City of Wanneroo
Black Cockatoo Habitat Tree Assessment
Flynn Drive, Neerabup (Stage 3)

Tree 4

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Acknowledgement of Country

Ngala kaaditj Noongar moort keyen kaadak nidja boodja.
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D1	June 2023	New Document	ST	BC	Superseded
V1	July 2023	Response to comments	ST	JW	Released

Contents

1.0 Introduction

Natural Area Consulting Management and Services (Natural Area) was commissioned by the City of Wanneroo (the City) to undertake a Black Cockatoo habitat tree assessment of a previously identified potential Black Cockatoo habitat tree (Tree 4) to determine breeding suitability prior to scheduled road upgrades. Natural Area conducted the assessment of Tree 4 on 2 June 2023 with the results provided in this report.

1.1 Location

Tree 4 is located within 190 Flynn Drive, just east of Pinjar Rd, in the suburb of Neerabup within the City of Wanneroo (Figure 1).

1.2 Scope

The scope of works undertaken by Natural Area included:

- determining the survey methodology and limitations
- mapping the location of Tree 4
- on ground assessment of Tree 4 (*Eucalyptus marginata*; Jarrah) including:
    - noting the time and date of the tree inspection
    - recording the GPS location, diameter at breast height (DBH) measurement, tree height and condition/health of Tree 4
    - determining the suitability of Tree 4 as a habitat tree, using the Bamford scale (Bamford, 2016) to determine class rating
    - taking photographs of Tree 4 including within the hollows
    - inspecting hollows to determine size and angle of hollow entrance, and identify evidence of Black Cockatoo breeding (current or past) in the form of:
        - chew marks around hollow entrances
        - feeding signs or feeding debris (e.g. chewed nuts)
        - scats or feathers
        - hollow occupancy.

Figure 1:
Site Location
Neerabup, Western Australia

Client: City of Wanneroo
Date: July 2023
Created by: S. Treloar
Image Source: Nearmap, 2023
Datum: GDA 94

2.0 Methodology

Natural Area ecologists attended the site on 2 June 2023 at 8am to conduct the Black Cockatoo habitat tree assessment. The assessment was conducted in accordance with the *Referral guidelines for three WA threatened black cockatoo species* (Department of Agriculture, Water and the Environment (DAWE), 2022).

The following details were recorded for Tree 4:

- GPS location
- diameter at breast height (DBH) measurement
- tree height
- condition and health
- tree class rating (Bamford, 2016).

All potential hollows on Tree 4 were inspected for the following:

- size of entrance and angle of entry
- chew marks around hollow entrances
- feedings signs or feeding debris (chewed nuts)
- presence of droppings or feathers
- occupancy: hollows were inspected from the ground using a camera mounted on a telescopic pole.

2.1 Limitations

Potential survey limitations and their impacts are outlined in Table 1 below.

Table 1: Survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of data and information	Not a limitation	Government data on the three black cockatoo species as well as published guidelines are available (DCCEEW, 2022). Up to date site information as Ecoscape conducted a Black Cockatoo habitat tree assessment in 2020 (Ecoscape, 2020).
Competency/experience of the survey team, including experience in the bioregion survey	Not a limitation	Experienced and qualified ecologists have conducted Black Cockatoo habitat assessments across the Swan Coastal Plain, Wheatbelt and Jarrah Forest bioregions.
Scope of the survey	Minor limitation	One hollow out of a total of 7 hollows could not be internally inspected as it was too high and occupied by Galahs.
Timing, weather, season	Minor limitation	Survey was conducted outside the main Black Cockatoo breeding season within the Swan Coastal Plain (July to December).
Disturbance that may have affected results, e.g., fire, flood	Not a limitation	No recent large-scale disturbance noted at the time of the survey.

Potential Limitation	Degree of Limitation	Comments
The proportion of fauna identified, recorded or collected	Not a limitation	This is a targeted Black Cockatoo habitat survey.
Adequacy of the survey intensity and proportion of survey achieved, e.g**.** the extent to which the area was surveyed	Minor limitation	One hollow out of a total of 7 hollows could not be internally inspected as it was too high and occupied by Galahs.
Access problems	Not a limitation	Ecologists were able to traverse through site with no restriction. A Letter of Authority was provided by the landowner before visiting the site (Appendix 1).
Problems with data and analysis, including sampling biases	Not a limitation	Analysis and assessment of Black Cockatoo habitat was carried out in accordance to published guidelines (DAWE, 2022).

Source: Environmental Protection Authority (EPA), 2022

3.0 Results

Tree 4 exhibited a total of seven potential hollows (Figure 2). Four of the hollows were identified as unavailable for Black Cockatoo use at the time of the assessment due to being occupied by European Honey Bees (**Apis mellifera*) or breeding Galahs (*Eolophus roseicapilla*). The remaining three hollows were identified as unsuitable for Black Cockatoo breeding due to not meeting the hollow entrance size and/or orientation requirements for Black Cockatoos (Cherriman, 2022; EPA, 2019; Groom, 2010). There was no secondary evidence (past or present) of Black Cockatoo use in the form of chew marks, feeding signs, scats, or feathers at any of the hollows within Tree 4. Table 2 provides details and photographs of each hollow.

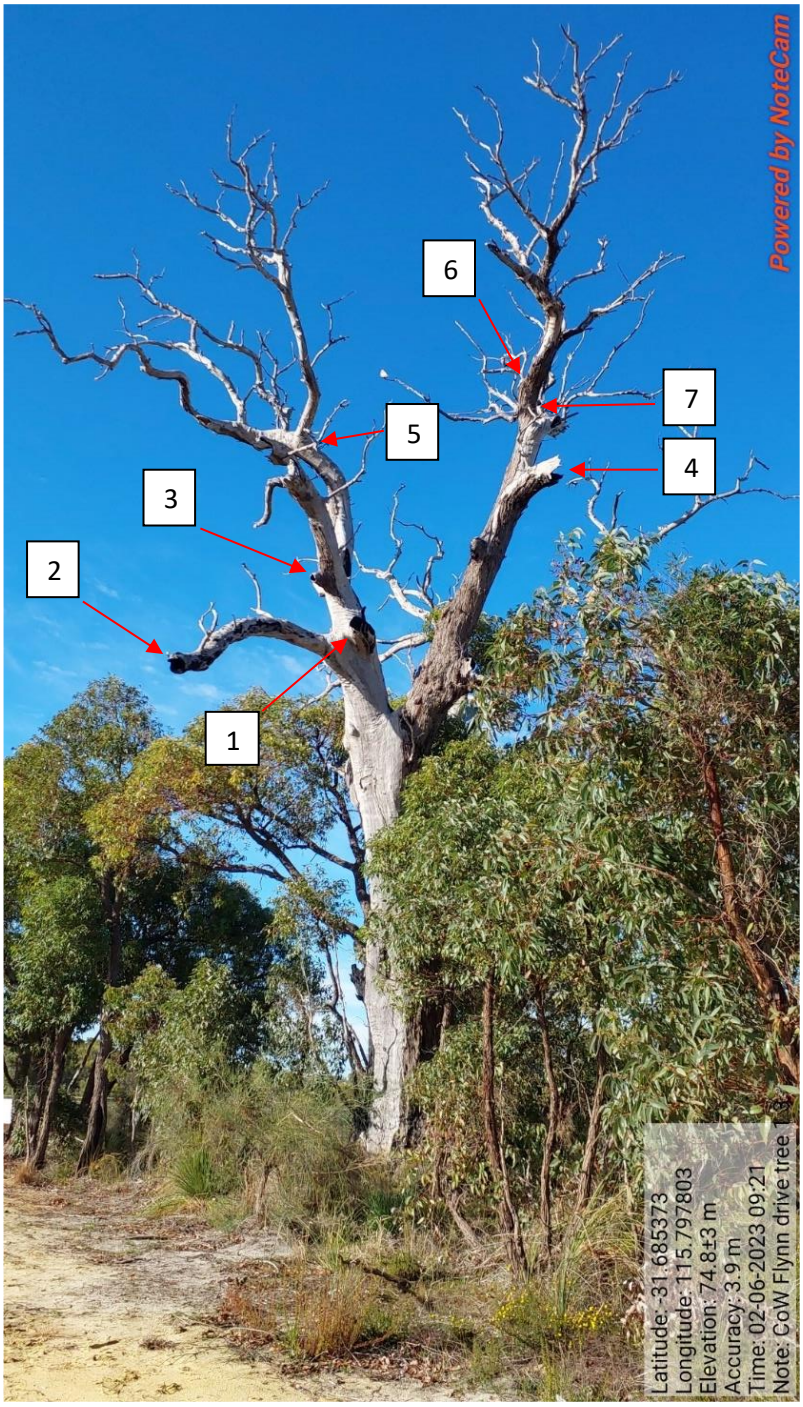

Figure 2: Tree 4, with the location of each hollow shown.

Table 2: Details of Tree 4.

Species	*Eucalyptus marginata* (Jarrah)
Location	-31.68537 (Lat) 115.79780 (Long)
Diameter at breast height (DBH)	1600 mm
Height	13 m
Condition	Poor condition. Full crown senescence, fresh regrowth observed at base of tree
Bamford Class	3

Hollow 1:
Suitable type (vertical hollow) and entrance size (300 mm diameter) for Black Cockatoos.
8 m above ground.

Occupied by European Honey Bee (**Apis mellifera*). Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 2:
Side hollow, entrance 100 mm diameter.
7.3 m above ground**.**
Side orientation unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use.

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 3:
Side hollow, entrance 100 mm diameter.
8.2 m above ground.
Side orientation unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 4:
Suitable type (vertical hollow) and entrance size (150 mm diameter) for Black Cockatoos.
9.2 m above ground.

Occupied by European Honey Bee (**Apis mellifera*) hive. Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 5:
Side hollow, entrance 80 mm diameter.
10 m above ground.
Side orientation and size of hollow unsuitable for Black Cockatoos.

Unoccupied.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 6:
Suitable type (vertical hollow) and entrance size (estimated 150 mm diameter) for Black Cockatoos.
10.5 m above ground.

Occupied by Galahs (*Eolophus roseicapilla*).

Unable to measure and view inside of hollow with camera on telescopic pole due to height and inaccessibility. Depth unknown.

Potentially suitable for Black Cockatoos, however currently unavailable due to nesting Galahs.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

Hollow 7:
Suitable type (vertical hollow) and entrance size (200 mm diameter) for Black Cockatoos.
10 m above ground.

Occupied by European Honey Bee (**Apis mellifera*) hive. Depth unknown.

Not available for Black Cockatoos due to beehive.

No secondary evidence of Black Cockatoo use:

- No chew marks.
- No feeding signs/feeding debris.
- No scats or feathers.

An image of the base of Tree 4 is provided below, showing the regrowth of foliage (Figure 3).

Figure 3: Base of Tree 4 with regrowth.

4.0 Discussion

4.1 Hollow Occupancy

Four of the seven hollows were identified as being unavailable for Black Cockatoo breeding at the time of the assessment. Hollows 1, 4 and 7 were occupied by non-native European Honey Bee (**Apis mellifera*) hives and consequently these hollows cannot be used by Black Cockatoos. Hollow 6 was occupied by breeding Galahs at the time of the assessment and therefore is not currently available for use by Black Cockatoos either.

It is possible other bird species (including Black Cockatoos) may not share Tree 4 for breeding whilst it is being utilised by Galahs. This is because Galahs can be aggressive guardians of nest hollows, deterring other species from breeding (Cherriman, 2013). Additionally, they are known to mark the tree surrounding the nest hollow with a powdery substance from their eye ring which is believed to advertise that the hollow is occupied (Cherriman, 2022) and subsequently may warn off other bird species from utilising the tree for breeding.

4.2 Hollow Entrance

All hollows within Tree 4 (excluding hollow 5) meet the minimum entrance diameter requirement (100 mm) for use by Black Cockatoos (Groom, 2010). The entrance diameter of hollow 6 could not be determined during the assessment due to its height and inaccessibility. However, as this hollow was being used by Galahs for breeding, it was assumed that the entrance to this hollow would be large enough for use by Black Cockatoos and hence was estimated to be 150 mm in diameter.

4.3 Hollow Depth

Black Cockatoos require a hollow that is at least 1 m deep (DBCA, 2017; EPA, 2019). All hollows that met the minimum entrance size (at least 100 mm diameter) and orientation (near vertical) requirements were occupied by non-native European Honey Bee hives (i.e. hollows 1, 4 and 7) and breeding Galahs (hollow 6). Consequently, the depth of these hollows could not be determined. Therefore, the suitability of these hollows for Black Cockatoo breeding could not be confirmed. Once these hollows are unoccupied and if they meet the minimum required depth of 1 m, they will likely be suitable for use by Black Cockatoos.

4.4 Additional Species Observed Utilising Tree 4

Additional bird species were observed on Tree 4 during the tree assessment (Figure 4) including the Australian Ringneck (*Barnardius zonarius*), Elegant Parrot (*Neophema elegans*), Nankeen Kestrel (*Falco cenchroides*), and Singing Honeyeater (*Gavicalis virescens* subsp. *virescens*).

Australian Ringneck (*Barnardius zonarius*)

Elegant Parrot (*Neophema elegans*)

Nankeen Kestrel (*Falco cenchroides*)

Singing Honeyeater (*Gavicalis virescens* subsp. *virescens*)

Figure 4: Additional bird species utilising Tree 4 during assessment.

5.0 Conclusion

Tree 4 was deemed unsuitable for Black Cockatoo breeding at the time of the assessment due to the presence of European Honey Bee hives within three of the hollows, breeding Galahs within one hollow, and three hollows not meeting the minimum entrance size and/or orientation requirements for Black Cockatoo breeding. The hollows containing the European Honey Bee hives and Galahs met the size and orientation requirements for Black Cockatoo breeding, however the minimum depth requirement (1 m) could not be confirmed for these hollows due to their occupancy.

No evidence of past or present use of Tree 4 by Black Cockatoos was observed, however, if the European Honey Bee hives were removed, these hollows will likely be suitable for Black Cockatoo breeding if they are at least 1 m deep. Similarly, the hollow containing the Galah nest will likely be suitable for Black Cockatoo breeding if it is at least 1 m deep.

6.0 Recommendations

It is recommended Tree 4 is not removed until the Galah chicks have fully fledged and the hollow is not occupied. Natural Area also recommends the treatment and removal of the European Honey Bee hives from the affected hollows. During hive removal, internal hollow dimensions can be recorded by the apiarist to determine the depth and therefore determine if the hollows are deemed suitable for Black Cockatoos.

7.0 References

Bamford Consulting Ecologists. (2016). *Black Cockatoo potential nest tree grading system,* as cited in Ecoscape. (2020). *Flynn Drive Basic Fauna Survey 2020.* Unpublished report for the City of Wanneroo

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Department of Agriculture, Water and the Environment (DAWE). (2022). *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo.* Department of Agriculture, Water and the Environment. Canberra, February.

Department of Biodiversity, Conservation and Attractions (DBCA). (2017). *Fauna Profile – Forest red-tailed black cockatoo Calyptorhynchus banksia naso.* Retrieved from http://www.dbca.wa.gov.au.

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Environmental Protection Authority (EPA). (2020). *Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment*. Retrieved from https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf

Groom, C. (2010). *Artificial hollows for Carnaby's black cockatoo.* Department of Environment and Conservation, Western Australia.

Appendix 1: Letter of Authority for Site Access

From: stamps1@bigpond.com <stamps1@bigpond.com>
Sent: Friday, May 26, 2023 2:11 PM
To: Sue Brand <SBrand@mbsenvironmental.com.au>
Subject: Access Permision - 190 Flynn Dr

To whom it may concern,

I, Mark Stampalia provide the City's environmental consultant Natural Area Consulting Management Services (NACMS) Authority to Access 190 Flynn Drive, Neerabup for the purpose of conducting an inspection of one (1) tree within the property to determine the suitability of Black Cockatoo breeding within the 5x hollows of the tree. I note that there is likely to be two NACMS staff with vehicle in attendance and the work is estimated to take a maximum of 2 hours to complete.

Regards

Mark Stampalia
Director
Alvito Pty Ltd