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ENVIRONMENTAL SCIENCES

Targeted black cockatoo survey for the Marri Wind Farm Project

Prepared for Aurecon Group, on behalf of Alinta Energy

April 2026

Final

Targeted Black Cockatoo survey for the Marri Wind Farm Project

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Phoenix Environmental Sciences Pty Ltd

5 Pitino Court OSBORNE PARK WA 6017

P: 08 6323 5410

E: admin@phoenixenv.com.au

Job code: 1712-DAN-AUR-VER; 1739-DAN-AUR-FAU

EXECUTIVE SUMMARY

Marri WF Pty Ltd as trustee for the Marri WF Unit Trust (the Proponent), a wholly owned subsidiary of Alinta Energy Pty Limited (Alinta Energy), is seeking approval to develop Marri Wind Farm (the Project) located approximately 20 km south of the township of Dandaragan, Western Australia (WA). The proposed Project involves the construction of a 550 MW wind farm in Dandaragan, consisting of 82 turbines that will be able to generate 2,000 GWh of renewable energy. In February 2025, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Aurecon Group (Aurecon), on behalf of the Proponent, to undertake a survey of Potential Nesting Trees (PNTs) for the Project. The purpose of the survey was to determine the quantity and characteristics of PNTs within the study area. The black cockatoo values (i.e. roosting and foraging values) within and around the Project were also assessed.

The field surveys occurred on 11-13th March, 24-28th July and 11-14th August in 2025 with hollow checks undertaken between 14-17th of November in line with the breeding season for Carnaby's Cockatoo. Additional data was recorded during the basic and targeted terrestrial fauna surveys, and the bird and bat utilisation surveys conducted for the Project (Phoenix 2025, in prep).

This report summarises black cockatoo sightings since surveys for the Project commenced in August 2024 until November 2025, with the exception of the active black cockatoo breeding tree opportunistically recorded in January 2026. A total of 1,212 Carnaby's Cockatoo (CC) have been recorded visually over 50 occasions within and around the study area. The species has been heard calling on an additional 21 occasions. A total of 30 Forest Red-tailed Black Cockatoo (FRTBC) have been sighted over 6 occasions within and around the study area. The species was heard calling on an additional 4 occasions. Foraging evidence from both black cockatoo species was recorded throughout the study area. Additionally, a total of 7 unidentifiable black cockatoo species were recorded over 3 occasions; it is likely these records are CC or FRTBC.

Only 7.8% of the study area is comprised of native vegetation, often occurring along roadsides as native vegetation. Narrow roadside vegetation fulfills an important role in maintaining connectivity in a highly cleared landscape; providing foraging habitat for black cockatoos but also movement corridors between breeding habitat, night roosting habitat and foraging resources (DAWE 2022). The limited high-quality foraging habitat within the study area is unlikely to reduce its suitability for breeding. Both breeding habitat and foraging habitat suitability are independent of one another, and foraging evidence has been found throughout the study area for both species.

A total of 1,686 PNTs were recorded during the survey. Despite the study area being predominantly cleared for agriculture, this habitat type supported a notable abundance of PNTs with a total of 1,241 PNTs recorded. A total of 276 PNTs occurred in Open Jarrah-Marri woodland, 116 in Drainage line and riparian zones, 29 in areas cleared for infrastructure, 17 in *Banksia* heath and woodland and 4 in Pine plantations. The remaining 3 PNTs were opportunistically recorded outside the study area.

A total of 21 PNTs had hollows considered possibly suitable for breeding and 37 PNTs had hollows considered suitable for breeding. Of the 58 suitable or possibly suitable hollows, 9 were occupied by other species such as the European Honeybee, Galah, Boobook or Corella. Hollows occupied by other species could potentially host black cockatoos if vacated. Of the remaining suitable or potentially suitable hollows, 16 showed recent evidence of use (indicated by chewing around the hollow entrance), 20 had evidence of old chew marks and one had active black cockatoo breeding activity. Chewing marks alone do not confirm that a hollow has been used for breeding by black cockatoos; they do instead indicate that the hollow has at least been inspected by a hollow nesting species. Other cockatoo and parrot species are known to chew around nesting hollows, such as Galahs or Corellas, which are known competitors with black cockatoos for suitable breeding sites. Black cockatoos were not recorded utilising the hollows checked during the November 2025 survey; however, it cannot be ruled out that breeding may occur within the study area.

The desktop review identified one night roost site within the study area, situated on private property that was inaccessible at the time of the surveys (DANREGR001). An additional 2 night roosts were identified during surveys undertaken for the Project. The presence of 3 distinct night roosts along Moore River, supporting both FRTBC and CC, along with the availability of suitable roosting habitat including tall trees, permanent water and nearby foraging areas, demonstrates that Moore River is a significant area for black cockatoos. Additional roosts may be present along Moore River.

Areas considered high value for black cockatoos include high value foraging habitat, PNTs (especially if they contain suitable or potentially suitable hollows) and areas with known night roosts. Infrastructure development for the Project should avoid areas considered high value.

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ACRONYMS AND ABBREVIATIONS

AG	Aurecon Group
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
EPBC	Environment Protection and Biodiversity Conservation Act
FRTBC	Forest Red-tailed Black Cockatoo
NES	National Environmental Significance
OS	Species otherwise in need of special protection
PHT	Potential habitat trees
PNT	Potential nesting trees
T&P	Threatened & Priority
TEC	Threatened Ecological Community
SP	Specially Protected
VU	Vulnerable
WA	Western Australia

1 INTRODUCTION

Marri WF Pty Ltd as trustee for the Marri WF Unit Trust (the Proponent), a wholly owned subsidiary of Alinta Energy Pty Limited (Alinta Energy), is seeking approval to develop Marri Wind Farm (the Project) located approximately 20 km south of the township of Dandaragan, Western Australia (WA; Figure 1-1). The study area is located in the Shire of Dandaragan and the South-West Climatic Region as defined by EPA (2020).

The Project involves the construction of a 550 MW wind farm in Dandaragan, consisting of 82 turbines that will be able to generate 2,000 GWh of renewable energy. In February 2025, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Aurecon Group (Aurecon), on behalf of the Proponent, to undertake a Potential Nesting Tree (PNT) survey for the Project. The purpose of the survey was to determine the quantity and characteristics of PNTs within the study area.

1.1 BACKGROUND

In 2024, Phoenix was commissioned by Aurecon to undertake terrestrial fauna surveys for the Project, including bird and bat utilisation surveys, and basic and targeted surveys (Phoenix 2025, in prep). During these surveys, both Carnaby's Cockatoo (CC; *Zanda latirostris*; Endangered) and Forest Red-tailed Black Cockatoo (FRTBC; *Calyptorhynchus banksii naso*; Vulnerable) were recorded within the Project area. Additionally, it was identified that the Project is located within the breeding range for CC (DAWE 2022) and potentially FRTBC, whose distribution is known to be expanding northwards (Garnett & Baker 2021). As such, Aurecon commissioned Phoenix to undertake a PNT survey within the Project's development envelope and assess the black cockatoo values with and around the Project.

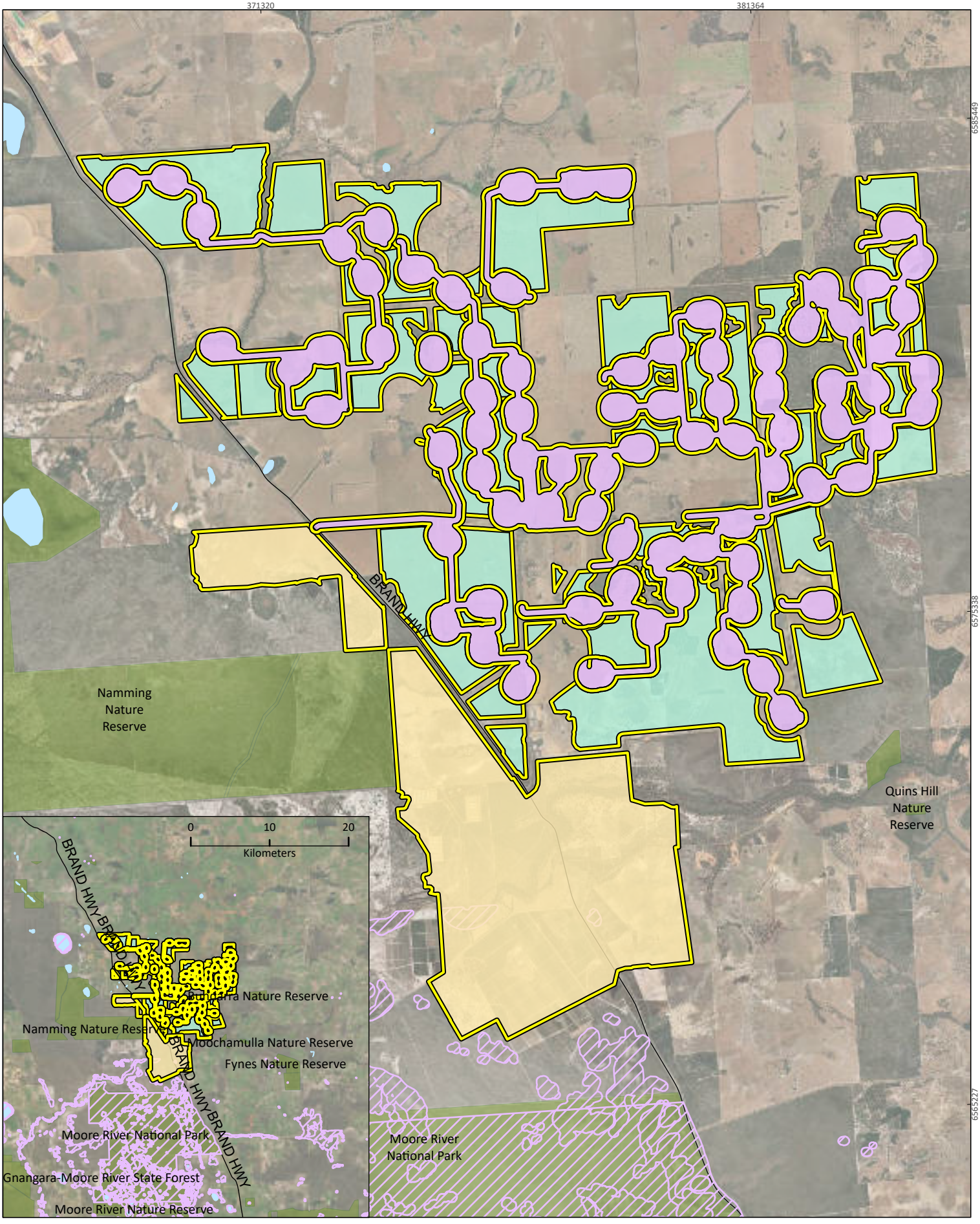
1.2 SCOPE OF WORK

The scope of work for the survey was as follows:

- to determine potential foraging, roosting and breeding habitat within the Project's development footprint
- to inspect, identify and GPS locate all PNTs, including hollow bearing trees.

1.3 STUDY AREA

The study area (12,376 ha) was composed of 3 development envelope subareas, including the proposed turbine footprint (V3), the option 1 expansion footprint and the transmission line footprint (Figure 1-1). Since completion of the surveys, the proposed turbine locations have been modified, resulting in some turbines being situated outside the study area (see current turbine layout in Figure 1-2).



Aurecon
Marri Wind Farm

Project No	1739
Date	22/08/2025
Drawn by	MW
Map author	BQ

0 1.5 3
Kilometers

1:100,960 (at A4) GDA 1994 MGA Zone 51

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- Study area
- Option 1 expansion footprint
- Transmission line footprint
- Turbine footprint (V3)
- Lakes
- Environmentally sensitive areas
- DBCA managed land
- Roads

Figure 1-1

Project location and study area

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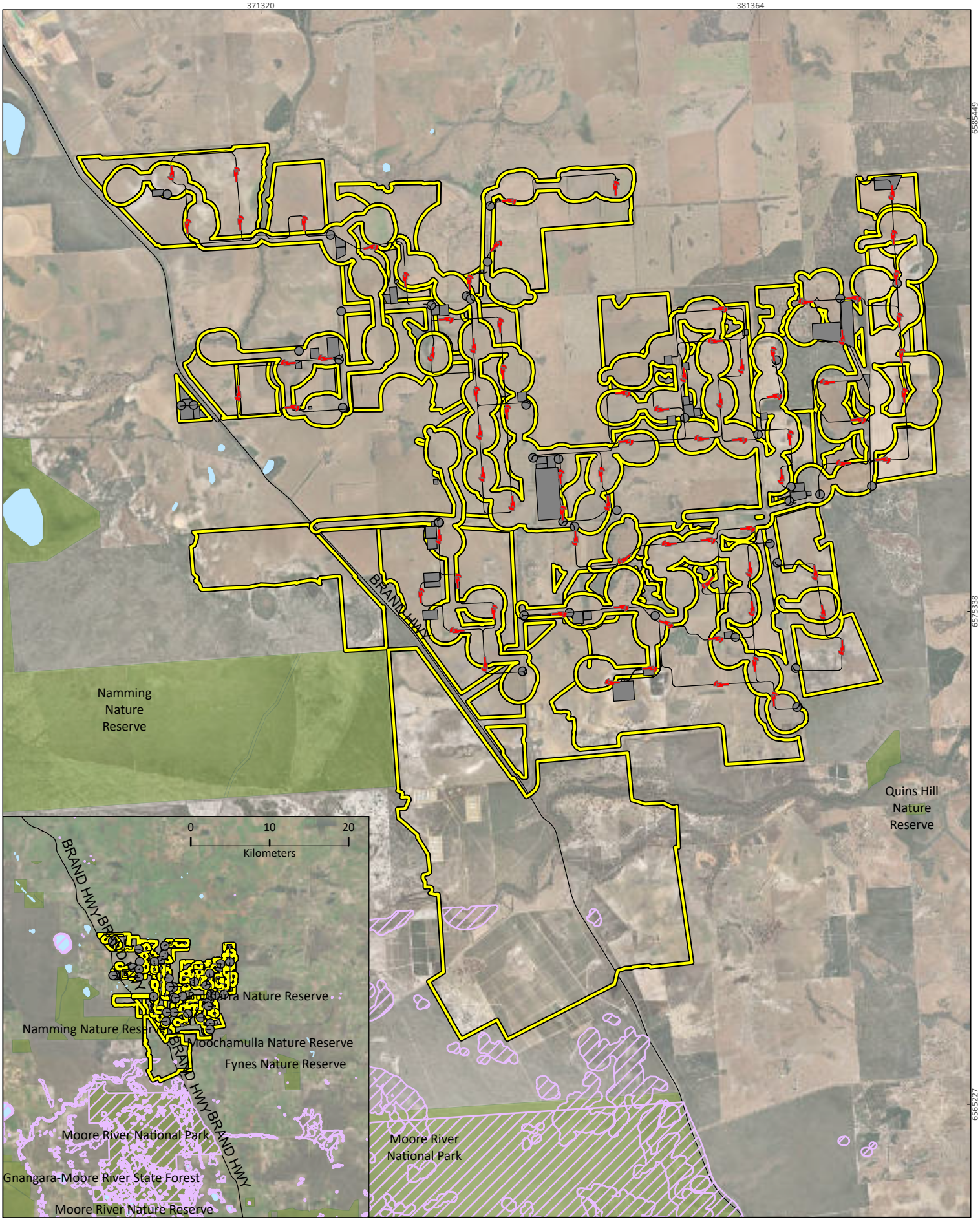

Aurecon
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- Study area
- Roads
- DBCA managed land
- Environmentally sensitive areas
- Lakes
- Current turbine layout (20250811)
- Concept roads (20250811)
- Proposal infrastructure (20250811)

Figure 1-2

Project infrastructure

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2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by 3 acts:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- State *Biodiversity Conservation Act 2016* (BC Act)
- State *Environmental Protection Act 1986* (EP Act).

2.1 COMMONWEALTH

The EPBC Act is administered by the Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act provides for the listing of Threatened fauna as Matters of National Environmental Significance (MNES). Under the EPBC Act, actions that have, or are likely to have, a significant impact on MNES, require approval from the Australian Government Minister for the Environment through a formal referral process. Key threats and habitat critical to the survival of EPBC Act Threatened species are usually defined in the conservation advice and/or recovery plan for the species.

Conservation categories applicable to Threatened fauna species under the EPBC Act are as follows:

- Extinct (EX)[1] – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent (CD)[1] – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable, Endangered or Critically Endangered.

2.2 STATE

2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b) in the following categories:

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future[2]
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future[2]
- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium-term future[2].

Species may also be listed as specially protected (SP) under the BC Act in one or more of the following categories:

[1] Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

[2] As determined in accordance with criteria set out in the ministerial guidelines.

- species of special conservation interest (conservation dependent fauna, CD) – species with a naturally low population, restricted natural range, of special interest to science, or subject to or recovering from a significant population decline or reduction in natural range
- migratory species (Mig.), including birds subject to international agreement
- species otherwise in need of special protection (OS).

The Department of Biodiversity, Conservation and Attractions (DBCA) administers the BC Act and also maintains a non-statutory list of Priority fauna. Priority species are still considered to be of conservation significance – that is they may be Threatened – but cannot be considered for listing under the BC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority fauna list are assigned to one of 4 Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

2.2.2 Critical habitat

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a Threatened species, or a TEC and its listing is otherwise in accordance with the ministerial guidelines.

3 METHODS

The field survey was conducted in accordance with relevant survey guidelines and guidance, including:

- *EPA Environmental Factor Guideline: Terrestrial fauna* (EPA 2016)
- *EPA Technical Guidance: Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- *Referral guideline for 3 WA Threatened Black Cockatoo species* (DAWE (2022).

3.1 DESKTOP REVIEW

Searches of several biological databases were undertaken to identify records of black cockatoos within and around the study area (Table 3-1). A literature search was conducted for accessible reports for biological surveys conducted within 40 km of the study area to build on the records developed from the database searches (Table 3-2).

Table 3-1 Database searches conducted for the desktop review

Database	Search coordinates and extent
BirdLife BirdData (Birdlife 2024)	Study area plus a 40 km buffer
Dandjoo Biodiversity Data Repository (DBCA 2024a)	Study area plus a 40 km buffer
DBCA Threatened and Priority Fauna Database (DBCA 2024b)	Study area plus a 30 km buffer[1]
Index of Biodiversity Surveys for Assessment (IBSA) database (DWER 2024) for nearby survey reports and data	Study area plus a 40 km buffer
Protected Matters Search Tool (DCCEEW 2024b)	Study area plus a 40 km buffer
Phoenix Biological Database (Phoenix 2024c)	Study area plus a 40 km buffer

[1]DBCA reduce the buffer size from 40 km for data-rich areas.

Table 3-2 Survey reports included in the desktop review

Report title	Survey type	Approximate distance from study area
Bamford (2015) Cooljarloo West Development Envelope Fauna Assessment	Detailed	21 km NW
DEC (2008) Resource Condition Report for a Significant Western Australian Wetland: Lake Guraga	Desktop	5 km W
Eco Logical Australia (2021) Black Cockatoo Habitat Assessment of Part of Lot 3333 Mimegarra Road, Cataby	Targeted	11.3 km NW
Ecoedge (2019) Orange Springs Road Fauna Assessment	Basic	2.5 km S
Ecologia (2024) Yandin Wind Farm Avian Fauna Monitoring Program	Monitoring	5 km N
Phoenix (2023) Black cockatoo potential habitat tree survey at potential offset site (confidential report)	Targeted	24.5 km SE
Phoenix (2023) Black cockatoo potential habitat tree survey at potential offset site at Lot 1, Indian Ocean Drive	Targeted	36.5 km SW

Report title	Survey type	Approximate distance from study area
Phoenix (2024a) Black cockatoo habitat assessment for potential offset site at Lot 2 Orange Springs Road	Targeted	8.5 km SW
Phoenix (2024b) Black Cockatoo habitat assessment for the northern section of Lot 3832/327 Nammegarra Road, Regans Ford	Targeted	1.5 km W

3.1.1 Survey timing

Field survey dates are provided in Table 3-3. Additional data was recorded during the basic and targeted terrestrial fauna surveys, and the bird and bat utilisation surveys conducted for the Project (Phoenix 2025, in prep). This report summarises data collected until November 2025, with the exception of the confirmed black cockatoo breeding tree opportunistically recorded in January 2026.

Table 3-3 Survey dates

Survey type	Dates	Focus area
Potential Nesting Tree survey	11-13th March 2025	V3 turbine footprint
	24-28th July 2025	Option 1 expansion footprint
	11-14th August 2025	Transmission line footprint
Hollow check survey during CC breeding season	14-17th November 2025	Revisiting trees with potentially suitable hollows

3.2 FIELD SURVEY

3.2.1 Field methods

3.2.1.1 Black Cockatoo sightings

Observations of black cockatoos were opportunistically made while undertaking the field survey, including physical observations, heard calls and foraging evidence. Additional records were made during the basic and targeted terrestrial fauna surveys and the bird and bat utilisation surveys conducted for the Project (Phoenix 2025, in prep).

3.2.1.2 PNT assessment

Breeding habitat for WA's 3 Threatened black cockatoo species consists of woodland or forest; however, they will also breed in areas of former woodland or forest habitats which consist of now fragmented patches of habitat and/or isolated trees. Breeding habitat is defined in DAWE (2022) as "habitat that contains known, suitable or potential nesting trees."

PNTs with a diameter at breast height (DBH) equal to or greater than 300 mm for Wandoo (*E. wandoo*), and 500 mm for all other hollow-bearing tree species, were recorded throughout the study area. The location of PNTs were recorded on a GPS accurate to <1 m. The following information was recorded for each tree:

- DBH (mm)
- tree location
- tree species
- life status of tree (dead or alive)

- presence of hollows
- number of visible hollows
- type of hollows
- approximate entrance size of hollows
- height of hollow
- evidence of use by black cockatoos or other species.

Black cockatoos have been recorded successfully nesting in hollows as shallow as 100 mm (Saunders 1979), however research suggests nesting attempts in shallow hollows (<400 mm) are less successful than those in deeper hollows (Saunders *et al.* 2014). Hollows suitable for black cockatoos must have a minimum diameter of 100 mm (preferably 200-300 mm) (Groom 2010). Black cockatoos show no preference for aspect of natural hollows (Groom 2010). Hollows considered possibly suitable to host breeding black cockatoos during the initial PNT surveys were revisited during the CC breeding season. A pole camera was used to determine if hollows were of suitable dimension to host black cockatoos, or if they were being utilised.

3.2.1.3 Roost monitoring

Phoenix has undertaken black cockatoo roost monitoring within the study area since December 2024 (Phoenix in prep). To date, Phoenix has undertaken 6 monitoring events within the study area. Additional monitoring events have been undertaken annually at a known roost site located within the transmission line footprint (DANREG001) for The Great Cocky Count, a long-term citizen science survey run by Birdlife WA, between 2010 and 2012 (Peck *et al.* 2019). Roost monitoring involved counting black cockatoos as they fly into their nighttime roost until dusk.

3.2.1.4 Assessment of foraging value

Habitat mapping conducted for the basic and targeted terrestrial fauna survey for the Project was used to determine foraging value for black cockatoo species within the study area (Phoenix 2025). The foraging value of each habitat type within the study area was assessed for each black cockatoo species using the habitat quality score (HQS) methodology developed by Bamford Consulting Ecologists (Bamford 2021). The scoring system provides a numerical value that reflects the significance of vegetation as foraging habitat for black cockatoos, and this numerical value is designed to provide the information needed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), Department of Water and Environmental Regulation (DWER) and the EPA to assess impact significance and offset requirements. The components required for calculating the score are as follows:

- Site condition – a score out of 6 for the vegetation composition, condition and structure
- Site context – a score out of 3 for the context of the site, such as availability of foraging habitat nearby
- Species stocking rate – a score out of one for species density.

A fourth component is then required to moderate the context and species density in relation to the vegetation condition. The combination of the scores provides an overall foraging value score out of 10, where a higher score represents better foraging value. The calculation of scores and moderation process are described in detail in Bamford (2021). HQS values range from 0 to 10, with scores of 0 to 3 classified as low foraging value foraging habitat, scores of 4 to 6 represented moderate foraging value and scores of 7 to 10 represented high foraging value (Bamford 2021).

The HQS for each habitat type was determined based on the presence and density of key foraging species. CC are known to forage on native shrublands, kwongan heathlands, woodlands, proteaceous species such as *Banksia* sp., *Hakea* sp., *Grevillea* sp., as well as *Callistemon* sp. and Marri. They also

utilise a variety of non-native plant species including but not limited to pines, canola, *Erodium* sp., almonds, macadamias, pecans, apples, persimmons, and liquidambar (DAWE 2022). FRTBC primarily forage on Jarrah, Marri, Karri, Wandoo, *Allocasuarina*, Snottygobble and Mountain Marri. Secondary food sources include Bullich, Blackbutt, *Hakea,* Tuart, Bushy Yate and Redheart Moit (DAWE 2022).

3.3 SURVEY PERSONNEL

The personnel involved in the surveys are listed in Table 3-4.

Table 3-4 Survey personnel

Name	Permit	Qualifications	Role/s
Floyd Holmes	Scientific Use Licence no. U304/2022-2024 and U304/2025-2027 Fauna taking (biological assessment) licence no. BA27001101 and BA27001359	PhD (Biological Sciences)	Project oversight, report review
Brendan Thomson		BSc (Environmental Management & Planning)	Field survey, data management and reporting
Brooke Quick		BSc (Environmental Science)	Project management, field survey, data management and reporting
Ethan Broom		BSc (Zoology), Hons (Zoology)	Field survey
Seth Capon		BSc (Conservation & Wildlife Management)	Field survey
Jade Larkman		BSc (Environmental Management)	Field survey
Jaala da Costa		BSc (Environmental Science)	Field survey
Madeline Wallington		BSc (Conservation & Wildlife Biology/ Marine Biology), Hons (Marine Biology)	Field survey, GIS and cartography
Brigitte Kovar	N/A	MSc (Geospatial Intelligence)	GIS and cartography

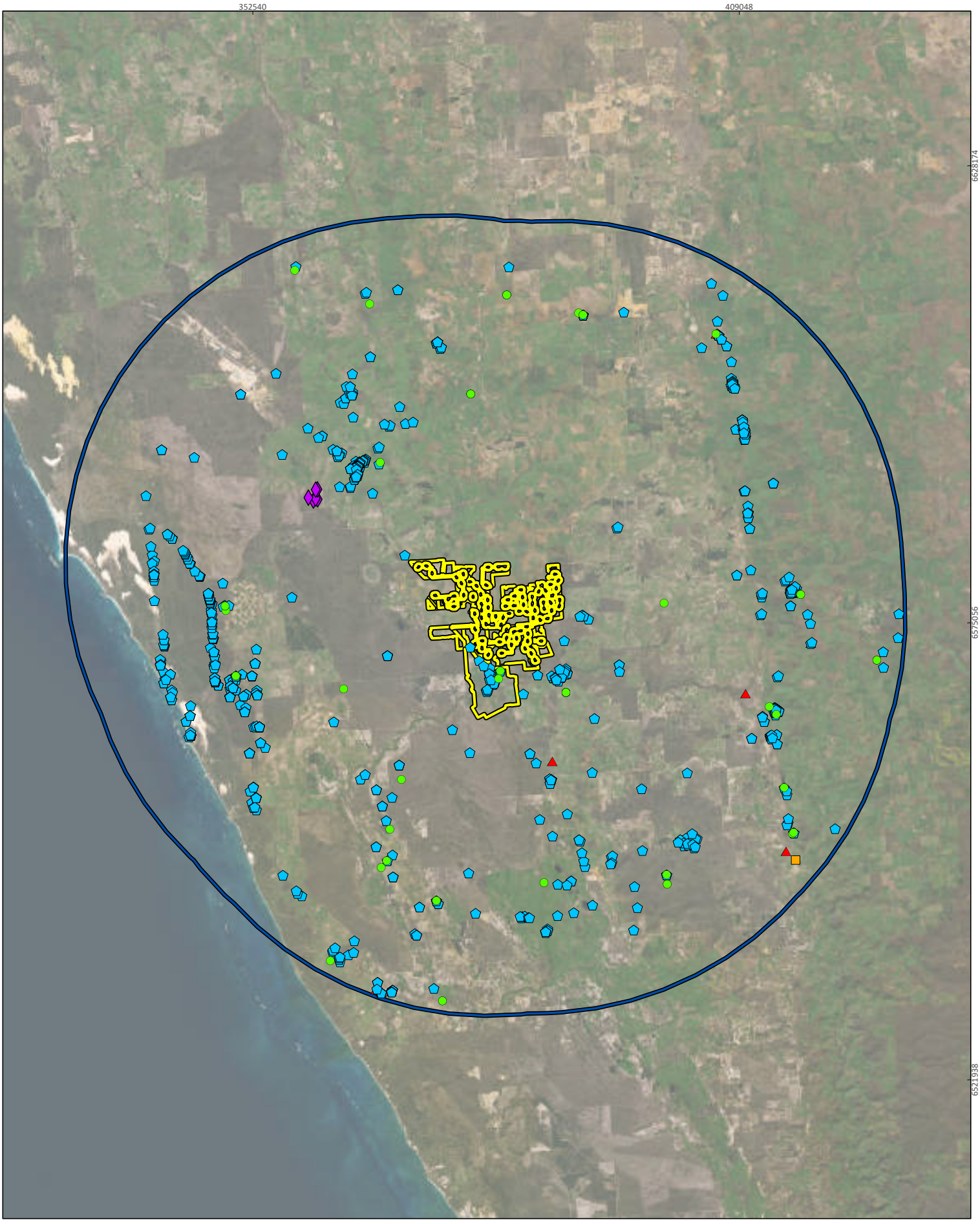
4 RESULTS

4.1 DESKTOP REVIEW

The desktop review identified that records of all 3 black cockatoo species known from southwest WA occur within the desktop search extent (Figure 4-1). One of these, CC *Zanda latirostris* - EN (EPBC & BC Acts), has previously been recorded from within the study area.

The DBCA Threatened and Priority fauna database contained 1,269 black cockatoo records in the desktop search extent (Figure 4-1), including 1,185 CC, 67 white-tailed black cockatoos, and 6 black cockatoos, the latter 2 of which are likely CC. There were also 10 records of FRTBC and one of Baudin's Cockatoo; these records were predominantly south of the study area. The study area is outside the known range of Baudin's Cockatoo, and it is likely that the Baudin's record was a misidentified CC.

The DBCA black cockatoo breeding site dataset contains records of trees which have been assessed for breeding suitability for black cockatoos (DBCA 2019b). The dataset contained 198 confirmed breeding trees (i.e. breeding known to have occurred) and 27 potential breeding trees (i.e. potential for breeding, with no evidence that breeding has been observed) within the desktop search extent (Figure 4-2). None of the trees were located inside the study area, but 2 clusters of breeding trees occur within 5 km of the study area (Figure 4-2). The first is to the south of the study area along Moore River (22 confirmed and 10 potential breeding trees). The other is in Bundarra Nature Reserve (3 confirmed breeding trees). Four known roosting sites are within the desktop area (Birdlife WA 2020), the most notable, DANREGR001, is located within the transmission line footprint (Figure 4-2).



Aurecon
Marri Wind Farm

Project No	1739
Date	19/09/2025
Drawn by	MW
Map author	BQ

0 10 20
Kilometers

1:571,878 (at A4) GDA 1994 MGA Zone 51

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- Study area
- 40 km desktop search extent

Desktop records

- FRTBC (VU, EPBC & BC Acts)
- Baudin's Black Cockatoo (EN, EPBC & BC Acts)
- CC (EN, EPBC & BC Acts)
- White-tailed Black Cockatoo sp. (EN, EPBC & BC Acts)
- Black Cockatoo sp. (EN-VU, EPBC & BC Acts)

Figure 4-1

Black cockatoo desktop records

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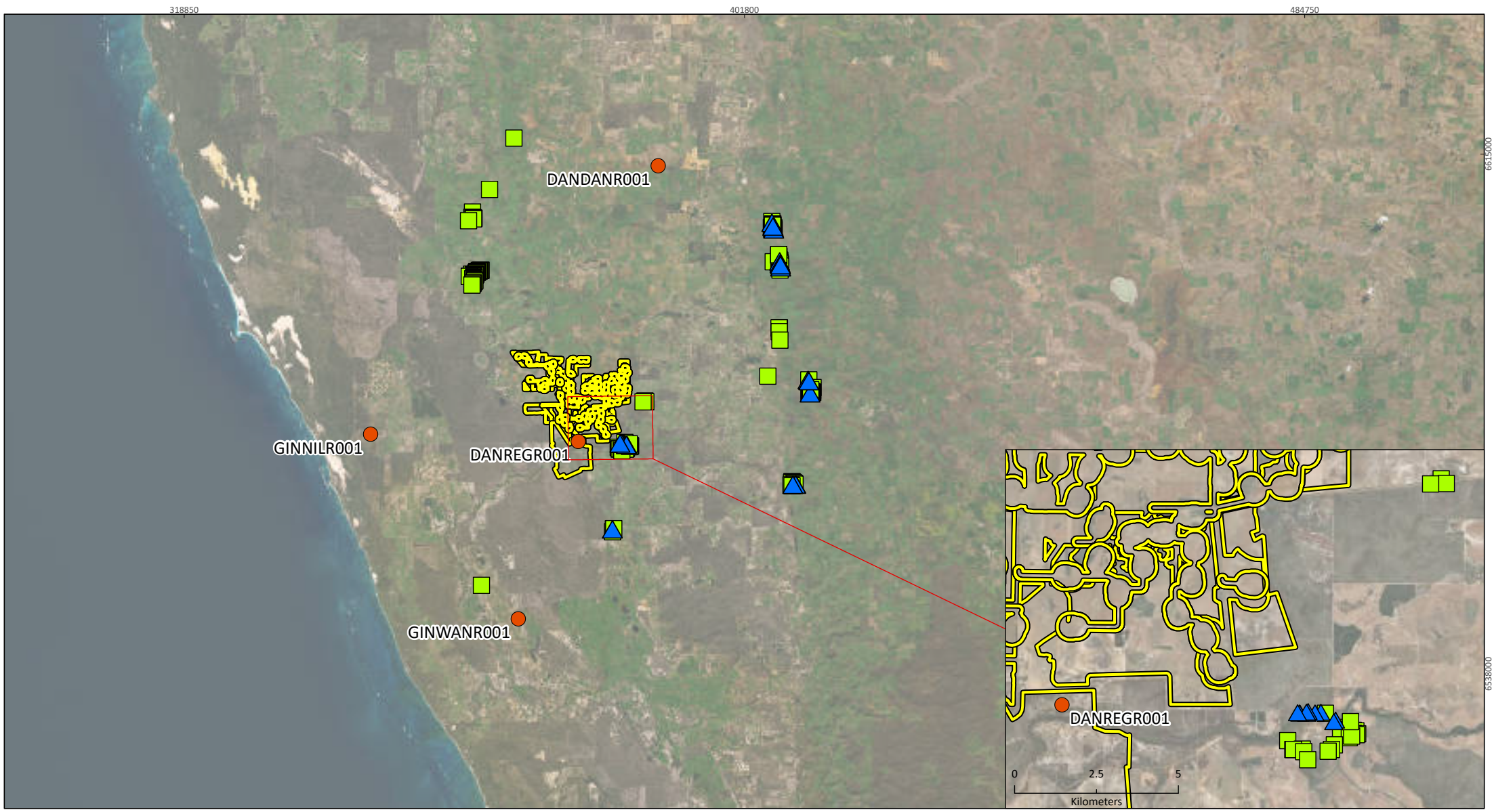

Alinta Energy
Marri Wind Farm Project

Project No	1739
Date	29/08/2025
Drawn by	MW
Map author	BQ

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Kilometers

1:758,600 (at A4) GDA 1994 MGA Zone 50

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- Study area
- Confirmed breeding sites for black cockatoos (DBCA 2019)
- Potential breeding sites for black cockatoos (DBCA 2019)
- Known roost sites for black cockatoos (Birdlife 2020)

Figure 4-2

Black cockatoo breeding and roosting locations identified in the desktop

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4.2 FIELD SURVEY

4.2.1 Black cockatoo records

Two species of black cockatoo were observed within the study area (Figure 4-7; Figure 4-8; Appendix 1);

- Carnaby's Cockatoo, EN (EPBC & BC Acts)
    - A total of 1,212 CC have been directly sighted over 50 occasions to date. Of these, 942 CC have been recorded either within, or in the immediate vicinity (<1 km) of the study area.
    - CC has been heard calling on an additional 21 occasions.
- Forest Red-tailed Black Cockatoo (*naso* subspecies) listed as VU (EPBC & BC Acts)
    - A total of 30 FRTBC have been directly sighted over 6 occasions to date. Of these, 10 individuals have been recorded within, or in the immediate vicinity (<1 km) of the study area.
    - FRTBC has been heard calling on an additional 4 occasions.
- Black cockatoo species, VU-EN (EPBC & BC Acts)
    - A total of 7 unidentifiable black cockatoo species have been directly sighted over 3 occasions, one of which was located within or in the immediate vicinity (<1km) of the study area. It is likely they are CC or FRTBC.

Additionally, foraging evidence from both black cockatoo species (e.g. fruits of Jarrah or Marri trees with visible black cockatoo chew marks on the outside) has been recorded throughout the study area (Figure 4-7; Figure 4-8; Appendix 2).

4.2.1 Habitats

Six broad fauna habitat types were identified in the study area, comprising Cleared (which includes agricultural paddocks and infrastructure), Open Jarrah-Marri woodland, Pine plantation, *Banksia* heath and woodland, Wetlands, and Drainage line and riparian zone (Table 4-5) (Phoenix 2025). Cleared areas were defined as a habitat as they included isolated trees which may contain nesting hollows and or feeding opportunities, dams which provide drinking water sources for black cockatoos, and agricultural crops, including canola, known to be foraged on by CC. Habitat condition (based on the site descriptions) varied from Completely degraded to Excellent depending on the impact of livestock and/ or level of historic clearing for agricultural purposes.

The Cleared habitat was the most dominant habitat type making up 91.5% (11,324.7 ha) of the study area. The remaining areas were made up of small patches of remnant native vegetation; *Banksia* heath and woodland made up 5.3% (657.3 ha), Drainage line and riparian zone made up 1.3% (159.3 ha), Open Jarrah-Marri woodland made up 1.2% (145.1 ha), and Wetlands made up <0.1% (0.5 ha). These habitats were restricted within the study area occurring only in pockets of agriculture areas and along drainage lines, connected by remnant roadside vegetation (Table 4-1). Pine plantations made up 0.7% (89.1 ha) of the study area (Table 4-1).

Table 4-1 Extent and description of each fauna habitat in the study area

Habitat type	Description	Extent in study area	Representative photograph
1. Cleared – agriculture and infrastructure	Areas predominantly cleared for agricultural use, roads, or urban developments. Remnant isolated trees were found scattered in agricultural areas, providing foraging habitat and potential roosting/breeding habitat for CC and FRTBC (see Figure 4-3). Farm dams scattered in agricultural areas provide drinking habitat. CC are also known to forage on the seeds of introduced species including canola, which was present as a crop in the study area (DAWE 2022).	11,324.7 ha 91.5%	

Habitat type	Description	Extent in study area	Representative photograph
2. *Banksia* heath and woodland	*Banksia* woodland/shrubland including *Acacia, Xanthorrhoea, and* woolly bush with scattered trees of eucalypts, *Nuytsia and Allocasuarina.* Provides foraging habitat for CC.	657.3 ha 5.3%	
3. Drainage line & riparian	Drainage line and riparian zones of wetlands composed of Eucalyptus, Marri and/or Melaleuca lacking understory. Marri trees provide foraging habitat and potential roosting/breeding habitat.	159.3 ha 1.3%	

Habitat type	Description	Extent in study area	Representative photograph
4. Open Jarrah-Marri woodland	Open eucalypt woodland over mixed trees and shrubs including eucalypt saplings, *Allocasuarina, Xanthorrhoea, Banksia, Acacia,* peas*, and Hakea.* Provides foraging habitat and potential roosting/breeding habitat for black cockatoos.	145.1 ha 1.2%	
5. Pine plantations	Pine plantations lacking understory. Pine plantations provide foraging and roosting habitat for CC.	89.1 ha 0.7%	

Habitat type	Description	Extent in study area	Representative photograph
6. Wetlands	Permanently and seasonally inundated areas. Provides drinking habitat for black cockatoos.	0.5 ha <0.1%	

4.2.1.1 Foraging value for CC

Foraging HQS for CC are presented in Table 4-2 (Bamford 2021). The study area is within the modelled distribution and breeding range for CC (DAWE 2022); however, the patches of foraging habitat within the study area were typically small, resulting in a reduced vegetation score. CC were recorded in the study area on multiple occasions during the survey, so a score of one was assigned to abundance, except for moderated habitat types (see section 3.2.1.4). One habitat type, (*Banksia* heath and woodland), was assessed as high quality (score of 8 or more) foraging habitat for CC (Table 4-2).

Table 4-2 CC foraging habitat quality score by habitat type

Habitat type	Extent of study area	Vegetation score (/6)	Context score (/3)	Abundance score (/1)	Total (/10)
Cleared - agriculture	90.8%	1	0*	1	**2**
Open Jarrah-Marri woodland	1.2%	3	2	1	**6**
Banksia health and woodland	5.3%	5	2	1	**8**
Pine plantations	0.7%	2**	2	1	**5**
Cleared - infrastructure	0.7%	0	0*	0	**0**
Drainage line & riparian	1.3%	2	1	1	**4**
Wetlands	<0.1%	0	0*	0	**0**

* - Moderated from 3 to 0 due to low vegetation score

** - trees are >30 years old

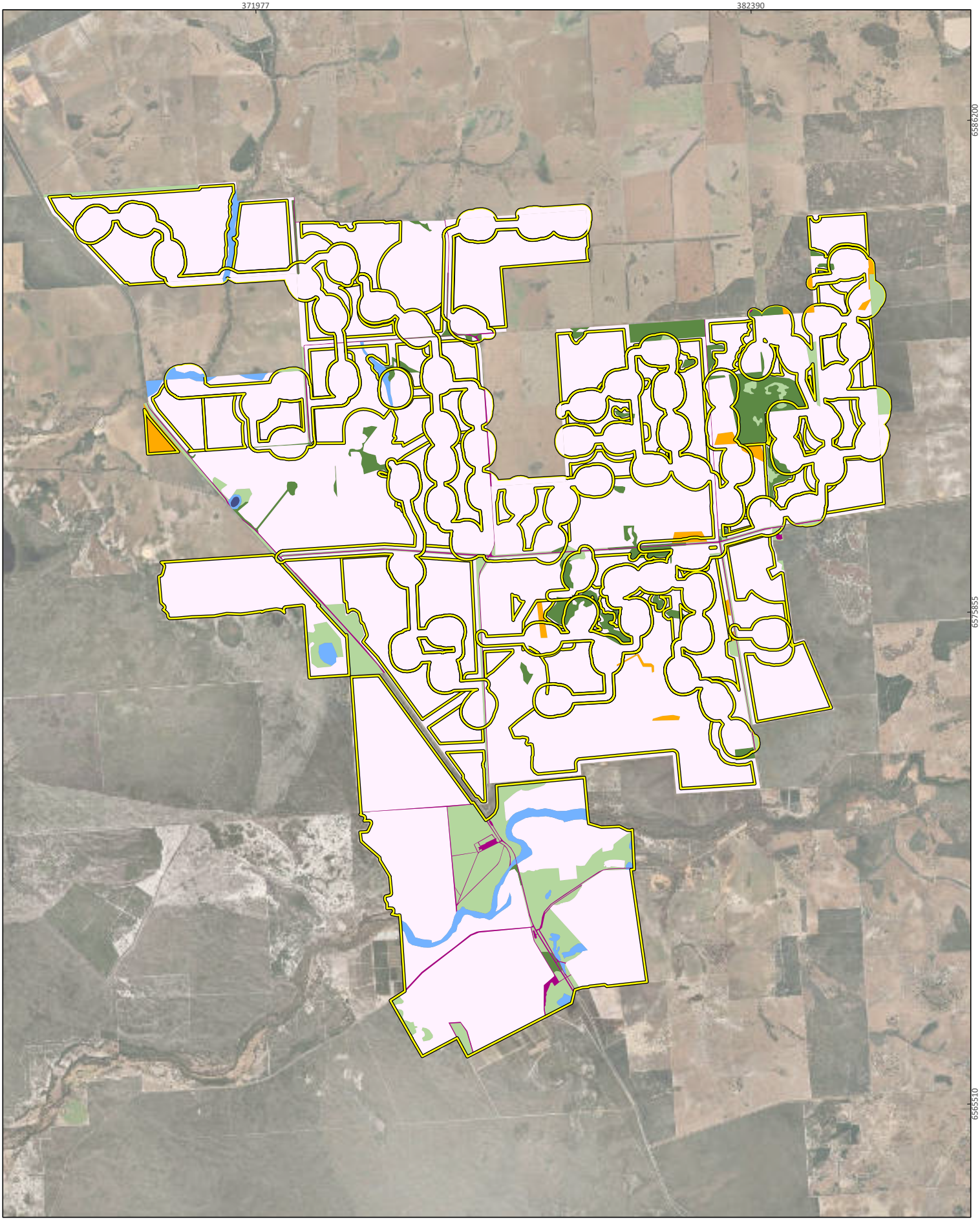
4.2.1.2 Foraging value for FRTBC

Foraging HQS for FRTBC are presented in Table 4-3. The study area occurs just outside the current northern boundary of the species modelled distribution and breeding range (DAWE 2022); however, FRTBC were recorded within the study area on multiple occasions (see section 4.2.1), foraging evidence was present and the species is known to be returning to its former northern range which encompasses the study area (Garnett & Baker 2021). As such, a score of one was issued to context and a score of one was issued to species abundance. Open Jarrah-Marri woodland was assessed as moderate-quality foraging habitat for FRTBC (Table 4-3).

Table 4-3 FRTBC foraging habitat quality score by habitat type

Habitat type	Extent of study area	Vegetation score (/6)	Context score (/3)	Abundance score (/1)	Total (/10)
Cleared - agriculture	90.8%	1	0*	0	**1**
Open Jarrah-Marri woodland	1.2%	3	1	1	**5**
Banksia health and woodland	5.3%	1	1	1	**3**
Pine plantations	0.7%	0	0*	0	**0**
Cleared - infrastructure	0.7%	0	0*	0	**0**
Drainage line & riparian	1.3%	2	1	1	**4**
Wetlands	<0.1%	0	0*	0	**0**

* - Moderated from 2 to 0 due to low vegetation score



Aurecon
Marri Wind Farm

Project No	1739
Date	9/09/2025
Drawn by	MW
Map author	BQ

0 1.5 3
Kilometers

1:103,556 (at A4) GDA 1994 MGA Zone 51

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- Study area

Fauna habitats

- Banksia heath and woodland
- Open Jarrah-Marri woodland
- Drainage line & riparian zone
- Wetland
- Pine plantation
- Cleared - infastructure
- Cleared - agriculture

Figure 4-3

Fauna habitats from the field survey

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4.2.2 PNT assessment

A total of 1,686 PNTs were recorded during the surveys (Table 4-4), including 1,488 Marri (*Corymbia calophylla*), 83 unidentified eucalypt trees, 43 Tuart (*Eucalyptus gomphocephala*), 35 River Gums (*Eucalyptus camaldulensis*), 18 Jarrah (*Eucalyptus marginata*), 11 Wandoo (*Eucalyptus wandoo*), 5 Blackbutt (*Eucalyptus todtiana*), and 3 Powderbark Wandoo (*Eucalyptus accedens*) (Table 4-4). Not all PNTs within the study area could be recorded due to restricted access to some properties and the presence of crops limiting the team's ability to survey all areas within the time available (detailed in Table 4-6).

Of the 1,686 PNTs recorded, 116 were found to contain one or more hollows; however, 58 of these did not meet the criteria required to host breeding black cockatoos i.e. hollow openings were not of suitable diameter, orientation, and/or of suitable depth (see 3.2.1.2). A total of 21 hollows were considered possibly suitable and 37 were considered suitable for black cockatoo breeding. Of the 58 trees with suitable or possibly suitable hollows, one was occupied by Carnaby's Cockatoo and 9 were occupied by other species such as the European Honeybee, Galah, Boobook or Corella. Hollows occupied by other species could potentially host black cockatoos if vacated. Of the remaining PNTs meeting the required size and orientation, 16 showed evidence of recent chew marks, 20 showed evidence of old chew marks and the remaining 12 had no evidence of use (Table 4-4).

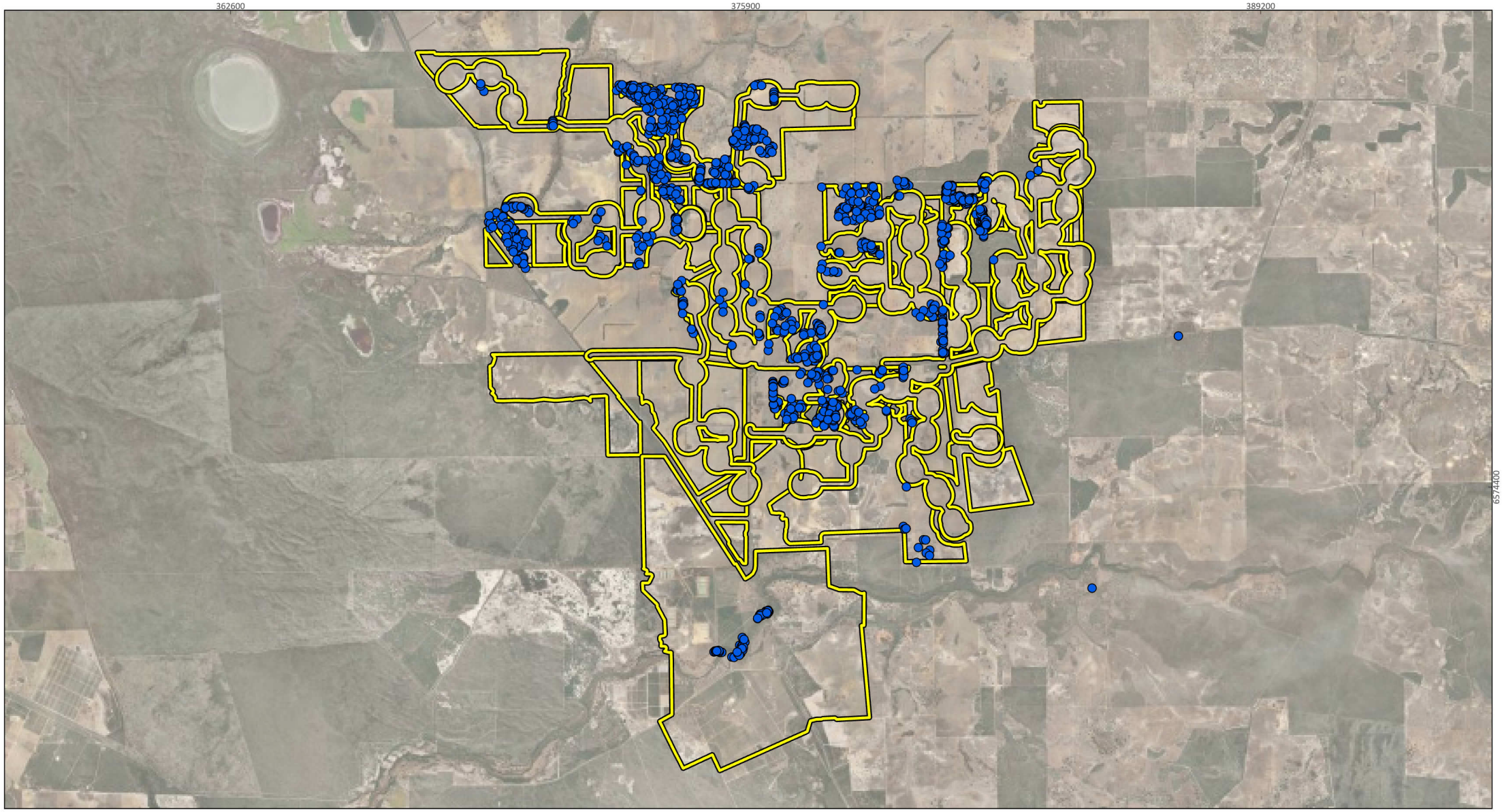
PNTs were scattered throughout the study area, with their abundance and densities varying across different fauna habitat types (Figure 4-3; Figure 4-5). PNTs were mostly found in areas cleared for agriculture as remnant isolated trees but also scattered in the other habitat types. Of the 1,685 PNTs recorded, 1,241 were in areas cleared for agriculture, 276 in Open Jarrah-Marri woodland, 116 in Drainage line and riparian zones, 29 in areas cleared for infrastructure, 17 in *Banksia* heath and woodland, 4 in Pine plantations. The remaining 3 PNTs were recorded opportunistically outside the study area.

No active black cockatoo breeding activity was observed during the PNT surveys (Table 4-4), however breeding activity was opportunistically recorded in a subsequent bird and bat utilisation survey in January 2026 (Phoenix in prep). A male Carnaby's Cockatoo was observed in a hollow with a female perching in a nearby. The breeding tree was located 2.7 km southeast of the study area near a cluster of known breeding trees identified in the desktop review (Figure 4-6).

Table 4-4 Summary of PNTs recorded during the survey

Tree species	PNTs (#)	PNTs with hollows (#)	Hollow suitability		
			Unsuitable	Possibly	Suitable
Coastal Blackbutt (*Eucalyptus todtiana*)	5	0	0	0	0
Unknown eucalypt (*Eucalyptus* sp.)	83	6	0	2	4
Jarrah (*Eucalyptus marginata*)	18	5	2	2	1
Marri (*Corymbia calophylla)*	1,488	101	55	17	29
Powderbark Wandoo (*Eucalyptus accedens*)	3	1	0	0	1
River Gum (*Eucalyptus camaldulensis*)	35	0	0	0	0
Tuart (*Eucalyptus gomphocephala*)	43	0	0	0	0
Wandoo (*Eucalyptus wandoo*)	11	3	1	0	2
Total	**1,686**	**116**	**58**	**21**	**37**

Figure 4-4 **PNTs (from left to right): Remnant hollow bearing tree in agricultural area, small recently chewed hollow and large recently chewed hollow**



Alinta Energy
Marri Wind Farm Project

Project No	1739
Date	17/04/2026
Drawn by	JL
Map author	BQ

0 2.5 5
Kilometers

1:133,000 (at A4) GDA 1994 MGA Zone 50

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Study area
PNT

Figure 4-5

PNTs recorded during the field survey

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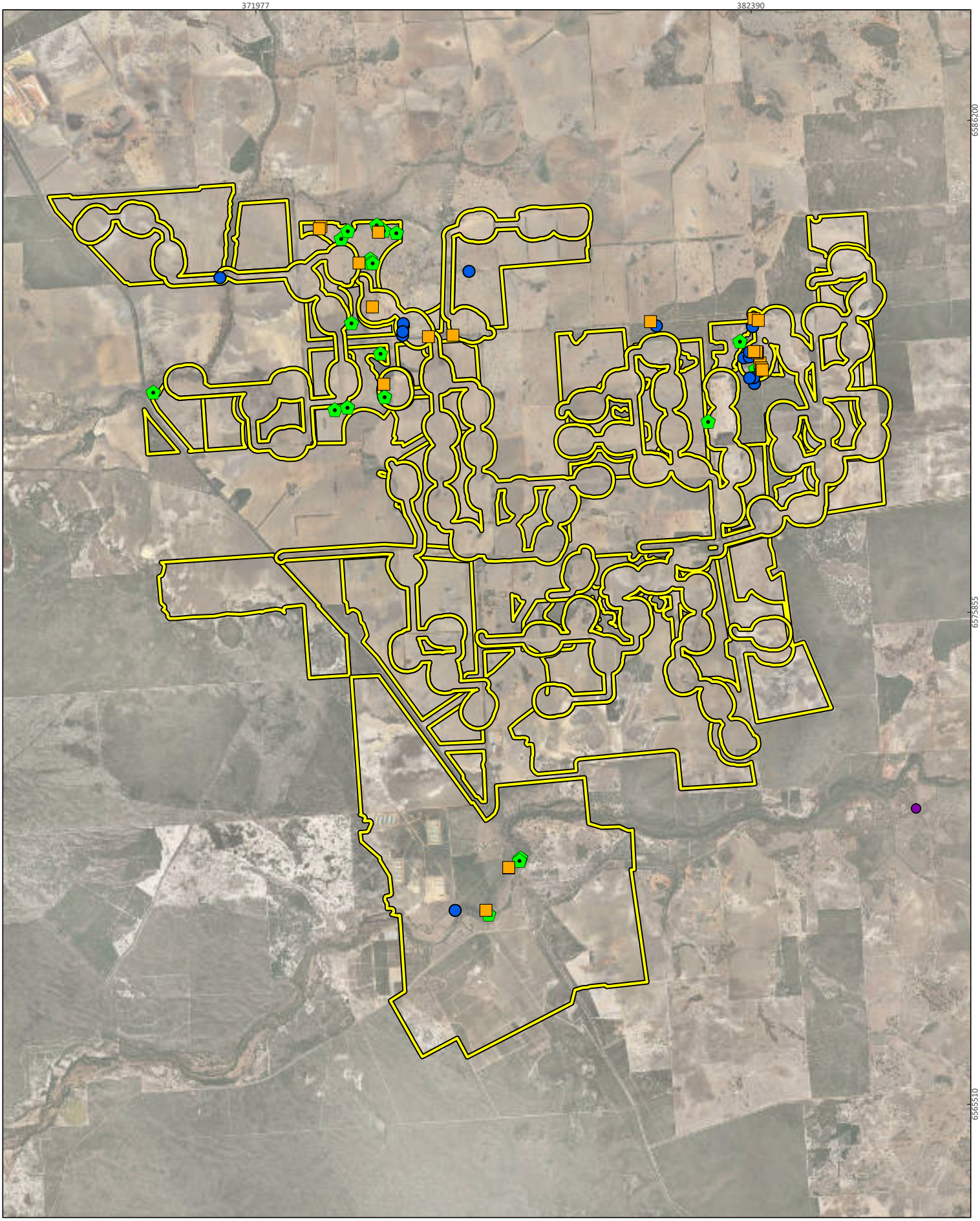

Aurecon
Marri Wind Farm

Project No	1739
Date	18/03/2026
Drawn by	MW
Map author	BQ

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Kilometers

1:103,550 (at A4) GDA 1994 MGA Zone 51

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- Study area

Evidence of use

- Fresh chewing
- No
- Old chewing
- Active Carnaby's Cockatoo breeding

Figure 4-6

PNTs with hollows

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4.2.3 Roost monitoring

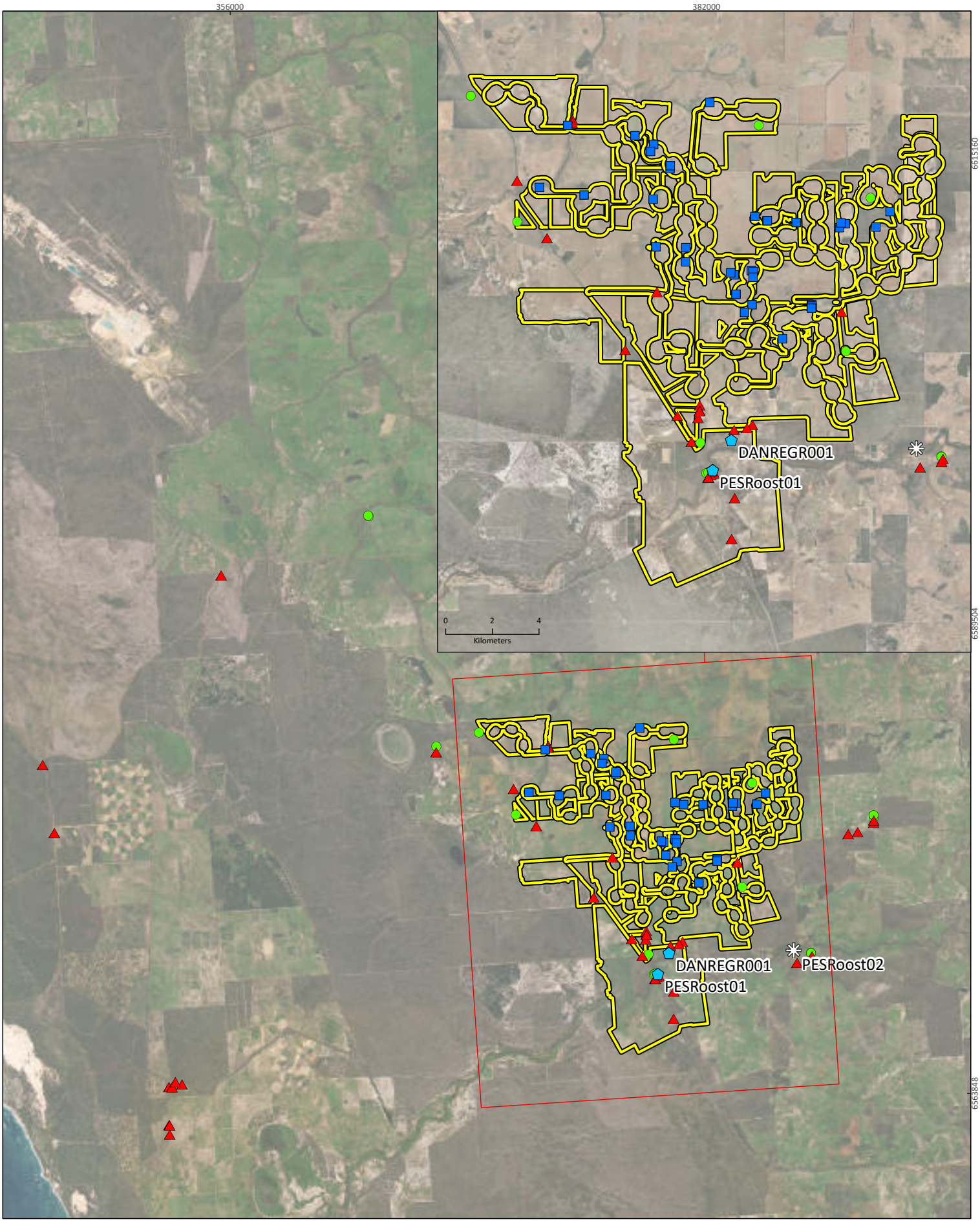
A black cockatoo night roost is an area of trees where black cockatoos congregate to rest at night, usually close to an important water source and near high-quality foraging habitat (DAWE 2022). Night roosting habitat includes all vegetation within a 500 m radius of each known roosting tree (DAWE 2022).

The desktop review identified that one night roost site occurs within the study area (DANREGR001; Figure 4-2; Table 4-5), located on private property that was inaccessible at the time of the surveys. Between the years of 2010 and 2012, Birdlife WA conducted 3 monitoring events at DANREGR001; a total of 22 CC was recorded in 2011, and no cockatoos were recorded in 2010 or 2012.

Since December 2024, Phoenix has conducted roost monitoring across 6 monitoring events within the accessible portions of the study area. In December 2024, a total of 100 CC were recorded roosting 1.3 km southwest of DANREGR001 (Figure 4-7). As this site was >500 m from DANREGR001 it was considered a new roost site (PESRoost01). PESRoost01 was visited again in February 2025, and small flocks of up to 45 CC were observed flying east from the point at dusk, indicating that they were roosting somewhere nearby along Moore River. No black cockatoos were recorded roosting at PESRoost01 in May or August of 2025; however, both CC and FRTBCs (including 2 juveniles) were recorded calling in the direction of Moore River around sunset the next day at a new site over 500 m from PESRoost01. As such, this was considered a new roost site (PESRoost02; Figure 4-7). Counts could not be conducted at PESRoost02 as it was located on an inaccessible private property, but at least 2 juvenile FRTBC were heard calling. PESRoost02 was located approximately 2.6 km southeast of the study area. In November 2025, a total of 15 CC were observed flying over PESRoost01 before dusk, and a total of 45 CC were observed roosting at PESRoost01 at dusk.

Table 4-5 Number of black cockatoos recorded during roost monitoring – grey rows represent counts conducted by Phoenix and white rows represent counts conducted by Birdlife WA volunteers

Monitoring event	Date	Site code	Latitude	Longitude	Number of birds	
					CC	FRTBC
1	2010	DANREGR001	-30.9752	115.7138	0	0
2	2011	DANREGR001	-30.9752	115.7138	22	0
3	2012	DANREGR001	-30.9752	115.7138	0	0
4	9/12/2024	PESRoost01	-30.9851	115.7067	100	0
5	2/02/2025	PESRoost01	Unknown	Unknown	45 CC observed flying east of PESRoost01 at dusk.	0
6	5/05/2025	PESRoost01	-30.9851	115.7067	0	0
7	4/08/2025	PESRoost01	-30.9851	115.7067	0	0
8	5/08/2025	PESRoost02	-30.9844	115.7865	Unknown number of CC heard calling around sunset towards Moore River.	Unknown number of FRTBC with multiple juveniles heard calling around sunset towards Moore River.
9	10/11/2025	PESRoost01	-30.9851	115.7067	45 CC observed roosting at PESRoost01 at dusk and an additional 15 observed flying over PESRoost01 before dusk.	0



Aurecon
Marri Wind Farm

Project No	1739
Date	5/09/2025
Drawn by	MW
Map author	BQ

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Kilometers

1:268,764 (at A4) GDA 1994 MGA Zone 51

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Study area

Evidence type

- Calling
- Direct sighting
- Foraging evidence
- Black cockatoo night roosts
- Black cockatoo night roosts (approximate location)

Figure 4-7

CC observations and foraging evidence recorded at the Project

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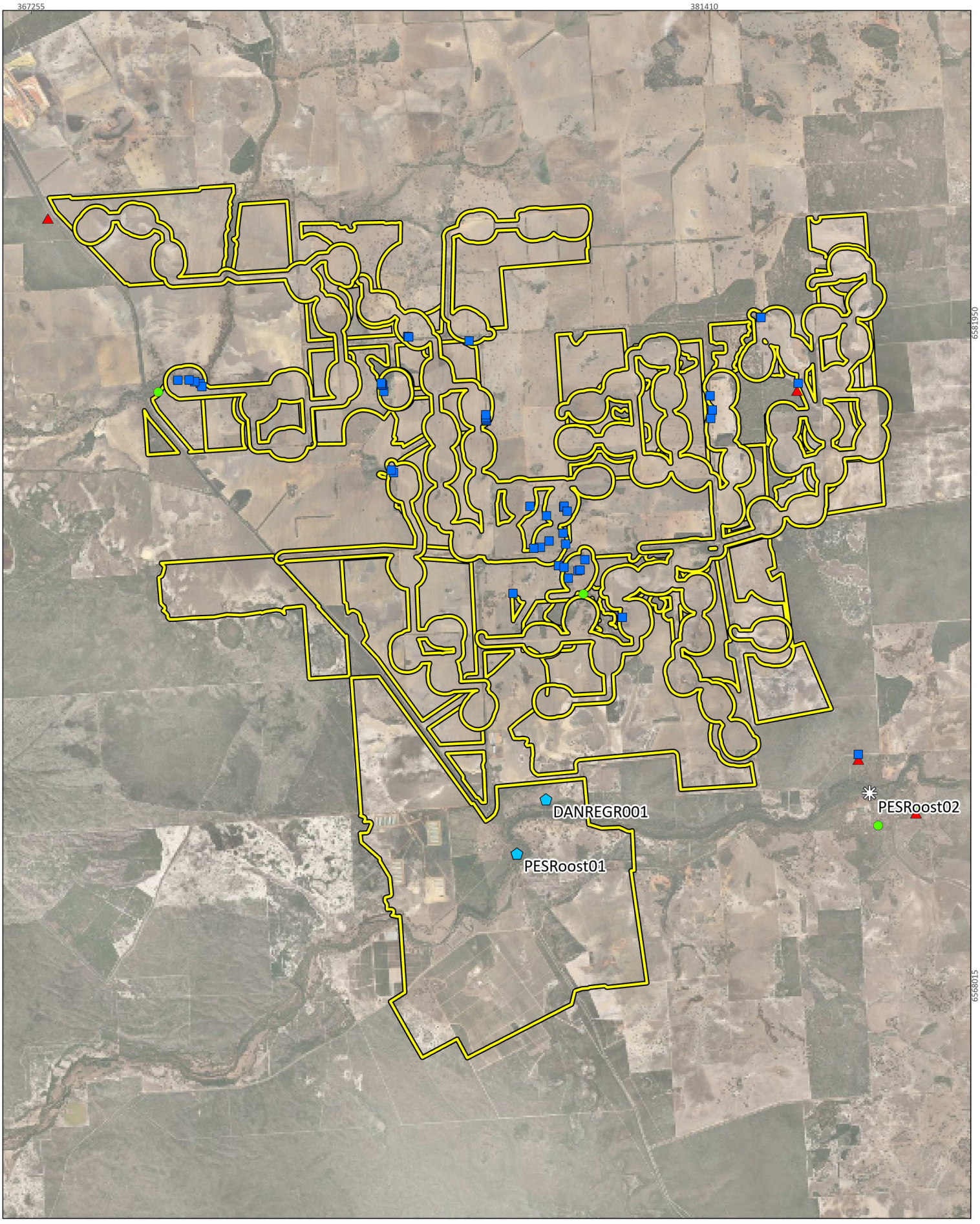

Aurecon
Marri Wind Farm

Project No	1739
Date	17/04/2026
Drawn by	MW
Map author	BQ

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Kilometers

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Study area

Evidence type

- Calling
- Direct sighting
- Foraging evidence
- Black cockatoo night roosts
- Black cockatoo night roosts (approximate location)

Figure 4-8

FRTBC observations and foraging evidence recorded at the Project

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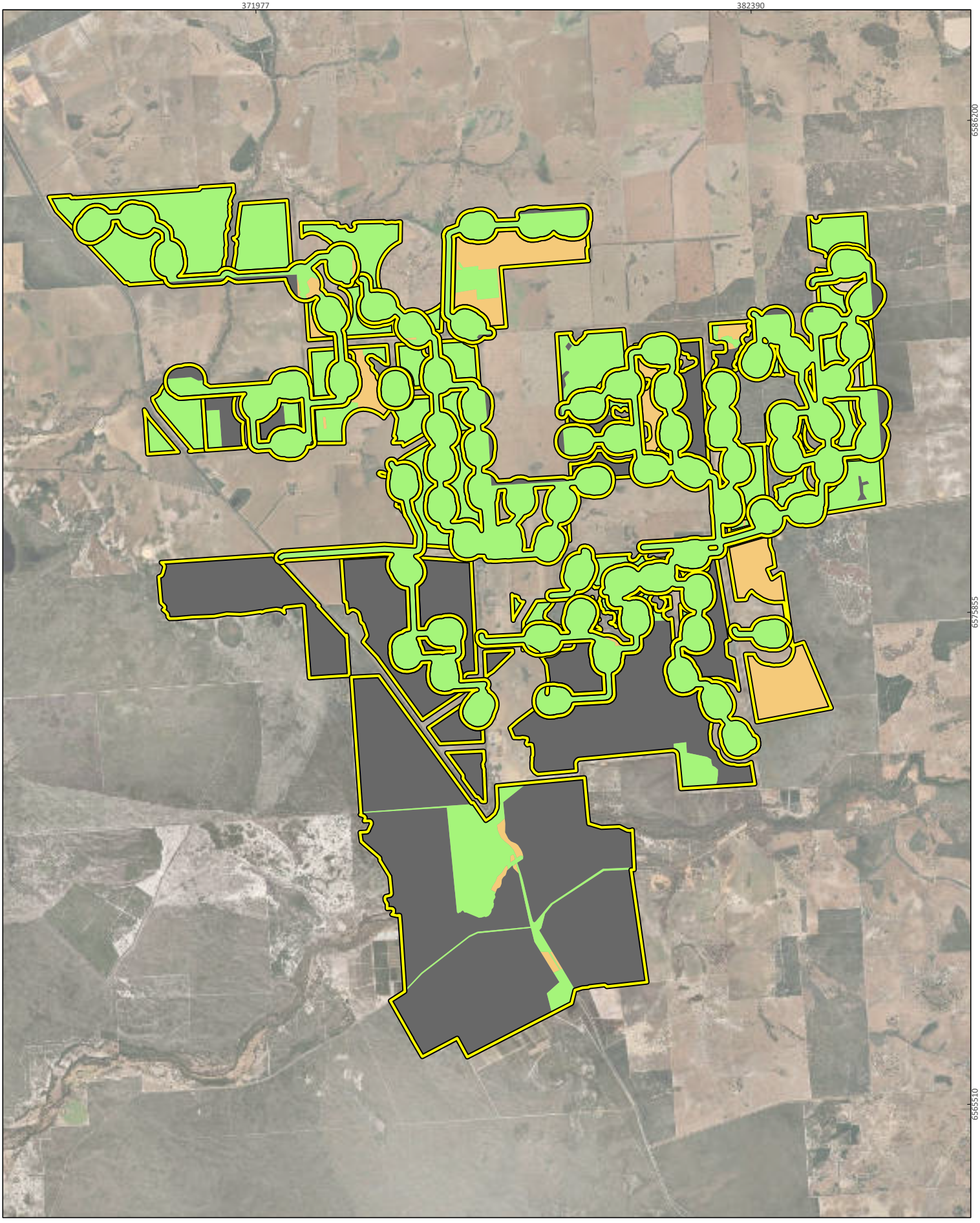
4.3 SURVEY LIMITATIONS

The limitations of the black cockatoo nesting tree survey have been considered in accordance with EPA (EPA 2020) (Table 4-6).

Table 4-6 Consideration of potential survey limitations

Limitations	Limitation	Comments
Availability of contextual information at a regional and local scale	No	Not a limitation. All contextual data was made available.
Competency/experience of the team carrying out the survey	No	Not a limitation. The field survey team has experience in conducting black cockatoo surveys.
Scope and completeness	Yes	Not all PNTs could be recorded within the study area due restricted access (detailed below; Figure 4-9). It cannot be ruled out that breeding may occur within the study area.
Proportion of fauna recorded and/or collected, any identification issues	Partial	Some secondary evidence was only able to be identified to 'Black Cockatoo sp.' due to the overlap in the species' range and similarities in foraging markings in some instances.
Access within the study area	Yes	The following factors limited the ability to survey all PNTs within the study area (Figure 4-9): • Restricted access to some properties within the proposed turbine footprint and Option 1 expansion footprint resulted in some areas not being surveyed. • No access to any landholder properties located within the transmission line area. • Exclusion of properties where contact with landholders could not be established while completing the surveys. • Most paddocks had crops growing and could not be driven through, limiting the team's ability to survey all areas within the allotted time.
Timing, rainfall, season	No	There are no seasonality or rainfall requirements for the completion of a PNT survey. The hollow check survey was undertaken in November, which falls within the CC breeding season (July to December) and the FRTBC breeding season (any time of year).
Disturbance that may have affected the results of the survey	No	Not a limitation. No disturbances affected the survey.



Aurecon
Marri Wind Farm

Project No	1739
Date	9/09/2025
Drawn by	MW
Map author	BQ

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Kilometers

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Study area

Access

Inaccessible

Not surveyed

Surveyed

Figure 4-9

Areas surveyed

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5 DISCUSSION

The objective of the survey was to determine black cockatoo values present within and around the study area. This included determination of potential breeding habitat within the Proposed Development Envelope and inspection and identification of all PNTs. This section provides interpretation of PNT data collected in accordance with the survey scope.

5.1 BLACK COCKATOO RECORDS

The occurrence of CC is consistent with their known distribution on a local and regional scale. The observations of FRTBC were made in May, August and November of 2025, indicating that the species is present in the area for at least a couple of months of the year. The study area is located on the northern edge of the foraging distribution for FRTBC, whose distribution is known to be expanding northwards (Garnett & Baker 2021). This movement has been attributed with the scarcity of foraging resources in the forest and a resulting adaption to new food sources in the northern extent of the Swan Coastal Plain (Garnett & Baker 2021).

Black Cockatoos were generally sighted perching or foraging in areas of native vegetation, including along roadside verges or bush plots, or transversing the study area using remnant roadside vegetation as movement corridors. Less frequently, they were observed transversing agricultural areas. CC was recorded in native habitat and agricultural areas, including large flocks perching in native roadside vegetation adjacent to an agricultural grain storage facility and foraging on available grain. These observations are consistent with known foraging characteristics of CC (Riley *et al.* 2023).

The study area occurs outside the known range of Baudin's Cockatoo, which is currently known to occur as far north as Gidgegannup and Hoddy Hill (DAWE 2022; Garnett & Baker 2021). One record of Baudin's Cockatoo was identified in the desktop review; however, this is more likely to have been a misidentified CC as they are morphologically similar.

5.2 FORAGING VALUE

Most of the study area (91.5%) was assessed as providing low foraging value for CC as it consisted of mainly canola crop, which is a short-term seasonal food source, and sparsely scattered Marri. High quality foraging habitat was restricted to *Banksia* heath and woodland habitat (5.3% of the study area). The remaining habitat types were assessed as having moderate foraging value to CC.

Most of the study area (92.2%) was also considered low value foraging habitat for FRTBC. Canola crop is not known to be a food source for FRTBC, thus a score of one was allocated to agricultural habitat. Open Jarrah-Marri woodland, Banksia heath and woodland and Drainage line & riparian habitat was considered to have moderate foraging value to FRTBC as they contained suitable foraging species, but in reduced densities due to historic clearing. Unlike CC, FRTBC are not known to forage on pine plantations so a HQS of 0 was allocated to this habitat. Areas cleared for infrastructure and wetlands contained no known foraging plants for either species, so accordingly received a HQS of 0, although Wetlands may provide drinking habitat for both species.

While most of the study area received a low foraging value score, CC and FRTBC will traverse low scoring habitats to access higher value foraging areas within the study area and in the surrounding region. Native vegetation is restricted within the study area, occurring along roadsides as remnant vegetation or in bush plots. While narrow, roadside vegetation fulfills an important role in maintaining connectivity in a highly cleared landscape (DAWE 2022).

5.3 BREEDING HABITAT

Black cockatoos are reliant on trees with large hollows (300-500 mm) for breeding habitat. Breeding trees are generally in woodland or forest, but also may occur in partially cleared woodlands or in isolated trees (DAWE 2022), such as those present within the study area. Known breeding trees for CC include Salmon Gum, Wandoo, Tuart, Jarrah, Flooded Gum, York Gum, Powderbark, Karri and Marri. Known breeding trees for FRTBC include Marri, Karri Wandoo, Bullich, Blackbutt, Tuart and Jarrah (DAWE 2022). In the Swan Coastal Plain region, CC are known to breed from July to December and FRTBC can breed any time of year.

Despite the study area being predominantly cleared for agriculture, agricultural paddocks supported a notable abundance of PNTs with a total of 1,241 PNTs recorded. High-quality foraging habitats did not record as many PNTs due to making up only a small proportion of the study area.

PNTs containing suitable nesting hollows are the most important records from the survey in relation to Project development, especially given the closest confirmed breeding zone for CC covers more than half the study area (DBCA (2019a). A total of 58 PNTs had hollows considered suitable or possibly suitable for breeding. Of these, one was occupied by Carnaby's Cockatoo, 9 were occupied by other species, 16 showed recent evidence of use (indicated by chewing around the hollow entrance) and 20 had evidence of old chew marks, though these alone do not confirm that a hollow has been used for breeding by black cockatoos and only indicate that the hollow has at least been inspected by a hollow nesting species. Other cockatoo and parrot species are known to chew around nesting hollows, such as Galahs or Corellas, which are known competitors with black cockatoos for suitable breeding sites. Without direct observation of the bird species responsible, chew marks could be attributed to any parrot or cockatoo species.

Sightings of CC during the 2024 and 2025 breeding season (Phoenix in prep.), along with evidence of foraging and confirmed breeding tree located 2.7 km outside the study area, confirms the species is nesting near the study area and may also nest within the study area. The presence of juvenile FRTBC and the availability of suitable breeding habitat also indicate that FRTBC may also breed within or around the study area. Although black cockatoos were not observed in hollows within the study area during the survey, it cannot be ruled out the breeding occurs here, as FRTBC can breed any time of year and therefore may have utilised hollows outside the survey period. It is also possible CC chicks fledged prior to the survey. While it is possible CC and FRTBC may breed in the study area, it doesn't appear they are breeding within the study area in high numbers. Suitable or possibly suitable hollows may be utilised in the future or may have been used in the past.

5.4 ROOSTING HABITAT

The desktop review identified one night roost site within the study area, situated on private property (DANREG001; Figure 4-2). This site had records of CC roosting in 2011 but was inaccessible during the time of the surveys so could not be monitored.

An additional 2 roosts were identified during surveys undertaken as part of the Marri Wind Farm Bird and Bat Utilisation surveys for the Project (Phoenix 2025, in prep); one was located within the transmission line footprint (PESRoost01), and the other was located ~2.6 km southeast of the study area (PESRoost02), however the precise location could not be determined as it was situated on private property.

A total of 100 CC were observed at PESRoost01 in December 2024. In February 2025, small flocks of CC totalling 45 individuals were observed flying east from PESRoost01 at dusk, indicating that they were roosting somewhere nearby along Moore River. No black cockatoos were observed roosting at PESRoost01 in May or August of 2025. This is unsurprising given CC are known to use a network of roost sites within an area based on resource availability (Le Roux 2017). PESRoost02 was recorded in August 2025 hosting both FRTBC and CC, also near Moore River. In November 2025, a total of 15 CC

were observed flying over PESRoost01 before dusk, and a total of 45 CC were observed roosting at PESRoost01 at dusk.

The presence of 3 distinct night roosts along Moore River, supporting both FRTBC and CC, along with the availability of suitable roosting habitat including tall trees, permanent water and nearby foraging areas, demonstrates that Moore River is a significant area for black cockatoos. Additional roosts may be present along Moore River.

5.5 PRIORITY AREAS

Wind turbines can impact bird populations through collisions and habitat disruption (DAWE 2021). Areas considered high value for black cockatoos include roosting areas, breeding habitat and high value foraging habitats.

Federal guidelines for wind farms (DAWE 2021; DCCEEW 2024a; DEWHA 2009) identify the following as the main risks to birds:

- direct impacts
    - habitat loss through clearing for turbines and other infrastructure
    - mortality or injury from collisions by birds or bats with operating wind turbines
    - mortality or injury from barotrauma (damage to body tissues from a drop in air pressure when animals fly too close to turbines)
- indirect impacts
    - displacement, when birds or bats avoid the area due to wind farm construction and operation (e.g. due to rotor movement, artificial noise or light sources), which can result in breeding disturbances or force longer flights to access feeding areas
    - alienation of important sites, such as those where Threatened species concentrate when roosting, feeding, breeding or on migration.

The risk and consequences of Project's impacts in relation to foraging roosting and breeding habitats will be further examined in the risk assessment component of the bird and bat utilisation report for the Project (Phoenix in prep.).

High value foraging habitat for CC included *Banksia* heath and woodland habitat (Figure 4-3). No high value foraging habitat for FRTBC was recorded within the study area, however patches of moderate value foraging habitat occurs within the study area. Abundant foraging evidence was recorded in the central and northern portion of the study area (Figure 4-7; Figure 4-8); however, the presence of foraging evidence within the study area generally reflects where survey effort was concentrated (i.e. during the PNT survey) and does not mean that these are the only areas of foraging importance. In the absence of a defined region where foraging birds appear to congregate, it is recommended that Project development should avoid clearing foraging habitat that has been identified as high-value.

The study area is within the breeding range of CC. Breeding habitat includes areas with suitable nesting trees for black cockatoos i.e. trees with suitable hollows (DAWE 2021). A major contributor to declines of populations of black cockatoos is the loss of nesting trees. The loss of any suitable nesting tree or area of breeding habitat in the study area may be impactful and lead to referral (DAWE 2022). Turbine placement and other required development activity for the Project should therefore consider the presence of breeding habitat and breeding habitat proximal to the Project. It is recommended that high impacts to breeding habitat should be avoided where possible to reduce the risk of a significant impact, along with mitigation measures for the loss of any breeding habitat (DAWE 2022).

The survey confirmed that of the 116 PNTs with hollows, 37 were suitable for black cockatoo breeding and 21 were possibly suitable for black cockatoo breeding. Regardless, any PNT without hollows holds value due to its potential to develop hollows in the future. This includes the PNTs that are in

agricultural habitat (Section 4.2.2). A precautionary approach is recommended, and infrastructure should avoid clearing any PNT (note: not all PNTs could be recorded during the survey). PNTs recorded during the survey were generally located within the central and northern portion of the study area, and along Moore River (Figure 4-5), and this should be considered when planning the development of the Project.

The field survey also identified that both CC and occasionally FRTBC congregate at dusk to roost in the trees along Moore River. The evidence of 3 distinct night roost sites highlights the importance of the Moore River, as night roosting habitat and sites are considered to be similarly important as breeding habitat (DAWE 2022). Turbine development should be prevented from the vicinity of Moore River to avoid potential collisions with birds flying to the area to roost. If turbines are placed near Moore River, there is potential for changes in black cockatoo behaviour. Many studies have been conducted globally on the displacement effects of wind farms on birds, with a systematic review of 84 peer-reviewed studies (Tolvanen *et al.* 2023) finding that 63% of cases reported displacement for birds leading to reduced bird density, reduced number of breeding birds, changes in flight behaviour and changes in selection of roosting and feeding areas (Tolvanen *et al.* 2023). While no site-specific impact assessment was undertaken as part of this scope, such findings will be relevant for consideration in future impact assessment.

6 CONCLUSION

FRTBC and CC have been recorded on numerous occasions within and around the study area, predominantly in remnant native vegetation in bush plots or along roadsides. Although restricted within the study area, high quality foraging habitat for black cockatoo species occurs within the study area. Native vegetation provides important movement corridors between breeding habitat, night roosting habitat and foraging resources. The occurrence of 3 distinct night roost sites hosting CC, and occasionally FRTBC, highlights the importance of the Moore River area.

The desktop review identified that the study area occurs near 2 clusters of confirmed breeding trees within 5 km of the study area: one to the south along Moore River and the other in Bundarra Nature Reserve. The surveys confirmed that black cockatoos breed near the study area, with one breeding tree recorded 2.7 km from the study area in January 2026. Given that the study area occurs in the known breeding range for CC, the presence of PNTs with possibly suitable and suitable hollows within the study area, and the presence of nearby foraging and roosting habitat, it is possible that CC breed within the study area as well. The occurrence of juvenile FRTBC recorded within the study area and the presence of PNTs suggests that FRTBC could also breed in the area.

In total, 57 PNT containing hollows suitable or potentially suitable for black cockatoo breeding were identified within the study area. Black cockatoos were not recorded utilising the hollows checked during the November 2025 survey; however, it cannot be ruled out that breeding may occur within the study area, although it doesn't appear that they are breeding here in high numbers. Infrastructure development for the Project should avoid areas considered high value for black cockatoos where possible. The risk and consequences of Project's impacts in relation to foraging roosting and breeding habitats will be further examined in the bird and bat utilisation report for the Project (Phoenix in prep.)

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Appendix 1 Field observations of black cockatoos

Date	Species	Latitude	Longitude	Evidence	No. of individuals
5/08/2024	CC	-30.8622471	115.3637325	Direct sighting	100
5/08/2024	CC	-30.7749829	115.4727771	Direct sighting	7
6/08/2024	CC	-30.8633263	115.6135511	Calling	1
7/08/2024	CC	-30.9330323	115.7562956	Direct sighting	56
8/08/2024	CC	-30.9264577	115.6852096	Direct sighting	8
26/08/2024	CC	-30.8696583	115.6527304	Direct sighting	2
27/08/2024	CC	-30.94561303	115.672973	Direct sighting	1
28/08/2024	CC	-30.96809993	115.7010755	Direct sighting	2
28/08/2024	CC	-30.86960297	115.6526772	Direct sighting	3
29/08/2024	CC	-30.86909767	115.5885335	Direct sighting	4
29/08/2024	CC	-30.87055458	115.6525572	Direct sighting	30
29/08/2024	CC	-30.89701238	115.7675939	Calling	1
30/08/2024	CC	-30.86877577	115.5887705	Calling	1
9/12/2024	CC	-30.98647517	115.7072924	Direct sighting	100
9/12/2024	CC	-30.97590951	115.6985126	Direct sighting	100
10/12/2024	CC	-30.98255493	115.7948567	Direct sighting	4
10/12/2024	CC	-30.98782838	115.7049125	Direct sighting	5
10/12/2024	CC	-30.98782838	115.7049125	Calling	1
10/12/2024	CC	-30.99455976	115.7151639	Direct sighting	6
11/12/2024	CC	-30.98245969	115.794815	Calling	1
11/12/2024	CC	-30.75329418	115.5590085	Calling	1
11/12/2024	CC	-30.96735852	115.6931024	Direct sighting	2
12/12/2024	CC	-30.91793621	115.8355497	Calling	1
12/12/2024	CC	-30.91793621	115.8355497	Direct sighting	4
13/12/2024	CC	-30.92202267	115.8260592	Direct sighting	1
16/12/2024	CC	-30.92271816	115.8205863	Direct sighting	6
2/02/2025	CC	-30.98687978	115.7059279	Direct sighting	46
3/02/2025	CC	-30.98748619	115.7054836	Calling	1
3/02/2025	CC	-30.9703351	115.7219806	Direct sighting	40
4/02/2025	CC	-31.04351296	115.4218204	Direct sighting	25
5/02/2025	CC	-30.75294523	115.5586898	Calling	2
6/05/2025	CC	-30.98777579	115.7050212	Calling	1
6/05/2025	FRTBC	-30.89999978	115.7750386	Direct sighting	3
7/05/2025	CC	-30.91677226	115.8356896	Calling	1
7/05/2025	CC	-30.91677226	115.8356896	Direct sighting	2
7/05/2025	CC	-31.0248771	115.4231592	Direct sighting	28
7/05/2025	CC	-31.02402726	115.4307223	Direct sighting	10
9/05/2025	CC	-30.9877731	115.7050082	Direct sighting	2
9/05/2025	CC	-30.9877731	115.7050082	Direct sighting	1

Date	Species	Latitude	Longitude	Evidence	No. of individuals
9/05/2025	CC	-30.89604695	115.3677675	Direct sighting	4
24/07/2025	CC	-30.9656638	115.7016772	Direct sighting	110
25/07/2025	CC	-30.965691	115.7016434	Direct sighting	10
26/07/2025	FRTBC	-30.89329028	115.6345357	Calling	5
29/07/2025	CC	-31.04380375	115.422025	Direct sighting	6
29/07/2025	CC	-31.04824544	115.4217447	Direct sighting	2
29/07/2025	CC	-30.965788	115.7016477	Direct sighting	10
29/07/2025	CC	-31.00800915	115.7139721	Direct sighting	6
5/08/2025	CC	-30.98159295	115.7953638	Direct sighting	2
5/08/2025	CC	-30.98441588	115.7865995	Direct sighting	30
5/08/2025	CC	-31.02261979	115.4269791	Direct sighting	20
5/08/2025	CC	-30.96390347	115.7016954	Direct sighting	100
5/08/2025	FRTBC	-30.98165303	115.7950347	Calling	1
5/08/2025	FRTBC	-30.98441588	115.7865995	Calling	1
6/08/2025	CC	-30.94777648	115.7580357	Calling	1
6/08/2025	CC	-30.97202087	115.7149474	Direct sighting	50
6/08/2025	CC	-30.97140853	115.7198989	Direct sighting	4
6/08/2025	CC	-30.9086572	115.6428757	Direct sighting	100
6/08/2025	CC	-30.90494127	115.6314638	Calling	1
6/08/2025	FRTBC	-30.98159729	115.7951676	Direct sighting	18
6/08/2025	FRTBC	-30.85803743	115.6128788	Direct sighting	3
6/08/2025	FRTBC	-30.93686872	115.7250793	Calling	2
6/08/2025	FRTBC	-30.97069208	115.7832477	Direct sighting	2
7/08/2025	CC	-30.91672988	115.8357171	Calling	1
7/08/2025	CC	-31.02508338	115.4249871	Direct sighting	8
13/08/2025	CC	-30.97795317	115.7020224	Calling	2
15/08/2025	CC	-30.8896912	115.6313286	Direct sighting	4
Unknown	CC	-30.98258954	115.7948351	Calling	1
Unknown	CC	-30.98797191	115.7042699	Calling	1
Unknown	CC	-30.8730812	115.7244968	Calling	1
13/08/2025	CC	-30.9782	115.7018	Calling	2
15/08/2025	CC	-30.8901	115.6307	Direct sighting	4
10/11/2025	CC	-30.9859	115.7081	Direct sighting	60
11/11/2025	CC	-30.9816	115.7951	Direct sighting	7
12/11/2025	CC	-30.9879	115.7048	Direct sighting	1
12/11/2025	CC	-30.9816	115.7951	Calling	1
12/11/2025	Black cockatoo	-30.9816	115.7951	Direct sighting	1
12/11/2025	CC	-30.9255	115.6583	Direct sighting	75
13/11/2025	CC	-30.9255	115.6583	Direct sighting	2
13/11/2025	CC	-30.893	115.6328	Direct sighting	2

Date	Species	Latitude	Longitude	Evidence	No. of individuals
14/11/2025	Black cockatoo	-30.9255	115.6583	Direct sighting	1
14/11/2025	FRTBC	-30.8864	115.6994	Direct sighting	3
14/11/2025	CC	-30.9859	115.7081	Calling	1
14/11/2025	FRTBC	-30.8762	115.6998	Direct sighting	1
15/11/2025	Black cockatoo	-30.9223	115.8235	Direct sighting	5

Appendix 2 Foraging evidence of black cockatoos from the survey

Species	Latitude	Longitude	Observation type	Comments
CC	-30.9419	115.7336	Foraging evidence	Chewed Marri nuts
CC	-30.9332	115.719	Foraging evidence	Chewed Marri nuts
CC	-30.9318	115.7448	Foraging evidence	Chewed Marri nuts
CC	-30.9316	115.745	Foraging evidence	Chewed Marri nuts
CC	-30.9312	115.7448	Foraging evidence	Chewed Marri nuts
CC	-30.9311	115.745	Foraging evidence	Chewed Marri nuts
CC	-30.9309	115.7447	Foraging evidence	Chewed Marri nuts
CC	-30.9308	115.7449	Foraging evidence	Chewed Marri nuts
CC	-30.9307	115.7219	Foraging evidence	Potential foraging on banksia
CC	-30.9306	115.7449	Foraging evidence	Chewed Marri nuts
CC	-30.9272	115.7157	Foraging evidence	Chewed Marri nuts
CC	-30.9272	115.7157	Foraging evidence	Chewed Marri nuts
CC	-30.9216	115.7223	Foraging evidence	Chewed Marri nuts
CC	-30.9208	115.715	Foraging evidence	Chewed Marri nuts
CC	-30.9201	115.7137	Foraging evidence	Chewed Marri nuts
CC	-30.9197	115.7223	Foraging evidence	Chewed Marri nuts
CC	-30.9194	115.7216	Foraging evidence	Chewed Marri nuts
CC	-30.9165	115.6963	Foraging evidence	Chewed Marri nuts
CC	-30.9118	115.6964	Foraging evidence	Chewed Marri nuts
CC	-30.9115	115.6849	Foraging evidence	Chewed Marri nuts
CC	-30.9052	115.7556	Foraging evidence	Chewed Marri nuts
CC	-30.905	115.7696	Foraging evidence	Chewed Marri nuts
CC	-30.9039	115.7578	Foraging evidence	Chewed Marri nuts
CC	-30.9036	115.7561	Foraging evidence	Chewed Marri nuts
CC	-30.9035	115.7389	Foraging evidence	Chewed Marri nuts
CC	-30.9029	115.7276	Foraging evidence	Chewed Marri nuts
CC	-30.9029	115.7278	Foraging evidence	Chewed Marri nuts
CC	-30.9015	115.723	Foraging evidence	Chewed Marri nuts
CC	-30.8999	115.775	Foraging evidence	Foraging evidence on banksia and old Marri nuts
CC	-30.8958	115.6838	Foraging evidence	Chewed Marri nuts
CC	-30.8944	115.6572	Foraging evidence	Chewed Marri nuts
CC	-30.8919	115.64	Foraging evidence	Chewed Marri nuts
CC	-30.8857	115.6903	Foraging evidence	Chewed Marri nuts
CC	-30.8847	115.6904	Foraging evidence	Chewed Marri nuts
CC	-30.88	115.6828	Foraging evidence	Chewed Marri nuts
CC	-30.8777	115.684	Foraging evidence	Chewed Marri nuts
CC	-30.8748	115.6768	Foraging evidence	Chewed Marri nuts
CC	-30.8714	115.6509	Foraging evidence	Chewed Marri nuts
CC	-30.8638	115.7056	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9707	115.7832	Foraging evidence	Marri nuts foraged

Species	Latitude	Longitude	Observation type	Comments
FRTBC	-30.9418	115.7333	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9359	115.7096	Foraging evidence	Chewed Tuart fruit
FRTBC	-30.9359	115.7096	Foraging evidence	Chewed Tuart fruit
FRTBC	-30.9337	115.722	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9324	115.7242	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9323	115.7247	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9316	115.7212	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9312	115.72	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9304	115.7259	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9276	115.7148	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9275	115.7163	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9272	115.7219	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9264	115.7183	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9251	115.7215	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9216	115.7181	Foraging evidence	Chewed Marri nuts
FRTBC	-30.921	115.7227	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9202	115.722	Foraging evidence	Chewed Marri nuts
FRTBC	-30.92	115.7221	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9196	115.7146	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9115	115.6851	Foraging evidence	Chewed Marri nuts
FRTBC	-30.911	115.6846	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9052	115.7556	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9036	115.7561	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9029	115.7062	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9028	115.7063	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9025	115.7061	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9022	115.7062	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9017	115.7062	Foraging evidence	Chewed Marri nuts
FRTBC	-30.9009	115.7558	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8996	115.7753	Foraging evidence	Chewed Marri nuts
FRTBC	-30.896	115.6841	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8948	115.684	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8947	115.6838	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8944	115.6837	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8928	115.6442	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8922	115.6439	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8918	115.6427	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8914	115.6415	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8913	115.639	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8875	115.7036	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8867	115.7681	Foraging evidence	Chewed Marri nuts
FRTBC	-30.8866	115.768	Foraging evidence	Chewed Marri nuts
FRTBC	-30.886	115.6904	Foraging evidence	Chewed Marri nuts

Species	Latitude	Longitude	Observation type	Comments
FRTBC	-30.8859	115.6902	Foraging evidence	Chewed Marri nuts
FRTBC	-30.7531	115.5588	Foraging evidence	Chewed Marri nuts