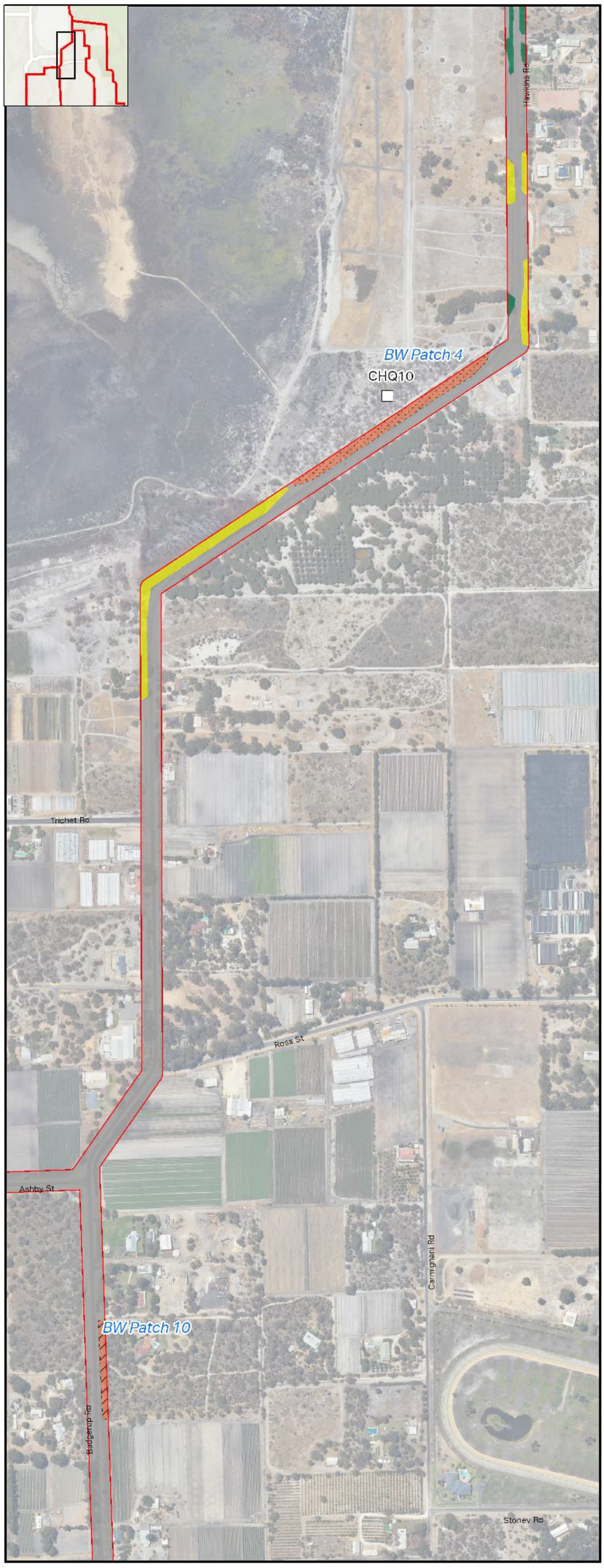

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N
1:7,500
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DATA SOURCES: Base data is sourced from various government agencies and Landgate (2010).
Vegetation, Flora, Fauna and Survey Effort data is sourced from AECOM.
Topographic Map Grid, Topographic Map Grid Numbers, Cadastre, Roads, Urban Areas, Rural Roads, Water Courses, Water Bodies, Contours, Reserves, Cadastre

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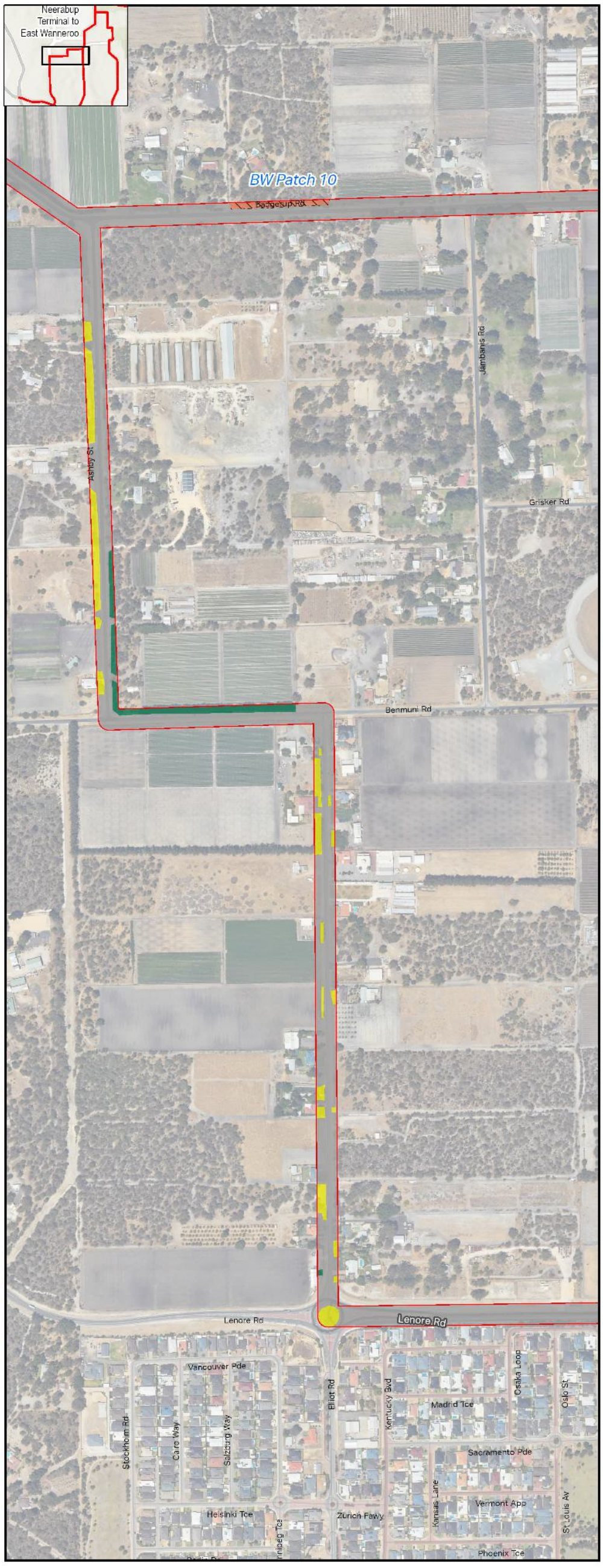

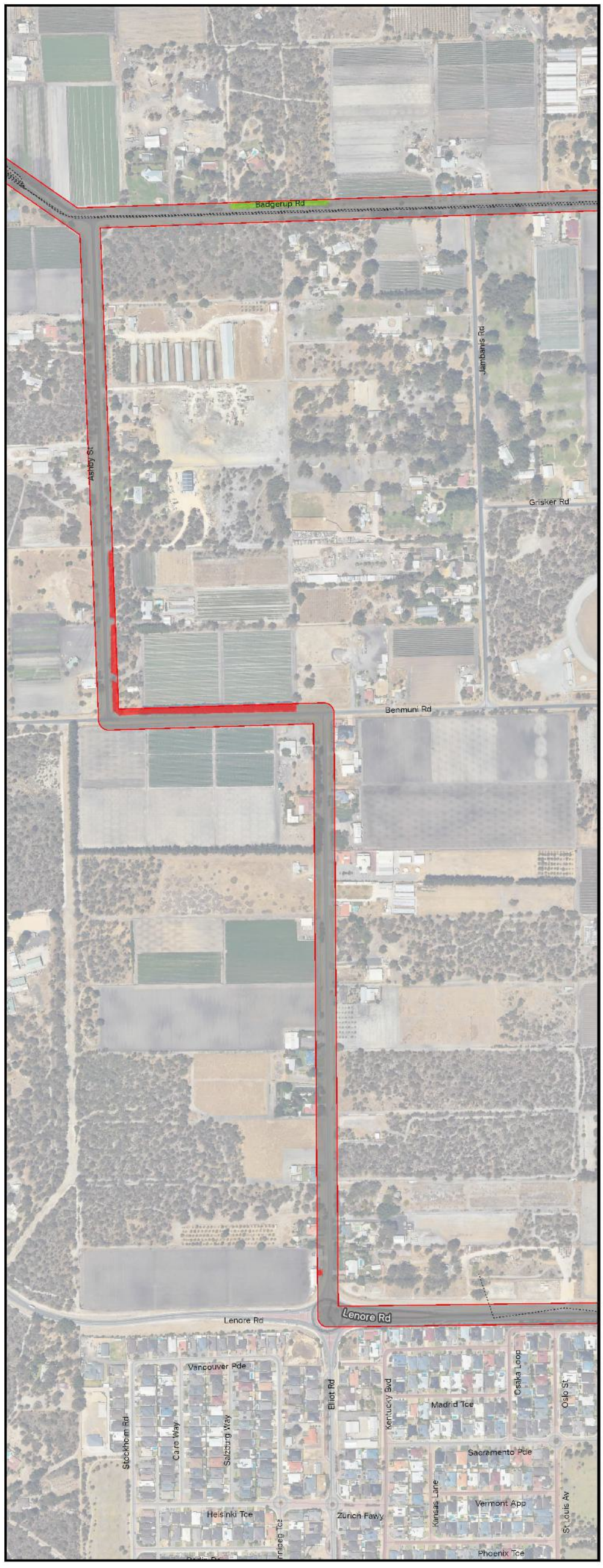

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0 50 100 150 200 metres

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GDA2020 MGA ZONE 50

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Sources: Esri, DeLorme, World Hillshade, Esri, USGS, Intermap, Topographic Map Esri, Japan, METI, Esri China (Hong Kong), Esri Thailand, TomTom, Garmin, FAO, METI/NASA, USGS World Imagery/Natural World Hillshade Esri, Geoscience Australia, NASA, NGA, USGS, WMS

LEGEND

- Survey Area
- Tracklog
- WA PEC, EPBC TEC
- Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BaAcDf

- Planted
- Trees
- Cleared

Vegetation Condition
- Very Good
- Completely Degraded
- Cleared

Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.19**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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A4 size

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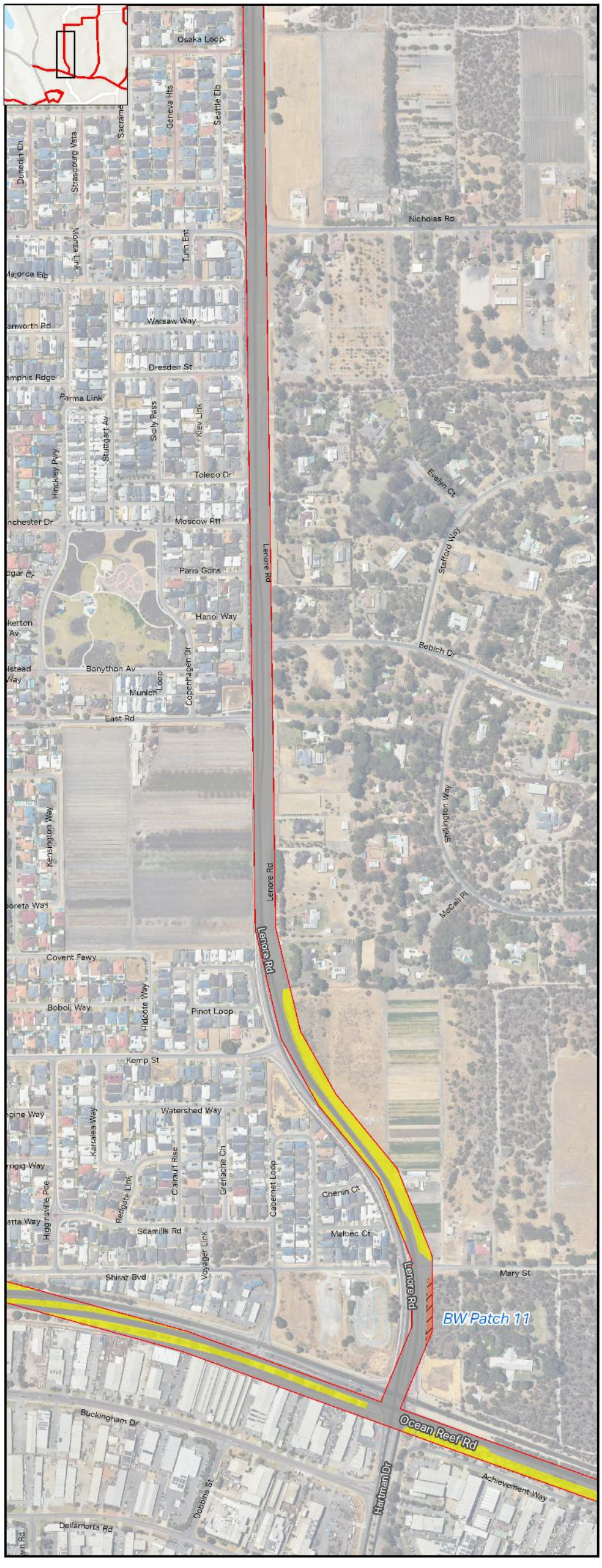

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N

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0 50 100 150 200 metres

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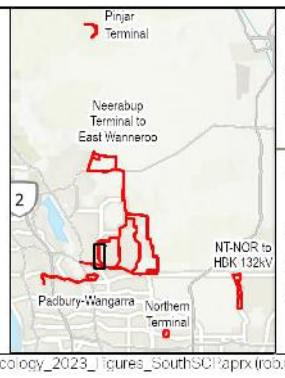
DATA SOURCES: Base data is licensed for internal purposes only and with the permission of the Western Australian Land Information Authority (trading as Landgate (2019)
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri, HERE, Garmin, FAO, NOAA, USGS, World Topographic Map Esri, TomTom, Garmin, Foursquare, FAO, NOAA, USGS, World Imagery Maxar, World Hillshade Esri, Geoscience Australia, NASA, MGA, USGS, WMS

LEGEND

- Survey Area
- Tracklog
- WA PEC, EPBC TEC Banksia Woodlands of the Swan Coastal Plain

Vegetation Community
- BaAcDf
- Planted
- Cleared

Vegetation Condition
- Very Good
- Cleared



Vegetation Communities, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.20**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCP.aprx (rob.mcgregor)
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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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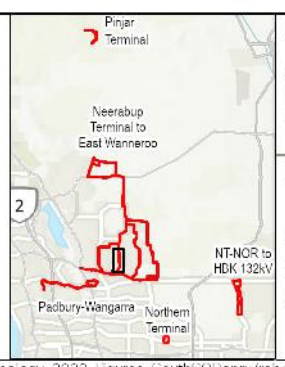
Sources: Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, FAO, METI/NASA, USGS, World Imagery: Maxar, Microsoft, Esri, Earthstar Geographics, NASA, NGA, USGS, WMS

LEGEND
- Survey Area
- Tracklog

Vegetation Community
- Planted
- Trees
- Cleared

Vegetation Condition
- Completely Degraded
- Cleared



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Neerabup Terminal to East Wanneroo*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.21**

A4 size

Project: \\na.aecomnet.com\lfs\AU\ACI\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLI_Ecology_2023\900_CAD_GIS\920_GIS_NRLI\02_MXD_APRX\60713462_NRLI_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
Layout: G60713462_Fig8_NRLI_South_VegCommCond_A3P_v1, Last exported: 20/05/2024 12:48 PM

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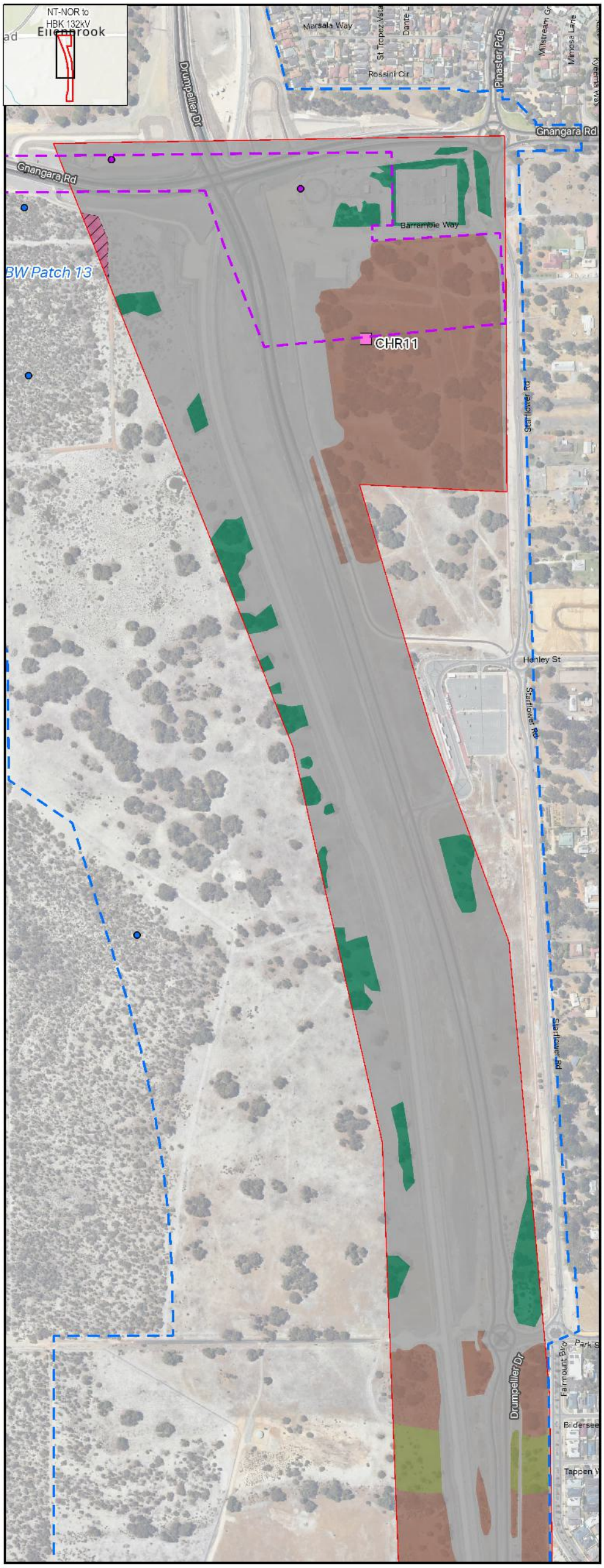

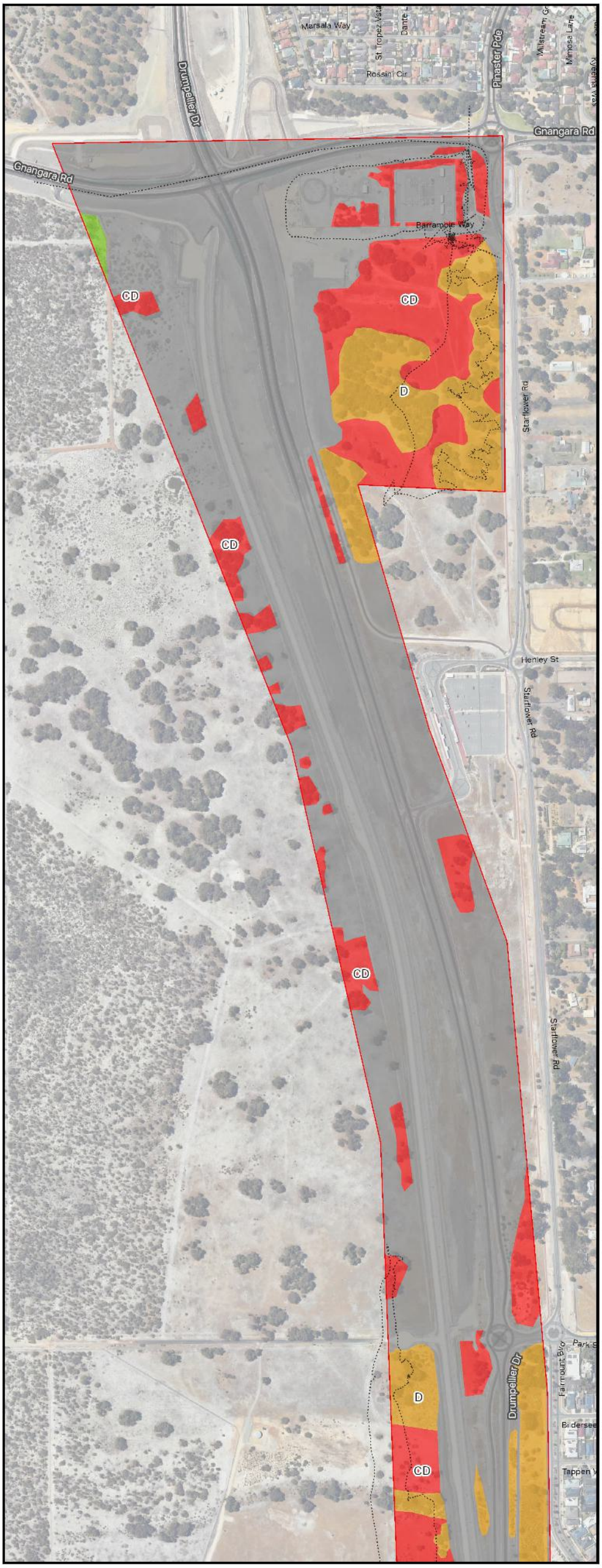

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N
1:7,500
(When printed at A4)

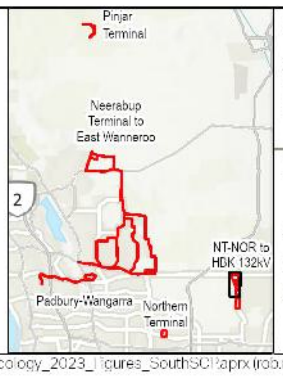
0 50 100 150 200
metres

GDA2020 MGA ZONE 50

Data: © 2024 Maxar Technologies. Based on or product in part by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2016)
Sources: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, MCTM/AGA, USGS/World Topographic Map Cache, Esri, TomTom, Garmin, Foursquare, FAO, MCTM/AGA, USGS/World Imagery/MetaWorld, Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community, AGA, MGA, USGS/WMS

LEGEND

- Survey Area
- Sample Sites
  - Relevé
  - Tracklog
- WA PEC, EPBC TEC
  - Banksia Woodlands of the Swan Coastal Plain
- Vegetation Community
  - BaBmBiXp
  - BaBmSiPo
  - CcMpXp
  - Trees
  - Cleared
- Vegetation Condition
  - Very Good
  - Degraded
  - Completely Degraded
  - Cleared
- Sample Sites: (RPS (2020)
- Survey Area: (RPS (2020)
- Sample Sites: AECOM (2016)
- Survey Area: AECOM (2016)



Vegetation Communities, Condition, Significant Flora and Survey Effort: *NT-NOR to HBK 132kV*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.22**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig8_NRLP_South_VegCommCond_A3P_v1, Last exported: 20/05/2024 12:48 PM

A4 size

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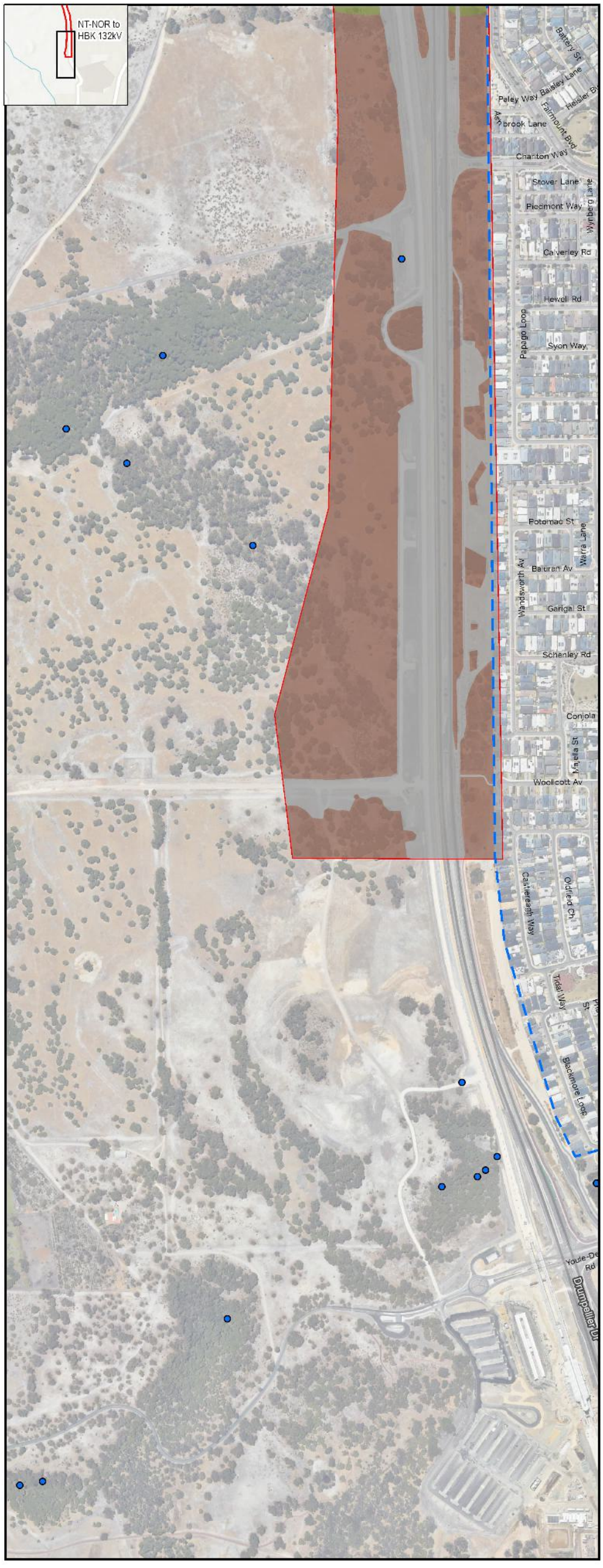

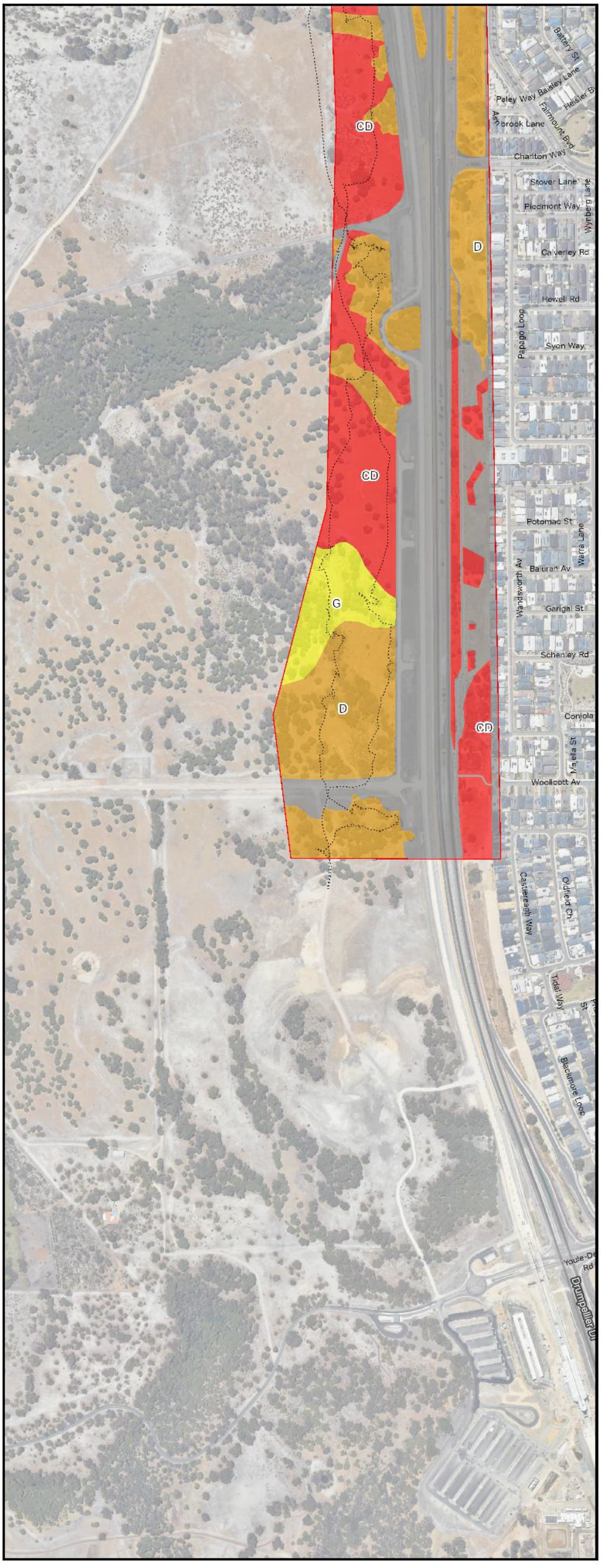

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DATE MODIFIED	13 JUN 2024	APPROVED BY	C. HOUSE

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

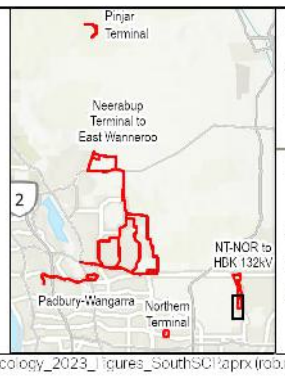
Data: AECOM/DPLH Base Data (c) Based on information provided by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2010)
Sources: Esri, DeLorme, World Hillshade, Esri, USGS, Intermap, Topographic Map Layer, Increment P, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), TomTom, Garmin, FoursquareTMD, METI/NASA, USGS, World Imagery/MapServer, World Hillshade Dark, Esri Europe, Australia: NASA, MGA, USGS, WMS

LEGEND

Survey Area
Tracklog

Vegetation Community
BaBmBiXp
CcMpXp
Cleared

Vegetation Condition
Good
Degraded
Completely Degraded
Cleared
Sample Sites: (RPS (2020)
Survey Area: (RPS (2020)



Vegetation Communities, Condition, Significant Flora and Survey Effort: *NT-NOR to HBK 132kV*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.23**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig8_NRLP_South_VegCommCond_A3P_v1, Last exported: 20/05/2024 12:48 PM

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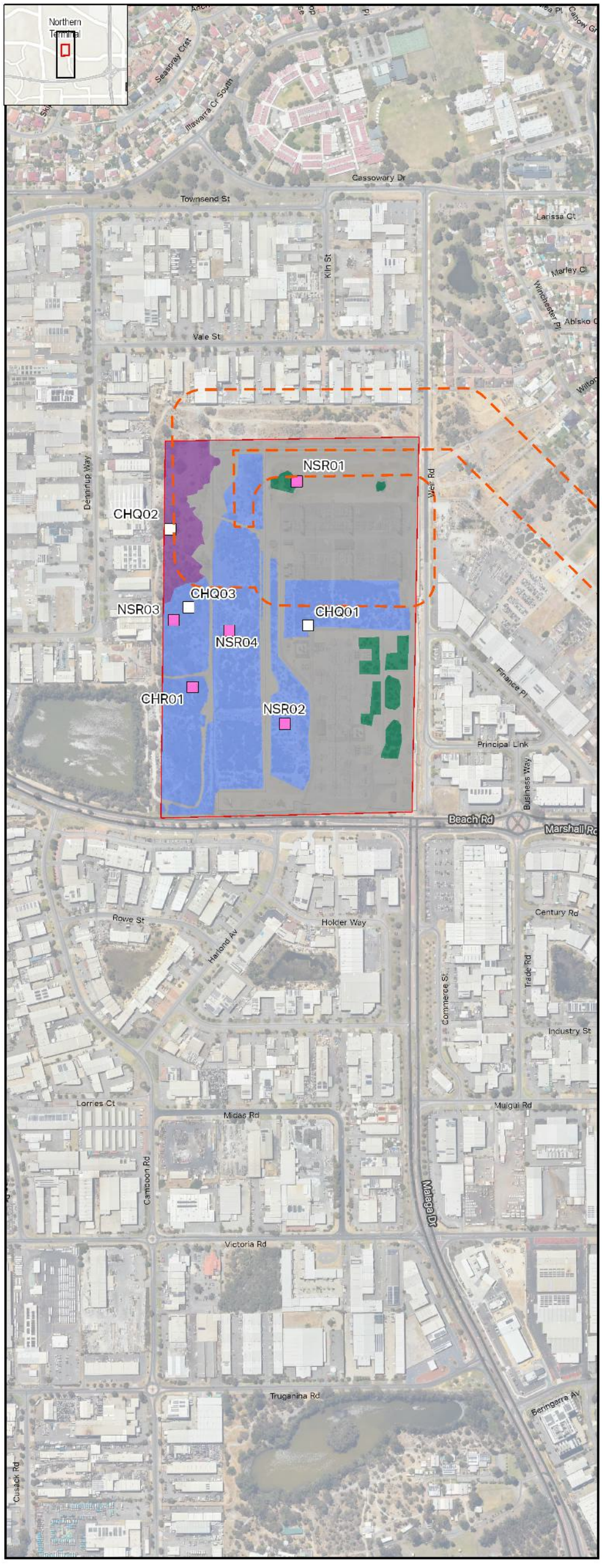

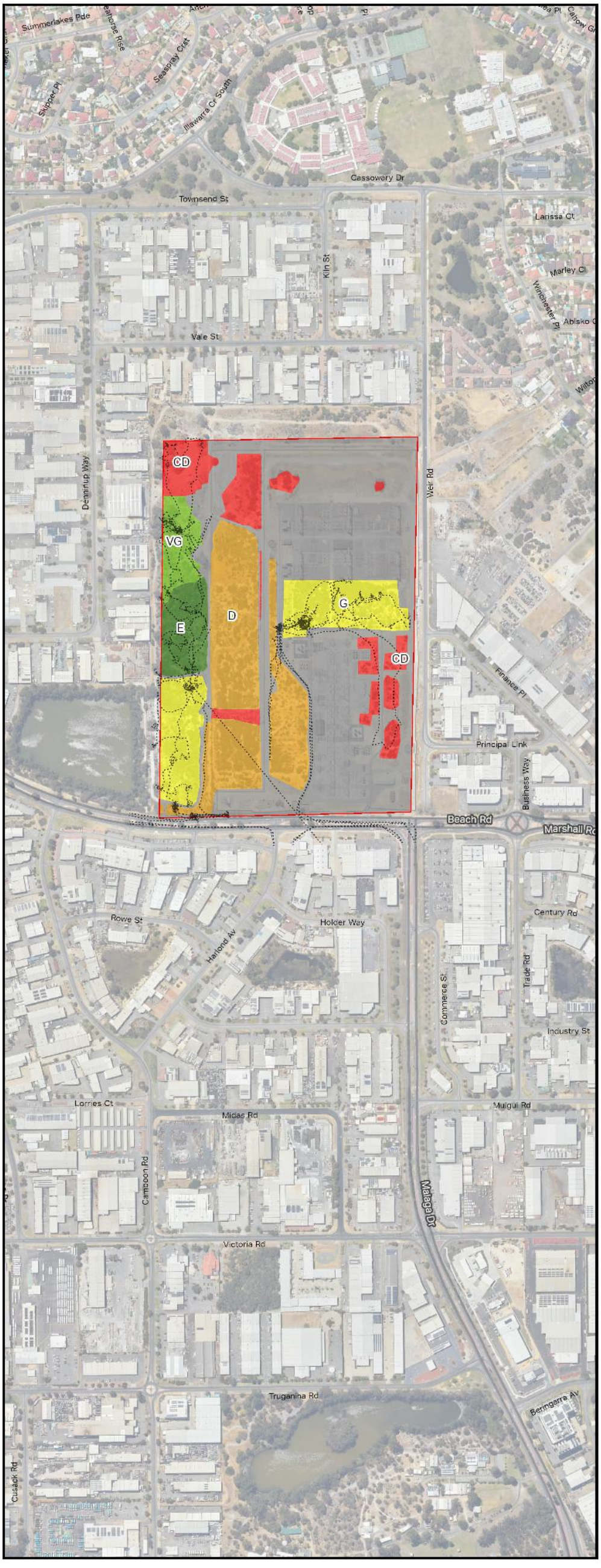

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0 50 100 150 200
metres

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[A 4 60] HCE Base Data is Based on information supplied and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2010)
Sentinel_layer Credits: World Hillshade: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), TomTom, 2012, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS; World Topographic Map: Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS; World Imagery: World Imagery: DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

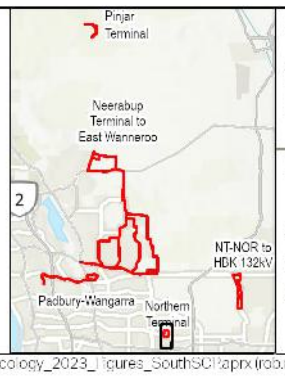
Survey Area

Sample Sites
- Quadrat
- Relevé
- Tracklog

Vegetation Community
- CcXpEc
- ErAcCc
- Trees
- Cleared

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

Survey Area:
AECOM (2022b)
NREP



Vegetation Communities, Condition, Significant Flora and Survey Effort: *Northern Terminal*

WESTERN POWER

NREP SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **8.24**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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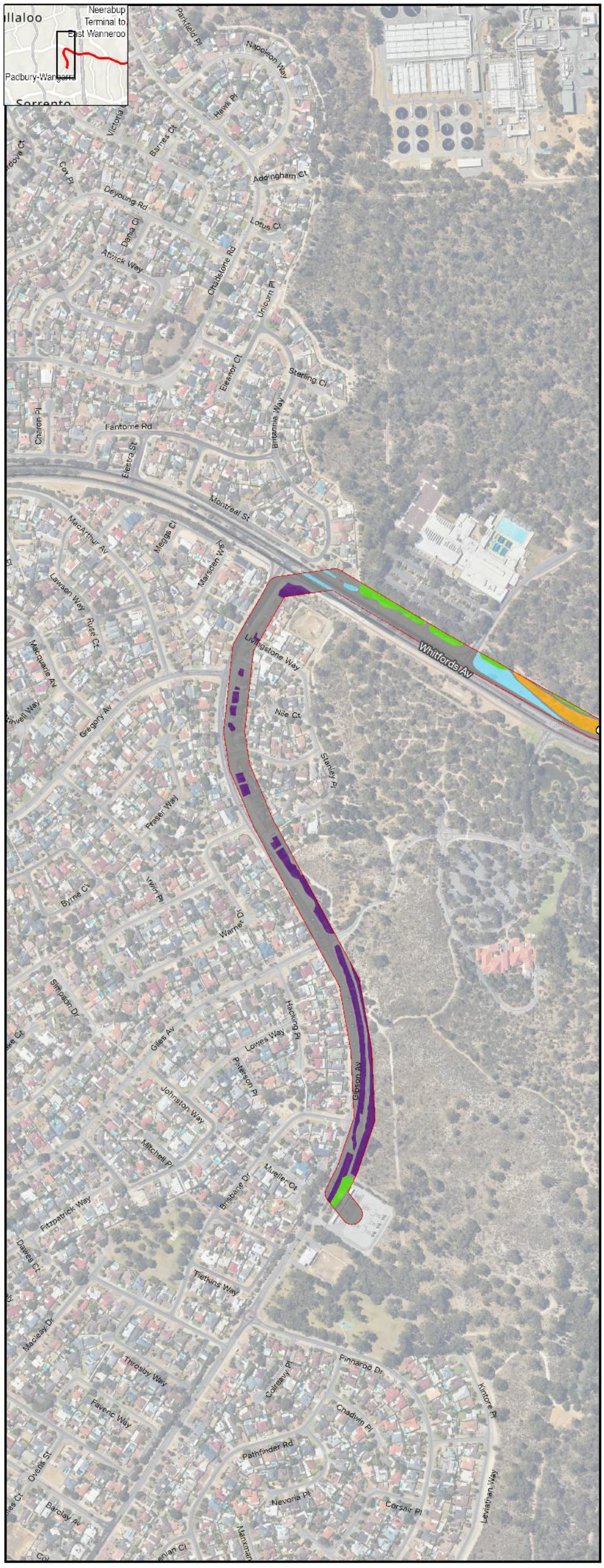

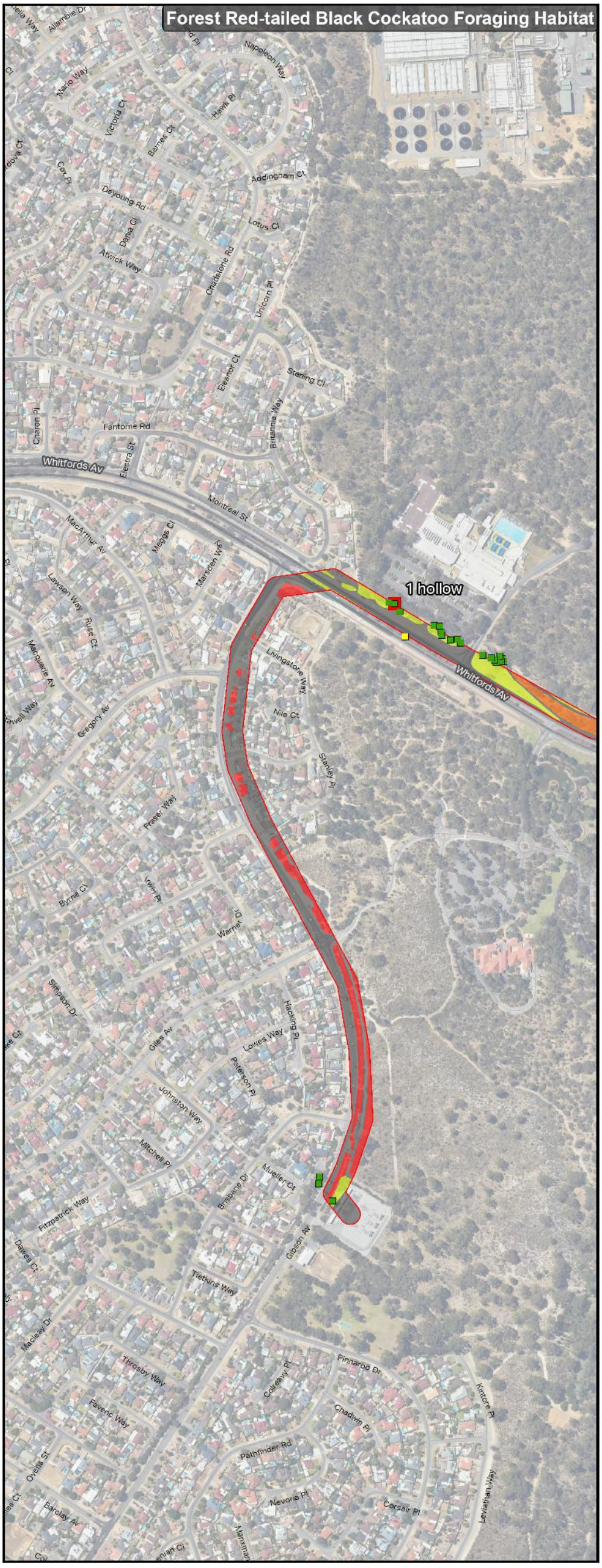

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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

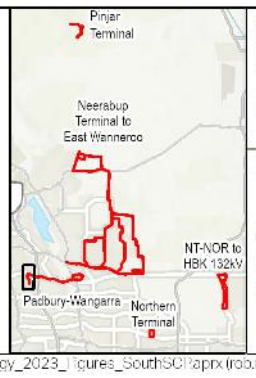
Survey Area

Fauna Habitat
- Banksia Woodland
- Eucalyptus Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Significant Fauna
- Carnaby's Cockatoo

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate

Black Cockatoo Breeding Habitat
- Marri (*Corymbia calophylla*)
- Tuart (*Eucalyptus gomphocephala*)
- Tree with Suitable Hollow



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.1

A4 size

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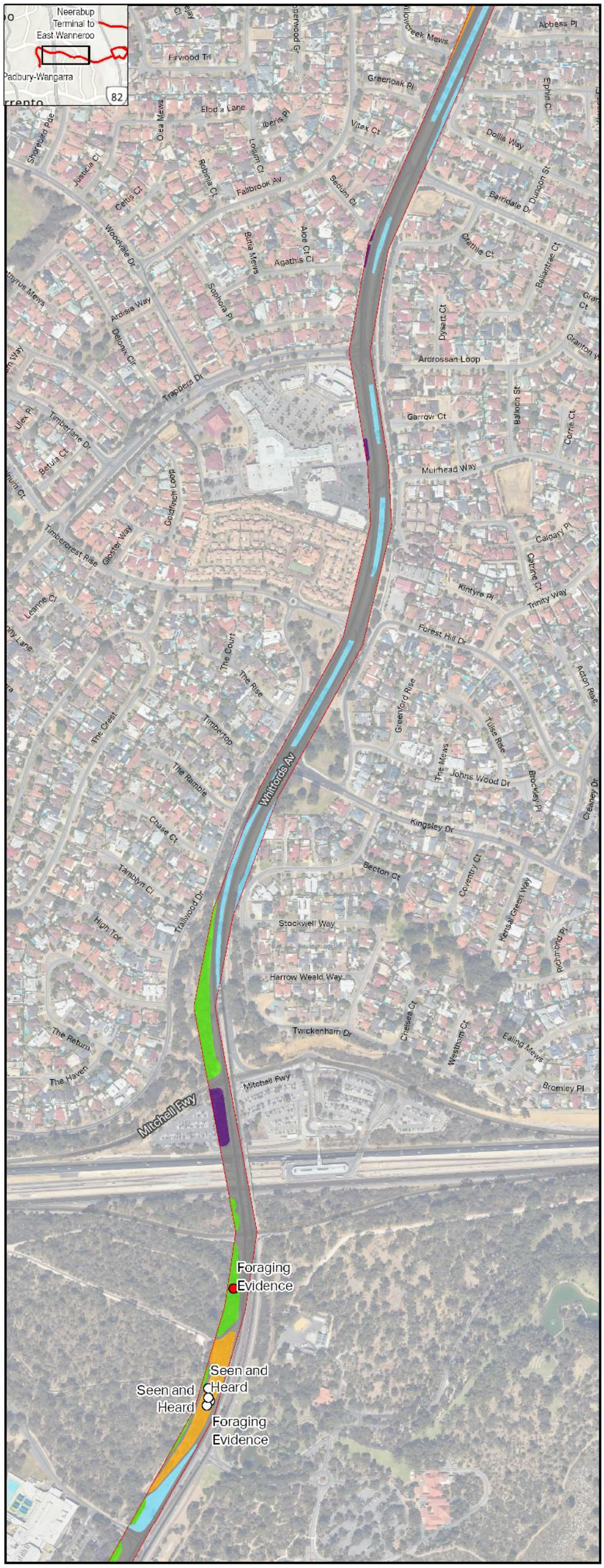

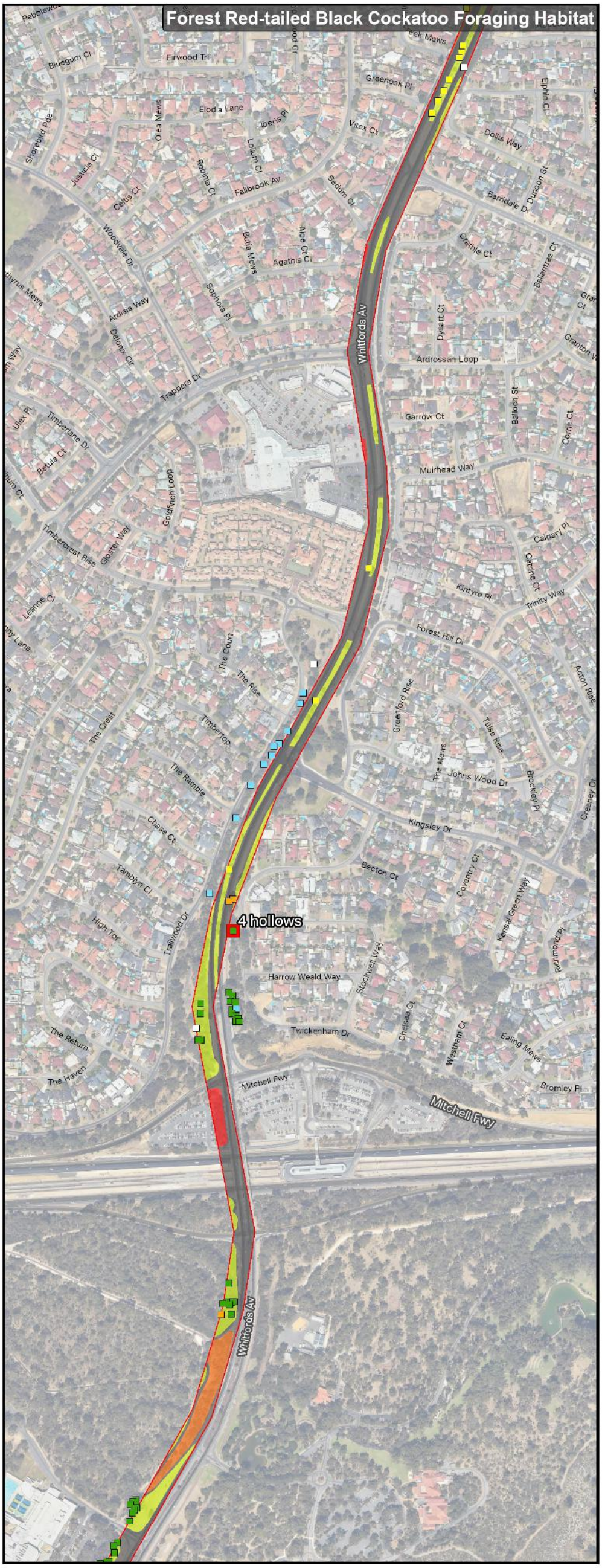

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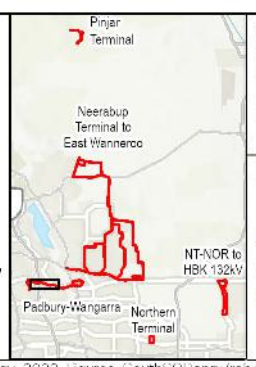
GDA2020 MGA ZONE 50

LEGEND

- Survey Area
- Fauna Habitat
  - Banksia Woodland
  - Eucalyptus Woodland
  - Mixed Shrubland
  - Trees Over Cleared
  - Cleared
- Significant Fauna
  - Carnaby's Cockatoo
  - Forest Red-tailed Black Cockatoo
- Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
  - None
  - Negligible
  - Low
  - Moderate
- Black Cockatoo Breeding Habitat
  - Marri (*Corymbia calophylla*)
  - Jarrah (*Eucalyptus marginata*)
  - Tuart (*Eucalyptus gomphocephala*)
  - Introduced
  - Other
  - Tree with Suitable Hollow



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.2**

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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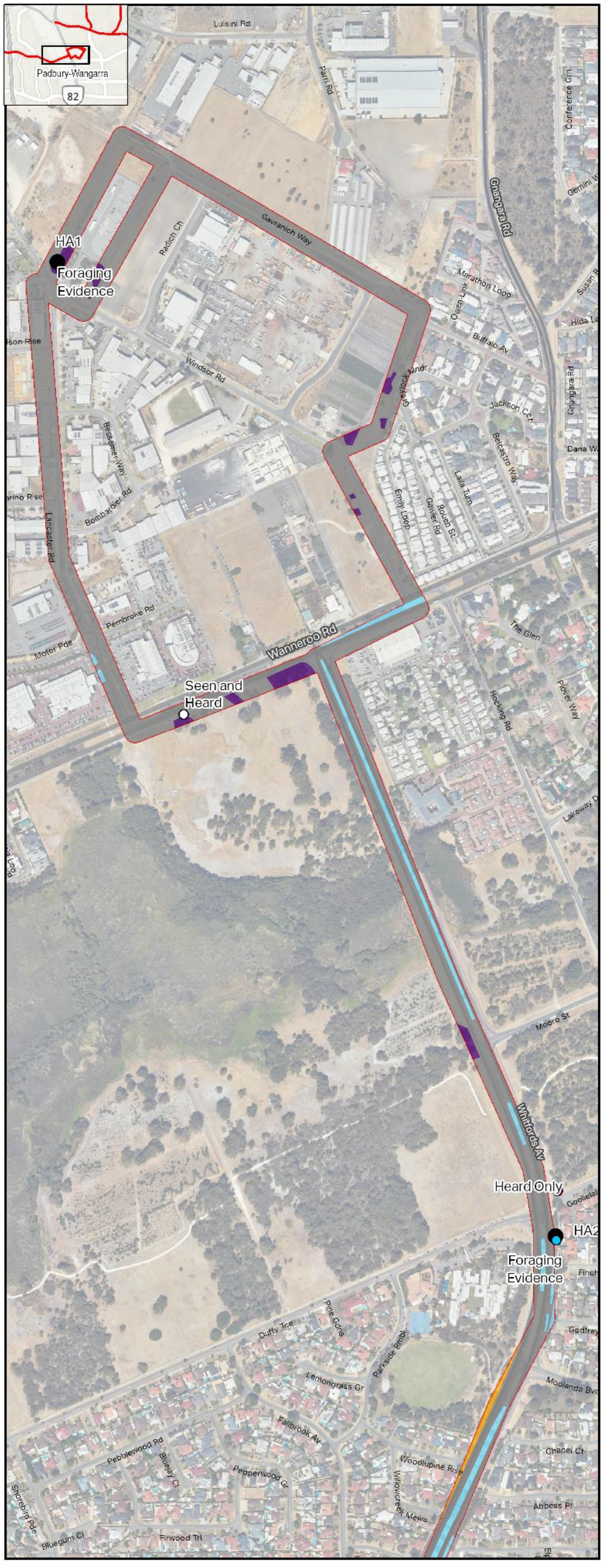

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0 50 100 150 200 metres

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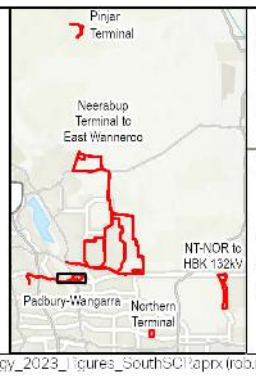
GDA2020 MGA ZONE 50

LEGEND

- Survey Area
- Fauna Habitat
  - Banksia Woodland
  - Mixed Shrubland
  - Trees Over Cleared
  - Cleared
  - Fauna Habitat Sample Sites
- Significant Fauna
  - Carnaby's Cockatoo
  - Forest Red-tailed Black Cockatoo
  - Quenda
- Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
  - None
  - Negligible
  - Low
  - Moderate
- Black Cockatoo Breeding Habitat
  - Marri (*Corymbia calophylla*)
  - Jarrah (*Eucalyptus marginata*)
  - Introduced
  - Other



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.3

A4 size

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Layout: G60713462_Fig9_NRLP_South_Faunal lab_PRT lab_A3P_v1, Last exported: 20/06/2024 1:37 PM

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1:10,000
(when printed at A4)

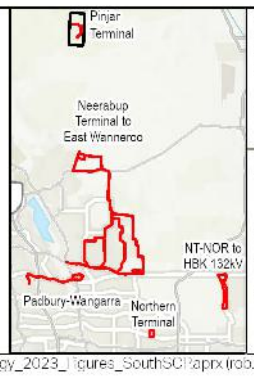
0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND
- Survey Area

Fauna Habitat
- Banksia Woodland
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Quenda
- Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
  - None



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Pinjar Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.4**

A4 size

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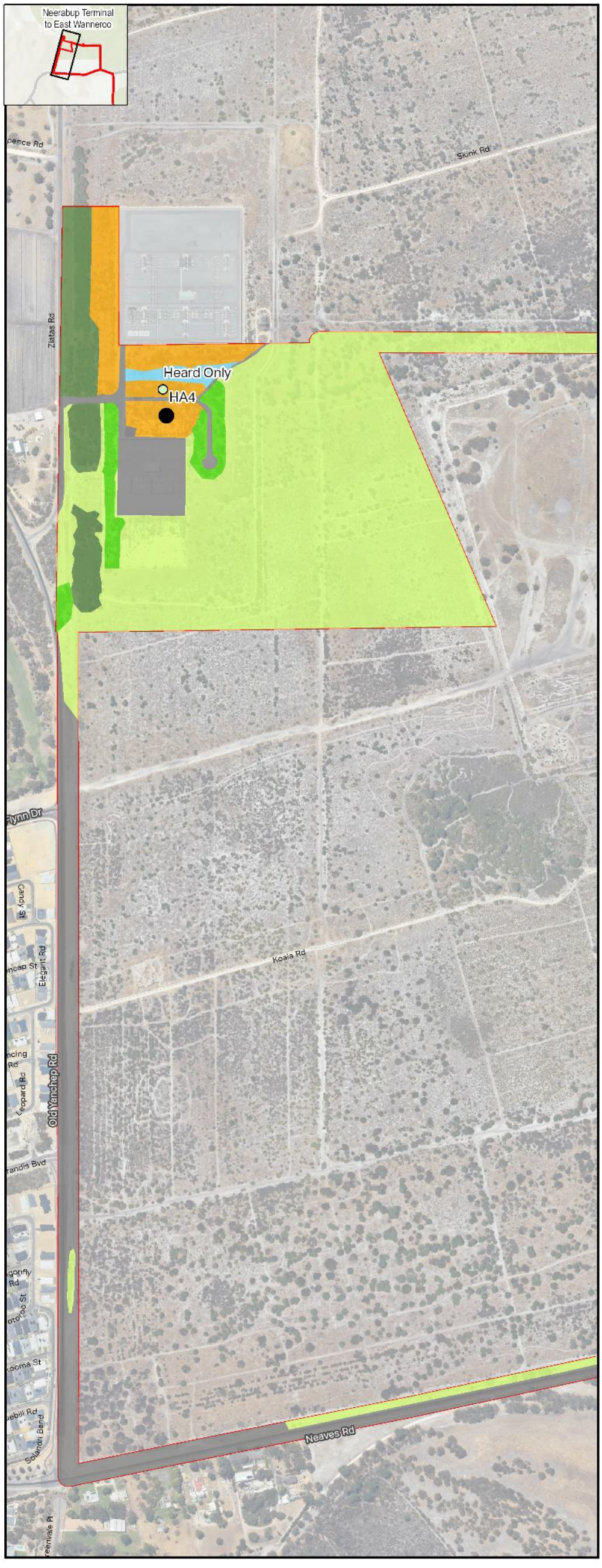

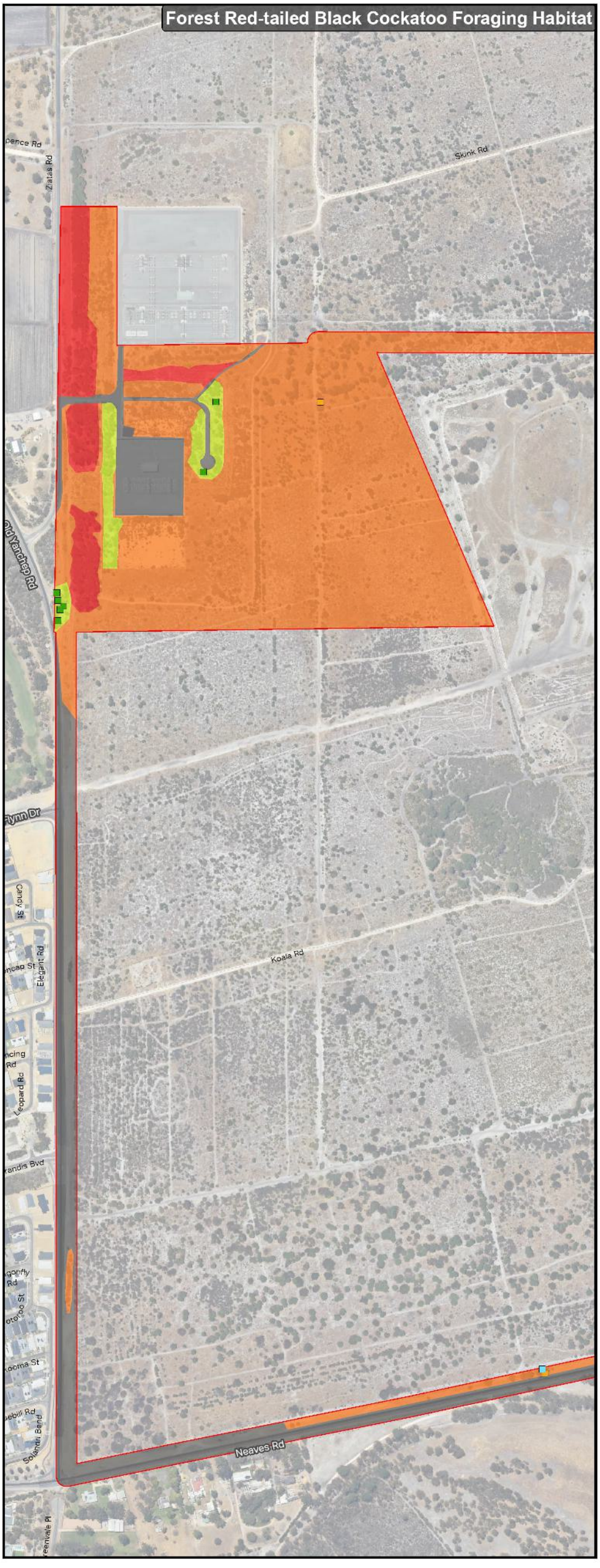

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Data: DBCA-DBCA Base Data (c) Based on information supplied by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2010)
Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, MCTM/NGA, USGS/World Topographic Map Cat., Esri Esri, Garmin, Foursquare, FAO, MCTM/NGA, USGS/World Imagery/MetaWorld Hillshade Esri, GeoEye/Airbus, NASA, MGA, USGS/WMS

LEGEND

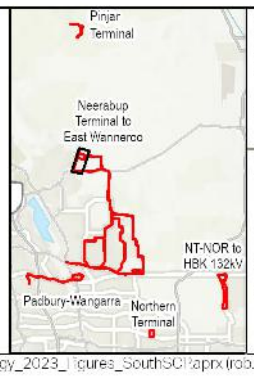
- Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodland
- Eucalyptus Woodland
- Pine Plantation
- Trees Over Cleared
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Black-faced Cuckooshrike

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)
- Tuart (*Eucalyptus gomphocephala*)
- Introduced



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.5

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
Layout: G60713462_Fig9_NRLP_South_Faunal lab_PLR1 lab_A3P_v1, Last exported: 20/06/2024 1:37 PM

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, World Hillshade, Esri, DGA, Esri, World Topographic Map, Esri, TomTom, Garmin, FAO, METI/NASA, USGS, World Imagery, Maxar, Microsoft, Esri, Geoscience Australia, NASA, NGA, USGS, WMS

LEGEND

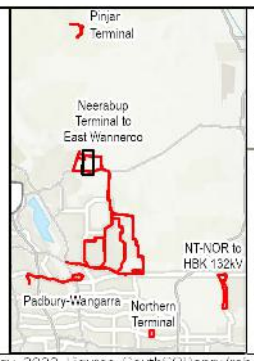
Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared

Significant Fauna
- Quenda

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Low

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)
- Stag (old dead tree, unknown species)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.6**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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1:7,500
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DATA SOURCES: Base data sourced from Landgate and Shire of Wanneroo. Land Information Authority (Landgate) (2019). Service: Aerial Imagery World Imagery Data Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community. Projection: GDA 1994 MGA Zone 50. Datum: GDA 1994. Topographic Map Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. Projection: WGS 1984 Web Mercator Auxiliary Sphere. Datum: WGS 1984.

LEGEND
- Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared

Significant Fauna
- Quenda

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Low

Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.7**

A4 size

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Layout: G60713462_Fig9_NRLP_South_Faunal lab_PRT lab_A3P_v1, Last exported: 20/06/2024 1:37 PM

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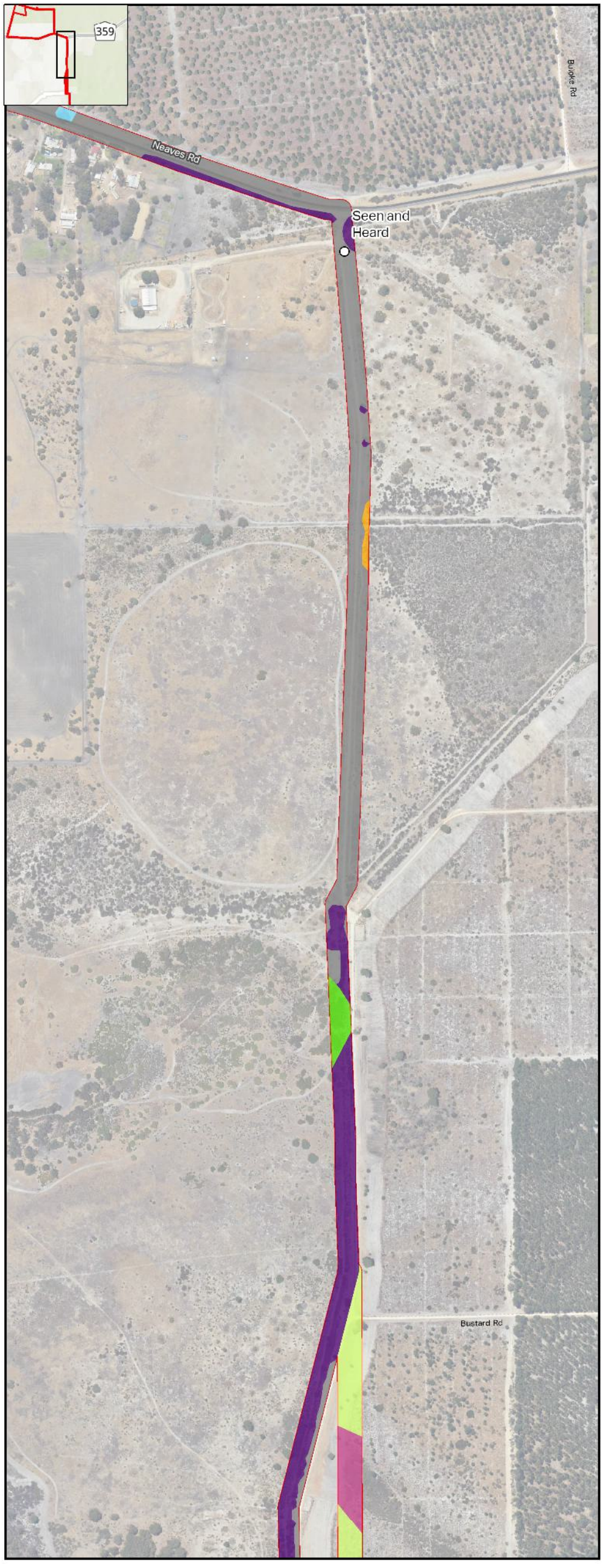

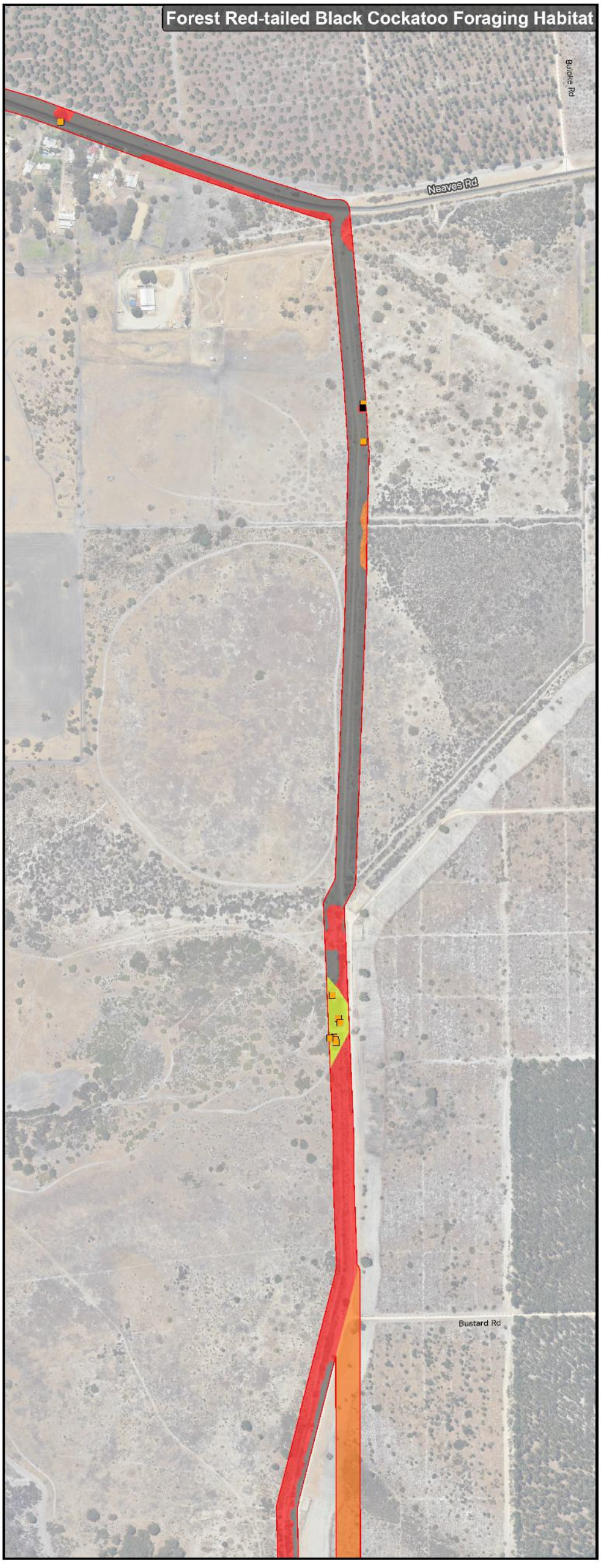

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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

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LEGEND

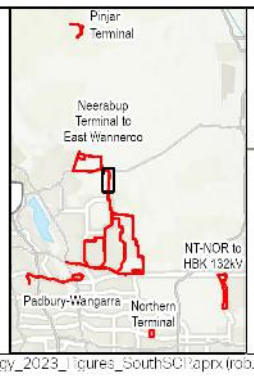
Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodland
- Eucalyptus Woodland
- Melaleuca Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Significant Fauna
- Carnaby's Cockatoo

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)
- Stag (old dead tree, unknown species)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.8**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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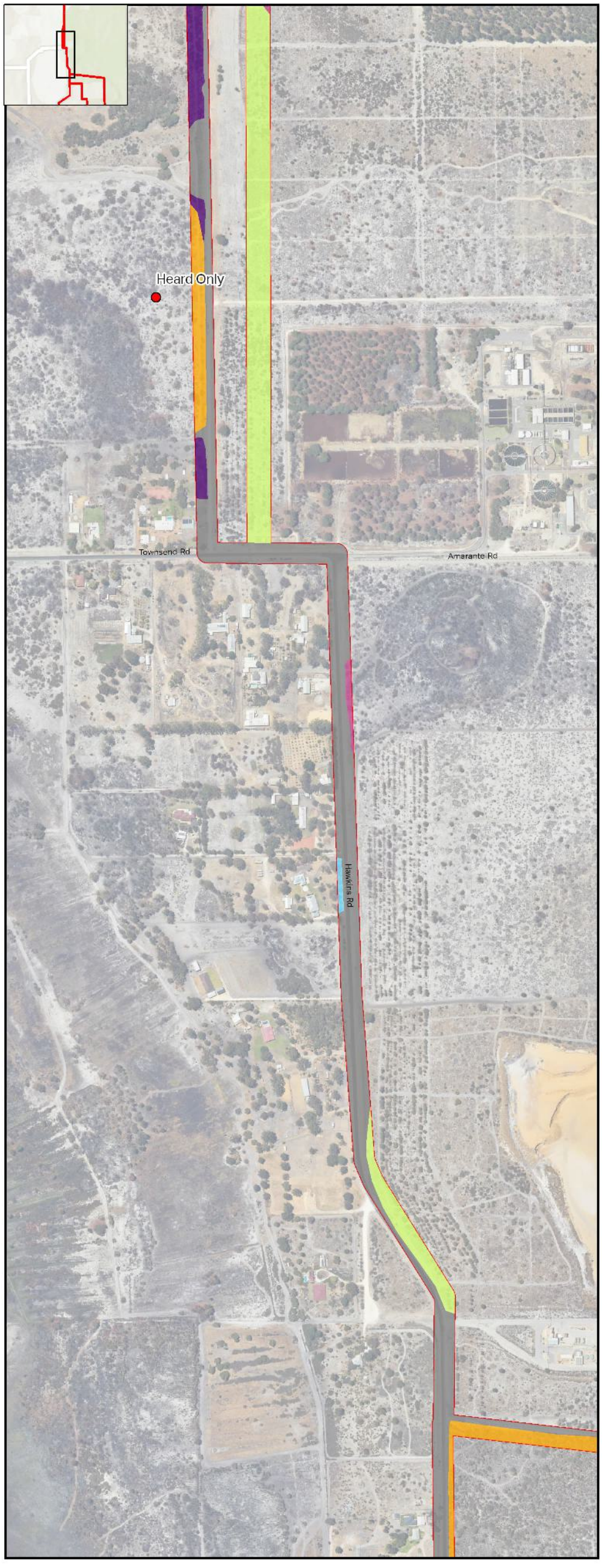

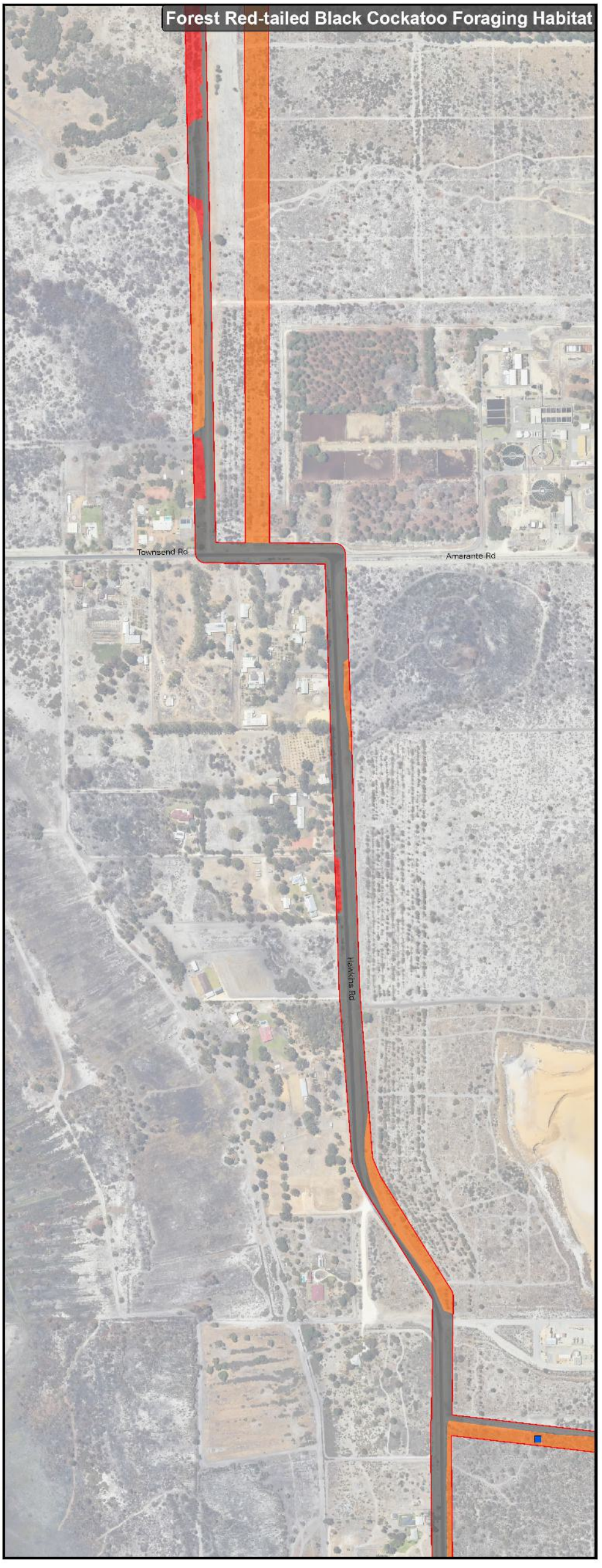

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N

1:7,500
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

DA A SOUTHERN Base Data is Based on information provided and with the permission of the Western Australian Land Information Authority (Landgate) (2019)
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Topographic Map Base, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS, World Imagery/Metal World Hillshade/Esri, Geoscience Australia, NASA, NGA, USGS, WMS

LEGEND

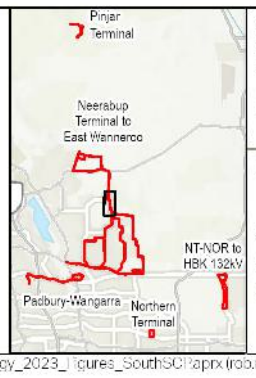
Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodland
- Melaleuca Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Significant Fauna
- Forest Red-tailed Black Cockatoo

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Coastal Blackbutt (*Euc. todtiana*)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.9**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
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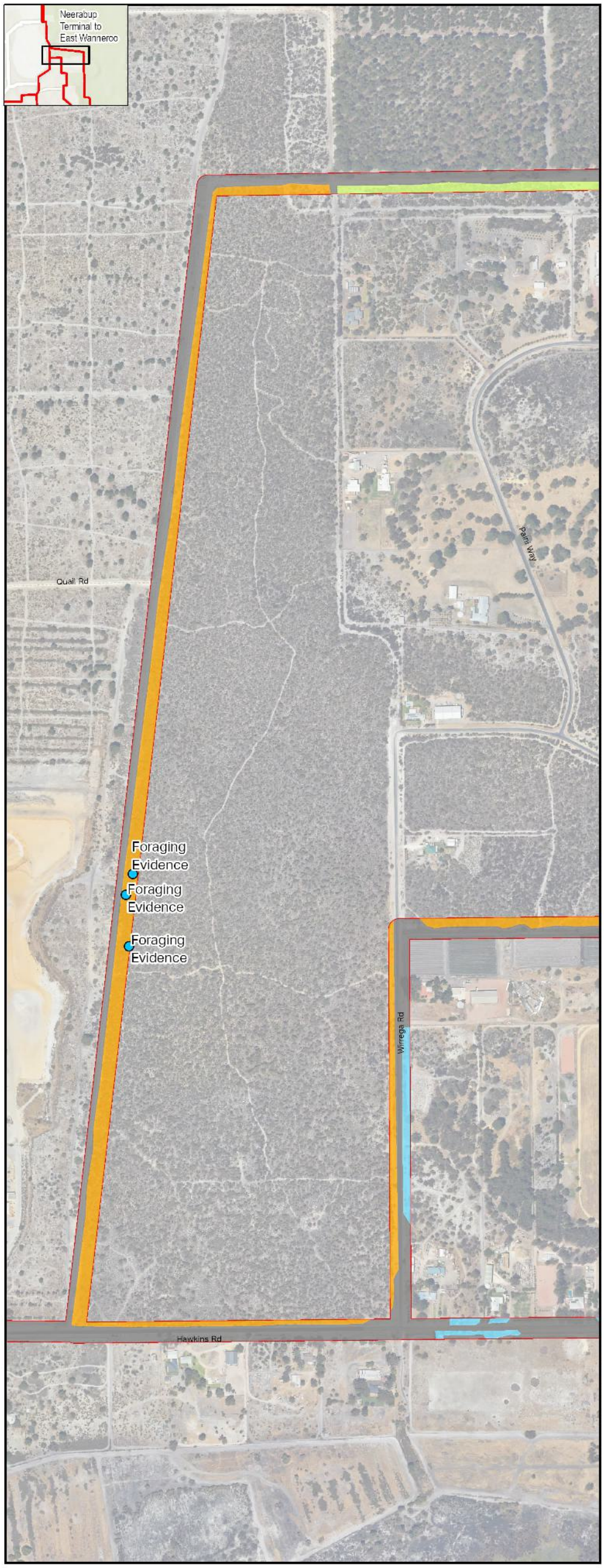

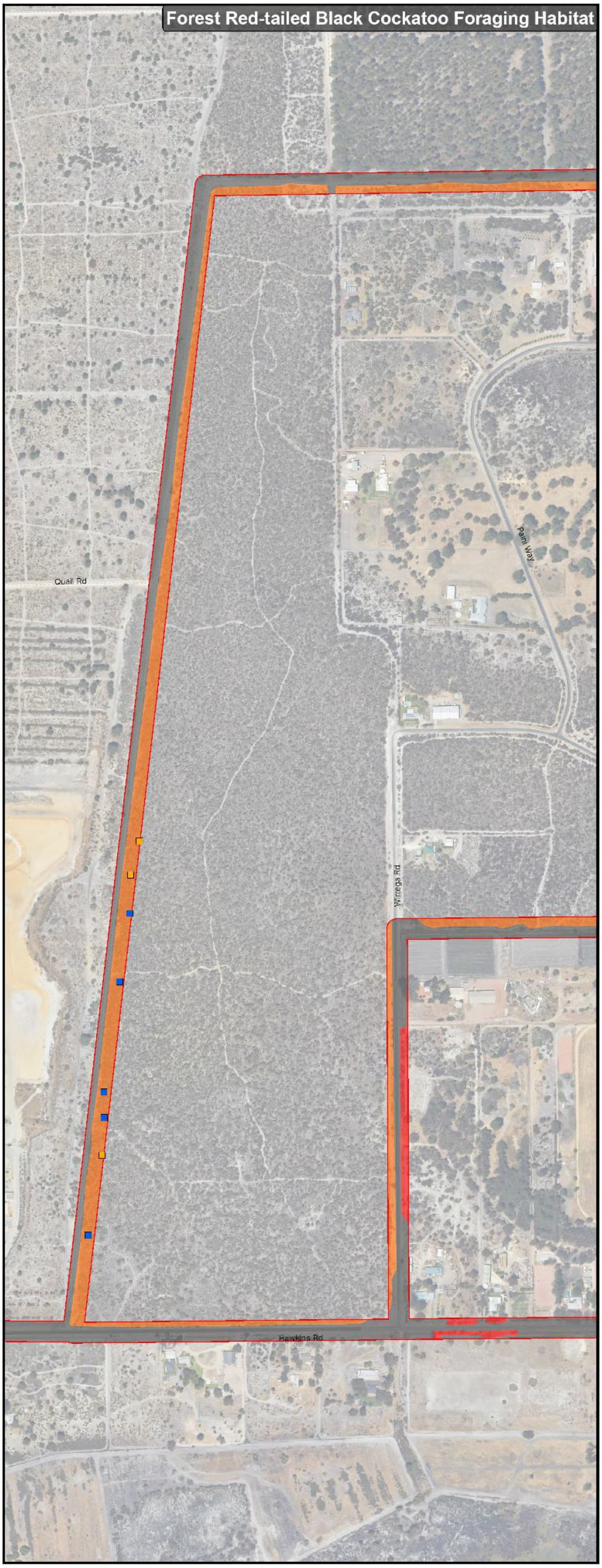

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LEGEND

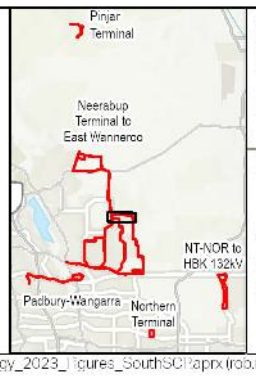
Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodland
- Trees Over Cleared
- Cleared

Significant Fauna
- Quenda

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)
- Coastal Blackbutt (*Euc. todtiana*)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.10

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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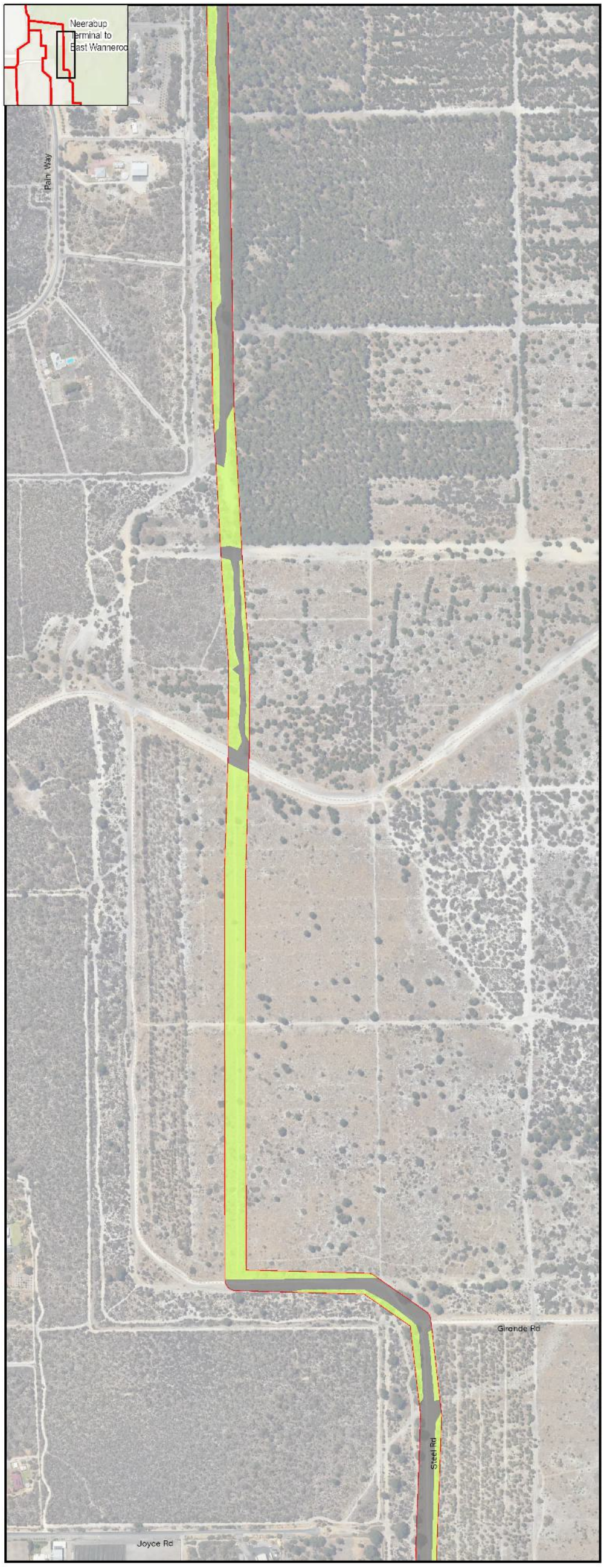

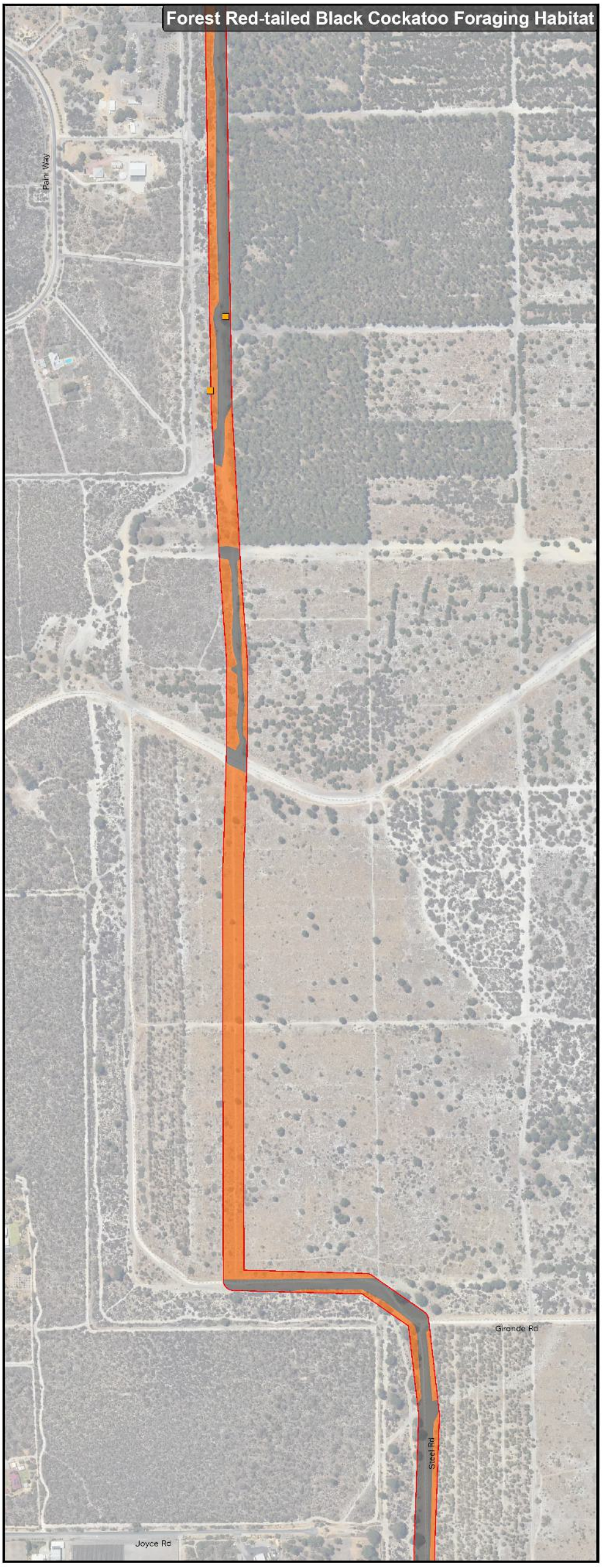

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0 50 100 150 200
metres

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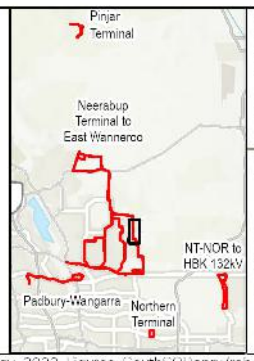
LEGEND

Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Low

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.11

A4 size

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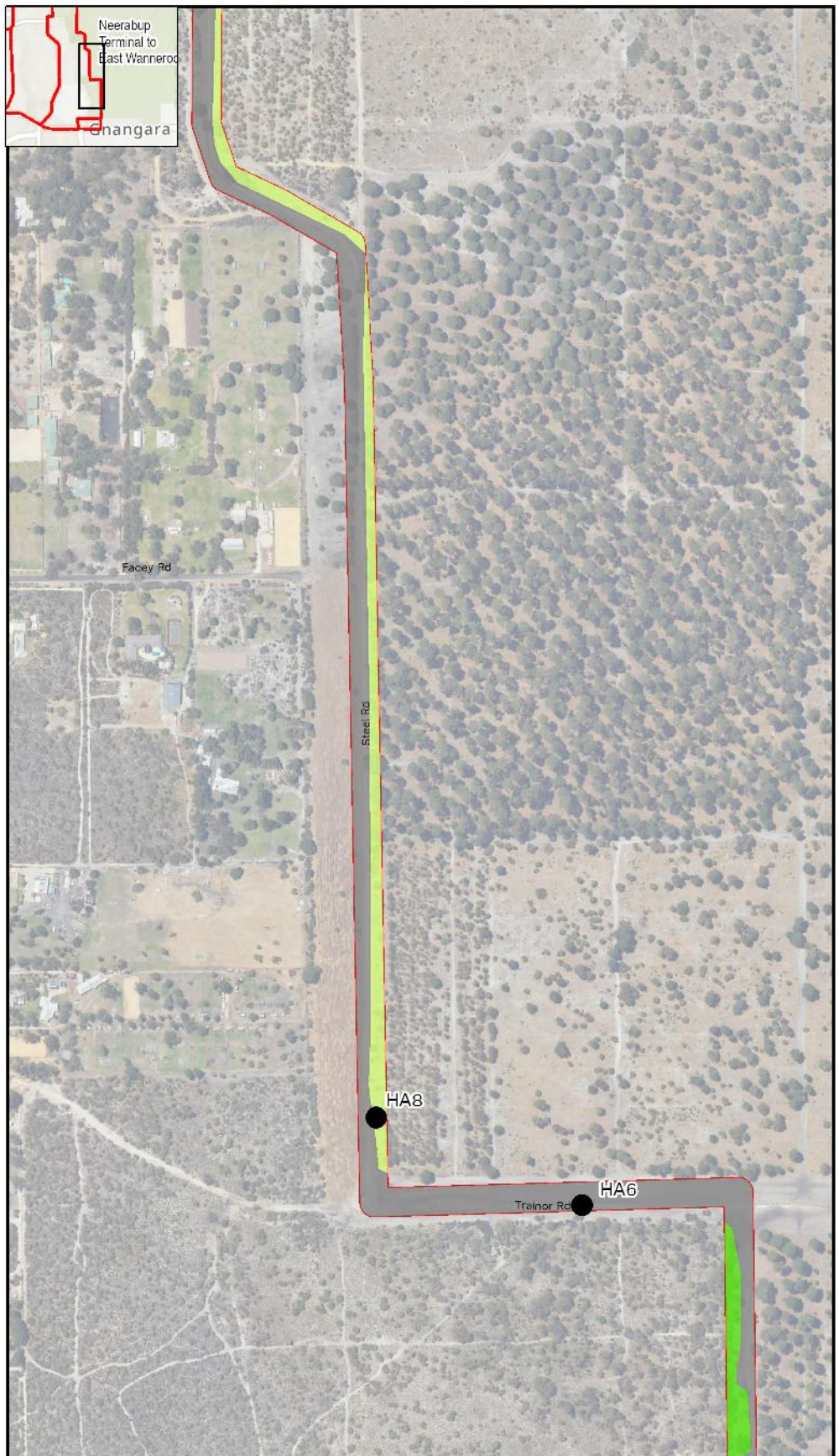

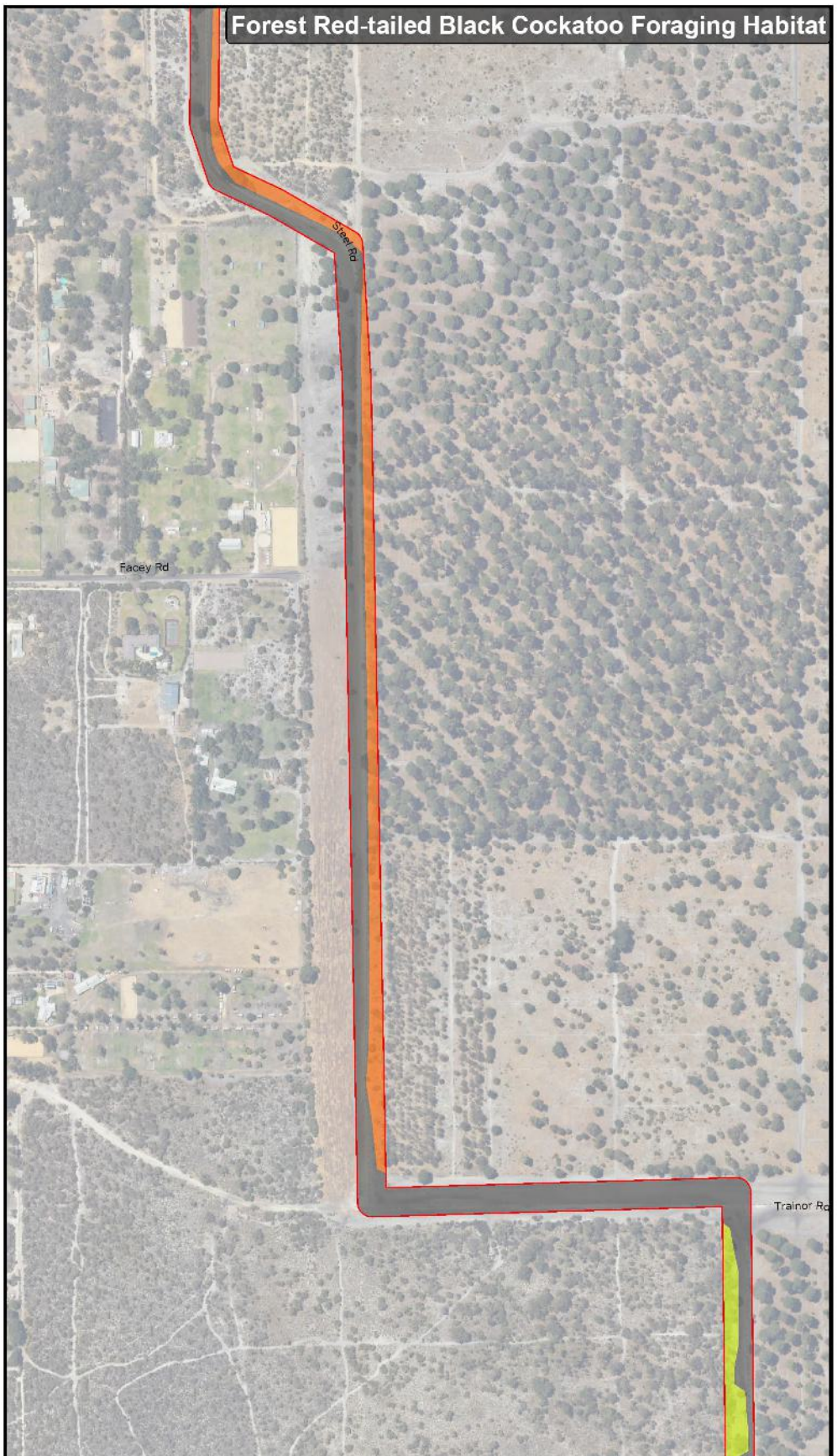

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0 50 100 150 200
metres

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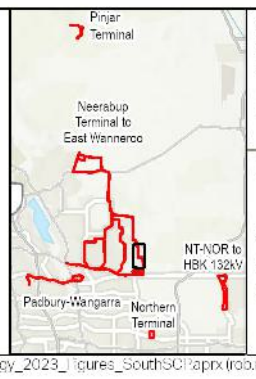
LEGEND

- Survey Area
- Fauna Habitat
  - Adenanthos/Plantation
  - Eucalyptus Woodland
  - Cleared
  - Fauna Habitat Sample Sites
- Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
  - None
  - Low
  - Moderate



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.12

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
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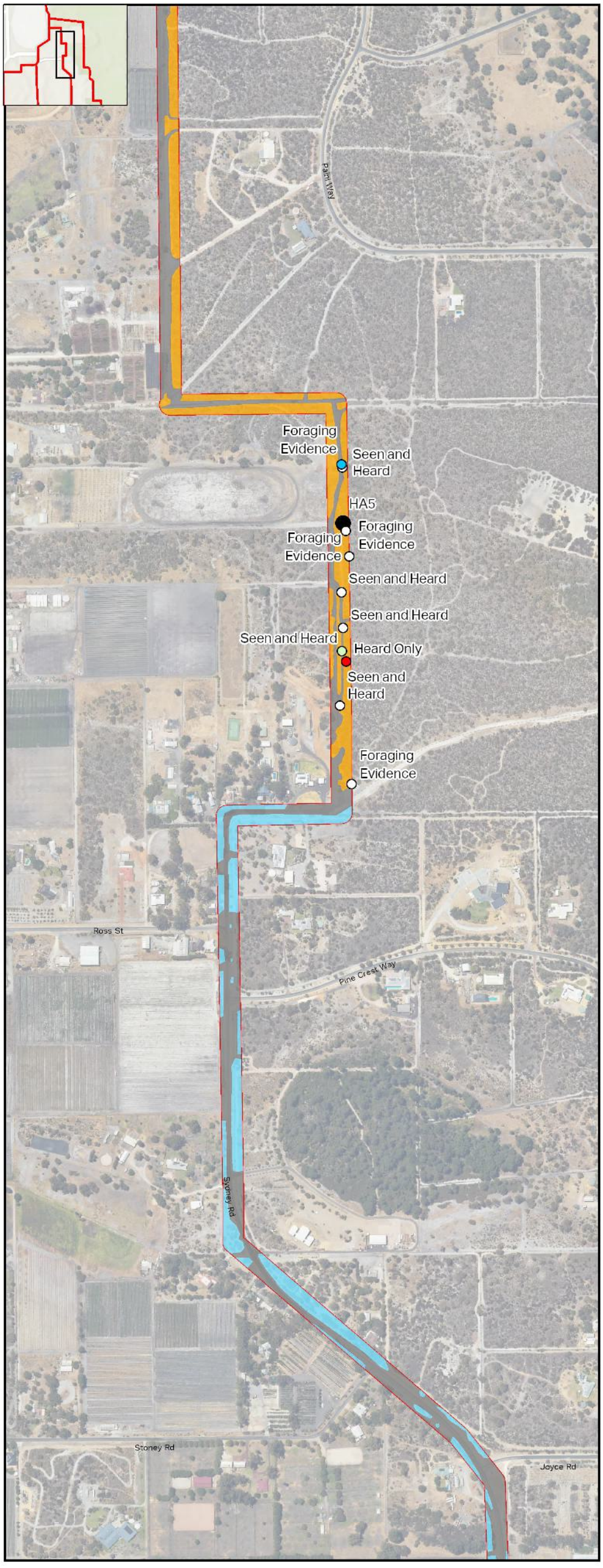

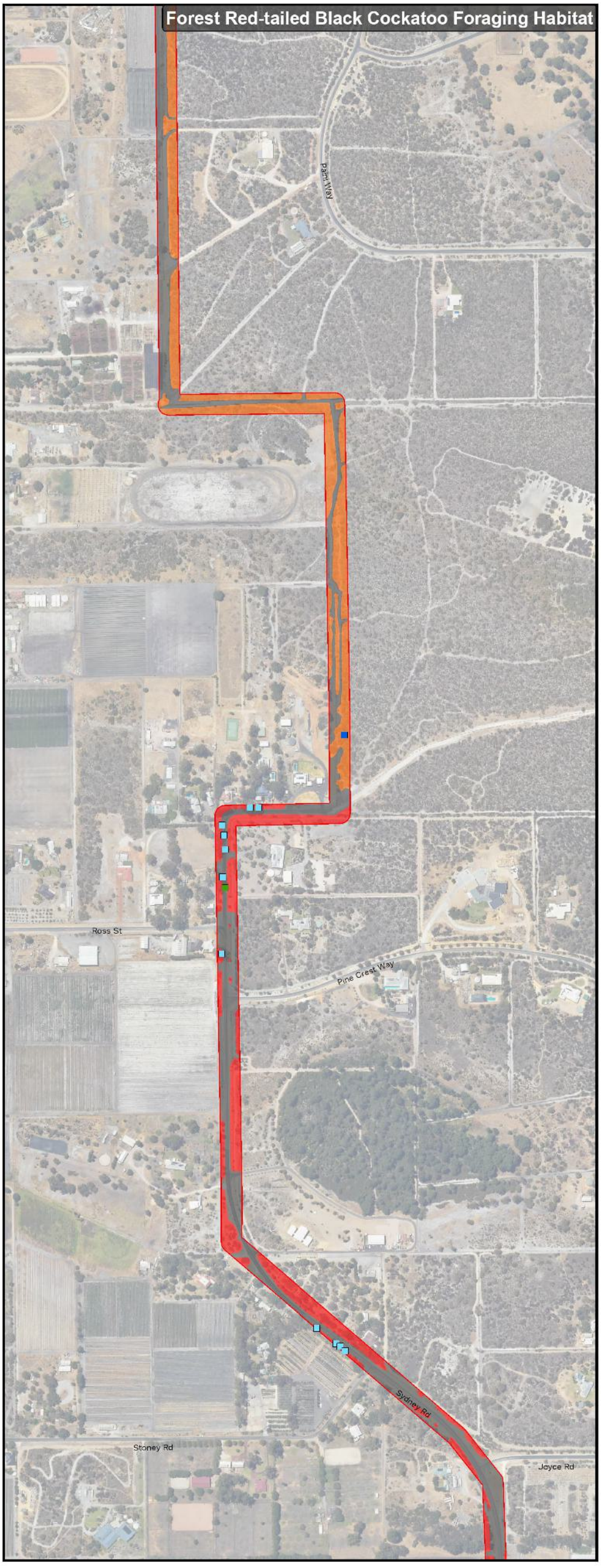

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1:7,500
(When printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND

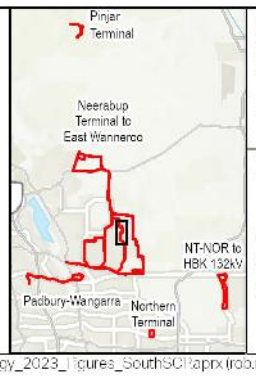
Survey Area

Fauna Habitat
- Banksia Woodland
- Trees Over Cleared
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Black-faced Cuckooshrike
- Carnaby's Cockatoo
- Forest Red-tailed Black Cockatoo
- Quenda

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Tuart (*Eucalyptus gomphocephala*)
- Coastal Blackbutt (*Euc. todtiana*)
- Introduced



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.13**

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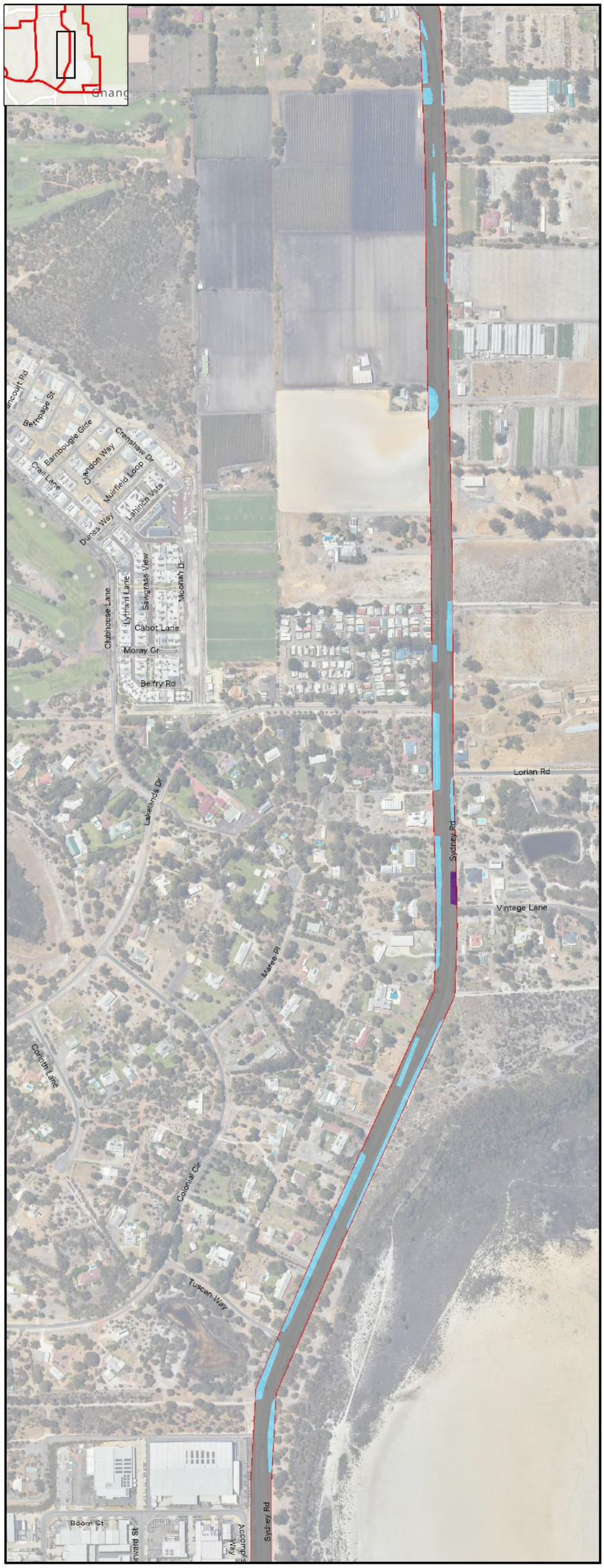

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N

1:7,500 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

- Survey Area

Fauna Habitat

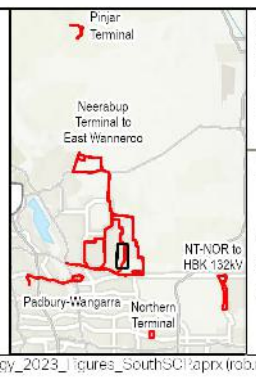
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)

- None
- Negligible

Black Cockatoo Breeding Habitat

- Introduced



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.14

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

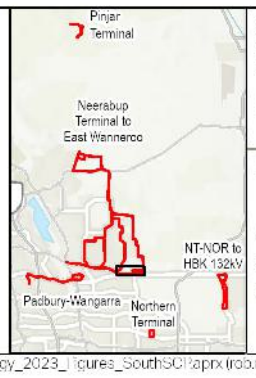
Survey Area

Fauna Habitat
- Adenanthos/Plantation
- Banksia Woodland
- Eucalyptus Woodland
- Melaleuca Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Carnaby's Cockatoo
- Forest Red-tailed Black Cockatoo

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate

Black Cockatoo Breeding Habitat
- Marri (*Corymbia calophylla*)
- Jarrah (*Eucalyptus marginata*)
- Coastal Blackbutt (*Euc. todtiana*)
- Introduced



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.15

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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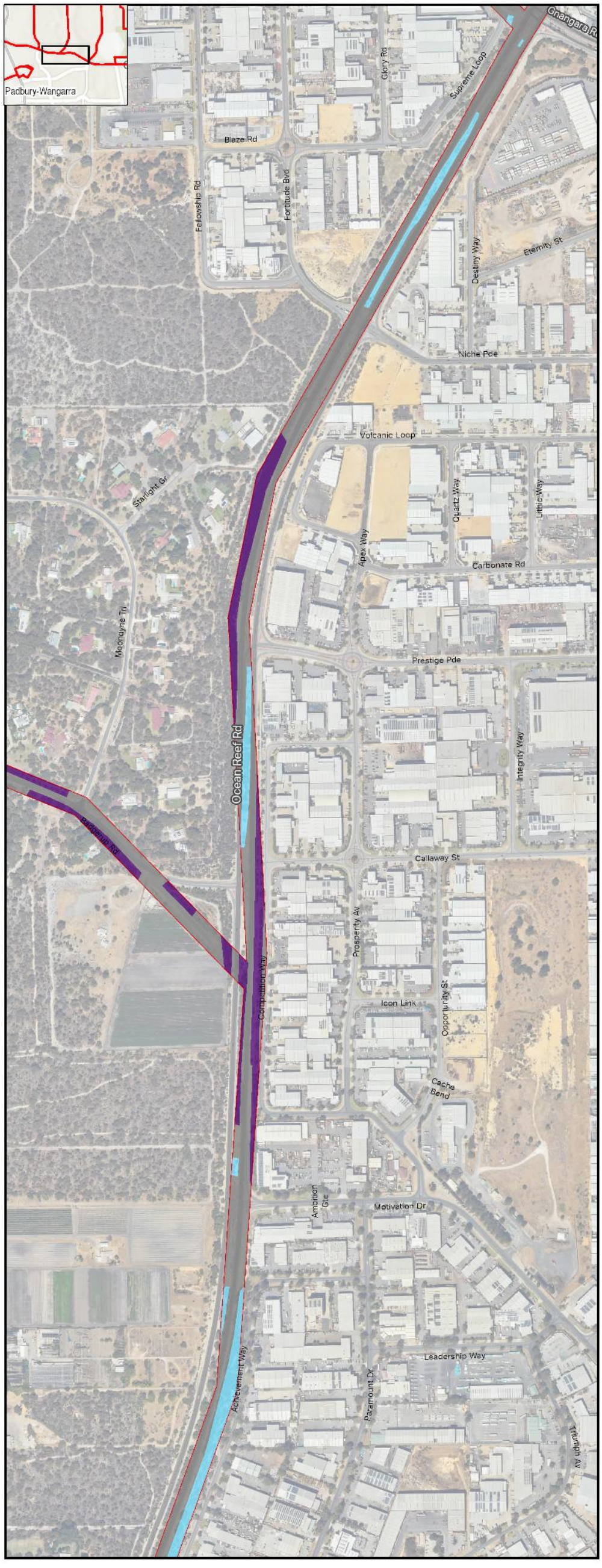

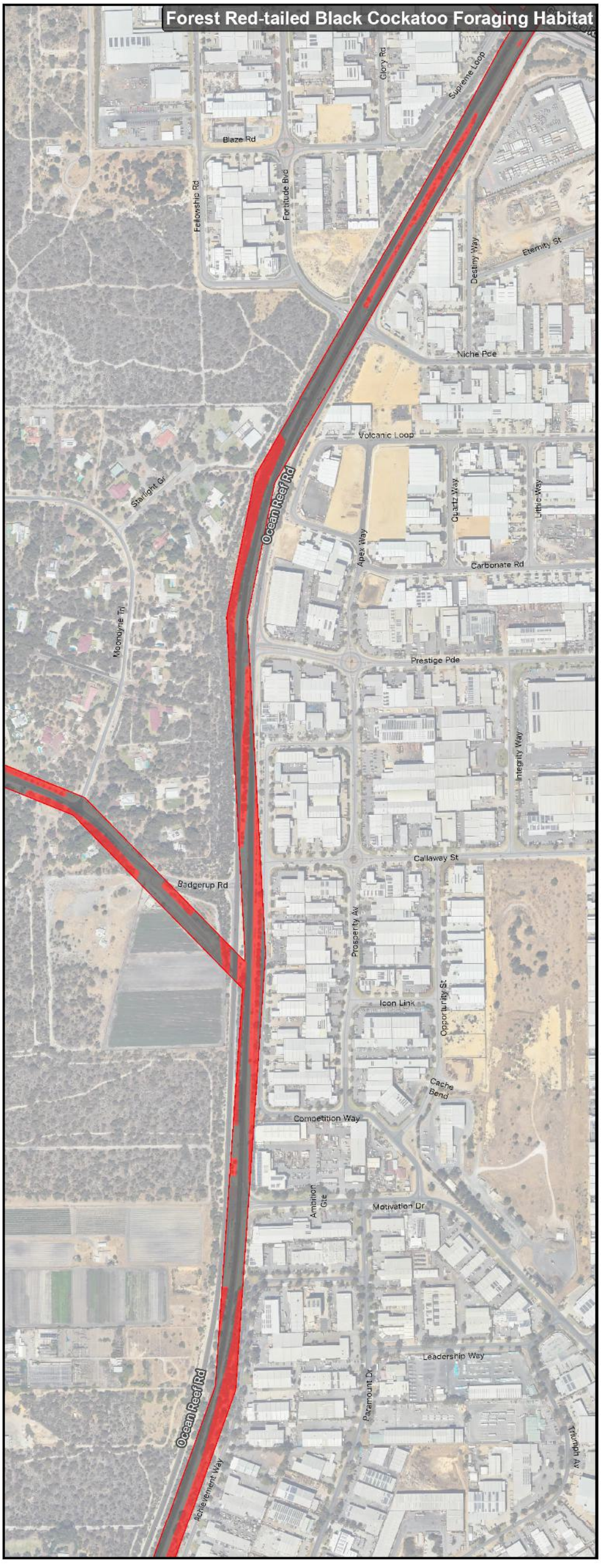

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0 50 100 150 200 metres

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Data Source and Attribution: Roads and Imagery sourced from Esri, Maxar, Earthstar Geographics, and the GIS User Community. Land Information Authority Landgate (2010). Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri, TomTom, Garmin, FAO, METI/NASA, USGS, World Imagery/MapServer, Esri, Garmin, FAO, METI/NASA, USGS

LEGEND

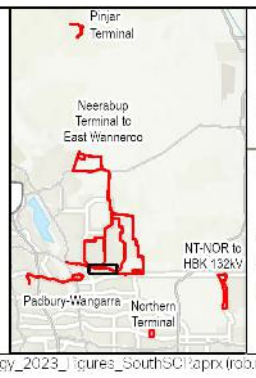
- Survey Area

Fauna Habitat

- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)

- None
- Negligible



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.16**

A4 size

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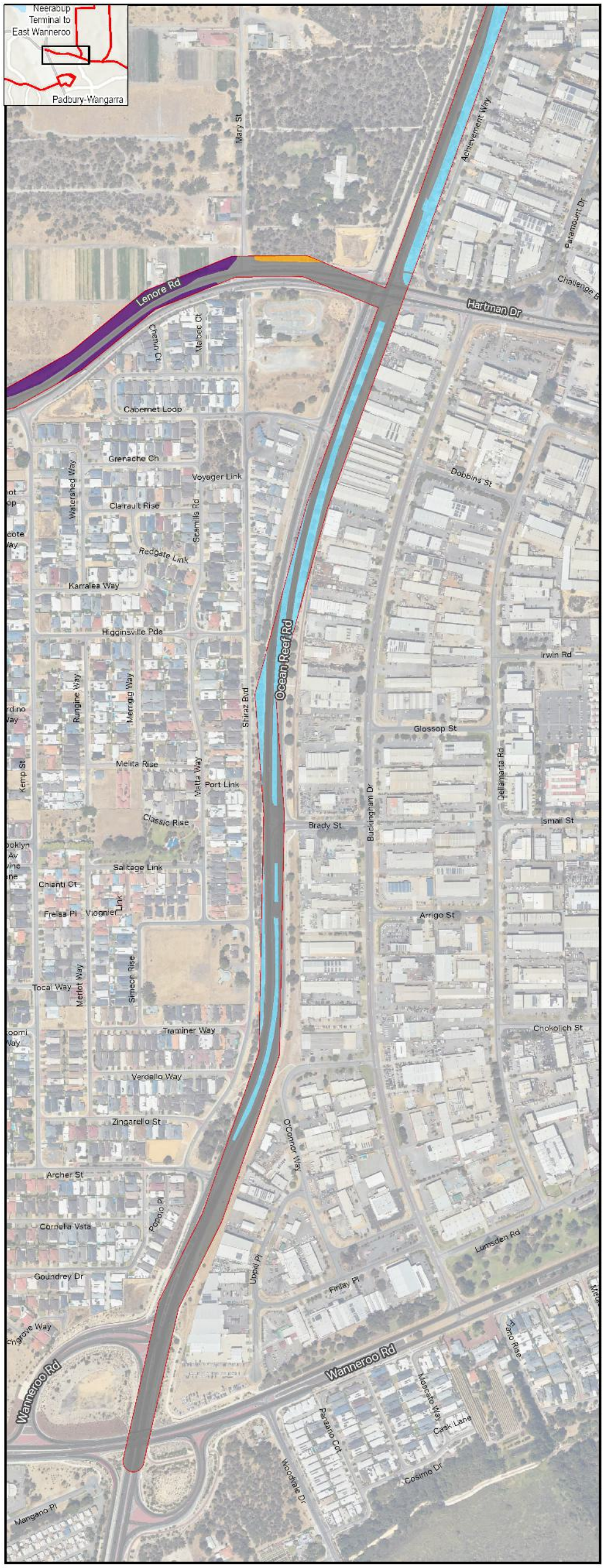

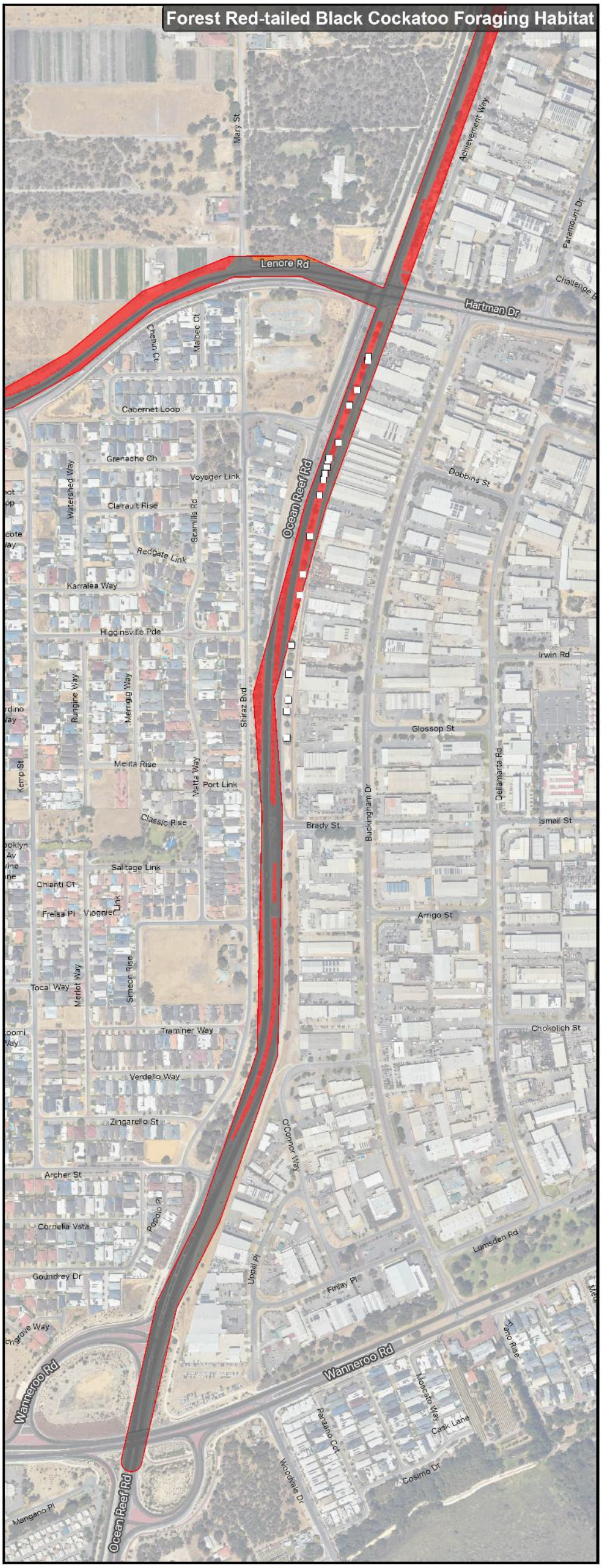

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

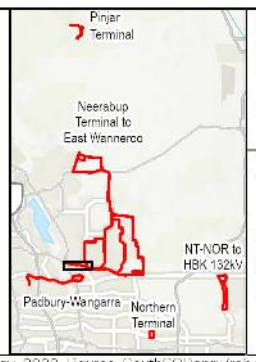
LEGEND

Survey Area

Fauna Habitat
- Banksia Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Other



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.17

A4 size

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

Data: © Main Roads Western Australia (2024); Cadastre sourced from Landgate and Shire of Murray (2024); Imagery: Nearmap (2024); Contains information supplied by Digital Atlas of Australia (2024); Contains information supplied by Esri Australia (2024); Contains information supplied by Department of Biodiversity, Conservation and Attractions (2024); Contains information supplied by Department of Water and Environmental Regulation (2024); Contains information supplied by Department of Primary Industries and Regional Development (2024); Contains information supplied by Department of Mines, Industry Regulation and Safety (2024); Contains information supplied by Department of Planning, Lands and Heritage (2024); Contains information supplied by Department of Transport (2024); Contains information supplied by Department of Fire and Emergency Services (2024); Contains information supplied by Department of Energy, Mines, Industry Regulation and Safety

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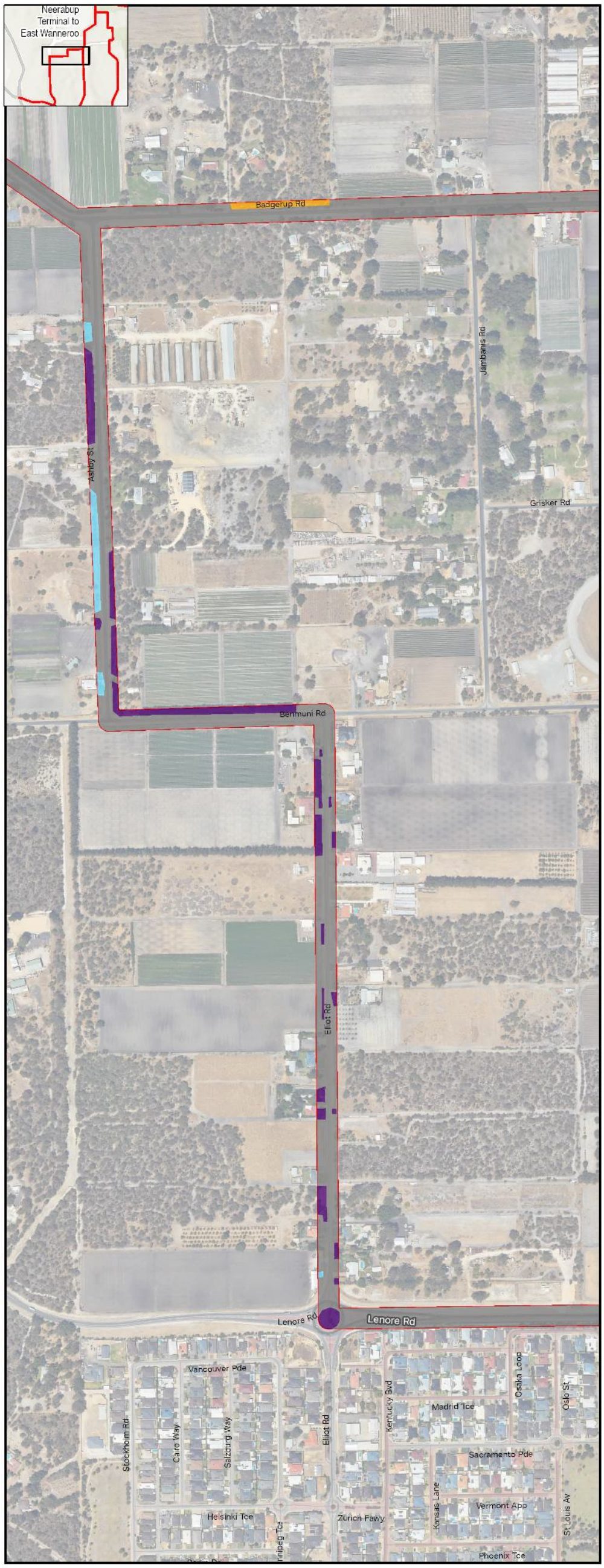

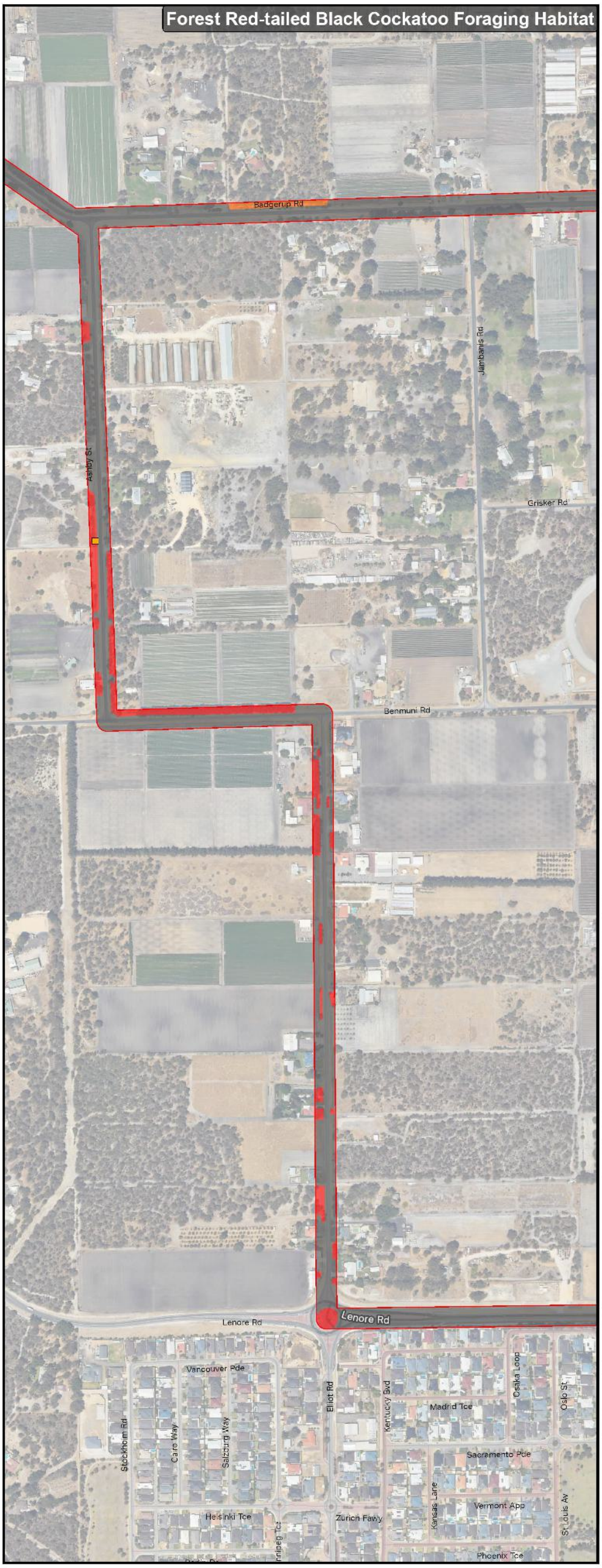

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DA A SOUTHERN Base Data is Based on information provided and with the permission of the Western Australian Land Information Authority (Landgate) (2019).
Sources: Esri, DeLorme, World Elevation 3d, USDA, World Topographic Map Esri, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MCTI/MGA, USGS/World Topographic Map Esri, TomTom, Garmin, FAO, MCTI/MGA, USGS/World Imagery/World Hillshade Esri, Geoscience Australia, MGA, USGS/MG

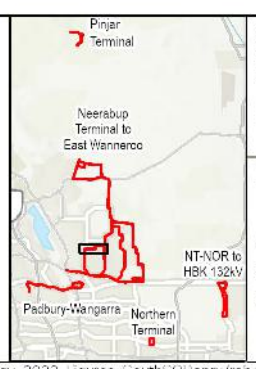
LEGEND

Survey Area

Fauna Habitat
- Banksia Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Jarrah (*Eucalyptus marginata*)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.19

A4 size

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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

[A SOURCE Base Data is Based on a prior data query and with the permission of the Western Australian Land Information Authority trading as Landgate (2018)
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri Community Maps Contributors, HERE, Garmin, Foursquare, METI/NASA, USGS, World Topographic Map Service, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, World Imagery, Maxar, World Hillshade, Esri, DEArm, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCP, (c) OpenStreetMap contributors, and the GIS User Community, Esri, Geoscience Australia, NASA, NGA, USGS, WMS

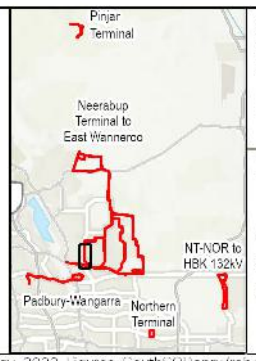
LEGEND

- Survey Area

Fauna Habitat
- Banksia Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low

Black Cockatoo Breeding Habitat
- Other



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.20

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

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Sources: Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, MCTI/MGA, USGS World Topographic Map Cache, Esri, TomTom, Garmin, Foursquare, FAO, MCTI/NASA, USGS World Imagery Map, World Hillshade Esri, DeLorme, HERE, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, NASA, MGA, USGS/MMG

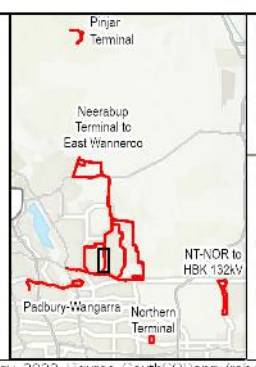
LEGEND

Survey Area

Fauna Habitat
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible

Black Cockatoo Breeding Habitat
- Stag (old dead tree, unknown species)
- Other
- Tree with Suitable Hollow



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.21**

A4 size

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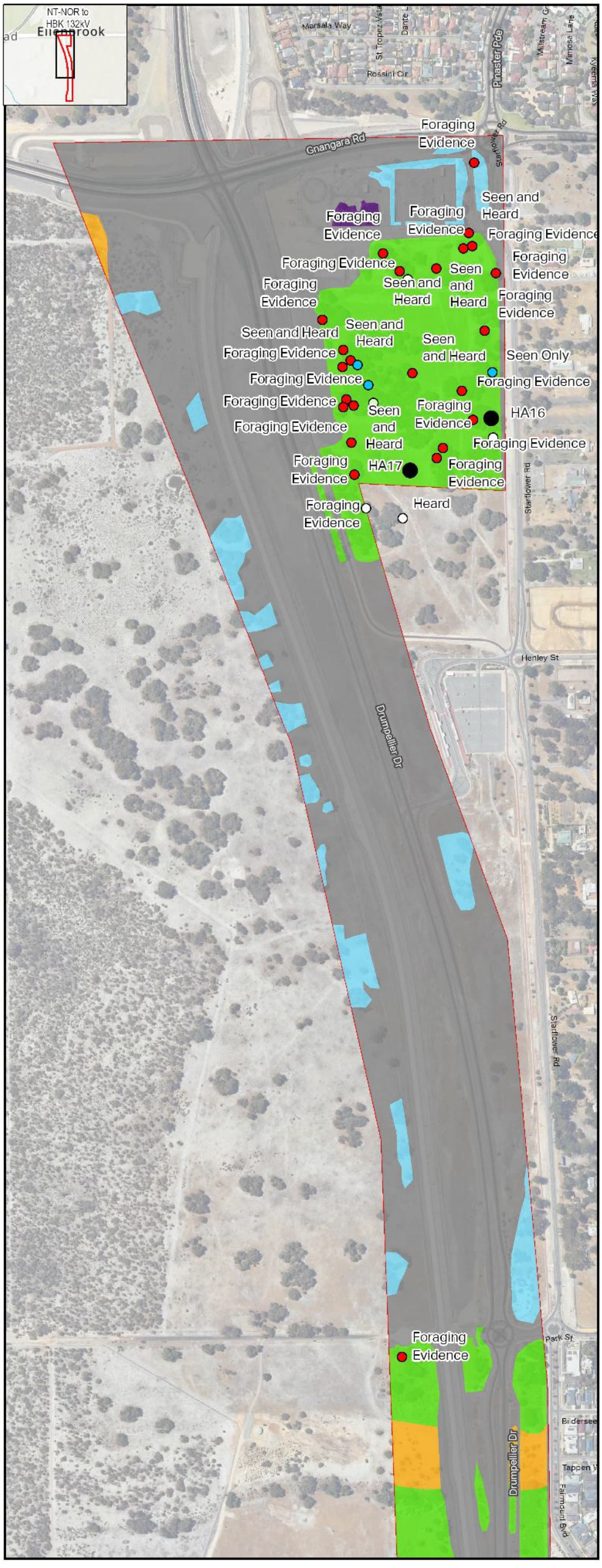

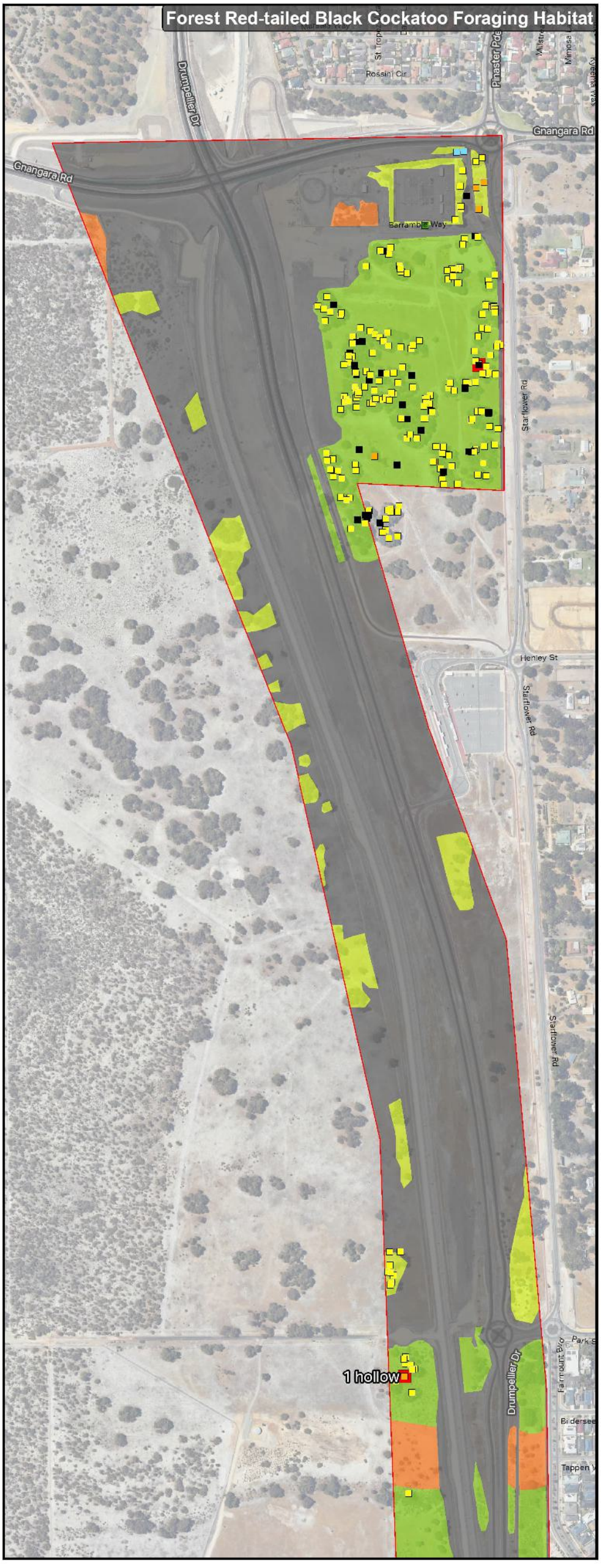

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0 50 100 150 200
metres

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Sources: Layer Credits: World Hillshade: Esri, DeLorme, World Topographic Map: Esri, Intermap, iPC, USGS, Esri, TomTom, Garmin, FAO, METI/NASA, USGS; World Imagery: Maxar, Microsoft; Basemap: Australia: NASA, MGA, USGS/WMS

LEGEND

- Survey Area

Fauna Habitat
- Banksia Woodland
- Eucalyptus Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Black-faced Cuckooshrike
- Carnaby's Cockatoo
- Forest Red-tailed Black Cockatoo
- Quenda

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Low
- Moderate
- Moderate to High

Black Cockatoo Breeding Habitat
- Marri (*Corymbia calophylla*)
- Jarrah (*Eucalyptus marginata*)
- Tuart (*Eucalyptus gomphocephala*)
- Stag (old dead tree, unknown species)
- Introduced
- Tree with Suitable Hollow

Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.22**

A4 size

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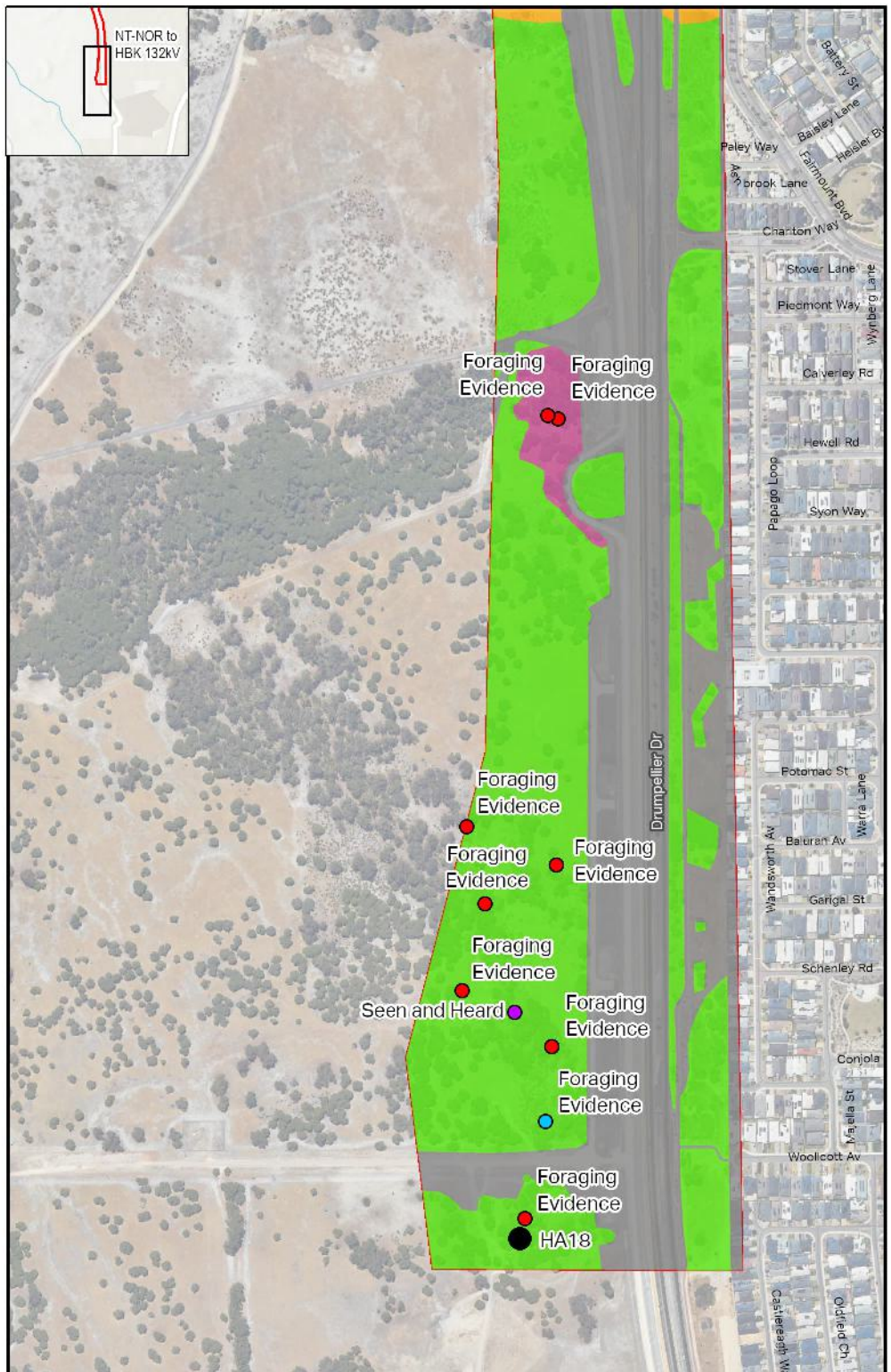

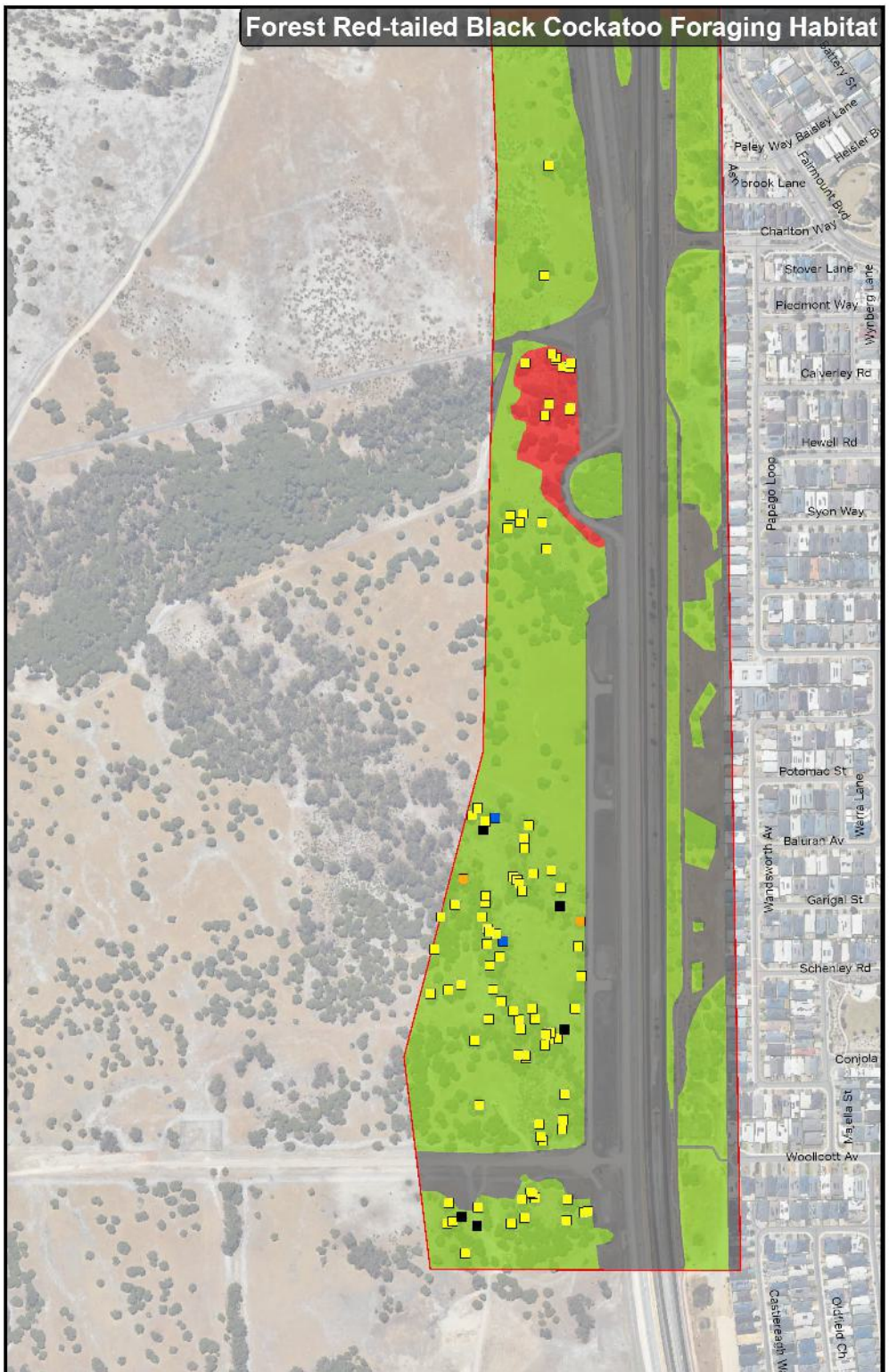

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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

Data Source: Landgate Road Data (c) Landgate and its licensors. This product is provided by and with the permission of the Western Australian Land Information Authority (Landgate) (2010).
Sources: Esri, DeLorme, World Hillshade, Esri, DeLorme, World Topographic Map Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS World Imagery/WorldHillshade/Esri, GeoscienceAustralia, NASA, MGA, USGS/WMS

LEGEND

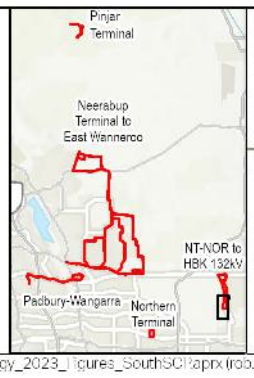
Survey Area

Fauna Habitat
- Banksia Woodland
- Eucalyptus Woodland
- Melaleuca Woodland
- Cleared
- Fauna Habitat Sample Sites

Significant Fauna
- Forest Red-tailed Black Cockatoo
- Quenda
- Rainbow Bee-eater

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate to High

Black Cockatoo Breeding Habitat
- Marri (*Corymbia calophylla*)
- Jarrah (*Eucalyptus marginata*)
- Coastal Blackbutt (*Euc. todtiana*)
- Stag (old dead tree, unknown species)



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **9.23**

A4 size

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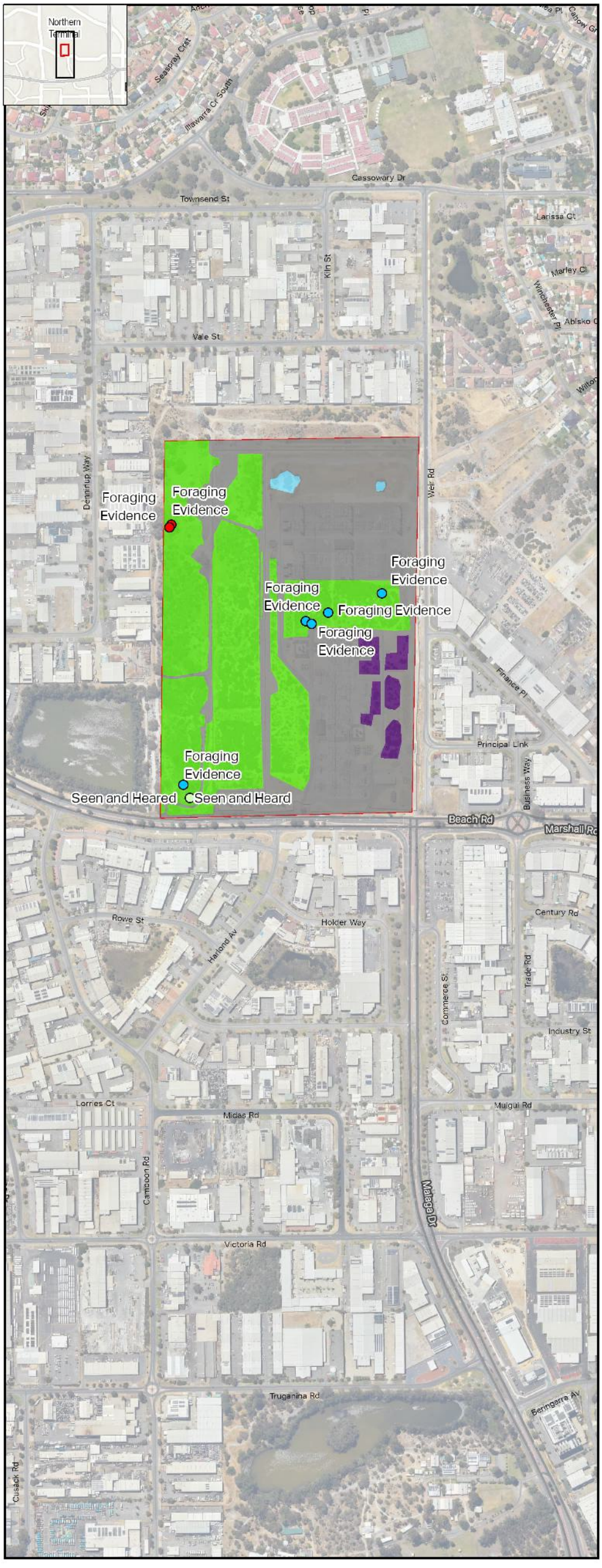

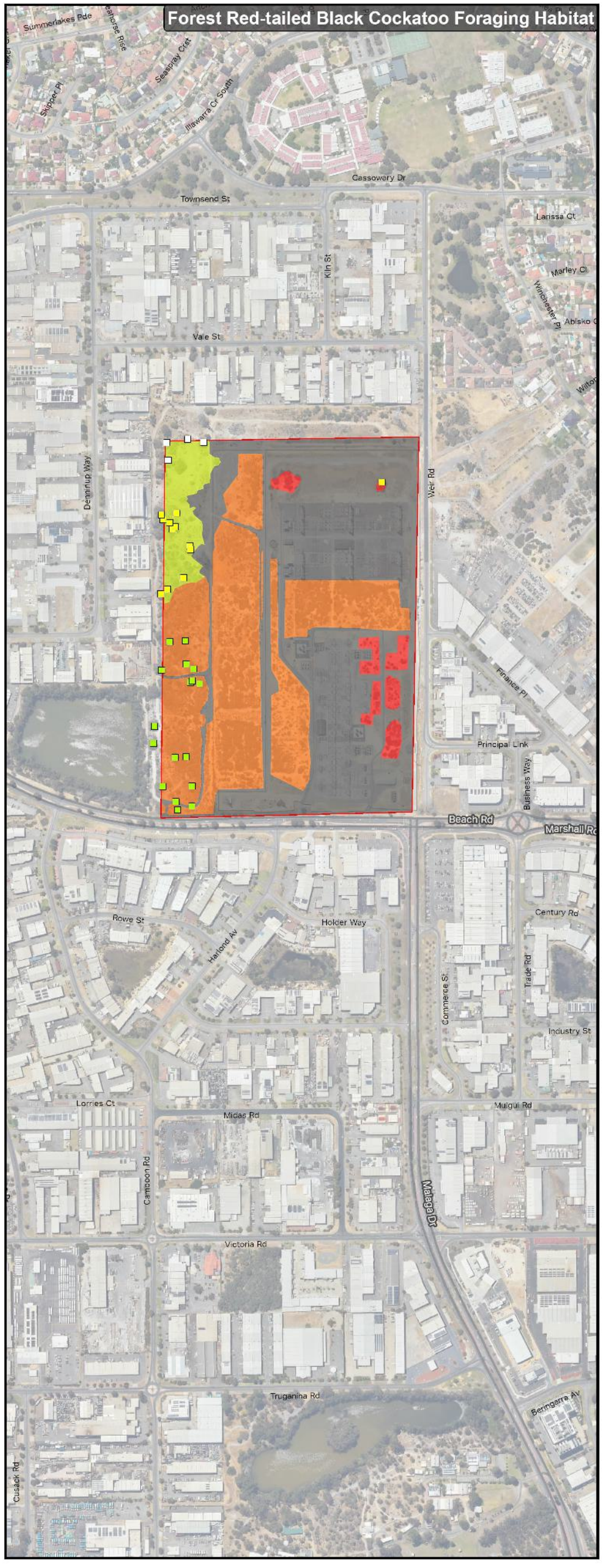

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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MGA_1966_World_Geographic_Mean_Zone_Tolerance: PAO, METI/NASA, USGS
World_Imagery/World_Hillshade/Esri_Community_Maps_Contributors: NASA, MGA, USGS, VITO

LEGEND

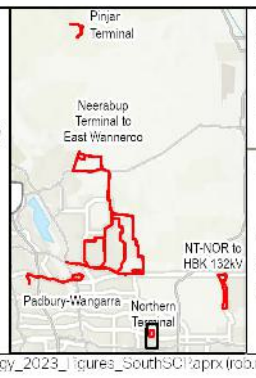
Survey Area

Fauna Habitat
- Eucalyptus Woodland
- Mixed Shrubland
- Trees Over Cleared
- Cleared

Significant Fauna
- Black-faced Cuckooshrike
- Forest Red-tailed Black Cockatoo
- Quenda
- Rainbow Bee-eater

Forest Red-tailed Black Cockatoo Foraging Habitat Quality (Bamford, 2020)
- None
- Negligible
- Low
- Moderate

Black Cockatoo Breeding Habitat
- Marri (*Corymbia calophylla*)
- Flooded Gum (*Euc. rudis*)
- Other



Significant Fauna and Fauna Habitat, including *Calyptorhynchus* sp. foraging

Northern Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 9.24

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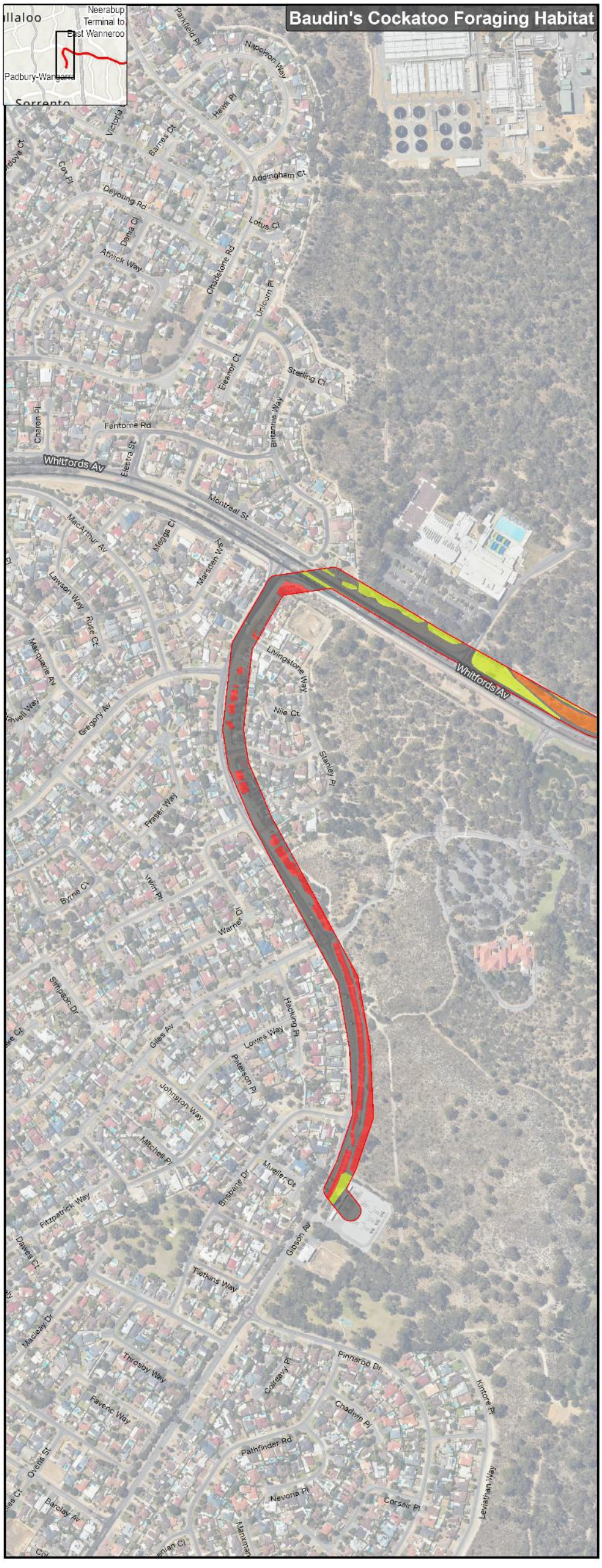

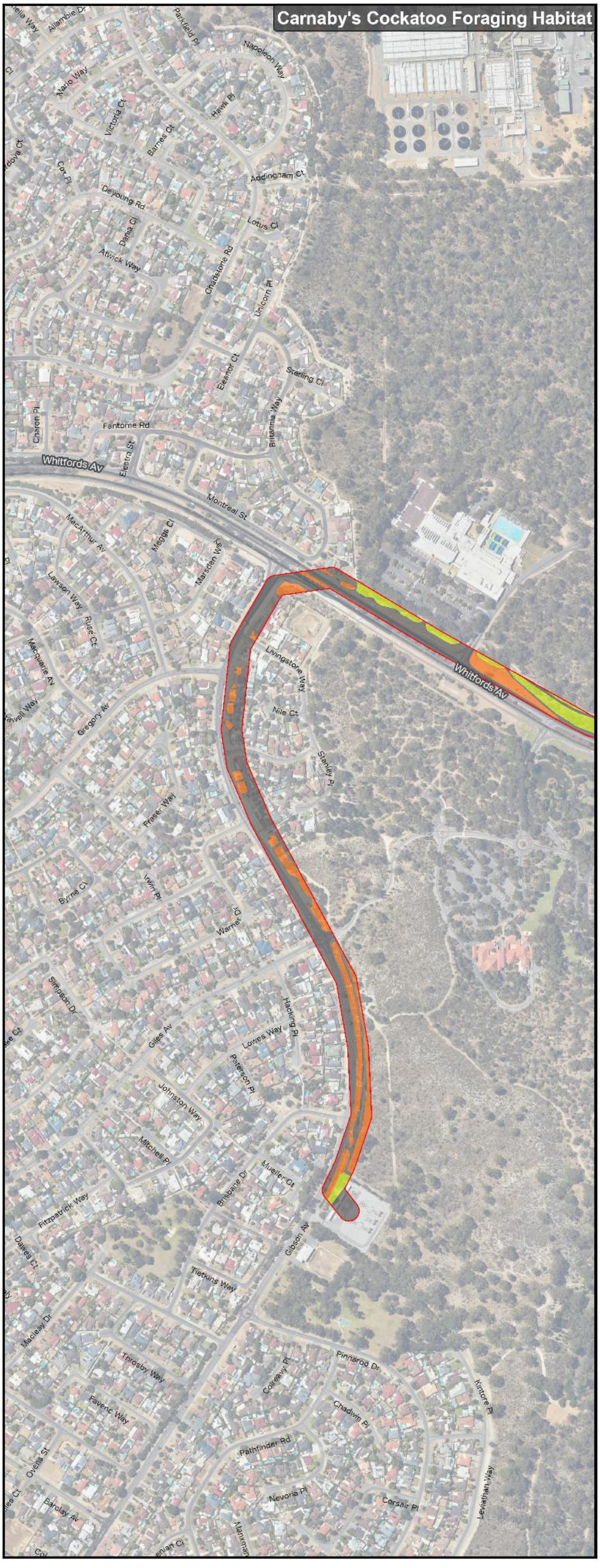

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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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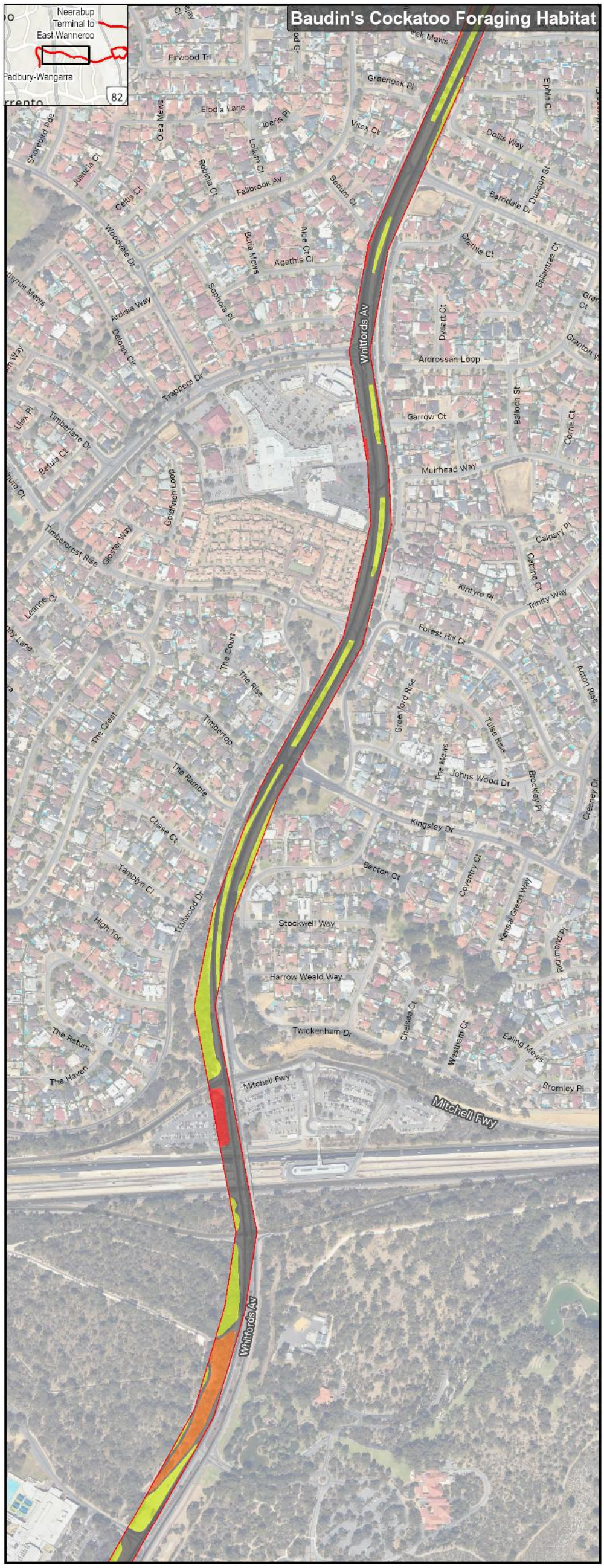

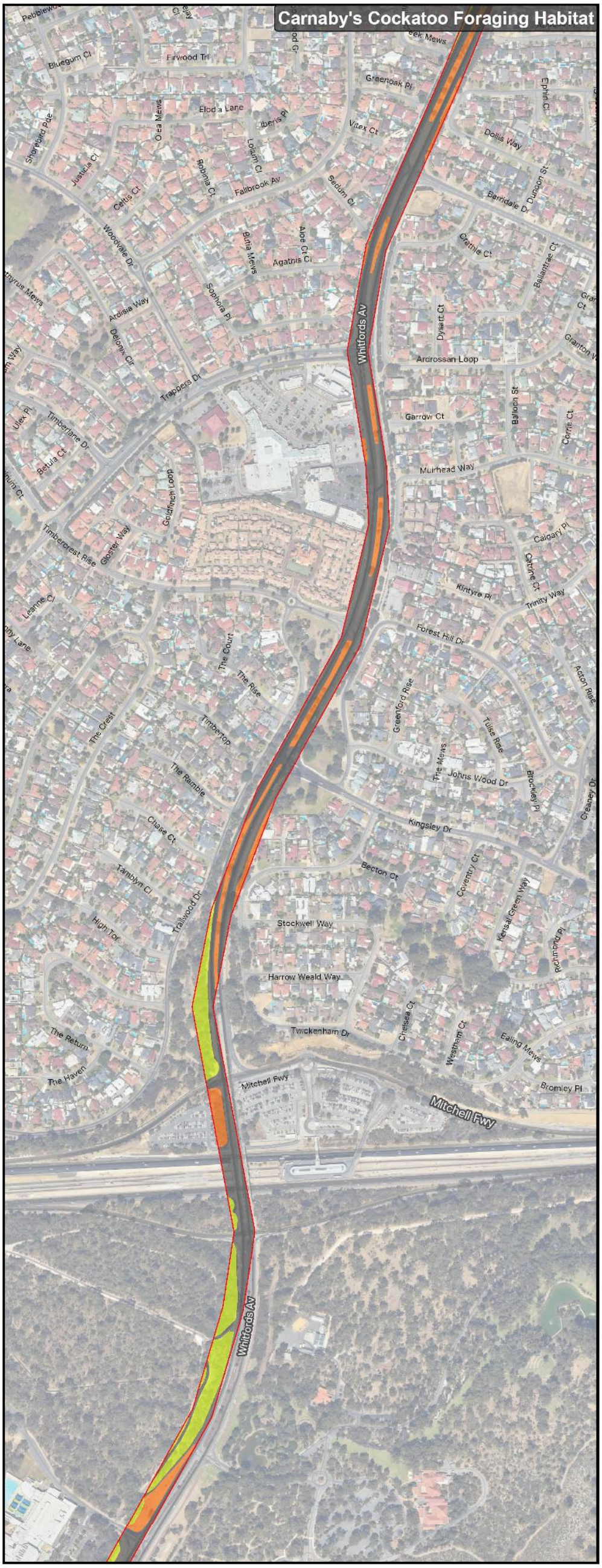

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0 50 100 150 200 metres

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LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low
- Moderate

Black Cockatoo Foraging (*Zanda* sp.)

Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.2

A4 size

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLRT\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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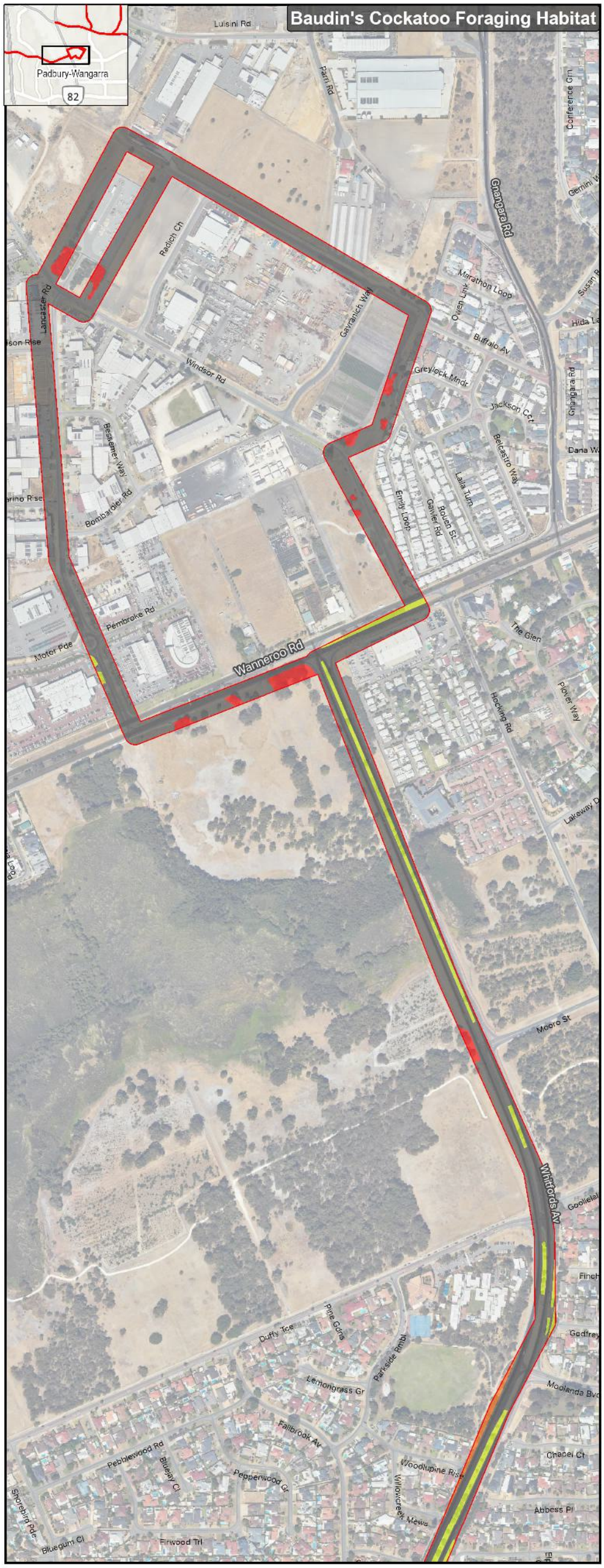

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0 50 100 150 200 metres

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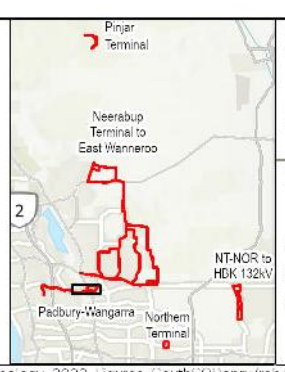
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Padbury-Wangarra

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.3

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSCI.aprx (rob.mcgregor)
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0 50 100 150 200
metres

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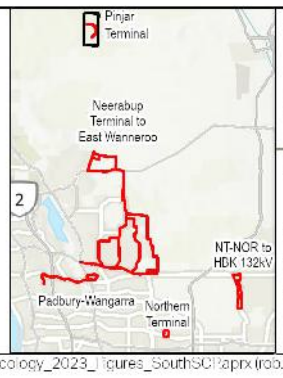
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Pinjar Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.4

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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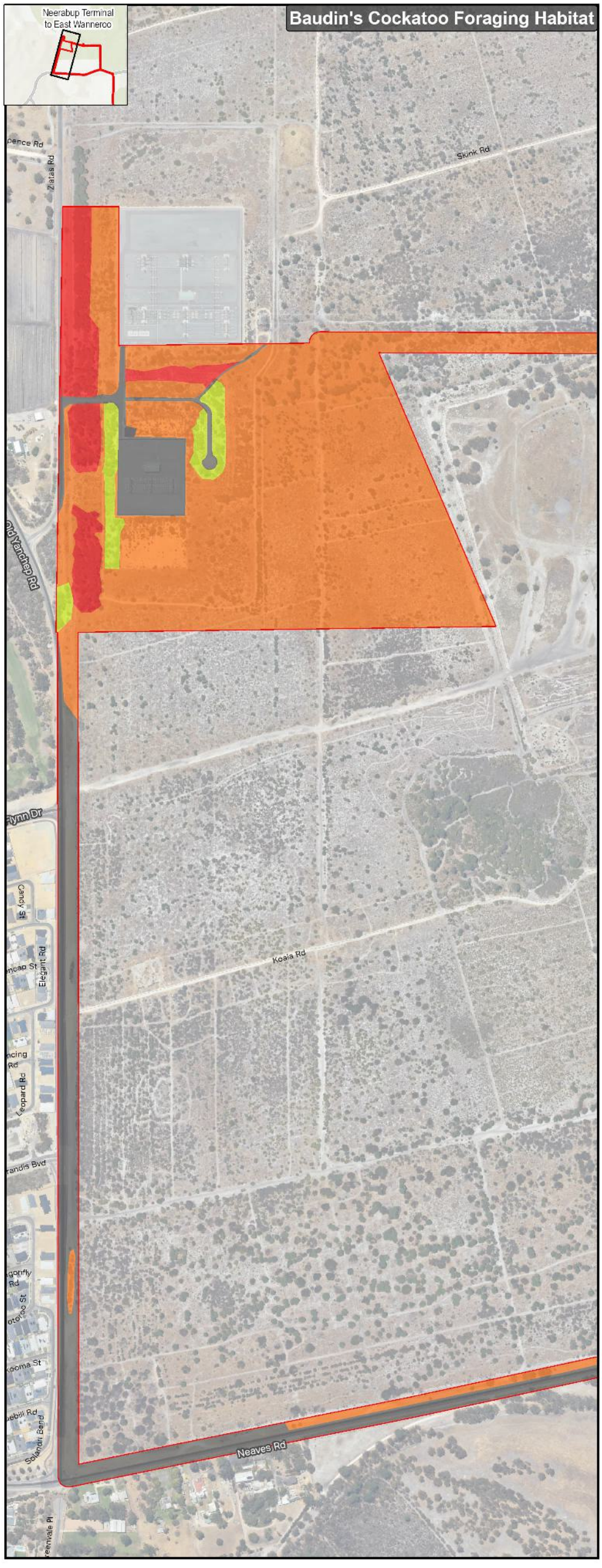

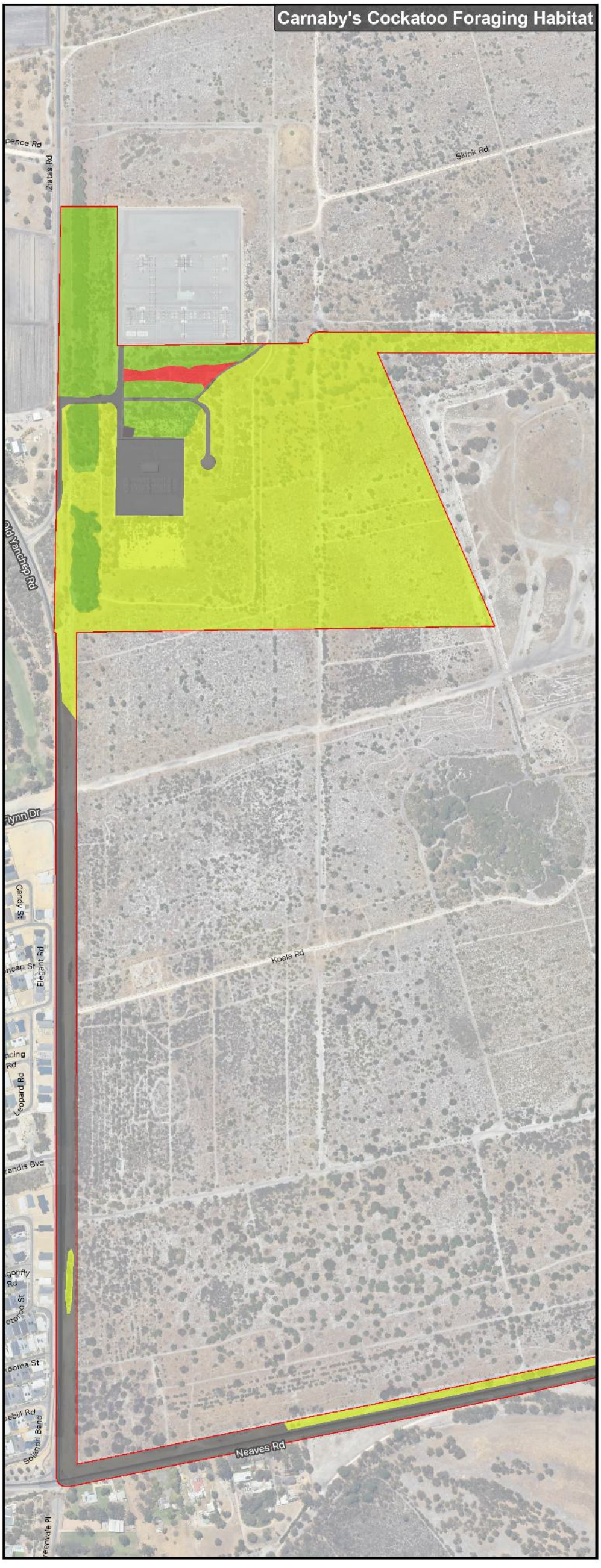

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0 50 100 150 200 metres

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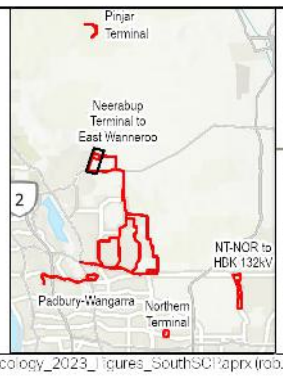
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Moderate
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.5**

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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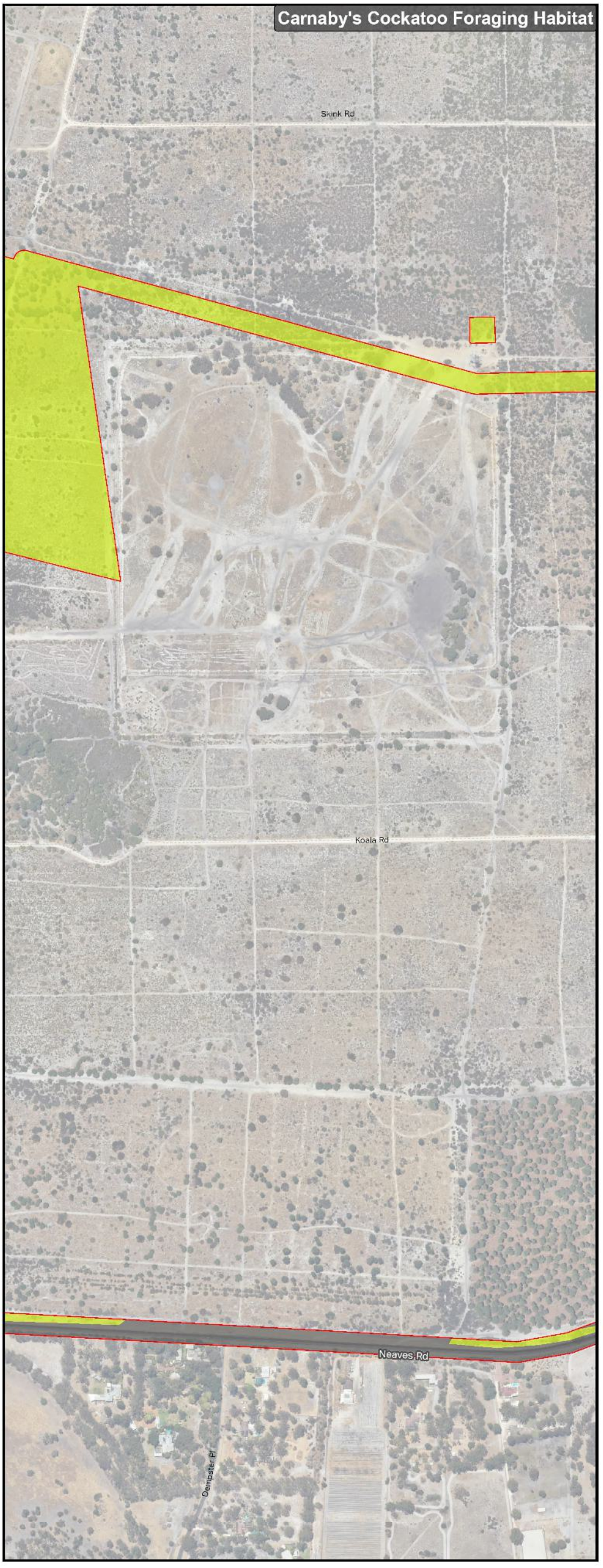

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(when printed at A4)

0 50 100 150 200
metres

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0 50 100 150 200
metres

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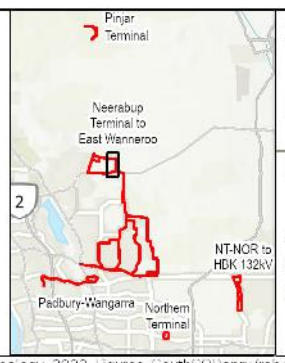
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.7**

A4 size

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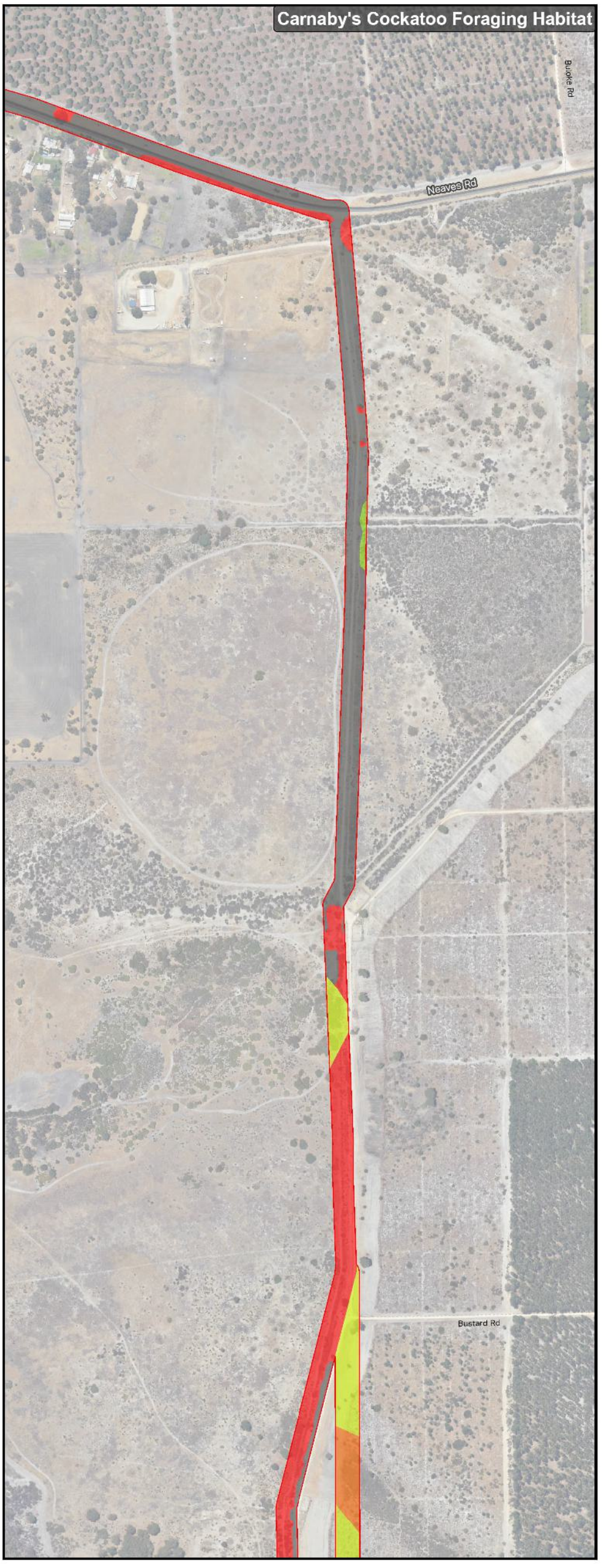

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(when printed at A4)

0 50 100 150 200
metres

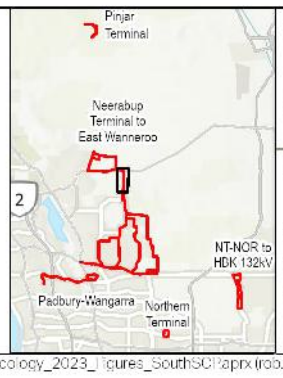
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.8**

A4 size

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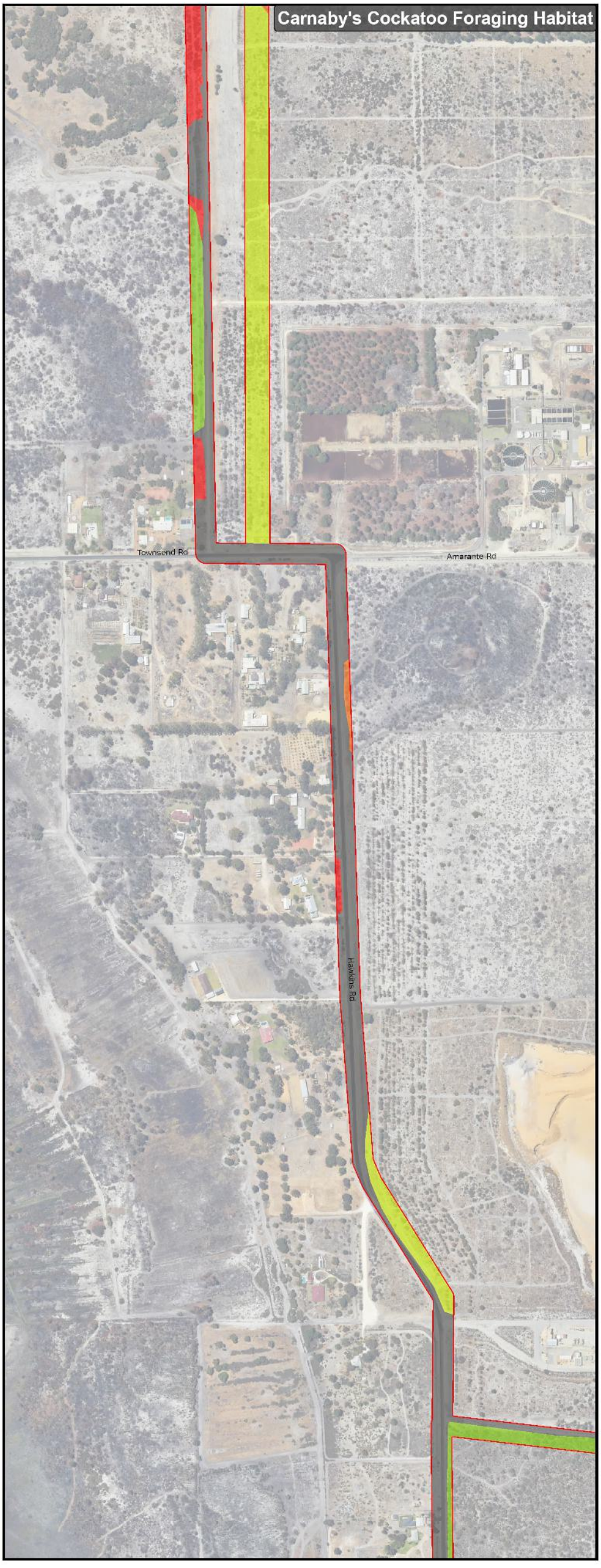

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metres

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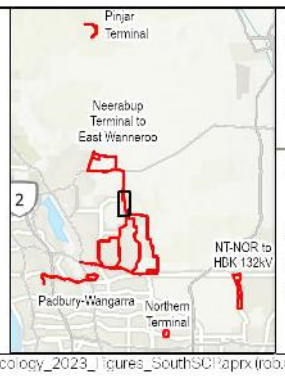
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.9**

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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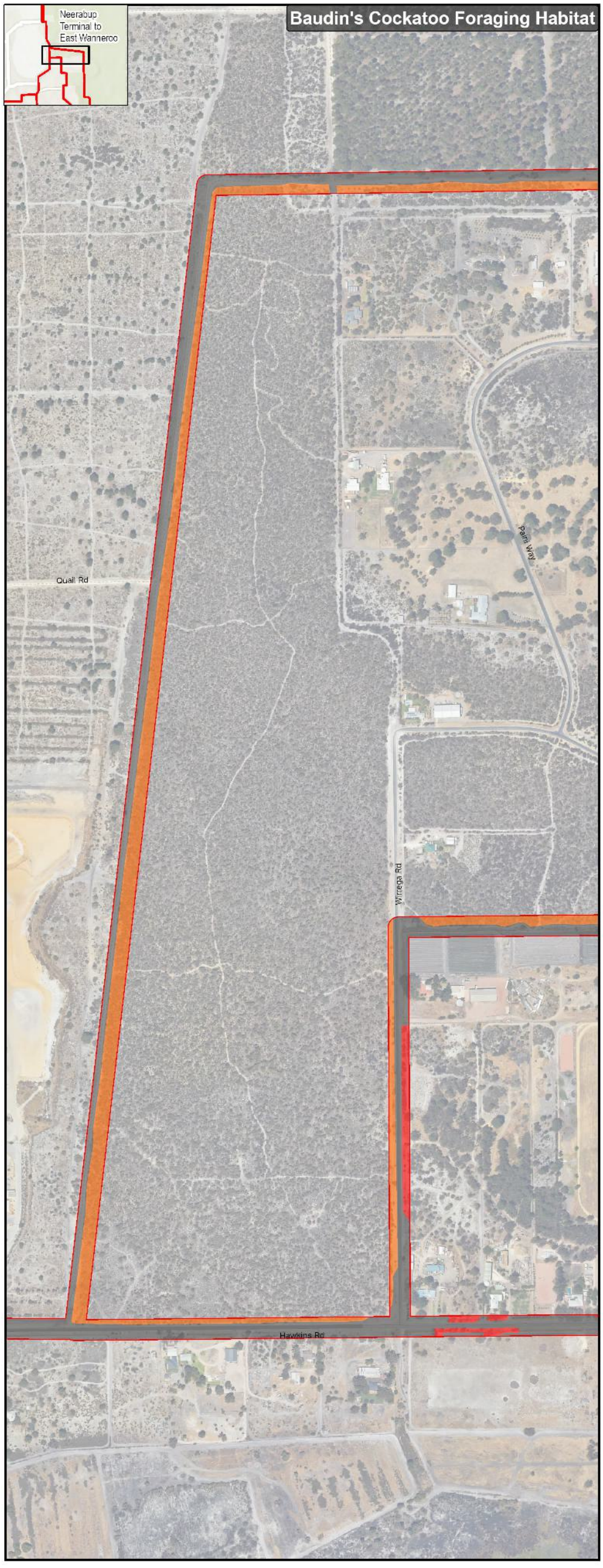

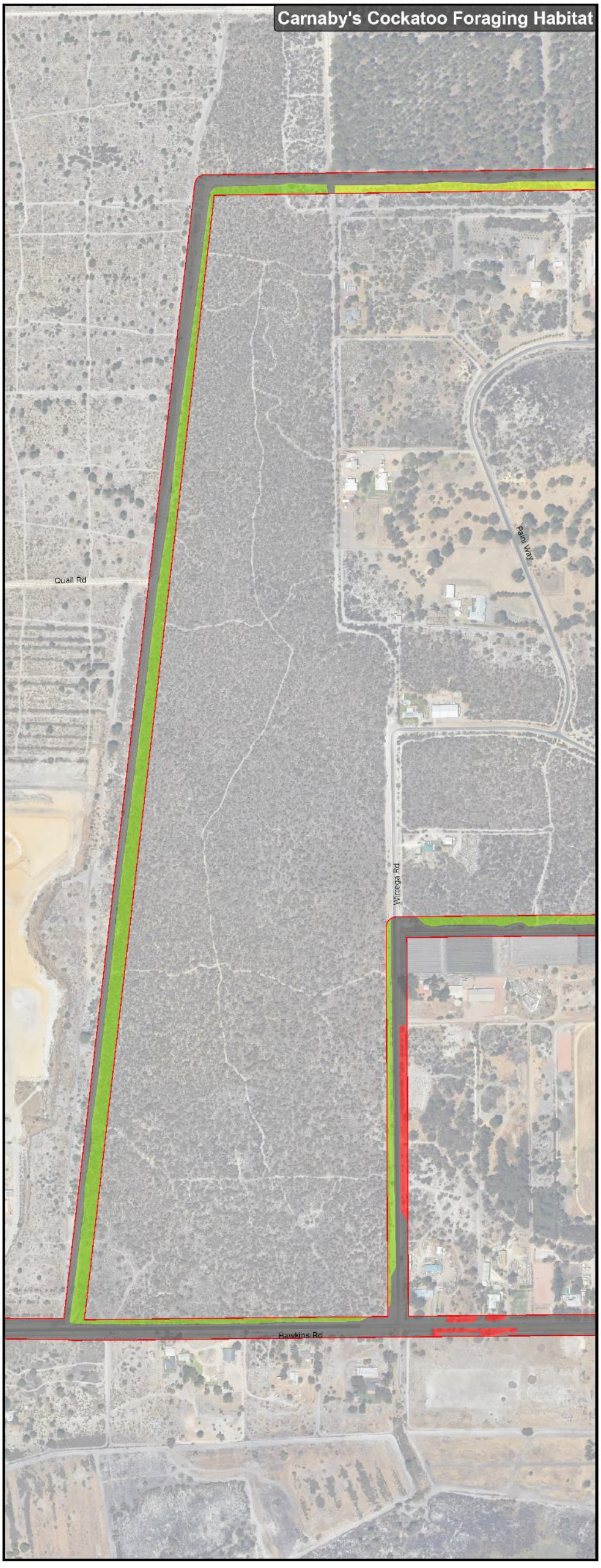

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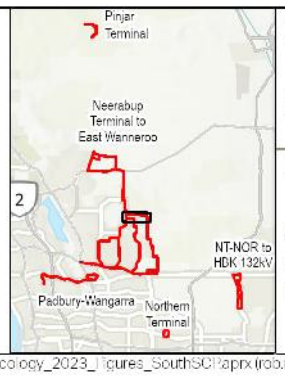
LEGEND

- Survey Area
- Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Low
- Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Moderate
  - Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.10**

A4 size

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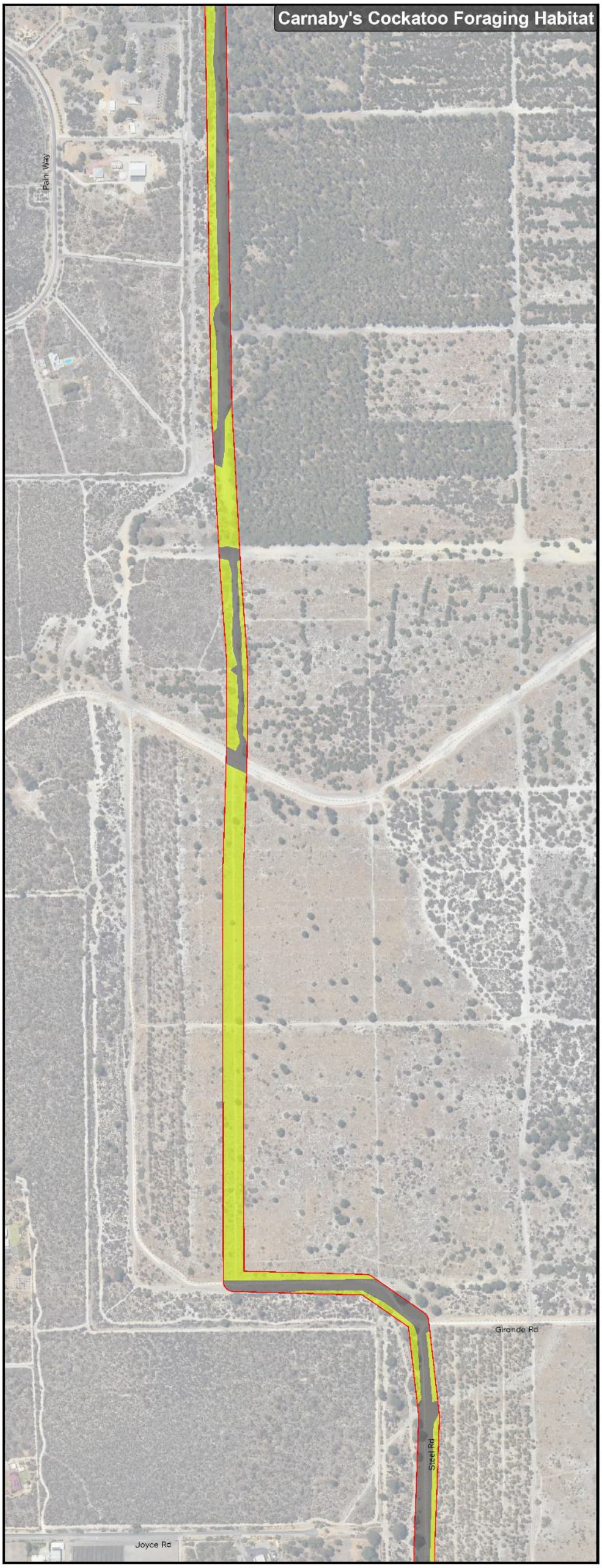

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N
1:7,500
(when printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

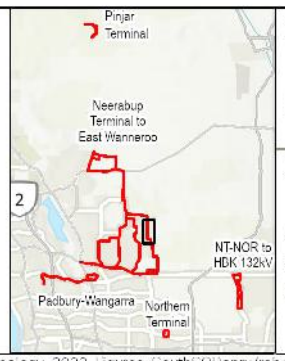
DATA SOURCES: Base data is sourced from various third party data sets with the permission of the Western Australian Land Information Authority (trading as Landgate (2019).
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community, Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri Community Maps Contributors, Map data © OpenStreetMap, Microsoft, Esri Community Maps Contributors, Map layer by Esri, MCTI/MGA, USGS/World Topographic Map Est, Esri Pol, Garmin, Foursquare FAO, MCTI/MGA, USGS/World Imagery/Maxar/World Hillshade/Esri, DeLorme/Australia, NASA, MGA, USGS/WMS

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.11**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig10_NRLP_South_Faunal lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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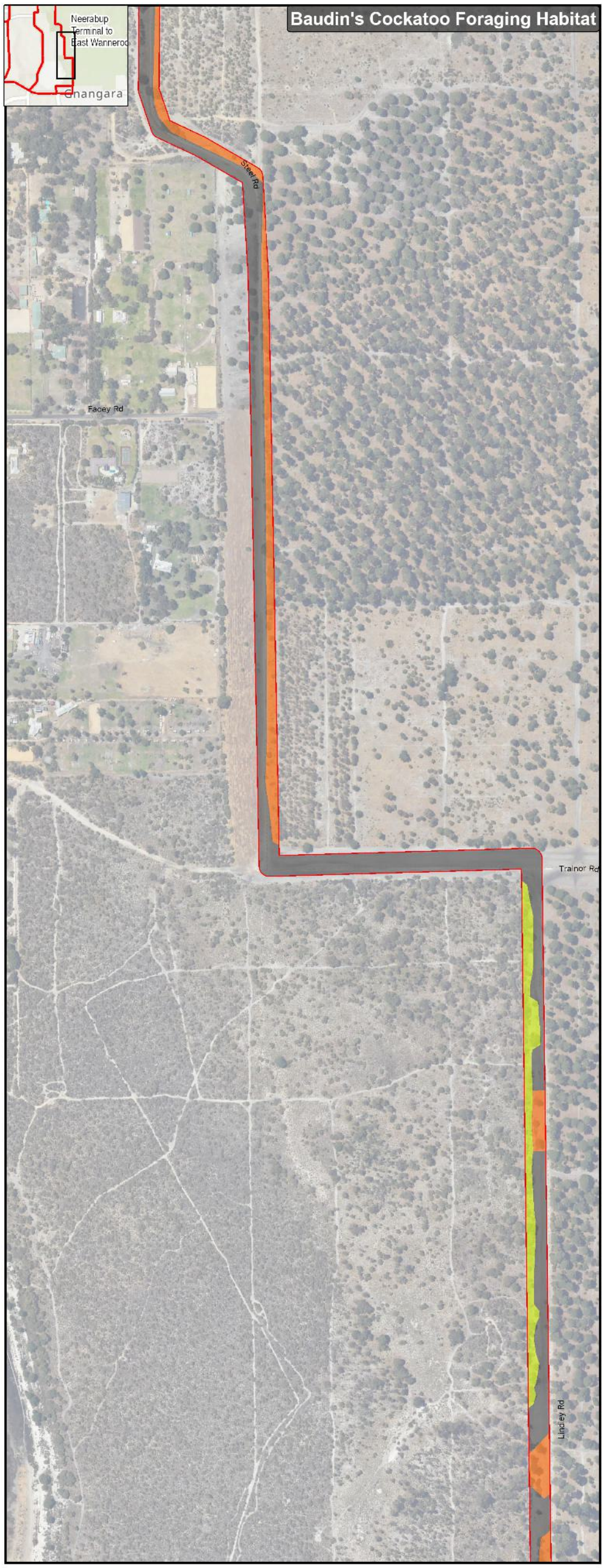

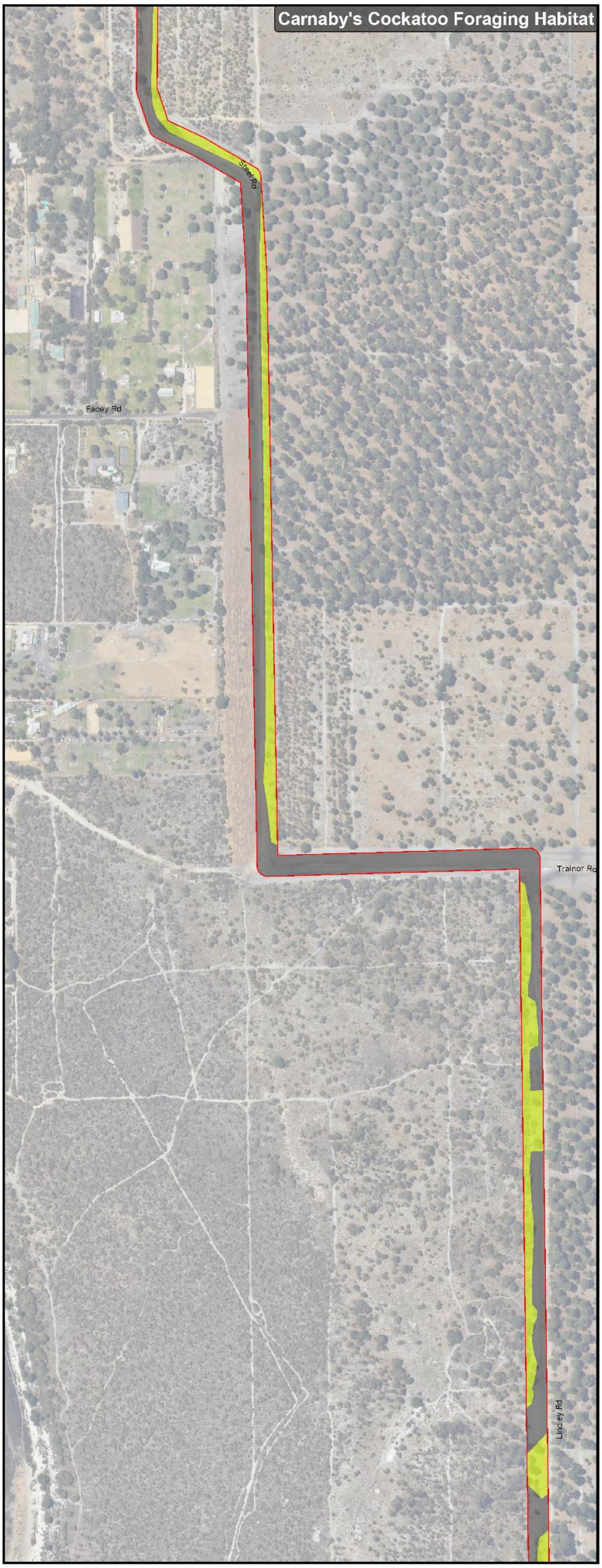

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N
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0 50 100 150 200
metres

GDA2020 MGA ZONE 50

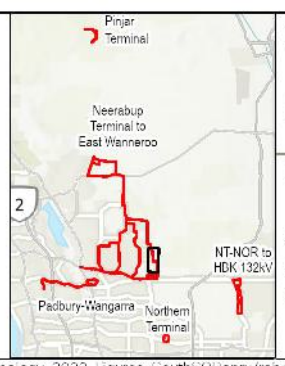
DATA SOURCES: Base Data (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2019)
Service Layer Credits: World Hillshade: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
World Topographic Map: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Imagery: World Hillshade: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.12**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig10_NRLP_South_Layout_lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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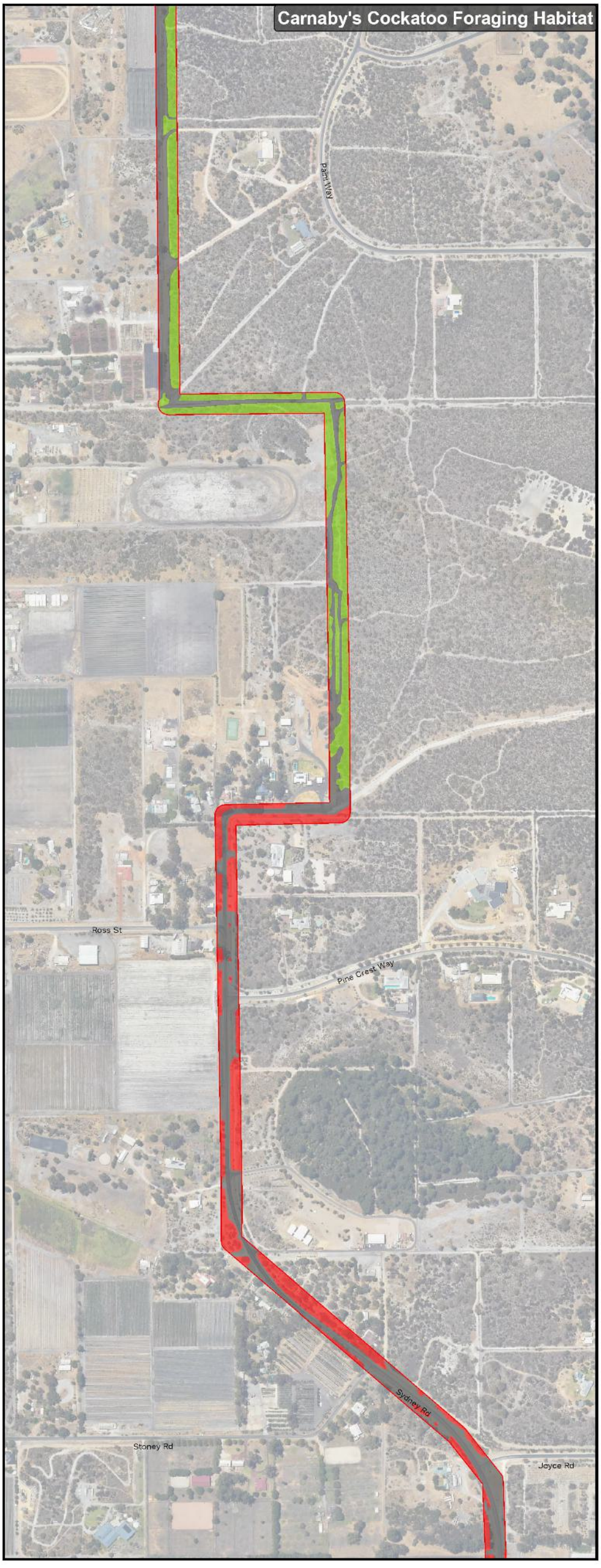

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N
1:7,500
(when printed at A4)

0 50 100 150 200
metres

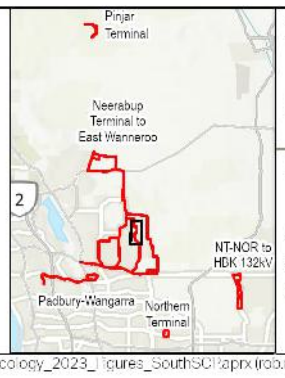
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.13**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig10_NRLP_South_Journal lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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0 50 100 150 200 metres

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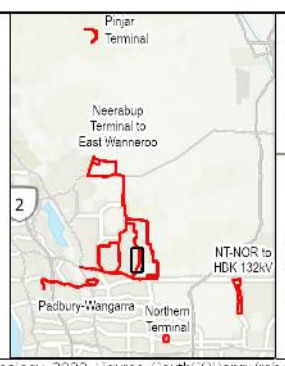
Vector layer Credits: World Hillshade: Esri, DeLorme, World Topographic Map: Esri, Intermap, iPC, USGS, NPS, NRCAN, MCTI/MGA, USGS/World Topographic Map Ref., Tom Tom, Garmin, Foursquare, FAO, MCTI/MGA, USGS/World Imagery/MetaWorld Hillshade Ref., Geoscience Australia, NASA, MGA, USGS/WMS

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.14**

Project: \\na.aecomnet.com\lfs\AUPAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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0 50 100 150 200 metres

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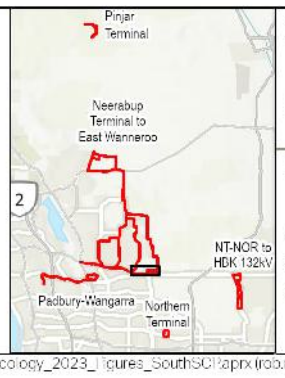
LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.15

A4 size

Data: © AECOM, Main Roads (c) Roads as at 01/07/2021 displayed by and with the permission of the Western Australian Land Information Authority (trading as Landgate) (2019).
Sources: Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, MCTM/AGA, J56GWorld Topographic Map Cache, Esri Community Maps Contributors, Garmin, Foursquare, FAO, MCTM/AGA, J56GWorld Imagery/MetaWorld Hillshade Dark, GeoscienceAustralia, NASA/MGA, J56GWMS

Project: \\na.aecomnet.com\ifs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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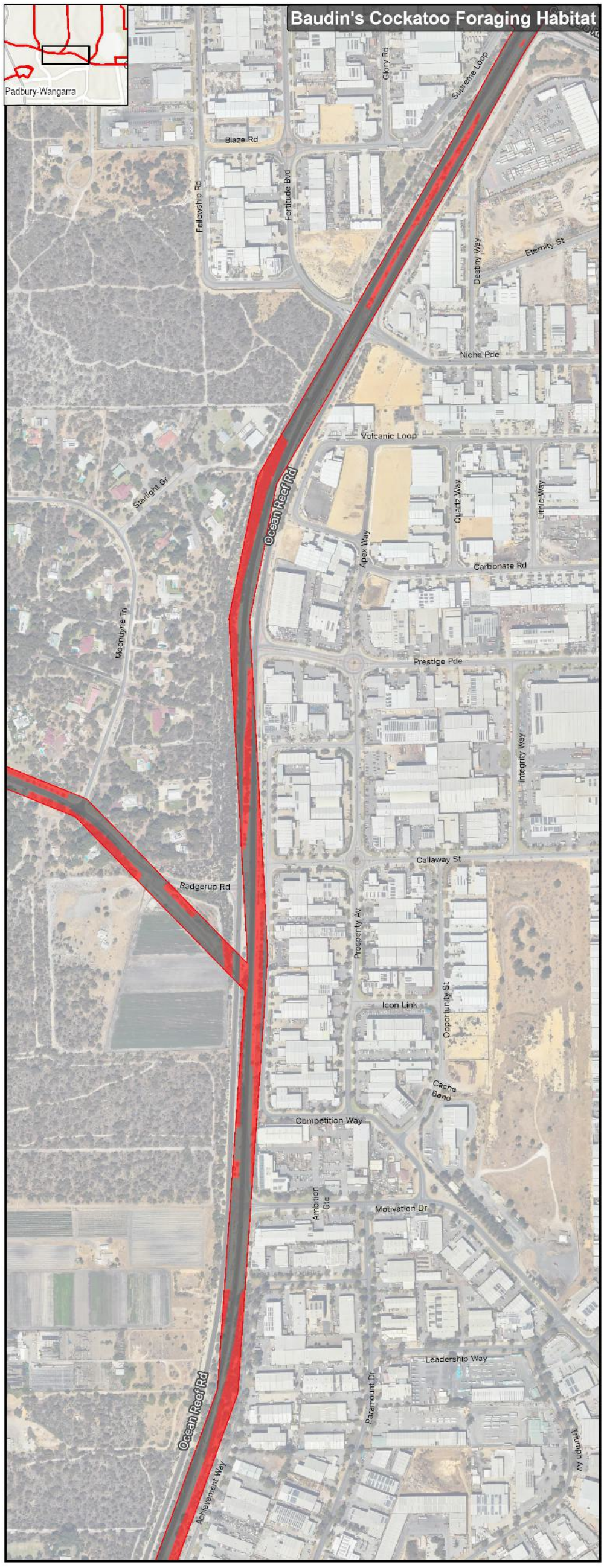

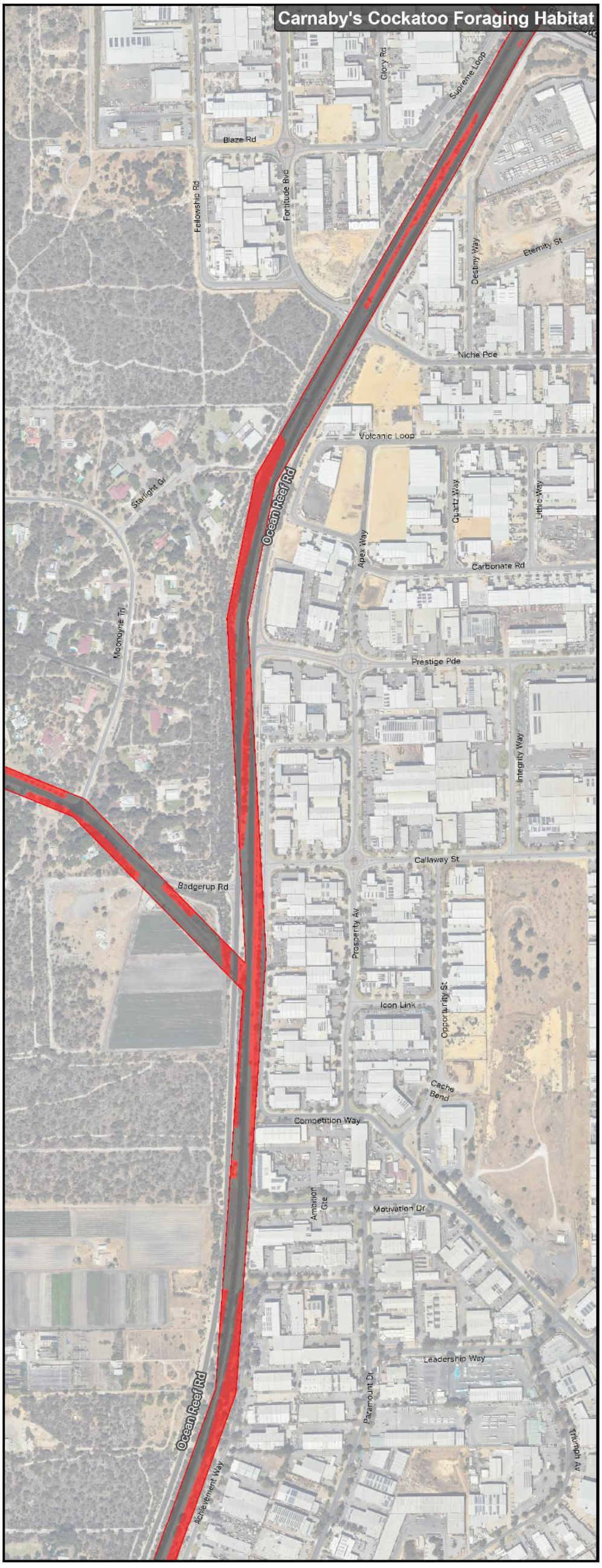

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0 50 100 150 200 metres

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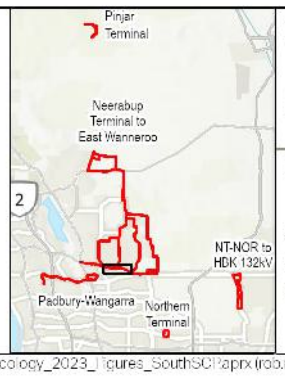
Sources: Esri, DeLorme, World Hillshade, Esri, DEA, Maxar, Topographic Map Base, Boundaries, Canvas, Reference, MCTI/NASA, USGS/World Topographic Map Cat, Tom Tom, Garmin, Foursquare, FAO, MCTI/NASA, USGS/World Imagery/Maxar World Hillshade Cat, Geoscience Australia, NASA, NGA, USGS/WMS

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.16**

Project: \\na.aecomnet.com\lfs\APAC\Perth-AJP\LR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
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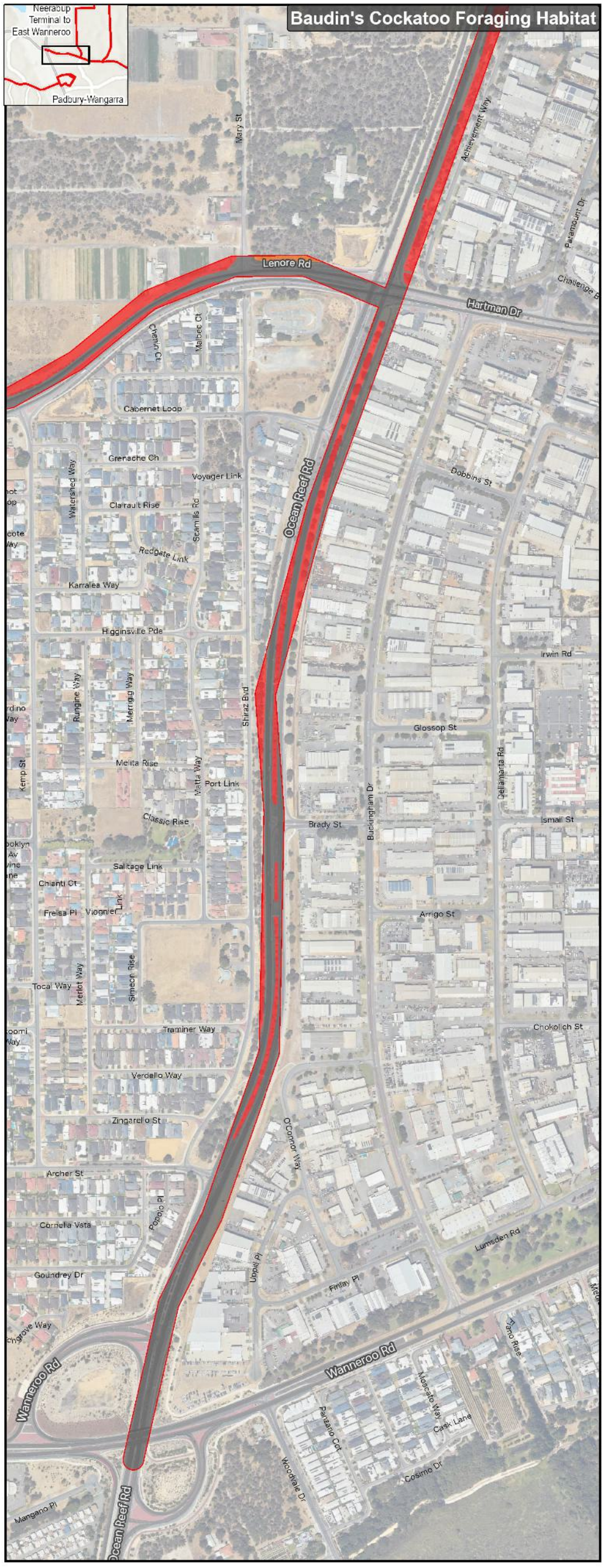

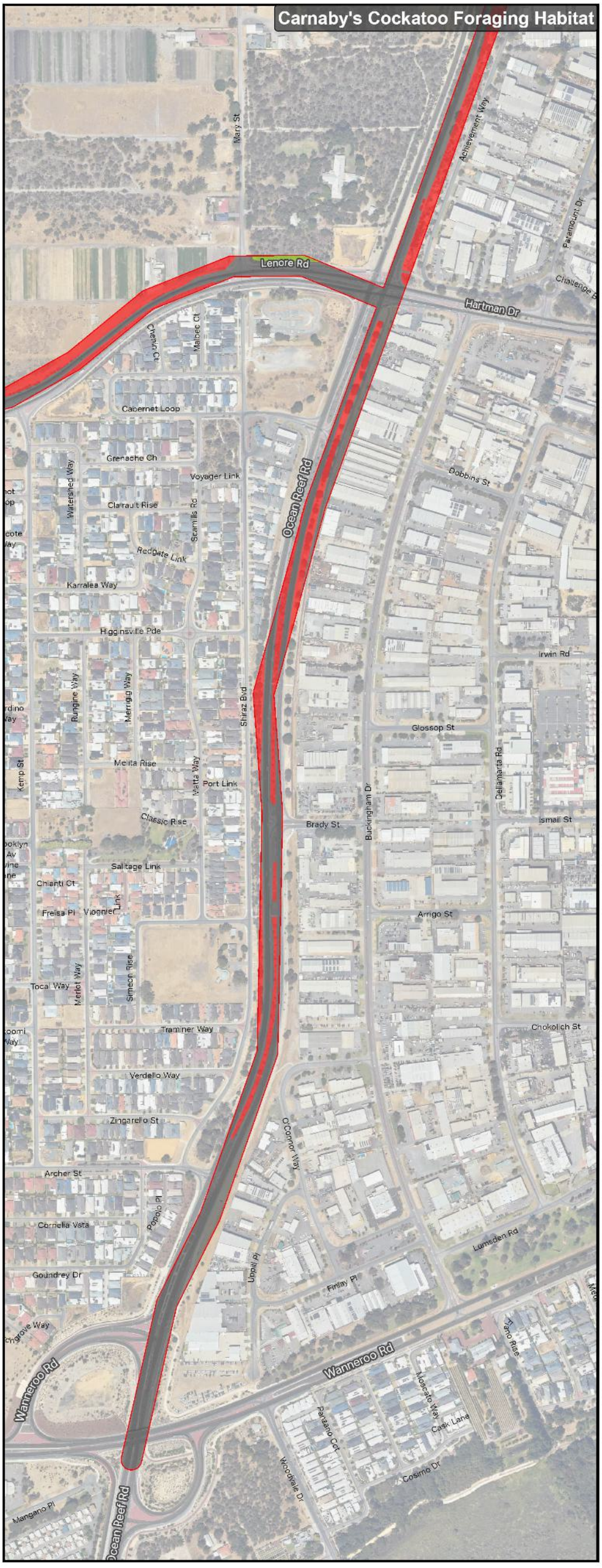

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0 50 100 150 200 metres

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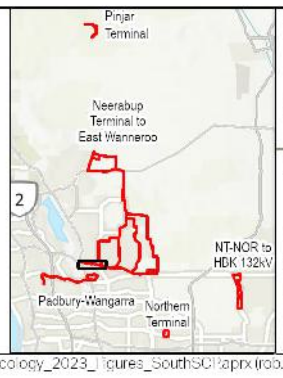
Basemap: Esri, DeLorme, World Hillshade, and ©2024 Maxar, Topographic Map Layer: Esri, Garmin, Foursquare, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community, MCTI/NASA, USGS, World Topographic Map Cache, Garmin, Foursquare, TAO, MCTI/NASA, USGS, World Imagery, Maxar, World Hillshade Cache, Geoscience Australia, NASA, MGA, USGS, WMS

LEGEND

- Survey Area
- Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Low
- Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.17**

A4 size

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC.aprx (rob.mcgregor)
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0 50 100 150 200 metres

GDA2020 MGA ZONE 50

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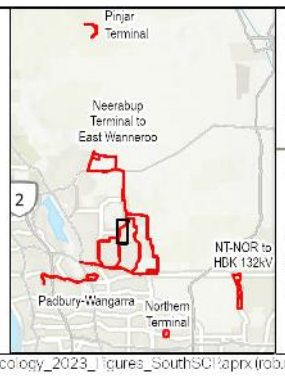
Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

LEGEND

- Survey Area
- Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Low
- Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.18

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (robumcgregor)
Layout: G60713462_Fig10_NRLP_South_Faunal lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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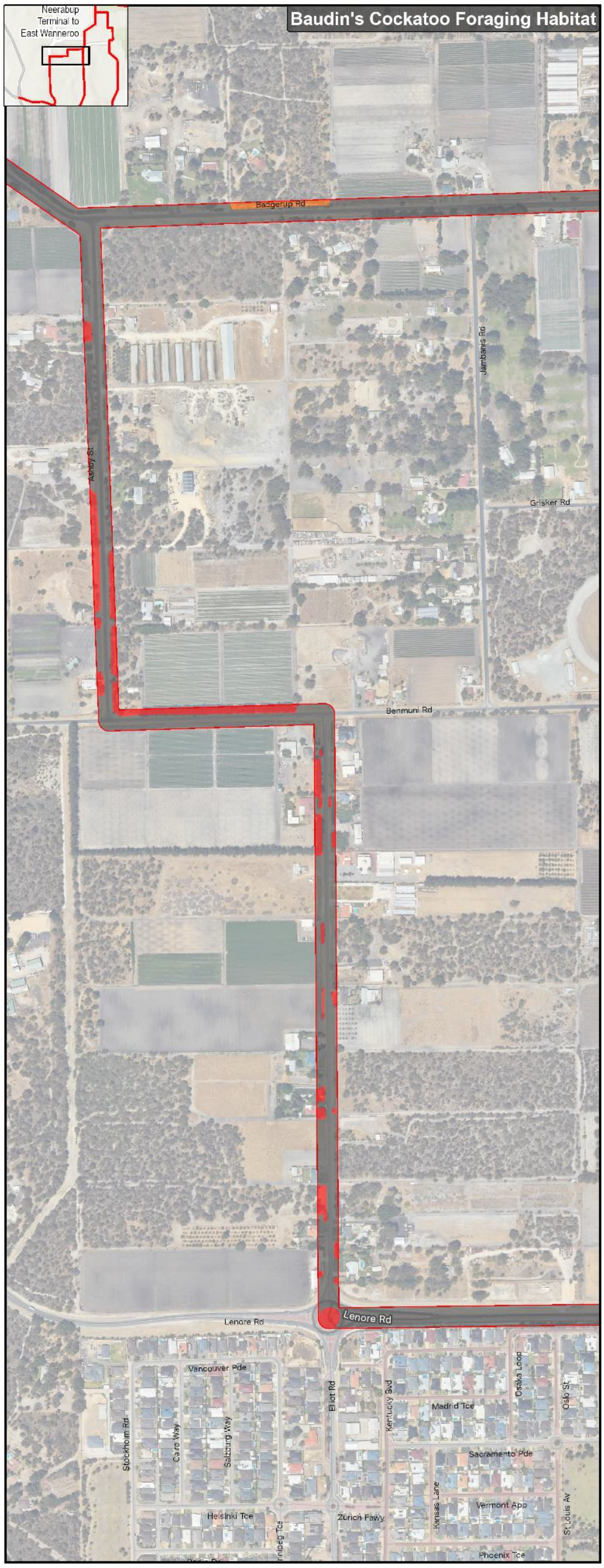

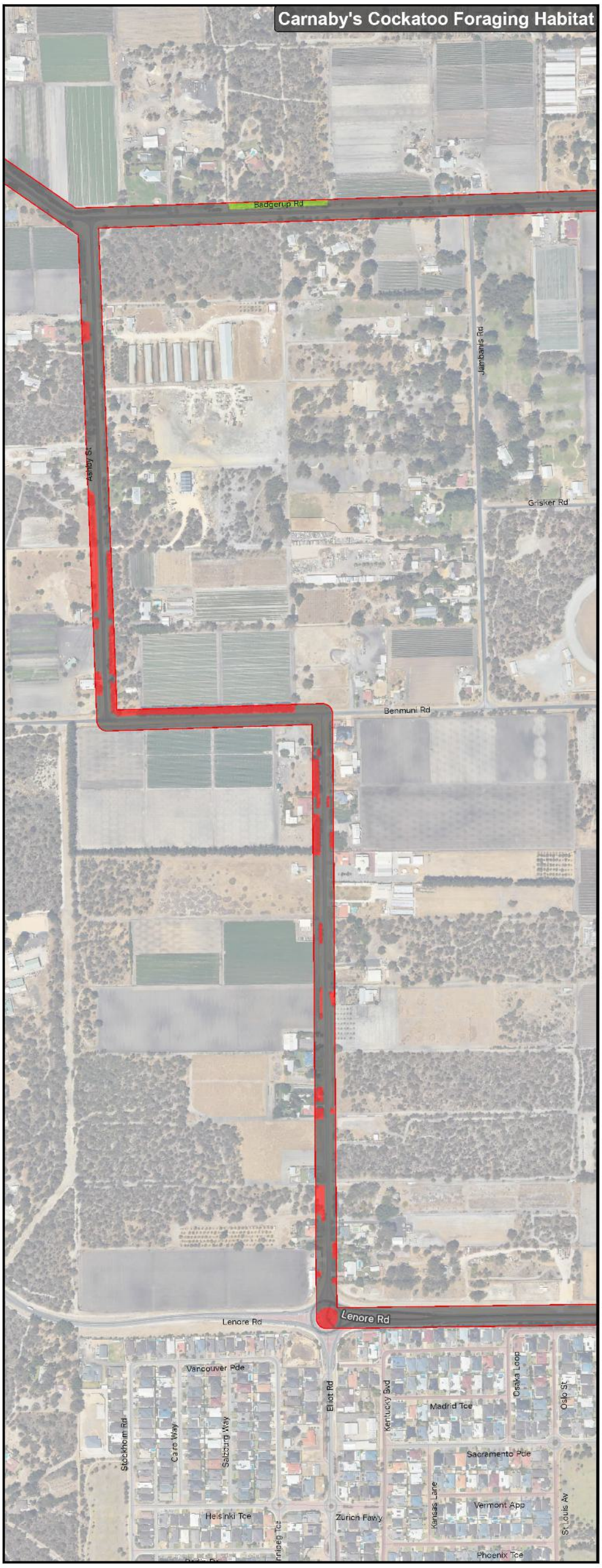

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1:7,500 (when printed at A4)

0 50 100 150 200 metres

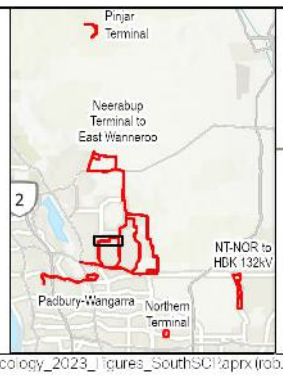
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.19

Project: \\na.aecomnet.com\lfs\APAC\Perth-AU\PLR1\Legacy\Projects\607x\60713462_NRLP_Ecology_2023\900_CAD_GIS\920_GIS_NRLP\02_MXD_APRX\60713462_NRLP_Ecology_2023_Figures_SouthSC1.aprx (rob.mcgregor)
Layout: G60713462_Fig10_NRLP_South_Journal lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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N

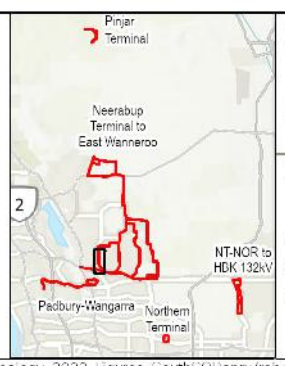
1:7,500 (when printed at A4)

0 50 100 150 200 metres

GDA2020 MGA ZONE 50

LEGEND

- Survey Area
- Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Low
- Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
  - Moderate to High



Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.20

A4 size

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1:7,500
(When printed at A4)

0 50 100 150 200
metres

GDA2020 MGA ZONE 50

LEGEND
- Survey Area
- Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible
- Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
  - None
  - Negligible

Black Cockatoo Foraging (*Zanda* sp.)

Neerabup Terminal to East Wanneroo

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure 10.21

A4 size

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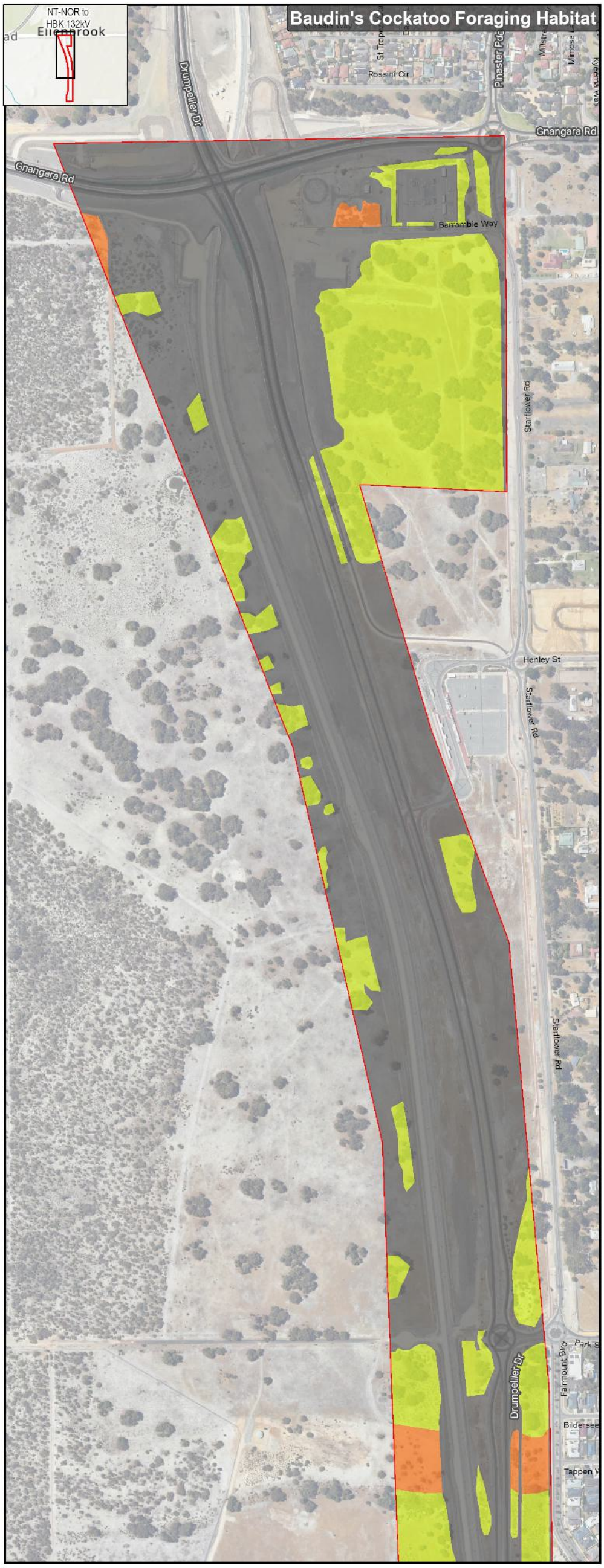

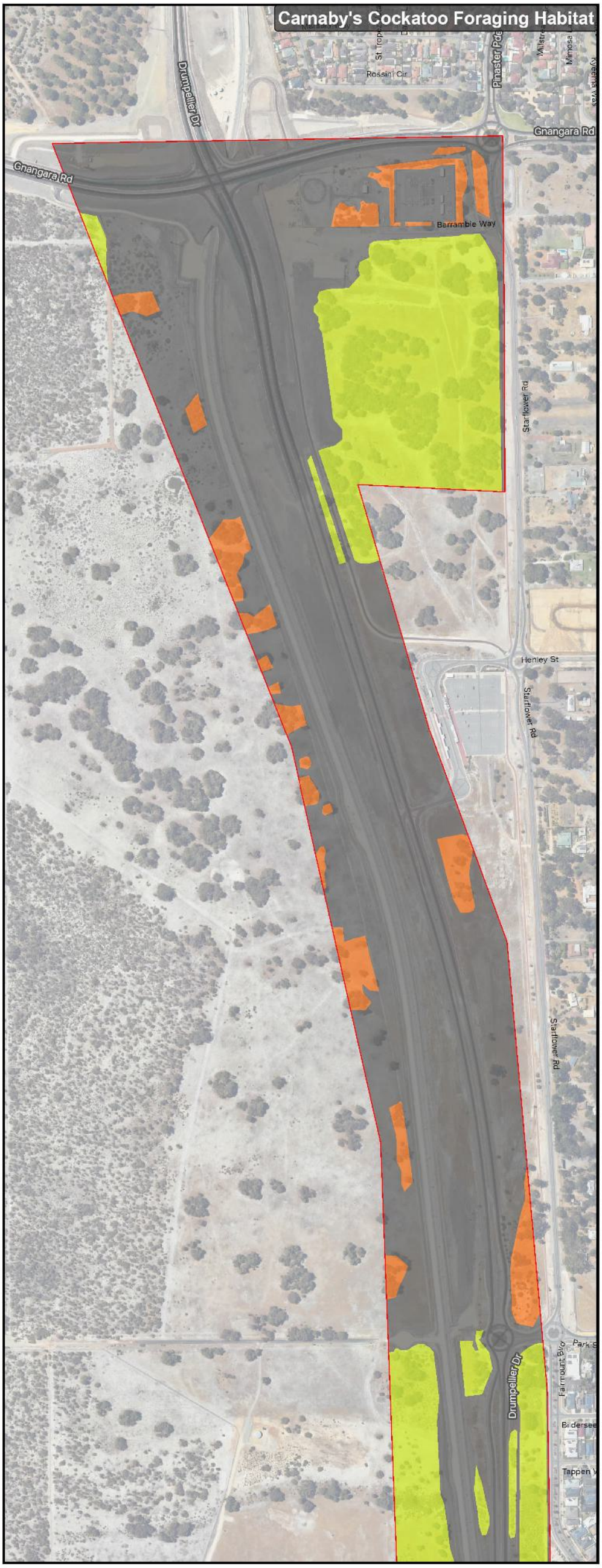

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(when printed at A4)

0 50 100 150 200
metres

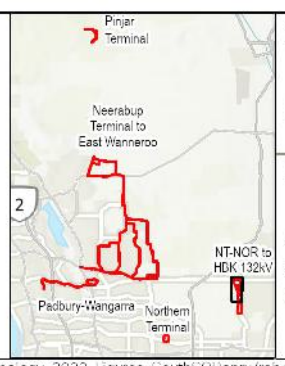
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Low
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.22**

A4 size

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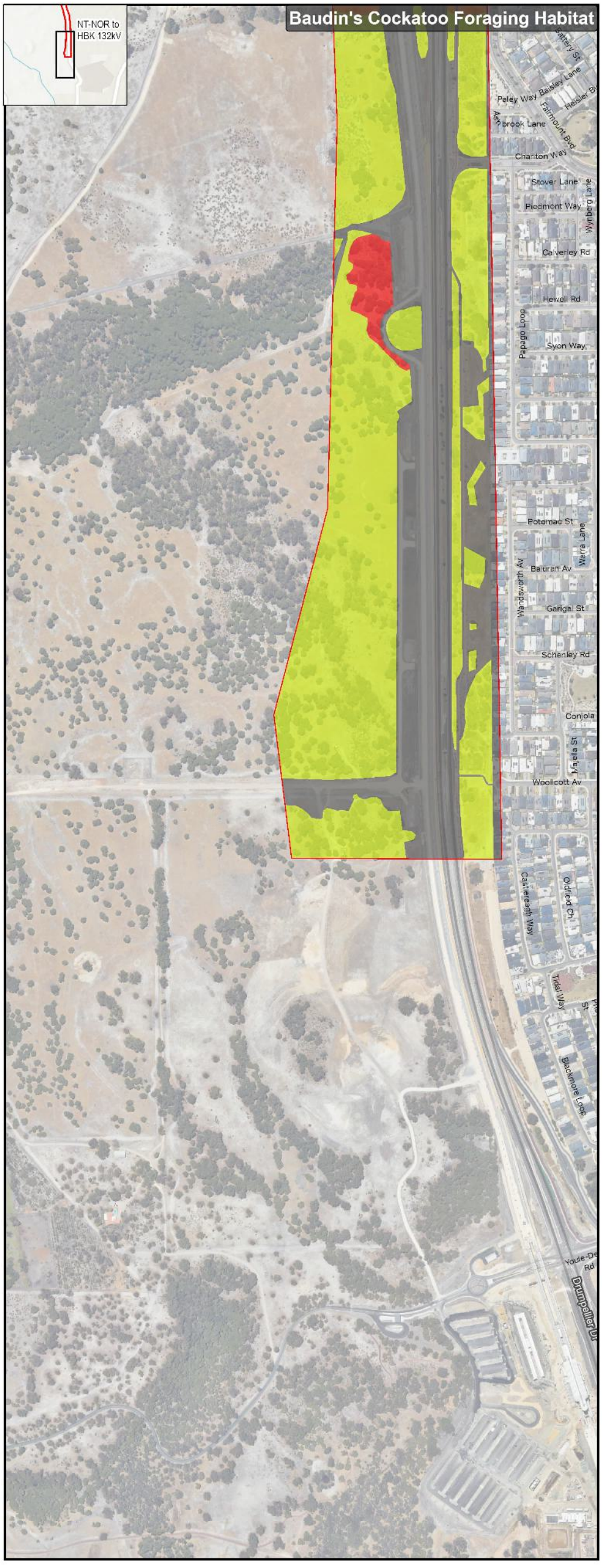

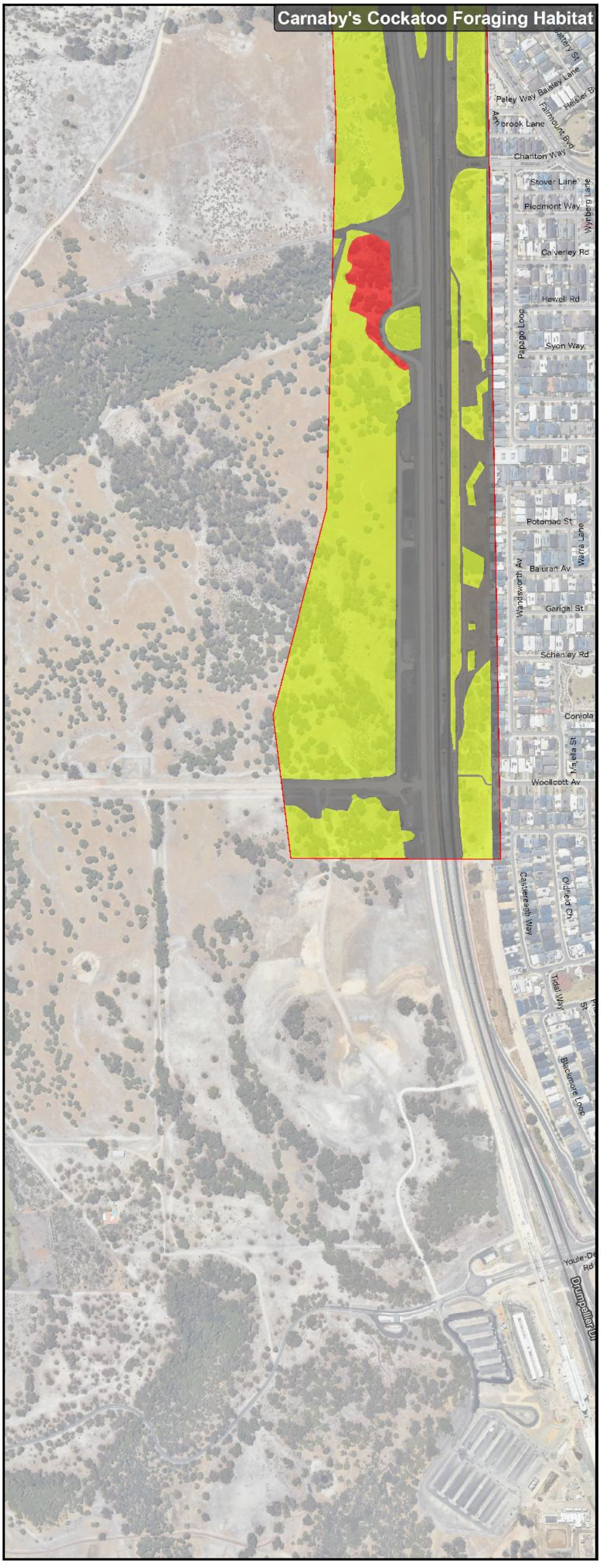

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N

1:7,500
(when printed at A4)

0 50 100 150 200
metres

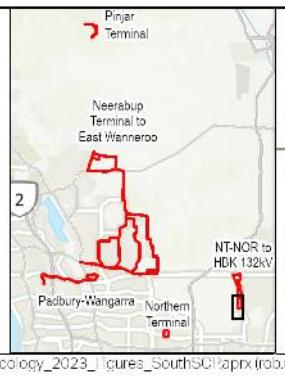
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

NT-NOR to HBK 132kV

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.23**

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Layout: G60713462_Fig10_NRLP_South_Faunal lab_Zanda_sp_A3P_v1, Last exported: 16/05/2024 4:38 PM

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N

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0 50 100 150 200 metres

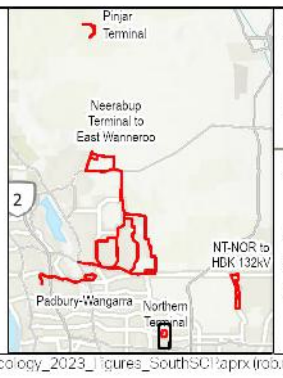
GDA2020 MGA ZONE 50

LEGEND

Survey Area

Baudin's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate

Carnaby's Cockatoo Foraging Habitat Quality (Bamford Consulting Ecologists (BCE), 2020)
- None
- Negligible
- Low
- Moderate



Black Cockatoo Foraging (*Zanda* sp.)

Northern Terminal

WESTERN POWER

CLEAN ENERGY LINK SWAN COASTAL PLAIN FLORA, VEGETATION AND FAUNA ASSESSMENT

Figure **10.24**

A4 size

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Appendix A

Significant Communities Desktop Assessment

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Significant Communities Desktop Assessment

TECs/PECs listed under the EPBC Act, BC Act and by DBCA that occur in the vicinity of the survey area

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
Acacia shrublands on taller dunes, southern Swan Coastal Plain ('floristic community type 29b') Community is dominated by Acacia shrublands or mixed heaths on the larger dunes. This community stretches from Seabird to south of Mandurah. No consistent dominant but species such as *Acacia rostellifera, Acacia lasiocarpa*, and *Melaleuca acerosa* were important.		P3	Unlikely to occur. Nearest record 10.6 km	Unlikely, incorrect habitat and distribution. Nearest record 11.6 km	Unlikely to occur. No close records or suitable habitat.	Unlikely to occur. Nearest record 34.0 km	Unlikely, incorrect habitat and distribution. Nearest record 7.4 km
Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain The community occurs in caves at sites that include Yanchep National Park and surrounds. It comprises root mats of *Eucalyptus gomphocephala* (Tuart) supported by groundwater fed streams and pools that occur in the caves. The root mats support a highly diverse and distinctive assemblage of cave fauna including the critically endangered cave shrimp *Hurleya* sp. (WAM C23193; Crystal Cave Crangonyctoid). A key characteristic is a habitat of pools or permanently damp areas in cave habitats in the Yanchep area. Comprises a distinctive suite of cave fauna.	E	CE	Unlikely to occur. Nearest record 11.3 km	Unlikely, incorrect habitat and distribution. Nearest record 30.4 km	Unlikely to occur. No close records or suitable habitat.	Possible to occur. Nearest record 5.6 km	Unlikely, incorrect habitat and distribution. Nearest record 21.2 km.
***Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))**	E	EN	Present	Possible to occur. Nearest record 600 m	Present	Unlikely to occur. Nearest record 12.1 km	Possible, nearest record 2.2km.

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
The community has been recorded from sands near Koondoola and Banksia Grove, and at the base of the Darling Scarp largely between Wannamal and Maddington. This community is generally very species rich. It is usually dominated by *Banksia attenuata* (slender Banksia), occasionally with *Eucalyptus marginata* (Jarrah), with *Bossiaea eriocarpa* (Common Brown Pea), *Conostephium pendulum* (Pearl Flower), *Hibbertia huegelii, Hibbertia hypericoides* (Yellow Buttercups), *Petrophile linearis* (Pixie Mops), *Scaevola repens, Stirlingia latifolia* (Blueboy), *Mesomelaena pseudostygia* and *Alexgeorgea nitens* being common in the understorey. The community is also known as "floristic community type 20a" as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994).							
SCP 22 *Banksia ilicifolia* woodlands (a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) Low lying sites generally consisting of *Banksia ilicifolia – B. attenuata* woodlands, but *Melaleuca preissiana* woodlands and scrubs are also recorded. Occurs on Bassendean and Spearwood systems in the central Swan Coastal Plain north of Rockingham. Typically, has very open understorey, and sites are likely to be seasonally waterlogged.	E	P3	Possible, nearest record 0.5 km	Possible, nearest record 2.2 km	Possible, nearest record 0.5 km	Possible, nearest record, 1.3 km	Possible, nearest record 5.4 km
Banksia Woodlands of the Swan Coastal Plain ecological community Canopy is most commonly dominated or co-dominated by *Banksia attenuata* and/or *B. menziesii*. Other Banksia species that can dominate in the	E	P3	Present	Present	Present	Present	Present

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
community are *B. prionotes* or *B. ilicifolia*. It typically occurs on well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean, and Spearwood sands and occasionally on Quindalup sands; it is also common on sandy colluvium and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau and can occur in other less common scenarios.							
***Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain (floristic community type 30 a as originally described in Gibson et al. (1994))** The community is located on calcareous sandy soils of the Quindalup Dunes generally occurring between Craigie and Point Peron, and on the Swan River in Peppermint Grove. The community also occurs on Garden Island and Rottnest Island. Typical and common native taxa in the community are: *Callitris preissii* (Rottnest Island pine), *Melaleuca lanceolata* (Rottnest Teatree), *Spyridium globulosum* (Basket Bush), *Acanthocarpus preissii, Rhagodia baccata* (Berry Saltbush), *Austrostipa flavescens* and *Trachymene pilosa* (Native Parsnip). The community is also known as 'floristic community type 30a' as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994).		VU	Possible, nearest record 3.0 km	Unlikely, incorrect distribution. Nearest record 12.0 km	Unlikely, no close record, incorrect habitat.	Unlikely, incorrect habitat and distribution. Nearest record 24.7 km	Present
Central Northern Darling Scarp Granite Shrubland Community Shrublands and heath on deeper loams and red earths on fragmented granite/quartzite. Heath species typically consist of the taller shrubs *Xanthorrhoea acanthostachya* and *Allocasuarina*		P4	Unlikely to occur. Nearest record 16.2 km	Unlikely, incorrect distribution. Nearest record 15.0 km	Unlikely to occur. No close record, no suitable habitat.		Unlikely, incorrect habitat and distribution. Nearest record 21.5 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
humilis over smaller proteaceous and myrtaceous shrubs, namely *Melaleuca* aff. *scabra, Baeckea camphorosmae* and to a lesser extent, the proteaceous *shrubs Dryandra armata, Hakea incrassata* and *Hakea undulata*. Located in central region of the Northern Darling Scarp near Perth.							
Coastal shrublands on shallow sands, southern Swan Coastal Plain ('floristic community type 29a') Mostly heaths on shallow sands over limestone close to the coast. No single dominant but important species include *Spyridium globulosum*, *Rhagodia baccata*, and *Olearia axillaris*.		P3	Possible, nearest record 3.9 km.	Unlikely, incorrect distribution. Nearest record 11.1 km	Possible, close record, potential habitat.	Unlikely incorrect distribution. Nearest record 20.0 km.	Possible, nearest record 265 m.
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) The community occurs in Tumulus Springs (Organic Mound Springs) on the Swan Coastal Plain. The habitat of the mound springs is characterised by continuous discharge of groundwater in raised areas of peat. The peat and surrounds provide a stable, permanently moist series of microhabitats, with a high level of heterogeneity of invertebrate fauna assemblages between sites. Groups commonly represented include Ostracoda, Nematoda, Cladocera, Copepoda, Oligochaeta, Tardigrada, Turbellaria and Insecta. Typical and common native vascular plant species associated with the Tumulus Springs are the trees *Banksia littoralis* (Swamp Banksia), *Melaleuca preissiana* (Moonah) and *Eucalyptus rudis* (Flooded Gum), and the shrubs *Taxandria linearifolia* (Swamp Peppermint), *Pteridium*	E	CE	Possible, nearest record 5.4 km	Possible, nearest record 3.5 km	Unlikely, no suitable habitat.	Unlikely, incorrect habitat and distribution. Nearest record 25.0 km	Unlikely, incorrect habitat and distribution. Nearest record 9.9 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
esculentum (Bracken), *Astartea scoparia* (Common Astartea) and *Cyclosorus interruptus* (Swamp Shield-fern).							
***Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))** The community has been recorded from heavy soils of the eastern side of the southern Swan Coastal Plain largely between Capel and Chittering. Typical native taxa in the community are: the tree *Corymbia calophylla* (Marri); the shrubs *Banksia dallanneyi* (Couch Honeypot), *Philotheca spicata* (Pepper and Salt), *Kingia australis* (Kingia) and *Xanthorrhoea preissii* (Balga); and the herbs, rushes and sedges *Cyathochaeta avenacea, Dampiera linearis* (Common Dampiera), *Haemodorum laxum, Desmocladus fasciculatus, Mesomelaena tetragona* (Semaphore Sedge) and *Morelotia octandra*. The community is also known as "floristic community type 3a" as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994).	E	CE	Unlikely to occur. Nearest record 16.9 km	Unlikely, incorrect distribution. Nearest record 14.2 km	Unlikely to occur.	Unlikely, incorrect habitat and distribution. Nearest record 38.8 km	Unlikely, incorrect habitat and distribution. Nearest record 21.8 km
***Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in in Gibson et al. (1994))** The community occurs on heavy soils of the eastern side of the southern Swan Coastal Plain, generally between Bullsbrook and Stratham. The community is usually dominated *by Corymbia calophylla* (Marri) and *Xanthorrhoea preissii* (Balga). It also occasionally	E	CE	Unlikely to occur. Nearest record 14.1 km	Unlikely, incorrect distribution. Nearest record 10.3 km	Unlikely to occur.	Unlikely, incorrect habitat and distribution. Nearest record 28.4 km	Unlikely, incorrect habitat and distribution. Nearest record 18.6 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
includes *Eucalyptus wandoo* (Wandoo). The more common shrubs include *Gompholobium marginatum*, *Hypocalymma angustifolium* (White Myrtle) and *Banksia dallanneyi* (Couch Honeypot), with herbs, grasses and sedges including *Burchardia congesta, Cyathochaeta avenacea, Neurachne alopecuroidea* (Foxtail mulga grass), Caesia micrantha (Pale Grass-lily), *Mesomelaena tetragona* (Semaphore Sedge), *Morelotia octandra, Desmocladus flexuosus, Opercularia vaginata* (Dog Weed), *Sowerbaea laxiflora* (Purple Tassels), *Lepidosperma* spp. and *Drosera menziesii* (Pink Rainbow) also common.							
Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994)) The community has been recorded between Bullsbrook and Ludlow and occurs in low lying flats with a clay impeding layer that facilitates seasonal inundation. The vegetation can be dominated by *Viminaria juncea* (Swishbush), *Melaleuca viminea* (Mohan), *Melaleuca lateritia* (Robin Redbreast Bush) or *Melaleuca osullivanii* but also occasionally by *Eucalyptus wandoo* (Wandoo). Commonly occurring species include *Hypocalymma angustifolium* (White Myrtle), *Acacia lasiocarpa* var. *bracteolata* (Long Peduncle Form) and *Verticordia huegelii* (Variegated Featherflower), and aquatic annuals.	CE	VU	Unlikely to occur. Nearest record 13.4 km	Unlikely, incorrect distribution. Nearest record 15.8 km	Unlikely to occur. No suitable habitat.	Unlikely, incorrect habitat and distribution. Nearest record 28.2 km	Unlikely, incorrect habitat and distribution. Nearest record 19.1 km
Low lying *Banksia attenuata* woodlands or shrublands (**'floristic community type 21c'**)	E	P3	Possible, nearest record 0.7 km	Possible, nearest record 2.0 km	Likely, close record.	Possible, nearest record 1.1 km	Possible, nearest record 5.4 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
(a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) This type occurs sporadically between Gingin and Bunbury, and is largely restricted to the Bassendean system. The type tends to occupy lower lying wetter sites and is variously dominated by Melaleuca preissiana, Banksia attenuata, B. menziesii, Regelia ciliata, Eucalyptus marginata or Corymbia calophylla. Structurally, this community type may be either a woodland or occasionally shrubland.							
***Melaleuca huegelii - Melaleuca systena* shrublands on limestone ridges (floristic community type 26a as originally described in Gibson et al. (1994))** The community is found on skeletal soils on limestone ridge slopes and ridge tops between Yanchep north of Perth, and south of Perth near Lake Clifton. The community commonly comprises species-rich thickets, heaths and scrubs dominated by *Melaleuca huegelii* (Chenille Honeymyrtle), *Melaleuca systena* (Coastal Honeymyrtle) and *Banksia sessilis* (Parrot Bush), commonly over *Grevillea preissii* (Spider Net Grevillea), *Spyridium globulosum* (Basket Bush), and *Acacia lasiocarpa* (Pajang). A suite of herbs commonly occurs under the shrub layer.	E	EN	Possible, nearest record 3.7 km	Unlikely, incorrect distribution. Nearest record 22.4 km	Possible, records in close proximity.	Unlikely, incorrect distribution. Nearest record 6.7 km.	Unlikely, incorrect habitat and distribution. Nearest record 13.9 km
Northern Spearwood shrublands and woodlands **Northern Spearwood shrublands and woodlands.** Other communities identified on limestone by Gibson et al. (1994) are 'species poor mallees and shrublands on limestone (floristic community type 27), FCT24 northern Spearwood shrublands and woodlands, and Southern Eucalyptus gomphocephala – Agonis flexuosa woodlands (floristic community type		P3	Possible to occur, nearest record 3.8 km	Unlikely, incorrect distribution. Nearest record 11.3 km	Possible to occur, close records, may be suitable habitat.	Unlikely, incorrect distribution. Nearest record 6.5 km	Possible, nearest record 800 m

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
25). Each of these is indicated as floristically distinct through statistical analyses							
Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in in Gibson et al. (1994)) The community occurs mainly on the transitional soils of the Ridge Hill Shelf, on the Swan Coastal Plain adjacent to the Darling Scarp, but also extends marginally onto the alluvial clays deposited on the eastern fringe of the Swan Coastal Plain. It has been recorded between Stratton and Maddington. It generally comprises a shrubland or woodland of *Banksia attenuata* (Slender Banksia) and *Banksia menziesii* (Firewood Banksia), sometimes with *Allocasuarina fraseriana* (Sheoak), over a shrub layer that can include the species *Adenanthos cygnorum* (Common Woollybush), *Hibbertia huegelii*, *Scaevola repens* var. *repens* (Fan Flower), *Allocasuarina humilis* (Dwarf Sheoak), *Bossiaea eriocarpa* (Common Brown Pea), *Hibbertia hypericoides* (Yellow Buttercups) and *Stirlingia latifolia* (Blueboy). A suite of herbs including *Conostylis aurea* (Golden Conostylis), *Trachymene pilosa* (Native Parsnip), *Lomandra hermaphrodita*, *Burchardia congesta* (Milkmaids) and *Patersonia occidentalis* (Purple Flag), and the sedges *Mesomelaena pseudostygia* (Semaphore Sedge) and *Lyginia barbata* usually occur in the community.	E	CE	Unlikely to occur. Nearest record 16.3 km	Unlikely, incorrect habitat and distribution. Nearest record 13.0 km	Unlikely to occur. Unsuitable habitat and no close record.	Unlikely, incorrect habitat and distribution. Nearest record 38.7 km	Unlikely, incorrect habitat and distribution. Nearest record 21.1 km
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain The community occurs on the heavy soils of the eastern side of the Swan Coastal Plain and has been recorded between Beermullah and Wokalup. Known patches include wetland and well-drained habitats, in a variety of landforms. It is defined on the basis of	E	EN	Unlikely to occur. Nearest record 8.5 km	Unlikely, incorrect habitat and distribution. Nearest record 11.4 km	Unlikely to occur. Incorrect habitat.	Unlikely, incorrect habitat and distribution. Nearest record 24.9 km	Unlikely, incorrect habitat and distribution. Nearest record 14.3 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
substrates with a limestone influence. Many of the species are commonly associated with the limestone soils that occur on the coast, and do not generally occur further inland. Typical and common native species in areas of best developed limestone are: the tree *Casuarina obesa* (Swamp Sheoak); the Mallees *Eucalyptus decipiens* (Redheart) and *Eucalyptus foecunda* (Narrow-Leaved Red Mallee); the shrubs *Melaleuca huegelii* (Chenille Honey-Myrtle), *Alyogyne huegelii* (Lilac Hibiscus), *Grevillea curviloba* (threatened), and *Grevillea evanescens* (priority 1), *Melaleuca systena* (Narrow-Leaved Paperbark); and the herb *Thysanotus arenarius* (Fringed Lily). Where the limestone substrate is less well developed and limestone may occur as nodules or chunks, the flora assemblages can be influenced by other characteristics of the substrate, such as clay content, with the presence of calcicoles such as *Thysanotus arenarius, Gahnia trifida* (Coast Saw-Sedge), *Eremophila glabra* (Tar Bush) and *Melaleuca brevifolia* (Mallee Honey-Myrtle), providing evidence of the limestone influence. *Melaleuca huegelii* shrublands, *Eucalyptus decipiens mallee, Casuarina obesa* woodlands and *Melaleuca brevifolia, Melaleuca systena* or *Melaleuca viminea* shrublands have been recorded on Muchea Limestone								
Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in in Gibson et al. (1994)) The community is recorded from between Yalgorup National Park and Bunbury. It is species-rich, consists of open low shrubs with a rich annual flora and is known from calcareous silt flats. A suckering form of *Acacia saligna* (Orange Wattle), Melaleuca *viminea* (Mohan), *Melaleuca teretifolia* (Banbar), *Hakea varia*		VU	Unlikely to occur. Incorrect habitat and record distant.	Unlikely, incorrect habitat and distribution. Nearest record 15.4 km	Unlikely to occur. Nearest record 10.9 km	Unlikely, incorrect habitat and distribution. Nearest record 24.2 km	Unlikely, incorrect habitat and distribution. Nearest record 16.8 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
(Variable-Leaved Hakea), *Xanthorrhoea preissii* (Balga) and *Leptomeria ellytes* are common in the shrub layer, with sedges including *Lepidosperma longitudinale* (Pithy Sword-Sedge) and *Gahnia trifida* (Coast Saw-Sedge), and a suite of herbs including *Meionectes tenuifolia* (priority 3) are also common. The community is also known as 'floristic community type 18' as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994)							
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. (1994)) The community occurs on clay flats with thin skeletal soils and has been recorded largely between Wattle Grove and Sabina River. It comprises rapidly drying clay flats. Typical and common shrubs include *Hakea sulcata* (Furrowed Hakea), *Verticordia densiflora* (Compacted Featherflower), *Hakea varia* (Variable-Leaved Hakea), *Pericalymma ellipticum* (Swamp Teatree) and *Viminaria juncea* (Swishbush). *Aphelia cyperoides* (Hairy Aphelia), *Centrolepis aristata* (Pointed Centrolepis), *Drosera gigantea* (Giant Sundew) and *Drosera menziesii* (Pink Rainbow) also commonly occur. The community is also known as "floristic community type 10a" as originally described in Gibson N., Keighery B.J., Keighery G.J., Burbidge A.H. and Lyons M.N. (1994)	CR	EN	Unlikely to occur	Unlikely, incorrect habitat and distribution. Nearest record 25.0 km	Unlikely to occur	Unlikely, incorrect habitat and distribution. Nearest record 6.7 km	Unlikely, incorrect habitat and distribution. Nearest record 17.7 km
Southern *Eucalyptus gomphocephala-Agonis flexuosa* woodlands - Floristic community type 25 (can be a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC, or the Tuart woodlands and forests of the Swan Coastal Plain EPBC listed TEC)		P3	Possible, nearest record 4.9 km	Unlikely, incorrect habitat and distribution. Nearest record 15.5 km	Unlikely to occur.	Unlikely, incorrect habitat and distribution. Nearest record 18.8 km	Possible, nearest record 5.4 km.

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
Woodlands of *Eucalyptus gomphocephala* - *Agonis flexuosa* south of Woodman Point. Recorded from the Karrakatta, Cottesloe and Vasse units. Dominants other than Tuart were occasionally recorded, including *Corymbia calophylla* at Paganoni block and Eucalyptus decipiens at Kemerton. Banksias found in this community include *Banksia attenuata*, *B. grandis* and *B. littoralis*. Tuart formed the overstorey nearby however.							
Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. (1994)) The community typically comprises shrublands or open woodlands. It occurs on seasonally inundated sandy clay soils that are restricted to small remnants on the eastern side of the Swan Coastal Plain. It has been recorded from Forrestfield to Chapman Hill. The community has moderate species richness with the occurrence of species reflecting the wetter nature of the sites. Typical and common native taxa in the community are the shrubs *Kingia australis* (Kingia), *Pericalymma ellipticum* (Swamp Teatree), *Hakea ceratophylla* (Horned Leaf Hakea), *Calothamnus lateralis, Hypocalymma angustifolium* (White Myrtle), *Eutaxia virgata, Stirlingia latifolia* (Blueboy), *Banksia dallanneyi* (Couch Honeypot) and herbs, rushes and sedges including *Dampiera linearis* (Common Dampiera), *Comesperma virgatum* (Milkwort), *Stylidium brunonianum* (Pink Fountain Triggerplant), *Thysanotus multiflorus* (Many-Flowered Fringe Lily) and *Mesomelaena tetragona* (Semaphore Sedge). The community also contains priority flora including *Isopogon formosus* subsp. *dasylepis* (priority 3) and *Grevillea brachystylis* subsp. *brachystylis* (priority 3).		EN	Possible, nearest record 6.6 km	Possible, nearest record 1.7 km.	Unlikely to occur, incorrect habitat.	Unlikely, incorrect habitat and distribution. Nearest record 32.4 km	Unlikely, incorrect habitat and distribution. Nearest record 10.1 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
Subtropical and Temperate Coastal Saltmarsh (synonymous with the Subtropical and Temperate Coastal Saltmarsh EPBC-listed TEC). Consists of the assemblage of plants, animals and micro-organisms associated` with saltmarsh in coastal regions of sub-tropical and temperate Australia (south of 23°S latitude). It occurs on the coastal margin, along estuaries and coastal embayments and on low wave energy coast in places with at least some tidal connection, including rarely inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences. The community occurs on sandy or muddy substrate and may include coastal clay pans and similar habitats. It consists of dense to patchy areas of characteristic coastal saltmarsh plant species that include salt- tolerant herbs, succulent shrubs or grasses, and may also include bare sediment as part of the mosaic. It can occur where the proportional cover by tree canopy such as mangroves, Melaleucas or Casuarinas or seagrass is not greater than 50%. The description, area and condition thresholds that apply to the EPBC-listed TEC of the same name, also apply to this Priority ecological community.	V	P3	Unlikely to occur. Nearest record 14.1 km	Unlikely, incorrect distribution. Nearest record 7.8 km	Unlikely to occur.	Unlikely, incorrect distribution. Nearest record 39.9 km	Unlikely, incorrect distribution. Nearest record 16.2 km
Swan Coastal Plain *Banksia attenuata* - *Banksia menziesii* woodlands (floristic type 23 b) (a component of the Endangered Banksia Woodlands of the Swan Coastal Plain EPBC listed TEC) These woodlands occur in the Bassendean system, from Melaleuca Park to Gingin. Occurs	E	P3	Possible to occur, nearest record 750 m	Possible, nearest record 1.8 km.	Known to occur.	Possible, nearest record 2.6 km	Unlikely, nearest record 6.2 km

NREP Swan Coastal Plain Flora, Vegetation and Fauna Assessment

DRAFT

Community Name[1]	Cons. Code[2]		Likelihood				
	EPBC Act	BC Act / DBCA	Neerabup Terminal and NBT Group	Northern Terminal	NT-NOR to HBK 132kV Line	Pinjar Terminal	WGA-MUL PBY 81
in reasonably extensive Banksia woodlands north of Perth.							
Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain The Tuart (*Eucalyptus gomphocephala)* Woodlands and Forests of the Swan Coastal Plain are a nationally significant ecological community. The ecological community was listed as critically endangered on 4 July 2019 under national environmental law (the Environment Protection and Biodiversity Conservation Act 1999 or EPBC Act). This nationally protected ecological community is comprised of woodlands or forests within which the presence of Tuart (*Eucalyptus gomphocephala*) trees in the uppermost canopy are the primary defining feature. The community also often contains other native trees such as Peppermint, Bull Banksia, Candlestick Banksia or Jarrah, with a substantial diversity of understorey plants. Primarily occurs on the Swan Coastal Plain in Western Australia between Jurien in the north and Busselton in the South, including some remnants in the Perth metropolitan area. The ecological community is mainly found on the calcareous soils of the Spearwood and Quindalup sand dune systems on the western part of the plain.	CE	P3	Present	Possible, nearest record 5.3 km.	Unlikely to occur.	Possible, nearest record 3.7 km	Present

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

Appendix B

Flora Desktop Assessment

Northern Terminal Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Acacia benthamii	Typically on limestone breakaways.		P2	6.09	16.79	2013	2000		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Acacia oncinophylla subsp. *oncinophylla*	Granitic soils.		P3	12.88		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Adenanthos cygnorum subsp. *chamaephyton*	Grey sand, lateritic gravel.		P3	32.49	32.49	1981	1981		0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand, clay, gravel, laterite		P4	3.28		2014			0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.
Austrostipa mundula	In sand over limestone.		P3	15.63		1900			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	Grey sand, yellow sand with limestone outcropping, hills.		P1	12.09	12.22	2021	2021		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Bolboschoenus fluviatilis	Littoral zone, floodplain. Wet grey sand, silt, mud.		P1	5.53		2008			0	0	1	0	2	3	Moderate	Low	No habitat or individuals identified during survey.
Byblis gigantea	Sandy-peat swamps. Seasonally wet areas.		P3	9.34		1901			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Caladenia huegelii	Grey or brown sand, clay loam.	CE	CR	3.81	2.18	2000	2017	Known	0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Calandrinia sp. Bayswater (C. Andrews s.n. 11/1902)	No information available		P1	5.43		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calectasia elegans	between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).		P1	13.28	13.93	2008	2021		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Carex tereticaulis	Black peaty sand.		P3	7.59	7.67	1999	1999		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	6.24		1991			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyanicula ixioides subsp. *ixioides*	Laterite, gravel.		P4	14.84		1900			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyathochaeta teretifolia	Seasonally wet drainage lines and margins of permanent water sources, flat ground. Grey sand with clay, poor drainage (WA Herbarium 2023).		P3	3.71	2.85	2008	2002		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Dampiera triloba	Loamy sand.		P3	6.24		2009			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Darwinia pimelioides	Loam, sandy loam. Granite outcrops.		P4	9.44		1987			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Diuris drummondii	Low-lying depressions, swamps.	V	VU	8.52		1900		Likely	0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes.		P1	2.15		2020			0	1	1	0	2	4	High	Low	No habitat identified during survey. No individuals identified.
Drosera x sidjamesii	Peaty sand. Along lake margins, close to winter high-water line.		P1	2.15		2020			0	1	1	0	2	4	High	Low	No habitat identified during survey. No individuals identified.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	16.05	17.21	2007	2007	Known	0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Eryngium pinnatifidum subsp. *Palustre* (G.J. Keighery 13459)	In a winter wet claypan, water to 20 cm deep. Grey-brown clay		P3	12.83		1995			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus argutifolia	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.	V	VU	22.23	24.52	2006	2018	May	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Eucalyptus foecunda subsp. *foecunda*	Limestone/ limestone outcrops in heath and sandy soils in coastal areas. Sometimes on fixed dunes and slopes of hills (DCCEEW, 2023).		P4	12.69		2010			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E	EN	12.97		2019			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Grevillea sp. Ocean Reef (D. Pike Joon 4)	Broard sand dune, grey-brown dry sand. Limestone boulders (WA Herbarium, 2023).		P1	18.05		2013			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	14.95	15.14	1981	1981		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Hydrocotyle lemnoides	Swamps		P4	9.34	15.75	1906	1990		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle striata	Winter wet creekline, springs. Light leaf litter on dark brown sandy humic loam, clay (WA Herbarium, 2023).		P1	4.18		2016			0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Hypolaena robusta	Dune crest. White sand, sandplains (WA Herbarium, 2023).		P4	11.67		1999			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	6.24		1991			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Jacksonia sericea	Calcareous and sandy soils		P4	0.70	6.80	2020	1990		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Lasiopetalum glutinosum subsp. *glutinosum*	Open woodland dominated by *Eucalyptus marginata, Corymbia calophylla, Banksia menziesii* and *B. attenuata* and in open, low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops and creeklines (Shepherd and Wilkins, 2015).		P3	10.55		1900			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Leucopogon maritimus	Occurs in deep, calcareous sands, on the mid to upper slopes of dunes or in shallow sand over limestone, but avoiding the thicker vegetation of the swales, grows in low heathland communities		P1	16.49		1966			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Levenhookia preissii	Grey or black, peaty sand. Swamps.		P1	6.24		1951			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Marianthus paralius	Coastal heath in areas of white sand and brown loam, on coastal limestone cliffs	E	CR	16.02	20.33	2021	2018	Known	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Meionectes tenuifolia	Granite flats, shallow soils at margins, inundated. Grey clay, reserve and wetland (Mainroads, 2015).		P3	7.59	14.13	2007	1995		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Restricted to limestone ridges within locality of Nowergup. Plants occur on upper slopes of rugged limestone ridges or where a high proportion of limestone outcropping occurs. Soils are shallow grey to mossy black sands, depeding on the amount of limestone 'caprock' (TSSC 2019)	E	EN	24.27	24.27	2019	2019		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Millotia tenuifolia var. *laevis*	Granite or laterite soils.		P2	4.91		2018			0	1	1	1	0	3	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Myriophyllum echinatum	Grey-black sandy clay. Winter-wet flats.		P3	9.84		1900			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Netrostylis sp. Chandala (G.J. Keighery 17055)	Dampland with thick leaf litter over dark grey sand.		P2	4.47		2013			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Persoonia sulcata	Lateritic or granitic soils.		P4	16.11		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	13.99		1999			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	13.30		1990			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.		P3	26.73		1963			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Poranthera moorokatta	Very gently inclined plain, white silica sand in open spaces between shurbs, not in shaded areas or in areas of high litter cover (WA Herbarium, 2023)		P2	3.88		2018			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Sarcozona bicarinata	White sand.		P3	19.60	20.25	1997	1992		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus capillifolius	Brown mud. Claypans.		P3	12.49	17.04	2012	1990		0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus griffinianus	White sand.		P4	17.30		1993			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Schoenus natans	Winter-wet depressions.		P4	17.20		2004			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Schoenus sp. Waroona (G.J. Keighery 12235)	Clay or sandy clay. Winter-wet flats.		P3	12.49		1988			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Stachystemon exilis	On grey sand, seasonally damp.		P1	3.88		2018			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	21.17		2005			0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands		P4	10.55	4.48	2012	2005		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3	29.20		2009			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.		P3	6.24		2006			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.		P3	12.21		2000			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Styphelia filifolia	Sandy soils of the coastal plain (with one known occurrence from the northern Darling Scarp), usually in Banksia or Jarrah woodland and in low-lying situations (Hislop & Puente--Lelièvre, 2017).		P3	7.67		2007			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Tetratheca pilifera	Gravelly soils.		P3	6.27		2020			0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Thelymitra variegata	Sandy clay, sand, laterite.		P2	14.07		1900			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	11.73		1990			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel.		P2	11.35		1991			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Grey, black or peaty sand. Winter - wet flats		P4	24.24	24.24	1994	1994		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Trithuria occidentalis	Known from one population near Ellenbrook (DEWHA, 2008). It grows in partly submerged water on edge of shallow, winter-wet claypan in very open shrubland of *Melaleuca lateritia* and annual herbs (DEWHA, 2008).	E	EN	10.55	17.23	2012	2018	Likely	0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	3.76		2006			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Drosera occidentalis	Sandy & clayey soils. Swamps & wet depressions.		P4		1.55		1986		0	1	0	1	2	4	Moderate	Low	No habitat identified during survey.
Grevillea curviloba subsp. *curviloba*	Grey sand. Winter-wet heath.	E			13.73		2019	Known	0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		30.79		2002		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia leptotheca	Limestone ridges. Ranges from Yalgorup to Lancelin		P3		20.27		1990		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia foetida	Grey-white sand on swampy, seasonally wet sites. Found alongside water pit/well (sump land). Recorded at three locations near town of Muchea.	E	CE					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	Grey, clayey sand with lateritic pebbles. In low woodland, near winter-wet flats with weedy grasses (DCCEEW, 2023).	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea thelemanniana	Sand, sandy clay. Winter-wet low-lying flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Ptilotus pyramidatus	Seasonally inundated flat (floodplain). Pale grey, muddy-sand to sandy-mud alluvium (DCCEEW, 2023)	CE	CR					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
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	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter-wet swamps.	E	CR					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calytrix breviseta subsp. *breviseta*	Sandy clay. Swampy flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra stellata	Red, brown, yellow, or grey sandy loams, clay or gravel over laterite or gravel.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E						Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia apiculata	Lateritic soils.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Lepidosperma rostratum	Peaty sand, clay.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea christineae	Clay loam, sandy clay, often moist.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CR					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Andersonia gracilis	This species is known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation with species such as *Calothamnus hirsutus, Verticordia densiflora* and *Kunzea recurva* over sedges (DEC, 2006).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Diplolaena andrewsii	Loam, clay. Granite outcrops & hillsides.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra dedmaniarum	Granite	E	EN					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Macarthuria keigheryi	White or grey sand.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Austrostipa bronweniae	Flat low-lying calcareous winter wet habitat type on the extensively cleared Swan Coastal Plain (TSSC, 2018).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with *Eucalyptus todtiana* (Pricklybark), *Banksia attenuata* (Coast Banksia), and *Hibbertia* sp. (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia anomala	Grows over laterite in shallow sand, loam, clay or gravel that is brown, yellow or grey. Grows on ridges, slopes and low plains, entagled amongst other low shrubs in dense vegetation, and in low open woodland or forest dominated by *Eucalyptus marginata, E. wandoo, E. accedens and Corymbia calophylla*. Occurs on western slopes of Darling Ranges, near Chittering south to Pickering Brook	V	VU					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea flexuosa	Red-brown sand with laterite & gravel, sand over granite. Ridgetop plateau & associated breakaways.	V	VU					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Conospermum undulatum	Grey or yellow-orange clayey sand.	V	VU					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anthocercis gracilis	Sandy or loamy soils. Granite outcrops.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia aphylla	Sand, loam, clay loam. Granite outcrops, hills.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea micrantha	White-grey sand.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Appendix B - Flora Desktop Assesment

Padbury to Wangarra Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Acacia benthamii	Typically on limestone breakaways.		P2	0.97	8.98	2013	2000		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Acacia oncinophylla subsp. *oncinophylla*	Granitic soils.		P3	18.08		1980			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Adenanthos cygnorum subsp. *chamaephyton*	Grey sand, lateritic gravel.		P3	25.46	25.46	1981	1981		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand, clay, gravel, laterite		P4	8.70		2014			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Austrostipa mundula	In sand over limestone.		P3	4.87		1900			0	1	0	1	1	3	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. *Limestone* (N. Gibson & M.N. Lyons 1425)	Grey sand, yellow sand with limestone outcropping, hills.		P1	3.65	3.63	2021	2021		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Bolboschoenus fluviatilis	Littoral zone, floodplain. Wet grey sand, silt, mud (WA Herbarium, 2023).		P1	14.26		2008			0	0	1	0	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Byblis gigantea	Sandy-peat swamps. Seasonally wet areas.		P3	18.22		1901			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Caladenia huegelii	Grey or brown sand, clay loam.	CE	CR	4.16	9.35	2000	2017	Likely	0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Calandrinia sp. *Bayswater* (C. Andrews s.n. 11/1902)	No information available		P1	14.08		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calectasia elegans	between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).		P1	12.76	13.40	2008	2021		0	0	1	1	1	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Carex tereticaulis	Black peaty sand.		P3	16.37	16.41	1999	1999		0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Conostylis bracteata	Sand, limestone. Consolidated sand dunes.		P3	2.07	2.53	1997	1997		0	1	0	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Cyanicula ixioides subsp. *ixioides*	Laterite, gravel.		P4	18.39		1900			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyathochaeta teretifolia	Seasonally wet drainage lines and margins of permanent water sources, flat ground. Grey sand with clay, poor drainage (WA Herbarium, 2023).		P3	4.16	4.65	2008	2002		0	1	1	1	1	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Dampiera triloba	Loamy sand (WA Herbarium, 2023).		P3	4.13		2009			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Darwinia pimelioides	Loam, sandy loam. Granite outcrops.		P4	16.97		1987			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris drummondii	Low-lying depressions, swamps.	V	VU	17.46		1900		May	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes.		P1	4.01		2020			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Drosera x sidjamesii	Peaty sand. Along lake margins, close to winter high-water line.		P1	4.67		2020			0	1	1	1	1	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	18.81	20.61	2007	2007	May	0	0	1	0	1	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Eryngium pinnatifidum subsp. *Palustre* (G.J. Keighery 13459)	In a winter wet claypan, water to 20 cm deep. Grey-brown clay		P3	14.87		1995			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus argutifolia	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.	V	VU	11.24	15.98	2006	2018	May	0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Eucalyptus foecunda subsp. *foecunda*	Limestone/ limestone outcrops in heath and sandy soils in coastal areas. Sometimes on fixed dunes and slopes of hills (DCCEEW, 2023).		P4	3.63		2010			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E	EN	12.94		2019			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.

Appendix B - Flora Desktop Assesment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Grevillea sp. Ocean Reef (D. Pike Joon 4)	Broard sand dune, grey-brown dry sand. Limestone boulders (WA Herbarium, 2023).		P1	5.66		2013			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	17.30	17.48	1981	1981		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle lemnoides	Swamps		P4	18.22	18.84	1906	1990		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle striata	Winter wet creekline, springs. Light leaf litter on dark brown sandy humic loam, clay.		P1	11.16		2016			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Hypolaena robusta	Dune crest. White sand, sandplains.		P4	13.59		1999			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	14.11		1991			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Jacksonia sericea	Calcareous and sandy soils		P4	2.36	0.98	2020	1990		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Lasiopetalum glutinosum subsp. *glutinosum*	Open woodland dominated by *Eucalyptus marginata*, *Corymbia calophylla*, *Banksia menziesii* and *B. attenuata* and in open, low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops and creeklines (Shepherd and Wilkins, 2015).		P3	19.06		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Leucopogon maritimus	Occurs in deep, calcareous sands, on the mid to upper slopes of dunes or in shallow sand over limestone, but avoiding the thicker vegetation of the swales, grows in low heathland communities		P1	3.93		1966			0	1	0	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Levenhookia preissii	Grey or black, peaty sand. Swamps.		P1	14.11		1951			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Marianthus paralius	Coastal heath in areas of white sand and brown loam, on coastal limestone cliffs	E	CR	5.06	8.22	2021	2018	Known	0	0	1	1	1	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Meionectes tenuifolia	Granite flats, shallow soils at margins, inundated. Grey clay, reserve and wetland (Mainroads, 2015).		P3	16.37	16.96	2007	1995		0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Melaleuca sp. *Wanneroo* (G.J. Keighery 16705)	Restricted to limestone ridges within locality of Nowergup. Plants occur on upper slopes of rugged limestone ridges or where a high proportion of limestone outcropping occurs. Soils are shallow grey to mossy black sands, depeding on the amount of limestone 'caprock' (TSSC 2019)	E	EN	15.23	15.23	2019	2019		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Millotia tenuifolia var. *laevis*	Granite or laterite soils.		P2	6.76		2018			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Myriophyllum echinatum	Grey-black sandy clay. Winter-wet flats.		P3	18.72		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Netrostylis sp. *Chandala* (G.J. Keighery 17055)	Dampland with thick leaf litter over dark grey sand.		P2	11.69		2013			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Persoonia sulcata	Lateritic or granitic soils.		P4	19.94		1980			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	15.04		1999			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	3.87		1990			0	1	0	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.		P3	19.84		1963			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Poranthera moorokatta	Very gently inclined plain, white silica sand in open spaces between shurbs, not in shaded areas or in areas of high litter cover.		P2	9.08		2018			0	0	1	1	1	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Sarcozona bicarinata	White sand.		P3	7.82	8.15	1997	1992		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Schoenus capillifolius	Brown mud. Claypans.		P3	16.57	20.35	2012	1990		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus griffinianus	White sand.		P4	13.76		1993			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Schoenus natans	Winter-wet depressions.		P4	20.57		2004			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.

Appendix B - Flora Desktop Assesment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Schoenus sp. Waroona (G.J. Keighery 12235)	Clay or sandy clay. Winter-wet flats.		P3	16.57		1988			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Stachystemon exilis	On grey sand, seasonally damp (WA Herbarium, 2023)		P1	9.08		2018			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	14.69		2005			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands		P4	16.28	11.86	2012	2005		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3	20.59		2009			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.		P3	5.06		2006			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.		P3	13.59		2000			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Styphelia filifolia	Sandy soils of the coastal plain (with one known occurrence from the northern Darling Scarp), usually in Banksia or Jarrah woodland and in low-lying situations (Hislop & Puente–Lelièvre, 2017).		P3	4.13		2007			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified during survey.
Tetratheca pilifera	Gravelly soils.		P3	13.20		2020			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Thelymitra variegata	Sandy clay, sand, laterite.		P2	5.55		1900			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	19.64		1990			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel.		P2	17.92		1991			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Grey, black or peaty sand. Winter - wet flats		P4	17.21	17.21	1994	1994		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Trithuria occidentalis	Known from one population near Ellenbrook. It grows in partly submerged water on edge of shallow, winter-wet claypan in very open shrubland of Melaleuca lateritia and annual herbs (DEWHA, 2008).	E	EN	16.57	20.59	2012	2018	Likely	0	0	1	0	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	9.32		2006			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Drosera occidentalis	Sandy & clayey soils. Swamps & wet depressions.		P4		10.20		1986		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba subsp. *curviloba*	Grey sand. Winter-wet heath.	E			16.60		2019	May	0	0	1	0	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		25.62		2002		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia leptotheca	Limestone ridges. Ranges from Yalgorup to Lancelin		P3		8.18		1990		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey. No individuals identified during survey.
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	Grey, clayey sand with lateritic pebbles. In low woodland, near winter-wet flats with weedy grasses (DCCEEW, 2023).	CE	CR					Likely	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Andersonia gracilis	This species is known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation with species such as *Calothamnus hirsutus, Verticordia densiflora* and *Kunzea recurva* over sedges (DEC, 2006).	E	EN					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter-wet swamps.	E	CR					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Thelymitra stellata	Red, brown, yellow, or grey sandy loams, clay or gravel over laterite or gravel.	E	EN					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.

Appendix B - Flora Desktop Assesment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Macarthuria keigheryi	White or grey sand.	E	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Thelymitra dedmaniarum	Granite	E	EN					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E						May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Drakaea micrantha	White-grey sand.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.

Pinjar Terminal Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Acacia anomala	Grows over laterite in shallow san, loam, clay or gravl that is brown, yellow or grey. Grows on ridges, slopes and low plains. Grows entagled amongst other low shrubs in dense vegetation, and in low open woodland or forest dominated by *Eucalyptus marginata, E. wandoo, E. accedens* and *Corymbia calophylla*. Occurs on western slopes of Darling Ranges, near Chittering south to Pickering Brook	V	VU	13.65	19.95	1900	2007		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia benthamii	Typically found on limestone breakaways, sand, restricted to Kings Park and Subiaco, Wanneroo and near Yanchep		P2	7.65	14.28	2009	2000		0	0	1	1	2	4	High	Low	Species not recorded, no suitable habitat identified during survey.
Acacia cummingiana	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways		P3	17.89		2012			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia drummondii subsp. *affinis*	Lateritic gravelly soils, or sand in laterite. Grows in Jarrah, Jarrah-Marri and Wandoo forest and woodland. Occurs from New Norcia S to Bullsbrook East		P3	15.06	16.81	1976	1975		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Adenanthos cygnorum subsp. *chamaephyton*	Grey sand, lateritic gravel		P3	1.79	1.79	1981	1996		0	1	0	1	1	3	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Andersonia gracilis	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					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Sand, clay, gravel, laterite		P4	20.21		2016			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	Known from North of Perth only within 100km of coast. Found in Banksia woodland on sand over limestone.		P1	7.69	7.73	2017	2020		0	0	1	1	1	3	Moderate	Low	No habitat identified during survey.
Banksia mimica	Grows on flat to gentle slopes in grey and white sand in open woodlands (DEWHA, 2008). It is known to occur on the Whicher Range and Darling Range in Banksia Woodlands (DEWHA, 2008).	E	VU					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Caladenia huegelii	This species occurs in mixed woodland of Jarrah, *Banksia attenuata, B. ilicifolia, B. menziesii* with scattered *Allocasuarina fraseriana* and *Corymbia calophylla* over dense shrubs (DEC, 2009). It occurs between north of Perth to Busselton within 20km of the coast. Soils are deep grey-white sand associated with the Bassendean dune system, occassionally the Spearwood system (DEC, 2009).	E	CR					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Caleana dixonii	Grows in deep sand in open areas beneath dense tall shrubs with scattered Banksias, or in heathland in shallow sand over laterite (DEWHA, 2008b).	E	VU					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Caustis gigas	White or grey sand		P2	16.83		2006			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Chamaescilla gibsonii	Clay to sandy clay, winter-wet flast, shallow water-filled clay pans		P3	13.65		1965			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with *Eucalyptus todtiana*, *Banksia attenuata*, and *Hibbertia* sp. (TSSC, 2016).	E	VU	16.15		2010		May	0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Conostylis bracteata	Sand, limestone. Consolidated sand dunes.		P3	16.79		2015			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Conostylis pauciflora subsp. *euryrhipis*	White, grey or yellow sand, consolidated dunes		P4	14.76		2016			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Conostylis pauciflora subsp. *pauciflora*	Grey sand, limestone, hillslopes, consolidated dunes		P4	14.99	14.99	2007	2007		0	0	1	1	2	4	High	Low	No habitat identified during survey.
Cyathochaeta teretifolia	Brown, grey sand. Sandy clay. Swamps, creek edges. Jarrah forest, SCP.		P3	8.88	14.26	1995	1994		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia foetida	Grey-white sand on swampy, seasonally wet sites. Found alongside water pit/well (sump land). Recorded at three locations near town of Muchea.	E	CR	13.65	14.25	2020	2018	May	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris drummondii	Found in low-lying depressions in peaty and sandy clay swamps. Plants frequently observed standing in several centimetres of water even during the summer flowering period	V	VU	13.48		1961			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris micrantha	This species is usually found in cleared fire breaks or open sandy patches that are disturbed. It occurs in infertile grey sands, in Banksia, Jarrah, and Common Sheoak woodland or forest (DEWHA, 2008).	V	EN					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.

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									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter wet swamps.	E	CR					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea micrantha	Cleared firebreaks or open sandy patches that have been disturbed. In infertile white-grey sands, in Jarrah and sheoak forest.	V	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Drosera occidentalis	Sandy & clayey soils. Swamps & wet depressions.		P4		19.48		1986		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drosera sewelliae	Laterite and silica sand soils		P2	17.23		2007			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus argutifolia	Known from between Wanneroo, Lake Clifton and Guilderton. This Mallee grows on slopes or gullies close to the summits of limestone ridges, where soils are shallow, well drained and grey with outcrops of limestone (DEWHA, 2008).	V	VU	9.16	9.10	2017	2021	Known	0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea althoferorum subsp. *fragilis*	Found at the base of the Darling Scarp, growing in greyish-yellow colluvial sand. Forms part of the shrub layer in a *Banksia menziesii* and *B. attenuata* woodland.	E	CR	19.39	19.70	2014	2013		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea candolleana	Laterite, lateritic loam. Hillsides.		P2	19.80		2007			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E	CR	12.59	12591.00	2011	2017	Likely	0	0	1	0	1	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Grevillea evanescens	Brown Spearwood sand.		P1		13.90		2004		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		6.36		2002		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia leptotheca	Limestone ridges. Ranges from Yalgorup to Lancelin		P3	12.65	14.99	2016	2005		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hypolaena robusta	Dune crest. White sand, sandplains (WAHerb 2023).		P4	16.70		2006			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Isotropis cuneifolia subsp. glabra	Sand, clay loam. Winter-wet flats. Ironstone soils		P3	14.00		1952			0	0	0	0	1	1	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Jacksonia gracillima	Winter wet flats; brown clay, Flat of grey sand (pgv Environmental, 2015)		P3	16.86		2015			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Jacksonia sericea	Calcareous and sandy soils.		P4	8.57		2010			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Lasiopetalum membranaceum	Sand over limestone.		P3		10.71		1987		0	0	0	1	1	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Lepidium pseudotasmanicum	Loam, sand		P4	12.65		1953			0	0	0	0	1	1	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Leucopogon maritimus	Occurs in deep, calcareous sands, on the mid to upper slopes of dunes or in shallow sand over limestone, but avoiding the thicker vegetation of the swales, grows in low heathland communities		P1	12.65		2007			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Leucopogon sp. Yanchep (M. Hislop 1986)	Light grey-yellow sand, brown loam, limestone, laterite, granite. Coastal plain, breakaways, valley slopes, low hills		P3	9.97		2005			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Leucopogon squarrosus subsp. *trigynus*	White/grey sand		P2	9.37		2020			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Macarthuria keigheryi	White or grey sand.	E	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Marianthus paralius	Population is low coastal heath on low coastal limestone cliff (TSSC, 2018).	E	EN		16.94		2013		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Restricted to limestone ridges within locality of Nowergup. Plants occur on upper slopes of rugged limestone ridges or where a high proportion of limestone outcropping occurs. Soils are shallow grey to mossy black sands, depeding on the amount of limestone 'caprock' (TCCS, 2019).	E	EN	9.02	9.09	2019	2017	Known	0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (KM)	Distance TPFL (KM)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey Likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Millotia tenuifolia var. *laevis*	Granite or laterite soils.		P2	18.33		2015			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Ornduffia submersa	Submerged. Claypan, wet sandy clay. seasonally inundated wetland (Mattiske, 2019).		P4	14.16		2014			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	12.26		1964			0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops		P3	5.42		1963			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Platysace ramosissima	Sandy soils.		P3	15.31		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Poranthera moorokatta	it was recorded on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high leaf litter cover (Barret, 2012). In Ellenbrook it was recorded in a shallow dampland on mixed grey white sand with scattered leaf litter (Barret, 2012).		P2	17.47		2014			0	0	1	0	2	3	Moderate	Low	Not identified during two field survey events in ideal detection period. Not known from sand dunes.
Schoenus griffinianus	White sand		P4	17.45		2006			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Sphaerolobium calcicola	White-grey brown sand, sandy clay over limestone, black peaty sandy clay. Tall dunes, winter-wet flats, interdunal swamps, low-lying areas		P3	12.32		1997			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands.		P4	7.87	7.91	2005	1994		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland		P3	7.20	14.25	2017	2004		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Stylidium squamellosum	Brown to red-brown clay loam. Winter-wet habitats and depressions, open woodland, shrubland		P2	19.60		2006			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Styphelia filifolia	Sandy soils of the coastal plain (with one known occurrence from the northern Darling Scarp), usually in Banksia or Jarrah woodland and in low-lying situations (Hislop & Puente--Lelièvre, 2017).		P3	3.71		2006			0	1	1	0	2	4	High	Low	No habitat identified during survey.
Synaphea grandis	Laterite.		P4	18.35		1971			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra dedmaniarum	This species is known from two populations north east of Perth, where it is confined to open wandoo woodland on red/brown sandy loam associated with dolerite and granite outcropping. The associated vegetation consists of *Eucalyptus wandoo, E. accedens and E. calophylla* , over low scrub of *Acacia pulchella* , *A. saligna, Calothamnus quadrifidus, Melaleuca radula* and *Hakea lissocarpha* (CALM, 1999).	E	CR					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra stellata	Grows among low heath and scrub in Jarrah and Wandoo woodland, both on ridges and slopes, flats, also on riverbanks and breakaways. Soil types are red, brown, yellow, or grey sandy loams, clay or gravel over laterite or gravel.	E	EN		18.77		2005		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Grey, black or peaty sand. Winter - wet flats		P4	8.06	8.06	1994	1994		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter wet depressions		P4	19.16	20.07	1996	1996		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Verticordia rutilastra	Sand and lateritic gravel. Hills. Geraldton Sandplains		P3	17.88		2006			0	0	1	0	1	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.
Verticordia serrata var. *linearis*	White sand, gravel. Open woodland.		P3	13.93	16.86	2013	1988		0	0	1	0	1	2	Low	Negligible	No suitable habitat identified suring survey. No recent records.

Appendix B - Flora Desktop Assessment

Neerabup Terminal and East Wanneroo Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	Max Date	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Acacia benthamii	Typically on limestone breakaways.		P2	2.13	2.32	2009	1975	2009		0	1	1	1	0	3	Negligible	Negligible	No suitable habitat present.
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand.		P4	2.11		2016		2016		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Austrostipa mundula	Known from Swan Coastal Plain and South Coast. Little information available, known from Tuart Woodlands.		P3	5.01		1900		1900		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	Known from North of Perth only within 100km of coast. Found in Banksia woodland on sand over limestone.		P1	2.00	7.08	2021	2017	2021		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					1900	May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Caladenia huegelii	Grey or brown sand, clay loam.	CE	CR	0.21	3.12	2000	1997	2000	Known	0	1	0	1	1	3	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					1900	May	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calectasia elegans	Between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).		P1	1.68	1.04	2008	2018	2018		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Conostylis bracteata	Sand, limestone. Consolidated sand dunes.		P3	4.38	4.73	2015	1997	2015		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Cyathochaeta teretifolia	Brown, grey sand. Sandy clay. Swamps, creek edges. Jarrah forest, SCP.		P3	0.21	0.37	2008	1994	2008		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Dampiera triloba	Loamy sand.		P3	0.19		2009		2009		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water.	V	VU					1900	Likely	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter wet swamps.	E	CR					1900	Likely	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea micrantha	cleared firebreaks or open sandy patches that have been disturbed. In infertile white-grey sands, in Jarrah and sheoak forest.	V	E					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drosera occidentalis	Sandy & clayey soils. Swamps & wet depressions.		P4		7.11		1986	1986		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes.		P1	0.07		2020		2020		0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.
Drosera x sidjamesii	Peaty sand. Along lake margins, close to winter high-water line.		P1	0.56		2020		2020		0	1	1	1	0	3	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eryngium pinnatifidum subsp. *Palustre* (G.J. Keighery 13459)	In a winter wet claypan, water to 20 cm deep. Grey-brown clay		P3	9.05		1995		1995		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus argutifolia	Known from between Wanneroo, Lake Clifton and Guilderton. This Mallee grows on slopes or gullies close to the summits of limestone ridges, where soils are shallow, well drained and grey with outcrops of limestone (DEWHA, 2008).	V	VU	5.50	5.50	2017	2008	2017	Known	0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus foecunda subsp. *foecunda*	Limestone/ limestone outcrops in heath and sandy soils in coastal areas. Sometimes on fixed dunes and slopes of hills (DCCEEW, 2023).		P4	6.85		1991		1991		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CR					1900	May	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea christineae	Clay loam, sandy clay, often moist.	E	EN					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba	This taxon used to include subsp. incurva and subsp. curviloba. Grey sand, sandy loam. Winter-wet heath.	E	CR	6.88	10842.06	2017	1905	2017	Known	0	0	1	1	1	3	Moderate	Low	No habitat identified during survey.

Appendix B - Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	Max Date	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
										Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Hydrocotyle striata	Winter wet creekline, springs. Light leaf litter on dark brown sandy humic loam, clay.		P1	6.59		2016		2016		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hypolaena robusta	Dune crest. White sand, sandplains.		P4	7.79		2006		2006		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Jacksonia sericea	Calcareous and sandy soils.		P4	0.19	2.70	2020	1979	2020		0	1	1	1	2	5	High	Known	Identified during survey.
Macarthuria keigheryi	White or grey sand.	E	EN					1900	May	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Marianthus paralius	Population is low coastal heath on low coastal limestone cliff (TSSC, 2018).	E	EN	5.40	10.97	2010	2013	2013	Known	0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Restricted to limestone ridges within locality of Nowergup. Plants occur on upper slopes of rugged limestone ridges or where a high proportion of limestone outcropping occurs. Soils are shallow grey to mossy black sands, depeding on the amount of limestone 'caprock'	E	EN	5.85	5.84	2019	2008	2019	Known	0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Millotia tenuifolia var. laevis	Granite or laterite soils.		P2	1.67		2018		2018		0	1	1	1	0	3	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Netrostylis sp. Chandala (G.J. Keighery 17055)	Dampland with thick leaf litter over dark grey sand.		P2	7.16		2013		2013		0	0	1	1	1	3	Moderate	Low	No habitat identified during survey.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	9.20		1999		1999		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	0.82		1990		1990		0	1	0	1	2	4	Moderate	Low	No habitat identified during survey.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.		P3	7.08		1963		1963		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Poranthera moorokatta	Banksia Woodland (Barret, R. 2012).		P2	1.57		2018		2018		0	1	1	1	2	5	High	Moderate	Potential habitat identified during survey.
Schoenus griffinianus	White sand.		P4	5.34		2006		2006		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Stachystemon exilis	On grey sand, seasonally damp (WAHerb 2023)		P1	4.31		2018		2018		0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	2.02		2005		2005		0	1	1	1	2	5	High	Low	No habitat identified during survey.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands		P4	4.70	4.60	2005	1992	2005		0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland		P3	9.79	16.37	2017	2004	2017		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.		P3	5.40		2006		2006		0	0	1	1	1	3	Moderate	Low	No habitat identified during survey.
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.		P3	7.75		2000		2000		0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Styphelia filifolia	Sandy soils of the coastal plain, usually in banksia or Jarrah woodland and low lying situations (Hislop, M, Puente-Lelievre, C, 2017).		P3	0.00		2007		2007		1	1	1	1	2	6	Known	Low	Record location on a cleared road side location, adjacent to a pine plantation. Record over 17 years old.
Synaphea sp. Fairbridge Farm (D.Papentus 696)	Grey, clayey sand with lateritic pebbles. In low woodland, near winter-wet flats with weedy grasses (DCCEEW, 2023).	CE	CR					1900	Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Tetratheca pilifera	Gravelly soils.		P3	8.33		2020		2020		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra diedmaniarum	Granite	E	EN					1900	May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN		22.38		2005	2005	Likely	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra variegata	Sandy clay, sand, laterite.		P2	3.95		1900		1900		0	1	0	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Grey, black or peaty sand. Winter - wet flats		P4	4.51	4.51	1994	1994	1994		0	1	0	1	0	2	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Trithuria occidentalis	Known from one population near Ellenbrook.. It grows in partly submerged water on edge of shallow, winter-wet claypan in very open shrubland of *Melaleuca lateritia* and annual herbs (DEWHA, 2008).	E	EN	11.05		1982		1982	Likely	0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	4.57	25.29	2006	1996	2006		0	1	1	1	2	5	High	Low	No habitat identified during survey.

Appendix B - Flora Desktop Assessment

NT-NOR to HBK 132kv Line Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0.1.2)				
Acacia benthamii	Typically on limestone breakaways.		P2	3.76	16.58	2013	2000		0	1	1	1	0	3	Moderate	Low	No suitable habitat present. No records in the vicinity.
Acacia oncinophylla subsp. *oncinophylla*	Granitic soils.		P3	5.11		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Adenanthos cygnorum subsp. *chamaephyton*	Grey sand, lateritic gravel.		P3	29.32	29.32	1981	1981		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand.		P4	3.15		2014			0	1	1	1	2	5	High	Low	Species not recorded, no suitable habitat identified during survey.
Austrostipa mundula	Exposed limestone areas. Areas of low heath (Esperance Wildflower Society (N.D.).		P3	18.10		1900			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	Grey sand, yellow sand with limestone outcropping. On hills (GHD, 2017).		P1	15.01	17.41	2021	2021		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Bolboschoenus fluviatilis	Coastal to lowland in saltmarshes and other shallow poorly drained saline areas, also found along some freshwater rivers and lakes (New Zealand Plant Conservation Network, 2023). Grey wet sand, on river bank.		P1	7.51		2008			0	0	1	0	1	2	Low	Negligible	No record within the vicinity, no habitat recorded within survey area.
Byblis gigantea	Sandy-peat swamps. Seasonally wet areas.		P3	7.90		1901			0	0	0	1	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Caladenia huegelii	Grey or brown sand, clay loam.	CE	CR	7.35	3.08	2000	2017	Known	0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Calandrinia sp. Bayswater (C. Andrews s.n. 11/1902)	Unavailable.		P1	8.95		1900			0	0	0	0	2	2	Low	Negligible	No recent records recorded within the vicinity. Not identified during survey.
Calectasia elegans	between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).		P1	6.66	7.12	2008	2021		0	0	1	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Carex tereticaulis	Black peaty sand.		P3	6.12	6.00	1999	1999		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Conostylis bracteata	Sand, limestone. Consolidated sand dunes.		P3	17.01	17.40	1997	1997		0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyanicula ixioides subsp. *ixioides*	Laterite, gravel.		P4	6.03		1900			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyathochaeta teretifolia	Grey sand, sandy clay. Swamps, creek edges.		P3	3.01	3.01	2008	2002		0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Dampiera triloba	Loamy sand (WA Herbarium, 2023).		P3	7.80		2009			0	0	1	0	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Darwinia pimelioides	Loam, sandy loam. Granite outcrops.		P4	3.85		1987			0	1	0	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Diuris drummondii	Low-lying depressions, swamps.	V	VU	7.97		1900		Likely	0	0	0	1	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes.		P1	6.39		2020			0	0	1	0	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Drosera x sidjamesii	Peaty sand. Along lake margins, close to winter high-water line.		P1	6.39		2020			0	0	1	0	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	7.19	8.41	2007	2007	Known	0	0	1	1	1	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Eryngium pinnatifidum subsp. *Palustre* (G.J. Keighery 13459)	In a winter wet claypan, water to 20 cm deep. Grey-brown clay (pgv, Environmental, 2019).		P3	4.38		1995			0	1	0	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Eucalyptus argutifolia	On slopes or gullies near the coast and shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.	V	VU	23.36	23.38	2006	2018	May	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Eucalyptus foecunda subsp. *foecunda*	Limestone heath and limestone soils in coastal areas (DCCEEW, 2023).		P4	19.24		2010			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E		4.92		2019			0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Grevillea sp. Ocean Reef (D. Pike Joon 4)	Broard sand dune, grey-brown dry sand. Limestone boulders (WA Herbarium, 2023).		P1	21.58		2013			0	0	1	0	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	6.16	6.36	1981	1981		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle lemnoides	Swamps.		P4	7.33	6.88	1906	1990		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle striata	Clay and/or springs.		P1	2.26		2016			0	1	1	1	2	5	High	Low	Species not recorded, no suitable habitat identified during survey.

Appendix B - Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Hypolaena robusta	White sand. Sandplains.		P4	3.60		1999			0	1	0	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	5.50		1991			0	0	0	1	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Jacksonia sericea	Calcareous & sandy soils.		P4	6.40	13.47	2020	1990		0	0	1	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Lasiopetalum glutinosum subsp. glutinosum	Typically found on the Darling Scarp in the Jarrah Forest or open woodland dominated by Jarrah, Marri and banksia in open, low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops or creeklines (Shepard, K & Wilkins, C, 2015).		P3	7.03		1900			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Leucopogon maritimus	On near-coastal Quindalup dunes in low healthland and deep, calcareous sands, on the mid to upper slopes of dunes or in shallow sand over limestone, but avoiding the thicker vegetation of the swales (Hislop, M, 2011).		P1	21.02		1966			0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Levenhookia preissii	Grey or black, peaty sand. Swamps.		P1	7.90		1951			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Marianthus paralius	White sand over limestone. Low coastal cliffs.	E	EN	18.53	23.13	2021	2018	Known	0	0	1	0	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Meionectes tenuifolia	Granite flats, shallow soil at margins, inundated. Grey clay (Mainroads, 2015).		P3	4.23	5.27	2007	1995		0	1	1	1	0	3	Moderate	Low	No suitable habitat present.Not recorded during the survey.
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Dense patches Melaleuca species, predominantly *M. systena*, when growing on very shallow soils over limestone 'caprock' on ridges (TSSC, 2019).	E	EN	23.56	23.56	2019	2019		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Millotia tenuifolia var. *laevis*	Granite or laterite soils.		P2	5.63		2018			0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Myriophyllum echinatum	Clay. Winter-wet flats.		P3	8.18		1900			0	0	0	1	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Netrostylis sp. Chandala (G.J. Keighery 17055)	Dampland with thick leaf litter over dark grey sand (WA Herbarium, 2023).		P2	2.29		2013			0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Persoonia sulcata	Lateritic or granitic soils.		P4	7.42		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Phlebocarya pilosissima subsp. pilosissima	White or grey sand, lateritic gravel.		P3	5.97		1999			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	11.46		1990			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.		P3	23.77		1963			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Poranthera moorokatta	Two populations: Kings Park in Banksia woodland, on white silica sand in open spaces(no litter or shade) and in Ellenbrook in a shallow dampland on mixed grey and white sand with scattered leaf litter (Barrett, R, 2012).		P2	3.82		2018			0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Sarcozona bicarinata	White sand.		P3	22.09	23.05	1997	1992		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus capillifolius	Brown mud. Claypans.		P3	3.80	8.22	2012	1990		0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Schoenus griffinianus	White sand.		P4	12.13		1993			0	0	0	1	2	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Schoenus natans	Winter-wet depressions.		P4	8.39		2004			0	0	1	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Schoenus sp. Waroona (G.J. Keighery 12235)	Clay or sandy clay. Winter-wet flats.		P3	3.80		1988			0	1	0	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Stachystemon exilis	Open, low-lying Banksia woodland (Hislop, M & Davies, R, 2020).		P1	1.17		2018			0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	17.20		2005			0	0	1	1	1	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Stylidium longitubum	Sandy clay, clay. Seasonal wetlands.		P4	3.80	2.37	2012	2005		0	1	1	1	2	5	High	Low	Species not recorded, no suitable habitat identified during survey.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3	27.54		2009			0	0	1	0	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.		P3	6.59		2006			0	0	1	1	1	3	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.		P3	4.42		2000			0	1	0	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.

Appendix B - Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Styphelia filifolia	Sandy soils of the coastal plain, usually in banksia or Jarrah woodland and low lying situations (Hislop, M, Puente-Lelievre, C, 2017).		P3	7.97		2007			0	0	1	1	2	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Tetratheca pilifera	Gravelly soils.		P3	0.83		2020			0	1	1	1	1	4	Moderate	Low	No gravels documented onsite
Thelymitra variegata	Sandy clay, sand, laterite.		P2	15.60		1900			0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	6.61		1990			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel.		P2	4.57		1991			0	1	0	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Seasonal Wetland, flat ground, black fine peaty clay loam sand, poor drainage, wet during winter/spring (WA Herbarium, 2023).		P4	21.72	21.72	1994	1994		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No records in the vicinity.
Trithuria occidentalis	From one confirmed location in Ellenbrook. On the edge, partly submerged within a shallow, winter wet claypan in very open *Melaleuca lateritia* (DEC, 2012).	E	EN	3.79	8.43	2012	2018	Likely	0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	1.89		2006			0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Drosera occidentalis	Wetlands between Perth and Pinjarra (Alexander, G, 1989).		P4		4.68		1986		0	1	0	1	1	3	Low	Negligible	Species not recorded, no suitable habitat identified during survey.
Grevillea curviloba subsp. *curviloba*	Grey sand. Winter-wet heath.	E			4.88		2019	Known	0	1	1	1	1	4	Moderate	Low	Species not recorded, no suitable habitat identified during survey.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		25.53		2002		0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia leptotheca	Grey sand, limestone, small cliff (TPFL, 2023).		P3		23.06		1990		0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea thelemanniana	Sand, sandy clay. Winter-wet low-lying flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia foetida	grey-white sand on swampy, seasonally wet, winter-wet or wet clay sites. Plants are found alongside sump land (DCCEEW, 2023).	CR	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	CR	CE					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Ptilotus pyramidatus	Seasonally inundated flat (floodplain) with pale grey, muddy-sand to sandy-mud alluvium (DCCEEW, 2023).	CR	CE					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Andersonia gracilis	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					Known	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia apiculata	Lateritic soils.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra stellata	Sand, gravel, lateritic loam.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CE					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calytrix breviseta subsp. *breviseta*	Sandy clay. Swampy flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E						Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Conospermum densiflorum subsp. *unicephalatum*	Clay soils. Low-lying areas.	E	EN					May	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus leprophloia	White or grey sand over laterite. Valley slopes.	E	EN					May	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea corrugata	Gravelly loam. Roadsides.	E	EN					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diplolaena andrewsii	Loam, clay. Granite outcrops & hillsides.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Macarthuria keigheryi	White or grey sand.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra dedmaniarum	Granite.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea althoferorum	Grey sand with gravel.	E						Likely	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
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	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					Known	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter-wet swamps.	E	CE					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea christineae	Clay loam, sandy clay, often moist.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Appendix B - Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Lepidosperma rostratum	Peaty sand, clay.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Austrostipa bronweniae	Swan Coastal Plain in flat low-lying calcareous winter wet grey-brown sandy loam or dark brown loam over clay TSSC, 2018).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Chamelaucium lullfitzii	white/yellow sand supporting open low woodland within coatal Banksia woodlan and a species-rich scrub understorey (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia anomala	Lateritic soils. Slopes.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia aphylla	Sand, loam, clay loam. Granite outcrops, hills.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea micrantha	Often infertile white-grey sand. On cleared fire breaks or on disturbed open-sandy patches.	V	EN					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Anthocercis gracilis	Sandy or loamy soils. Granite outcrops.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea flexuosa	Red-brown sand with laterite & gravel, sand over granite. Ridgetop plateau & associated breakaways.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Conospermum undulatum	Grey or yellow-orange clayey sand.	V	VU					Known	0	0	0	0	1	1	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Northern Terminal Flora Desktop Assessment

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Acacia benthamii	Typically on limestone breakaways.		P2	6.09	16.79	2013	2000		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Acacia oncinophylla subsp. *oncinophylla*	Granitic soils.		P3	12.88		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Adenanthos cygnorum subsp. *chamaephyton*	Grey sand, lateritic gravel.		P3	32.49	32.49	1981	1981		0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos humilis subsp. *chrysanthus*	Grey or yellow sand, clay, gravel, laterite		P4	3.28		2014			0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.
Austrostipa mundula	In sand over limestone.		P3	15.63		1900			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Baeckea sp. Limestone (N. Gibson & M.N. Lyons 1425)	Grey sand, yellow sand with limestone outcropping, hills.		P1	12.09	12.22	2021	2021		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Bolboschoenus fluviatilis	Littoral zone, floodplain. Wet grey sand, silt, mud.		P1	5.53		2008			0	0	1	0	2	3	Moderate	Low	No habitat or individuals identified during survey.
Byblis gigantea	Sandy-peat swamps. Seasonally wet areas.		P3	9.34		1901			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Caladenia huegelii	Grey or brown sand, clay loam.	CE	CR	3.81	2.18	2000	2017	Known	0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Calandrinia sp. Bayswater (C. Andrews s.n. 11/1902)	No information available		P1	5.43		1900			0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calectasia elegans	between Pinjar and Bullsbrook on deep, grey, quartz sand in habitats that have experienced infrequent fires. Recorded growing in *Banksia menziesii* and *B. attenuata* woodland (Barrett, R and Barret, M, 2015).		P1	13.28	13.93	2008	2021		0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Carex tereticaulis	Black peaty sand.		P3	7.59	7.67	1999	1999		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	6.24		1991			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyanicula ixioides subsp. *ixioides*	Laterite, gravel.		P4	14.84		1900			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Cyathochaeta teretifolia	Seasonally wet drainage lines and margins of permanent water sources, flat ground. Grey sand with clay, poor drainage (WA Herbarium 2023).		P3	3.71	2.85	2008	2002		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Dampiera triloba	Loamy sand.		P3	6.24		2009			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Darwinia pimelioides	Loam, sandy loam. Granite outcrops.		P4	9.44		1987			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Diuris drummondii	Low-lying depressions, swamps.	V	VU	8.52		1900		Likely	0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Drosera patens	Sandy soils. Margins of winter-wet depressions, swamps and lakes.		P1	2.15		2020			0	1	1	0	2	4	High	Low	No habitat identified during survey. No individuals identified.
Drosera x sidjamesii	Peaty sand. Along lake margins, close to winter high-water line.		P1	2.15		2020			0	1	1	0	2	4	High	Low	No habitat identified during survey. No individuals identified.
Eleocharis keigheryi	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	V	VU	16.05	17.21	2007	2007	Known	0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Eryngium pinnatifidum subsp. *Palustre* (G.J. Keighery 13459)	In a winter wet claypan, water to 20 cm deep. Grey-brown clay		P3	12.83		1995			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Eucalyptus argutifolia	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops.	V	VU	22.23	24.52	2006	2018	May	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Eucalyptus foecunda subsp. *foecunda*	Limestone/ limestone outcrops in heath and sandy soils in coastal areas. Sometimes on fixed dunes and slopes of hills (DCCEEW, 2023).		P4	12.69		2010			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba	Grey sand, sandy loam. Winter-wet heath.	E	EN	12.97		2019			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Grevillea sp. Ocean Reef (D. Pike Joon 4)	Broard sand dune, grey-brown dry sand. Limestone boulders (WA Herbarium, 2023).		P1	18.05		2013			0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Haemodorum loratum	Grey or yellow sand, gravel.		P3	14.95	15.14	1981	1981		0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Hydrocotyle lemnoides	Swamps		P4	9.34	15.75	1906	1990		0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Hydrocotyle striata	Winter wet creekline, springs. Light leaf litter on dark brown sandy humic loam, clay (WA Herbarium, 2023).		P1	4.18		2016			0	1	1	1	1	4	Moderate	Low	No habitat identified during survey.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Hypolaena robusta	Dune crest. White sand, sandplains (WA Herbarium, 2023).		P4	11.67		1999			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Isopogon autumnalis	Sandy soils, often in Banksia woodlands		P3	6.24		1991			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Jacksonia sericea	Calcareous and sandy soils		P4	0.70	6.80	2020	1990		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Lasiopetalum glutinosum subsp. *glutinosum*	Open woodland dominated by *Eucalyptus marginata, Corymbia calophylla, Banksia menziesii* and *B. attenuata* and in open, low scrub over heath, on steep slopes of lateritic gravel, clay or sandy loam near granite outcrops and creeklines (Shepherd and Wilkins, 2015).		P3	10.55		1900			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Leucopogon maritimus	Occurs in deep, calcareous sands, on the mid to upper slopes of dunes or in shallow sand over limestone, but avoiding the thicker vegetation of the swales, grows in low heathland communities		P1	16.49		1966			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Levenhookia preissii	Grey or black, peaty sand. Swamps.		P1	6.24		1951			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Marianthus paralius	Coastal heath in areas of white sand and brown loam, on coastal limestone cliffs	E	CR	16.02	20.33	2021	2018	Known	0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Meionectes tenuifolia	Granite flats, shallow soils at margins, inundated. Grey clay, reserve and wetland (Mainroads, 2015).		P3	7.59	14.13	2007	1995		0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Melaleuca sp. Wanneroo (G.J. Keighery 16705)	Restricted to limestone ridges within locality of Nowergup. Plants occur on upper slopes of rugged limestone ridges or where a high proportion of limestone outcropping occurs. Soils are shallow grey to mossy black sands, depeding on the amount of limestone 'caprock' (TSSC 2019)	E	EN	24.27	24.27	2019	2019		0	0	1	0	0	1	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Millotia tenuifolia var. *laevis*	Granite or laterite soils.		P2	4.91		2018			0	1	1	1	0	3	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Myriophyllum echinatum	Grey-black sandy clay. Winter-wet flats.		P3	9.84		1900			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Netrostylis sp. Chandala (G.J. Keighery 17055)	Dampland with thick leaf litter over dark grey sand.		P2	4.47		2013			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Persoonia sulcata	Lateritic or granitic soils.		P4	16.11		1980			0	0	0	1	0	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Phlebocarya pilosissima subsp. *pilosissima*	White or grey sand, lateritic gravel.		P3	13.99		1999			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Pimelea calcicola	Sand. Coastal limestone ridges.		P3	13.30		1990			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Pithocarpa corymbulosa	Gravelly or sandy loam. Amongst granite outcrops.		P3	26.73		1963			0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Poranthera moorokatta	Very gently inclined plain, white silica sand in open spaces between shurbs, not in shaded areas or in areas of high litter cover (WA Herbarium, 2023)		P2	3.88		2018			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Sarcozona bicarinata	White sand.		P3	19.60	20.25	1997	1992		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus capillifolius	Brown mud. Claypans.		P3	12.49	17.04	2012	1990		0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Schoenus griffinianus	White sand.		P4	17.30		1993			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Schoenus natans	Winter-wet depressions.		P4	17.20		2004			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Schoenus sp. Waroona (G.J. Keighery 12235)	Clay or sandy clay. Winter-wet flats.		P3	12.49		1988			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Stachystemon exilis	On grey sand, seasonally damp.		P1	3.88		2018			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Stenanthemum sublineare	Littered white sand. Coastal plain.		P2	21.17		2005			0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Stylidium longitubum	Sandy clay, clay, seasonal wetlands		P4	10.55	4.48	2012	2005		0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Stylidium maritimum	Sand over limestone. Dune slopes and flats. Coastal heath and shrubland, open Banksia woodland.		P3	29.20		2009			0	0	1	0	2	3	Moderate	Low	No habitat identified during survey.
Stylidium paludicola	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.		P3	6.24		2006			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Stylidium trudgenii	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.		P3	12.21		2000			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Styphelia filifolia	Sandy soils of the coastal plain (with one known occurrence from the northern Darling Scarp), usually in Banksia or Jarrah woodland and in low-lying situations (Hislop & Puente--Lelièvre, 2017).		P3	7.67		2007			0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Tetratheca pilifera	Gravelly soils.		P3	6.27		2020			0	0	1	1	0	2	Negligible	Negligible	No suitable habitat present. No records in the vicinity.
Thelymitra variegata	Sandy clay, sand, laterite.		P2	14.07		1900			0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thysanotus glaucus	White, grey or yellow sand, sandy gravel.		P4	11.73		1990			0	0	0	1	2	3	Moderate	Low	No habitat identified during survey.
Thysanotus sp. Badgingarra (E.A. Griffin 2511)	Grey sand with lateritic gravel.		P2	11.35		1991			0	0	0	1	1	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Tripterococcus sp. Brachylobus (A.S. George 14234)	Grey, black or peaty sand. Winter - wet flats		P4	24.24	24.24	1994	1994		0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Trithuria occidentalis	Known from one population near Ellenbrook (DEWHA, 2008). It grows in partly submerged water on edge of shallow, winter-wet claypan in very open shrubland of *Melaleuca lateritia* and annual herbs (DEWHA, 2008).	E	EN	10.55	17.23	2012	2018	Likely	0	0	1	1	1	3	Low	Negligible	No suitable habitat present. No records in the vicinity.
Verticordia lindleyi subsp. *lindleyi*	Sand, sandy clay. Winter-wet depressions.		P4	3.76		2006			0	1	1	1	2	5	High	Low	No habitat identified during survey. No individuals identified.
Drosera occidentalis	Sandy & clayey soils. Swamps & wet depressions.		P4		1.55		1986		0	1	0	1	2	4	Moderate	Low	No habitat identified during survey.
Grevillea curviloba subsp. *curviloba*	Grey sand. Winter-wet heath.	E			13.73		2019	Known	0	0	1	1	2	4	Moderate	Low	No habitat identified during survey.
Hibbertia helianthemoides	Clayey sand over sandstone or loam over quartzite. Hills and scree slopes.		P4		30.79		2002		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Hibbertia leptotheca	Limestone ridges. Ranges from Yalgorup to Lancelin		P3		20.27		1990		0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia foetida	Grey-white sand on swampy, seasonally wet sites. Found alongside water pit/well (sump land). Recorded at three locations near town of Muchea.	E	CE					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	Grey, clayey sand with lateritic pebbles. In low woodland, near winter-wet flats with weedy grasses (DCCEEW, 2023).	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea thelemanniana	Sand, sandy clay. Winter-wet low-lying flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Ptilotus pyramidatus	Seasonally inundated flat (floodplain). Pale grey, muddy-sand to sandy-mud alluvium (DCCEEW, 2023)	CE	CR					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
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	EN					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea elastica	White or grey sand. Low-lying situations adjoining winter-wet swamps.	E	CR					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris purdiei	Grey-black sand, moist. Winter-wet swamps.		P4					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Calytrix breviseta subsp. *breviseta*	Sandy clay. Swampy flats.	CE	CR					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra stellata	Red, brown, yellow, or grey sandy loams, clay or gravel over laterite or gravel.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea curviloba subsp. *incurva*	Sand, sandy loam. Winter-wet heath.	E						Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Darwinia apiculata	Lateritic soils.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Lepidosperma rostratum	Peaty sand, clay.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea christineae	Clay loam, sandy clay, often moist.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Eremophila glabra subsp. *chlorella*	Sandy clay. Winter-wet depressions.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Taxon	Habitat[1]	Cons. Code EPBC	Cons. Code WA	Distance WAHERB (Km)	Distance TPFL (Km)	Date WAHERB	Date TPFL	PMST	Likelihood Assessment					Total Score	Likelihood	Post-survey likelihood	Comments
									Recorded in the survey area	Known occurrence nearby (5km)	Recent Record (Last 20 years)	Known occurrence within the LGA	Potential presence of suitable habitat within the Survey Area (0,1,2)				
Eucalyptus x balanites	Sandy soils with lateritic gravel.	E	CR					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Banksia mimica	White or grey sand over laterite, sandy loam.	V	VU					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Andersonia gracilis	This species is known from the Badgingarra, Dandaragan and Kenwick areas where it is found on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation with species such as *Calothamnus hirsutus, Verticordia densiflora* and *Kunzea recurva* over sedges (DEC, 2006).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Diplolaena andrewsii	Loam, clay. Granite outcrops & hillsides.	E	EN					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Thelymitra dedmaniarum	Granite	E	EN					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Macarthuria keigheryi	White or grey sand.	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Austrostipa bronweniae	Flat low-lying calcareous winter wet habitat type on the extensively cleared Swan Coastal Plain (TSSC, 2018).	E	EN					Known	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Chamelaucium lullfitzii	White/yellow sand supporting open low woodland with *Eucalyptus todtiana* (Pricklybark), *Banksia attenuata* (Coast Banksia), and *Hibbertia* sp. (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Caleana dixonii	Deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (DCCEEW, 2023).	E	VU					May	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Anigozanthos viridis subsp. *terraspectans*	Grey sand, clay loam. Winter-wet depressions.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia anomala	Grows over laterite in shallow sand, loam, clay or gravel that is brown, yellow or grey. Grows on ridges, slopes and low plains, entagled amongst other low shrubs in dense vegetation, and in low open woodland or forest dominated by *Eucalyptus marginata, E. wandoo, E. accedens and Corymbia calophylla*. Occurs on western slopes of Darling Ranges, near Chittering south to Pickering Brook	V	VU					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Grevillea flexuosa	Red-brown sand with laterite & gravel, sand over granite. Ridgetop plateau & associated breakaways.	V	VU					May	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Diuris micrantha	Brown loamy clay. Winter-wet swamps, in shallow water.	V	VU					Likely	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Conospermum undulatum	Grey or yellow-orange clayey sand.	V	VU					Known	0	0	0	0	1	1	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Anthocercis gracilis	Sandy or loamy soils. Granite outcrops.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Acacia aphylla	Sand, loam, clay loam. Granite outcrops, hills.	V	VU					Known	0	0	0	0	0	0	Negligible	Negligible	No suitable habitat present. No recent records in the vicinity.
Drakaea micrantha	White-grey sand.	V	VU					Likely	0	0	0	0	2	2	Low	Negligible	No suitable habitat present. No recent records in the vicinity.

Appendix C

Fauna Desktop Assessment

Appendix C - Fauna Desktop Assessment

Padbury-Wangara Fauna Likelihood Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Bird	*Actitis hypoleucos*	Common Sandpiper	Wide range of coastal wetlands, around muddy margins or rocky shores, some inland wetlands and rarely on mudflats (DCCEEW, 2023)	IA	MI & MA	1991	2	10.36		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Apus pacificus*	Fork-tailed Swift	Over inland plains, sometimes boave foothills or in coastal areas (DCCEEW, 2023).	IA	MI & MA	2014	17	6.85		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Arenaria interpres*	Ruddy Turnstone	Coastal regions with exposed rock coast lines or coral reefs (DCCEEW, 2023).	IA	V & MI & MA	1991	4	30.29		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Insect	*Australotomurus morbidus*	Cemetary springtail, Guildford springtail	Undisturbed native grasslands and heathland at low and high elevations (P. Greenslade & R. Jordana, 2014).	P3		1993	6	11.02		0	1	0	1	2	Low	Low	No suitable habitat identified.
Invertebrate	*Austroconops mcmillani*	A biting midge	Larvae live in small aquatic habitats.	P2		2011	8	33.88		0	0	1	0	1	Negligible	Negligible	No surface water identified.
Invertebrate	*Austrosaga spinifer*	Cricket	Banksia heath and low woodlands (South Metro Connect, 2011). Known records exist in Neerabup National Park (DEC, 2012b).	P2		1982	2	15.04		0	1	0	1	2	Low	Low	Limited recent records in proximity.
Mammal	*Bettongia lesueur graii*	Boodie, Burrowing Bettong	open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	Ex	N/A	2	24.32		0	0	0	1	1	Low	Low	Species considered extinct.
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Dry sclerophyllous forest with a dense understory (ALA, 2023).	EN	CE	2018	98	11.15	Known	0	1	1	1	3	Moderate	Low	No surface water identified.
Bird	*Botaurus poiciloptilus*	Australasian Bittern	Freshwater wetlands and, rarely, estuaries or tidal wetlands, favouring tall dense vegetation (TSSC, 2019).	EN	E	2003	20	6.49	Known	0	1	1	1	3	Moderate	Low	Limited habitat identified.
Bird	*Cacatua pastinator pastinator*	Muir's Corella	Large or dead eucalypts and paperbark in forested areas or lone trees in paddocks along roadsides (DEC, 2008)	CD		N/A	7	18.55		0	1	0	1	2	Low	Low	Limited recent records in proximity.
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	Occurs along muddy edges of shallow fresh or brackish wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (DCCEEW, 2023).	IA	V & MI & MA	2012	9	6.49		0	1	1	1	3	Moderate	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris alba*	Sanderling	Restricted to the coast, mostly on open sandy beaches exposed to open sea-swell, exposed sandbars and spits, and shingle banks (DCCEEW, 2023).	IA	MI & MA	1980	3	18.32		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris canutus*	Red Knot	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	V & MI & MA	2002	8	18.32		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ferruginea*	Curlew Sandpiper	Intertidal mudflats in sheltered coastal areas and inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud and sand (DCCEEW, 2023).	CR & IA	CE & MI & MA	2005	31	6.49		0	1	1	1	3	Moderate	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris melanotos*	Pectoral Sandpiper	Occupies shallow, fresh waters often containing low grass or other small herbs, swamp margins, flooded pastures and saltmarshes (Pizzey & Knight, 2007;DCCEEW, 2023).	IA	MI & MA	1992	2	20.83		0	0	0	1	1	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ruficollis*	Red-necked Stint	Coastal sheltered areas and exposed or ocean beaches, sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI & MA	2011	96	4.52		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris subminuta*	Long-toed Stint	Freshwater wetlands (DCCEEW, 2023).	IA	MI & MA	1992	4	6.49		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris tenuirostris*	Great Knot	Sheltered coastal habitats with large intertidal mudflats or sandflats (DCCEEW, 2023).	CR & IA	V & MI & MA	2005	12	18.32		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia, rarely ventures inland (Pizzey & Knight, 2007)	IA	MI & MA	2010	1	12.07		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Inhabits dense Eucalyptus marginata (Jarrah), E. diversicolor (Karri) and Corymbia calophylla (Marri) forests (TSSC, 2009).	VU	V	2020	363	1.20	Known	0	1	1	2	4	High	Known	Identified suring survey.
Bird	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	V & MI & MA	2011	2	6.72		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Charadrius mongolus*	Lesser Sand Plover	Open intertidal flats of sheltered bays, lagoons or estuaries (Pizzey & Knight, 2007).	EN & IA	E & MI & MA	1999	1	24.21		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Chlidonias leucopterus*	White-winged Black Tern, White-winged Tern	Fresh, brackish or saline, and coastal or subcoastal wetlands. They rarely occur on inland wetlands in Australia (DCCEEW, 2023).	IA	MI & MA	1990	1	6.49		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Ctenotus gemmula*	Jewelled Ctenotus	Endemic to Western Australia. In the Perth region it is uncommon and restricted to the Swan Coastal Plain. It inhabits low vegetation in Banksia woodland, sheltering in leaf litter under trees, shrubs and abandoned stick-ant nests (Bush et al., 2010).	P3		1999	1	27.49		0	0	0	0	0	Negligible	Negligible	Limited recent records in proximity.

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Bird	*Dasyornis longirostris*	Western Bristlebird	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	E	0	1	19.74		0	1	0	0	1	Negligible	Negligible	Limited habitat present.
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2022	58	4.33	Known	0	1	1	1	3	Moderate	Low	Limited habitat present.
Reptile	*Delma concinna major*	Javelin Lizard	Heaths on dunes and sand-plains along mid- to lower west coast. Subspecies dwells in dense matrix of low vegetation and associated leaf litter in Shark Bay.	P1		2015	1	38.54		0	0	1	0	1	Negligible	Negligible	No habitat present.
Bird	*Elanus scriptus*	Letter-winged kite	Open country and grasslands throughout arid and semi-arid regionsWill disperse to high rainfall and coastal regions when food is abundent (BirdLife, 2021).	P4		1980	1	18.32		0	1	0	1	2	Low	Low	Limited habitat present.
Invertebrate	*Euoplos inornatus*	Australian armored trapdoor spiders	Most records are from the Darling Scarp and jarrah forest (Invertebrate Solutions, 2018).	P3		1998	1	22.12		0	0	0	0	0	Negligible	Negligible	Limited recent records in close proximity.
Bird	*Falco hypoleucos*	Grey Falcon	Timered lowland plains, including acacia shrublands)particularly with tree-lined watercourses), tussock grassland and open woodland (TSSC, 2020).	VU	V	1929	1	19.95		0	1	0	1	2	Low	Low	No watercourses present.
Bird	*Falco peregrinus*	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	OS		2014	109	0.54		0	1	1	1	3	Moderate	Moderate	Likely a fly over species.
Fish	*Galaxiella nigrostriata*	Black-stripe Minnow	Acidic ephemeral bodies of water in peat flats located in the south west corner of Western Australia. The major populations occur from Augusta to Albany and near Bunbury and Gingin (Morgan et al, 2011). Generally prefer sandy, moist soil when ephemeral pools dry out.	EN		2009	3	20.77	Known	0	0	1	0	1	Negligible	Negligible	No surface water identified.
Bird	*Glareola maldivarum*	Oriental Pratincole	Open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI & MA	1981	1	12.06		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Hesperocolletes douglasi*	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE	2015	2	27.45	May	0	0	1	0	1	Negligible	Negligible	Limited recent records in close proximity.
Mammal	*Hydromys chrysogaster*	Water Rat	Tnear permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	52	1.08		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Hydroprogne caspia*	Caspian Tern	The Caspian Tern is found in sheltered coastal embayments and those with sandy or muddy margins (DCCEEW, 2023).	IA	MI & MA	1994	8	16.47		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Hylaeus globuliferus*	Native Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	19	13.26		0	1	0	1	2	Low	Low	Limited suitable habitat present.
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	124	0.24		0	1	1	2	4	High	Moderate	Banksia woodland present.
Mammal	*Isoodon fusciventer*	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2021	1588	0.04		0	1	1	2	4	High	Known	Identified during survey.
Bird	*Ixobrychus flavicollis australis (south*	Black Bittern (Southwest subpopulation)	Terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation includng flooded grassland, forest, woodland, rainforest and mangroves (NSW Government, 2018).	P2		1987	2	5.98		0	1	0	1	2	Low	Low	No surface water identified.
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		1982	6	14.91		0	1	0	1	2	Low	Low	Limited suitable habitat present.
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	Known from Kenwick wetlands, Cannington and Forestdale Lake and near Lithgow in the Blue Mountains of NSW (ALA, 2019). Has an association with Goodenia filiformis and Anthotium junciforme (South Metro Connect, 2011).	EN		1954	4	27.00	Known	0	0	0	1	1	Low	Low	No surface water identified.
Bird	*Leipoa ocellata*	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (Melaleuca uncinata) and Scrub Pine (Callitris verrucosa) (Benshemesh, 2007).	VU	V	1981	46	21.88	Likely	0	0	0	0	0	Negligible	Negligible	No habitat present.
Bird	*Limosa lapponica*	Bar-tailed Godwit	Widespread around the coast of Western Australia from Eyre to Derby (DotE, 2015).	IA (& VU or CR at subsp. level)	Mi (& V or CE at subsp. level)	2004	18	9.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	Coastal habitat, including 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	CE				Known	0	0	0	1	1	Low	Low	No surface water identified.
Bird	*Limosa limosa*	Black-tailed Godwit	Coastal habitat including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (DCCEEW, 2023)	IA	MI & MA	2011	4	6.49		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Macroderma gigas*	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	0	0	0	Negligible	Negligible	No habitat present.
Bird	*Macronectes giganteus*	Southern Giant-Petrel	The Southern Giant-Petrel occurs over subantarctic waters in summer near its breeding islands in the Atlantic and Indian Oceans, in subantarctic to southern subtropical waters on the Argentinean continental shelf and off New Zealand and the cold eastern boundary current off South America. In winter, it is common off South America, South Africa, Australia and New Zealand. It occurs in both pelagic and inshore waters. It is attracted to land at sewage outfalls and scavenges ashore (Marchant & Higgins 1990).		E & MI & MA	2009	1	6.19		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Macrotis lagotis*	Bilby	Arid to semi-arid woodlands and hummock grasslands in the north of Australia, restricted to the Gibson, Little Sandy and Great Sandy Deserts, and parts of the Pilbara, Dampierland, Central Kimberley and Ord-Victoria Plains bioregions in Western Asutralia (Bradley et al. 2015).	VU	V	1974	4	19.41		0	1	0	1	2	Low	Low	Limited habitat present.
Mammal	*Myrmecobius fasciatus*	Numbat	Mulga woodland, spinifex sandplains and Eucalypt forests and woodlands. In WA, their habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches (DBCA, 2021)	EN	E	1974	1	4.33		0	1	0	1	2	Low	Low	Limited habitat present.
Reptile	*Neelaps calonotos*	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2017	97	0.61		0	1	1	2	4	High	Moderate	Banksia and Eucalyptus woodland present.

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Bird	*Ninox connivens connivens (southwe*	(Barking Owl (southwest subpop.))	Open eucalyptus woodlands and the edges of forests, often adjacent to farmland. Likely to use the interior of forested habitat and prefer woodlands and forests with a high density of large trees and particularly sites with hollows (Davis et al., 2022).	P2		1902	1	14.71		0	1	0	1	2	Low	Low	Limited habitat present.
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).	P4		2017	18	14.28		0	1	1	1	3	Moderate	Low	Limited habitat present.
Mammal	*Notamacropus irma*	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2018	35	7.33		0	1	1	1	3	Moderate	Low	Limited habitat present.
Bird	*Numenius madagascariensis*	Eastern Curlew	Intertidal mudflats. The southern most important international site in Western Australia is Eighty Mile Beach (Bamford et al., 2008).	CR & IA	CE& MI & MA	1959	2	23.05		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Numenius phaeopus*	Whimbrel	Along the Australian coast, inhabiting estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	IA	MI & MA	1978	2	32.74		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Oxyura australis*	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2013	866	0.93		0	1	1	0	2	Low	Negligible	No surface water identified.
Bird	*Pachyptila turtur subantarctica*	Fairy Prion (Southern)	Subtropical waters, circumpolar. Burrows in cervices or hollows beneath Colobanthus muscoides with peaty soil (TSSC, 2015).	VU					Known	0	0	0	0	0	Negligible	Negligible	No surface water identified.
Mammal	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	Wide variety of rock types, requiring sufficient cave and crevice development (DPaW 2015).	EN		2004	8	24.32	Known	0	0	1	0	1	Negligible	Negligible	No caves or rock crevices identified.
Mammal	*Phascogale tapoatafa wambenger*	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD		2018	6	4.33		0	1	1	1	3	Moderate	Low	Limited habitat present.
Bird	*Plegadis falcinellus*	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI & MA	2013	200	0.64		0	1	1	1	3	Moderate	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Pluvialis squatarola*	Grey Plover	Coastal, marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats, sandy beachesand rocky coasts. It is occasionally found inland (Birdlife Australia, 2021).		MI & MA	2007	90	12.06		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE	2019	222	19.10	Known	0	1	1	0	2	Low	Low	No surface water identified.
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	Peppermint (*Agonis flexuosa*) forest and woodland and Tuart (*Eucalyptus gomphocephala*) with a peppermint mid-story. Inland, the species is found in Jarrah (*Eucalyptus marginata*), Wandoo (*Eucalyptus wandoo)* and Marri (*Corymbia calophylla*) forest (Van Dyck & Strahan, 2008).	CR	CE	1958	1	23.06	Likely	0	0	0	0	0	Negligible	Negligible	No suitable habitat identified.
Bird	*Rostratula australis*	Australian Painted Snipe	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2023).	EN	E	2012	3	15.28		0	1	1	1	3	Moderate	Low	No surface water identified.
Mammal	*Setonix brachyurus*	Quokka	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. Rottnest Island (DCCEEW, 2023).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	Not within known range.
Bird	*Sternula nereis nereis*	Fairy Tern	It is most common in Western Australia, found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons, favouring both fresh and saline wetlands and near-coastal terrestial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2021)	VU	V	2013	5	24.22	Known	0	0	1	0	1	Negligible	Negligible	No surface water identified.
Invertebrate	*Synemon gratiosa*	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant Lomandra maritima, the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2019	741	0.65		0	1	1	1	3	Moderate	Low	No suitable habitat identified,
Bird	*Thalassarche carteri*	Indian Yellow-nosed Albatross	Subtropical and warmer subantarctic waters, foraging mostly in the southern Indian Ocean, particually off the coast of southern Western Australia, as far north as Shark Bay (Marchant & Higgins, 1990) (Weimerskirch et al., 1986).	VU	V & MI & MA	1968	1	11.61		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Thalasseus bergii*	Crested Tern	A strictly coastal species. Occasional records in the arid interior of Australia (BirdLife Australia, 2022).	IA	MI & MA	2016	393	4.34		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Thinornis rubricollis*	Hooded Plover	West of the Nullarbor Plain. Additionally recorded on ocean beaches and salt lakes,sometimes hundreds of kilometres from the coast (Birdlife, 2019).		V	1995	2	22.11		0	0	0	0	0	Negligible	Negligible	No surface water identified.
Bird	*Tringa glareola*	Wood Sandpiper	Common in Northern Australia, a casual visitor to southern parts, occuping wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2007).	IA	MI & MA	2008	29	6.49		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa nebularia*	Common Greenshank	Inland wetlands and sheltered coastal habitats 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	MA & MA	2013	124	2.92		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa stagnatilis*	Marsh Sandpiper	Wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2007).	IA		2011	5	6.49		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Tyto novaehollandiae novaehollandia*	Masked Owl (Southern Subspecies)	Forests, open woodlands, farmlands with large trees, paperbark woodlands and caves (Fulton, 2017)	P3		2000	3	19.81		0	1	0	1	2	Low	Low	Limited recent records in close proximity.
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	2020	36	12.88	Known	0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Zanda baudinii*	Baudin's Cockatoo	Temperate forest and woodland dominated by Eucalyptus marginata (jarrah), Corymbia calophylla (marri) and E. diversicolor (karri) (TSSC, 2018).	EN	E	2015	136	7.51	Known	0	1	1	2	4	High	Moderate	Habitat present.

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Bird	*Zanda latirostris*	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2020	9264	0.08	Known	0	1	1	2	4	High	Known	Identified during survey.

Pinjar Terminal Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Bird	*Actitis hypoleucos*	Common Sandpiper	Wide range of coastal wetlands, around muddy margins or rocky shores, some inland wetlands and rarely on mudflats (DCCEEW, 2023)	IA	MI & MA	1991	2	41.15		0	0	0	1	1	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Apus pacificus*	Fork-tailed Swift	Over inland plains, sometimes boave foothills or in coastal areas (DCCEEW, 2023).	IA	MI & MA	2014	17	7.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Arenaria interpres*	Ruddy Turnstone	Coastal regions with exposed rock coast lines or coral reefs (DCCEEW, 2023).	IA	V & MI & MA	1991	4	14.03		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Insect	*Australotomurus morbidus*	Cemetary springtail, Guildford springtail	Undisturbed native grasslands and heathland at low and high elevations (P. Greenslade & R. Jordana, 2014).	P3		1993	6	41.00		0	0	0	0	0	Negligible	Negligible	Limited suitable habitat identified.
Invertebrate	*Austroconops mcmillani*	A biting midge	Larvae live in small aquatic habitats.	P2		2011	8	14.34		0	1	1	0	2	Low	Low	No surface waterbodies identified.
Invertebrate	*Austrosaga spinifer*	Cricket	Banksia heath and low woodlands (South Metro Connect, 2011). Known records exist in Neerabup National Park (DEC, 2012b).	P2		1982	2	16.84		0	1	0	1	2	Low	Low	Limited recent records in close proximity.
Mammal	*Bettongia lesueur graii*	Boodie, Burrowing Bettong	open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	Ex	N/A	2	9.09		0	1	0	1	2	Low	Low	Species considered extinct.
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Dry sclerophyllous forest with a dense understory (ALA, 2023).	EN	CE	2018	98	9.09	Known	0	1	1	1	3	Moderate	Negligible	Records from conservation reserve.
Bird	*Botaurus poiciloptilus*	Australasian Bittern	Freshwater wetlands and, rarely, estuaries or tidal wetlands, favouring tall dense vegetation (TSSC, 2019).	EN	E	2003	20	7.71	Known	0	1	1	1	3	Moderate	Low	No surface waterbodies identified.
Bird	*Cacatua pastinator pastinator*	Muir's Corella	Large or dead eucalypts and paperbark in forested areas or lone trees in paddocks along roadsides (DEC, 2008)	CD		N/A	7	46.41		0	0	0	1	1	Low	Low	Limited recent records in close proximity.
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	Occurs along muddy edges of shallow fresh or brackish wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (DCCEEW, 2023).	IA	V & MI & MA	2012	9	14.03		0	1	1	1	3	Moderate	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris alba*	Sanderling	Restricted to the coast, mostly on open sandy beaches exposed to open sea-swell, exposed sandbars and spits, and shingle banks (DCCEEW, 2023).	IA	MI & MA	1980	3	46.77		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris canutus*	Red Knot	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	V & MI & MA	2002	8	14.03		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ferruginea*	Curlew Sandpiper	Intertidal mudflats in sheltered coastal areas and inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud and sand (DCCEEW, 2023).	CR & IA	CE & MI & MA	2005	31	7.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris melanotos*	Pectoral Sandpiper	Occupies shallow, fresh waters often containing low grass or other small herbs, swamp margins, flooded pastures and saltmarshes (Pizzey & Knight, 2007;DCCEEW, 2023).	IA	MI & MA	1992	2	16.62		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ruficollis*	Red-necked Stint	Coastal sheltered areas and exposed or ocean beaches, sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI & MA	2011	96	7.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris subminuta*	Long-toed Stint	Freshwater wetlands (DCCEEW, 2023).	IA	MI & MA	1992	4	14.03		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris tenuirostris*	Great Knot	Sheltered coastal habitats with large intertidal mudflats or sandflats (DCCEEW, 2023).	CR & IA	V & MI & MA	2005	12	14.03		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia, rarely ventures inland (Pizzey & Knight, 2007)	IA	MI & MA	2010	1	25.67		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Inhabits dense Eucalyptus marginata (Jarrah), E. diversicolor (Karri) and Corymbia calophylla (Marri) forests (TSSC, 2009).	VU	V	2020	363	16.93	Known	0	1	1	2	4	High	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	V & MI & MA	2011	2	23.50		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Charadrius mongolus*	Lesser Sand Plover	Open intertidal flats of sheltered bays, lagoons or estuaries (Pizzey & Knight, 2007).	EN & IA	E & MI & MA	1999	1	54.90		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Chlidonias leucopterus*	White-winged Black Tern, White-winged Tern	Fresh, brackish or saline, and coastal or subcoastal wetlands. They rarely occur on inland wetlands in Australia (DCCEEW, 2023).	IA	MI & MA	1990	1	37.65		0	0	0	1	1	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Ctenotus gemmula*	Jewelled Ctenotus	Endemic to Western Australia. In the Perth region it is uncommon and restricted to the Swan Coastal Plain. It inhabits low vegetation in Banksia woodland, sheltering in leaf litter under trees, shrubs and abandoned stick-ant nests (Bush et al., 2010).	P3		1999	4	27.49		0	0	0	0	0	Negligible	Low	Limited suitable habitat identified. Limited recent records in close proximity.
Bird	*Dasyornis longirostris*	Western Bristlebird	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	E	N/A	1	50.06		0	0	0	0	0	Negligible	Negligible	No coastal habitat present. Limited recent records in close proximity.
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2022	58	9.09	Known	0	1	1	1	3	Moderate	Moderate	Marginal suitable habitat may be present.
Reptile	*Delma concinna major*	Javelin Lizard	Heaths on dunes and sand-plains along mid- to lower west coast. Subspecies dwells in dense matrix of low vegetation and associated leaf litter in Shark Bay.	P1		2015	1	14.16		0	1	1	0	2	Low	Low	No coastal habitat present. Limited recent records in close proximity.
Bird	*Elanus scriptus*	Letter-winged kite	Open country and grasslands throughout arid and semi-arid regionsWill disperse to high rainfall and coastal regions when food is abundent (BirdLife, 2021).	P4		1980	1	46.77		0	0	0	0	0	Negligible	Negligible	No coastal habitat present. Limited recent records in close proximity.
Invertebrate	*Euoplos inornatus*	Australian armored trapdoor spiders	Most records are from the Darling Scarp and jarrah forest (Invertebrate Solutions, 2018).	P3		1998	1	52.77		0	0	0	0	0	Negligible	Negligible	No coastal habitat present. Limited recent records in close proximity.

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Bird	*Falco hypoleucos*	Grey Falcon	Timered lowland plains, including acacia shrublands)particularly with tree-lined watercourses), tussock grassland and open woodland (TSSC, 2020).	VU	V	1929	1	50.15		0	0	0	1	1	Low	Low	No coastal habitat present. Limited recent records in close proximity.
Bird	*Falco peregrinus*	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	OS		2014	109	7.71		0	1	1	1	3	Moderate	Low	No coastal habitat present. Limited recent records in close proximity.
Fish	*Galaxiella nigrostriata*	Black-stripe Minnow	Acidic ephemeral bodies of water in peat flats located in the south west corner of Western Australia. The major populations occur from Augusta to Albany and near Bunbury and Gingin (Morgan et al, 2011). Generally prefer sandy, moist soil when ephemeral pools dry out.	EN		2009	3	16.70	Known	0	1	1	0	2	Low	Low	No surface waterbodies identified.
Bird	*Glareola maldivarum*	Oriental Pratincole	Open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI & MA	1981	1	26.03		0	0	0	1	1	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Hesperocolletes douglasi*	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE	2015	2	2.47	May	0	1	1	0	2	Low	Low	Limited recent records in close proximity.
Invertebrate	*Hurleya sp. (WAM C23193)*	Crystal Cave crangonyctoid, cave shrimp	Only known from Yanchep Aquatic Root Mat Community	CR		1997	2	13.37		0	1	0	0	1	Negligible	Negligible	No suitable habitat identifed.
Mammal	*Hydromys chrysogaster*	Water Rat	Near permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	52	14.66		0	1	1	0	2	Low	Low	No suitable habitat identifed.
Bird	*Hydroprogne caspia*	Caspian Tern	The Caspian Tern is found in sheltered coastal embayments and those with sandy or muddy margins (DCCEEW, 2023).	IA	MI & MA	1994	8	14.03		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Hylaeus globuliferus*	Native Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	19	15.81		0	1	0	0	1	Low	Low	Suitable habitat identified (*Adenanthos cygnorum* and also *Banksia attenuata*)
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	124	14.46		0	1	1	2	4	High	High	Suitable habitat identified.
Mammal	*Isoodon fusciventer*	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2021	1588	9.09		0	1	1	2	4	High	Known	Identified during survey.
Bird	*Ixobrychus flavicollis australis* (southwest subpop.)	Black Bittern (Southwest subpopulation)	Terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation includng flooded grassland, forest, woodland, rainforest and mangroves (NSW Government, 2018).	P2		1987	2	24.23		0	0	0	1	1	Low	Low	No surface water identified.
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	Western Australia, associated with *Goodenia s* p. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		1982	6	15.18		0	1	0	0	1	Negligible	Negligible	
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	Known from Kenwick wetlands, Cannington and Forestdale Lake and near Lithgow in the Blue Mountains of NSW (ALA, 2019). Has an association with Goodenia filiformis and Anthotium junciforme (South Metro Connect, 2011).	EN		1954	4	25.25	Known	0	0	0	0	0	Negligible	Negligible	No surface water identifed.
Bird	*Leipoa ocellata*	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V	1981	46	52.45	Likely	0	0	0	0	0	Negligible	Negligible	Limited suitable habitat identified. Limited recent records in close proximity.
Bird	*Limosa lapponica*	Bar-tailed Godwit	Widespread around the coast of Western Australia from Eyre to Derby (DotE, 2015).	IA (& VU or CR at subsp. level)	Mi (& V or CE at subsp. level)	2004	18	7.71		0	1	1	0	2	Low	Low	Limited suitable habitat identified.
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	Coastal habitat, including 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	CE				Known	0	0	0	0	0	Negligible	Negligible	No coastal habitat identified. No surface water identified.
Bird	*Limosa limosa*	Black-tailed Godwit	Coastal habitat including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (DCCEEW, 2023)	IA	E & MI & MA	2011	4	22.76		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Macroderma gigas*	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	0	0	0	Negligible	Negligible	No suitable habitat identified.
Mammal	*Myrmecobius fasciatus*	Numbat	Mulga woodland, spinifex sandplains and Eucalypt forests and woodlands. In WA, their habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches (DBCA, 2021)	EN	E	1974	1	34.76		0	0	0	1	1	Low	Low	Limited suitable habitat identified. Limited recent records in close proximity.
Reptile	*Neelaps calonotos*	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2017	97	12.37		0	1	1	2	4	High	High	Suitable habitat identified.
Bird	*Ninox connivens connivens (southwest subpop.)*	(Barking Owl (southwest subpop.))	Open eucalyptus woodlands and the edges of forests, often adjacent to farmland. Likely to use the interior of forested habitat and prefer woodlands and forests with a high density of large trees and particularly sites with hollows (Davis et al., 2022).	P2		1902	1	45.54		0	0	0	0	0	Negligible	Negligible	Limited suitable habitat identified. Limited recent records in close proximity.
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).	P4		2017	18	34.16		0	0	1	0	1	Negligible	Negligible	Limited recent records in close proximity.
Mammal	*Notamacropus irma*	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2018	35	13.53		0	1	1	1	3	Moderate	Moderate	No wetland systems identifed.
Bird	*Numenius madagascariensis*	Eastern Curlew	Intertidal mudflats. The southern most important international site in Western Australia is Eighty Mile Beach (Bamford et al., 2008).	CR & IA	CE& MI & MA	1959	2	53.37		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Numenius phaeopus*	Whimbrel	Along the Australian coast, inhabiting estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	IA	MI & MA	1978	2	54.17		0	0	0	1	1	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Oxyura australis*	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2013	866	7.71		0	1	1	0	2	Low	Low	No wetlands identified.
Bird	*Pachyptila turtur subantarctica*	Fairy Prion (Southern)	Subtropical waters, circumpolar. Burrows in cervices or hollows beneath *Colobanthus muscoides* with peaty soil (TSSC, 2015).	VU					Known	0	0	0	0	0	Negligible	Negligible	No surface water identified.

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comments
Mammal	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	Wide variety of rock types, requiring sufficient cave and crevice development (DPaW 2015).	EN		2004	8	9.09	Known	0	1	1	0	2	Low	Low	No crevices or rock crevices identified.
Mammal	*Phascogale tapoatafa wambenger*	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD		2018	6	34.76		0	0	1	0	1	Negligible	Negligible	Limited recent records in close proximity.
Bird	*Plegadis falcinellus*	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI & MA	2013	200	7.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Pluvialis squatarola*	Grey Plover	Coastal, marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats, sandy beachesand rocky coasts. It is occasionally found inland (Birdlife Australia, 2021).		MI & MA	2007	90	14.03		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE	2019	222	26.51	Known	0	0	1	0	1	Negligible	Negligible	No surface water identified.
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	Peppermint (*Agonis flexuosa*) forest and woodland and Tuart (Eucalyptus gomphocephala) with a peppermint mid-story. Inland, the species is found in Jarrah (*Eucalyptus marginata*), Wandoo (*Eucalyptus wandoo*) and Marri (*Corymbia calophylla*) forest (Van Dyck & Strahan, 2008).	CR	CE	1958	1	46.78	Likely	0	0	0	0	0	Negligible	Negligible	No suitable habitat identifed.
Bird	*Rostratula australis*	Australian Painted Snipe	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2023).	EN	E & MA	2012	3	24.74		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Setonix brachyurus*	Quokka	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. Rottnest Island (DCCEEW, 2023).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	Limited recent records in close proximity.
Bird	*Sternula nereis nereis*	Fairy Tern	It is most common in Western Australia, found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons, favouring both fresh and saline wetlands and near-coastal terrestial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2021)	VU	V	2013	5	14.03	Known	0	1	1	0	2	Low	Low	No coastal habitat
Invertebrate	*Synemon gratiosa*	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant Lomandra maritima, the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2019	741	14.17		0	1	1	1	3	Moderate	Moderate	Suitable habitat identified.
Bird	*Thalasseus bergii*	Crested Tern	A strictly coastal species. Occasional records in the arid interior of Australia (BirdLife Australia, 2022).	IA	MI & MA	2016	393	19.10		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Thinornis rubricollis*	Hooded Plover	West of the Nullarbor Plain. Additionally recorded on ocean beaches and salt lakes,sometimes hundreds of kilometres from the coast (Birdlife, 2019).		V	1995	2	53.34		0	0	0	0	0	Negligible	Negligible	Limited recent records in close proximity.
Bird	*Tringa glareola*	Wood Sandpiper	Common in Northern Australia, a casual visitor to southern parts, occuping wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2007).	IA	MI & MA	2008	29	16.62		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa nebularia*	Common Greenshank	Inland wetlands and sheltered coastal habitats 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 & MA	2013	124	7.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa stagnatilis*	Marsh Sandpiper	Wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2007).	IA		2011	5	23.80		0	0	1	0	1	Negligible	Negligible	No surface water identified.
Bird	*Tyto novaehollandiae novaehollandiae*	Masked Owl (Southern Subspecies)	Forests, open woodlands, farmlands with large trees, paperbark woodlands and caves (Fulton, 2017)	P3		2000	3	50.31		0	0	0	1	1	Low	Low	No wetlands habitat identified
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	2020	36	9.09	Known	0	1	1	1	3	Moderate	Negligible	No surface water identified.
Bird	*Zanda baudinii*	Baudin's Cockatoo	Temperate forest and woodland dominated by Eucalyptus marginata (jarrah), Corymbia calophylla (marri) and E. diversicolor (karri) (TSSC, 2018).	EN	E	2015	136	20.79	Known	0	0	1	2	3	High	Low	Suitable habitat identified, out of range.
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2020	9264	0.12	Known	0	1	1	2	4	High	High	Suitable habitat identified.

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-Survey Likelihood	Comments
Bird	*Apus pacificus*	Fork-tailed Swift	Over inland plains, sometimes above foothills or in coastal areas (DCCEEW, 2023).	IA	MI & MA	2009	6	3.33		0	1	1	0	2	Low	Negligible	Marine species, no coastal habitat
Bird	*Arenaria interpres*	Ruddy Turnstone	Coastal regions with exposed rock coast lines or coral reefs (DCCEEW, 2023).	IA	V & MI & MA					0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat
Invertebrate	*Austrosaga spinifer*	Cricket	Banksia heath and low woodlands (South Metro Connect, 2011). Known records exist in Neerabup National Park (DEC, 2012b).	P2		1982	2	7.55		0	1	0	1	2	Low	Low	Limited recent records in proximity.
Mammal	*Bettongia lesueur graii*	Boodie, Burrowing Bettong	open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	EX	N/A	1	11.98		0	1	0	1	2	Negligible	Negligible	Extinct species
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Dry sclerophyllous forest with a dense understory (ALA, 2023).	EN	CE	N/A	96	7.98	Known	0	1	0	1	2	Low	Low	No suitable habtat identified in survey area.
Bird	*Botaurus poiciloptilus*	Australasian Bittern	Freshwater wetlands and, rarely, estuaries or tidal wetlands, favouring tall dense vegetation (TSSC, 2019).	EN	E	2003	14	1.02	Known	0	1	1	1	3	Moderate	Low	No waterbodies identified in survey area.
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	Occurs along muddy edges of shallow fresh or brackish wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (DCCEEW, 2023).	IA	V & MI & MA	2012	5	9.64		0	1	1	1	3	Moderate	Low	No waterbodies identified in survey area.
Bird	*Calidris canutus*	Red Knot	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	V & MI & MA	1978	1	16.47	Likely	0	1	0	0	1	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Calidris ferruginea*	Curlew Sandpiper	Intertidal mudflats in sheltered coastal areas and inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud and sand (DCCEEW, 2023).	CR & IA	CE & MI & MA	2003	17	4.95	Known	0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Calidris ruficollis*	Red-necked Stint	Coastal sheltered areas and exposed or ocean beaches, sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI & MA	2011	27	0.03		0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Calidris subminuta*	Long-toed Stint	Freshwater wetlands (DCCEEW, 2023).	IA	MI & MA	1991	1	9.64		0	1	0	1	2	Low	Low	No waterbodies identified in survey area.
Bird	*Calidris tenuirostris*	Great Knot	Sheltered coastal habitats with large intertidal mudflats or sandflats (DCCEEW, 2023).	CR & IA	V & MI & MA	1978	1	16.47		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia, rarely ventures inland (Pizzey & Knight, 2007)	IA	MI & MA	2010	1	4.81		0	1	1	0	2	Low	Low	Marine species, no coastal habitat
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Inhabits dense *Eucalyptus marginata* (Jarrah), *E. diversicolo* r (Karri) and *Corymbia calophylla* (Marri) forests (TSSC, 2009).	VU	V	2020	71	0.20	Known	0	1	1	2	4	High	Known	Identified during field survey.
Bird	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	V & MI & MA	2011	1	6.08	Likely	0	1	1	0	2	Low	Low	Marine species, no coastal habitat
Reptile	*Ctenotus gemmula* (Swan Coastal Plain population)	Jewelled Sanplain Ctenotus, Jewelled South-West Ctenotus	Diurnal open forest, open heath, open scrub, oviparous (Clayton, Wombrey, Mason, Cheter and Wells, 2006).	P3		1999	2	12.67		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2017	10	5.04	Known	0	1	1	0	2	Low	Negligible	Limited recent records in proximity.
Bird	*Falco peregrinus*	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	OS		2013	68	0.01		1	1	1	0	3	#N/A	Negligible	Limited recent records in proximity. No suitable habtat identified in survey area.
Fish	*Galaxiella nigrostriata*	Black-stripe Minnow	Acidic ephemeral bodies of water in peat flats located in the south west corner of Western Australia. The major populations occur from Augusta to Albany and near Bunbury and Gingin (Morgan et al, 2011). Generally prefer sandy, moist soil when ephemeral pools dry out.	EN	E	0	1	14.26	Known	0	1	0	0	1	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Glareola maldivarum*	Oriental Pratincole	Open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI & MA	1981	1	4.95		0	1	0	1	2	Low	Low	Limited suitable habitat, no coastal habitat.
Invertebrate	*Hesperocolletes douglasi*	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE	2015	1	12.43	Known	0	1	1	0	2	Low	Low	Limited data available.
Mammal	*Hydromys chrysogaster*	Water Rat	Near permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	24	3.24		0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Hydroprogne caspia*	Caspian Tern	The Caspian Tern is found in sheltered coastal embayments and those with sandy or muddy margins (DCCEEW, 2023).	IA	MI & MA	1992	3	16.61		0	1	0	1	2	Low	Low	Marine species, no coastal habitat
Invertebrate	*Hylaeus globuliferus*	Native Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	10	2.71		0	1	0	1	2	Low	Moderate	*Adenanthos cygnorum* and *Banksia attenuata* both identified during survey. Limited recent records in proximity.
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	70	0.16		0	1	1	2	4	High	Moderate	Limited recent records in proximity. No burrows identified, habitat still present.
Mammal	*Isoodon fusciventer*	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2020	629	0.01		1	1	1	2	5	Known	Known	Identified during field survey.
Bird	*Ixobrychus dubius*	Australian Little Bittern (Black-backed Bittern)	Wetlands and permananet fresh water bodies, including subtropical/tropical mangroves, bogs, marshes and arable land (BirdLife, 2024).	P4		2001	5	1.20		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Bird	*Ixobrychus flavicollis australis (southwest subpop.)*	Black Bittern (Southwest subpopulation)	Terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation includng flooded grassland, forest, woodland, rainforest and mangroves (NSW Government, 2018).	P2		1987	2	5.51		0	1	0	1	2	Low	Low	No waterbodies identified in survey area.
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		1982	3	0.06		0	1	0	0	1	Negligible	Moderate	Limited recent records in proximity. Limited habitat within survey area, *Lechenaultia* sp.
Bird	*Leipoa ocellata*	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	Limited recent records in proximity. No suitable habitat identified.
Bird	*Limosa lapponica*	Bar-tailed Godwit	Widespread around the coast of Western Australia from Eyre to Derby (DotE, 2015).	IA (& VU or CR at subsp. level)	Mi (& V or CE at subsp. level)	1999	9	4.95		0	1	0	1	2	Low	Low	Limited recent records in proximity.

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-Survey Likelihood	Comments
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	Coastal habitat, including 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	E				Known	0	0	0	0	0	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Limosa limosa*	Black-tailed Godwit	Coastal habitat including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (DCCEEW, 2023)	IA	E & MI & MA	2011	3	6.91		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Mammal	*Macroderma gigas*	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	0	0	0	Negligible	Negligible	No caves or rock crevices identified in survey area.
Bird	*Macronectes giganteus*	Southern Giant-Petrel	The Southern Giant-Petrel occurs over subantarctic waters in summer near its breeding islands in the Atlantic and Indian Oceans, in subantarctic to southern subtropical waters on the Argentinean continental shelf and off New Zealand and the cold eastern boundary current off South America. In winter, it is common off South America, South Africa, Australia and New Zealand. It occurs in both pelagic and inshore waters. It is attracted to land at sewage outfalls and scavenges ashore (Marchant & Higgins 1990).		E & MI & MA	2009	1	10.60	May	0	1	1	0	2	Low	Negligible	Marine species, no coastal habitat
Mammal	*Macrotis lagotis*	Bilby	Arid to semi-arid woodlands and hummock grasslands in the north of Australia, restricted to the Gibson, Little Sandy and Great Sandy Deserts, and parts of the Pilbara, Dampierland, Central Kimberley and Ord-Victoria Plains bioregions in Western Asutralia (Bradley et al. 2015).	VU	V	1974	2	13.05		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity. No suitable habitat identified.
Mammal	*Myrmecobius fasciatus*	Numbat	Mulga woodland, spinifex sandplains and Eucalypt forests and woodlands. In WA, their habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches (DBCA, 2021)	EN	E	1974	1	5.77		0	1	0	1	2	Low	Low	Limited recent records in proximity.
Reptile	*Neelaps calonotos*	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2017	67	0.08		0	1	1	2	4	High	Moderate	Limited recent records in proximity. Not identified during survey.Banksia woodland suitable habitat still present.
Mammal	*Notamacropus irma*	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2018	19	1.61		0	1	1	2	4	Moderate	Low	Limited recent records in proximity. No suitable habitat identified.
Bird	*Numenius madagascariensis*	Eastern Curlew	Intertidal mudflats. The southern most important international site in Western Australia is Eighty Mile Beach (Bamford et al., 2008).	CR & IA	CE & MI & MA				May	0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat
Bird	*Oxyura australis*	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2013	565	0.31		0	1	1	0	2	Low	Negligible	Limited recent records in proximity. No waterbodies identified during survey.
Bird	*Pachyptila turtur subantarctica*	Fairy Prion (Southern)	Subtropical waters, circumpolar. Burrows in cervices or hollows beneath *Colobanthus muscoides* with peaty soil (TSSC, 2015).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	No marine or surface waterbodies.
Mammal	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	Wide variety of rock types, requiring sufficient cave and crevice development (DPaW 2015).	EN	E	N/A	1	11.98		0	1	0	0	1	Negligible	Negligible	No caves or crevices identified within survey area.
Mammal	*Phascogale tapoatafa wambenger*	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD		1974	1	5.77		0	1	0	0	1	Negligible	Negligible	No suitable habtat identified in survey area.
Bird	*Phoebetria fusca*	Sooty Albatross	On vegetated cliffs and steep slopes that are sheltered from prevailing winds, often amongst tussock grass and has sometimes been observed foraging in inshore waters in southern Australia.	EN & IA	V & MI & MA				May	0	0	0	0	0	Negligible	Negligible	No suitable habtat identified in survey area.
Bird	*Plegadis falcinellus*	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI & MA	2013	190	0.94		0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Pluvialis squatarola*	Grey Plover	Coastal, marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats, sandy beachesand rocky coasts. It is occasionally found inland (Birdlife Australia, 2021).		V & MI & MA	1981	18	4.95		0	1	0	0	1	Negligible	Negligible	No waterbodies identified in survey area. Marine species, no coastal habitat.
Bird	*Procellaria aequinoctialis*	White-chinned peteral	Marine Habitat only. No breeding habitat in Australia (Commonwealth of Australia, 2018).	VU	MI & MA	2000	1	8.30		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	E	2019	110	12.18		0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	Peppermint (*Agonis flexuosa*) forest and woodland and Tuart (*Eucalyptus gomphocephala)* with a peppermint mid-story. Inland, the species is found in Jarrah (*Eucalyptus marginata*), Wandoo (*Eucalyptus wandoo*) and Marri (*Corymbia calophylla*) forest (Van Dyck & Strahan, 2008).	CR	CE	1958	1	18.47	Likely	0	1	0	0	1	Negligible	Negligible	Outside known range. No suitable habitat present.
Bird	*Rostratula australis*	Australian Painted Snipe	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2023).	EN	E & MA	2012	2	17.09	Known	0	1	1	0	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Sternula nereis nereis*	Fairy Tern	It is most common in Western Australia, found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons, favouring both fresh and saline wetlands and near-coastal terrestial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2021)	VU	V				Known	0	0	0	0	0	Negligible	Negligible	No waterbodies identified in survey area.
Invertebrate	*Synemon gratiosa*	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant *Lomandra maritima,* the prefered habitat (denser population). 2. *Banksia woodland* on Spearwood and Bassendean dunes, where the second known host plant *L. hermaphrodita* is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2019	397	0.17		0	1	1	2	4	Moderate	Moderate	Suitable habitat present. *L. hermaphrodita* potentially present within banksia woodland.
Bird	*Thalassarche carteri*	Indian Yellow-nosed Albatross	Subtropical and warmer subantarctic waters, foraging mostly in the southern Indian Ocean, particually off the coast of southern Western Australia, as far north as Shark Bay (Marchant & Higgins, 1990) (Weimerskirch et al., 1986).	EN	V & MI & MA	1968	1	15.44	Likely	0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat
Bird	*Thalasseus bergii*	Crested Tern	A strictly coastal species. Occasional records in the arid interior of Australia (BirdLife Australia, 2022).	IA	MI & MA	2016	210	4.95		0	1	1	0	2	Low	Negligible	Marine species, no coastal habitat

Appendix C - Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-Survey Likelihood	Comments
Bird	*Thinornis cucullatus (ru*	Hooded Plover	West of the Nullarbor Plain. Additionally recorded on ocean beaches and salt lakes,sometimes hundreds of kilometres from the coast (Birdlife, 2019).		MA					0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat
Bird	*Tringa glareola*	Wood Sandpiper	Common in Northern Australia, a casual visitor to southern parts, occuping wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2007).	IA	MI & MA	2008	23	0.89		0	1	1	1	3	Moderate	Low	No waterbodies identified in survey area.
Bird	*Tringa nebularia*	Common Greenshank	Inland wetlands and sheltered coastal habitats 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	E & MI & MA	2013	72	0.95		0	1	1	0	2	Low	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa stagnatilis*	Marsh Sandpiper	Wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2007).	IA	MI & MA	2011	5	1.02		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V		16	7.80	May	0	1	0	1	2	Low	Negligible	No waterbodies identified in survey area.
Bird	*Zanda baudinii*	Baudin's Cockatoo	Temperate forest and woodland dominated by *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *E. diversicolor* (karri) (TSSC, 2018).	EN	E	2012	15	1.29	Likely	0	1	1	1	3	Moderate	Moderate	Suitable habitat identified suring durvey area. Current distriburion patterns result in a moderate likelihood.
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2020	3009	0.01	Known	1	1	1	2	5	Known	Known	Identified during field survey.

NT-NOR to HBK 132kV Fauna Desktop Assessment

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey Likelihood	Comments
Bird	*Actitis hypoleucos*	Common Sandpiper	Wide range of coastal wetlands, around muddy margins or rocky shores, some inland wetlands and rarely on mudflats (DCCEEW, 2023)	IA	MI & MA	1991	2	18.05		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Apus pacificus*	Fork-tailed Swift	Over inland plains, sometimes boave foothills or in coastal areas (DCCEEW, 2023).	IA	MI & MA	2014	17	13.51		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Arenaria interpres*	Ruddy Turnstone	Coastal regions with exposed rock coast lines or coral reefs (DCCEEW, 2023).	IA	MI & MA	1991	4	17.70		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Insect	*Australotomurus morbidus*	Cemetary springtail, Guildford springtail	Undisturbed native grasslands and heathland at low and high elevations (P. Greenslade & R. Jordana, 2014).	P3		1993	6	11.15		0	1	0	0	1	Negligible	Negligible	No suitable habitat identified.
Invertebrate	*Austroconops mcmillani*	A biting midge	Larvae live in small aquatic habitats.	P2	N/A	2011	8	44.48		0	0	1	0	1	Negligible	Negligible	No surface water identified.
Invertebrate	*Austrosaga spinifer*	Cricket	Banksia heath and low woodlands (South Metro Connect, 2011). Known records exist in Neerabup National Park (DEC, 2012b).	P2		1982	2	27.22		0	0	0	1	1	Low	Low	Limited recent records in proximity.
Mammal	*Bettongia lesueur graii*	Boodie, Burrowing Bettong	open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	Ex	0	2	32.93		0	0	0	1	1	Low	Low	Limited recent records in proximity.
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Dry sclerophyllous forest with a dense understory (ALA, 2023).	EN	CE	2018	98	1.11	Known	0	1	1	1	3	Moderate	Low	Limited recent records in proximity.
Bird	*Botaurus poiciloptilus*	Australasian Bittern	Freshwater wetlands and, rarely, estuaries or tidal wetlands, favouring tall dense vegetation (TSSC, 2019).	EN	E	2003	20	12.34	Known	0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Cacatua pastinator pastinator*	Muir's Corella	Large or dead eucalypts and paperbark in forested areas or lone trees in paddocks along roadsides (DEC, 2008)	CD		0	7	9.42		0	1	0	1	2	Low	Low	Limited suitable habitat identified.
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	Occurs along muddy edges of shallow fresh or brackish wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (DCCEEW, 2023).	IA	V & MI & MA	2012	9	12.34		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris alba*	Sanderling	Restricted to the coast, mostly on open sandy beaches exposed to open sea-swell, exposed sandbars and spits, and shingle banks (DCCEEW, 2023).	IA	MI & MA	1980	3	12.34		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris canutus*	Red Knot	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	V & MI & MA	2002	8	12.34		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ferruginea*	Curlew Sandpiper	Intertidal mudflats in sheltered coastal areas and inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud and sand (DCCEEW, 2023).	CR & IA	CE & MI & MA	2005	31	7.37		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris melanotos*	Pectoral Sandpiper	Occupies shallow, fresh waters often containing low grass or other small herbs, swamp margins, flooded pastures and saltmarshes (Pizzey & Knight, 2007;DCCEEW, 2023).	IA	MI & MA	1992	2	15.51		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ruficollis*	Red-necked Stint	Coastal sheltered areas and exposed or ocean beaches, sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI & MA	2011	96	7.37		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris subminuta*	Long-toed Stint	Freshwater wetlands (DCCEEW, 2023).	IA	MI & MA	1992	4	19.92		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris tenuirostris*	Great Knot	Sheltered coastal habitats with large intertidal mudflats or sandflats (DCCEEW, 2023).	CR & IA	V & MI & MA	2005	12	12.34		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia, rarely ventures inland (Pizzey & Knight, 2007)	IA	MI & MA	2010	1	7.74		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Inhabits dense Eucalyptus marginata (Jarrah), E. diversicolor (Karri) and Corymbia calophylla (Marri) forests (TSSC, 2009).	VU	V	2020	363	2.00	Known	0	1	1	2	4	High	Known	Identified during survey.
Bird	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	V & MI & MA	2011	2	20.66		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Charadrius mongolus*	Lesser Sand Plover	Open intertidal flats of sheltered bays, lagoons or estuaries (Pizzey & Knight, 2007).	EN & IA	E & MI & MA	1999	1	25.58		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Chlidonias leucopterus*	White-winged Black Tern, White-winged Tern	Fresh, brackish or saline, and coastal or subcoastal wetlands. They rarely occur on inland wetlands in Australia (DCCEEW, 2023).	IA	MI & MA	1990	1	19.92		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Ctenotus gemmula*	Jewelled Ctenotus	Endemic to Western Australia. In the Perth region it is uncommon and restricted to the Swan Coastal Plain. It inhabits low vegetation in Banksia woodland, sheltering in leaf litter under trees, shrubs and abandoned stick-ant nests (Bush et al., 2010).	P3		1999	1	29.92		0	0	0	0	0	Negligible	Negligible	Limited recent records in proximity.
Bird	*Dasyornis longirostris*	Western Bristlebird	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	E	0	1	19.33		0	1	0	0	1	Negligible	Negligible	No coastal habitat identified.

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey Likelihood	Comments
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2022	58	3.58	Known	0	1	1	1	3	Moderate	Low	Limited suitable habitat identified.
Reptile	*Delma concinna major*	Javelin Lizard	Heaths on dunes and sand-plains along mid- to lower west coast. Subspecies dwells in dense matrix of low vegetation and associated leaf litter in Shark Bay.	P1		2015	1	47.26		0	0	1	0	1	Negligible	Negligible	Limited suitable habitat identified.
Bird	*Elanus scriptus*	Letter-winged kite	Open country and grasslands throughout arid and semi-arid regionsWill disperse to high rainfall and coastal regions when food is abundent (BirdLife, 2021).	P4		1980	1	12.34		0	1	0	0	1	Negligible	Negligible	Limited suitable habitat identified.
Invertebrate	*Euoplos inornatus*	Australian armored trapdoor spiders	Most records are from the Darling Scarp and jarrah forest (Invertebrate Solutions, 2018).	P3		1998	1	23.61		0	0	0	0	0	Negligible	Negligible	Limited suitable habitat identified.
Bird	*Falco hypoleucos*	Grey Falcon	Timered lowland plains, including acacia shrublands)particularly with tree-lined watercourses), tussock grassland and open woodland (TSSC, 2020).	VU	V	1929	1	18.81		0	1	0	1	2	Low	Low	No surface water identified.
Bird	*Falco peregrinus*	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	OS		2014	109	1.43		0	1	1	1	3	Moderate	Moderate	Potential suitable habitat identified.
Fish	*Galaxiella nigrostriata*	Black-stripe Minnow	Acidic ephemeral bodies of water in peat flats located in the south west corner of Western Australia. The major populations occur from Augusta to Albany and near Bunbury and Gingin (Morgan et al, 2011). Generally prefer sandy, moist soil when ephemeral pools dry out.	EN		2009	3	5.86	Known	0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Glareola maldivarum*	Oriental Pratincole	Open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI & MA	1981	1	7.37		0	1	0	1	2	Low	Low	No surface water identified.
Invertebrate	*Hesperocolletes douglasi*	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE	2015	2	31.64	May	0	0	1	0	1	Negligible	Negligible	Limited recent records in proximity.
Invertebrate	*Hurleya sp. (WAM C23193)*	Crystal Cave crangonyctoid, cave shrimp	Only known from Yanchep Aquatic Root Mat Community	CR		1997	2	43.29		0	0	0	0	0	Negligible	Negligible	No surface water identified.
Mammal	*Hydromys chrysogaster*	Water Rat	Tnear permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	52	2.93		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Hydroprogne caspia*	Caspian Tern	The Caspian Tern is found in sheltered coastal embayments and those with sandy or muddy margins (DCCEEW, 2023).	IA	MI & MA	1994	8	9.89		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Invertebrate	*Hylaeus globuliferus*	Native Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	19	15.42		0	1	0	0	1	Negligible	Negligible	No suitable habitat identified. No associated species identified.
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	124	8.34		0	1	1	1	3	Moderate	Low	No suitable habitat identfied.
Mammal	*Isoodon fusciventer*	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2021	1588	0.06		0	1	1	2	4	High	Known	Identified during survey.
Bird	*Ixobrychus flavicollis australis (southwest subpop.)*	Black Bittern (Southwest subpopulation)	Terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation includng flooded grassland, forest, woodland, rainforest and mangroves (NSW Government, 2018).	P2		1987	2	9.27		0	1	0	1	2	Low	Low	No surface water identified.
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		1982	6	18.56		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	Known from Kenwick wetlands, Cannington and Forestdale Lake and near Lithgow in the Blue Mountains of NSW (ALA, 2019). Has an association with *Goodenia filiformis* and *Anthotium junciforme* (South Metro Connect, 2011).	EN		1954	4	17.51	Known	0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Bird	*Leipoa ocellata*	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V	1981	46	22.93	Likely	0	0	0	0	0	Negligible	Negligible	No suitable habitat identified. No associated species identified.
Bird	*Limosa lapponica*	Bar-tailed Godwit	Widespread around the coast of Western Australia from Eyre to Derby (DotE, 2015).	IA (& VU or CR at subsp. level)	Mi (& V or CE at subsp. level)	2004	18	7.37		0	1	1	0	2	Low	Low	Limited recent records in proximity.
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	Coastal habitat, including 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	CE				Known	0	0	0	0	0	Negligible	Negligible	No surface water identified.
Bird	*Limosa limosa*	Black-tailed Godwit	Coastal habitat including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (DCCEEW, 2023)	IA	MI & MA	2011	4	12.34		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Macroderma gigas*	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	0	0	0	Negligible	Negligible	No rock crevices or caves identified.
Bird	*Macronectes giganteus*	Southern Giant-Petrel	The Southern Giant-Petrel occurs over subantarctic waters in summer near its breeding islands in the Atlantic and Indian Oceans, in subantarctic to southern subtropical waters on the Argentinean continental shelf and off New Zealand and the cold eastern boundary current off South America. In winter, it is common off South America, South Africa, Australia and New Zealand. It occurs in both pelagic and inshore waters. It is attracted to land at sewage outfalls and scavenges ashore (Marchant & Higgins 1990).		E & MI & MA	2009	1	23.31		0	0	1	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Mammal	*Myrmecobius fasciatus*	Numbat	Mulga woodland, spinifex sandplains and Eucalypt forests and woodlands. In WA, their habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches (DBCA, 2021)	EN	E	1974	1	14.07		0	1	0	1	2	Low	Low	Limited recent records in proximity.No suitable habitat identified.
Reptile	*Neelaps calonotos*	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2017	97	2.88		0	1	1	1	3	Moderate	Low	Limited suitable habitat identified.

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Bird	*Ninox connivens connivens (southwest subpop.)*	(Barking Owl (southwest subpop.))	Open eucalyptus woodlands and the edges of forests, often adjacent to farmland. Likely to use the interior of forested habitat and prefer woodlands and forests with a high density of large trees and particularly sites with hollows (Davis et al., 2022).	P2		1902	1	21.00		0	0	0	0	0	Negligible	Negligible	Limited recent records in proximity.
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).	P4		2017	18	1.46		0	1	1	0	2	Low	Low	Limited suitable hbaitat identified.
Mammal	*Notamacropus irma*	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2018	35	2.10		0	1	1	1	3	Moderate	Low	No seasonal wetflats identified.
Bird	*Numenius madagascariensis*	Eastern Curlew	Intertidal mudflats. The southern most important international site in Western Australia is Eighty Mile Beach (Bamford et al., 2008).	CR & IA	CE & MI & MA	1959	2	21.89		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Numenius phaeopus*	Whimbrel	Along the Australian coast, inhabiting estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	IA	MI & MA	1978	2	17.70		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Oxyura australis*	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2013	866	4.18		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Pachyptila turtur subantarctica*	Fairy Prion (Southern)	Subtropical waters, circumpolar. Burrows in cervices or hollows beneath *Colobanthus muscoides* with peaty soil (TSSC, 2015).	VU					Known	0	0	0	0	0	Negligible	Negligible	Associated species and suitable habitat not identified.
Mammal	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	Wide variety of rock types, requiring sufficient cave and crevice development (DPaW 2015).	EN		2004	8	15.93	Known	0	1	1	0	2	Low	Low	No rock caves or crevices identifed.
Mammal	*Phascogale tapoatafa wambenger*	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (Eucalyptus marginata) (DCCEEW, 2023).	CD		2018	6	14.07		0	1	1	0	2	Low	Low	No jarrah forest identified.
Bird	*Plegadis falcinellus*	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI & MA	2013	200	0.54		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Pluvialis squatarola*	Grey Plover	Coastal, marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats, sandy beachesand rocky coasts. It is occasionally found inland (Birdlife Australia, 2021).		MI & MA	2007	90	7.37		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE	2019	222	7.45	Known	0	1	1	0	2	Low	Low	Not within known range. No surface water.
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	Peppermint (*Agonis flexuosa*) forest and woodland and Tuart (*Eucalyptus gomphocephala*) with a peppermint mid-story. Inland, the species is found in Jarrah (*Eucalyptus marginata*) , Wandoo (*Eucalyptus wandoo*) and Marri *(Corymbia calophylla*) forest (Van Dyck & Strahan, 2008).	CR	CE	1958	1	9.20	Likely	0	1	0	0	1	Negligible	Negligible	Not within current known range. No suitable habitat identified.
Bird	*Rostratula australis*	Australian Painted Snipe	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2023).	EN	E	2012	3	16.99		0	1	1	0	2	Low	Low	No surface water identified.
Mammal	*Setonix brachyurus*	Quokka	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. Rottnest Island (DCCEEW, 2023).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	Not within known range. No surface water identified.
Bird	*Sternula nereis nereis*	Fairy Tern	It is most common in Western Australia, found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons, favouring both fresh and saline wetlands and near-coastal terrestial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2021)	VU	V	2013	5	25.60	Known	0	0	1	1	2	Low	Low	No coastal habitat identified.
Invertebrate	*Synemon gratiosa*	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant Lomandra maritima, the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2019	741	0.50		0	1	1	1	3	Moderate	Low	No suitable habitat identified.
Bird	*Thalasseus bergii*	Crested Tern	A strictly coastal species. Occasional records in the arid interior of Australia (BirdLife Australia, 2022).	IA	MI & MA	2016	393	6.71		0	1	1	0	2	Low	Low	Marine species, no coastal habitat identified.
Bird	*Thinornis rubricollis*	Hooded Plover	West of the Nullarbor Plain. Additionally recorded on ocean beaches and salt lakes,sometimes hundreds of kilometres from the coast (Birdlife, 2019).		V	1995	2	26.25		0	0	0	0	0	Negligible	Negligible	No surface water identified.
Bird	*Tringa glareola*	Wood Sandpiper	Common in Northern Australia, a casual visitor to southern parts, occuping wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2007).	IA	MI & MA	2008	29	7.37		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Tringa nebularia*	Common Greenshank	Inland wetlands and sheltered coastal habitats 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 & MA	2013	124	7.37		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Tringa stagnatilis*	Marsh Sandpiper	Wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2007).	IA		2011	5	12.34		0	1	1	0	2	Low	Low	No surface water identified.
Bird	*Tyto novaehollandiae novaehollandiae*	Masked Owl (Southern Subspecies)	Forests, open woodlands, farmlands with large trees, paperbark woodlands and caves (Fulton, 2017)	P3		2000	3	20.74		0	0	0	1	1	Low	Low	Limited recent records in proximity.
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	2020	36	2.34	Known	0	1	1	0	2	Low	Negligible	No surface water identified.
Bird	*Zanda baudinii*	Baudin's Cockatoo	Temperate forest and woodland dominated by *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *E. diversicolor* (karri) (TSSC, 2018).	EN	E	2015	136	0.70	Known	0	1	1	2	4	High	High	Suitable habitat identified

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Bird	*Zanda latirostris*	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2020	9264	0.29	Known	0	1	1	2	4	High	Known	Identified during survey.

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Bird	*Actitis hypoleucos*	Common Sandpiper	Wide range of coastal wetlands, around muddy margins or rocky shores, some inland wetlands and rarely on mudflats (DCCEEW, 2023)	IA	MI & MA	1991	2	9.42		0	1	0	1	2	Low	Low	Marine species, no coastal habitat
Bird	*Apus pacificus*	Fork-tailed Swift	Over inland plains, sometimes boave foothills or in coastal areas (DCCEEW, 2023).	IA	MI & MA	2014	17	9.94		0	1	1	0	2	Low	Low	Marine species, no coastal habitat
Bird	*Arenaria interpres*	Ruddy Turnstone	Coastal regions with exposed rock coast lines or coral reefs (DCCEEW, 2023).	IA	V & MI & MA	1991	4	22.71		0	0	0	0	0	Negligible	Negligible	Marine species, no coastal habitat
Insect	*Australotomurus morbidus*	Cemetary springtail, Guildford springtail	Undisturbed native grasslands and heathland at low and high elevations (P. Greenslade & R. Jordana, 2014).	P3		1993	6	4.48		0	1	0	0	1	Negligible	Negligible	Limited recent records, limited suitable habitat identified.
Invertebrate	*Austroconops mcmillani*	A biting midge	Larvae live in small aquatic habitats.	P2		2011	8	45.75		0	0	1	0	1	Negligible	Negligible	No waterbodies identified in survey area.
Invertebrate	*Austrosaga spinifer*	Cricket	Banksia heath and low woodlands (South Metro Connect, 2011). Known records exist in Neerabup National Park (DEC, 2012b).	P2		1982	2	26.86		0	0	0	1	1	Low	Low	Limited recent records in proximity.
Mammal	*Bettongia lesueur graii*	Boodie, Burrowing Bettong	open eucalypt or acacia woodland with a grass and shrub understorey to sandridge desert with spinifex hummocks and sparse shrubs (DCCEEW, 2023).	EX	Ex	N/A	2	34.74		0	0	0	1	1	Low	Low	Extinct species
Mammal	*Bettongia penicillata ogilbyi*	Woylie	Dry sclerophyllous forest with a dense understory (ALA, 2023).	EN	CE	2018	98	1.01	Known	0	1	1	1	3	Moderate	Low	No suitable habtat identified in survey area.
Bird	*Botaurus poiciloptilus*	Australasian Bittern	Freshwater wetlands and, rarely, estuaries or tidal wetlands, favouring tall dense vegetation (TSSC, 2019).	EN	E	2003	20	8.35	Known	0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Bird	*Cacatua pastinator pastinator*	Muir's Corella	Large or dead eucalypts and paperbark in forested areas or lone trees in paddocks along roadsides (DEC, 2008)	CD		0	7	10.04		0	1	0	1	2	Low	Low	Limited suitable habitat identified.
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	Occurs along muddy edges of shallow fresh or brackish wetlands with inundated or emergent sedges, grass, saltmarsh or other low vegetation (DCCEEW, 2023).	IA	V & MI & MA	2012	9	8.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris alba*	Sanderling	Restricted to the coast, mostly on open sandy beaches exposed to open sea-swell, exposed sandbars and spits, and shingle banks (DCCEEW, 2023).	IA	MI & MA	1980	3	8.35		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat
Bird	*Calidris canutus*	Red Knot	Intertidal mudflats, sandflats and sandy beaches of sheltered coasts (DCCEEW, 2023).	EN & IA	V & MA & MI	2002	8	8.35		0	1	0	0	1	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Calidris ferruginea*	Curlew Sandpiper	Intertidal mudflats in sheltered coastal areas and inland around ephemeral and permanent lakes, dams, waterholes and bore drains with bare edges of mud and sand (DCCEEW, 2023).	CR & IA	CE & MI & MA	2005	31	8.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris melanotos*	Pectoral Sandpiper	Occupies shallow, fresh waters often containing low grass or other small herbs, swamp margins, flooded pastures and saltmarshes (Pizzey & Knight, 2007;DCCEEW, 2023).	IA	MI & MA	1992	2	11.35		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris ruficollis*	Red-necked Stint	Coastal sheltered areas and exposed or ocean beaches, sometimes on stony or rocky shores, reefs or shoals (DCCEEW, 2023).	IA	MI & MA	2011	96	8.06		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris subminuta*	Long-toed Stint	Freshwater wetlands (DCCEEW, 2023).	IA	MI & MA	1992	4	11.77		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calidris tenuirostris*	Great Knot	Sheltered coastal habitats with large intertidal mudflats or sandflats (DCCEEW, 2023).	CR & IA	V & MI & MA	2005	12	8.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calonectris leucomelas*	Streaked Shearwater	Common and widespread around much of the northern coast of Australia, rarely ventures inland (Pizzey & Knight, 2007)	IA	MI & MA	2010	1	13.77		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Inhabits dense Eucalyptus marginata (Jarrah), E. diversicolor (Karri) and Corymbia calophylla (Marri) forests (TSSC, 2009).	VU	V	2020	363	2.26	Known	0	1	1	2	4	High	Known	Sighted during survey.
Bird	*Charadrius leschenaultii*	Greater Sand Plover, Large Sand Plover	Beaches, tidal mudflats, reefs, dunes and is seldom observed far inland (Pizzey & Knight, 2007).	VU & IA	V & MI & MA	2011	2	18.45		0	1	1	0	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Charadrius mongolus*	Lesser Sand Plover	Open intertidal flats of sheltered bays, lagoons or estuaries (Pizzey & Knight, 2007).	EN & IA	E & MI & MA	1999	1	18.63		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Chlidonias leucopterus*	White-winged Black Tern, White-winged Tern	Fresh, brackish or saline, and coastal or subcoastal wetlands. They rarely occur on inland wetlands in Australia (DCCEEW, 2023).	IA	MI & MA	1990	1	11.77		0	1	0	1	2	Low	Low	Marine species, no coastal habitat. No waterbodies identified in survey area.
Reptile	*Ctenotus gemmula*	Jewelled South-west Ctenotus	Endemic to Western Australia. In the Perth region it is uncommon and restricted to the Swan Coastal Plain. It inhabits low vegetation in Banksia woodland, sheltering in leaf litter under trees, shrubs and abandoned stick-ant nests (Bush et al., 2010).	P3		1999	4	17.79		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Bird	*Dasyornis longirostris*	Western Bristlebird	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	E	N/A	1	12.68		0	1	0	0	1	Negligible	Negligible	Limited recent records.
Mammal	*Dasyurus geoffroii*	Western Quoll, Chuditch	Currently restricted to south-west Western Australia, in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008).	VU	V	2022	58	6.58	Known	0	1	1	1	3	Moderate	Low	Limited records in proximity.Limited suitable habitat identified.
Reptile	*Delma concinna major*	Javelin Lizard	Heaths on dunes and sand-plains along mid- to lower west coast. Subspecies dwells in dense matrix of low vegetation and associated leaf litter in Shark Bay.	P1		2015	1	49.54		0	0	1	0	1	Negligible	Negligible	Limited recent records in proximity.Limited suitable habitat identified.
Bird	*Elanus scriptus*	Letter-winged kite	Open country and grasslands throughout arid and semi-arid regionsWill disperse to high rainfall and coastal regions when food is abundent (BirdLife, 2021).	P4		1980	1	8.35		0	1	0	0	1	Negligible	Negligible	Limited recent records. Limited suitable habitat identified.

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comment
Invertebrate	*Euoplos inornatus*	Australian armored trapdoor spiders	Most records are from the Darling Scarp and jarrah forest (Invertebrate Solutions, 2018).	P3		1998	1	16.50		0	1	0	0	1	Negligible	Negligible	No suitable habitat identified.
Bird	*Falco hypoleucos*	Grey Falcon	Timered lowland plains, including acacia shrublands)particularly with tree-lined watercourses), tussock grassland and open woodland (TSSC, 2020).	VU	V	1929	1	12.48		0	1	0	1	2	Low	Low	Limited suitable habitat identified.
Bird	*Falco peregrinus*	Peregrine Falcon	Rainforests, arid zones and coastal to alpine areas (BirdLife, 2021).	OS		2014	109	3.03		0	1	1	1	3	Moderate	Moderate	Potential suitable habitat identified.
Fish	*Galaxiella nigrostriata*	Black-stripe Minnow	Acidic ephemeral bodies of water in peat flats located in the south west corner of Western Australia. The major populations occur from Augusta to Albany and near Bunbury and Gingin (Morgan et al, 2011). Generally prefer sandy, moist soil when ephemeral pools dry out.	EN	E	2009	3	16.10	Known	0	1	1	0	2	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Glareola maldivarum*	Oriental Pratincole	Open plains, floodplains or short grassland (including farmland), often occurring near terrestrial wetlands, and occurring along the coast. The species does not breed in Australia (DCCEEW, 2023).	IA	MI & MA	1981	1	13.49		0	1	0	1	2	Low	Low	Marine species, no coastal habitat
Invertebrate	*Hesperocolletes douglasi*	Rottnest Bee	Extant population known in Pinjar. Only been two individuals ever found (TSSC, 2019).	CR	CE	2015	2	35.54	May	0	0	1	0	1	Negligible	Negligible	Limited recent records. Limited suitable habitat identified.
Invertebrate	*Hurleya sp. (WAM C23193)*	Crystal Cave crangonyctoid, cave shrimp	Only known from Yanchep Aquatic Root Mat Community	CR		1997	2	44.78		0	0	0	0	0	Negligible	Negligible	No suitable habitat identified.
Mammal	*Hydromys chrysogaster*	Water Rat	Tnear permanent bodies of fresh or brackish water (Van Dyck & Strahan, 2008).	P4		2019	52	6.58		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Bird	*Hydroprogne caspia*	Caspian Tern	The Caspian Tern is found in sheltered coastal embayments and those with sandy or muddy margins (DCCEEW, 2023).	IA	MI & MA	1994	8	9.21		0	1	0	1	2	Low	Low	Marine species, no coastal habitat
Invertebrate	*Hylaeus globuliferus*	Native Bee	Habitats containing flowers from *Adenanthos cygnorum* and also *Banksia attenuata* (Western Wildlife, 2009).	P3		1996	19	7.30		0	1	0	1	2	Low	Moderate	*Adenanthos cygnorum* identified.
Invertebrate	*Idiosoma sigillatum*	Swan Coastal Plain shield-backed trapdoor spider	Remnant habitats in Banksia woodland and heathland on sandy soils (Rix et al., 2018).	P3		2019	124	1.66		0	1	1	1	3	Moderate	Low	Limited recent records. Limited suitable habitat identified.
Mammal	*Isoodon fusciventer*	Quenda, Southern Brown Bandicoot	Forest, woodland, heath and shrub communities, with sandy soils and dense heathy vegetation (Van Dyck & Strahan, 2008).	P4		2021	1589	1.96		0	1	1	1	3	Moderate	Known	Sighted during survey.
Bird	*Ixobrychus minutus*	Australian Little Bittern	Dense low swamp vegetation and on floating water plants in the south-west of Western Australia (Pizzey & Knight, 2007).	P4		2012	8	10.36		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Bird	*Ixobrychus flavicollis australis (southwest subpop.)*	Black Bittern (Southwest subpopulation)	Terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation includng flooded grassland, forest, woodland, rainforest and mangroves (NSW Government, 2018).	P2		1987	2	10.09		0	1	0	1	2	Low	Low	No waterbodies identified in survey area.
Invertebrate	*Leioproctus contrarius*	a short-tongued bee	Western Australia, associated with *Goodenia* sp. and *Lechenaultia* sp. (South Metro Connect, 2011).	P3		1982	6	22.52		0	0	0	0	0	Negligible	Negligible	No suitable habitat identified.
Invertebrate	*Leioproctus douglasiellus*	a short-tongued bee	Known from Kenwick wetlands, Cannington and Forestdale Lake and near Lithgow in the Blue Mountains of NSW (ALA, 2019). Has an association with Goodenia filiformis and Anthotium junciforme (South Metro Connect, 2011).	EN		1954	4	27.24	Known	0	0	0	0	0	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Leipoa ocellata*	Malleefowl	Semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*) (Benshemesh, 2007).	VU	V	1981	46	15.93	Likely	0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity.
Bird	*Limosa lapponica*	Bar-tailed Godwit	Widespread around the coast of Western Australia from Eyre to Derby (DotE, 2015).	IA (& VU or CR at subsp. level)	Mi (& V or CE at subsp. level)	2004	18	8.35		0	1	1	0	2	Low	Low	Limited suitable habitat identified.
Bird	*Limosa lapponica menzbieri*	Northern Siberian Bar-tailed Godwit	Coastal habitat, including 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	CE				Known	0	0	0	0	0	Negligible	Negligible	Limited recent records in proximity.
Bird	*Limosa limosa*	Black-tailed Godwit	Coastal habitat including sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats (DCCEEW, 2023)	IA	E & MI & MA	2011	4	8.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat
Mammal	*Macroderma gigas*	Ghost Bat	Northern Australia, inhabiting arid Pilbara to tropical savanna woodlands and rainforests rainforest, monsoon and vine thicket, open woodlands and arid areas and reside in caves, rock crevices and disused mine adits (DoE 2016).	VU	V				May	0	0	0	0	0	Negligible	Negligible	No caves or rock crevices identified.
Mammal	*Macrotis lagotis*	Bilby	Arid to semi-arid woodlands and hummock grasslands in the north of Australia, restricted to the Gibson, Little Sandy and Great Sandy Deserts, and parts of the Pilbara, Dampierland, Central Kimberley and Ord-Victoria Plains bioregions in Western Asutralia (Bradley et al. 2015).	VU	V	1974	4	13.79		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity. Limited suitable habitat identified.
Mammal	*Myrmecobius fasciatus*	Numbat	Mulga woodland, spinifex sandplains and Eucalypt forests and woodlands. In WA, their habitat is generally woodland dominated by Eucalyptus species, with abundant hollow logs and branches (DBCA, 2021)	EN	E	1974	1	6.58		0	1	0	1	2	Low	Low	Limited suitable habitat identified.
Reptile	*Neelaps calonotos*	Black-striped Snake	Confined to the Swan Coastal Plain between Mandurah and Lancelin, sheltering in upper layers of loose soil beneath leaf litter in Eucalyptus/Banksia woodlands, typically at the base of trees and shrubs (Bush et al., 2010).	P3		2017	97	3.36		0	1	1	1	3	Moderate	Low	Limited suitable habitat identified.
Bird	*Ninox connivens connivens (southwest subpop.)*	(Barking Owl (southwest subpop.))	Open eucalyptus woodlands and the edges of forests, often adjacent to farmland. Likely to use the interior of forested habitat and prefer woodlands and forests with a high density of large trees and particularly sites with hollows (Davis et al., 2022).	P2		1902	1	12.54		0	1	0	0	1	Negligible	Negligible	Limited recent records in proximity. Limited suitable habitat identified.
Mammal	*Notamacropus eugenii derbianus*	Tammar Wallaby	South-western Western Australia and five offshore islands, in dense low vegetation, open grassy areas, coastal scrub, heath, dry sclerophyll forest, and thickets in mallee and woodland (DCCEEW, 2023).	P4		2017	18	6.41		0	1	1	0	2	Low	Low	Limited suitable habitat identified.

Type	Taxon	Common Name	Habitat	Cons. Code WA	Cons. Code EPBC	Date (DBCA)	Records (DBCA)	Distance (km) [DBCA]	PMST	Recorded in Survey Area	Known from Vicinity (<20km)	Recent Record (Last 20 years)	Potential presence of suitable habitat within the Survey Area (0,1,2)	Total Score	Likelihood	Post-survey likelihood	Comment
Mammal	*Notamacropus irma*	Western Brush Wallaby	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DCCEEW, 2023).	P4		2018	35	2.27		0	1	1	1	3	Moderate	Negligible	Limited suitable habitat identified.
Bird	*Numenius madagascariensis*	Eastern Curlew	Intertidal mudflats. The southern most important international site in Western Australia is Eighty Mile Beach (Bamford et al., 2008).	CR & IA	CE & MI & MA	1959	2	15.80		0	1	0	0	1	Negligible	Negligible	No waterbodies identified in survey area.
Bird	*Numenius phaeopus*	Whimbrel	Along the Australian coast, inhabiting estuaries, mangroves, tidal flats, flooded paddocks, and bare grasslands (Pizzey & Knight, 2007)	IA	MI & MA	1978	2	22.71		0	0	0	1	1	Low	Low	No waterbodies identified in survey area.
Bird	*Oxyura australis*	Blue-billed duck	Deep water in large permanent wetlands and swamps with aquatic vegetation (Marchant & Higgins, 1990).	P4		2013	866	1.40		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Bird	*Pachyptila turtur subantarctica*	Fairy Prion (Southern)	Subtropical waters, circumpolar. Burrows in cervices or hollows beneath Colobanthus muscoides with peaty soil (TSSC, 2015).	VU	V				Known	0	0	0	0	0	Negligible	Negligible	No coastal habitat identified.
Mammal	*Petrogale lateralis lateralis*	Black-footed Rock-wallaby	Wide variety of rock types, requiring sufficient cave and crevice development (DPaW 2015).	EN	E	2004	8	26.30	Known	0	0	1	0	1	Negligible	Negligible	No rock types identified.
Mammal	*Phascogale tapoatafa wambenger*	Southern Brush-tailed Phascogale	Largely restricted to Jarrah dominated forests (*Eucalyptus marginata*) (DCCEEW, 2023).	CD		2018	6	6.58		0	1	1	0	2	Low	Low	Limited suitable habitat identified.
Bird	*Plegadis falcinellus*	Glossy Ibis	Well vegetated wetlands, wet pastures, floodwaters, brackish wetlands and mudflats (Pizzey & Knight, 2007).	IA	MI & MA	2013	200	9.44		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Bird	*Pluvialis squatarola*	Grey Plover	Coastal, marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats, sandy beachesand rocky coasts. It is occasionally found inland (Birdlife Australia, 2021).		V & MI & MA	2007	90	8.35		0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Reptile	*Pseudemydura umbrina*	Western Swamp Tortoise	Small geographic range, recorded from scattered localities in a narrow strip (3–5 km wide) of the Swan Coastal Plain, roughly parallel with the Darling Range (Burbidge & Kuchling, 2004). Currently, the Ellen Brook Nature Reserve population is the only viable, naturally occurring population in the wild. The Twin Swamps Nature Reserve and Mogumber Nature Reserve populations are maintained with translocated individuals (TSSC 2004).	CR	CE	2019	222	13.44	Known	0	1	1	0	2	Low	Low	No waterbodies identified in survey area.
Mammal	*Pseudocheirus occidentalis*	Western Ringtail Possum	Peppermint (*Agonis flexuosa*) forest and woodland and Tuart (*Eucalyptus gomphocephala*) with a peppermint mid-story. Inland, the species is found in Jarrah (*Eucalyptus marginata)*, Wandoo (*Eucalyptus wandoo*) and Marri (*Corymbia calophylla*) forest (Van Dyck & Strahan, 2008).	CR	CE	1958	1	12.88	Likely	0	1	0	0	1	Negligible	Negligible	No suitable habitat identifed.
Bird	*Rostratula australis*	Australian Painted Snipe	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2023).	EN	E & MA	2012	3	11.79		0	1	1	1	3	Moderate	Negligible	No waterbodies identified in survey area.
Mammal	*Setonix brachyurus*	Quokka	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. Rottnest Island (DCCEEW, 2023).	VU	V				Likely	0	0	0	0	0	Negligible	Negligible	Thought to be absent from the swan coastal plain.
Bird	*Sternula nereis nereis*	Fairy Tern	It is most common in Western Australia, found on coastal beaches, inshore and offshore islands, sheltered inlets, sewage farms, harbours, estuaries and lagoons, favouring both fresh and saline wetlands and near-coastal terrestial wetlands, including lakes and salt-ponds. (BirdLife Australia, 2021)	VU	V	2013	5	18.65	Known	0	1	1	1	3	Moderate	Negligible	No coastal habitat identified.
Invertebrate	*Synemon gratiosa*	Graceful Sun Moth	1. Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the host plant Lomandra maritima, the prefered habitat (denser population). 2. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread. Throughout the Swan Coastal Plain, extending into the Geraldton Sandplains (DEC, 2011).	P4		2019	741	2.90		0	1	1	1	3	Moderate	Negligible	Limited suitable habitat identified.
Bird	*Thalasseus bergii*	Crested Tern	A strictly coastal species. Occasional records in the arid interior of Australia (BirdLife Australia, 2022).	IA	MI & MA	2016	393	8.35		0	1	1	0	2	Low	Low	Marine species, no coastal habitat.
Bird	*Thinornis rubricollis*	Hooded Plover	West of the Nullarbor Plain. Additionally recorded on ocean beaches and salt lakes,sometimes hundreds of kilometres from the coast (Birdlife, 2019).		MA	1995	2	19.90		0	1	0	0	1	Negligible	Negligible	Marine species, no coastal habitat. No waterbodies identified in survey area.
Bird	*Tringa glareola*	Wood Sandpiper	Common in Northern Australia, a casual visitor to southern parts, occuping wetland margins, saltmarshes and sewage ponds (Pizzey & Knight, 2007).	IA	MI & MA	2008	29	9.21		0	1	1	1	3	Moderate	Negligible	No waterbodies identified in survey area.
Bird	*Tringa nebularia*	Common Greenshank	Inland wetlands and sheltered coastal habitats 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	E & MI & MA	2013	124	8.35		0	1	1	1	3	Moderate	Negligible	No waterbodies identified in survey area.
Bird	*Tringa stagnatilis*	Marsh Sandpiper	Wetlands of varying salinity including fresh, sewage ponds and estuaries (Pizzey & Knight, 2007).	IA	MI & MA	2011	5	8.35		0	1	1	1	3	Moderate	Negligible	No waterbodies identified in survey area.
Bird	*Tyto novaehollandiae novaehollandiae*	Masked Owl (Southern Subspecies)	Forests, open woodlands, farmlands with large trees, paperbark woodlands and caves (Fulton, 2017)	P3		2000	3	13.62		0	1	0	1	2	Low	Low	Limited suitable habitat identified.
Invertebrate	*Westralunio carteri*	Carter's Freshwater Mussel	Freshwaters of south-west Western Australia, greatest in abundance in slower flowing waters with stable, soft sediments and low salinity (>3 g /L is lethal) (Klunzinger et al., 2012).	VU	V	2020	36	4.91	Known	0	1	1	0	2	Negligible	Negligible	No surface water identified.
Bird	*Zanda baudinii*	Baudin's Cockatoo	Temperate forest and woodland dominated by *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and *E. diversicolor* (karri) (TSSC, 2018).	EN	E	2015	136	0.64	Known	0	1	1	1	3	Moderate	Moderate	Suitable habitat identified suring durvey area. Current distriburion patterns result in a moderate likelihood.
Bird	*Zanda latirostris*	Carnaby's Cockatoo	Uncleared or remnant native eucalypt woodlands containing salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. Forages seasonally in pine plantations (DCCEEW, 2023)	EN	E	2020	9264	0.65	Known	0	1	1	2	4	High	high	Suitable habitat identified suring durvey area. Current distriburion patterns result in a moderate likelihood.

Appendix D

Species x Survey Area x Community Matrix

Appendix C - Species x Survey Area x Community Matrix

Client Name Western Power
Project Number 60713462
Project Name NREP SCP

| Family | | Taxon | Padbury-Wangara | | | | Pinjar Terminal | Neerabup Terminal and East Wanneroo | | | |

Appendix C - Species x Survey Area x Community Matrix

Client Name Western Power
Project Number 60713462
Project Name NREP SCP

Family		Taxon	Padbury-Wangara				Pinjar Terminal	Neerabup Terminal and East Wanneroo											IT-NOR TO HBK 132kV	Northern Terminal		Oppo
			BaAbAb	BaAlTe	CpMsLo	EqHcPp	BaAcCc	BaAcDf	BaAhDf	BaRcGt	BmAcPo	BmEpLi	CcXpDf	EqGlCe	EmHhDf	MpHaDb	MpHaEc	MpXpDb	PpAcCe	CcMpXp	CcXpEc	ErAcCc	
Dasypogonaceae																							
		Calectasia sp.							X														
		Dasypogon bromeliifolius											X			X		X	X			X	
Dilleniaceae																							
		Hibbertia hypericoides subsp. *hypericoides*		X			X		X			X			X				X				
		Hibbertia cuneiformis				X																	
		Hibbertia huegelii							X			X			X								
		Hibbertia subvaginata					X					X	X		X	X							
		Hibbertia hypericoides						X															
Droseraceae																							
		Drosera erythrorhiza					X					X											
		Drosera macrantha					X					X											
Ericaceae																							
		Conostephium pendulum					X		X			X									X		
		Leucopogon pulchellus					X					X	X										
		Styphelia propinqua																	X				
		Styphelia conostephioides										X										X	
		Styphelia pallida										X											
Euphorbiaceae																							
	*	*Euphorbia terracina*	X	X		X								X								X	
		Monotaxis grandiflora var. *grandiflora*													X								
	*	*Ricinus communis*																				X	
Fabaceae																							
		Acacia applanata											X										
		Acacia blakelyi	X																				
		Acacia huegelii						X															X
	*	*Acacia iteaphylla*																				X	
		Acacia lasiocarpa												X									
		Acacia lasiocarpa var. *lasiocarpa*		X																			
		Acacia lasiocarpa var. *sedifolia*			X																		
	*	*Acacia longifolia subsp. longifolia*														X							
		Acacia pulchella					X			X	X	X		X								X	
		Acacia saligna				X																X	
		Acacia sessilis							X			X											
		Acacia pulchella					X																
		Bossiaea eriocarpa					X		X		X	X	X		X								
		Daviesia divaricata subsp. *divericata*		X					X						X				X			X	
		Daviesia triflora							X			X										X	
		Gastrolobium ebracteolatum																				X	
		Gastrolobium linearifolium								X	X			X					X				
		Gompholobium tomentosum					X	X	X	X		X		X	X	X		X				X	
		Hardenbergia comptoniana			X					X									X				
		Hovea trisperma					X					X			X								
		Jacksonia floribunda					X				X	X	X		X				X				
		Jacksonia sericea							X														
		Jacksonia sternbergiana							X						X							X	
		Jacksonia furcellata								X							X	X				X	
		Kennedia prostrata												X	X							X	
	*	*Lupinus angustifolius*																					
	*	*Lupinus cosentinii*	X																				
	*	*Medicago polymorpha*												X									
	*	*Ornithopus pinnatus*								X				X					X				
	*	*Trifolium arvense*																	X				
	*	*Trifolium campestre*																				X	
	*	*Vicia sativa* subsp. *nigra*				X													X			X	
Gentianaceae																							
		Centaurium tenuiflorum												X									
Geraniaceae																							
	*	*Pelargonium capitatum*	X	X			X							X			X		X			X	
Goodeniaceae																							
		Dampiera linearis					X				X	X	X		X								
		Lechenaultia floribunda					X		X												X		
		Scaevola repens					X		X			X			X				X				
		Scaevola canescens					X																
Haemodoraceae																							
		Anigozanthos humilis																					X
		Anigozanthos manglesii													X								
		Conostylis aurea							X			X			X								
		Conostylis candicans					X																
		Conostylis candicans subsp. candicans					X							X								X	
		Conostylis setigera		X			X					X											
		Conostylis teretifolia					X																
		Conostylis candicans subsp. calci cola			X																		
		Conostylis juncea												X									
		Haemodorum laxum										X			X								
		Haemodorum spicatum							X			X							X		X		
		Phlebocarya ciliata					X			X												X	
Haloragaceae																							
		Gonocarpus pithyoides									X												
Hemerocallidaceae																							
		Arnocrinum preissii							X														
		Corynotheca micrantha						X	X			X							X				
		Dianella revoluta				X		X	X			X				X	X		X		X	X	
		Tricoryne elatior		X			X																
		Tricoryne tenella																				X	
Iridaceae																							
	*	*Gladiolus caryophyllaceus*					X	X	X		X	X			X	X	X		X			X	
		Patersonia occidentalis					X	X	X		X	X		X	X			X	X		X	X	
	*	*Romulea rosea*																		X			
Lamiaceae																							
		Hemiandra pungens									X												
	*	*Lavandula stoechas*																				X	
Lauraceae																							
		Cassytha flava					X																
		Cassytha racemosa forma *racemosa*																				X	
Loganiaceae																							
		Phyllangium divergens										X											
		Phyllangium paradoxum															X						
Loranthaceae																							
		Nuytsia floribunda						X													X		
Macarthuriaceae																							
		Macarthuria australis							X														
Meliaceae																							
	*	*Melia azedarach*																				X	

Appendix C - Species x Survey Area x Community Matrix

Client Name Western Power
Project Number 60713462
Project Name NREP SCP

Family		Taxon	Padbury-Wangara				Pinjar Terminal	Neerabup Terminal and East Wanneroo												iT-NOR TO HBK 132kV	Northern Terminal		Oppo
			BaAbAb	BaAlTe	CpMsLo	EqHcPp	BaAcCc	BaAcDf	BaAhDf	BaRcGl	BmAcPo	BmEpLi	CcXpDf	EgGlCe	EmHhDf	MpHaDb	MpHaEc	MpXpDb	PpAcCe	CcMpXp	CcXpEc	ErAcCc	
Myrtaceae																							
		Agonis flexuosa												X									
		Astartea scoparia																X					
		Beaufortia elegans					X																
		Callistemon phoeniceus																					
		Calothamnus hirsutus												X									
		Calothamnus sanguineus										X		X									
		Calytrix angulata										X	X										
		Calytrix fraviescens					X		X														
		Calytrix fraseri																				X	
	*	*Chamelaucium uncinatum*																				X	
		Corymbia calophylla				X							X							X	X		
		Eremaea pauciflora var. pauciflora							X			X		X									
		Eremaea purpurea										X		X									
		Eucalyptus camaldulensis																					X
		Eucalyptus marginata											X		X				X				
		Eucalyptus rudis								X				X								X	
		Eucalyptus todtiana							X														
		Eucalyptus gomphocephala				X								X									
	*	*Gaudium laevigatum*																				X	
		Hypocalymma angustifolium							X			X			X	X	X						
		Hypocalymma robustum						X			X											X	
		Kunzea glabrescens					X			X				X		X	X						
		Melaleuca huegelii	X			X																	
	*	*Melaleuca nesophila*				X																	
		Melaleuca preissiana														X		X				X	
		Melaleuca rhaphiophylla																					X
		Melaleuca systena										X											
		Melaleuca teretifolia												X									
		Melaleuca parviceps										X											
		Melaleuca preissiana															X						
		Melaleuca seriata			X		X		X														
		Melaleuca systena												X									
		Pericalymma ellipticum var. flond um																				X	
		Regelia ciliata								X	X			X									
		Regelia inops								X				X								X	
		Scholtzia involucrata					X					X										X	
		Siloxerus humifusus																				X	
		Taxandria linearifolia															X					X	
		Verticordia densiflora																				X	
		Verticordia nitens					X																
Oleaceae																							
	*	*Olea europaea*												X									
Onagraceae																							
	*	*Oenothera laciniata*												X									
	*	*Oenothera drummondii*			X																		
Orchidaceae																							
		Caladenia flava						X															
	*	*Disa bracteata*								X				X									
		Microtis media						X															
		Thelymitra benthamiana					X	X															
Orobanchaceae																							
	*	*Orobanche minor*															X						
Papaveraceae																							
	*	*Fumaria capreolata*				X											X						
Pinaceae																							
	*	*Pinus pinaster*												X		X			X				
Poaceae																							
		Amphipogon turbinatus							X			X			X								
		Austrostipa flavescens	X																				
		Austrostipa compressa							X			X											
	*	*Avena barbata*	X	X		X			X									X	X	X			
	*	*Briza maxima*				X	X	X	X		X	X	X	X	X	X		X	X	X		X	
	*	*Bromus diandrus*	X	X	X	X													X	X			
	*	*Cynodon dactylon*			X																		
	*	*Ehrharta longiflora*																	X	X			
	*	*Ehrharta calycina*	X		X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	
	*	*Eragrostis curvula*																				X	
	*	*Lagurus ovatus*			X																		
	*	*Lolium rigidum*		X																X			
	*	*Melinis repens*												X									
		Microlaena stipoides															X						
	*	*Pentameris airoides*							X			X	X		X						X	X	
	*	*Pentameris pallida*									X					X			X			X	
		Poa porphyroclados				X								X									
		Rytidosperma occidentale							X			X	X		X								
	*	*Vulpia myuros*												X									
Polygalaceae																							
		Comesperma calymega										X											
Primulaceae																							
	*	*Lysimachia arvensis*				X																	
Proteaceae																							
		Adenanthos cygnorum subsp. *cygnorum*					X	X			X								X			X	
		Banksia attenuata	X	X			X	X	X	X	X	X	X	X	X				X				
		Banksia dallanneyi																X					
		Banksia grandis		X										X									
		Banksia menziesii					X	X	X	X	X	X			X								
		Conospermum stoechadis subsp. *sclerophyllum*					X												X				
		Grevillea leucopteris										X											
		Grevillea preissii	X																				
		Petrophile linearis					X		X		X	X	X						X		X		
		Stirlingia latifolia					X		X		X	X			X							X	
Restionaceae																							
		Alexgeorgea nitens									X								X				
		Desmocladus fascriculatus											X					X					
		Desmocladus flexuosus					X	X	X			X	X		X								
Restionaceae																							
		Hypolaena exsulca															X						
Rubiaceae																							
		Opercularia vaginata																				X	
		Opercularia hispidula																X					
Rubiaceae																							
	*	*Galium murale*		X																			
Rutaceae																							
		Cyanothamnus ramosus										X											
		Philotheca spicata					X																
Santalaceae																							
		Exocarpos sparteus												X									
Solanaceae																							
	*	*Nicotiana glauca*																				X	
Stylidaceae																							
		Levenhookia pusilla			X																		
		Stylidium araeophyllum										X			X								
		Stylidium brunonianum					X					X											
		Stylidium crossocephalum										X											X
		Stylidium cygnorum					X					X											
		Stylidium repens					X	X	X			X											
Thymelaeaceae																							
		Pimelea ferruginea							X														
Xanthorrhoeaceae																							
		Xanthorrhoea preissii		X			X					X	X	X	X	X		X	X	X	X		
Zamiaceae																							
		Macrozamia fraseri						X				X							X			X	
		Macrozamia riedlei							X														

Appendix E

Flora Site Data

Appendix C – Flora Site Data – Northern Terminal

Site No: CHQ01	**Date**: 16/10/2023	**Longitude**: 115.89167	**Latitude**: -31.8524548

Type: Quadrat
Soil Types: Grey sand
Topography: Flat
Surface: 5 bare, 15 litter
Outcrops: None
Litter: 10 fine, 5 coarse
Vegetation Condition: Good
Condition Notes: Disturbed site, previously cleared
Soil Condition: Dry
Fire: 10+

Vegetation Type: ErAcCa: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata, Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata and Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Adenanthos cygnorum subsp. *cygnorum*	370	60
*	*Briza maxima*	30	0.1
*	*Carpobrotus edulis*	20	0.2
	Conostylis candicans subsp. *candicans*	40	0.8
	Crassula colorata	5	0.1

Weed	Taxon	Height (cm)	Foliage (%)
	Daviesia triflora	100	1
*	*Ehrharta calycina*	90	1
	Styphelia conostephioides	30	0.5
*	*Gaudium laevigatum*	350	12
*	*Gladiolus caryophyllaceus*	50	0.1
*	*Hypochaeris glabra*	20	0.1
	Jacksonia furcellata	110	0.5
	Kennedia prostrata	5	0.1
*	*Urospermum picroides*	5	0.1
	Macrozamia fraseri	200	3
*	*Pentameris airoides*	25	0.1
*	*Pelargonium capitatum*	60	0.5
	Scholtzia involucrata	50	1
*	*Asteraceae sp.*	10	0.1
	Stirlingia latifolia	150	0.2
*	*Wahlenbergia capensis*	10	0.1
	Trachymene pilosa	10	0.1
*	*Trifolium campestre*	25	0.1
*	*Ursinia anthemoides*	35	0.1
*	*Vicia sativa* subsp. *nigra*	na	0.1

Appendix C – Flora Site Data – Northern Terminal

Site No: CHQ02	**Date**: 16/10/2023	**Longitude**: 115.88929142	**Latitude**: -31.85100798

Type: Quadrat
Soil Types: Grey white sand
Topography: Flat
Surface: bare ground 25%, litter 50%
Outcrops: None
Litter: fine litter 20%, coarse litter 30%
Vegetation Condition: Very Good
Condition Notes: Weedy grasses, rubbish nearby
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: CcXpEc: *Corymbia calophylla* and *Nuytsia floribunda* open woodland over *Xanthorrhoea preissii, Conostephium pendulum* and *Petrophile linearis* sparse shrubland over **Ehrharta calycina* and **Pentameris airoides* open grassland.

Weed	Taxon	Height (cm)	Foliage (%)
	Dianella revoluta	70	0.2
*	*Monoculus monstrosus*	20	0.1
*	*Ehrharta calycina*	140	45
	Haemodorum spicatum	140	0.2
	Lechenaultia floribunda	30	0.1
	Lyginia imberbis	70	2

Weed	Taxon	Height (cm)	Foliage (%)
	Corymbia calophylla	1500	25
	Nuytsia floribunda	900	15
	Patersonia occidentalis	80	1
*	*Pentameris airoides*	25	25
	Petrophile linearis	35	0.5
	Conostephium pendulum	70	1
	Xanthorrhoea preissii	200	5

Appendix C – Flora Site Data – Northern Terminal

Site No: CHQ03	**Date**: 16/10/2023	**Longitude**: 115.88959	**Latitude**: -31.8521689

Type: Quadrat
Soil Types: Grey sand
Topography: Flat
Surface: Bare 2%
Outcrops: None
Litter: Coarse 1%, Fine 5%
Vegetation Condition: Excellent
Condition Notes: Dense native vegetation
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata* and *Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Adenanthos cygnorum subsp. *cygnorum*	250	2
	Regelia inops	150	0.1
	Cassytha racemosa forma racemosa	na	3
	Dasypogon bromeliifolius	70	0.5

Weed	Taxon	Height (cm)	Foliage (%)
	Dianella revoluta	50	0.1
*	*Ehrharta calycina*	170	2
	Gastrolobium ebracteolatum	70	0.1
	Gompholobium tomentosum	100	0.1
	Hypocalymma robustum	160	60
	Phlebocarya ciliata	60	4
	Melaleuca preissiana	700	10
	Opercularia vaginata	40	0.2
	Patersonia occidentalis	80	0.5
*	*Pentameris airoides*	20	0.1
	Pericalymma ellipticum var. *floridum*	90	0.1
	Acacia pulchella	40	0.1
	Taxandria linearifolia	180	10
*	*Ursinia anthemoides*	25	0.1
	Tricoryne tenella	50	1

Appendix C – Flora Site Data – WGA-MUL

Site No: CHQ05	**Date**: 17/10/2023	**Longitude**: 115.7803591	**Latitude**: -31.79803933

Type: Quadrat
Soil Types: Brown loamy sand
Topography: Gentle slope
Surface: -
Outcrops: None
Litter: 60 coarse, 10 fine, 5 bare
Vegetation Condition: Good
Condition Notes:
Soil Condition: Damp
Fire: 10+ years

Vegetation Type: EgHcPp: *Eucalyptus gomphocephala, Corymbia calophylla* and *Melaleuca huegelii* open forest over *Hibbertia cuneiformis* and *Acacia saligna* sparse shrubland over *Poa porphyroclados*, **Ehrharta calycina* and **Avena barbata* grassland.

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia saligna	80	0.5
*	*Avena barbata*	40	5
*	*Briza maxima*	20	0.5
*	*Bromus diandrus*	40	0.5
	Dianella revoluta	40	0.2

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ehrharta calycina*	100	10
*	*Euphorbia terracina*	80	1.5
*	*Fumaria capreolata*	na	2
	Hibbertia cuneiformis	190	5
*	*Lactuca serriola*	30	0.5
*	*Lysimachia arvensis*	15	1
	Corymbia calophylla	800	2
*	*Melaleuca nesophila*	300	1.5
	Melaleuca huegelii	400	3
*	*Sonchus asper*	35	1
*	*Sonchus oleraceus*	30	0.5
	Poa porphyroclados	120	15
	Eucalyptus gomphocephala	1600	30
*	*Vicia sativa* subsp. *nigra*	na	0.1

Appendix C – Flora Site Data – Pinjar Terminal

Site No: CHQ06	**Date**: 18/10/2023	**Longitude**: 115.8216580	**Latitude**: -31.5653747

Type: Quadrat
Soil Types: White-grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 2%, coarse 40%, 10% fine
Vegetation Condition: Excellent
Condition Notes: Minimal weeds
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAcCc: *Banksia attenuata* and *Banksia menziesii* woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Xanthorrhoea preissii, Kunzea glabrescens* open shrubland over *Conostylis candicans, Patersonia occidentalis* and *Lomandra sericea* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	25	0.5
	Adenanthos cygnorum subsp. *cygnorum*	10	0.1
	Allocasuarina humilis	160	8
	Banksia attenuata	1000	40
	Banksia menziesii	850	10

Weed	Taxon	Height (cm)	Foliage (%)
	Beaufortia elegans	100	5
	Bossiaea eriocarpa	35	2
	Burchardia congesta	50	0.1
	Calytrix flavescens	30	2
	Cassytha flava	na	0.5
	Conostephium pendulum	30	1
	Conostylis teretifolia	5	0.1
	Conostylis candicans	26	1.5
	Dampiera linearis	15	0.1
	Desmocladus flexuosus	10	0.2
	Drosera erythrorhiza	2	0.1
	Drosera macrantha	na	0.1
*	*Gladiolus caryophyllaceus*	50	0.1
	Gompholobium tomentosum	30	1
	Hibbertia hypericoides	40	0.5
	Hibbertia hypericoides	100	6
	Hibbertia subvaginata	30	0.2
	Hovea trisperma	70	0.1
	Jacksonia floribunda	90	1.5
	Leucopogon pulchellus	25	0.2
	Lomandra indet (sterile)	15	0.1
	Lomandra sericea	40	0.5
	Lyginia imberbis	70	0.1
	Melaleuca seriata	80	15
	Mesomelaena pseudostygia	60	10
	Patersonia occidentalis	80	10
	Philotheca spicata	50	0.5
	Phlebocarya ciliata	40	0.2
	Scaevola canescens	10	0.2
	Stirlingia latifolia	110	1.5
	Stylidium cygnorum	5	0.5
	Thelymitra benthamiana	35	0.1
	Trachymene pilosa	5	0.1
	Tricoryne elatior	70	0.1
	Xanthorrhoea preissii	180	15
	Xanthosia huegelii	5	0.1

Appendix C – Flora Site Data – Pinjar Terminal

Site No: CHQ07	**Date**: 18/10/2023	**Longitude**: 115.8238332	**Latitude**: -31.55889882

Type: Quadrat
Soil Types: White-grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 2%, coarse 40%, 10% fine
Vegetation Condition: Excellent
Condition Notes: Minimal weeds
Soil Condition: Dry
Fire: 10+

Vegetation Type: BaAcCc: *Banksia attenuata* and *Banksia menziesii* woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Xanthorrhoea preissii, Kunzea glabrescens* open shrubland over *Conostylis candicans, Patersonia occidentalis* and *Lomandra sericea* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
	Cassytha flava	na	0.5
	Conostylis candicans	25	2
	Lomandra sericea	35	0.5
	Patersonia occidentalis	30	0.5
	Thysanotus manglesianus	na	0.3

Weed	Taxon	Height (cm)	Foliage (%)
	Desmocladus flexuosus	10	0.2
	Phlebocarya ciliata	40	0.2
	Stylidium brunonianum	40	0.2
	Tricoryne elatior	50	0.2
	Burchardia congesta	40	0.1
	Conostylis teretifolia	5	0.1
	Drosera erythrorhiza	1	0.1
	Drosera macrantha	na	0.1
*	*Gladiolus caryophyllaceus*	30	0.1
	Stylidium repens	5	0.1
	Thysanotus thyrsoideus	30	0.1
	Xanthosia huegelii	10	0.1
	Borya sphaerocephala	5	0.1
	Mesomelaena pseudostygia	60	35
	Xanthorrhoea preissii	170	5
	Scholtzia involucrata	110	3
	Kunzea glabrescens	300	1.5
	Adenanthos cygnorum subsp. *cygnorum*	250	1
	Bossiaea eriocarpa	35	1
	Melaleuca seriata	60	1
	Petrophile linearis	35	1
	Stirlingia latifolia	100	1
	Verticordia nitens	140	0.6
	Conospermum stoechadis subsp. *sclerophyllum*	60	0.5
	Conostephium pendulum	35	0.5
	Hibbertia hypericoides	30	0.5
	Jacksonia floribunda	100	0.5
	Acacia pulchella	35	0.3
	Calytrix flavescens	35	0.2
	Gompholobium tomentosum	25	0.2
	Hibbertia hypericoides subsp. *hypericoides*	20	0.2
	Hovea trisperma	60	0.2
	Banksia attenuata	700	30
	Banksia menziesii	500	4

Appendix C – Flora Site Data – Neerabup Terminal and NBT Group

Site No: CHQ08	**Date**: 19/10/2023	**Longitude**: 115.8232144	**Latitude**: -31.6814714

Type: Quadrat
Soil Types: White-grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 5%, coarse 20%, 15% fine
Vegetation Condition: Very Good
Condition Notes: Weeds
Soil Condition: Dry
Fire: 10+

Vegetation Type: EgGlCe: *Eucalyptus gomphocephala, Eucalyptus rudis* and *Banksia grandis* open woodland over *Gastrolobium liearifolium, Kunzea glabrescens* and *Xanthorrhoea preissi* over **Carpobrotus edulis,*Disa bracteata* and **Euphorbia terracina* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ornithopus pinnatus*	na	1
	Poa porphyroclados	80	0.5
*	*Briza maxima*	5	0.2
*	*Ehrharta calycina*	130	0.2
*	*Carpobrotus edulis*	15	5

Weed	Taxon	Height (cm)	Foliage (%)
*	*Disa bracteata*	25	0.1
*	*Hypochaeris glabra*	2	0.1
	Ficinia nodosa	90	1
	Gastrolobium linearifolium	50	6
	Regelia ciliata	200	5
	Kennedia prostrata	10	5
	Acacia pulchella	110	3
	Eremaea purpurea	150	2
	Kunzea glabrescens	300	2
	Calothamnus hirsutus	50	0.5
	Eremaea pauciflora var. *pauciflora*	30	0.5
	Regelia inops	100	0.5
	Eucalyptus gomphocephala	1500	10
*	*Pinus pinaster*	120	0.5

Appendix C – Flora Site Data – Neerabup Terminal and NBT Group

Site No: CHQ09	**Date**: 20/10/2023	**Longitude**: 115.85197822	**Latitude**: -31.72570105

Type: Quadrat
Soil Types: Grey sand
Topography: Slight slope
Surface: -
Outcrops: None
Litter: 4% bare, 20% coarse, 30% fine
Vegetation Condition: Very Good
Condition Notes: Weeds
Soil Condition: Damp
Fire: 10+ years

Vegetation Type: MpHaEc: *Melaleuca preissiana* woodlands over *Hypocalymma angustifolium*, *Kunzea glabrescens* and *Jacksonia furcellata* shrubland over **Ehrharta calycina* and *Microlaena stipoides* grassland.

Weed	Taxon	Height (cm)	Foliage (%)
	Dianella revoluta	40	0.2
	Kunzea glabrescens	300	1
*	*Ehrharta calycina*	110	20
	Microlaena stipoides	40	5
	Platysace filiformis	na	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Fumaria capreolata*	na	0.3
*	*Gladiolus caryophyllaceus*	80	0.1
	Hypocalymma angustifolium	100	10
	Hypolaena exsulca	30	0.5
	Jacksonia furcellata	150	0.5
	Melaleuca preissiana	700	60
*	*Orobanche minor*	20	0.1
*	*Pelargonium capitatum*	30	0.2
*	*Sonchus oleraceus*	10	0.1
	Taxandria linearifolia	130	4
	Phyllangium paradoxum	10	0.1

Appendix C – Flora Site Data – Neerabup Terminal and NBT Group

Site No: CHQ10	**Date**: 20/10/2023	**Longitude**: 115.85097632	**Latitude**: -31.74821830

Type: Quadrat
Soil Types: Grey sand
Topography: Gently sloping
Surface: -
Outcrops: None
Litter: 5 bare, 20 coarse, 10 fine
Vegetation Condition: Excellent
Condition Notes: Weeds
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAcDf: *Banksia attenuata, Banksia menziesii* and *Nuytsia floribunda* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Macrozamia fraseri* and *Gompholobium tomentosum* open shrubland over *Desmocladus flexuosus, Patersonia occidentalis* and *Corynotheca micrantha* forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia huegelii	35	0.8
	Adenanthos cygnorum subsp. *cygnorum*	400	25
	Banksia attenuata	800	40

Weed	Taxon	Height (cm)	Foliage (%)
	Banksia menziesii	700	15
*	*Briza maxima*	40	3
	Burchardia congesta	50	1
	Caladenia flava	5	0.1
	Lomandra ?micrantha	40	0.1
	Desmocladus flexuosus	25	50
	Dianella revoluta	40	0.3
*	*Ehrharta calycina*	130	2
	Thysanotus arbuscula	50	0.1
*	*Gladiolus caryophyllaceus*	60	0.5
	Gompholobium tomentosum	35	0.5
	Hibbertia hypericoides	30	0.5
	Hypocalymma robustum	60	0.2
	Lobelia tenuior	40	0.2
	Lepidosperma sp. sterile	25	0.1
	Lyginia imberbis	70	1
	Macrozamia fraseri	220	1.5
	Microtis media	25	0.1
	Lagenophora huegelii	30	0.2
	Nuytsia floribunda	600	1
	Patersonia occidentalis	70	2.5
	Podolepis gracilis	25	0.1
	Sowerbaea laxiflora	50	0.2
	Corynotheca micrantha	60	1.1
	Stylidium repens	15	0.5
	Thelymitra benthamiana	30	0.1
	Trachymene pilosa	10	0.5
*	*Ursinia anthemoides*	20	0.8

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHQ11	**Date**: 20/10/2023	**Longitude**: 115.84867	**Latitude**: -31.7193940667

Type: Quadrat
Soil Types: White sand
Topography: Gently undulating
Surface: -
Outcrops: None
Litter: 6% bare, 5% coarse, 35% fine
Vegetation Condition: Excellent
Condition Notes: Weeds, grazing
Soil Condition: Dry
Fire: 10+

Vegetation Type: BmEpLi: *Banksia menziesii, Banksia attenuata, Allocasuarina fraseriana* low open woodland over *Eremaea purpurea*, *Hibbertia hypercoides* and *Macrozamia fraseri* open shrubland over *Lyginia imerbis, Lepidosperma leptostachyum* and *Mesomelaena pseudostygia* sedgeland.

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	30	0.1
	Allocasuarina fraseriana	800	5
	Allocasuarina humilis	110	1
	Austrostipa compressa	40	0.1
	Banksia attenuata	650	3

Weed	Taxon	Height (cm)	Foliage (%)
	Banksia menziesii	750	12
*	*Briza maxima*	20	0.1
	Burchardia congesta	60	0.1
	Cyanothamnus ramosus	25	0.1
	Conostephium pendulum	25	0
	Dianella revoluta	30	0.2
*	*Ehrharta calycina*	150	0.5
	Eremaea purpurea	150	5
	Gompholobium tomentosum	25	0.3
	Haemodorum spicatum	100	0.2
	Jacksonia floribunda	150	1
	Hibbertia hypericoides	90	2
	Hibbertia subvaginata	25	0.2
	Styphelia conostephioides	25	0.3
	Lyginia imberbis	70	7
	Macrozamia fraseri	200	1.5
*	*Lomandra nigricans*	48	0.1
*	*Pentameris airoides*	15	1.5
	Petrophile linearis	35	1
	Scholtzia involucrata	30	0.2
	Bossiaea eriocarpa	30	0.1
	Stirlingia latifolia	90	0.3
*	*Ursinia anthemoides*	25	0.1
*	*Wahlenbergia capensis*	30	0.1
	Lepidosperma sp. *sterile*	40	0.1

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHQ12	**Date**: 20/10/2023	**Longitude**: 115.8636807	**Latitude**: -31.7388921

Type: Quadrat
Soil Types: Grey white sand
Topography: Gently undulating
Surface: -
Outcrops: None
Litter: 5% bare, 10% coarse, 10% fine
Vegetation Condition: Excellent
Condition Notes: Low weeds, no tracks
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BmEpLi: *Banksia menziesii, Banksia attenuata, Allocasuarina fraseriana* low open woodland over *Eremaea purpurea, Hibbertia hypercoides* and *Macrozamia fraseri* open shrubland over *Lyginia imerbis, Lepidosperma leptostachyum* and *Mesomelaena pseudostygia* sedgeland.

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	60	1
	Amphipogon turbinatus	60	1.5
	Austrostipa compressa	80	0.1
	Banksia attenuata	700	10
	Banksia menziesii	500	5

Weed	Taxon	Height (cm)	Foliage (%)
	Comesperma calymega	50	0.2
	Grevillea leucopteris	60	0.5
	Bossiaea eriocarpa	35	0.5
*	*Briza maxima*	25	0.5
	Burchardia congesta	90	0.2
	Calytrix angulata	50	1
	Conostephium pendulum	45	3
	Conostylis setigera	40	2
	Lyginia imerbis	10	5
	Dampiera linearis	15	0.5
	Desmocladus flexuosus	10	0.5
	Drosera erythrorhiza	1	0.2
	Drosera macrantha	na	0.5
	Eremaea purpurea	110	10
	Rytidosperma occidentale	100	0.2
	Olearia axillaris	30	0.2
*	*Gladiolus caryophyllaceus*	100	0.5
	Gompholobium tomentosum	30	1
	Haemodorum spicatum	130	0.1
	Jacksonia floribunda	150	1
	Hibbertia huegelii	40	0.5
	Hibbertia hypercoides	80	2
	Hibbertia hypericoides subsp. *hypericoides*	30	1
	Daviesia triflora	70	0.5
	Hibbertia subvaginata	25	0.5
	Hovea trisperma	30	1
	Laxmannia squarrosa	10	0.2
	Lepidosperma leptostachyum	40	0.2
	Leucopogon pulchellus	30	0.2
	Lomandra ?micrantha	20	0.3
	Lyginia imerbis	30	1
	Stylidium crossocephalum	25	0.1
	Melaleuca parviceps	40	0.2
	Mesomelaena pseudostygia	90	0.2
	Patersonia occidentalis	60	1.5
	Petrophile linearis	25	1
	Stylidium brunonianum	40	0.1

Weed	Taxon	Height (cm)	Foliage (%)
	Scholtzia involucrata	50	5
	Acanthocarpus preissii	25	0.1
	Corynotheca micrantha	50	0.2
	Stirlingia latifolia	120	3
	Stylidium araeophyllum	20	0.1
	Stylidium repens	10	1
	Styphelia pallida	5	0.5
	Thysanotus manglesianus	na	0.5
	Hyalosperma cotula	10	0.5
	Trachymene pilosa	15	0.2
*	*Ursinia anthemoides*	20	0.5

Appendix C – Flora Site Data- Neerabup/NBT Group

Site No: CHQ13	**Date**: 6/11/2023	**Longitude**: 115.86355885	**Latitude**: -31.7531997

Type: Quadrat
Soil Types: White sand
Topography: Gently undulating
Surface: -
Outcrops: None
Litter: bare 5%, coarse 10%, fine 10%
Vegetation Condition: Excellent
Condition Notes:
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BmEpLi: *Banksia menziesii, Banksia attenuata, Allocasuarina fraseriana* low open woodland over *Eremaea purpurea, Hibbertia hypercoides* and *Macrozamia fraseri* open shrubland over *Lyginia imerbis, Lepidosperma leptostachyum* and *Mesomelaena pseudostygia* sedgeland.

- Neerabup/NBT GroupWeed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	110	10
	Rytidosperma occidentale	100	0.5
	Banksia attenuata	800	6
	Banksia menziesii	700	3
	Bossiaea eriocarpa	30	1

- Neerabup/NBT GroupWeed	Taxon	Height (cm)	Foliage (%)
*	*Briza maxima*	25	0.2
	Burchardia congesta	40	0.2
	Calothamnus sanguineus	110	2
	Calytrix angulata	30	1
	Comesperma calymega	40	0.1
	Conostephium pendulum	50	1.5
	Conostylis aurea	30	1
	Amphipogon turbinatus	20	0.2
	Dampiera linearis	20	0.2
	Desmocladus flexuosus	10	5
*	*Ehrharta calycina*	120	0.2
	Eremaea pauciflora var. *pauciflora*	90	10
*	*Gladiolus caryophyllaceus*	90	0.2
	Gompholobium tomentosum	30	0.5
	Acacia sessilis	50	0.5
	Haemodorum laxum	100	0.3
	Jacksonia floribunda	130	1
	Hibbertia hueglii	50	1.5
	Hibbertia hypericoides	50	1
	Hibbertia subvaginata	30	0.2
	Hypocalymma angustifolium	100	1
	Laxmannia squarrosa	10	0.1
	Lepidosperma calcicola	25	0.5
	Leucopogon pulchellus	40	1
	Lomandra micrantha	25	0.5
	Lyginia imerbis	50	2
	Melaleuca systena	100	0.5
	Mesomelaena pseudostygia	60	10
	Patersonia occidentalis	60	2.5
*	*Pentameris airoides*	20	0.1
	Petrophile linearis	40	1.5
	Phyllangium divergens	3	0.1
	Scaevola repens	10	1
	Stirlingia latifolia	40	0.5
	Stylidium brunonianum	60	0.3
	Thysanotus manglesianus	na	0.1
	Stylidium cygnorum	10	0.5

- Neerabup/NBT GroupWeed	Taxon	Height (cm)	Foliage (%)
*	*Ursinia anthemoides*	25	0.5
	Hyalosperma cotula	4	0.1
	Xanthorrhoea preissii	120	1.5

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHQ14	**Date**: 6/11/2023	**Longitude**: 115.87847848	**Latitude**: -31.7829674

Type: Quadrat
Soil Types: White sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 5, coarse 15, fine 10
Vegetation Condition: Excellent
Condition Notes: bare 5, coarse 15, fine 10
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAhDf: *Banksia attenuata, Banksia menziesii* and *Eucalyptus todtiana* low open woodland over *Allocasuarina humilis, Calytrix flavescens* and *Eremaea pauciflora* var. *pauciflora* low shrubland over *Desmocladus flexuosus, Patersonia occidentalis* and **Ursinia anthemoides* forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Allocasuarina humilis	150	7
	Amphipogon turbinatus	70	1
	Rytidosperma occidentale	110	0.5
	Banksia attenuata	600	4
	Banksia menziesii	500	3.5

Weed	Taxon	Height (cm)	Foliage (%)
	Bossiaea eriocarpa	30	1
*	*Briza maxima*	25	0.2
	Burchardia congesta	90	0.5
	Conostephium pendulum	50	1.5
	Conostylis aurea	30	1
	Chaetospora curvifolia	25	1
	Pimelea ferruginea	35	0.5
	Desmocladus flexuosus	10	25
*	*Ehrharta calycina*	100	0.5
	Eremaea pauciflora var. *pauciflora*	140	3.5
	Eucalyptus todtiana	250	2
	Arnocrinum preissii	80	0.5
*	*Gladiolus caryophyllaceus*	100	0.2
	Gompholobium tomentosum	25	0.5
	Acacia sessilis	30	0.5
	Haemodorum spicatum	120	0.2
	Hibbertia hueglii	30	0.5
	Hibbertia hypericoides	40	1
	Lepidosperma calcicola	30	2
	Lyginia imerbis	70	12
	Mesomelaena pseudostygia	60	8
	Patersonia occidentalis	70	10
*	*Pentameris airoides*	25	5
*	*Petrorhagia dubia*	40	0.1
	Petrophile linearis	30	1
	Melaleuca seriata	100	1.5
	Scaevola repens	10	1.5
	Daviesia triflora	70	0.5
	Stylidium repens	5	0.5
	Thysanotus manglesianus	na	0.1
	Calectasia sp.	30	1
*	*Ursinia anthemoides*	20	5
	Hyalosperma cotula	5	0.5
	Calytrix flavescens	50	5
*	*Asteraceae sp.*	60	0.2

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHQ15	**Date**: 8/11/2023	**Longitude**: 115.8719680	**Latitude**: -31.79398398

Type: Quadrat
Soil Types: White sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 2, coarse 10, fine 10
Vegetation Condition: Very Good
Condition Notes: weeds
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAhDf: *Banksia attenuata, Banksia menziesii* and *Eucalyptus todtiana* low open woodland over *Allocasuarina humilis, Calytrix flavescens* and *Eremaea pauciflora* var. *pauciflora* low shrubland over *Desmocladus flexuosus, Patersonia occidentalis* and **Ursinia anthemoides* forbland

Weed/Cons. Status	Taxon	Height (cm)	Foliage (%)
	Austrostipa compressa	25	0.1
*	*Avena barbata*	90	0.1
	Banksia attenuata	800	15
	Bossiaea eriocarpa	30	0.2
*	*Briza maxima*	25	0.2

Weed/Cons. Status	Taxon	Height (cm)	Foliage (%)
	Burchardia congesta	50	0.5
*	*Carpobrotus edulis*	10	0.5
	Conostephium pendulum	35	0.2
	Conostylis aurea	35	1.5
	Daviesia divaricata subsp. *divaricata*	90	0.8
	Desmocladus flexuosus	15	60
	Dianella revoluta	90	0.8
*	*Ehrharta calycina*	120	3
	Gompholobium tomentosum	40	2
	Haemodorum spicatum	110	1
	Corynotheca micrantha	40	1.5
	Hibbertia hypericoides	40	0.5
	Hypocalymma angustifolium	45	0.5
P4	*Jacksonia sericea*	40	0.5
	Jacksonia sternbergiana	200	6
	Laxmannia squarrosa	15	0.5
	Lechenaultia floribunda	30	0.5
	Lomandra micrantha	25	0.3
	Lyginia imberbis	50	4
	Macrozamia riedlei	200	2
	Mesomelaena pseudostygia	50	2.5
	Patersonia occidentalis	70	8
*	*Pentameris airoides*	15	3
	Petrophile linearis	30	2
	Podotheca gnaphalioides	20	3
	Scaevola repens	10	1.5
*	*Sonchus asper*	5	0.1
	Stirlingia latifolia	35	0.5
*	*Ursinia anthemoides*	20	4
	Macarthuria australis	60	7

Appendix C – Flora Site Data

Site No: CHQ16	**Date**:	**Longitude**: 115.8719680	**Latitude**: -31.79398399

Type: Quadrat
Soil Types: White sand
Topography: Flat
Surface: Bare 2%, Litter 20%, Grass 20%
Outcrops: None
Litter: bare 2, coarse 10, fine 10
Vegetation Condition: Good
Condition Notes: Next to road, pathway, weeds
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAlTe: *Banksia attenuata* and *Banksia grandis* woodland over *Acacia lasiocarpa, Davesia divaricata* and *Xanthorrhoea preissii* shrubland over *Tricoryne elatior, *Euphorbia terracina* and **Hypochaeris glabra* sparse forbland

Weed/Cons. Status	Taxon	Height (cm)	Foliage (%)
	Acacia lasiocarpa var. *lasiocarpa*	90	6
*	*Avena barbata*	100	0.1
	Banksia attenuata	700	25
	Banksia grandis	800	5
	Conostylis setigera	40	0.2
	Daviesia divaricata subsp. *divaricata*	120	3
*	*Euphorbia terracina*	60	1.5

Weed/Cons. Status	Taxon	Height (cm)	Foliage (%)
	Hibbertia hypericoides	110	1.5
*	*Hypochaeris glabra*	30	0.5
*	*Lolium rigidum*	80	0.1
*	*Pelargonium capitatum*	50	1
*	*Bromus diandrus*	30	1
*	*Sonchus oleraceus*	40	1
*	*Galium murale*	3	0.1
	Tricoryne elatior	40	2
	Xanthorrhoea preissii	220	4

Appendix C – Flora Site Data – Northern Terminal

Site No: CHR01	**Date**: 16/10/2023	**Longitude**: 115.8896455	**Latitude**: -31.85335375

Type: Relevé
Soil Types: Grey sand
Topography: Flat
Surface: Bare 1%, Sedges/Grasses 60%
Outcrops: None
Litter: Fine: 5%, Coarse: 1%
Vegetation Condition: Good
Condition Notes: Weedy grasses
Soil Condition: Dry
Fire: 10+

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata* and *Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
*	*Briza maxima*	30	0.1
*	*Carpobrotus edulis*	10	0.5
	Crassula colorata	4	0.1
*	*Ehrharta calycina*	130	1.5

Weed	Taxon	Height (cm)	Foliage (%)
	Eucalyptus rudis	1400	25
	Verticordia densiflora	35	0.1
*	*Gaudium laevigatum*	200	1
*	*Gladiolus caryophyllaceus*	45	0.5
	Jacksonia furcellata	200	5
	Siloxerus humifusus	1	0.1
	Taxandria linearifolia	200	15
	Trachymene pilosa	10	0.1
*	*Ursinia anthemoides*	20	0.1
	Schoenus subfascicularis	100	80

Appendix C – Flora Site Data – WGA-MUL

Site No: CHR04	**Date**: 17/10/2023	**Longitude**: 115.8036003	**Latitude**: -31.8022440

Type: Relevé
Soil Types: White-grey sand
Topography: Slope
Surface: -
Outcrops: None
Litter: bare 5, coarse 45, fine 20
Vegetation Condition: Degraded
Condition Notes: bare 5, coarse 45, fine 20
Soil Condition: Dry
Fire: -

Vegetation Type: BaAbAb: *Banksia attenuata* and *Callitris preissii* open woodland over *Acacia blakelyi*, *Melaleuca huefelii* and **Grevillea preissii* shrubland over **Avena barbata*, **Bromus diandrus* and *Austrostipa flavescens* grassland.

Weed	Taxon	Height (cm)	Foliage (%)
*	*Avena barbata*	120	3
	Banksia attenuata	600	45
*	*Bromus diandrus*	80	1
	Callitris preissii	400	1
*	*Ehrharta calycina*	100	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Euphorbia terracina*	80	0.5
*	*Grevillea preissii*	110	2
	Acacia blakelyi	600	30
*	*Lupinus cosentinii*	30	0.1
	Melaleuca huegelii	120	2
*	*Pelargonium capitatum*	30	0.1
*	*Sonchus asper*	30	0.5
	Austrostipa flavescens	110	0.2
*	*Gazania linearis*	10	0.1

Appendix C – Flora Site Data – WGA-MUL

Site No: CHR05	**Date**: 18/10/2023	**Longitude**: 115.7729762	**Latitude**: -31.79981584

Type: Relevé
Soil Types: White sand
Topography: Flat
Surface: -
Outcrops: None
Litter: Minimal
Vegetation Condition: Good
Condition Notes: Weedy grasses
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: CpMsLo: *Callitris preissii* low open woodland over *Melaleuca seriata, Acacia lasiocarpa* var. *sedifolia* and *Rhagodia baccata* sparse shrubland over **Lagurus ovatus*, **Cynodon dactylon* and **Ehrharta calycina* open grassland.

Weed	Taxon	Height (cm)	Foliage (%)
*	*Bromus diandrus*	60	0.5
	Callitris preissii	600	8
	Conostylis candicans subsp. *calcicola*	30	0.2
*	*Cynodon dactylon*	10	5
*	*Ehrharta calycina*	70	1

Weed	Taxon	Height (cm)	Foliage (%)
	Hardenbergia comptoniana	na	0.1
*	*Lagurus ovatus*	30	5
	Levenhookia pusilla	3	0.1
*	*Leontodon rhagadioloides*	15	0.1
*	*Lobularia maritima*	10	0.1
*	*Oenothera drummondii*	25	0.1
	Melaleuca seriata	150	2
	Rhagodia baccata	80	0.2
	Acanthocarpus preissii	80	1
	Acacia lasiocarpa var. *sedifolia*	50	0.1
*	*Trachyandra divaricata*	30	1
*	*Gazania linearis*	20	0.2

Appendix C – Flora Site Data – WGA-MUL

Site No: CHR06	**Date**: 19/10/2023	**Longitude**: 115.8199385	**Latitude**: -31.68318473

Type: Relevé
Soil Types: White sand
Topography: Flat
Surface: -
Outcrops: None
Litter: 10% bare, 20% fine, 10% coarse
Vegetation Condition: Degraded
Condition Notes: Cleared and road adjacent, weeds
Soil Condition: Dry
Fire: 10+

Vegetation Type: EgGlCe: *Eucalyptus gomphocephala*, *Eucalyptus rudis* and *Banksia grandis* open woodland over *Gastrolobium linearifolium*, *Kunzea glabrescens* and *Xanthorrhoea preissi* over **Carpobrotus edulis*, **Disa bracteata* and **Euphorbia terracina* sparse forbland.

Weed	Taxon	Height (cm)	Foliage (%)
*	*Briza maxima*	15	1
*	*Ehrharta calycina*	110	10
*	*Carpobrotus edulis*	10	0.5
*	*Disa bracteata*	20	0.1
*	*Hypochaeris glabra*	2	0.2
*	*Euphorbia terracina*	25	0.8

Weed	Taxon	Height (cm)	Foliage (%)
	Eucalyptus gomphocephala	1800	20
	Xanthorrhoea preissii	130	1.5

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHR07	**Date**: 19/10/2023	**Longitude**: 115.82261289	**Latitude**: -31.68044945

Type: Relevé
Soil Types: - White grey sand
Topography: Undulating
Surface: -
Outcrops: None
Litter: 8% bare, 10% coarse, 5% fine
Vegetation Condition: Excellent
Condition Notes: Weeds, tracks
Soil Condition: Dry
Fire: 10+

Vegetation Type: BaRcGt: *Banksia attenuata, Banksia menziesii* and *Eucalyptus rudis* open woodland over *Regelia ciliata, Kunzea glabrescens* and *Gompholobium tomentosum* dense shrubland over *Ficinia nodosa and Lyginia imerbis* sedgeland

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	70	0.5
	Banksia attenuata	500	7
	Banksia menziesii	400	5
	Regelia ciliata	220	15
*	*Carpobrotus edulis*	15	0.5

Weed	Taxon	Height (cm)	Foliage (%)
*	*Disa bracteata*	25	0.1
	Eucalyptus rudis	800	3
	Ficinia nodosa	80	0.5
	Gompholobium tomentosum	70	1.5
	Hardenbergia comptoniana	na	1
	Jacksonia furcellata	300	0.5
	Kunzea glabrescens	300	15
	Gastrolobium linearifolium	30	0.2
	Lyginia imerbis	60	1
	Regelia inops	250	1
*	*Ornithopus pinnatus*	na	0.1
	Phlebocarya ciliata	60	0.5

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHR08	**Date**: 19/10/2023	**Longitude**: 115.833386	**Latitude**: -31.68132765

Type: Relevé
Soil Types: Grey sand
Topography: Slight slope
Surface: -
Outcrops: None
Litter: 15% coarse, 10% fine
Vegetation Condition: Good
Condition Notes: 8% bare, 10% coarse, fine 5%
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: PpAcCe: *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.

Weed	Taxon	Height (cm)	Foliage (%)
	Adenanthos cygnorum subsp. *cygnorum*	300	60
*	*Avena barbata*	80	1
*	*Briza maxima*	50	1
*	*Bromus diandrus*	20	2
*	*Carpobrotus edulis*	15	3

Weed	Taxon	Height (cm)	Foliage (%)
	Conospermum stoechadis subsp. *sclerophyllum*	40	0.2
	Dasypogon bromeliifolius	60	0.5
	Daviesia divaricata subsp. divaricata	320	4
*	*Ehrharta calycina*	140	8
*	*Ehrharta longiflora*	20	0.1
	Gastrolobium linearifolium	30	0.3
	Haemodorum spicatum	120	0.1
	Jacksonia floribunda	170	0.5
	Hardenbergia comptoniana	na	1
	Hibbertia hypericoides	90	1
	Macrozamia fraseri	160	1
	Mesomelaena pseudostygia	80	3
*	*Ornithopus pinnatus*	na	20
	Patersonia occidentalis	60	0.5
*	*Pelargonium capitatum*	40	0.1
*	*Pinus pinaster*	800	10
	Scaevola repens	25	0.5
*	*Sonchus oleraceus*	20	0.2
*	*Trifolium arvense*	10	1
*	*Vicia sativa* subsp. *nigra*	na	0.1

Appendix C – Flora Site Data- Neerabup/NBT Group

Site No: CHR09	**Date**: 6/11/2023	**Longitude**: 115.88252475	**Latitude**: -31.794415617

Type: Relevé
Soil Types: Grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: coarse 10%, fine 10%
Vegetation Condition: Excellent
Condition Notes: Next to track
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: MpXpDb: *Melaleuca preissiana* open woodland over *Xanthorrhoea preissii*, *Banksia dallanneyi* and *Beaufortia elegans* open shrubland over *Dasypogon bromeliifolius*, *Desmocladus fasciculatus* and *Patersonia occidentalis* closed forbland.

Weed	Taxon	Height (cm)	Foliage (%)
*	*Avena barbata*	80	1
*	*Briza maxima*	50	1
*	*Bromus diandrus*	20	2
*	*Carpobrotus edulis*	15	3
	Conospermum stoechadis subsp. *sclerophyllum*	40	0.2

Weed	Taxon	Height (cm)	Foliage (%)
	Dasypogon bromeliifolius	60	0.5
	Daviesia divaricata subsp. *divaricata*	320	4
*	*Ehrharta calycina*	140	8
*	*Ehrharta longiflora*	20	0.1
	Gastrolobium linearifolium	30	0.3
	Haemodorum spicatum	120	0.1
	Jacksonia floribunda	170	0.5
	Hardenbergia comptoniana	na	1
	Hibbertia hypericoides	90	1
	Macrozamia fraseri	160	1

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: CHR10	**Date**: 6/11/2023	**Longitude**: 115.8826581	**Latitude**: -31.79286852

Type: Relevé
Soil Types: Grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: bare 2%, coarse 10%, fine 5%
Vegetation Condition: Excellent
Condition Notes: Next to track
Soil Condition: Dry
Fire: 5-10 years

Vegetation Type: CcXpDf: *Corymbia calophylla, Eucalyptus marginata* and *Banksia attenuata* open woodland over *Xanthorrhoea preissii, Jacksonia floribunda* and *Leucopogon pulchellus* shrubland over *Desmocladus flexuosus, Lomandra micrantha* and *Dasypogon bromeliifolius* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
	Mesomelaena pseudostygia	80	3
*	*Ornithopus pinnatus*	na	20
	Patersonia occidentalis	60	0.5
*	*Pelargonium capitatum*	40	0.1
*	*Pinus pinaster*	800	10

Weed	Taxon	Height (cm)	Foliage (%)
	Scaevola repens	25	0.5
*	*Sonchus oleraceus*	20	0.2
*	*Trifolium arvense*	10	1
*	*Vicia sativa* subsp. *nigra*	na	0.1
*	*Wahlenbergia capensis*	40	0.1
	Desmocladus fasciculatus	10	1.5
	Desmocladus flexuosus	15	15
*	*Ehrharta calycina*	100	0.2
	Eucalyptus marginata	1200	8
	Lomandra nigricans	50	0.8
	Jacksonia floribunda	180	5
	Hibbertia subvaginata	10	0.5
	Leucopogon pulchellus	25	1.5
	Lomandra micrantha	25	5
	Lyginia imerbis	40	3
*	*Pentameris airoides*	20	1
	Petrophile linearis	25	0.5
*	*Ursinia anthemoides*	25	1
	Xanthorrhoea preissii	200	15

Appendix C – Flora Site Data – NT-NOR

Site No: CHR11	**Date**: 7/11/2023	**Longitude**: 115.9602401	**Latitude**: -31.79854362

Type: Relevé
Soil Types: Brown grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: fine 30, coarse 20
Vegetation Condition: Degraded
Condition Notes: fine 30, coarse 20
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: CcMpXp: *Corymbia calophylla* mid open forest to mid closed forest over *Melaleuca preissiana* low isolated trees to low Woodland over *Xanthorrhoea preissii* isolated shrubs to mid open shrubland over *Dielsia stenostachya* rushland with a mixed exotic open grassland

Weed	Taxon	Height (cm)	Foliage (%)
*	*Avena barbata*	60	1
*	*Briza maxima*	20	0.5
*	*Bromus diandrus*	25	10
	Corymbia calophylla	1500	40
*	*Ehrharta calycina*	100	1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ehrharta longiflora*	30	15
*	*Lolium rigidum*	30	5
*	*Romulea rosea*	15	0.1
	Xanthorrhoea preissii	120	1

Appendix C – Flora Site Data – Northern Terminal

Site No: NSR01	**Date**: 16/10/2023	**Longitude**: 115.8915009	**Latitude**: -31.8503181

Type: Relevé
Soil Types: Yellow and grey sand sand
Topography: Flat
Surface: -
Outcrops: None
Litter: 10% bare ground
Vegetation Condition: Degraded
Condition Notes: weeds, Jasmine tree
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata and Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia saligna	250	4
*	*Acacia iteaphylla*	450	10
	Adenanthos cygnorum subsp. *cygnorum*	250	0.5
*	*Carpobrotus edulis*	15	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ricinus communis*	300	1
	Callitris pyramidalis	350	0.2
*	*Ehrharta calycina*	100	3
	Eucalyptus rudis	600	8
*	*Gaudium laevigatum*	400	2
*	*Melia azedarach*	700	3
*	*Lavandula stoechas*	140	0.2
	Melaleuca preissiana	310	0.5
*	*Pelargonium capitatum*	110	0.1
*	*Euphorbia terracina*	80	1
*	*Nicotiana glauca*	4	1.5

Appendix C – Flora Site Data -Northern Terminal

Site No: NSR02	**Date**: 16/10/2023	**Longitude**: 115.89125112	**Latitude**: -31.8539138500

Type: Relevé
Soil Types: Yellow sand with rocks
Topography: Flat
Surface: -
Outcrops: None
Litter: 20% bare ground
Vegetation Condition: Good
Condition Notes: rubbish
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata and Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
*	*Acacia iteaphylla*	2	1
	Adenanthos cygnorum subsp. *cygnorum*	380	2
	Briza maxima	20	1
*	*Carpobrotus edulis*	10	0.1
	Daviesia divaricata subsp. *divaricata*	40	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ehrharta calycina*	110	1.5
	Eucalyptus rudis	500	0.5
*	*Euphorbia terracina*	40	0.5
*	*Gladiolus caryophyllaceus*	70	0.5
*	*Gaudium laevigatum*	400	40
	Jacksonia sternbergiana	40	1
	Jacksonia furcellata	240	2
	Kennedia prostrata	10	0.1
	Laxmannia squarrosa	10	0.1
	Chamelaucium uncinatum	60	0.1
*	*Ursinia anthemoides*	20	0.1
	Acacia saligna	180	0.2

Appendix C – Flora Site Data – Northern Terminal

Site No: NSR03	**Date**: 16/10/2023	**Longitude**: 115.8893314	**Latitude**: -31.85235652

Type: Relevé
Soil Types: White grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: 5% bare ground
Vegetation Condition: Good
Condition Notes: Rubbish present
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata and Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Adenanthos cygnorum subsp. *cygnorum*	400	5
*	*Eragrostis curvula*	130	0.1
*	*Ehrharta calycina*	150	0.1
*	*Gladiolus caryophyllaceus*	70	0.1
	Melaleuca preissiana	400	2

Weed	Taxon	Height (cm)	Foliage (%)
*	*Pentameris pallida*	15	0.1
	Calytrix fraseri	2	5
	Hypocalymma robustum	150	5
*	*Ursinia anthemoides*	30	0.2

Appendix C – Flora Site Data – Northern Terminal

Site No: NSR04	**Date**: 16/10/2023	**Longitude**: 115.89029442	**Latitude**: -31.8525205

Type: Relevé
Soil Types: Yellow grey sand
Topography: Flat
Surface: -
Outcrops: None
Litter: 40% bare ground, 5% leaf litter/sticks
Vegetation Condition: Degraded
Condition Notes: weeds
Soil Condition: -Dry
Fire: 10+ years

Vegetation Type: ErAcCc: *Eucalyptus rudis, Melaleuca preissiana* and *Callitris pyramidalis* open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Jacksonia furcellata*, *Taxandria linearifolia* closed shrubland over *Conostylis candicans* subsp. *candicans, Phlebocarya ciliata and Tricoryne tenella* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Adenanthos cygnorum subsp. *cygnorum*	420	12
*	*Carpobrotus edulis*	15	0.1
	Conostylis candicans subsp. *candicans*	40	0.1
*	*Ehrharta calycina*	140	0.8
*	*Gladiolus caryophyllaceus*	40	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Gaudium laevigatum*	400	1
*	*Pelargonium capitatum*	50	0.5
*	*Pentameris pallida*	30	0.1
	Calytrix fraseri	110	0.1

Appendix C – Flora Site Data – Pinjar Terminal

Site No: NSR05	**Date**: 18/10/2023	**Longitude**: 115.813306	**Latitude**: -31.554779

Type: Relevé
Soil Types: White grey sand
Topography: Gently undulating
Surface: -
Outcrops: None
Litter: 3% bare ground
Vegetation Condition: Excellent
Condition Notes: dusty, beneath powerlines, flat
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BaAcCc: *Banksia attenuata* and *Banksia menziesii* woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Xanthorrhoea preissii*, *Kunzea glabrescens* open shrubland over *Conostylis candicans, Patersonia occidentalis* and *Lomandra sericea* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
	Briza maxima	20	0.2
	Patersonia occidentalis	50	0.8
	Conostylis candicans subsp. *candicans*	30	0.5
	Lechenaultia floribunda	40	0.5
	Dampiera linearis	20	0.2

Weed	Taxon	Height (cm)	Foliage (%)
	Burchardia congesta	40	0.2
	Conostylis setigera	5	0.1
*	*Gladiolus caryophyllaceus*	50	0.1
	Tricoryne elatior	40	0.1
	Mesomelaena pseudostygia	60	0.2
	Hibbertia hypericoides	110	35
	Adenanthos cygnorum subsp. *cygnorum*	320	12
	Conospermum stoechadis subsp. *sclerophyllum*	170	5
	Kunzea glabrescens	200	2
	Verticordia nitens	170	0.2
	Scaevola repens	10	0.1
*	*Pelargonium capitatum*	10	0.1
	Petrophile linearis	30	0.1
	Stirlingia latifolia	120	0.1
	Xanthorrhoea preissii	40	0.1
	Banksia attenuata	350	7

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: NSR06	**Date**: 19/10/2023	**Longitude**: 115.82165262	**Latitude**: -31.68042934

Type: Relevé
Soil Types: Grey white sand
Topography: Flat, slope toward SW
Surface: -
Outcrops: None
Litter:. >5% bare ground, 20% coarse leaf litter
Vegetation Condition: Very Good
Condition Notes: rubbish, borders pine plantation.
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: EgGlCe: *Eucalyptus gomphocephala, Eucalyptus rudis* and *Banksia grandis* open woodland over *Gastrolobium liearifolium, Kunzea glabrescens* and *Xanthorrhoea preissi* over **Carpobrotus edulis,*Disa bracteata* and **Euphorbia terracina* sparse forbland

Weed	Taxon	Height (cm)	Foliage (%)
	Banksia attenuata	210	0.8
	Banksia grandis	380	2
	Calothamnus sanguineus	80	4
*	*Carpobrotus edulis*	5	0.1
	Conostylis candicans subsp. *candicans*	20	0.1

Weed	Taxon	Height (cm)	Foliage (%)
	Conostylis juncea	15	0.1
*	*Ehrharta calycina*	100	0.1
	Eucalyptus rudis	1500	15
	Eucalyptus gomphocephala	1100	3
*	*Euphorbia terracina*	40	0.3
	Exocarpos sparteus	110	0.5
	Kunzea glabrescens	150	0.6
*	*Vulpia myuros*	30	0.1
	Melaleuca teretifolia	210	1
	Centaurium tenuiflorum	10	0.1
	Melaleuca systena	100	2
*	*Melinis repens*	60	0.1
	Mesomelaena pseudostygia	120	0.5
	Acacia lasiocarpa	40	0.1
	Patersonia occidentalis	50	0.2
*	*Pelargonium capitatum*	60	0.5
*	*Medicago polymorpha*	10	0.1
	Astartea scoparia	150	0.2
*	*Oenothera laciniata*	10	0.1
*	*Olea europaea*	65	0.1
	Gompholobium tomentosum	50	0.2

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: NSR07	**Date**: 19/10/2023	**Longitude**: 115.83176891	**Latitude**: -31.681813

Type: Relevé
Soil Types: Grey white sand
Topography: On a slope SW
Surface: -
Outcrops: None
Litter: Ground cover mainly grasses
Vegetation Condition: Very Good
Condition Notes: 10+
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: PpAcCe: *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.

Weed	Taxon	Height (cm)	Foliage (%)
	Banksia attenuata	150	0.8
	Briza maxima	10	0.1
*	*Carpobrotus edulis*	40	0.1
	Dasypogon bromeliifolius	50	0.2
	Dianella revoluta	150	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ehrharta calycina*	150	2
	Eucalyptus marginata	1000	12
	Alexgeorgea nitens	10	0.3
*	*Gladiolus caryophyllaceus*	40	0.15
	Hibbertia hypericoides	30	0.1
	Macrozamia fraseri	110	0.1
	Mesomelaena pseudostygia	70	0.2
*	*Pelargonium capitatum*	60	0.1
*	*Pentameris pallida*	20	0.8
	Petrophile linearis	30	0.1
*	*Pinus pinaster*	22	50
	Styphelia propinqua	100	0.5
	Corynotheca micrantha	40	0.2
	Xanthorrhoea preissii	200	3

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: NSR08	**Date**: 19/10/2023	**Longitude**: 115.851231	**Latitude**: -31.701221

Type: Relevé
Soil Types: White grey Sand
Topography: Flat
Surface: -
Outcrops: None
Litter: 10% bare ground, sticks branches and leaf litter
Vegetation Condition: Very Good
Condition Notes: Weeds, clearing
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: BmAcPo: *Banksia menziesii* and *Banksia attenuata* low open woodland over *Adenanthos cygnorum* subsp. *cygnorum, Regelia ciliata* and *Acacia pulchella* open shrubland over *Patersonia occidentalis, *Carpobrotus edulis* and *Dampiera linearis* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
	Acacia pulchella	60	0.3
	Adenanthos cygnorum subsp. *cygnorum*	350	20
	Banksia attenuata	6	4
	Banksia menziesii	4	5

Weed	Taxon	Height (cm)	Foliage (%)
*	*Briza maxima*	70	0.1
	Burchardia congesta	40	0.1
	Hemiandra pungens	10	0.2
*	*Carpobrotus edulis*	10	0.3
	Lyginia imerbis	10	0.1
*	*Ehrharta calycina*	100	0.1
*	*Asparagus asparagoides*	10	0.1
	Alexgeorgea nitens	10	0.1
*	*Gladiolus caryophyllaceus*	40	0.2
	Gastrolobium linearifolium	40	0.2
	Gonocarpus pithyoides	30	0.1
	Laxmannia squarrosa	10	0.1
	Patersonia occidentalis	60	0.4
*	*Pentameris pallida*	10	0.1
	Petrophile linearis	30	0.2
	Regelia ciliata	190	2
	Hypocalymma robustum	90	0.2
	Jacksonia floribunda	180	0.3
	Dampiera linearis	15	0.1
	Bossiaea eriocarpa	15	0.1
	Stirlingia latifolia	160	0.2
*	*Ursinia anthemoides*	20	0.3

Appendix C – Flora Site Data – Neerabup/NBT Group

Site No: NSR09	**Date**: 20/10/2023	**Longitude**: 115.8504780	**Latitude**: -31.714886448

Type: Relevé
Soil Types: White grey Sand
Topography: Sloped
Surface: -
Outcrops: None
Litter: >5% bare ground
Vegetation Condition: Good
Condition Notes: Good to very good condition
Soil Condition: Dry
Fire: 10+ years

Vegetation Type: MpHaDb: *Melaleuca preissiana* and **Pinus pinaster* woodlands over *Hypocalymma angustifolium, Kunzea glabrescens* and *Acacia longifolia* subsp. *longifolia* shrubland over *Dasypogon bromeliifolius, Dianella revoluta* and **Carpobrotus edulis* forbland.

Weed	Taxon	Height (cm)	Foliage (%)
*	*Acacia longifolia* subsp. *longifolia*	240	1.5
*	*Briza maxima*	60	0.1
*	*Carpobrotus edulis*	20	0.1
	Dasypogon bromeliifolius	60	0.2
	Dianella revoluta	20	0.1

Weed	Taxon	Height (cm)	Foliage (%)
*	*Ehrharta calycina*	140	0.5
*	*Gladiolus caryophyllaceus*	80	0.3
	Gompholobium tomentosum	80	0.4
	Hypocalymma angustifolium	11	25
	Kunzea glabrescens	90	12
	Melaleuca preissiana	1100	8
*	*Pentameris pallida*	10	0.1
*	*Pinus pinaster*	15	5
*	*Ursinia anthemoides*	10	0.1
	Xanthorrhoea preissii	200	0.5
	Hibbertia subvaginata	40	0.2

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