

Black Cockatoo Habitat Assessment

Lots 2 & 3 Nuttman Road, Chapman Hill

MAY 2017



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1 Introduction

1.1 The project

Leeuwin Civil are preparing a development application associated with a proposed gravel extraction pit at Lots 2 and 3 Nuttman Road, Chapman Hill, within the City of Busselton. The property is owned by Mr. Brian Baker. The proposed 9.73 ha gravel pit, herein referred to as 'the site', will require the clearing of approximately 2.8 ha of remnant native vegetation (see Figure 1-1).

Leeuwin Civil requires a Black Cockatoo Habitat Assessment for the site to support a Clearing Permit application. The Project may also require approval under the *Environment Protection and Biodiversity Conservation Act 1999*. This report provides advice on whether the project should be referred to the federal Department of Environment and Energy (DotEE) for assessment.

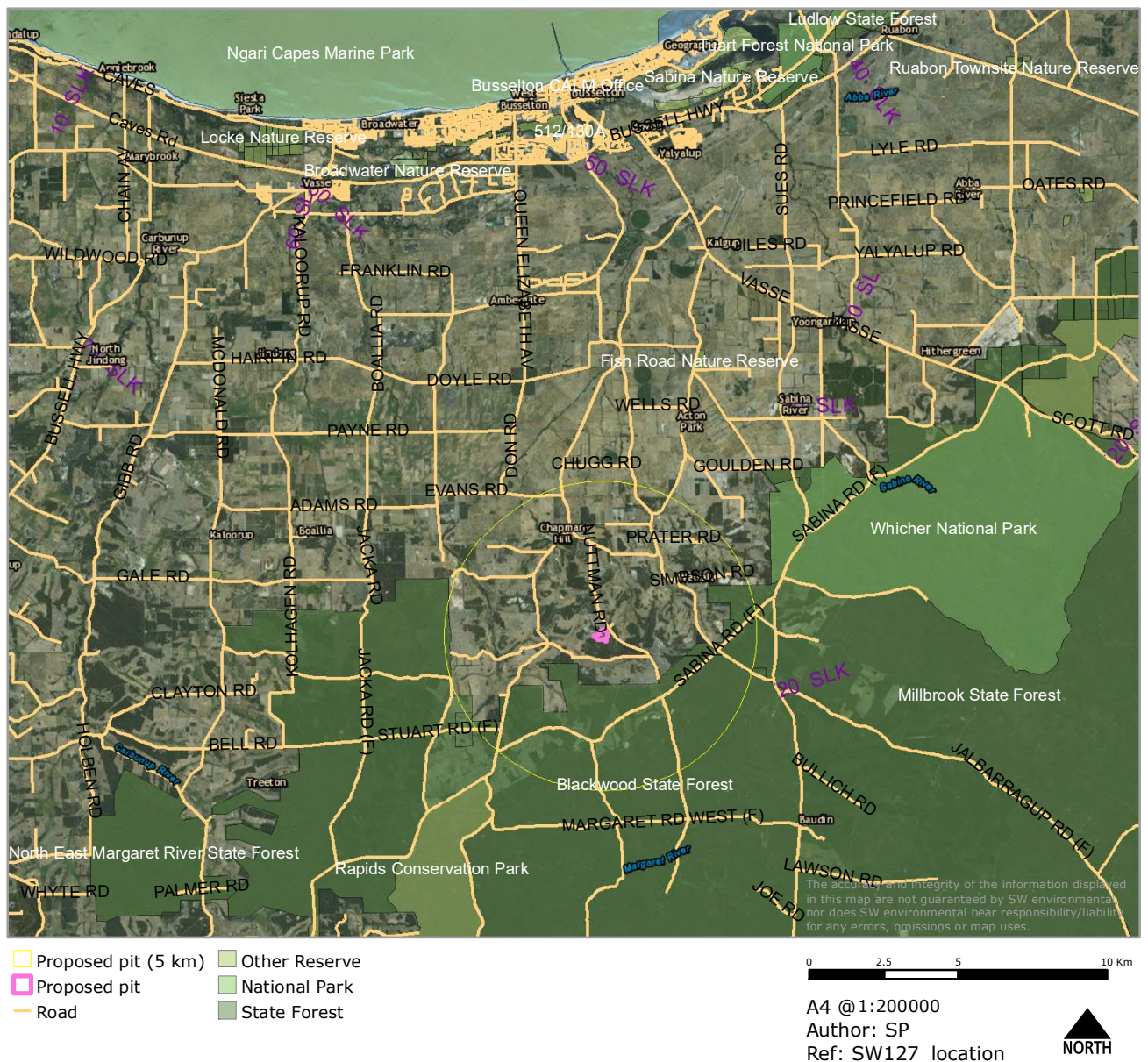


Figure 1-1 Site location

1.2 Statutory setting

The native vegetation at the site may provide habitat for Carnaby's, Baudin's and Forest Red-tailed Black Cockatoos, collectively referred to as 'Black Cockatoos'. Black Cockatoos are considered threatened¹;

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (T, V),
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (T, V)
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (T, E)

Relevant Commonwealth and State legislation in relation to Black Cockatoos includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Wildlife Conservation Act 1950* (WC Act)
- *Environmental Protection Act 1986* (EP Act)

1.2.1 EPBC Act

The EPBC Act provides a list of matters of 'National Environmental Significance' (NES), which includes significant fauna, flora and communities. A proposal that is likely to result in a significant impact to any matters of NES will require referral to the DotEE for assessment in accordance with the EPBC Act. As Black Cockatoos are considered threatened under the Act they are also matters of NES. The significance of a proposed action in relation to Black Cockatoos can be determined using the guidelines below:

- Commonwealth '*Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*, Department of the Environment, Water, Heritage and the Arts (DEWHA)', (2009)
- Commonwealth '*EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered), Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable), Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso*', (2012).

This assessment focusses on the 2012 guidelines as they were specifically developed and nested under the 2009 significant impact guidelines.

1.2.2 WC Act

Fauna may be afforded Declared Rare conservation status where their populations are restricted geographically or threatened by local processes. The WA Department of Parks and Wildlife (DPAW) administers the WC Act and applies regulations towards species protection. The Western Australian Minister for the Environment regularly gazettes a notice where taxa are listed as protected and classified as Schedule 1 through to Schedule 4 according to their conservation status. Black Cockatoos are listed under *Schedule 1 - Fauna that is rare or is likely to become extinct*.

1.2.3 EP Act

A Clearing Permit application, administered by the Department of Environment Regulation (DER) under the *Environmental Protection Act 1986*, may be required for the Project. DER will consider the proposal against the ten Clearing Principles, including *Principle (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia*. If the Project is likely to be at variance to any of the Principles an environmental offset may be required or the Clearing Permit application may be rejected.

¹ Note: T: Rare or likely to become extinct, set by the *Wildlife Conservation Act 1950*, V: Vulnerable, and E: Endangered, set by the *Environment Protection and Biodiversity Conservation Act 1999*.

1.3 Black Cockatoo species background and habitat requirements

A brief summary of the habitat requirements of each of the three Black Cockatoos is included below.

Baudin's Black Cockatoo (Threatened WC Act, Vulnerable EPBC Act)

Baudin's Black Cockatoo usually occurs in forest dominated by Marri and other Eucalypts, especially Karri and Jarrah, but may also occur in Wandoo woodland, and in orchards, and is occasionally recorded in farmland and grasslands. It forages mostly on Marri gumnuts and blossoms. When feeding in Marri, Baudin's Black Cockatoo extract seeds from their capsules by using its long, tapered upper mandible in a manner that causes little or no damage to the capsule itself (SPRAT 2010).

Preferred roosts are in areas with a dense canopy close to permanent sources of water (Johnstone and Kirkby 2008, in SPRAT 2010). The nesting season occurs through August through to December. The range of the species during the non-breeding season may be determined by the distribution of Marri dominated forest, its' favoured feed tree. It is known to nest in hollows of Eucalypts, (Pizzey and Knight 2007) mostly in tall wet sclerophyll forests such as the Karri forests around Pemberton but is known to also nest in the Capes region. Nests are often high (30-50 m above ground) (Jupp 2000). The entrance diameter of breeding hollows are usually large (30-40 cm), with large internal dimensions also (>30cm deep) (DEC 2007).

Forest red-tailed Black Cockatoo (Threatened WC Act, Vulnerable EPBC Act)

The Forest red-tailed Black Cockatoo inhabits the dense Jarrah, Karri and Marri forests receiving more than 600 mm average rainfall annually (Saunders and Ingram 1995 in SPRAT 2009). The Forest red-tailed Black Cockatoo occurs within the same habitat as the Baudin's Black Cockatoo. They nest in large, mostly vertical hollows of Karri, Marri, Wandoo, Jarrah and Bullich. Hollow heights range between eight and 14 m above ground, with an entrance diameter of 12-41 cm and hollow depth of one to five metres. Spouts may be preferred. They roost in Jarrah-Marri-Blackbutt habitat on road-sides, paddocks or forest blocks. Around 90% of the diet is made up of Marri and Jarrah seeds within its home range of 116-187 ha (Johnstone and Kirkby 1999; Johnstone and Storr 1998 in SPRAT 2009). Critical habitat for Forest red-tailed Black Cockatoo is considered to be any habitat where the species is known, or has potential, to occur (DEC 2007), whether suitable for foraging or breeding.

Carnaby's Black Cockatoo (Threatened WC Act, Endangered EPBC Act).

Carnaby's Black Cockatoo mainly occurs in or near Eucalypt woodlands, especially those dominated by Wandoo or Salmon Gum, and is only sometimes reported in forests of Marri, Jarrah or Karri (SPRAT 2010). Carnaby's Black Cockatoos nest in hollows in Eucalypt woodland in the wheatbelt and forage in nearby areas of scrub and heath dominated by Proteaceous trees and shrubs (Cale 2003). Nesting hollows have been recorded from 2 m to more than 10 m above the ground (SPRAT 2010), and hollow entrance size is generally larger than 10 centimetres (Scott 2010). Carnaby's Black Cockatoo is a mobile species and flocks wander across vast areas in search of food (Cale 2003). The recovery plan for this species identifies the following critical habitat: *"remaining woodland breeding sites in the south west of Western Australia, and feeding and watering areas used during the breeding period [as well as] woodland sites known to have supported breeding in the past and which could be used in the future if new food resources are established"* (Cale 2003 p.19).

Ron Johnstone (WA Museum Curator – Ornithology and recognised Black Cockatoo expert) was consulted (verbally on 05 and 07.08.2013) and indicated that all three Black Cockatoo species are known to breed within the Capes region. Black Cockatoos are likely to target the larger/older trees with around 98% of nest sites in Marri hollows or stags. Forest Red-tailed and Baudin's Black Cockatoos are known to breed on a two to three year cycle. Carnaby's Black Cockatoos however are annual breeders.

2 Methods

Fieldwork consisted of a site reconnaissance carried out on the 29th May 2017, by an experienced fauna and habitat surveyor (Shane Priddle). The weather conditions were clear and sunny (16° C) and were conducive for the survey. Habitat attributes including the presence/absence of potential breeding/habitat trees were noted along with forage habitat and roosting evidence, specifically:

- **Habitat Tree Survey:** This involved the identification of all suitable nesting trees within the study area that had a Diameter at Breast Height (DBH) of over 50cm. Hollow bearing trees less than this size with large hollows were also recorded. The location of each tree of a suitable species to develop nesting hollows (e.g. Jarrah, Marri) over 50cm DBH was recorded with a GPS along with details on tree species, size class and the number and size of hollows.
- **Black Cockatoo foraging habitat assessment:** The determination of the amount and quality of potential Black cockatoo foraging habitat on site was considered. Actual foraging evidence observed during the field survey was also noted.
- **Roosting habitat survey:** The presence/absence of any direct or indirect evidence of Black Cockatoos roosting within trees on site was also noted.

Photos were taken. The results are summarised in Section 3. Mapping was carried out using ArcGIS 10.0 geographic information system (GIS) software. Field data was captured using a Garmin GPSmap 60CSx high sensitivity handheld GPS.

In accordance with the EPA Guidance Statement No. 56 (EPA 2004), potential limitations of the fauna survey have been identified below.

Table 2-1 Limitations with regard to fauna assessment adequacy and accuracy

Aspect	Constraint	Comment
Access	None	The site was accessible and surveyed on foot.
Timing	Negligible	Surveys were undertaken in appropriate weather. Timing was not a limitation to detectability. A precautionary approach was adopted in that the survey targeted suitability of habitat, rather than actual presence of Black Cockatoos.
Scope	Negligible	A Black Cockatoo Habitat Assessment was undertaken. A single site visit is considered adequate to identify relevant habitat features.
Hollow-bearing trees	Negligible	It is difficult to be certain about whether an apparent hollow is actually hollow without physical inspection. Some hollows may have been overlooked; conversely some hollows may have been counted that were not actually deep enough to be used by Black Cockatoos.
Precautionary approach	Low	As it is difficult to rule out the presence of a particular species without rigorous surveys, a precautionary approach has been adopted. If suitable habitat is present, the species has been assumed to have potential to utilise habitat within the site.
Seasonal or occasional visitations	Low	Black Cockatoo use of the site may be seasonal and vary between species. Active nesting hollows would still have shown some evidence of chewing and old Marri nuts would provide evidence use of the site by Black Cockatoos.
Skill and knowledge of the surveyor	Negligible	A suitably qualified individual carried out the fauna survey habitat assessment: Shane Priddle, Certified Environmental Practitioner (EIANZ). Shane has conducted Level 1 equivalent fauna and targeted threatened species surveys, including for Black Cockatoos, in NSW and WA since 2003.

3 Results

Vegetation at the site consists of woodland and paddock trees of Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginate*) and occasional WA Sheoak (*Allocasuarina fraseriana*); see Figures 3-1 and 3-2. The project will require clearing of approximately 2.8 ha based on canopy areas from aerial photo interpretation (ESRI online, 2017); Appendix A.



Figure 3-1 Paddock trees and cleared understorey



Figure 3-2 Patched of trees with cleared understorey

3.1 Black Cockatoo foraging

Vegetation at the site (2.8 ha) is generally consistent with species known to be utilised by all three Black Cockatoos for foraging. Old evidence in the form of chewed Marri nuts by Forest Red-tailed and Baudin's Black Cockatoo was found widely over the site. Chewed Sheoak cones were also observed which could have been foraged on by any of the three species. Of interest was a Jarrah tree also within the project site that had its bark distressed over almost the entire tree (Figure 3-3).

This may have been caused by a flock of Baudin's Black Cockatoo attacking the borers which were observed in the bark.



Figure 3-3 Shredded Jarrah showing signs of borer predation

Whilst the vegetation at the site is considered suitable for all three Black Cockatoos, similar habitat is fairly abundant locally. GIS calculations of the DAFWA remaining remnant vegetation layer (obtained June 2013 based on mapping 1996-2013; see Figure 1-1) shows that a total of 3490 ha of native vegetation remains within 5 km of the site. Large areas of similar or better quality contiguous habitat are also reserved within the nearby Whitcher National Park, Rapids Conservation Park and Blackwood and Millbrook State Forests.

The loss of 2.8 ha of forage habitat only represents 0.08% of habitat likely to be available to Black Cockatoos locally (based on DAFWA GIS mapping).

3.2 Nesting and roosting

The field survey identified 39 trees that were greater than 50cm DBH (50cm is considered generally as a rule of thumb for large trees that may in time develop hollows). Many of the trees at the site over 50cm DBH however are not considered to be large - at height of greater than a couple metres they were multi stemmed and not ideal in term of providing branches thick enough to support the well-developed hollows required by Black Cockatoos for nesting. Large hollows take many years to form. For example a study by Mawson et al (1994) found that hollows utilised by the medium sized Long-billed Corella (which can utilise smaller hollows than Black Cockatoos) may take on average around 450 years to form in Marri and over 1000 years in Jarrah.

Of the 39 large trees identified, 12 contained (21) hollows that were greater than 10cm in diameter or large enough for Black Cockatoos to enter. It is unclear how deep these were and it is possible that some hollows were missed due to their orientation. The location of habitat trees and hollows are shown in Appendix A. No hollows were identified as being actively used (chewed) though the survey was conducted outside of the breeding period for Black Cockatoos. Approximately half of the hollows looked as though they might be suitable for Black Cockatoo breeding based on hollow size, trunk thickness and other aspects observed on site. Habitat tree data is provided in Appendix B.

The loss of 2.8 ha of habitat only represents 0.08% of that available to Black Cockatoos locally (based on DAFWA GIS mapping). It is conceivable that the large areas of contiguous habitat available locally would provide better breeding habitat opportunities than those at the site. Further, it was noted in Section 1.3 that Black Cockatoos are likely to target the larger/older trees with around 98% of nest sites in Marri hollows or stags. Only four of the 39 trees >50cm DBH trees within the site were Marri and the rest Jarrah.

No evidence of roosting was observed within the site.

Note several large stick nests were also observed and mapped – these have no relevance to Black Cockatoos but were mapped as they should be checked during the actual clearing activities.

3.3 Consideration against EPBC Act referral guidelines

Vegetation within the site contains key species known to be foraged on by Black Cockatoos and to support hollows that may be suitable for breeding.

Any proposal that is likely to result in a significant impact to Black Cockatoos will require referral to DotEE for assessment in accordance with the EPBC Act. An assessment against the EPBC significance criteria is outlined in Table 3-1.

Based on the Table 3-1, the proposal is likely to trigger the need for referral.

Table 3-1 EPBC Act significant impact trigger criteria from 'Referral guidelines for three species of Western Australian black cockatoos', SEWPAC 2012.

High risk of significant impacts: EPBC referral recommended	
Trigger	Triggered?
Clearing of any known nesting tree	No, no known nesting trees were identified within the site. There were 12 trees with 21 hollows that may potentially contain breeding habitat.
Clearing or degradation of any part of a vegetation community known to contain breeding habitat.	Possible but unlikely. There are 12 hollow bearing trees that will need to be cleared. Extensive areas of contiguous habitat is available locally and would provide better breeding habitat opportunities than those at the site.
Clearing of more than 1 ha of quality foraging habitat.	Yes, the proposal involves the clearing of 2.8 ha of vegetation that is likely to be considered 'quality foraging habitat' based on the species. The loss of 2.8 ha of forage habitat only represents 0.08% of habitat likely to be available to Black Cockatoos locally.
Clearing or degradation (including pruning of top canopy) of a known roosting site.	No, no evidence of roost sites were identified during the surveys.
Creating a gap or greater than 4 km between patches of Black Cockatoo Habitat (breeding, foraging or roosting).	No, the clearing would not create habitat fragmentation at the landscape scale.

Uncertainty: Referral recommended or contact SEWPAC	
Trigger	Triggered?
Degradation (such as through altered hydrology or fire regimes) of more than 1 ha of foraging habitat. Significance will depend on the level and extent of degradation and the quality of the habitat.	No, clearing is addressed above. No additional degradation is anticipated.
Clearing or disturbance in areas surrounding Black Cockatoo habitat that has the potential to degrade habitat through introduction of invasive species, edge effect, hydrological changes, increase human visitation or fire.	Unlikely, impacts will be retained to the circa 10 ha gravel pit site.
Actions that do not directly affect the listed species but that have the potential for indirect impacts such as increasing competitors for nest hollows.	No.
Actions with the potential to introduce known plant diseases such as <i>Phytophthora</i> spp. to an area where the pathogen was not previously known.	Unlikely given extensive areas of similar or better habitat are available locally.
Low Risk of significant impacts: referral may not be required but you may refer for legal certainty	
Trigger	Triggered?
Actions that do not affect black cockatoo habitat or individuals.	No.
Actions whose impacts occur outside the modelled distribution of the three Black Cockatoos.	No.

4 Conclusion and recommendations

The project will require the clearing of 2.8 ha of vegetation that is likely to be considered 'quality foraging habitat' based on the tree species being cleared. It is noted however that the loss of 2.8 ha of forage habitat only represents 0.08% of habitat likely to be available to Black Cockatoos locally (within 5 km of the site). Of the 39 'large' trees identified at the site, 12 contained (21) hollows that were greater than 10cm in diameter (large enough for Black Cockatoos to enter).

Recommendations include:

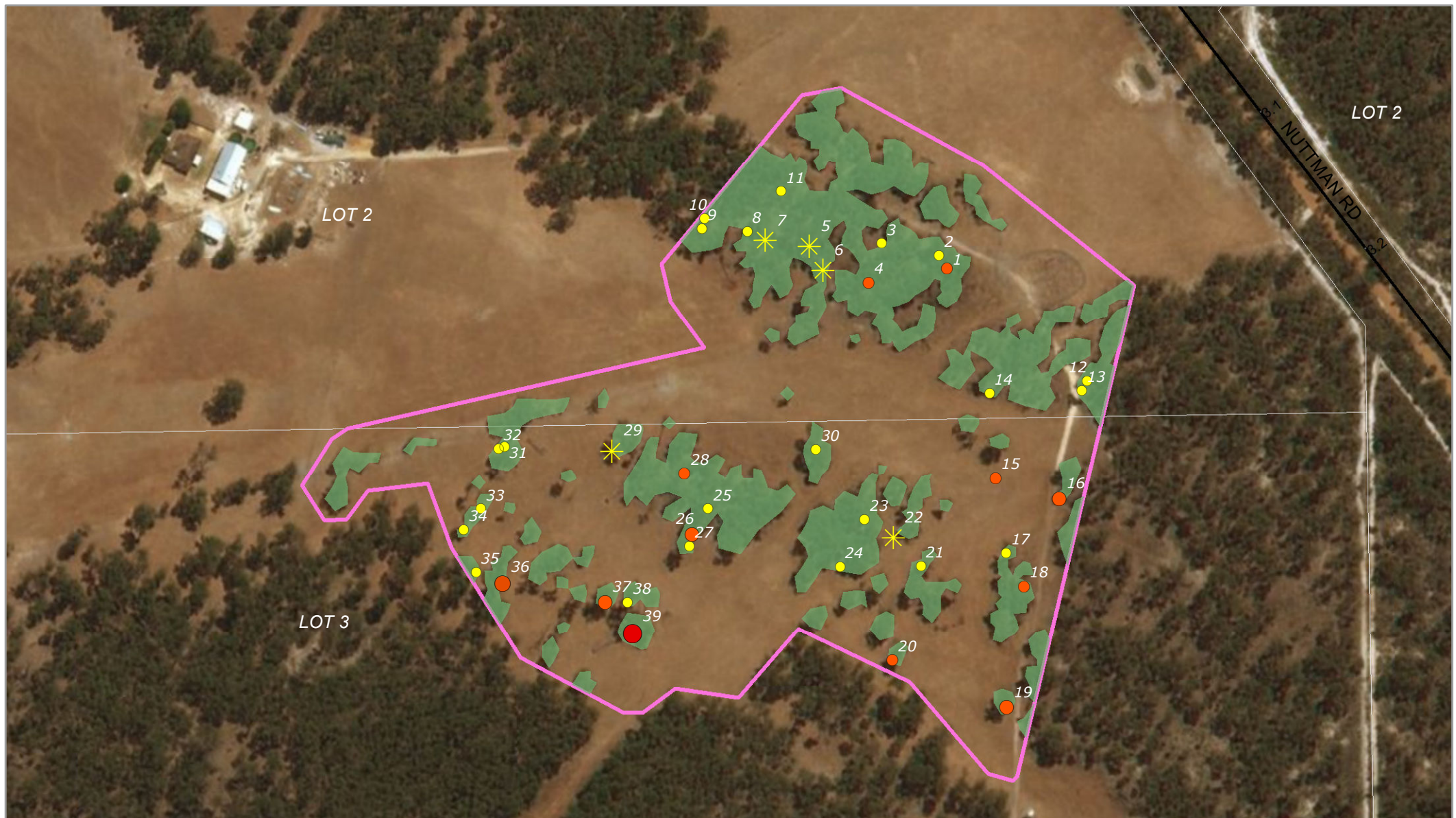
- Schedule clearing outside of key breeding periods (August-February).
- Ensure an experienced and licensed fauna specialist is present during clearing to manage any injured wildlife.
- If offsets are required consideration should be given to revegetating with Marri (*Corymbia calophylla*) as a dominant species.
- Liaise further with DotEE to determine if the project should be referred. Based on the assessment outcomes of Table 3-1, it is the Author's opinion that for legal certainty the project should be referred.

5 References

Note: Not all references are necessarily cited in the report text.

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- DEC (2007) *Forest Black Cockatoo (Baudin's Cockatoo Calyptorhynchus baudinii and Forest red-Tailed Black Cockatoo Calyptorhynchus banksii naso) Recovery Plan 2007 – 2016*, Department of Environment and Conservation
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Appendix A: Proposed clearing area



BLACK COCKATOO SURVEY

Lots 2 & 3 Nuttman Road, Chapman Hill

Habitat trees

- Tree >50cm DBH
- HBT (1 hollow >10cm)
- HBT (2 hollows >10cm)
- HBT (3 hollows >10cm)
- HBT (4 or more hollows >10cm)
- ✱ Stick nest

■ Potential black cockatoo forage habitat

■ Proposed pit

□ Cadastre (Landgate 2017)

~ Road

0 25 50 100 Metres

A4 @ 1:3000

Author: SP

Ref: SW127



Appendix B: Habitat tree data

Tree	y_proj_GDA	x_proj_GDA	Sp	DBH_cm	Hollows	H_1	Size_1_cm	H_2	Size_2_cm	H_3	Size_3_cm	H_4	Size_4_cm	BC_Chewed	Suitable_BC
1	6257304	347627	Jarrah	50+		1	Spout		10-20					No	Unlikely
2	6257312	347622	Jarrah	50+		0									
3	6257319	347589	Jarrah	100+		0									
4	6257296	347581	Marri	<50		1	Knot		10-20					No	Unlikely
5	6257317	347547	Marri	50+	Nest										
6	6257303	347555	Jarrah	50+	Nest										
7	6257321	347522	Jarrah	50+	Nest										
8	6257326	347511	Jarrah	50+		0									
9	6257327	347485	Jarrah	50+		0									
10	6257333	347487	Jarrah	50+		0									
11	6257349	347531	Jarrah	50+		0									
12	6257239	347708	Jarrah	50+		0									
13	6257234	347705	Jarrah	50+		0									
14	6257232	347651	Jarrah	50+		0									
15	6257183	347655	Jarrah	100+		1	Fissure		10-20					No	Possible
16	6257171	347692	Jarrah	50+		2	Spout		20+	Knot	10-20			No	Unlikely
17	6257140	347661	Jarrah	50+		0									
18	6257120	347671	Jarrah	50+		1	Spout		10-20					No	Possible
19	6257050	347661	Jarrah	50+		2	Spout		20+	Knot	10-20			No	Possible
20	6257077	347595	Jarrah	50+		1	Vertical		20+					No	Unlikely
21	6257132	347612	Marri	50+		0									
22	6257149	347596	Jarrah	50+	Nest										
23	6257159	347579	Jarrah	50+		0									
24	6257132	347565	Jarrah	50+		0									
25	6257165	347489	Jarrah	50+		0									
26	6257150	347479	Jarrah	50+		2	Spout		10-20	Spout	10-20			No	Possible
27	6257144	347478	Jarrah	50+		0									
28	6257185	347475	Jarrah	100+		1	Knot		10-20					No	Unlikely
29	6257199	347433	Jarrah	50+	Nest										

Tree	y_proj_GDA	x_proj_GDA	Sp	DBH_cm	Hollows	H_1	Size_1_cm	H_2	Size_2_cm	H_3	Size_3_cm	H_4	Size_4_cm	BC_Chewed	Suitable_BC
30	6257199	347551	Jarra	50+	0										
31	6257201	347371	Jarra	50+	0										
32	6257200	347367	Jarra	50+	0										
33	6257165	347357	Jarra	50+	0										
34	6257153	347347	Jarra	50+	0										
35	6257129	347354	Jarra	50+	0										
36	6257122	347370	Jarra	100+	3	Knot	10-20	Knot	10-20	Knot	10-20			No	Possible
37	6257111	347429	Jarra	50+	2	Knot	10-20	Knot	10-20					No	Possible
38	6257111	347442	Jarra	50+	0										
39	6257093	347445	Marri	100+	4	Knot	10-20	Knot	10-20	Spout	10-20	Spout	10-20	No	Possible