Lot 508 on Deposited Plan 414835 (Aboriginal Cultural and Visitors Centre) Native Vegetation Clearing Permit Application – Supporting Information

Attachment 5

Targeted Threatened Ecological Community and Black Cockatoo Habitat Assessment (Emerge Associates 2020)

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Emerge contact: Anna Welker

21 February 2020

Attention: Sarah Robinson
City of Cockburn
52 Wellard Street
Bibra Lake WA 6163

Delivered by email to: PMO_012AC@cockburn.wa.gov.au

Dear Sarah

TARGETED THREATENED ECOLOGICAL COMMUNITY AND BLACK COCKATOO ASSESSMENT – BIBRA LAKE ABORIGINAL CULTURAL AND VISITORS CENTRE

1 BACKGROUND

The City of Cockburn (CoC) is seeking to proceed with the development of an Aboriginal Cultural and Visitors Centre within the south eastern portion of Bibra Lake Reserve 65L. To facilitate the development, the City previously commissioned the preparation of the following ecological reports:

- *Flora and Vegetation Assessment* (Focused Vision Consulting 2019b)
- *Black Cockatoo Habitat Assessment* (Focused Vision Consulting 2019a).

The results of the above assessments indicated that further technical studies were necessary to support the development.

1.1 Scope of work

Emerge Associates were engaged by the CoC to undertake a vegetation and fauna assessment to supplement the previous surveys. The scope of work was to undertake the following:

- An assessment of the 'tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' threatened ecological community (TEC) within and adjacent to the proposed development area to refine the previous mapping by Focused Vision Consulting (2019b). This assessment included a 'targeted' TEC survey in accordance with the Environmental Protection Authority's (EPA's) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b). The survey area for the TEC assessment extends over 24.57 ha and is shown in **Figure 1**.
- An assessment of the black cockatoo[1] habitat values within a small area within the proposed development area. This assessment included a 'targeted' black cockatoo survey in

[1] The term 'black cockatoo' collectively refers to three species of black cockatoo that are listed as threatened in Western Australia and listed under the *Environment Protection and Biodiversity Conservation Act 1999*: *Calyptorhynchus latirostris* (Carnaby's cockatoo), *Calyptorhynchus baudinii* (Baudin's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).

accordance with the EPA's *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016a) and *Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna* (EPA 2016). The survey was undertaken within a small portion of the potential 21 m fire management zone that extends beyond the survey boundary of the previous Focused Vision Consulting (2019a) black cockatoo assessment study area (totalling 0.03 ha) (refer **Figure 1**).

As part of the above scope of work, the following tasks were undertaken:

- Desktop review of relevant background information pertaining to the survey areas and surrounds.
- A targeted TEC and black cockatoo survey.
- Mapping of the 'tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC within the applicable survey area.
- Mapping of black cockatoo habitat values within the applicable survey area.
- Documentation of the desktop assessment, survey methodology and results into a report.

2 TEC ASSESSMENT

2.1 Previous survey

The previous flora and vegetation assessment indicated that the tuart woodland TEC occurred within the proposed development area (Focused Vision Consulting 2019b). The tuart woodland TEC was also mapped as occurring within all of the contiguous native vegetation adjacent to the site, due to it being mapped as the TEC within the DBCA threatened and priority community database search results (Focused Vision Consulting 2019b). However, DBCA advise that areas mapped as tuart woodland TEC within their database require ground-truthing to 'verify if a particular site meets the required diagnostic characteristics and minimum condition and size thresholds to be deemed to be the described TEC'. Focused Vision Consulting (2019b) did not undertake an assessment of the adjacent vegetation to define the extent of the TEC. Therefore, the current survey was required to determine the full extent of the tuart woodland TEC associated with the development area.

2.2 Field survey

The TEC assessment was undertaken only for the survey area indicated in **Figure 1**.

An ecologist from Emerge visited the survey area on 23 January 2020 to record data required for undertaking the DoEE (2019) three-step process for determining the presence of the tuart woodland TEC.

The ecologist traversed the survey area on foot and recorded the locations of tuart trees with a diameter at breast height (DBH) ≥15 centimetres (cm). Note that only tuart trees required to meet criteria in step 1 of the process were recorded and a comprehensive survey of all tuart trees in the survey area was not undertaken.

Sampling of the vegetation was undertaken within each patch of tuart trees recorded. This sampling comprised a rapid assessment for determining vegetation condition (step 3 of the process) and recorded:

- number of native species (within a 10 m x 10 m plot or equivalent sample unit)
- percent cover of native species (within a 10 m x 10 m plot or equivalent sample unit)
- evidence of *Eucalyptus*/*Corymbia* seedlings/saplings (any appropriate species)
- distance/connectivity to native vegetation.

Photographs were taken throughout the field visit.

2.3 Data analysis and mapping

The data recorded during the field survey was assessed using the three-step process to determine whether it met the criteria to represent the tuart woodland TEC (DoEE 2019).

2.4 Results

The result of the TEC assessment using the three-step process is outlined in **Table 1.**

Three patches of tuart vegetation were determined to represent the tuart TEC as shown in **Figure 2**. Patch 1 occurs in the south eastern portion of the survey area and extends over 1.12 ha. Patch 2 occurs in the western portion and extends over 0.78 ha and patch 3 occurs in the north western portion and extends over 0.84 ha. The tuart trees recorded within each patch are shown in **Figure 2**.

Additional tuart trees were recorded within and outside of the survey area that were sufficiently separated from the identified patches of tuart TEC, and each other, such that they did not meet the criteria to represent the TEC.

Table 1: Assessment of conditions against the tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain TEC criteria (adapted from (DoEE 2019))

Criteria	Requirements for meeting criteria	Details	Implication
1. Must meet key diagnostic characteristics	• Located in appropriate bioregion and landform. • At least two living established *E. gomphocephala* trees with DBH≥ 15cm present in canopy layer and with <60 m between the outer edges of canopies^ • Vegetation structure is a woodland, forest, open forest, open woodland, or mallee (various forms).	• Survey area located in appropriate bioregion and landform. • Three patches each contain more than two living established *E. gomphocephala* trees with DBH≥ 15cm present in canopy layer and with <60 m between the outer edges of canopies • Vegetation within three patches. comprises a woodland structure.	Meets TEC criteria
2. Must meet size threshold	• A patch must be larger than 0.5 ha	• Three patches are each >0.5 ha. • Smaller patches were excluded.	Meets TEC criteria
3. Must meet condition thresholds	• Patches >5 ha: no condition threshold • Patches ≥0.5 – <2 ha: 'very high' or 'high' condition† • Patches ≥2 – ≤5 ha: 'very high', 'high' or 'moderate' condition†	• The three patches each lie within the ≥0.5 – <2 ha category, are in 'high' condition and 'have an important landscape role (≤100 m to native vegetation)'. • Other patches that do not meet condition thresholds were excluded.	Meets TEC criteria
Additional - incorporate surrounding context	• Breaks (e.g. tracks, cleared areas) < 30 m do not separate vegetation into separate patches • The site should be thoroughly sampled in the appropriate season. • Survey timing should be appropriate. • Surrounding environment should be considered (e.g. connectivity, conservation values, fauna habitat) • Buffer zones may apply (30 m recommended from patch edge)	• No breaks exist within the three patches. • The survey timing was sufficient to determine that the three patches represented the TEC and to rule out other potential patches. A spring survey may record more native species but is not considered to be required as the information is sufficient to determine that the vegetation meets the TEC criteria.	Meets TEC criteria
Result	Three patches of the tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC were identified within the survey area. • Patch 1 = 1.12 ha • Patch 2 = 0.78 ha • Patch 3 = 0.84 ha		

^Includes dead trees, †Using the condition scale provided in DoEE (2019).

3 BLACK COCKATOO ASSESSMENT

The black cockatoo assessment was undertaken only for the survey area indicated in **Figure 1**.

3.1 Previous survey

The Focused Vision Consulting (2019a) *Black Cockatoo Habitat Assessment* recorded the following black cockatoo habitat values within the development area:

- 22 habitat trees of which six contained hollows that were considered suitable or potentially suitable for black cockatoos but did not have evidence of nesting. The remaining 16 trees were not observed to contain any hollows (**Figure 3** and **Figure 4**).
- Foraging habitat for forest red-tailed black cockatoos that was classified as 'negligible to low', 'low', 'low to moderate', 'moderate' and 'moderate to high' foraging value (**Figure 3**).
- Foraging habitat for Carnaby's black cockatoos that was classified as 'negligible to low', 'low to moderate', 'moderate' and 'moderate to high' foraging value (**Figure 4**).

3.2 Field survey

An ecologist from Emerge undertook the targeted black cockatoo survey at the same time as the TEC assessment on the 23 January 2020. The ecologist traversed the survey area and searched for potential black cockatoo breeding, roosting and foraging habitat.

Potential breeding habitat trees ('habitat trees') were individually identified, tagged and assessed against attributes outlined in **Table 2**. A habitat tree is defined as a native *Eucalyptus* or *Corymbia* tree with a diameter at breast height (DBH) ≥50 centimetres (cm) or ≥30 cm for *Eucalyptus wandoo* (wandoo) and *Eucalyptus salmonophloia* (salmon gum) trees.

Habitat trees were deemed as potentially suitable for use by breeding black cockatoos if the opening diameter was ≥10 cm (Groom 2010) and if the hollow was located in a trunk or branch that is generally large enough to support a mature black cockatoo.

Table 2: Attributes recorded as part of the black cockatoo habitat tree assessment

Attribute	Description
Image	An individual photograph of each tree.
GPS location	The location of each tree using a handheld GPS unit.
Tree species	Species and common name.
Diameter at breast height (DBH) (cm)	Measured at approximately 1.3 m height using a diameter tape.
Tree height (m)	An estimate of the height of each tree.
Hollow information	If observed, hollows were noted and photographed.
Hollow entrance information	The entrance diameter was estimated and the entry position noted (e.g. top-entry or side-entry).
Hollow orientation	The orientation of hollows (vertical, near-vertical, non-vertical).
Signs of use of hollows	Signs of use of hollows by black cockatoos or other species.

The survey area was assessed for the potential of providing roosting habitat for black cockatoos, and secondary evidence of roosting activity, such as branch clippings, droppings or moulted feathers was searched. Patches of large native and non-native trees were assumed to provide potential black cockatoo roosting habitat. A dusk roost survey was not undertaken to confirm the presence of a roost.

Potential black cockatoo foraging habitat was identified by comparing the literature on known foraging habitat resources against the vegetation within the survey area (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Groom 2011; Johnstone

et al. 2011; DoEE 2012). Potential foraging habitat was then assessed for importance based on the presence of plant species known to be preferred as food source by black cockatoos, vegetation extent and regional context. Secondary evidence of black cockatoo foraging, such as chewed marri nuts or banksia cones, was searched for and allocated to a species where possible.

Active searches were conducted for secondary evidence of breeding, roosting and foraging activity such as chew marks, branch clippings, droppings, moulted feathers and chewed marri nuts or banksia cones.

3.3 Data analysis and mapping

The location of potential black cockatoo habitat trees recorded in the survey area and information on hollows (if present) were mapped on aerial imagery. The data for each potential black cockatoo habitat tree was compiled in a table format.

Potential black cockatoo foraging habitat was mapped according to notes taken in the field. The foraging habitat value scale used in the Focused Vision Consulting (2019a) assessment was applied to black cockatoo foraging habitat identified within the survey area.

3.4 Results

One black cockatoo habitat tree was recorded within the survey area. Details of this tree are provided in **Table 3** and its location is shown in **Figure 3** and **Figure 4**. This tree is a jarrah which is a suitable species for forest red-tailed black cockatoo and Carnaby's black cockatoo breeding.

Table 3: Black cockatoo habitat tree details

Attribute	Feature
Species name	*Eucalyptus marginata*
Common name	Jarrah
DBH (cm)	64
Hollows	Potential small hollows unsuitable for black cockatoos

The entire survey area supports black cockatoo foraging habitat due the presence of *Eucalyptus marginata* (jarrah) and *Banksia* spp. woodland vegetation.

The vegetation within the survey area was determined to be of 'moderate foraging value' for forest red-tailed black cockatoos, as shown in **Figure 3**. The adjacent vegetation directly to the south of the survey area was also previously determined to be of 'moderate foraging value' for forest red-tailed black cockatoos (Focused Vision Consulting 2019a) (**Figure 3**).

The vegetation within the survey area was determined to be of 'moderate to high foraging value' for Carnaby's cockatoos, as shown in **Figure 4**. The adjacent vegetation directly to the south of the survey area was also previously determined to be of 'moderate to high foraging value' for Carnaby's cockatoo (Focused Vision Consulting 2019a) (**Figure 4**).

No evidence of roosting was observed within the survey area.

4 CONCLUSIONS

Three patches of the 'tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC were recorded in the TEC survey area, comprising a total of 2.74 ha. Patch 1 is in the south eastern portion of the survey area and is 1.12 ha in size. Patches 2 and 3 are in the western portion of the site and 0.78 ha and 0.84 ha in size, respectively.

One black cockatoo habitat tree was recorded in the black cockatoo survey area. No hollows suitable for use by black cockatoos were observed in this tree.

The entire black cockatoo survey area (0.03 ha) represents 'moderate foraging value' for forest red-tailed black cockatoos and 'moderate to high foraging value' for Carnaby's cockatoos.

No evidence of black cockatoo roosting was observed within the black cockatoo survey area.

Summary and closing

We trust that this letter provides suitable information on the tuart woodland TEC and black cockatoo habitat within the surveyed areas. Should you have any questions regarding the content of this letter, please do not hesitate to contact the undersigned.

Yours sincerely
Emerge Associates

Tom Atkinson
SENIOR ENVIRONMENTALCONSULTANT, TEAM LEADER – ECOLOGY

cc: nil

Encl: Figure 1: Survey Locations
Figure 2: Threatened Ecological Community
Figure 3: Forest Red-tailed Black Cockatoo Habitat
Figure 4: Carnaby's Cockatoo Habitat

General References

Davies, S. J. J. F. 1966, *The movements of the White-tailed Black Cockatoo (Calyptorhynchus baudinii) in south-western Australia*, Western Australian Naturalist 10: 33-42.

Department of the Environment and Energy (DoEE) 2012, *EPBC Act referral guidelines for three threatened black cockatoo species*, Australian Government, Canberra.

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Environmental Protection Authority (EPA) 2016b, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth.

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Groom, C. 2010, *Artificial Hollows for Carnaby's Black Cockatoo: An investigation of the placement, use, monitoring and maintenance requirements of artificial hollows for Carnaby's black cockatoo*, Department of Environment and Conservation, Perth.

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Johnstone, R. E. and Kirkby, T. 1999, *Food of the Red-tailed Forest Black Cockatoo Calyptorhynchus banksii naso in Western Australia*, Western Australian Naturalist, 22: 167-178.

Johnstone, R. E. and Storr, G. M. 1998, *Handbook of Western Australian Birds. Volume 1 - Non-Passerines (Emu to Dollarbird)*, Western Australian Museum, Perth.

Saunders, D. A. 1980, *Food and Movements of the Short-billed Form of the White-tailed Black Cockatoo*, Australian Wildlife Research, 7: 257-269.

Figure 1: **Survey Locations**

Project: Targeted Threatened Ecological Community and Black Cockatoo Assessment
Bibra Lake Aboriginal Cultural and Visitors Centre

Client: City of Cockburn

Plan Number:
EP19-144(03)--F07

Drawn:	GAR
Date:	31/01/2020
Checked:	RAW
Approved:	ACW
Date:	04/02/2020

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Metres

Scale: 1:6,000@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

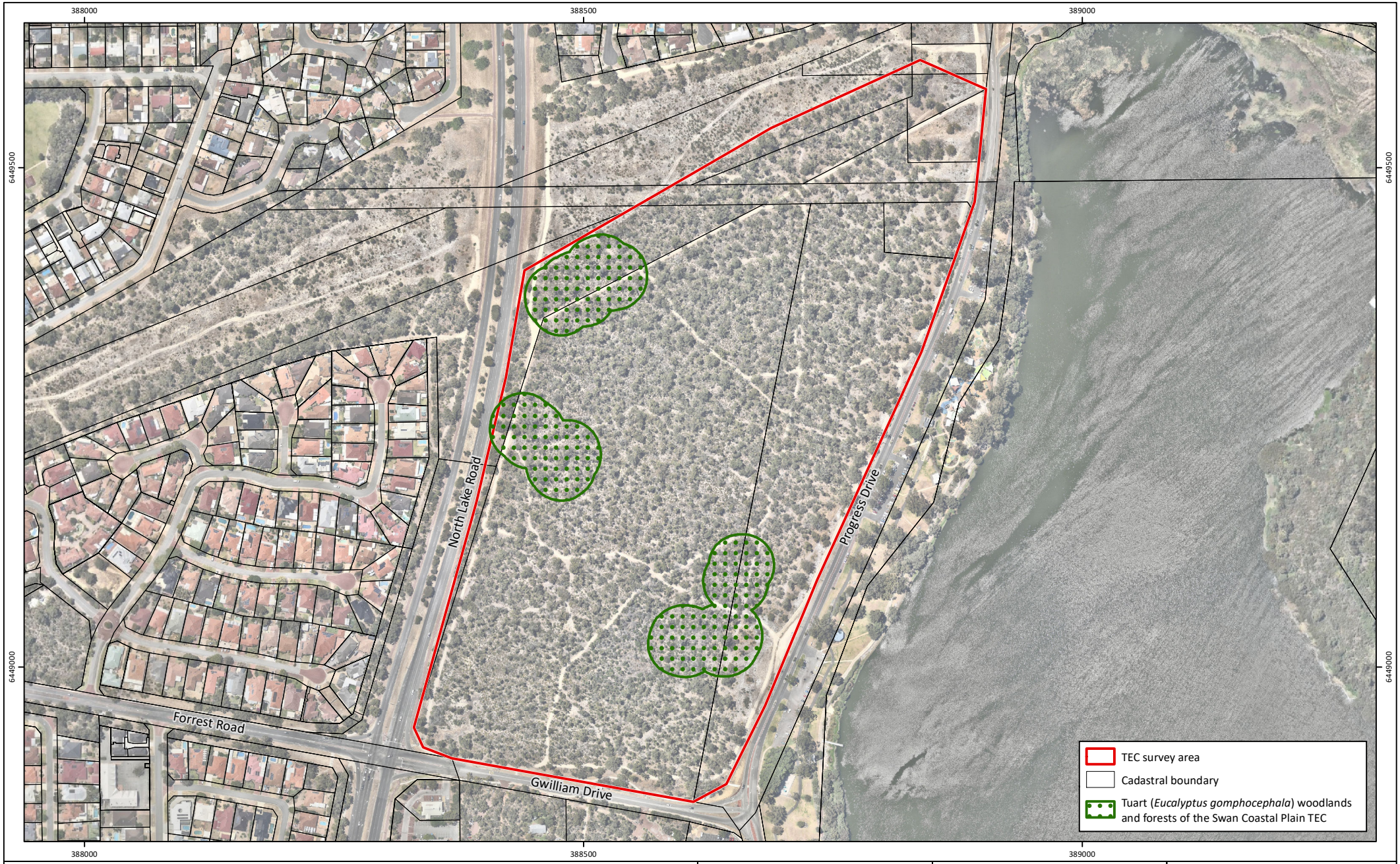

Figure 2: Threatened Ecological Community

Project: Targeted Threatened Ecological Community and Black Cockatoo Assessment
Bibra Lake Aboriginal Cultural and Visitors Centre
Client: City of Cockburn

Plan Number:
EP19-144(03)--F08

Drawn:	GAR
Date:	31/01/2020
Checked:	RAW
Approved:	ACW
Date:	04/02/2020

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Metres

Scale: 1:5,000@A4

GDA 1994 MGA Zone 50

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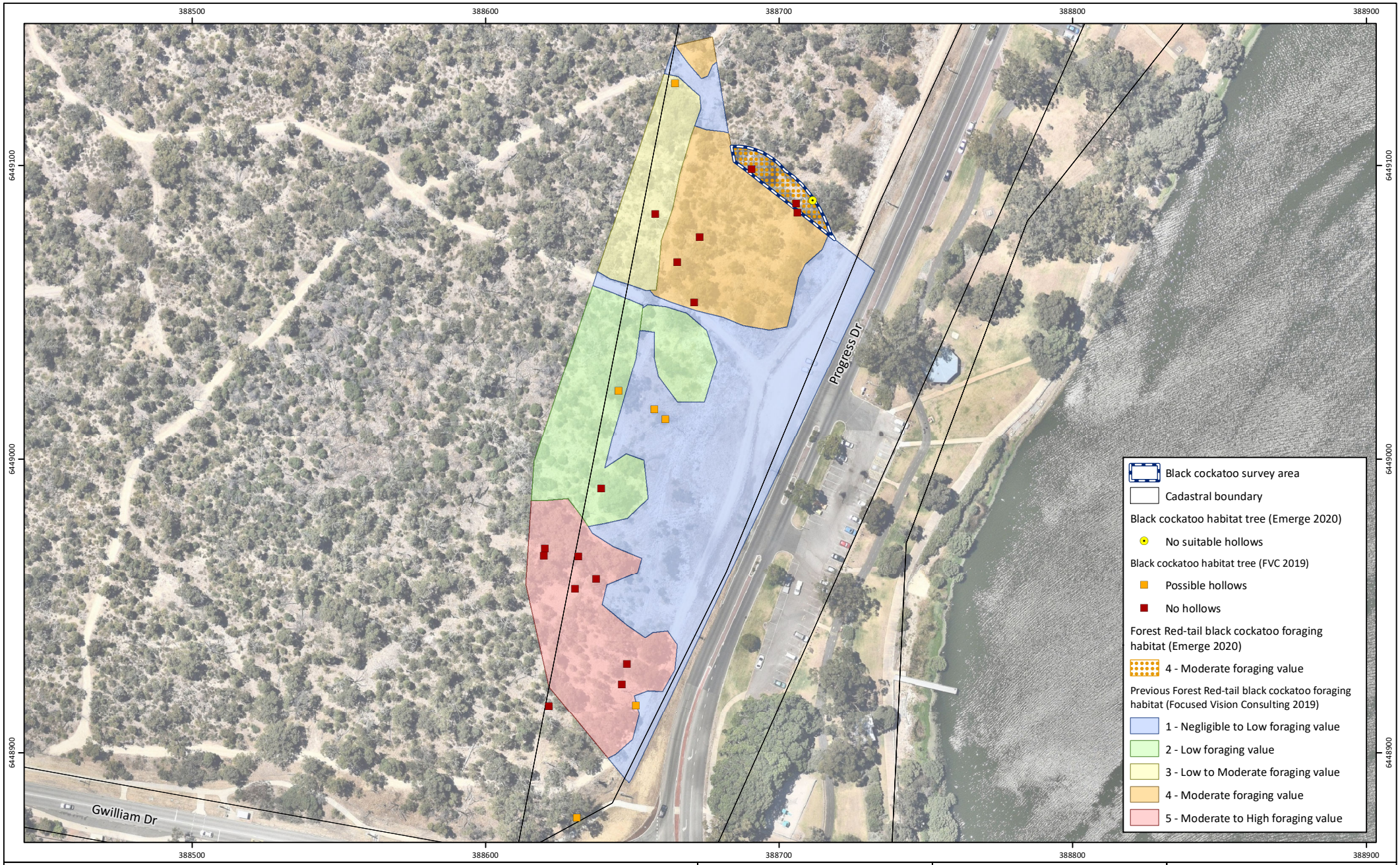

Figure 3: Forest Red-tailed Black Cockatoo Habitat

Project: Targeted Threatened Ecological Community and Black Cockatoo Assessment
Bibra Lake Aboriginal Cultural and Visitors Centre
Client: City of Cockburn

Plan Number:
EP19-144(03)--F09a
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Date: 21/02/2020
Checked: RAW
Approved: ACW
Date: 21/02/2020

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GDA 1994 MGA Zone 50

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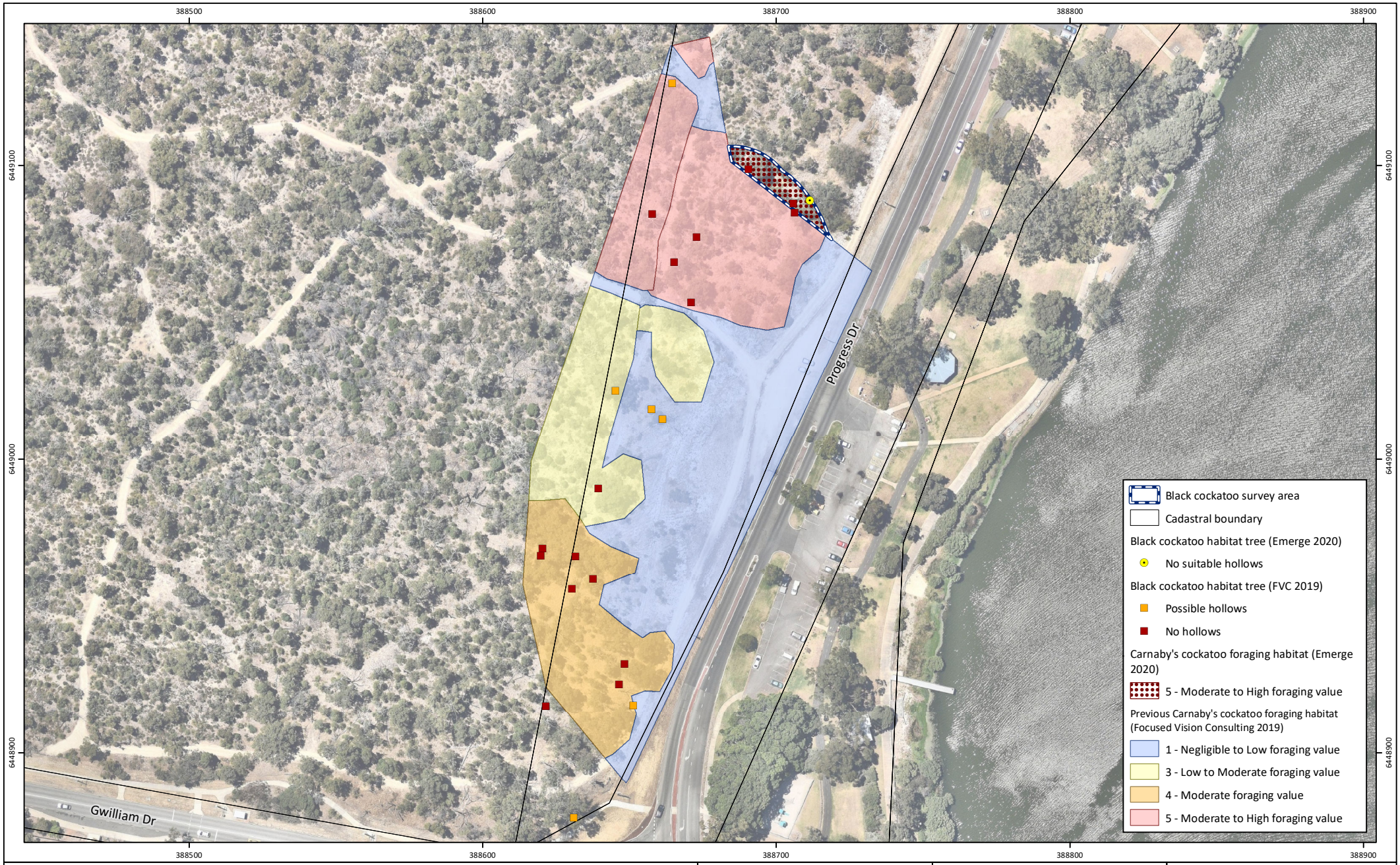

Figure 4: Carnaby's Cockatoo Habitat

Project: Targeted Threatened Ecological Community and Black Cockatoo Assessment
Bibra Lake Aboriginal Cultural and Visitors Centre
Client: City of Cockburn

Plan Number:
EP19-144(03)--F10a
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Date: 31/01/2020
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Date: 21/02/2020

N

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Metres
Scale: 1:1,700@A4
GDA 1994 MGA Zone 50

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