

Appendix 3

Black Cockatoo Addendum 2018



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Addendum Black Cockatoo Habitat Assessment - Armadale Road to North Lake Road Bridge

Background

Main Roads Western Australian (Main Roads) are proposing to upgrade sections of Armadale Road and the Kwinana Freeway in the City of Cockburn (the Proposal). The Proposal is to realign and extend Armadale Road from Solomon Road to Northlake Road; duplicate and upgrade intersections along Armadale Road between Solomon Road and Ghostgum Avenue; construct a southbound collector distributor road along the Kwinana Freeway between Berrigan Drive and Armadale Road; and construct a new bridge and on/off ramps over Kwinana Freeway.

A Level 1 Fauna and Black Cockatoo Survey was conducted in July 2017 (MRIA 2017a) for the vicinity of the Proposal footprint. Subsequent to the survey, Main Roads developed a defined Development Envelope (DE) for the Proposal.

Main Roads engaged Strategen to undertake this Addendum Black Cockatoo Assessment to resolve gaps in the 2017 survey and confirm the extent of black cockatoo habitat within the DE. This includes:

- review of the extent of black cockatoo foraging habitat
- re-inspection of potential habitat trees.

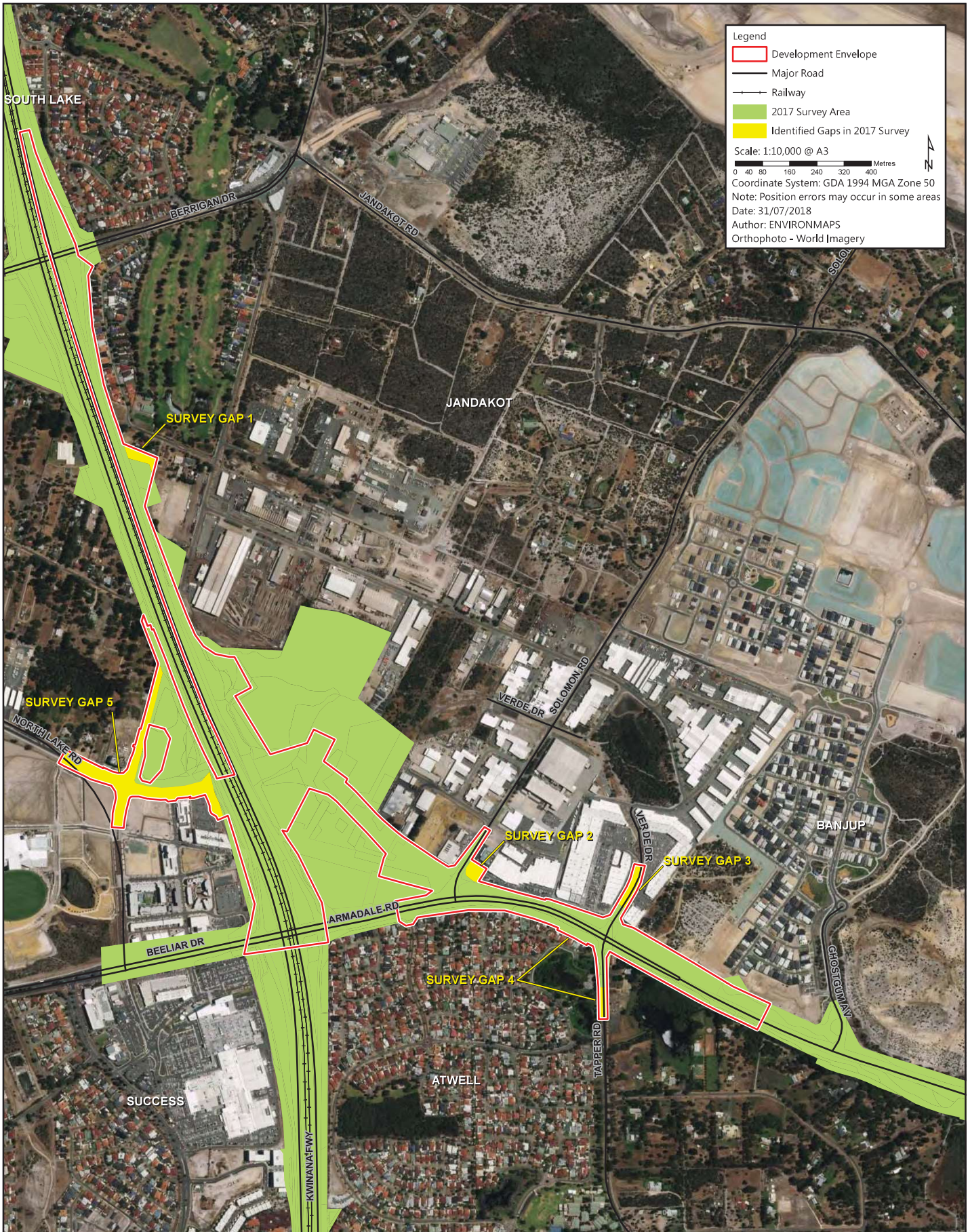
The Addendum Black Cockatoo Assessment was based on desktop review and field inspection as presented below.

Black cockatoo foraging habitat

Strategen has reviewed the Proposal DE and identified five gaps in the survey area covered by the Level 1 Fauna and Black Cockatoo Survey (MRIA 2017a) as presented in Figure 1.

Survey gap areas 2, 4 and 5 were assessed on the basis of aerial imagery and street photos, with field inspection undertaken for gap areas 1 and 4 to confirm Black Cockatoo habitat values, including foraging habitat and any potential habitat trees that lay outside the 2017 survey area. Consideration was given to mapping by MRIA (2017a) for adjacent areas and similar vegetation to ensure consistency with the 2017 survey mapping. Assessment was also undertaken with respect to fauna habitat types developed in the Level 1 Fauna Survey (MRIA 2017a) and vegetation types and condition mapped for the Detailed Flora and Vegetation Assessment (MRIA 2017b).

Table 1 presents the findings of the assessment of survey gap areas, with the additional mapped black cockatoo habitat presented in Figure 2.



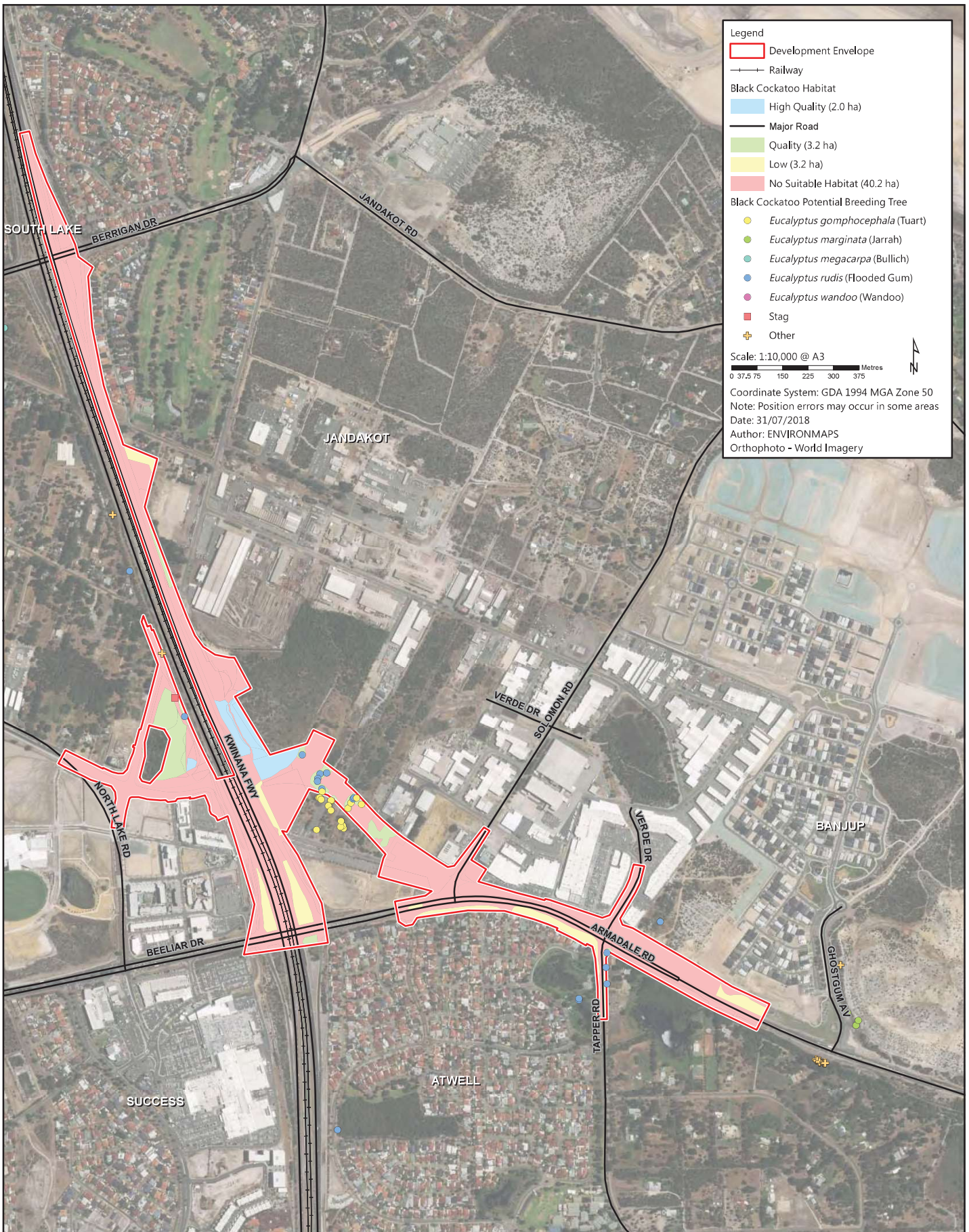


Table 1: Assessment of survey gap areas

Survey gap area	Description	Black Cockatoo habitat	Fauna habitat type	Vegetation type	Vegetation condition
1	Imlah Court Residential back yards with isolated trees over gardens / turf	Low quality No potential habitat trees	Private land	Planted non-native species	Completely degraded
2	Solomon Road Cleared and landscaped areas associated with service station and carparks	Not suitable No potential habitat trees	Private land	Planted non-native	Completely degraded
3	Verde Drive Cleared areas associated with existing road reserve	Not suitable No potential habitat trees	Cleared predominantly hardstand	Cleared	Completely degraded
4	Tapper Road Planted trees with cleared understorey along road reserve	Low quality (vegetated area) / Not suitable (road area) One potential habitat tree Tuart DBH > 500mm	Cleared predominantly bare ground / Cleared predominantly hardstand	Planted non-native species (vegetated area) / Cleared (road area)	Completely degraded
5	North Lake Road, Kentucky Court Cleared areas associated with existing road reserves	Not suitable No potential habitat trees	Parkland and maintained gardens / Cleared predominantly hardstand	Cleared	Completely degraded

In addition to addressing survey gaps, the Addendum Black Cockatoo Assessment included a refinement of foraging habitat developed from the 2017 survey over an area comprising scattered trees with a cleared understorey. This area is mapped as 'Isolated trees' as a fauna habitat type in the 2017 survey, and lies approximately 400 m to 600 m north-west of the intersection of Armadale Road and Solomon Road, north of the Transperth carparks associated with the Cockburn Central train station. The area comprises scattered Tuart (*Eucalyptus gomphocephala*) and Flooded Gum (*Eucalyptus rudis*) trees with a cleared understorey comprising exotic species.

The area mapped as the 'Isolated trees' fauna habitat type was re-mapped as comprising foraging habitat to the extent of the canopies of the scattered trees, as the intervening land does not provide foraging habitat value. The updated foraging mapping over the area is presented in Figure 2.

Black cockatoo breeding trees

MIRIA (2017a) identified five potential habitat trees (DBH \geq 500 mm) in the vicinity of the DE that had potential hollows and reported that none of the hollows were suitable for nesting by black cockatoos. MIRIA (2017a) did not provide supporting data to justify the assessment of suitability.

The Addendum Black Cockatoo Assessment incorporated a repeat field inspection of the five potential habitat trees with hollows to confirm the specific characteristics of the hollows and their suitability for nesting. In addition, an inspection was made of an additional potential habitat tree identified in Tapper Road (survey gap area 4) which was outside the 2017 survey area. The six potential habitat trees that were inspected are presented in Table 2 and their locations are presented in Figure 3. Photographs of the five significant trees are presented in Attachment 1.

Table 2: Significant trees identified with potential hollows

Tree ID	Easting	Northing	Species
110	392061	6445527	Jarrah (identified by MRIA [2017a] as a stag)
152	392485	6445233	Flooded Gum (identified by MRIA [2017a] as a Tuart)
191	392550	6445164	Tuart
194	392548	6445148	Tuart
215	393329	6444734	Flooded Gum
Additional tree identified in Tapper Road >500 mm DBH	393330	6444585	Tuart

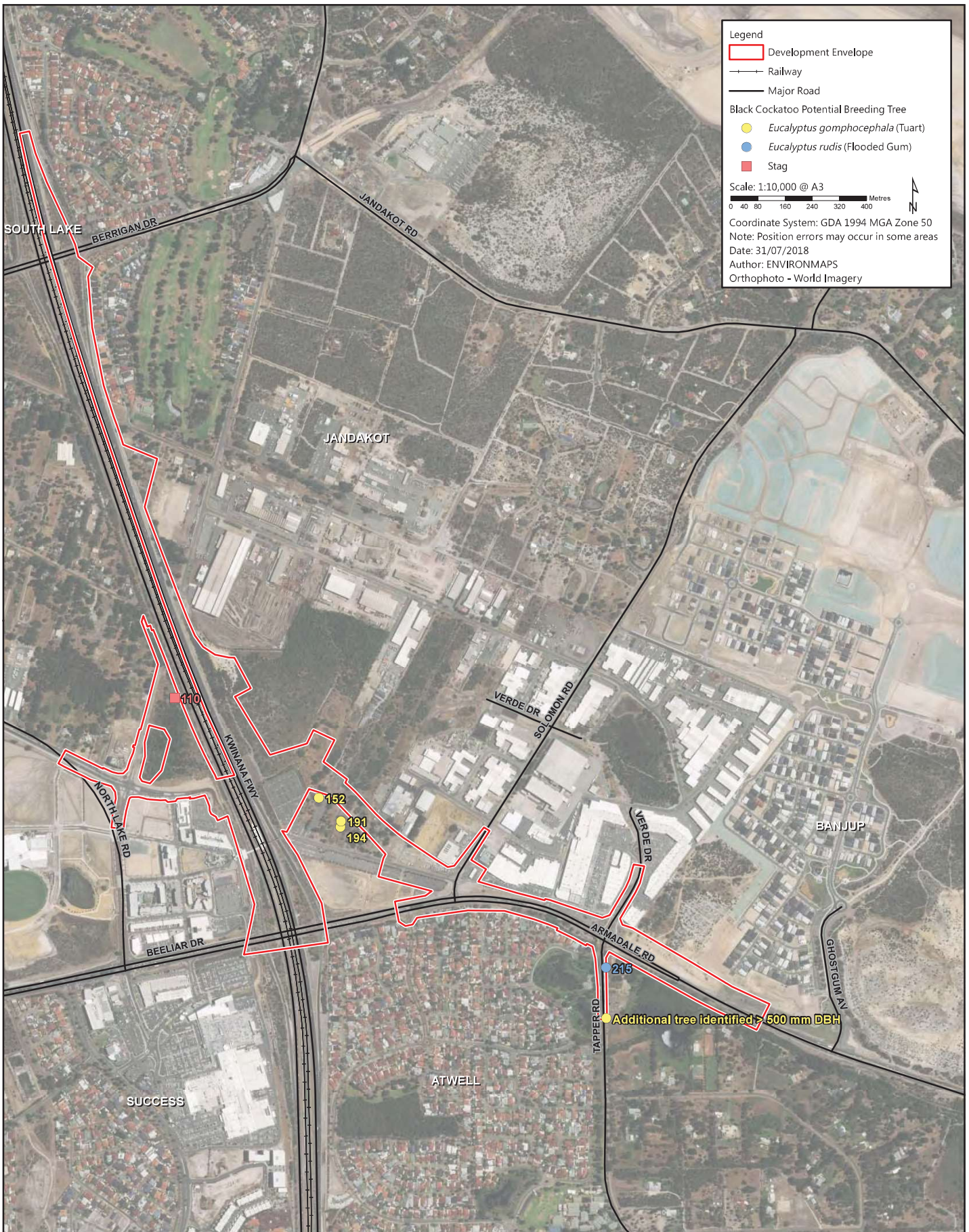
Tree 110 was identified by MRIA (2017a) as a stag (meaning dead tree), however, there was still one or two small branches with some leaves on the tree, which was identified as a Jarrah (noting that it was close to being a stag). The entrance diameter of this hollow was estimated at approximately 7-8 cm which is not a suitable size for black cockatoos. The minimum entrance size considered suitable is 10 x 12 cm and the mean size is 30 x 34 cm for the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Johnstone *et al.* 2013). Work undertaken on Carnaby's Cockatoos (*Calyptorhynchus latirostris*) indicate that their hollows have a vertical opening of about 27 cm (Saunders and Dawson 2017). In addition, the hollow entrance on tree 110 was approximately 4 m above ground and therefore likely too low to be suitable, as black cockatoos generally use hollows that are on average at 14.5 m above the ground (Johnstone *et al.* 2013). There was no evidence of previous nesting in the hollow on tree 110.

Based on the re-inspection of tree 110, the hollow is not considered suitable for nesting by black cockatoos.

The re-inspection did not record any hollows on the other four trees when viewed from the ground. Tree 152 was previously identified as a Tuart, however, when undertaking the re-inspection, the tree was identified as a Flooded Gum (see Attachment 1, Plate 2). The re-inspection considered trees in the vicinity of the coordinates in Table 2 to ensure that the difference in observation from that of MRIA (2017a) was not due to GPS positioning error.

All six trees inspected were confirmed to have DBH \geq 500 mm, however, all six trees had main trunks that split into two or more trunks at about 1.5 m above the ground. Because of this the six trees are less likely to be large enough to support suitable sized hollows in the main trunk, which is where black cockatoo nests are typically located (Johnstone *et al.* 2013). Accordingly, it is considered unlikely that un-observed hollows that are suitable for nesting are present on the six trees.

It is noted that the majority of the potential breeding trees in the Proposal DE are Flooded Gum. This species is identified in the literature as a dietary item, occasionally used for breeding, and as a roosting tree for Carnaby's Cockatoo (Groom 2011, Johnstone *et al.* 2011, DPaW 2013). Flooded Gum is not recognised in the literature as a dietary item, breeding or roosting tree for the Forest Red-tailed Black Cockatoo (DPaW 2008, Johnstone *et al.* 2011, Johnstone *et al.* 2013). The Flooded Gums recorded in the Proposal DE therefore represent limited potential breeding habitat compared to other tree species such as Tuarts.



References

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- Groom C. 2011, Plants Used by Carnaby's Black Cockatoo Department of Environment and Conservation, Perth.
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- Johnstone R. E., Kirkby T., & Sarti K. 2013, The breeding biology of the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Gould in south-western Australia. I. Characteristics of nest trees and nest hollows. *Pacific Conservation Biology* **19**, 121-142.
- Metropolitan Road Improvement Alliance 2017, Level 1 fauna and targeted Black Cockatoo surveys. Armadale Road to North Lake Road Bridge.
- Saunders D. A. and Dawson R. 2017, Cumulative learnings and conservation implications of a long-term study of the endangered Carnaby's Cockatoo *Calyptorhynchus latirostris*. *Australian Zoologist* **40**, 1-19.

Attachment – Photographs of Significant Trees Inspected for Hollows



Plate 1: Significant tree ID 110 (Jarrah)



Plate 2: Significant tree Tree ID 152 (Flooded Gum)



Plate 3: Significant tree ID 191 (Tuart)



Plate 4: Significant tree ID 194 (Tuart)



Plate 5: Significant tree ID 215 (Flooded Gum)

