

TECHNICAL MEMORANDUM

BUS Results and Avifauna Impact Risk Assessment (AIRA) Update

PROJECT NUMBER	EP23-085(11)	DOC. NUMBER	EP23-085(11)--040 JDH
PROJECT	Parron Wind Farm	CLIENT	Zephyr Energy Pty Ltd.
AUTHOR	JDH	REVIEWER	JDH
VERSION	001	DATE	11 February 2025

1 INTRODUCTION

1.1 Background

Zephyr Energy Pty Ltd (the proponent) is planning on developing the Parron Wind Farm (herein referred to as ‘the Parron proposal’) within lots 3738, 3739, 3742, 3743 and 3744 in Badgingarra, Western Australia (herein referred to as the ‘Parron site’). The location of the site is shown in **Figure 1**.

To progress the Parron proposal, referrals have been made pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Environmental Protection Act 1986* (EP Act). The Parron site in its entirety was part of a previous broader wind farm proposal (known as the Badgingarra Wind Farm) that was also subject to an EPBC Act referral and subsequent Not Controlled Action (NCA) decision in March 2008. The existing Badgingarra Wind Farm extends to the west and south of the site, as shown in **Figure 1**, and the Parron proposal now seeks to complete the remaining portion of the Badgingarra Wind Farm.

As part of supporting the design of the proposal, and the progression of the EP Act and EPBC Act referrals, the proponent undertook a number of baseline ecological assessments, including:

- Detailed flora and vegetation assessment (Emerge Associates 2024e)
- Basic fauna and targeted black cockatoo assessment (inclusive of a bird utilisation survey) (Emerge Associates 2024c).

The above were progressed in addition to a number of assessments that supported the Badgingarra Wind Farm and are therefore relevant to the site, including:

- Proposed Badgingarra Wind Farm Flora and Fauna Assessment (Brett Lane & Associates Pty Ltd 2008)
- Carnaby’s Cockatoo and Other Birds Year One Operational Monitoring (Ecoscape 2019).

Based on the above, the EP Act and EPBC Act referrals were supported by *Avifauna Impact Risk Assessment: Parron Wind Farm* (Emerge Associates 2024a), which targeted the two listed Matters of National Environmental Significance (MNES) bird species identified as having a high or moderate likelihood of occurrence within the site, which were:

- *Zanda latirostris* (Carnaby’s black cockatoo) which is listed as ‘endangered’ under the EPBC Act
- *Apus pacificus* (Pacific swift or fork tailed swift) which is listed as migratory under the EPBC Act.

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The Parron proposal avoids direct impacts associated with habitat clearing/loss for both species, which has been the primary impact avoidance strategy adopted for the Parron proposal.

Further to this the Avifauna Impact Risk Assessment (AIRA) (Emerge Associates 2024a) concluded that:

- *The risk of direct, indirect or facilitated impacts to Carnaby's black cockatoo that the Parron Wind Farm proposal poses is considered **low**. This is because impacts are unlikely and the consequence of the impacts if they were to occur to the species would be marginal.*
- *The risk of direct, indirect or facilitated impacts to Pacific swift that the Parron Wind Farm proposal poses is considered **low**. This is because impacts are unlikely and the consequence of the impacts if they were to occur to the species would be marginal.*

While this has been generally accepted for the Pacific swift, there has been a request for additional information to support the conclusions in relation to Carnaby's black cockatoo.

1.2 Purpose of this document

In order to provide additional information to support the AIRA in relation to Carnaby's black cockatoo, Emerge was engaged to review and compile relevant historic bird utilisation survey data, and undertake additional bird utilisation surveys (BUS) within and adjacent to the Parron site to provide more detailed information on bird utilisation within the site and to support the environmental impact assessment process.

While the BUS data is summarised in a separate document (*Bird Utilisation Surveys 2023-2025: Parron Windfarm* (Emerge Associates 2025)), the purpose of this document is to provide an update to the AIRA to incorporate the BUS information that has been subsequently available.

2 RELEVANT BACKGROUND AND CONTEXT: CARNABY'S BLACK COCKATOO

Carnaby's black cockatoo are known to breed from July to December with most nestlings having fledged by early January (DPaW 2013; DAWE 2022). It is also generally known that during breeding season Carnaby's black cockatoo will remain within approximately 12 km of their breeding location to forage (DPaW 2013; DAWE 2022).

The non-breeding season for Carnaby's black cockatoo is January to June. During non-breeding season most individuals will migrate to their foraging distribution area or remain locally depending on which population is in question. Carnaby's black cockatoo forage across further distances during non-breeding season than during the breeding season. During non-breeding Carnaby's black cockatoo would be expected to be moving around foraging over wide areas which may include the small areas of foraging habitat in the Parron site and adjacent areas, so it would be expected to record Carnaby's black cockatoo during this time.

Based on the known information, it is expected that that during breeding season (July to December) most Carnaby's black cockatoo would exist within known regional breeding hotspots (i.e. Coomallo, Eneabba and Cataby) and there would be fewer or no individuals flying across and foraging within the Parron site and surrounds. Carnaby's black cockatoo breeding isn't restricted to Coomallo,

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Eneabba and Cataby, but large numbers of birds are known to congregate and breed in these areas, and these breeding areas are more regionally relevant to the Parron site.

Based on the surveys undertaken to date there is no known breeding activity occurring within the Parron site or immediate surrounds. Based on the known breeding activity information, there are no known breeding sites within 12 km of the Parron site, and the nearest is approximately 16 km away at Coomallo.

Historically Ecoscape (2019) defined two peak Carnaby's black cockatoo flight periods that were relevant for the Badgingarra Wind Farm site, December to April when adults and fledglings migrate east-west for feeding, and July to September when adults migrate west-east for breeding. This was based on advice from Rick Dawson, an acknowledged Carnaby's black cockatoo expert with the Department of Biodiversity Conservation and Attractions (DBCA).

Carnaby's can breed anywhere during the breeding season but tend to migrate annually back to particular breeding areas. In the northern reaches of their distribution, they breed predominantly in Coomallo, Cataby and Enneaba (DEC 2013; Saunders D. A. et al. 2018; DBCA 2024). **Figure 2** shows these areas in relation to the Parron site, including the 12 km radius in which they would be expected to generally range during the breeding season.

In non-breeding season, movement of flocks varies according to the literature cited. In this northern area of their distribution it is noted by several sources however, that a number of individuals remain in the region around these breeding sites to feed on the remnant kwongan heath (Saunders 1980). Saunders (1980) found that at least 210 individuals bred at Coomallo Creek and feed predominantly in the region from Hill River to Dongara. More recent study showed they can range from Chapman Valley to Perth in some years (Bourne A.R. et al. 2024). These individuals join other groups from "other breeding areas" and foraged within 50 km of Coomallo Creek, particularly where water was available. Some individuals have also been recorded migrating to Manmaning during the non-breeding season.

Informally it is understood that Murdoch University tracking studies indicates that the Coomallo Creek population is highly localized with no movement outside of the breeding area during the breeding season, and most of the movement during the non-breeding season being north-south along the region to the east of the Parron site.

It is known that Carnaby's black cockatoo roost in several locations across Hill River and surrounds (Birdlife Australia 2024). These include one roost site which is 4.5 km north of the site. Carnaby's black cockatoo typically forage within 6 km of a roost site meaning a possible source of movement into the northern extent of the Parron site is from this nearby roost.

3 BUS RESULTS TO DATE

Incorporating historic BUS associated with the Badgingarra Wind Farm with the more recent BUS progressed by Emerge Associates, BUS data has been captured for the site and immediate surrounds for the following timeseries (Emerge Associates 2025):

- March/April 2007 (Autumn 2007, Carnaby's black cockatoo non-breeding season), six locations within the Parron site (Brett Lane & Associates Pty Ltd 2008).

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- February 2019 (Summer 2019, non-breeding season), two locations within the Parron site (Ecoscape 2019)
- March 2019 (Autumn 2019, breeding season), two locations within the Parron site (Ecoscape 2019)
- July 2019 (Winter 2019, breeding season), two locations within the Parron site (Ecoscape 2019)
- September 2019 (Spring 2019, breeding season), two locations within the Parron site (Ecoscape 2019)
- September 2023 (Spring 2023, breeding season), six locations within the Parron site (Emerge Associates 2024d, 2025)
- March 2024 (Autumn 2024, non-breeding season), three locations immediately north of the Parron site (Emerge Associates 2024b, 2025))
- October/November 2024 (Spring 2024, breeding season), 10 locations within (8) and immediately north (2) of the Parron site (Emerge Associates 2025)
- January 2025 (Summer 2025, non-breeding season), 10 locations within (8) and immediately north (2) of the Parron site (Emerge Associates 2025).

A specific and detailed summary of the BUS methodologies and results is provided in the attached *Bird Utilisation Surveys 2023-2025: Parron Windfarm* (Emerge Associates 2025).

Based on the BUS observations to date, the following general statements can be made:

- BUS has been undertaken across nine (9) events within the Parron site or immediate surrounds, incorporating all seasons, but specifically three (3) Spring events, two (2) Summer events, three (3) Autumn events, and one (1) Winter event. More broadly this can be classified into four (4) non-breeding season and five (5) breeding season events, which is possibly a more appropriate way to classify and target seasonal BUS survey for Carnaby's black cockatoo in the area of interest.
- Based on all BUS undertaken to date within the Parron site and surrounds, 97.7% of BUS observations and 100% of incidental observations have been during the non-breeding season. There have been no observations of Carnaby's black cockatoo within the Parron site during the breeding season.
- 100% of all birds sighted by Brett Lane & Associates Pty Ltd (2008) within the Parron site and surrounds were flying less than 10 m height.
- 80% of all birds sighted by Ecoscape (2019) within the Parron site and surrounds were flying below the Badgingarra Wind Farm Rotor Swept Area (RSA) of 20-150 m. While a flight height category of 0-150 m and 20-150 m was used, this was a broad classification and did not imply that birds were observed up to 150m flight height. The raw data regarding flight heights is not available to interrogate further.
- 100% of the birds sighted by Ecoscape (2019) within the Parron site were flying less than 20 m height.
- 100% of all birds sighted by Emerge Associates (2025) were flying less than 25 m height.

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4 BUS RELEVANCE AND IMPLICATIONS FOR AIRA CONCLUSIONS

4.1 Bird Movements

Based on nine (9) BUS events across all seasons, and four (4) within the Carnaby's black cockatoo breeding season and (5) within the non-breeding season, 97.7% of BUS Carnaby's black cockatoo observations and 100% of incidental observations have been during the non-breeding season. This supports the assumption made in the AIRA that breeding birds are unlikely to be visitors to the Parron site, supported by the known breeding sites being more than 12 km from the Parron site.

Flock sizes during non-breeding season within both the Parron site and the surrounding areas varied from two (2) to 200 individuals, with a median flock size of 15. Flock sizes within the site (100% of which were within the non-breeding season) ranged from four (4) to 144 individuals, with a median flock size of 14 (and four (4) zero (0) recordings from 13 survey dates). This supports the assumption made in the AIRA that while Carnaby's black cockatoo are visitors to the site, they are infrequent and in when they do in relatively small numbers (i.e. small flock sizes).

100% of birds observed within the site were significantly below the lower range of the Parron proposal RSA (maximum flight height of 25 m versus a lower RSA of 70 m). The majority of those observed within surrounding areas were significantly below the lower range of the Parron proposal RSA, and those that weren't were recorded within a height category of between 20-150 m. Based on this is reasonable to conclude that there is no basis to assume that Carnaby's black cockatoo would fly within the Parron site within the Parron proposal RSA range of 70-228 m. Given the observed heights there is a material separation between the likely maximum heights of flying Carnaby's black cockatoo and the lowest range of the RSA, which would also materially allow for any additional uncertainty or specific variability in flight due to other factors.

4.2 Likelihood of Collision

Assessments undertaken for the Warradarge Wind Farm (Flora, Vegetation and Fauna Assessment (Biota 2012)) indicates that the probability of Carnaby's black cockatoo encountering the proposed turbines and related infrastructure was considered very low for the following reasons (R.E. Johnstone (pers. comm. 2012)):

- There is a low rate at which Carnaby's black cockatoo appears to visit open farmland in the Warradarge area. In general, small flocks of less than 50 individuals are recorded as irregular visitors flying over farmland, compared to very large aggregations reported from intact bushland in the Eneabba and Badgingarra areas.
- Actual site utilisation would be very low at the Warradarge study area as it is mostly cleared and has relatively limited feeding, roosting and breeding habitat in close proximity.
- Although the species generally flies at turbine height (RSA of 30-100 m for Warradarge), they are very competent flyers in all conditions and would be capable of avoiding wind turbines. Individuals have been observed navigating around turbines and similar structures, even under low light conditions (R.E. Johnstone, pers. com. 2009).
- The Storr-Johnstone Bird Data Bank contains no records of Carnaby's black cockatoo hitting powerlines or turbines.

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The above observations in relation to Warradarge Wind Farm are relevant for the Parron proposal, on the basis that:

- BUS data indicates small flocks of less than 50 individuals have been recorded as irregular visitors flying over farmland or low vegetation within the Parron site. There are limited areas of intact bushland within the Parron site, and those that exist are at the perimeter of the Parron site and of low height.
- Actual site utilisation would be low at the Parron site as it is mostly cleared of native vegetation, although there is some foraging habitat in close proximity to the Parron site, one known roosting site approximately 4.5 km from the Parron site (although there is limited foraging habitat within the Parron site within 6 km of the roosting site) and no known breeding in close proximity (i.e. within 12 km).
- The Parron proposal RSA (70 m from ground) is significantly higher than the Warradarge Wind Farm RSA (30 m from ground), which means that while there was considered to be a low likelihood of collision for Warradarge Wind Farm, this likelihood is further significantly less when the RSA separation from ground is more than double for the Parron proposal.

Based on the BUS data obtained and summarised above (and in the attached BUS Summary Report), the 'Unlikely' designation applied in the impact risk assessment for Carnaby's black cockatoo is justified based on the data supporting the frequency of occurrence ('species occasionally occurs in site') and flight behaviour ('rarely flies within RSA').

4.3 Other considerations

It should be noted that in late 2024 there was a substantial summer bushfire that occurred in the wider region and within proximity to the Parron site that impacted in the order of 80,000 ha, that included areas of native vegetation that would include areas of Carnaby's black cockatoo foraging, roosting and breeding habitat. This event, and other historical bushfire events and climatic variations are likely to affect the occurrence of Carnaby's black cockatoo within and surrounding the Parron site.

These events have not been specifically considered within the BUS analysis, and while these may temporarily affect the temporal and spatial utilisation characteristics of the site by Carnaby's black cockatoo, are not expected to influence the key conclusions in relation to the site utilisation by Carnaby's black cockatoo to the extent that the overall impact risk profile changes.

5 SUMMARY AND CONCLUSIONS

To progress the Parron proposal, referrals have been made pursuant to the EPBC Act and EP Act. The Parron site in its entirety was part of a previous broader wind farm proposal (known as the Badgingarra Wind Farm) that was also subject to an EPBC Act referral and subsequent Not Controlled Action (NCA) decision in March 2008, the combined extent of which (the Parron proposal site which falls within the extent of the referred Badgingarra Wind Farm site) is shown in **Figure 1**.

An initial AIRA was completed to support the referrals, which concluded that for Carnaby's black cockatoo the risk of direct, indirect or facilitated impacts to Carnaby's black cockatoo that the Parron

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proposal poses is considered low, because impacts are unlikely and the consequence of the impacts if they were to occur to the species would be marginal.

In order to provide additional information to support the AIRA in relation to Carnaby's black cockatoo, there has been additional review and compilation of relevant historic bird utilisation survey data, and additional BUS undertaken within and adjacent to the Parron site to provide more detailed information on bird utilisation of the site and to support the environmental impact assessment process.

BUS has been undertaken across nine (9) events within the Parron site or immediate surrounds, incorporating all seasons across multiple years, but specifically three (3) Spring events, two (2) Summer events, three (3) Autumn events, and one (1) Winter event. More broadly this can be classified into four (4) non-breeding season and five (5) breeding season events.

The BUS data presented indicates small flocks of (median flock size of 14 birds) have been recorded as irregular visitors flying over farmland or low vegetation. There are limited areas of intact bushland within the Parron site, and those that exist are at the perimeter of the Parron site. Actual site utilisation would be low at the site as it is mostly cleared of native vegetation, although there is some feeding habitat in close proximity to the site, one known roosting site approximately 4.5 km from the site (although limited foraging habitat within 6 km of the roost site within the Parron site) and no known breeding in close proximity to the Parron site (i.e. within 12 km).

Further to the low level of site utilisation, given the Parron proposal RSA (70-278 m) there is a demonstrated very low likelihood that Carnaby's black cockatoo would ever fly at RSA height within the Parron site. With all records indicating Carnaby's black cockatoo flight heights of less than 25 m, and minimum RSA heights of 70 m, the likelihood of flight heights reaching potential collision heights even during disturbance from predators remains very low (with an approximate 50 m separation between maximum flight heights and the lower RSA height) and anecdotal evidence indicating a high capacity for avoidance of wind turbines by Carnaby's black cockatoo, even under low light conditions (R.E. Johnstone, pers. com. 2009).

Based on the BUS data obtained and summarised above (and in the attached BUS Summary Report), the 'Unlikely' designation applied in the impact risk assessment for Carnaby's black cockatoo is justified based on the data supporting the frequency of occurrence ('species occasionally occurs in site') and flight behaviour ('rarely flies within RSA').

6 REFERENCES

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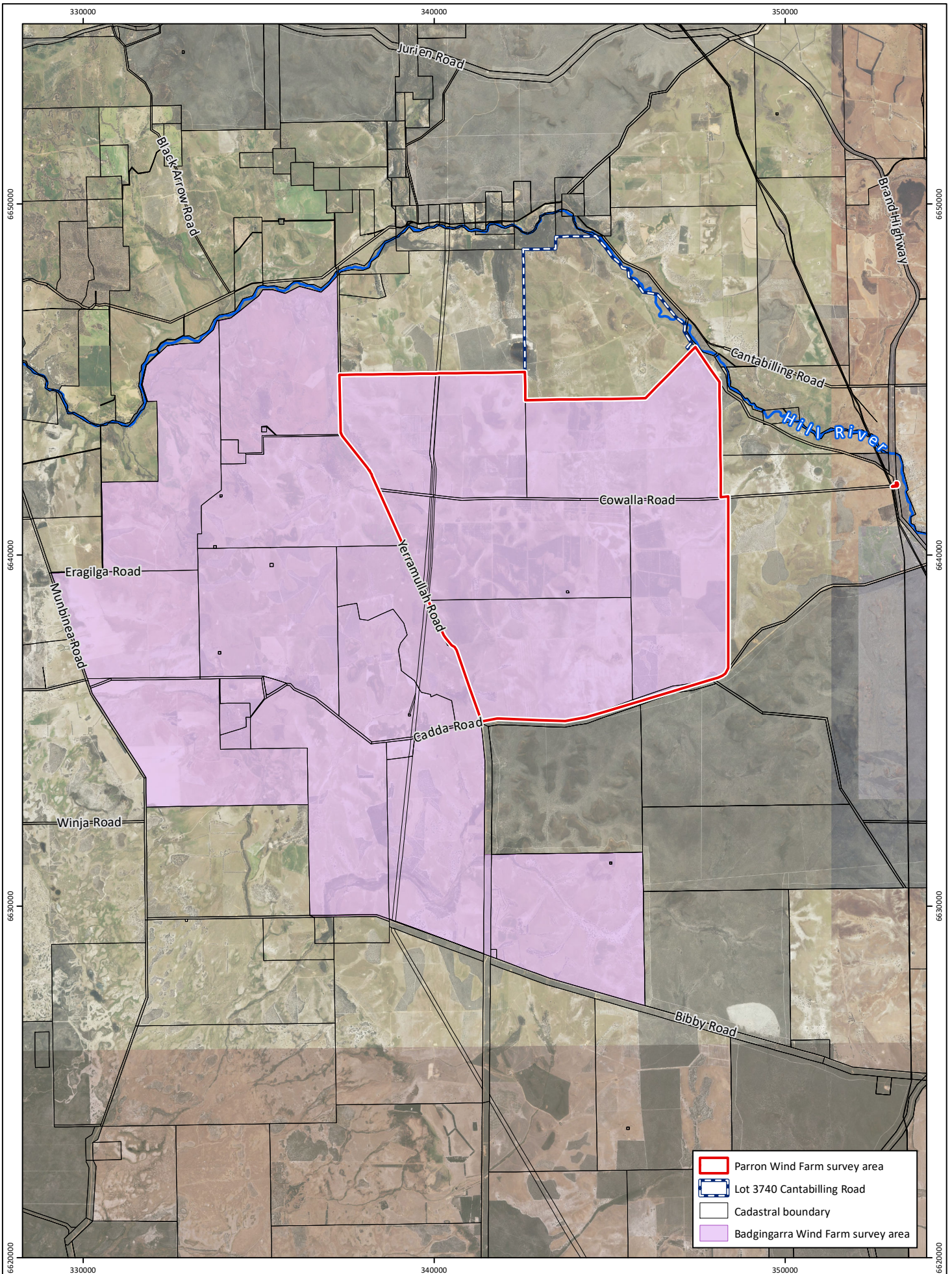
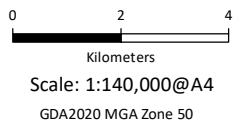


Figure 1: Parron Wind Farm and Badgingarra Wind Farm Survey Extent

Project: BUS Results and AIRA Update
Parron Wind Farm Development Support

Client: Zephyr Energy Pty Ltd

Plan Number: EP23-085(11)--F149
Drawn: GAR
Date: 19/02/2025
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Approved: JDH
Date: 19/02/2025



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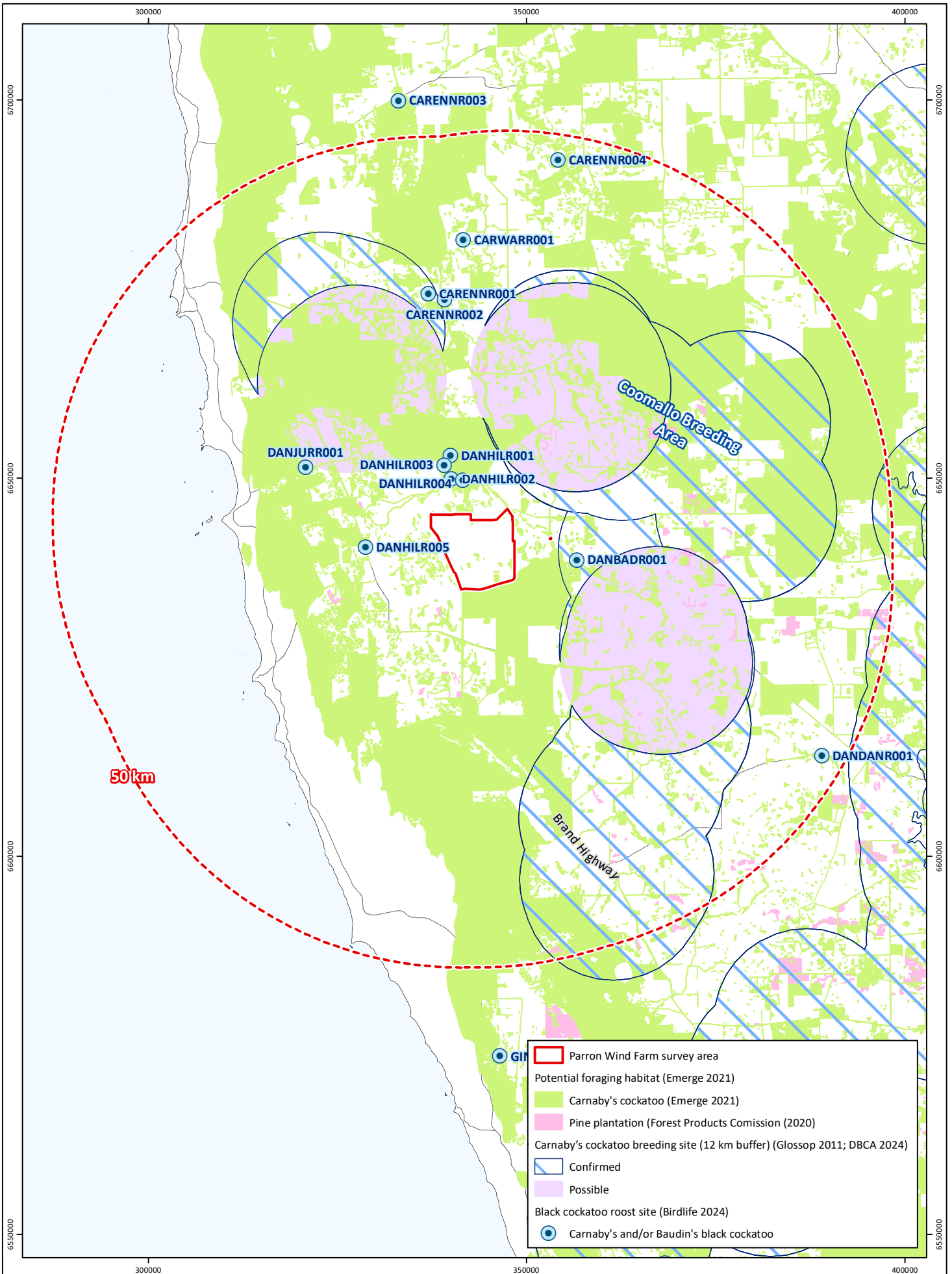


Figure 2: Carnaby's Black Cockatoo Habitat Context

Project: BUS Results and AIRA Update
Parron Wind Farm Development Support
Client: Zephyr Energy Pty Ltd

Plan Number: EP23-085(11)--F150
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Scale: 1:650,000@A4
GDA2020 MGA Zone 50

