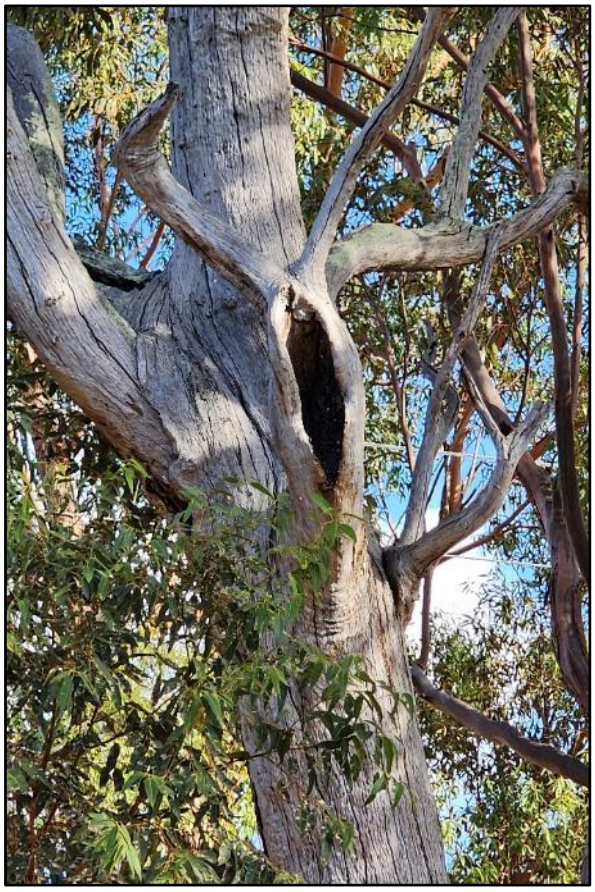
Tree Survey and Black-cockatoo Assessment

Karnup Road Hopeland

Shire of Serpentine Jarrahdale



Ecology Matters Australia Pty Ltd

June 2024

Tree survey and black-cockatoo assessment at Karnup Road, Hopeland

For the Shire of Serpentine-Jarrahdale

Prepared for:

Shire of Serpentine Jarrahdale

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14th June 2024

Images on front cover: Tree with suitable black-cockatoo breeding hollow (Tag ID: KA459); Southwest Grass Tree (*Kingia australis*); and Fence Skink (*Cryptoblepharus buchananii*)

Executive Summary

Background

The Shire of Serpentine Jarrahdale (the Shire) is proposing to widen a 4.5 kilometre section of Karnup Road in Hopeland. As part of native vegetation clearing permit submissions, the Shire has requested Ecology Matters Australia Pty Ltd (Ecology Matters) to conduct a tree survey and black-cockatoo assessment within the road verge along this section of road. These assessments included a desktop review and a field component.

Three threatened species of black-cockatoo are potentially present in the Shire of Serpentine Jarrahdale:

- **Baudin's Black-Cockatoo** (*Zanda baudinii*), listed as Endangered under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (EPBC Act) and Schedule 2 Division 2 (Endangered) under the Western Australian *Biodiversity Conservation Act 2016* (BC Act).
- **Carnaby's Black-Cockatoo** (*Zanda latirostris*), listed as Endangered under the EPBC Act and Schedule 2 Division 2 (Endangered) under the BC Act.
- **Forest Red-tailed Black-Cockatoo** (*Calyptorhynchus banksii naso*), listed as Vulnerable under the EPBC Act and Schedule 2 Division 3 (Vulnerable) of the BC Act

Environmental context

The survey area is located within agricultural land which has been largely cleared. In the immediate vicinity, remnant vegetation is mostly represented by linear strips along roads or isolated trees in paddocks. There are larger patches of native vegetation over 1 km from and surrounding the survey area which would provide foraging habitat for black-cockatoos. The remnant linear strips and isolated trees would provide connectivity through the landscape between these patches of native vegetation.

Tree survey

The tree survey identified a total of 482 trees, including 333 that were located within the clearing zone and 149 that were overhanging the clearing zone. A total of 318 trees were tagged (the remaining 166 trees were either overhanging or too small to be tagged). The 333 trees within the clearing zone consisted of at least 20 plant species with the majority of trees in excellent condition. The most common species were Swamp Paperbark, Flooded Gum and Marri.

Black-cockatoo assessment

No black-cockatoos were observed directly during field investigations. Foraging evidence of Forest Red-tailed Black-Cockatoos feeding on Marri nuts was found within the survey area. The Forest Red-tailed Black-Cockatoo and Carnaby's Black-Cockatoo are expected to visit the survey area regularly, while Baudin's Black-Cockatoo is expected to be a vagrant in this area.

<u>Breeding assessment</u>

There was no current black-cockatoo breeding recorded in the survey area. A total of 51 potential nesting trees (of DBH equal to or greater than 500 mm) was recorded. Forty-eight of these trees were within the clearing zone, while three were overhanging the clearing zone. There was only hollow which was considered to be of suitable characteristics for black-cockatoos but which showed no evidence of

current use and it was currently occupied by bees. The same tree contained smaller hollows suitable for smaller birds. All other trees did not contain any obvious hollows.

The closest known breeding sites are 6 km away (Carnaby's Black-Cockatoo) and 13 km away (Forest Red-tailed Black-Cockatoo), with breeding in artificial hollows also known from Baldivis Children's Forest 8 km from the survey area.

Foraging assessment

Two foraging habitat scores were calculated for each species: one following the current referral guidelines (DAWE 2022) and another following a method developed by Bamford Consulting Ecologists (BCE). According to the DAWE foraging quality scoring tool, the survey area represents moderate to high quality foraging habitat for all three species (scores between 6/10 and 10/10). According to BCE method, which consider alternative variables including site context, the survey area is of low value for Baudin's Black-Cockatoo (2/10) and moderate value for Carnaby's and Forest Red-tailed Black-Cockatoos (4/10). The lower scores of the BCE method reflect the extent and quality of vegetation present in the survey within the context of the local area and the weighting given to each factor (vegetation condition, site context and species density), which are not considered in the DAWE tool. Despite these differences, they both suggest the survey area provides suitable foraging habitat for all three species of black-cockatoo.

Roosting assessment

There were 182 large trees in the survey area that are considered potentially suitable roosting trees for black-cockatoos. Of these, 141 were within the clearing zone and 41 were overhanging the clearing zone. There are water sources in rural properties nearby so it is possible that the survey area may provide roosting opportunities for black-cockatoos as a nearby water source is an important feature of a black-cockatoo roost. The BirdLife database showed 45 confirmed roosting sites within 20 km of the survey area.

Federal Referral information

Based on the loss of potential nesting trees, the proposed action is likely to require a referral to the federal Minister for the Environment. Based on the loss of foraging habitat, the proposed action may or may not require a referral to the federal minister depending on the definition of impact area; the vegetated areas (which are the key areas providing foraging habitat) fall under the threshold of 1 ha while the entire survey area is greater than 1 ha.

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1 Introduction

1.1 Background

The Shire of Serpentine Jarrahdale (the Shire) is proposing to widen a section of Karnup Road in Hopeland. As part of native vegetation clearing permit submissions, the Shire has requested Ecology Matters Australia Pty Ltd (Ecology Matters) to conduct a tree survey and black-cockatoo assessment along this section of road. These assessments included a desktop review and a field component. The desktop review comprised spatial analyses of the survey area in relation to adjacent native vegetation and known black-cockatoo roosting and breeding sites. The field component involved a tree survey, during which all trees in the survey area were recorded and physically marked with aluminium tree tags, and a targeted black-cockatoo assessment during which the breeding, foraging, and roosting values of the survey area were assessed in relation to black-cockatoos.

This report presents the methods and results of the desktop review and field investigations for the tree survey and the targeted black-cockatoo assessment of the Karnup Road survey area.

1.2 Black-cockatoos

In the south-west of Western Australia there are three species of black-cockatoo that are listed as threatened under state and federal legislation. These are:

- **Baudin's Black-Cockatoo** (*Zanda baudinii*), listed as Endangered under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* (EPBC Act) and Schedule 2 Division 2 (Endangered) under the Western Australian *Biodiversity Conservation Act 2016* (BC Act).
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The survey area is within the distribution of all three species of black-cockatoo (DCCEEW, 2024a, 2024c, 2024b) but Baudin's Black-Cockatoo does not often occur on the Swan Coastal Plain and there are no records of breeding by this species on the Swan Coastal Plain. It is therefore expected as a vagrant in the survey area.

1.3 Survey area

The survey area is located 45 km south of Perth in the suburb of Hopeland and consists of an approximately 4.5 km stretch of road verge along Karnup Road (Rd), as shown in Figure 1-1. Based on boundaries provided by the client, the area within which clearing of vegetation is proposed to occur (referred to in the scope as the clearing zone) extends c. 3 m either side of the bitumen surface of Karnup Rd; the area of the clearing zone is thus approximately 2.4 ha (1.2 ha each side of the road). The survey area includes this clearing zone and takes into account vegetation that is overhanging the clearing zone. Vegetation within the survey area consists of scattered trees of mostly native species, over a highly disturbed understorey of African Love Grass and other grassy weeds. Note that the scope requested that trees beyond this boundary to the farm fence (cadastral

boundary) were not required to be surveyed and trees located on the clearing line or overhanging should be part of the survey. Representative photographs of the survey area are presented in Appendix 1.

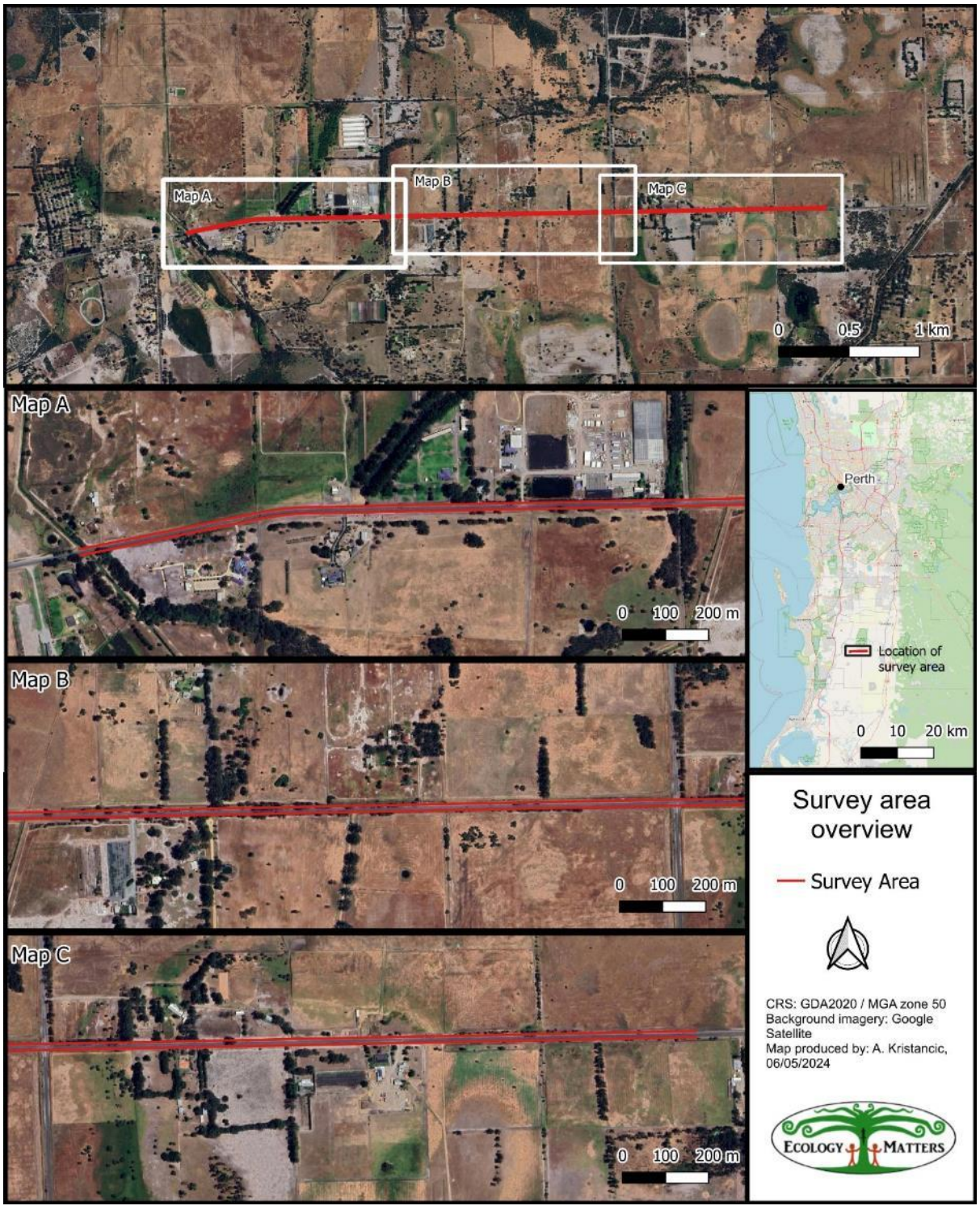

Figure 1-1 Location and boundaries of survey area.

2 Methods

2.1 Desktop review

The desktop review consisted of two components: (i) understanding the environmental context of the survey area through consultation with native vegetation datasets; and (ii) understanding the values of the survey area for black-cockatoos through consultation with black-cockatoo roosting and breeding site datasets. Databases were queried in April 2024, and a summary of databases and sources is provided in Table 2-1. Results of this desktop review are presented in the relevant sections of the Results. Information regarding black-cockatoo breeding sites was available from database searches conducted by the consultants for other projects nearby, and this was used as needed.

In addition, the understanding of the environmental context of the survey area is relevant to understanding the values of the survey area for black-cockatoos. For example, the federal referral guidelines for black-cockatoos (and the foraging scoring tool within these guidelines) requires consideration of information regarding the extent and nature of remnant vegetation within 20 km of the survey area. This informs the foraging score and therefore the potential importance of the site for black-cockatoos.

Table 2-1. Sources of information for the desktop review conducted in April 2024.

Reference	Type of records/data	Details/notes
DPIRD-005 dataset, DPIRD (2024a)	Native Vegetation Extent. Publicly available shapefile based on mapping of remnant vegetation in WA.	Last updated June 2023
DPIRD-006 dataset, DPIRD (2024b)	Pre-European Vegetation Types Publicly available shapefile that maps original natural vegetation presumed to have existed prior to European settlement in Western Australia	Also published as Beard et al. (2013). Last updated July 2019.
DBCA-064 dataset, DBCA (2024b)	Black Cockatoo Roosting Sites – Buffered. Known black-cockatoo roosting sites (publicly available shapefile). Based on data from the Great Cocky Count (BirdLife Australia).	Last updated August 2019
DBCA-063 dataset, (2024a)	Black Cockatoo Breeding Sites – Buffered. Sites where black-cockatoos (generally Carnaby's) are confirmed to be breeding (publicly available shapefile)	Last updated August 2019
BirdLife Australia (2023)	Black-cockatoo roosting sites dataset Records of confirmed and potential roosting sites from the Great Cocky Count; not publicly-available information.	Data available up to 2022.

2.2 Field survey and personnel

The survey area was visited on 19th and 22nd April 2024 by Dr Jamie Wadey (BSc, Hons, PhD; 8 years' experience). The entire survey area was traversed on foot; GPS tracks are shown in Figure 2-1. This report was prepared by Dr Amanda Kristancic (BSc, Hons, PhD; 3 years' experience), Natalia Huang (BSc, Hons, MBA; 17 years' experience) and Dr Jamie Wadey.

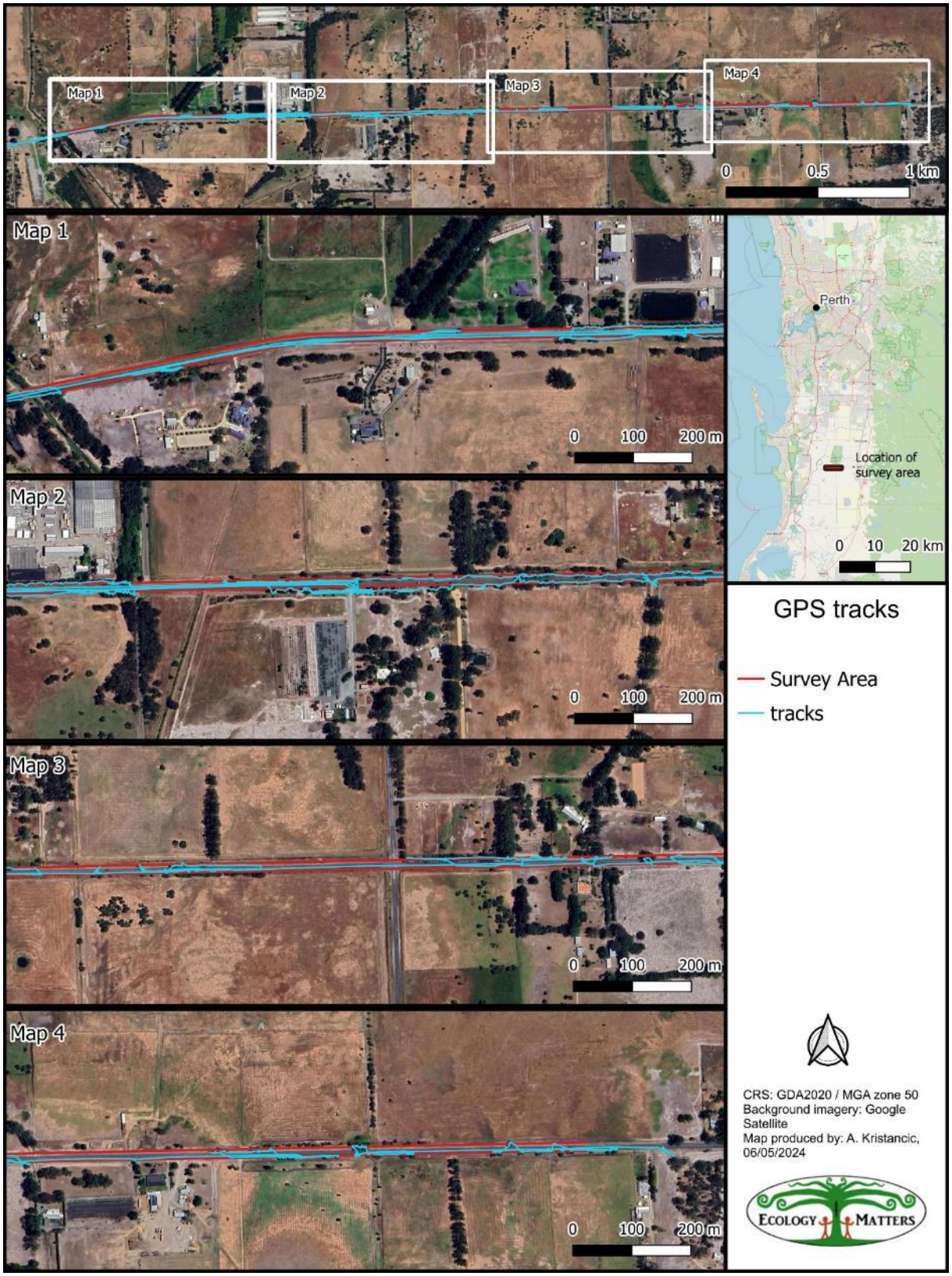

Figure 2-1 GPS tracks of field personnel.

2.2.1 Tree survey

The tree survey involved assessing all trees within the survey area and trees overhanging the survey area, as requested by the Shire. For trees within the survey area, the following information was recorded: tree identification number (waypoint and tag number), tree species, tree health and condition, GPS coordinates and the presence of any significant habitat features for fauna. An aluminium tree tag, printed with a unique tree identification number, was attached to each tree (except when trees were too small to allow attachment – in this case a unique tree identification number is given here by the waypoint only). Tags were placed on the trunk at chest height and facing the road where possible; where not possible, tags were placed at chest height in the most obvious location possible. Typical placement of a tree tag is shown in Plate 1. Trees which were overhanging the survey area or which were within the survey area but were too small to be tagged were not given a tree tag.

Tree condition was assessed based on the methodology of Webster (1978). The methodology focuses on six key areas: 1) trunk, 2) growth rate, 3) structure, 4) insect and disease problems, 5) crown development, and 6) life expectancy. Each area is given a rating out of either five or three and the highest possible total score is 26. Total scores that ranged from 23 to 26 were awarded the condition class 'Excellent', scores 19 to 22 were awarded 'Good', scores 14 to 18 were awarded the condition 'Fair', scores 10 to 13 were classed as 'Poor' and scores 6-9 were awarded 'Very Poor'. For more details see Webster (1978).

Throughout the tree survey, the ground was searched for evidence of foraging by black-cockatoos, and opportunistic observations were made of any fauna or fauna signs (scats, digs, burrows, etc).

Plate 1. Example of aluminium tag placement on trees in survey area.

2.2.2 Black-cockatoo assessment

2.2.2.1 Guidelines

Survey methodology followed the current federal referral guidelines for WA black-cockatoos (DAWE, 2022). As requested, foraging value was assessed based on the DAWE foraging quality scoring tool provided in the current federal referral guidelines (DAWE, 2022).

2.2.2.2 Breeding assessment

Based on the current referral guidelines for black-cockatoos (DAWE, 2022), a potential nesting tree was defined as any tree with a diameter at breast height (DBH) of at least 500 mm. All trees of DBH of at least 500 mm were recorded as potential nesting trees and examined for hollows. These trees were also included in the tree survey and associated information for each tree collected as per Section 2.2.1.

Suitable hollows for black-cockatoos are characterised by being vertical or near-vertical with a suitable-sized nest chamber at the base of the hollow, and a suitable-sized hollow entrance. The angle of the hollow and size of nest chamber is a key characteristic of a suitable black-cockatoo breeding hollow. While black-cockatoos favour vertical hollows for the nest chamber, the hollow entrance may be vertical, have a side entrance or have a horizontal spout entrance. All potential nesting treesare considered an important resource for the recovery of these species (DAWE, 2022).

2.2.2.3 Foraging assessment

<u>Foraging evidence</u>

Suitable foraging plants for black-cockatoos were identified along the survey area based on information from Groom (2011). Foraging trees were included in the tree survey as per Section 2.2.1. The area was searched for evidence of black-cockatoo foraging such as chewed Marri nuts or chewed Sheoak nuts. Foraging evidence was photographed and the following information was recorded: plant species, GPS coordinates, and species of black-cockatoo responsible.

<u>DAWE foraging quality scoring tool</u>

As per client requirements, the survey area was assessed according to the foraging quality scoring tool from the current federal referral guidelines for black-cockatoos (DAWE, 2022). This methodology involves starting with a score of 10 if suitable native vegetation is present, including along roadside areas and planted trees (in this case, eucalypt woodland along the roadside) and subtracting from this score depending on the presence or absence of other important features that are expected to affect the value of the area in terms of foraging for black-cockatoos. This process was completed for all three species of black-cockatoo. The score obtained via this scoring tool can be used in conjunction with Table 3 in the referral guidelines document (Referral thresholds for black-cockatoos, page 17, DAWE 2022) to help guide the decision making regarding whether to refer an action to the Minister for the Environment.

<u>BCE foraging score method</u>

The Bamford Consulting Ecologists (BCE) foraging score provides alternative foraging parameters to consider for each species of black-cockatoo. This method has been developed based on parameters outlined by DAWE (2022) but with more contextual information; it is recognized as providing as most

a realistic representation of the foraging value of a site for black-cockatoos as possible. The BCE foraging assessment involves assigning a foraging score to the survey area, based on three components – vegetation composition, condition and structure (a score out of six), context of the site (a score out of three), and species density (a score out of one). A higher score represents better foraging value. Details of this method are provided in Appendix 2. The foraging score provides a numerical value that is designed to provide information for DAWE, DWER and the Environmental Protection Authority (EPA) to assess impact significance and offset requirements.

2.2.2.4 Roosting assessment

Potential roosting trees were identified during the tree survey. Suitable roosting trees for black-cockatoos include large/tall trees of a variety of species. Note that if a targeted roosting assessment is required, the survey area needs to be revisited in the late afternoon. Information about roosting sites within the region was obtained from the Birdlife Australia roosting dataset (BirdLife Australia, 2023) as detailed in Table 2-1, with a 20 km radius around the site presented in the relevant figure. This dataset contains known (confirmed and potential) black-cockatoo roosting sites and is based on data collected during the Great Cocky Count.

2.3 Survey limitations

There were no survey limitations in terms of site access, time of survey, completeness of survey, experience of consultants and availability of relevant data. However, a key survey limitation in a breeding assessment is the inherent limitation of sighting hollows from the ground; hollows may not be obvious from the ground so may be missed, and features that appear to be hollows may in fact be solid. In addition, it is expected that additional foraging evidence may be obscured in some areas by tall and dense grass patches along the road.

3 Results

3.1 General fauna

There was one reptile and eight bird species recorded during the field assessment; these species are common species in degraded landscapes and in the local area (see Appendix 3).

3.2 Environmental context

3.2.1 Extent of remnant vegetation

The extent of native vegetation within 15-20 km of the survey area is shown in Figure 3-1. The survey area is not well connected to large patches of remnant vegetation and is surrounded mostly by agricultural land. There are linear strips of vegetation nearby expected to be mostly trees with weedy understorey which would provide connectivity for some species (e.g. nectivorous and canopy birds) through the landscape. For black-cockatoos, it is believed that gaps of more than 4 km may prevent individuals from reaching resources (DSEWPaC, 2012); the survey area is within 4 km of several areas of native vegetation, some of which connect to additional patches. Therefore, there is sufficient connectivity in this landscape that black-cockatoos could move between the survey area and surrounding remnant vegetation.

The amount of native vegetation remaining within the 'local area' (15 km buffer) is used to guide the context score given during the BCE foraging score assessment (see Section B: Site Context, Appendix 12). The context score recognizes that remnant vegetation in an otherwise heavily cleared region is of increased importance. The amount of native vegetation remaining within 15 km of the survey area is c. 6391 ha. The survey area as a whole (2.8 ha) represents 0.044 % of the native vegetation within 15 km. This information is used below when calculating the BCE foraging score for each species.

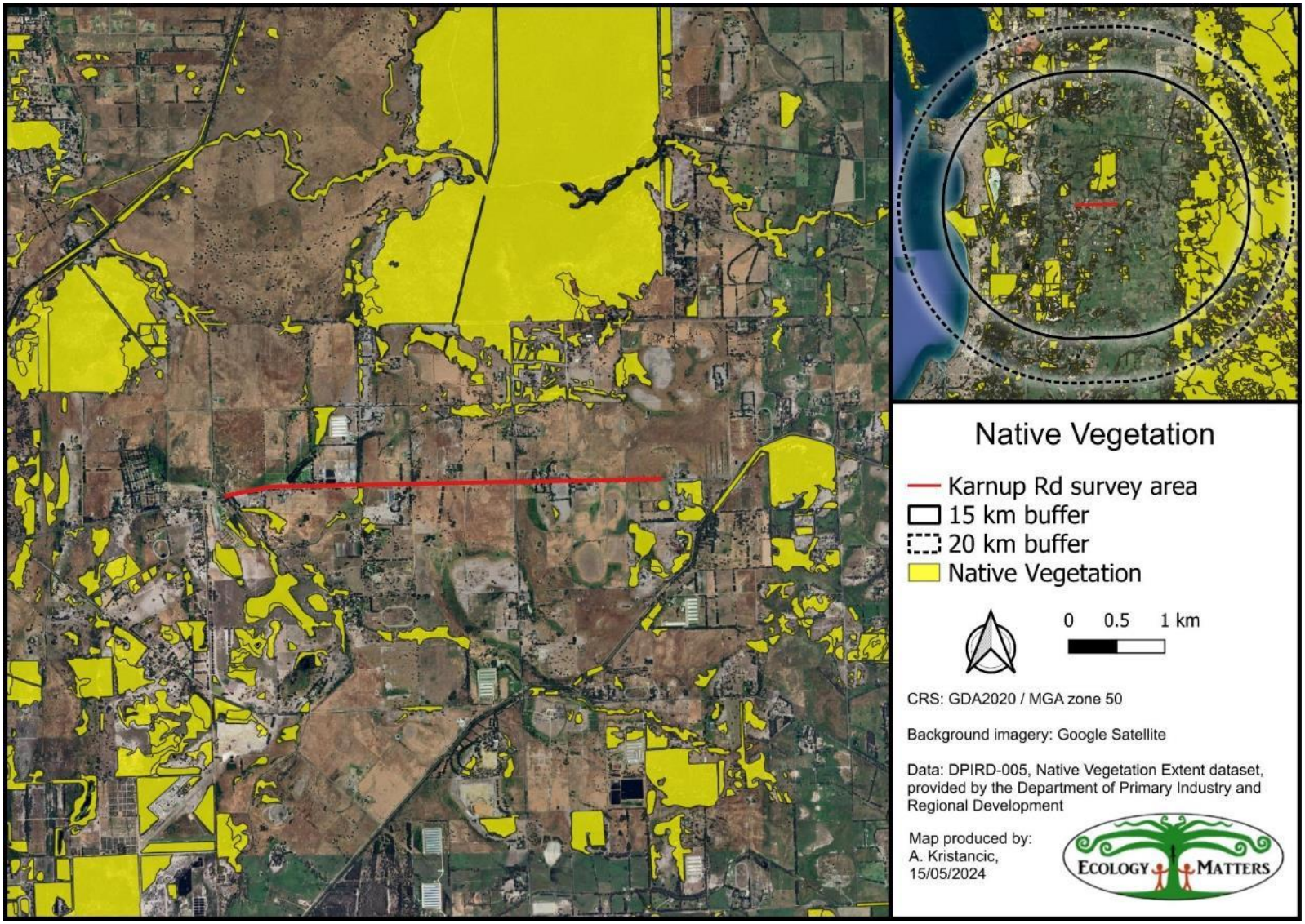

Figure 3-1. Remnant native vegetation within the vicinity of the survey area.

3.2.2 Pre-European vegetation types

Within 20 km of the survey area, there are seven pre-European vegetation types represented, and some of these will still exist in the form of remnant vegetation (although the majority of the vegetation in this area has been cleared for agriculture and residential development). Several of these vegetation types contain resources relevant to black-cockatoos (e.g. foraging species and/or potential nesting and roosting trees). The patch of remnant vegetation c. 1.5 km north of the survey area overlaps with vegetation type 7 which may contain *Banksia* woodland, a highly valuable foraging source for Carnaby's Black-Cockatoo. Other patches of remnant vegetation to the west overlap with vegetation types 3 (Jarrah, Marri and Wandoo) and 7 (Jarrah, Banksia or Casuarina), and are therefore likely to contain some foraging resources and potential nesting and roosting trees. To the east, the vegetation is significantly more intact and is expected to be primarily Jarrah and Marri (vegetation type 2) and Jarrah, Marri, and Wandoo (vegetation type 3), both of which provide foraging, breeding and roosting resources.

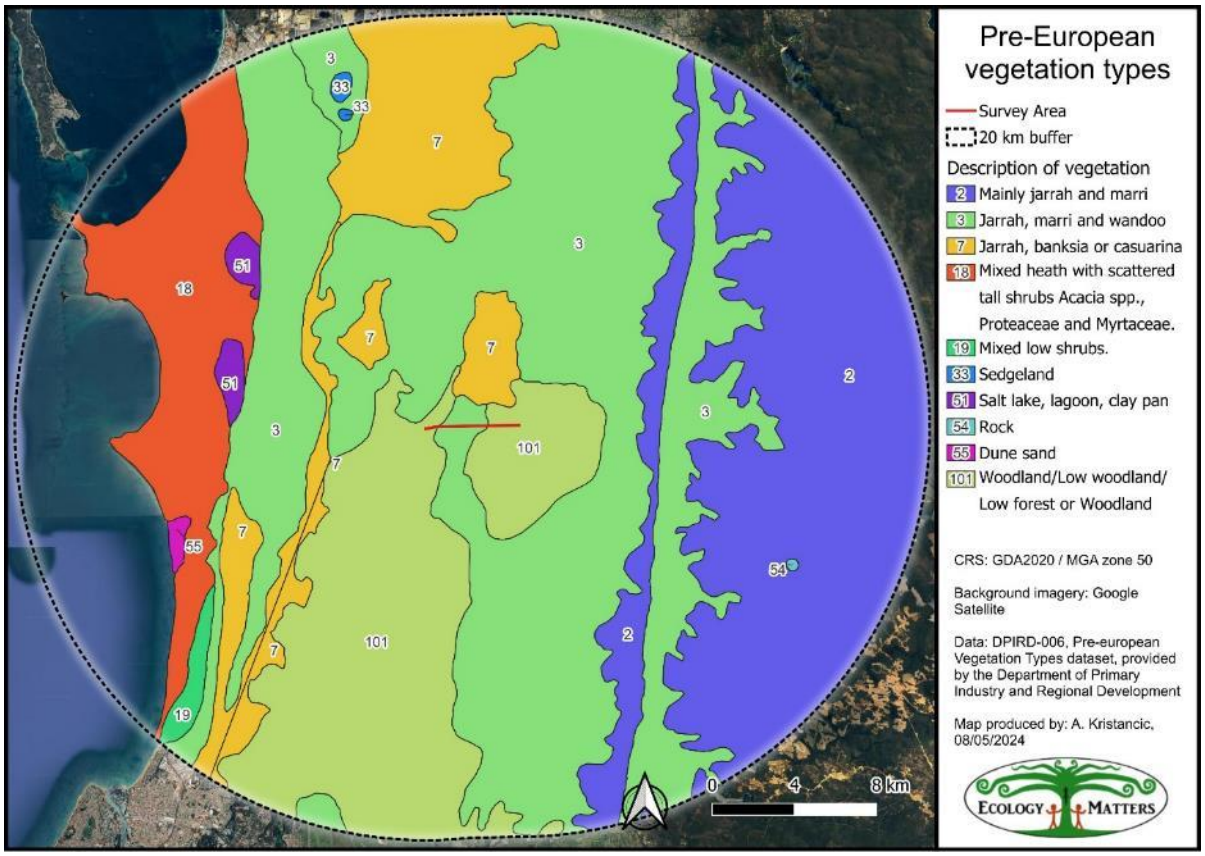

Figure 3-2. Pre-European vegetation types (DPIRD, 2024b) within 20 km of the survey area.

3.3 Tree survey

A total of 482 trees was recorded in the survey area - 333 were located within the clearing zone and 149 were overhanging the clearing zone. Of these, 318 trees were tagged; the others were either too small to be tagged or were overhanging the survey area. The locations of trees within the survey are given in Figure 3-3 to Figure 3-5. Representative photographs of trees are presented in Appendix 1.

The 333 trees within the clearing zone are comprised of 18 species (four identified to genus level only) from six plant families, plus an additional two unidentified species (an ornamental tree and a deciduous tree); see Table 3-1. The majority of trees within the clearing zone are in excellent condition (307 trees) with the remainder in good condition (14 trees), fair condition (two trees), poor condition (four trees) or very poor condition (six trees). The most common species of trees within the clearing zone are the Swamp Paperbark (*Melaleuca rhaphiophylla,* 100 specimens), Flooded Gum (*Eucalyptus rudis*, 79 specimens) and Marri (*Corymbia calophylla*, 57 specimens), with the remaining species each representing less than 10% of the total trees present. The 149 trees that are overhanging the clearing zone include 6 species, all from the Myrtaceae family. All trees that are overhanging the clearing zone are in excellent condition.

Details of all trees recorded during the tree survey are presented in Appendix 4.

Table 3-1 Tree species present in survey area

		Number of trees		
Latin Name	**Common Name**	**clearing zone**	**overhanging**	**Total**
Fabaceae				
Acacia saligna	Coojong	7		7
Proteaceae				
Grevillea sp.	Unknown Grevillea species	7		7
Myrtaceae				
Agonis flexuosa	Peppermint	1	1	2
Callistemon viminalis	Bottlebrush	15	106	121
Corymbia calophylla	Marri	57	2	59
Corymbia maculata	Spotted Gum	1		1
Corymbia sp.	Unknown Corymbia species	1		1
Eucalyptus rudis	Flooded Gum	79	2	81
Eucalyptus sp.	Introduced Eucalypt	28	37	65
Eucalyptus victrix	Snow Queen	1		1
Melaleuca preissiana	Stout Paperbark	16	1	17
Melaleuca rhaphiophylla	Swamp Paperbark	100		100
Melaleuca sp.	Unknown Melaleuca species	1		1
Casuarinaceae				
Allocasuarina fraseriana	Sheoak	3		3
Dasypogonaceae				
Kingia australis	Grass Tree	3		3
Pinaceae				
Pinus pinaster	Pine Tree	1		1
Unidentified				
	Deciduous Tree	11		11
	Ornamental Tree	1		1
Grand Total		**333**	**149**	**482**

Figure 3-3 Tree survey overview; locations of trees within and overhanging the survey area (clearing zone). Map 1 of 3.

Figure 3-4 Tree survey overview; locations of trees within and overhanging the survey area (clearing zone). Map 2 of 3.

Figure 3-5 Tree survey overview; locations of trees within and overhanging the survey area (clearing zone). Map 3 of 3.

3.4 Black-cockatoo assessment

3.4.1 Presence

Black-cockatoos were not recorded during the time of survey, but this does not mean they will not utilise the area. Foraging evidence was recorded (see Section 3.4.3.1) which suggests that the survey area is visited by black-cockatoos. Based on their known ranges (DAWE, 2022; DCCEEW, 2024a, 2024c, 2024b), Carnaby's and Forest Red-tailed Black-Cockatoos are expected to be regular visitors to the survey area while Baudin's Black-Cockatoo is expected to be a vagrant to the survey area.

3.4.2 Breeding assessment

There is potential black-cockatoo breeding habitat present in the survey area, with a total of 51 trees meeting the minimum DBH requirement of equal to or greater than 500 mm. Forty-eight of these trees were within the clearing zone, while three were overhanging the clearing zone (see Figure 3-6 to Figure 3-8).

There was only one tree which contained a hollow of suitable characteristics for breeding by black-cockatoos (based on hollow entrance and chamber size, hollow structure and hollow/spout angle) but contained no evidence of current use such as chew marks at the entrance (waypoint 459, tag # KA459; see front cover image and Figure 3-6); the hollow was currently occupied by bees. This tree contained additional hollows which were too small for black-cockatoos but which may be used by smaller parrots such as Galahs and Australian Ringnecks. None of the remaining potential nesting trees contained obvious hollows.

Based on the publicly available DBCA-064 dataset (DBCA, 2024b), there are no records of known breeding sites within 15 km of the survey area. The closest known breeding site in this dataset is c. 50 km south of the survey area. However, successful breeding (in artificial hollows) has been documented in the Baldivis Children's Forest, which is between 8-12 km from the Karnup Road survey area (Baldivis Children's Forest, 2024). A previous study located 10 km northeast of the study area recorded breeding sites 6 km (by Carnaby's Black-Cockatoo) and 13 km from the current survey area (by Forest Red-tailed Black-cockatoo) (Huang et al., 2023).

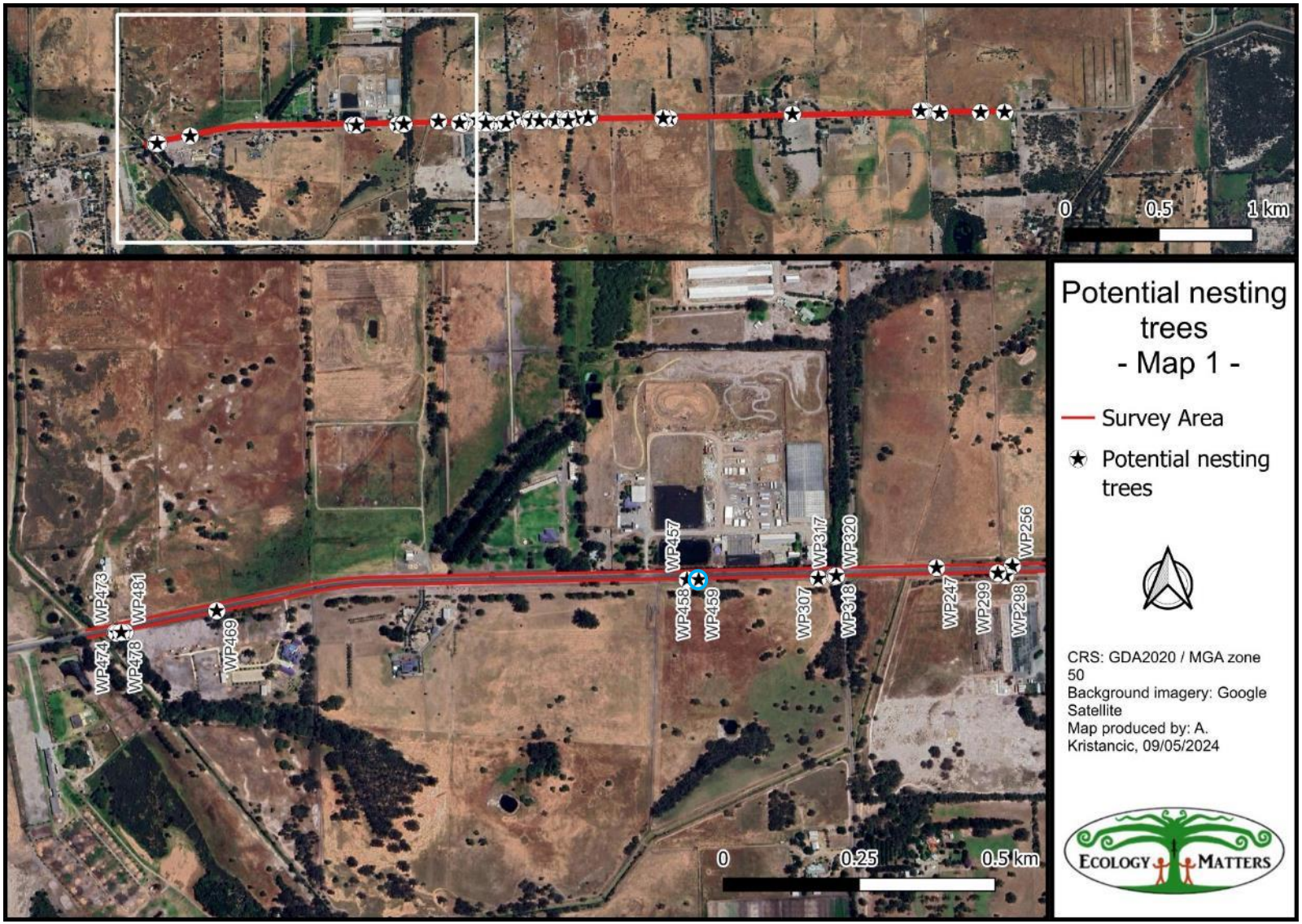

Figure 3-6 Locations of potential black-cockatoo breeding trees, map 1 of 3; tree with suitable black-cockatoo hollow indicated by blue ring (WP459).

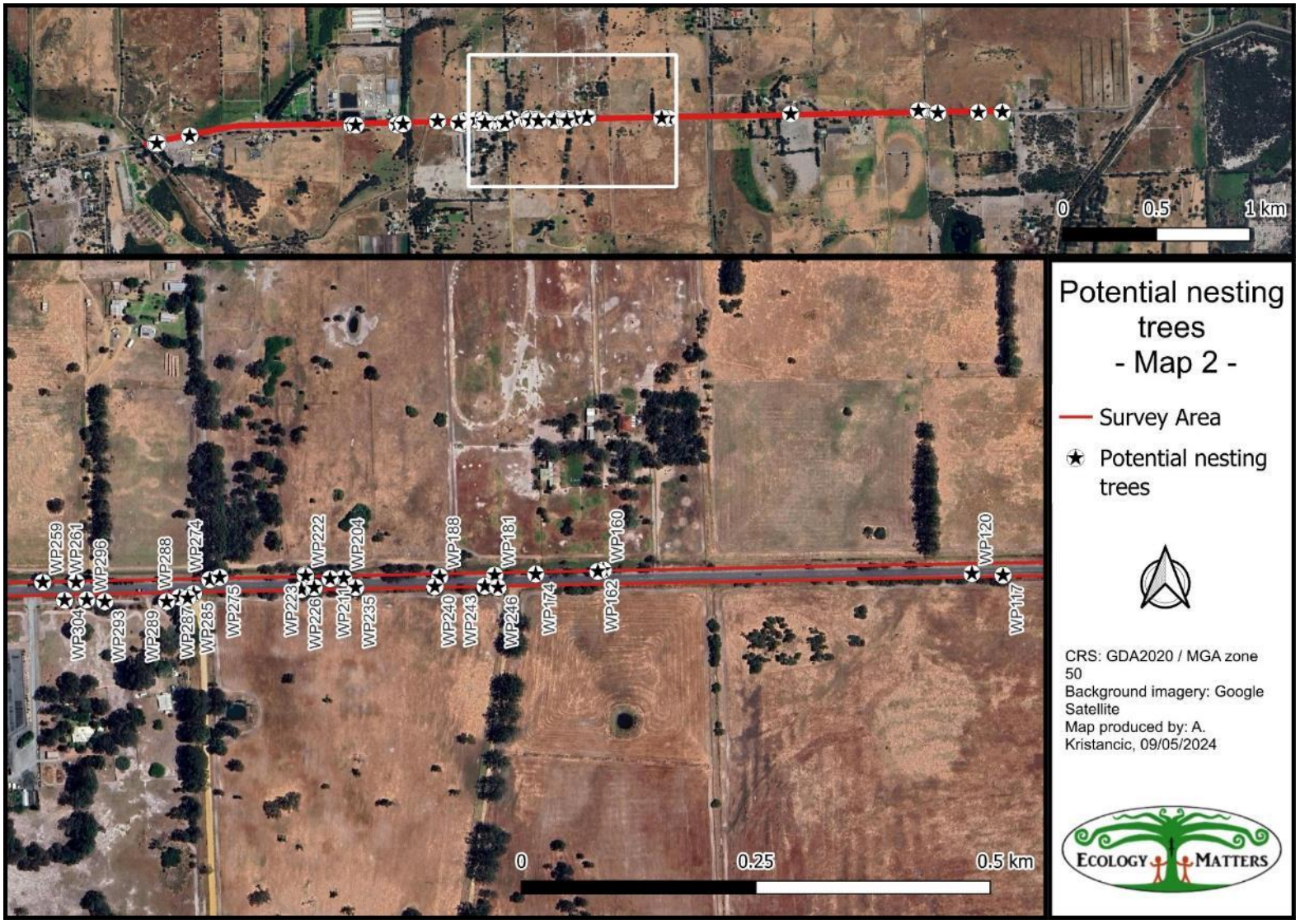

Figure 3-7 Locations of potential black-cockatoo nesting trees, map 2 of 3.

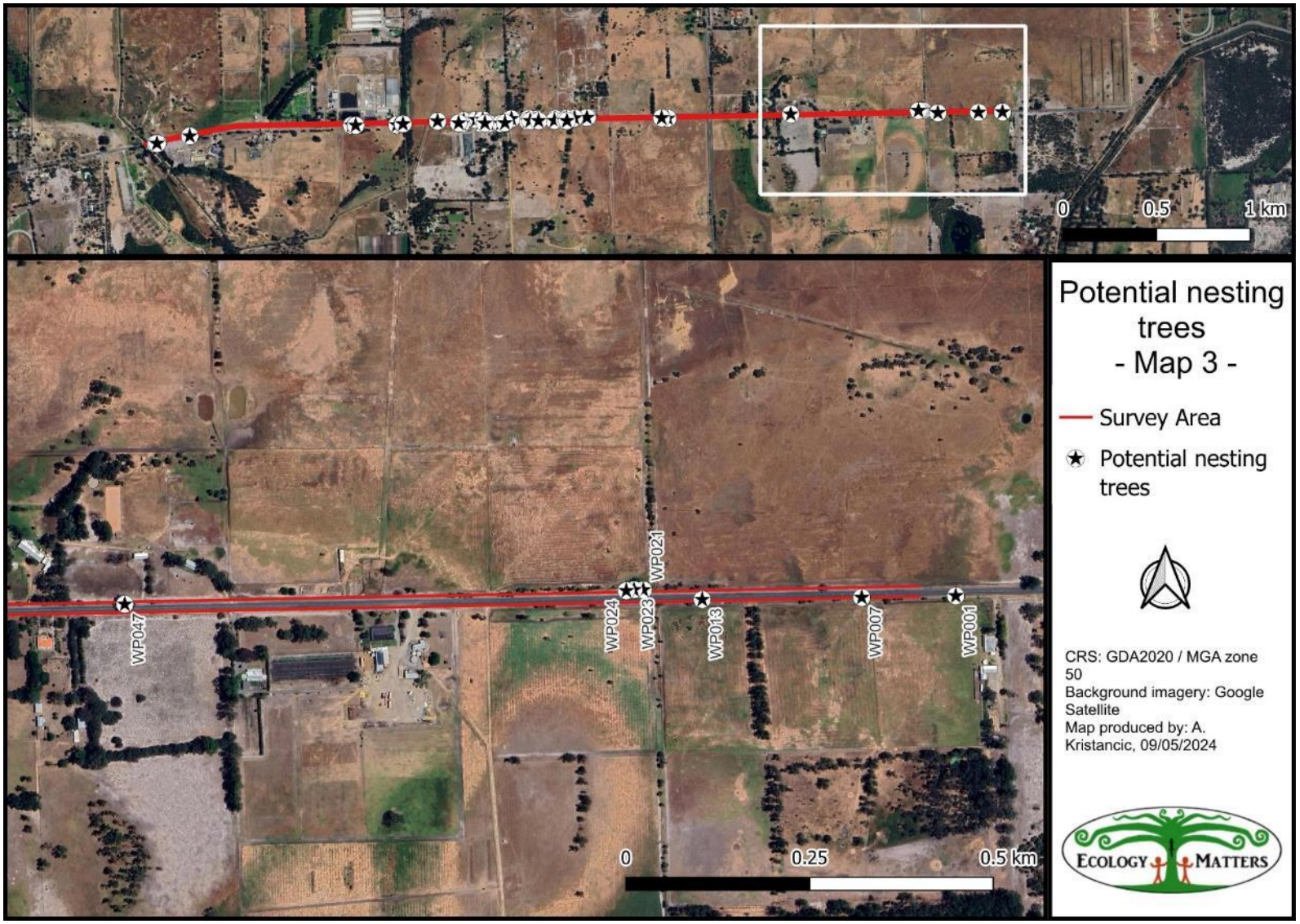

Figure 3-8 Locations of potential black-cockatoo nesting trees, map 3 of 3.

3.4.3 Foraging assessment

3.4.3.1 Evidence of foraging

Foraging evidence by the Forest Red-tailed Black-Cockatoo was recorded at waypoint 010 on a Marri nut (Figure 3-9). The location of this foraging evidence is shown in Figure 3-10. While only one nut was found, there are almost certainly additional nuts likely to be present (but which may have been obscured by the tall grass along the roadside) as the species forages in flocks and on many nuts at a time. This foraging evidence is moderately old, suggesting the survey area has been previously visited by the species for foraging.

Figure 3-9 Foraging evidence on Marri nut by Forest Red-tailed Black-Cockatoo, near tree KA010 (WP010). Note the Marri nut was not accessible (across the fence) so a scale object could not be included in the photograph.

Figure 3-10 Location of Forest Red-tailed Black-Cockatoo foraging evidence.

3.4.3.2 Summary of foraging value

Within the survey area, there were at least seven plant species which are known food plants for black-cockatoos; these were represented by 193 trees. Of particular importance is Marri which is a mainstay food plant for black-cockatoos.

3.4.3.3 DAWE foraging quality scoring tool

The assessment of the current survey area against the DAWE foraging quality scoring tool is presented in Table 3-2. The survey area scored a moderate value of 6/10 for Baudin's Black-Cockatoo and a high value of 8/10 for Carnaby's Black-Cockatoo and 10/10 for Forest Red-tailed Black-Cockatoo.

Table 3-2 Assessment of survey area against DAWE foraging quality scoring tool (DAWE, 2022)

Species		Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black-Cockatoo
Starting score		**Start at a score of 10**	**Start at a score of 10**	**Start at a score of 10**
Attribute	**Subtractions**	**Context adjustor (attributes reducing functionality of foraging habitat)**		
Foraging potential See Section 2.2.2.3	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	**-2** No evidence of foraging	**-2** No evidence of foraging	N/A Evidence of foraging on Marri
Connectivity See Section 3.1	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	N/A for all species 7 km to Serpentine National Park and the hills/scarp to the east. 1.5 km to large Nature Reserve to the north. See Figure 3-1 for extent of native veg within 20 km.		
Proximity to breeding See Section 3.4.2	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat	**-2** Breeding not known to occur within 12 km (DCCEEW, 2024d), not within the predicted breeding range for this species (map in DAWE, 2022)	N/A Known breeding 6 km and 8 km from survey area (DBCA, 2023). Breeding known to occur within 12 km (DCCEEW, 2024d)	N/A Breeding known to occur 13 km from survey area (Huang et al., 2023).
Proximity to roosting See Section 3.4.4	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	N/A Inconclusive evidence(DCCEEW, 2024d)	N/A 12 known roost sites within 20 km (BirdLife Australia, 2023).	N/A 15 known roost sites within 20 km (BirdLife Australia, 2023)

Impact from significant plant disease	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	N/A No evidence of disease affecting more than 50% of Marri	N/A No evidence of disease affecting more than 50% of foraging plants	N/A No evidence of disease affecting more than 50% of Marri
Total score		***6***	***8***	***10***
Appraisal	Foraging habitat within the survey area consists of scattered trees and dense stands of trees which are black-cockatoo food plants. For Baudin's and Forest Red-tailed Black-Cockatoos, the main foraging species in the survey area is Marri. For Carnaby's Black-Cockatoo, the survey area includes a variety of potential foraging species including Marri, other *Corymbia* spp., bottlebrush, *Grevillea* spp. and Pine, as well as *Acacia saligna* and *Agonis flexuosa* which are documented to be used for feeding (Groom, 2011) but are likely to be used very rarely. The remainder of the survey area consists of cleared degraded land of negligible foraging value. Within 20 km of the survey area there are several areas of native vegetation which would contain suitable foraging habitat, including the mainstay food plant *Banksia* for Carnaby's Black-Cockatoo (see Figure 3-2). These areas include Serpentine National Park and the hills/scarp that starts 7 km to the east of the survey area, a Nature Reserve 1.5 km north of the survey area, and several patches 9-10 km west of the project area. There are also multiple small patches and lines of trees in this surrounding landscape that are likely to include mature Marri and eucalypt trees (either planted or remnant). Approximately 1 km east of the survey area there is a small patch of scattered *Banksia* trees which provide high quality foraging habitat for Carnaby's Black-Cockatoo. The survey area is outside the predicted breeding range of Baudin's Black-Cockatoo but within the breeding range for Carnaby's Black Cockatoo (the breeding range is not specified for Forest Red-tailed Black-Cockatoo)(DAWE, 2022). Breeding by Carnaby's Black-Cockatoo has been confirmed 6 km and 8 km away from the survey area, according to data from DBCA (DBCA, 2023). The latter location is Baldivis Children's Forest, in which 5 out of 6 artificial cockatoo tubes contained chicks in 2023 (Baldivis Children's Forest, 2024); it is not clear whether these were only used by Carnaby's or also by Forest Red-tailed Black-Cockatoos. Breeding by Forest Red-tailed Black-Cockatoos has been confirmed 13 km from the survey area Huang et al. (2023). The Protected Matters Search Tool (DCCEEW, 2024d) states that roosting by Baudin's Black-Cockatoo is known to occur within 12 km – there is limited information available regarding the nature of this roosting in terms of exact location and how recently this was confirmed. For Carnaby's and Forest Red-tailed Black-Cockatoo, there are 12 and 15 known roosting sites, respectively, within 20 km (based on BirdLife Australia roosting data, from the Great Cocky Count). For each species, roosting at one or more of these sites within 20 km was confirmed as recently as 2022 (note that available data only goes until 2022, so birds may have also been counted at these sites in 2023).			

3.4.3.4 BCE foraging score method

The BCE foraging score method found the survey area to be of low to moderate foraging value for black-cockatoos. Note that these apply only to areas which contained shrubs and trees as the cleared areas generally provide negligible foraging value for black-cockatoos. Both Carnaby's Black-Cockatoo and Forest Red-tailed Black-Cockatoos scored a total of 4/10 while Baudin's Black-Cockatoo scored a total of 2/10 (Table 3-3).

There are foraging opportunities for all three black-cockatoo species in the survey area. There are stands of Marri across the survey area and these are the preferred foraging species for both Baudin's Black-Cockatoo and Forest Red-tailed Black-Cockatoo (the latter species also feeds on Sheoak that is present in the survey area). However, in the context of the landscape, there are only a few foraging trees in a degraded habitat and thus the vegetation condition was given a score of 2/6. While Carnaby's Black-Cockatoo feed on Marri less predominantly, there were additional food plant species present, including *Grevillea* spp., Pine, Bottlebrush and Sheoak, so vegetation condition was given 2/6.

The project area represents 0.044% of the native vegetation remaining within 15 km, therefore the maximum context score suggested for all three species is 0. However, given the high level of clearing in the region, small areas of foraging habitat can be recognized as significant, and the context score adjusted accordingly. This is particularly relevant when the foraging habitat being assessed forms a corridor that assists with connectivity between other patches of native vegetation. Therefore, the context score for Carnaby's and Forest Red-tailed Black-Cockatoo was increased to 1/3, to reflect the local significance of the vegetation, while the context score for Baudin's was given 0/3 because they are considered vagrants in the survey area. Although the low vegetation score for Forest Red-tailed Black-Cockatoos may indicate a context score of 0/3 is applicable, based on Appendix 12, the fact that foraging evidence from this species was observed in the survey area indicates the foraging resources are being utilized by this species and a context score of 1/3 is considered suitable.

A species stocking rate score of 0 was given for Baudin's Black-Cockatoo as it is not expected to visit the survey area regularly. A score of 1 was given for the two other species as both are expected to visit the survey area on a regular basis, and since foraging evidence from Forest Red-tailed Black-Cockatoos was observed during the survey period.

Table 3-3 Foraging values for each black-cockatoo species

Species	Site Condition (out of 6)	Site Context (out of 3)	Species Stocking Rate (0 or 1)	Total (out of 10)
Carnaby's Black-Cockatoo	2	1	1	4
Baudin's Black-Cockatoo	2	0	0	2
Forest Red-tailed Black-Cockatoo	2	1	1	4

3.4.3.5 Summary for foraging assessment

The DAWE tool gave a moderate to high score for black-cockatoos while the BCE method gave a low to moderate score for black-cockatoos. The lower scores of the BCE method reflect the extent and quality

of vegetation present in the survey area within the context of the local area and the weighting given to each factor (vegetation condition, site context and species density), which are not considered in the DAWE tool. Despite these differences, they both suggest the survey area provides suitable foraging habitat for all three species of black-cockatoo.

3.4.4 Roosting assessment

Within 20 km of the survey area, there are 45 confirmed roosting sites, and additional potential roosting sites, based on the BirdLife Australia Great Cocky Count dataset (BirdLife Australia, 2023). These known roosting sites are shown in Figure 3-11. Within this 20 km buffer, 32 roost sites are confirmed used by Forest Red-tailed Black-Cockatoos and 31 roost sites are confirmed used by white-tailed-black-cockatoos. For each species, roosting at one or more of these sites within 20 km was confirmed as recently as 2022 (note that available data only goes until 2022, so birds may have also been counted at these sites in 2023 The BirdLife dataset does not distinguish between Carnaby's and Baudin's (instead combining them as 'white-tailed black-cockatoos'). However, given the vagrant status of Baudin's Black-Cockatoo in this region, it is most likely that the roosting sites reported here as used by 'white-tailed black-cockatoos' were of Carnaby's Black-Cockatoo.

As described in the methods, a variety of species of large tree were considered potential roosting trees. The following species were considered potential roosting trees (unless they were found to be less than 200 mm DBH):

- Marri (*Corymbia calophylla*)
- Spotted Gum (*Corymbia maculata*)
- Unidentified *Corymbia* sp.
- Flooded Gum (*Eucalyptus rudis*)
- Introduced eucalypts
- Pine (*Pinus pinaster*)

Based on this assessment, there are 182 large trees that are considered potentially suitable roosting trees for black-cockatoos. Of these, 141 are within the clearing zone and 41 are overhanging the clearing zone.

A water source nearby is considered an important feature of a black-cockatoo roost as they drink just before roosting and just after waking; there are water sources in the form of dam and water features in rural properties nearby so the survey area provides suitable roosting opportunities for black-cockatoos.

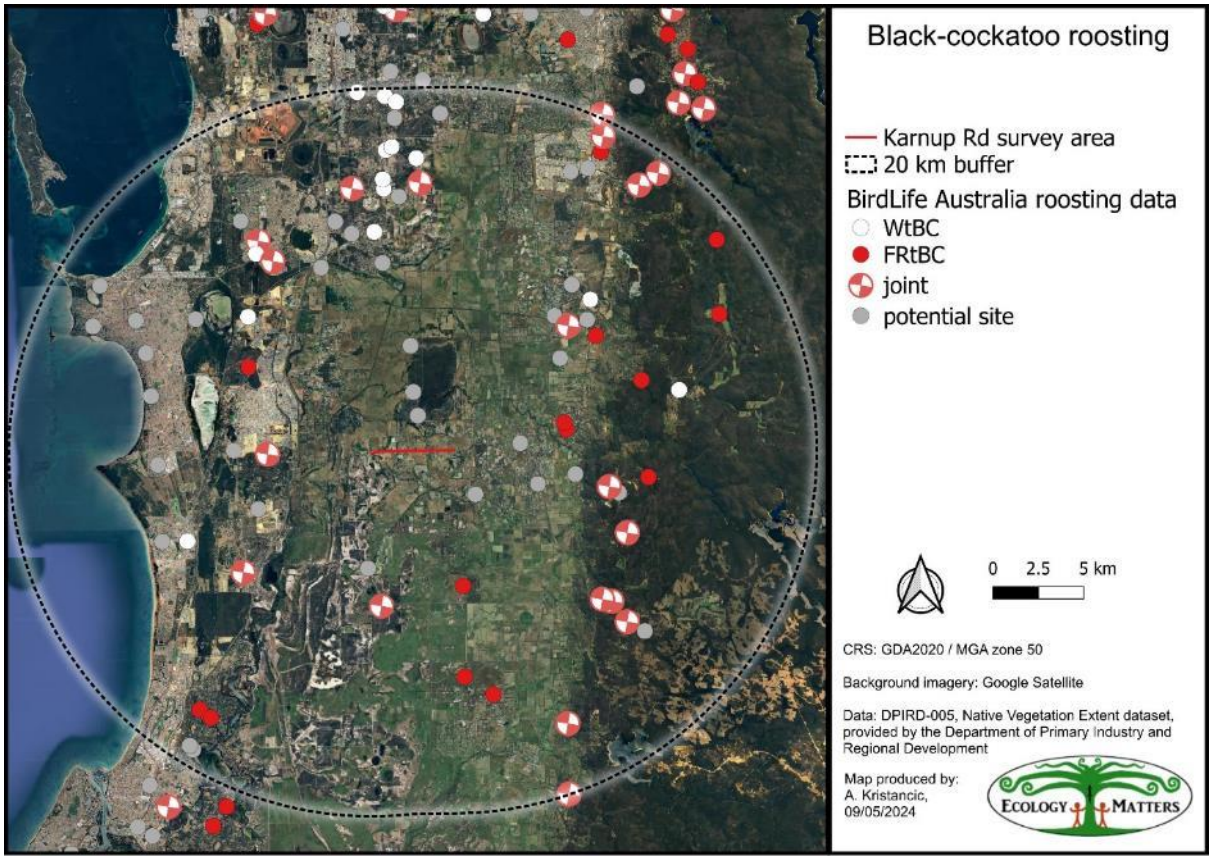

Figure 3-11. Known black-cockatoo roosting sites based on BirdLife Australia's Great Cocky Count dataset.

3.4.5 Federal referral information

The current federal referral guidelines for black-cockatoos (DAWE, 2022) contains a table of referral thresholds for black-cockatoos (see Table 3-4 below). Regarding nesting/breeding habitat, these guidelines suggest a referral to the minister based on the 'loss of potential nesting trees':

- Loss of potential nesting trees
    - There are 51 potential nesting trees (trees with DBH greater than 500 mm) within the survey area. Forty-eight of these are within the clearing zone and three are overhanging.
    - The referral guidelines state that "clearing of breeding habitat is a known threat to the 3 species as a lack of tree hollows is a limiting factor".
    - Removal of trees that have the potential to develop nesting hollows in the future is not consistent with the objectives of the Carnaby's Black-Cockatoo recovery plan.

In relation to foraging habitat, the guidelines suggest a referral to the minister based on a 1 ha threshold of habitat which *may be impacted*, however, it is not clear on the definition of impact area. The survey area is approximately 2.7 ha in size, however, only up to 0.2 ha of the area within the clearing zone contains black-cockatoo foraging habitat. This calculation is based on the total linear metres of habitat containing trees of foraging value multiplied by 3m (the width of the survey area). Both sides of the road were assessed independently, and only habitat within the clearing zone was

included. Inclusion of road verge where foraging habitat overhangs the clearing zone gives an area of up to 0.3 ha.

If the impact area is taken to be 0.2 ha, the removal of foraging habitat proposed by the Shire is unlikely to require a referral to the minister.

However, if the impact area is taken to be 2.7 ha, this proposed action is likely to require a referral to the minister. This is based on the following:

- Loss of foraging habitat
    - Based on the foraging quality assessment tool in the federal referral guidelines (DAWE, 2022), the score for the survey area is 6 for Baudin's Black-Cockatoo, 8 for Carnaby's Black-Cockatoo and 10 for Forest Red-tailed Black-Cockatoo; scores between 5-10 are defined in the referral guidelines as 'high-quality native foraging habitat'.
    - The referral guidelines state that 'clearing of foraging habitat is a known threat to the 3 species" and that "these resources are critical at all stages of life for the species".

As per the mitigation measures suggested in the federal referral guidelines, protection of trees that have the potential to provide hollows into the future is consistent with recovery objectives for black-cockatoos. Protection of potential nesting trees (those with DBH equal to or greater than 500 mm) will minimize the risk of this action having a significant impact on black-cockatoos.

Table 3-4 Referral thresholds for black-cockatoos, taken from DAWE 2022

Table 3 Referral thresholds for black cockatoos

Attribute	Referral threshold	Reasons
Breeding	Any loss of / impact upon known, suitable or potential nesting trees, and the habitat around these trees, is highly likely to require a referral to the minister. Loss of any potential nesting habitat is likely to require a referral to the minister.	As identified in the conservation planning documents, clearing of breeding habitat is a known threat to the 3 species[a] as a lack of tree hollows is a limiting factor. Habitat loss, habitat degradation, lack of recruitment, fire and competition are causing the scarcity of nesting resource[b].
High-quality native foraging habitat	Loss of greater than or equal to 1 ha of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (see Appendix A) and takes into account context i.e. proximity of the impact site to important attributes.	As identified in the conservation planning documents, clearing of foraging habitat is a known threat to the 3 species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources[c]. These resources are critical at all stages of life for the species.
Lower-quality native foraging habitat	Loss of greater than or equal to 10 ha of foraging habitat scoring 0-4 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (see Appendix A) and takes into account context i.e. proximity of the impact site to important attributes.	As identified in the conservation planning documents, clearing of foraging habitat is a known threat to the 3 species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources. These resources are critical at all stages of life for the species.
Exotic foraging habitat	Loss of greater than or equal to 1 ha of predominantly exotic habitat (e.g. Cape Lilac trees and pine trees) known to be utilised by black cockatoos is likely to require a referral to the minister.	As identified in the conservation planning documents, clearing of exotic foraging habitat is a known threat to the 3 species, noting that its value in comparison to native habitat depends upon the context.
Night roosting habitat	Removal of any part of a known night roosting site is likely to require referral to the minister.	As identified in the conservation planning documents, clearing of night roosting habitat is a known threat to the 3 species.

Note: Referral threshold described may be a result of direct loss, as well as loss from indirect and facilitated impacts.

a Chapman (2008); Department of Parks and Wildlife (2013)

b Johnstone & Kirkby (2008); Saunders et al. (2014)

c Saunders (1990); Johnstone et al. (2017)

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5 Appendices

Appendix 1. Representative photographs of survey area and trees.

A. Site photographs showing scattered native or exotic trees and shrubs over a degraded grassy understorey:

B. Representative photographs of trees:

Paperbark (*Melaleuca rhaphiophylla or Melaleuca preissiana*) trees

Example of tree overhanging clearing zone and included in survey but not tagged (Marri *Corymbia calophylla*)

Flooded Gum (*Eucalyptus rudis*)

Bottlebrush (*Callistemon viminalis*)

Appendix 2. Scoring system for the assessment of foraging value of vegetation for black-cockatoos; developed by BCE and based on EPBC guidance (taken from https://ecologists.bamford.id.au, reproduced with permission).

Introduction

Application of the Offset Assessment Guide (offsets guide) developed by the federal environment department for assessing Black-Cockatoo foraging habitat requires the calculation of a score out of 10. The following system has been developed by Bamford Consulting Ecologists (BCE) with assistance from Quessentia Consulting to provide an objective scoring system that is practical and can be used by trained field zoologists with experience in the environments frequented by the species.

The foraging value score provides a numerical value that reflects the significance of vegetation as foraging habitat for Black-Cockatoos, and this numerical value is designed to provide the information needed by the Federal Department of Agriculture, Water and the Environment (DAWE) to assess impact significance and offset requirements. The foraging value of the vegetation depends upon the type, density and condition of trees and shrubs in an area and can be influenced by the context such as the availability of foraging habitat nearby. The BCE scoring system for value of foraging habitat has three components as detailed above. These three components are drawn from the DAWE offsets guide but the scoring approach was developed by BCE and includes a fourth (moderation) component.

Note that the scoring system can only be applied within the range of the species or at least where the species could reasonably be expected to occur based upon existing information.

Calculating the total score (out of 10) requires the following steps:

A. Site condition. Determining a score out of six for the vegetation composition, condition and structure; plus
B. Site context. Determining a score out of three for the context of the site; plus
C. Species stocking rate. Determining a score out of one for species density.
D. Determining the total score out of 10, which may require moderation for context and species density with respect to the site condition (vegetation) score. Moderation also includes consideration of pine plantations as a special case for foraging value.

The BCE scoring system places the greatest weight on site condition (scale of 0 to 6) because this has the highest influence on the foraging values of a site, which in turn is the fundamental driver in meeting ecological requirements for continued survival.

Site context has a lower weight (scale of 0 to 3) in recognition of the mobility of the species, which means they can access good foraging habitat even in fragmented landscapes, but allowing for recognition of the extent of available habitat in a region and context in relation to activity (such as breeding and roosting). The application of scoring site context is further discussed below.

Species stocking rate is given a low weight (0 to 1) as it is a means only of recognising that a species may or may not be abundant at a site, but that abundance is dependent upon site condition and context and is thus not an independent variable. The abundance of a species is also sensitive to sampling effort, and to seasonal and annual variation, and is therefore an unreliable indicator of actual importance of a site to a species.

Calculation of scores and the moderation process are described in detail below.

A. <u>Site condition. Vegetation composition, condition and structure scoring</u>

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

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	**Baudin's Black-Cockatoo**	**Forest Red-tailed Black-Cockatoo**
2	Low foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have < 10% projected foliage cover; • Woodland with tree banksias 2-5% projected foliage cover; • Woodland with tree banksias (of key species *B. attenuata* and *B. menziesii*) with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Open eucalypt woodland/mallee of small-fruited species; • Paddocks that are densely vegetated with melons or other known food-source weeds (e.g. *Erodium* spp.) that represent a short-term and/or seasonal food source.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g. Marri and Jarrah) 1-5% projected foliage cover; • Marri-Jarrah Woodland with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants <10% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants <10% projected foliage cover (establishing food sources with good long-term viability); • Urban areas with scattered foraging trees.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g. Marri, Jarrah) 1-5% projected foliage cover; • Marri-Jarrah Woodland with <10% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Woodland with <10% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants <10% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants <10% projected foliage cover (establishing food sources with good long-term viability); • Urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.

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

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

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	**Baudin's Black-Cockatoo**	**Forest Red-tailed Black-Cockatoo**
5	Moderate to High foraging value. Examples: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with 40-60% projected foliage cover; • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 40-60% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term). • Pine plantations with trees more than 10 years old (but see pine note below in moderation section).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Parkland-cleared Eucalypt Woodland/Forest with known food plants >60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants >60% projected foliage cover (establishing food sources with good long-term viability).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with > 60% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants >60% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants >60% projected foliage cover (establishing food sources with good long-term viability).

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	**Baudin's Black-Cockatoo**	**Forest Red-tailed Black-Cockatoo**
6	High foraging value. Example: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term). • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have >60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).

Vegetation structural class terminology follows Keighery (1994).

B. Site context.

Site Context is a function of site size, availability of nearby habitat and the availability of nearby breeding areas. Site context includes consideration of connectivity, although Black-Cockatoos are very mobile and will fly across paddocks to access foraging sites. Based on BCE observations, Black-Cockatoos are unlikely to regularly go over open ground for a distance of more than a few kilometres and prefer to follow tree-lines.

The maximum score for site context is 3, and because it is effectively a function of presence/absence of nearby breeding and the distribution of foraging habitat across the landscape, the following table, developed by Bamford Consulting in conjunction with the DAWE (2022), provides a *guide* to the assignation of site context scores. Note that 'local area' is defined as within a 15 km radius of the centre point of the study site. This is greater than the maximum distance of 12km known to be flown by Carnaby's Black-Cockatoo when feeding chicks in the nest.

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

The table above provides weighting for where nearby breeding is known (or suspected) and for the proportion of foraging habitat within 15 km represented by the site being assessed. Some adjustments may be needed based on the judgement of the assessor and in relation to the likely function of the site. For example, a small area of foraging habitat (e.g. 0.5% of such habitat within 15 km) could be upgraded to a context of 2 if it formed part of a critical movement corridor. In contrast, the same sized area of habitat, of the same local proportion, could be downgraded if it were so isolated that birds could never access it.

C. Species density (stocking rate).

Species stocking rate is described as "the usage and/or density of a species at a particular site" in the offsets guide. The description also implies that a site supports a discrete population, which is unlikely in the case of very mobile black-cockatoos. Assignation of the species density score (0 or 1) is based upon the black-cockatoo species being either abundant or not abundant. A score of 1 is used where the species is seen or reported regularly and/or there is abundant foraging evidence. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year. A score of 0 is used when the species is recorded or reported very infrequently and there is little or no

foraging evidence. Where information on actual presence of birds is lacking, a species density score can be assigned by interpreting the landscape and the site context. For example, a site with a moderate condition score that is part of a network of such habitat where a black-cockatoo species is known would get a species density score of 1 even without clear presence data, while a species density score of 0 can be assigned to a site where the level of usage can confidently be predicted to be low.

D. Moderation of scores for the calculation of a value out of 10.

The calculation out of 10 requires the vegetation characteristics (out of 6) to be combined with the scores given for context and species density. It is considered that the context and density scores are not independent of vegetation characteristics; otherwise habitat of absolutely no value for black-cockatoo foraging (such as concrete or a wetland) could get a foraging score out of 10 as high as 4 if it occurred in an area where the species breed (context score of 3) and are abundant (species density score of 1). Similarly, vegetation of negligible or low characteristics which could not support black-cockatoos could be assigned a score as high as 6 out of 10. In that case, the score of 6 would be more a reflection of nearby vegetation of high characteristics than of the foraging value of the negligible to low scoring vegetation. The Black-Cockatoos would only be present because of vegetation of high characteristics, so applying the context and species density scores to vegetation of low characteristics would not give a true reflection of their foraging value.

For this reason, the context and species density scores need to be moderated for the vegetation characteristic score to prevent vegetation of little or no foraging value receiving an excessive score out of 10. A simple approach is to assign a context and species density score of zero to sites with a Condition score of low (2), negligible (1) or none (0), on the basis that birds will not use such areas unless they are adjacent to at least low-moderate quality foraging habitat ($\geq$3). The approach to calculating a score out of 10 can be summarised as follows:

Vegetation composition, condition and structure score	Context score	Species density score
3-6 (low/moderate to high value)	Assessed as per B above	Assessed as per C above
0-2 (no to low value)	0	0

Note that this moderation approach may require interpretation depending on the context. For example, vegetation with a condition score of 2 could be given a context score of 1 under special circumstances. Such as when very close to a major breeding area or if strategically located along a movement corridor.

Pine plantations

Pine plantations are an important foraging resource for Carnaby's Black-Cockatoo (only) but are not directly comparable with native vegetation. In comparing native vegetation with pine plantations for the purpose of calculating offsets, the following should be noted:

- Pine plantations are a commercial crop established with the intention of being harvested and thus have short-term availability (30-50 years), whereas native vegetation is available indefinitely if protected. Due to the temporary nature of pines as a food source, site condition and context differs between pines and native vegetation.
- Although pines provide a high abundance of food in the form of seeds, they are a limited food resource compared with native vegetation which provides seeds, insect larvae, flowers and nectar. The value of insect larvae in the diet of Carnaby's Black-Cockatoo has not been quantified, but in the vicinity of Perth, the birds forage very heavily on insect larvae in young cones of *Banksia attenuata* in winter, ignoring the seeds in these cones and seeds in older cones on the same trees (Scott & Black, 1981, M. Bamford pers. obs). This suggests that insect larvae are of high nutritional importance immediately prior to the breeding season.
- Pine plantations have very little biodiversity value other than their importance as a food source for Carnaby's Black-Cockatoos. They inhibit growth of other flora. While this is not a factor for direct consideration with respect to Carnaby's Black-Cockatoo, it is a factor in regional conservation planning of which offsets for the cockatoos are a part.

Taking the above points into consideration, it is possible to assign pine plantations a foraging value as follows:

- Site condition. The actual foraging value of pines is high. Stock *et al.* (2013) report that it takes nearly twice as many seeds of *Pinus pinaster* to meet the daily energy requirements for Carnaby's Black-Cockatoo compared with Marri, and three times as many *P. pinaster* seeds compared with Slender Banksia. However, pines are planted at a high density so the food supply per hectare can be high. Taking account of the lack of variety of food from pines, this suggests a site condition score of 4 or 5 out of 6 (5 is used in Section A above). As a source of food, pines are thus comparable to the best banksia woodland. This site condition score then needs to be adjusted to take account of the short-term nature of the food supply (for pine plantations to be harvested. Where pines are 'ornamental, such as in some urban contexts, they can be treated as with other trees in urban landscapes). The foraging value of a site after pines are harvested will effectively be 0, or possibly 1 if there is some retention. It is proposed that this should approximately halve the site condition score; young pine plantations could be redacted slightly less than old plantations on the basis that a young plantation provides a slightly longer term food supply. If a maximum site condition score of 5 is given, then a young plantation (>10 but <30 years old) could be assigned a score of 3, and an old plantation (>30 years old) could be assigned a score of 2. Plantations <10 years old and thus not producing large quantities of cones could also get a score of 2, but recognising they may increase in value.
- Site context. Although a temporary food source, pines can be very important for Carnaby's Black-Cockatoo in some contexts; they could be said to carry populations in areas where there is little native vegetation. The system for assigning a context score as outlined above (Section

B) also applies to pines. Thus, a context score of 3 can be given where pines are a significant proportion of foraging habitat (>5% if breeding occurs; >10% if no breeding), but where pines are a small part of the foraging landscape they will receive a context score of less than this.

- Species density. As outlined above (Section C), pines will receive a species density score of 1 where Carnaby's Black-Cockatoo are regular visitors. This is irrespective of an old plantation having a moderated condition score of 2.

Based on the above, pine plantations that represent a substantial part of the foraging landscape, such as in the region immediately north of Perth, would receive a total score (out of 10) of 6; young plantations in this area would receive a score of 7. In contrast, isolated and small plantations in rural landscapes could receive a score of just 2 if they are only a small proportion of foraging habitat and Carnaby's Black-Cockatoos are not regularly present.

Appendix 3. Fauna recorded during field assessment

Fence skink (*Cryptoblepharus buchananii)*

Splendid Fairy-wren

Singing Honeyeater

Australian Raven

Rainbow Lorikeet

Australian Ringneck

Yellow-rumped Thornbill

Galah

Magpie-lark

Appendix 4. Details of all trees recorded within and overhanging the survey area. UTM Zone 50.

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP001	KA001	398930.5	6418680	Swamp Paperbark	*Melaleuca rhaphiophylla*	500	Excellent	N	
WP002	KA002	398919.3	6418678	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP003	KA003	398889.4	6418679	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP004	KA004	398852.6	6418677	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP005	KA005	398851	6418678	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP006	KA006	398840	6418676	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP007	KA007	398802.5	6418676	Swamp Paperbark	*Melaleuca rhaphiophylla*	500	Excellent	N	
WP008	KA008	398799.4	6418676	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP009	KA009	398771.5	6418677	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Animal Burrow at base of tree.
WP010	KA010	398751.4	6418693	Marri	*Corymbia calophylla*	300	Excellent	F R	Foraging evidence on marri nuts (condition: old)
WP011	KA011	398735.9	6418674	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP012	KA012	398726.4	6418674	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP013	KA013	398586	6418671	Swamp Paperbark	*Melaleuca rhaphiophylla*	500	Excellent	N	
WP014	KA014	398577.1	6418672	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP015	KA015	398570.3	6418671	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP016	KA016	398531.9	6418671	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP017	KA017	398529.1	6418671	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP018	KA018	398527.2	6418672	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP019	KA019	398522.4	6418671	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP020	KA020	398512.1	6418670	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP021	KA021	398504.2	6418688	Marri	*Corymbia calophylla*	600	Excellent	F N R	
WP022	KA022	398501.3	6418688	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP023	NA	398494.7	6418688	Marri	*Corymbia calophylla*	500	Excellent	F N R	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP024	NA	398484.2	6418687	Marri	*Corymbia calophylla*	500	Excellent	F N R	Overhanging clearing zone
WP025	KA025	398460.5	6418670	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP026	KA026	398439.4	6418668	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP027	KA027	398382.5	6418667	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP028	KA028	398378	6418667	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP029	KA029	398368.6	6418667	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP030	KA030	398363.3	6418667	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Good		Minor branchlet death
WP031	KA031	398350.2	6418685	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP032	KA032	398328.6	6418683	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent		
WP033	KA033	398325.9	6418683	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP034	KA034	398324.1	6418683	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP035	KA035	398321.9	6418683	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP036	KA036	398318.9	6418683	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP037	KA037	398315	6418683	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP038	KA038	398270.7	6418682	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP039	KA039	398261.2	6418682	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP040	KA040	398246.3	6418682	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP041	KA041	398115	6418661	Ornamental Tree	*Unknown*	NA	Excellent		
WP042	NA	397938	6418656	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP043	KA043	397914.2	6418674	Snow Queen	*Eucalyptus vitrix*	NA	Excellent		
WP044	KA044	397886.9	6418674	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP045	KA045	397858.2	6418674	Coojong	*Acacia saligna*	NA	Excellent	F	
WP046	KA046	397840	6418671	Coojong	*Acacia saligna*	NA	Excellent	F	
WP047	KA047	397801.5	6418672	Introduced Eucalypts	*Eucalyptus sp.*	500	Excellent	N R	
WP048	KA048	397792.9	6418671	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP049	KA049	397742.6	6418671	Unknown	*Corymbia sp.*	400	Excellent	F R	probably planted
WP050	KA050	397732.7	6418671	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP051	KA051	397725.2	6418672	Introduced Eucalypts	*Eucalyptus sp.*	NA	Poor	R	Few green leaves (drought?). Appears to be dying
WP052	KA052	397716.2	6418671	Bottlebrush	*Callistemon viminalis*	200	Excellent	F	
WP053	KA053	397708.1	6418671	Bottlebrush	*Callistemon viminalis*	100	Excellent	F	
WP054	KA054	397692.8	6418671	Bottlebrush	*Callistemon viminalis*	100	Excellent	F	
WP055	NA	397666.2	6418670	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP056	KA056	397662.8	6418669	Deciduous Tree	*Unknown*	NA	Excellent		
WP057	KA057	397657.2	6418670	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP058	KA058	397652	6418670	Deciduous Tree	*Unknown*	NA	Excellent		
WP059	NA	397647.9	6418670	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP060	KA060	397642.1	6418670	Grevillea	*Grevillea sp.*	100	Excellent	F	
WP061	KA061	397635.1	6418669	Bottlebrush	*Callistemon viminalis*	100	Excellent	F	
WP062	KA062	397632	6418670	Grevillea	*Grevillea sp.*	150	Excellent	F	
WP063	KA063	397629.1	6418669	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP064	KA064	397625.3	6418670	Grevillea	*Grevillea sp.*	50	Excellent	F	Too small for tag
WP066	NA	397613.9	6418668	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP067	NA	397610	6418669	Grevillea	*Grevillea sp.*	50	Excellent	F	Too small for tag
WP068	NA	397603.5	6418668	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP069	NA	397597.8	6418668	Grevillea	*Grevillea sp.*	50	Excellent	F	Too small for tag
WP070	NA	397593.7	6418668	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP071	NA	397589.7	6418668	Grevillea	*Grevillea sp.*	50	Excellent	F	Too small for tag
WP072	NA	397581.6	6418668	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP073	NA	397576.7	6418667	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP074	KA074	397573	6418666	Deciduous Tree	*Unknown*	NA	Excellent		
WP075	NA	397569.6	6418666	Bottlebrush	*Callistemon viminalis*	50	Excellent	F	Too small for tag
WP076	KA076	397565.7	6418666	Grevillea	*Grevillea sp.*	50	Excellent	F	Too small for tag
WP077	NA	397531.3	6418669	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP078	NA	397523.6	6418668	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP079	NA	397515.7	6418668	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP080	NA	397503.1	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP081	NA	397496.6	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP082	NA	397489.4	6418668	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	Overhanging clearing zone
WP083	NA	397485.4	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP084	NA	397482.9	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP085	NA	397479.2	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP086	NA	397475.6	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP087	KA087	397473.8	6418666	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP088	NA	397472.3	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP089	NA	397469.7	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP090	NA	397464.9	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP091	NA	397462.8	6418667	Melaluca	*Melaleuca sp.*	NA	Very Poor		Dead
WP092	NA	397459.9	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP093	NA	397458.3	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP094	NA	397454.8	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP095	NA	397452	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP096	NA	397447.8	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP097	NA	397444.8	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP098	NA	397440.5	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP099	NA	397434	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP100	NA	397427.3	6418666	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP101	NA	397409.2	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP102	NA	397397.7	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP103	NA	397394.6	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP104	NA	397390.5	6418667	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	Overhanging clearing zone
WP105	KA105	397538.2	6418650	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP106	KA106	397542.4	6418650	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP107	KA107	396994	6418656	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP108	KA108	396997.7	6418655	Coojong	*Acacia saligna*	NA	Excellent	F	
WP109	KA109	397002.1	6418656	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP110	KA110	397007.3	6418656	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP111	KA111	397009.8	6418656	Coojong	*Acacia saligna*	NA	Excellent	F	
WP112	KA112	397020.7	6418657	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP113	KA113	397045.5	6418657	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP114	KA114	397062.7	6418658	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP115	KA115	397068.5	6418658	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP116	NA	397078.4	6418659	Coojong	*Acacia saligna*	NA	Excellent	F	Too small for tag
WP117	KA117	397142.1	6418646	Flooded Gum	*Eucalyptus rudis*	800	Excellent	N R	
WP118	KA118	397131.9	6418643	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP119	KA119	397124.6	6418645	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP120	KA120	397111.2	6418644	Swamp Paperbark	*Melaleuca rhaphiophylla*	600	Excellent	N	
WP121	KA121	397105.3	6418644	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP122	KA122	397103.1	6418644	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP123	KA123	397099.1	6418644	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP124	KA124	397090.4	6418644	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP125	KA125	397076.4	6418643	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP126	KA126	397068.3	6418643	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP127	KA127	397063.7	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP128	KA128	397060	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP129	KA129	397056.1	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP130	KA130	397049	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP131	KA131	397045.4	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP132	KA132	397040	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP133	KA133	397037.7	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP134	KA134	397034.9	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP135	KA135	397032.7	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP136	KA136	397027.9	6418642	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP137	KA137	397024.7	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP138	KA138	397018.1	6418641	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP139	KA139	397012.9	6418641	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP140	KA140	397005.7	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP141	KA141	396988.1	6418641	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP142	NA	396972.4	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		Too small for tag
WP143	KA143	396946	6418642	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP144	KA144	396939.5	6418656	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP145	NA	396875.2	6418655	Coojong	*Acacia saligna*	NA	Excellent	F	
WP146	KA146	396876.8	6418638	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		

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WP147	KA147	396864.9	6418638	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP148	KA148	396667	6418634	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP149	KA149	396681.7	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP150	KA150	396687.4	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP151	KA151	396690	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP152	KA152	396701	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP153	KA153	396709.1	6418635	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP154	KA154	396710.3	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Very Poor		Appears to be dead.
WP155	NA	396746.8	6418636	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		Too small for tag
WP156	KA156	396775.1	6418636	Grass Tree	*Kingia australis*	200	Excellent		
WP157	NA	396763.4	6418653	Flooded Gum	*Eucalyptus rudis*	NA	Excellent	R	Overhanging clearing zone
WP158	NA	396731.5	6418651	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Very Poor		Appears to be dead.
WP159	KA159	396721.7	6418652	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP160	KA160	396718.3	6418652	Marri	*Corymbia calophylla*	500	Excellent	F N R	
WP161	KA161	396713.6	6418651	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP162	KA162	396711.7	6418652	Marri	*Corymbia calophylla*	600	Excellent	F N R	
WP163	KA163	396705.1	6418651	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP164	KA164	396683.6	6418651	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP165	KA165	396680.4	6418651	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP166	KA166	396681.9	6418651	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP167	KA167	396676.8	6418650	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP168	KA168	396669.8	6418651	Marri	*Corymbia calophylla*	100	Excellent	F	
WP169	KA169	396672.3	6418651	Marri	*Corymbia calophylla*	150	Excellent	F	
WP170	KA170	396666.8	6418650	Marri	*Corymbia calophylla*	350	Excellent	F R	
WP171	KA171	396663.3	6418651	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP172	KA172	396658.6	6418651	Marri	*Corymbia calophylla*	250	Excellent	F R	

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WP173	KA173	396654.2	6418650	Marri	*Corymbia calophylla*	150	Excellent	F	
WP174	KA174	396646.6	6418650	Marri	*Corymbia calophylla*	500	Excellent	F N R	
WP175	KA175	396644.9	6418650	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP176	KA176	396642.4	6418650	Marri	*Corymbia calophylla*	350	Excellent	F R	
WP177	KA177	396639.1	6418650	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP178	KA178	396635.2	6418650	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP179	KA179	396618	6418649	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP180	KA180	396608.9	6418649	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP181	KA181	396605.3	6418650	Marri	*Corymbia calophylla*	500	Fair	F N R	Some signs of termites
WP182	KA182	396603.1	6418649	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP183	KA183	396587.3	6418649	Grass Tree	*Kingia australis*	100	Excellent		
WP184	KA184	396584.7	6418649	Marri	*Corymbia calophylla*	100	Excellent	F	
WP185	KA185	396568.7	6418648	Flooded Gum	*Eucalyptus rudis*	100	Poor		
WP186	KA186	396564	6418648	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP187	KA187	396550.3	6418647	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP188	KA188	396544.6	6418649	Marri	*Corymbia calophylla*	700	Good	F N R	Minor canker
WP190	KA190	396535.6	6418646	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP191	KA191	396515.2	6418646	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP192	KA192	396513.4	6418646	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP193	KA193	396507.9	6418645	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP194	KA194	396507.1	6418645	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP195	KA195	396501.7	6418645	Grass Tree	*Kingia australis*	100	Excellent		
WP196	KA196	396493.6	6418646	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP197	KA197	396495.2	6418645	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP198	KA198	396492.2	6418645	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP199	KA199	396489.7	6418646	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	

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WP200	KA200	396467	6418645	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP201	NA	396450.2	6418646	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		Overhanging clearing zone
WP202	KA202	396445.7	6418647	Marri	*Corymbia calophylla*	150	Excellent	F	
WP203	KA203	396443.6	6418646	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP204	KA204	396440.4	6418645	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP205	KA205	396443.4	6418644	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP206	KA206	396437.4	6418645	Flooded Gum	*Eucalyptus rudis*	450	Excellent	R	
WP207	KA207	396436	6418646	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP208	KA208	396433.4	6418645	Flooded Gum	*Eucalyptus rudis*	450	Excellent	R	
WP209	KA209	396430.2	6418646	Marri	*Corymbia calophylla*	350	Excellent	F R	
WP210	KA210	396428.8	6418645	Flooded Gum	*Eucalyptus rudis*	250	Excellent	R	
WP211	KA211	396426.3	6418644	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP212	KA212	396421.5	6418645	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP213	KA213	396419.3	6418644	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP214	KA214	396412.3	6418645	Marri	*Corymbia calophylla*	150	Excellent	F	
WP215	KA215	396417.9	6418644	Flooded Gum	*Eucalyptus rudis*	450	Excellent	R	
WP216	KA216	396408.8	6418646	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP217	KA217	396405.7	6418646	Flooded Gum	*Eucalyptus rudis*	350	Excellent	R	
WP218	KA218	396403.4	6418646	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP219	KA219	396404.5	6418646	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP220	KA220	396406.5	6418645	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP221	KA221	396397.1	6418644	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP222	KA222	396398.9	6418644	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP223	KA223	396400	6418644	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP224	KA224	396394.3	6418645	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP225	KA225	396391.7	6418629	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	

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WP226	KA226	396394.4	6418630	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP227	KA227	396398.1	6418630	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP228	KA228	396399.5	6418630	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP229	KA229	396408.2	6418631	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP230	KA230	396432.3	6418632	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP231	KA231	396434.1	6418632	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP232	KA232	396435.2	6418632	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP233	KA233	396443.2	6418633	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP234	KA234	396448.5	6418632	Marri	*Corymbia calophylla*	250	Excellent	F R	
WP235	KA235	396454.3	6418629	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP236	KA236	396490.3	6418630	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP237	KA237	396496.1	6418629	Flooded Gum	*Eucalyptus rudis*	50	Excellent		
WP238	KA238	396499	6418630	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP239	KA239	396514.7	6418631	Flooded Gum	*Eucalyptus rudis*	50	Excellent		
WP240	KA240	396540.8	6418634	Marri	*Corymbia calophylla*	700	Excellent	F N R	
WP241	KA241	396570	6418634	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP242	KA242	396568.5	6418634	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP243	KA243	396592.6	6418634	Marri	*Corymbia calophylla*	500	Excellent	F N R	Minor canker
WP244	KA244	396597.9	6418635	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP245	KA245	396602.7	6418632	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP246	KA246	396607.1	6418635	Marri	*Corymbia calophylla*	500	Excellent	F N R	
WP247	KA247	395914.3	6418635	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP248	KA248	395945.7	6418636	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP249	KA249	395948.6	6418636	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP250	KA250	395950.2	6418636	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP251	KA251	395954.7	6418636	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		

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WP252	KA252	395961.4	6418637	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP253	KA253	395984.1	6418636	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP254	KA254	395995.5	6418637	Flooded Gum	*Eucalyptus rudis*	350	Excellent	R	
WP255	KA255	396016.2	6418635	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP256	KA256	396050.9	6418637	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP257	KA257	396079.7	6418637	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP258	KA258	396114.7	6418640	Flooded Gum	*Eucalyptus rudis*	450	Excellent	R	
WP259	KA259	396121.3	6418641	Flooded Gum	*Eucalyptus rudis*	500	Excellent	N R	
WP260	KA260	396135.4	6418640	Flooded Gum	*Eucalyptus rudis*	100	Very Poor		Dying?
WP261	KA261	396155.2	6418641	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP262	KA262	396183.1	6418640	Deciduous Tree	*Unknown*	200	Excellent		
WP263	KA263	396195.3	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP264	KA264	396198.1	6418642	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP265	KA265	396200.4	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP266	KA266	396205.9	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP267	KA267	396208	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP268	KA268	396212	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP269	KA269	396213.8	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP270	KA270	396215.5	6418641	Deciduous Tree	*Unknown*	200	Excellent		
WP271	KA271	396243.4	6418641	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP272	KA272	396246.6	6418641	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP273	KA273	396286.4	6418643	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP274	KA274	396299.1	6418644	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP275	NA	396309.9	6418644	Introduced Eucalypts	*Eucalyptus sp.*	600	Excellent	N R	Overhanging clearing zone
WP276	KA276	396363.4	6418643	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		

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WP277	KA277	396367.7	6418629	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP278	KA278	396363.4	6418628	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP279	KA279	396360.4	6418630	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP280	KA280	396356.8	6418628	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP281	KA281	396337.9	6418629	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP282	KA282	396335.8	6418629	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP283	KA283	396329.9	6418628	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP284	KA284	396313.7	6418628	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP285	KA285	396281.4	6418628	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP286	KA286	396280.9	6418625	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP287	KA287	396273.1	6418624	Swamp Paperbark	*Melaleuca rhaphiophylla*	700	Excellent	N	
WP288	KA288	396262.5	6418624	Flooded Gum	*Eucalyptus rudis*	700	Excellent	N R	
WP289	KA289	396253.2	6418624	Introduced Eucalypts	*Eucalyptus sp.*	600	Excellent	N R	
WP290	KA290	396247.4	6418624	Pine Tree	*Pinus pinaster*	500	Very Poor	F R	Possibly dead.
WP291	KA291	396224.4	6418623	Introduced Eucalypts	*Eucalyptus sp.*	NA	Excellent	R	
WP292	KA292	396217.8	6418623	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP293	KA293	396185.1	6418623	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP294	KA294	396173.8	6418623	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP295	KA295	396166.5	6418622	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP296	KA296	396165.1	6418622	Swamp Paperbark	*Melaleuca rhaphiophylla*	600	Excellent	N	
WP297	KA297	396163.4	6418622	Flooded Gum	*Eucalyptus rudis*	150	Poor		
WP298	KA298	396041.8	6418620	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP299	KA299	396029.3	6418623	Flooded Gum	*Eucalyptus rudis*	700	Excellent	N R	
WP300	KA300	396010.1	6418620	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	

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WP301	KA301	395994.2	6418619	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP302	KA302	395975.3	6418618	Coojong	*Acacia saligna*	150	Excellent	F	
WP303	KA303	395972.7	6418619	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP304	KA304	396145.3	6418622	Spotted Gum	*Corymbia maculata*	600	Excellent	F N R	
WP305	KA305	395693.3	6418613	Marri	*Corymbia calophylla*	350	Excellent	F R	
WP306	KA306	395697.4	6418612	Marri	*Corymbia calophylla*	150	Fair	F	Minor termites
WP307	KA307	395700.3	6418612	Marri	*Corymbia calophylla*	500	Excellent	F N R	
WP308	KA308	395698.9	6418612	Marri	*Corymbia calophylla*	400	Excellent	F R	
WP309	KA309	395703.6	6418613	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP310	KA310	395708.5	6418615	Flooded Gum	*Eucalyptus rudis*	350	Excellent	R	
WP311	KA311	395714	6418615	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	
WP312	KA312	395715.8	6418615	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP313	KA313	395719.3	6418614	Flooded Gum	*Eucalyptus rudis*	50	Excellent		
WP314	KA314	395721.4	6418614	Stout Paperbark	*Melaleuca preissiana*	NA	Excellent		
WP315	KA315	395722.5	6418614	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP316	KA316	395724.8	6418614	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP317	KA317	395726.8	6418614	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP318	KA318	395728.7	6418614	Flooded Gum	*Eucalyptus rudis*	150	Excellent	N	
WP319	KA319	395731.4	6418614	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP320	KA320	395730.5	6418614	Swamp Paperbark	*Melaleuca rhaphiophylla*	500	Excellent	N	
WP321	KA321	395734	6418613	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP322	KA322	395735.7	6418614	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP323	KA323	395739.5	6418613	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP324	KA324	395740.7	6418613	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP325	KA325	395740.5	6418609	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP326	KA326	395740.6	6418611	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP327	KA327	395741.2	6418610	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP328	KA328	395733.2	6418630	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP329	KA329	395729.5	6418630	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP330	KA330	395725.9	6418632	Flooded Gum	*Eucalyptus rudis*	150	Excellent		Potential Fox Burrow
WP331	KA331	395723.3	6418633	Flooded Gum	*Eucalyptus rudis*	350	Very Poor	R	Potentially Dead.
WP332	KA332	395723.9	6418633	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP333	KA333	395721.1	6418632	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP334	KA334	395719.2	6418632	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP335	KA335	395717.8	6418631	Flooded Gum	*Eucalyptus rudis*	150	Excellent		
WP336	KA336	395716.3	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	
WP337	KA337	395714.7	6418632	Bottlebrush	*Callistemon viminalis*	100	Excellent	F	
WP338	KA338	395710.3	6418631	Flooded Gum	*Eucalyptus rudis*	400	Poor	R	Potentially Dead.
WP339	KA339	395707.4	6418631	Bottlebrush	*Callistemon viminalis*	100	Excellent	F	Overhanging clearing zone
WP340	NA	395706.7	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP341	NA	395705.6	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP342	NA	395704.9	6418633	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone
WP343	NA	395704.2	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP344	NA	395702.1	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP345	NA	395699.8	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP346	NA	395698	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP347	NA	395695.2	6418633	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone
WP348	NA	395691.6	6418633	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone
WP349	NA	395690.4	6418633	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP350	NA	395689	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP351	NA	395687.5	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP352	NA	395686.1	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP353	NA	395684.9	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP354	NA	395684.1	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP355	NA	395682.3	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP356	NA	395679.7	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP357	NA	395677.9	6418634	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP358	NA	395676.1	6418633	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP359	NA	395659	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP360	NA	395657	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP361	NA	395654.5	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP362	NA	395651.8	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP363	NA	395647.1	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP364	NA	395644.7	6418631	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone
WP365	NA	395643.5	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP366	NA	395641.1	6418632	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP367	NA	395636.4	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP368	NA	395635.7	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP369	NA	395633.9	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP370	NA	395631.8	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP371	NA	395629.3	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP372	NA	395627.3	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP373	NA	395624.8	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP374	NA	395622.8	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP375	NA	395619.4	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP376	NA	395617.6	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP377	NA	395614.7	6418631	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	Overhanging clearing zone
WP378	NA	395613.2	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP379	NA	395612.6	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP380	NA	395609.8	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP381	NA	395608.5	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP382	NA	395607.3	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP383	NA	395605.2	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP384	NA	395603.5	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP385	NA	395599	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP386	NA	395596.4	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP387	NA	395594.1	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP388	NA	395590.3	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP389	NA	395588.4	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP390	NA	395585.7	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP391	NA	395582.2	6418631	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP392	NA	395580.1	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP393	NA	395578.5	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP394	NA	395572.9	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP395	NA	395568.3	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP396	NA	395566	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP397	NA	395564	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP398	NA	395560.9	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP399	NA	395554.9	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP400	NA	395553.2	6418630	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP401	NA	395551.1	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP402	NA	395547.3	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP403	NA	395544.7	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP404	NA	395541.5	6418629	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP405	NA	395535.7	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP406	NA	395528.9	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP407	NA	395523	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP408	NA	395517.1	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP409	NA	395514.3	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP410	NA	395511.1	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP411	NA	395505.7	6418628	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP412	NA	395502.7	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP413	NA	395498.6	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP414	NA	395494.1	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP415	NA	395490.1	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP416	NA	395486.8	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP417	NA	395485.4	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP418	NA	395481.8	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP419	NA	395477.4	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP420	NA	395472.1	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP421	NA	395466.4	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP422	NA	395463.3	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP423	NA	395457.6	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP424	NA	395450.8	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP425	NA	395447.3	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP426	NA	395442.2	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP427	NA	395438.1	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP428	NA	395434.1	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP429	NA	395430.4	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP430	NA	395425.3	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP431	NA	395420.9	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP432	NA	395417.4	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP433	NA	395413.2	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP434	NA	395406.5	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP435	NA	395401.4	6418627	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP436	NA	395375.1	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP437	NA	395366.3	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP438	NA	395362.2	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP439	NA	395361.2	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP440	NA	395358.2	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP441	NA	395355.9	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP442	NA	395353.8	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP443	NA	395348.9	6418626	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP444	NA	395344.2	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP445	NA	395336.1	6418624	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP446	NA	395329.4	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP447	NA	395322.9	6418624	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP448	NA	395318.9	6418625	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP449	NA	395310.7	6418624	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone
WP450	NA	395304.2	6418623	Bottlebrush	*Callistemon viminalis*	150	Excellent	F	Overhanging clearing zone

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP451	KA451	395268.3	6418602	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	
WP452	KA452	395286.7	6418605	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	
WP453	KA453	395324.9	6418605	Introduced Eucalypts	*Eucalyptus sp.*	400	Excellent	R	
WP454	KA454	395326.5	6418605	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	
WP455	KA455	395388.8	6418609	Sheoak	*Allocasuarina fraseriana*	50	Excellent	F	
WP456	KA456	395393.6	6418609	Sheoak	*Allocasuarina fraseriana*	50	Excellent	F	
WP457	KA457	395456.6	6418609	Introduced Eucalypts	*Eucalyptus sp.*	600	Excellent	N R	
WP458	KA458	395476	6418609	Introduced Eucalypts	*Eucalyptus sp.*	600	Excellent	N R	
WP459	KA459	395478.1	6418608	Introduced Eucalypts	*Eucalyptus sp.*	600	Good	N R	One suitable BC hollow 8m high facing road (north facing). Currently occupied by european honey bee. Hollow shape is oval but narrow, with the widest point in the middle ~15 to 20cm. Hollow starts at a major limb that seems likely to continue to the trunk of the tree. There are two additional hollows higher in the tree but are not large enough for black cockatoos, possible for smaller parrots e.g. Galahs. Tree is dead.
WP460	KA460	395478.5	6418608	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP461	KA461	395516.8	6418607	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	
WP462	NA	395519	6418608	Introduced Eucalypts	*Eucalyptus sp.*	300	Excellent	R	Overhanging clearing zone
WP463	KA463	395527.9	6418609	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	
WP464	NA	395529.8	6418608	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	Overhanging clearing zone
WP465	NA	395535.2	6418608	Flooded Gum	*Eucalyptus rudis*	300	Excellent	R	Overhanging clearing zone
WP466	NA	395543.9	6418609	Introduced Eucalypts	*Eucalyptus sp.*	200	Excellent	R	Overhanging clearing zone
WP467	KA467	395602.2	6418611	Introduced Eucalypts	*Eucalyptus sp.*	300	Excellent	R	
WP468	KA468	395099.8	6418619	Sheoak	*Allocasuarina fraseriana*	300	Excellent	F	
WP469	KA469	394589.9	6418549	Flooded Gum	*Eucalyptus rudis*	800	Excellent	N R	
WP470	KA470	394592.8	6418550	Peppermint	*Agonis flexuosa*	NA	Excellent	F	Overhanging clearing zone
WP471	KA471	394626.8	6418555	Peppermint	*Agonis flexuosa*	NA	Excellent	F	
WP472	KA472	394352.6	6418502	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP473	KA473	394402.4	6418512	Flooded Gum	*Eucalyptus rudis*	900	Excellent	N R	
WP474	KA474	394406.1	6418510	Flooded Gum	*Eucalyptus rudis*	900	Excellent	N R	
WP475	KA475	394408.3	6418511	Swamp Paperbark	*Melaleuca rhaphiophylla*	NA	Excellent		
WP476	KA476	394414.3	6418512	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP477	KA477	394417	6418512	Flooded Gum	*Eucalyptus rudis*	400	Excellent	R	
WP478	KA478	394416.5	6418512	Flooded Gum	*Eucalyptus rudis*	600	Excellent	N R	
WP479	KA479	394417.9	6418514	Flooded Gum	*Eucalyptus rudis*	200	Excellent	R	
WP480	KA480	394421.7	6418515	Marri	*Corymbia calophylla*	150	Excellent	F	
WP481	KA481	394422.2	6418516	Marri	*Corymbia calophylla*	600	Excellent	F N R	

Waypoint	Tag Number	Easting	Northing	Tree Name	Tree Species	DBH	Condition	BCTreeType F= foraging N = potential nesting R = potential roosting	Comments
WP482	KA482	394420.4	6418514	Marri	*Corymbia calophylla*	300	Excellent	F R	
WP483	KA483	394421.5	6418515	Marri	*Corymbia calophylla*	200	Excellent	F R	
WP484	KA484	394420.2	6418513	Marri	*Corymbia calophylla*	100	Excellent	F	

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