



iNSiGHT Ornithology

Wildlife Photography ~ Research ~ Environmental Education

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Holcim Quarry Habitat Tree Assessment



LETTER REPORT

for

Holcim (Australia) Pty. Ltd.
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Western Australia 6112

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Background

In order to proceed with the development of the south-east extension of their Quarry at Lot 3 Mills Road East, Gosnells, Holcim (Australia) Pty. Ltd. obtained a permit (CPS 8582-1) from the Western Australian Department of Water and Environmental Regulation (DWER) to clear 10.7ha of native vegetation. Condition 5(a) of this permit stipulated:

Prior to undertaking any clearing authorised under this permit within the area cross-hatched yellow on Figure 1 of Schedule 1, the permit holder must engage a *fauna specialist* to inspect trees identified as *black cockatoo breeding trees* within the report 'Holcim Gosnells Quarry – Fauna Assessment of the Quarry Area' dated 19 July 2017, for *evidence* of current or past breeding use by *black cockatoos species* listed below:

- (i) *Calyptorhynchus latirostris* (Carnaby's cockatoo);
- (ii) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo); and
- (iii) *Calyptorhynchus baudinii* (Baudin's cockatoo).

Habitat Tree Assessment

Holcim commissioned iNSiGHT Ornithology to conduct this habitat tree inspection on 10th March 2021, during the afternoon. Four (4) habitat trees previously identified by Bamford Consulting Ecologists (Bamford 2017) as having “suitable {for black cockatoos} hollow(s) without chew marks” (rank of ‘3’), and occurring within the proposed clearing area (i.e. overlap of zones marked in maps shown in **Appendices 1 and 2**), were assessed from the ground. The characteristics of hollows in each tree were inspected closely using a high resolution camera attached to a telescopic pole, with particular focus on detecting heavy chew-marks at the entrance and inside the hollow consistent with evidence of black cockatoo use. Trees rated by Bamford (2017) as 4 (“potentially suitable hollow”) or 5 (“no hollows”) were not inspected, because, according to the definitions* (**Appendix 3**), were deemed unsuitable for black cockatoo use. No trees with a rating of 1 or 2 occurred within the proposed clearing area.

Details of the trees assessed and descriptions of the findings are presented in Table 1, with images of tree-hollows appearing in Figures 1–4. Hollows in two trees contained evidence of past use by black cockatoos, although none was active at the time of inspection.

Table 1. Characteristics of 4 habitat trees assessed at Holcim Quarry, Gosnells on 10th March 2021. DBH = diameter at breast height; BCE rank = Bamford Consulting Ecologists report (2017); ‘Score’ refers to rank given on day of inspection indicating black cockatoo nesting activity: 1 = active nest, 2 = evidence of past/current use, 3 = suitable hollow(s) but no evidence of past/current use, 4 = unsuitable hollow(s).

Tree No.	Easting	Northing	Species	DBH (mm)	BCE rank	Score
1	409104	6450932	Marri <i>Corymbia calophylla</i>	1100	3	2
Notes:	Single, vertical hollow near top of tree, internal diameter ~300mm, some chew marks present on exterior (Figure 1). Hollow depth >1m with heavy chewing inside indicating probable past use by black cockatoos. Contained broken/unhatched eggs of duck (probably Australian Wood Duck <i>Chenonetta jubata</i>), indicating most recent use (late 2020) was by this species and not black cockatoos.					
2	409077	6450952	Marri <i>Corymbia calophylla</i>	800	3	2
Notes:	Single, vertical hollow at top of tree, internal diameter ~300mm, chewing present on exterior (Figure 2). Hollow depth >2m into main trunk, some chewing inside, possible past use by black cockatoos. Nest chamber hard to fully discern but appears empty.					
3	409225	6450900	Marri <i>Corymbia calophylla</i>	600	3	3
Notes:	One vertical hollow spout ~6m high, internal diameter 250mm, hollow depth ~500mm, no evidence of chewing and nest chamber empty (Figure 3). Second small, horizontal hollow ~4m high, entrance diameter ~150mm, orientation of hollow unsuitable for black cockatoos.					
4	409073	6450678	Marri <i>Corymbia calophylla</i>	600	3	4
Notes:	Single, dead, near-vertical trunk with oblique hollow, diameter ~200mm, entrance almost horizontal but appears too small for black cockatoos.					

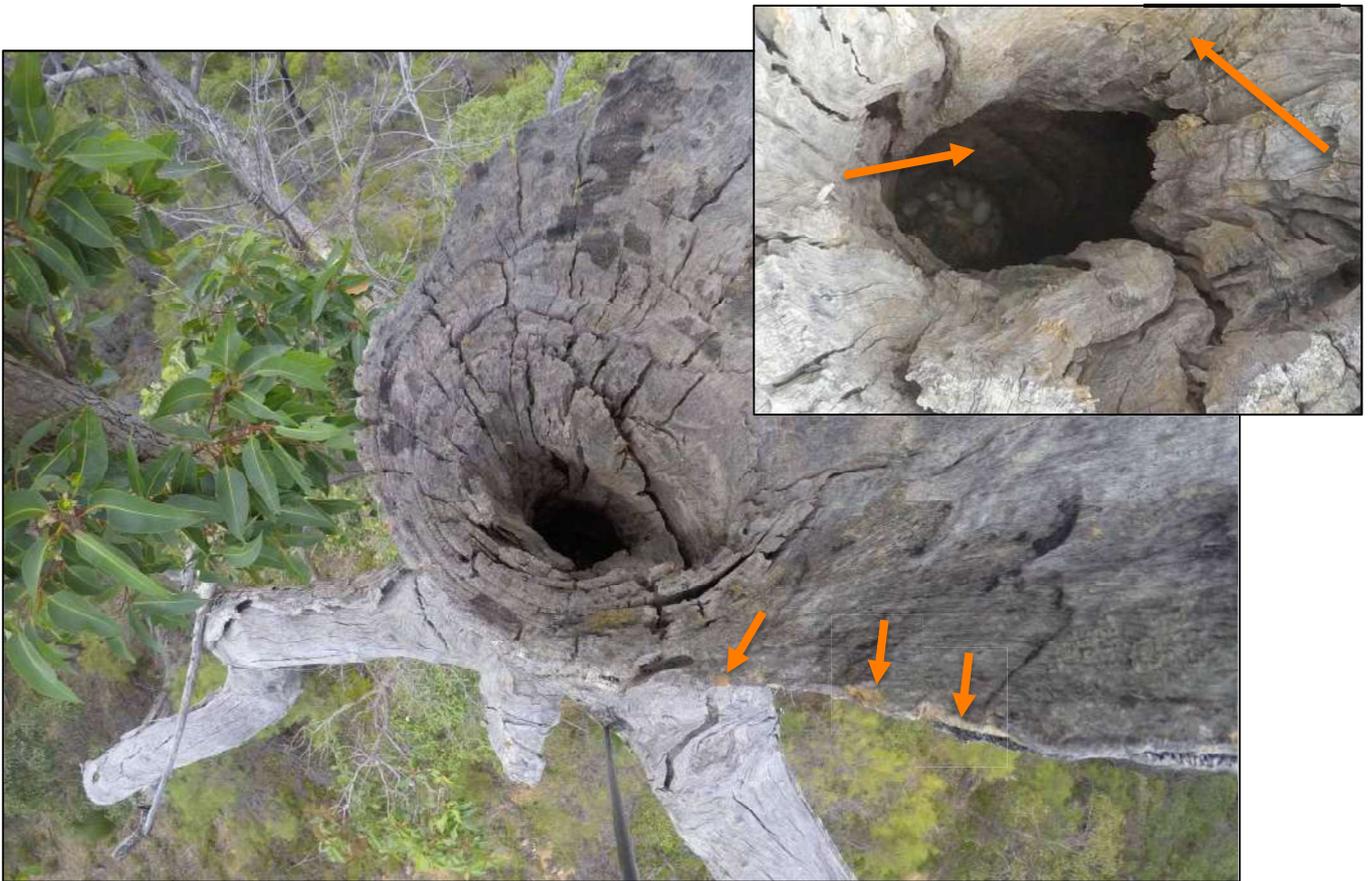


Figure 1. Top-entry hollow in Tree 1. Arrows point to chew marks / patches of heavy chewing indicated by brown colouration where faded (grey) surface has been removed. Broken duck eggs are visible in inset.



Figure 2. Top-entry hollow in Tree 2. Arrows point to chew marks / patches of heavy chewing indicated by brown colouration where faded (grey) surface has been removed.

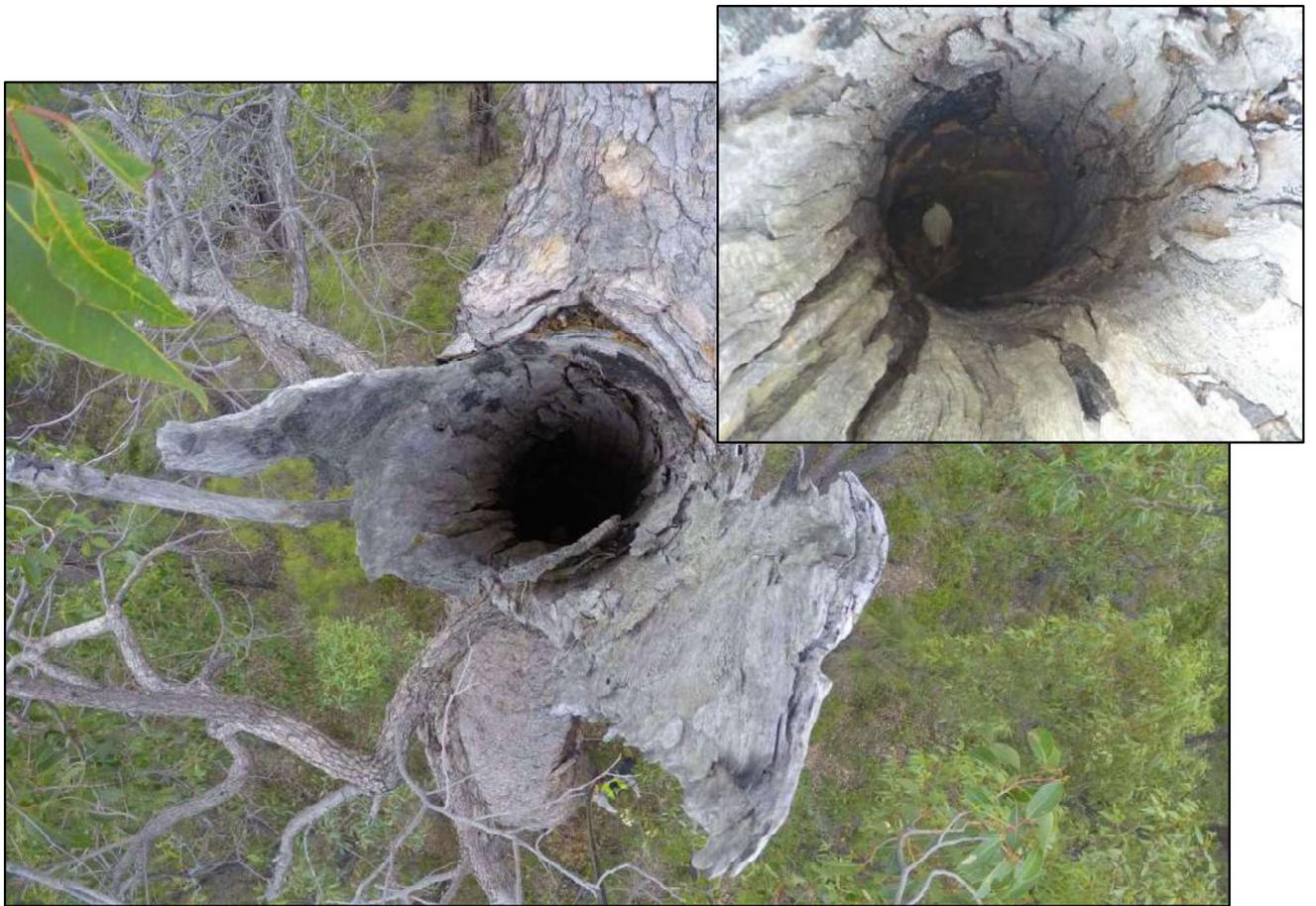


Figure 3. Top-entry hollow in Tree 3. 'Clean' hollow with no evidence of chewing either on exterior or inside hollow.



Figure 4. Oblique hollow in Tree 4. Arrow indicates wood chip 'nest chamber' which may have been used by smaller parrot species in the past.

Mitigating Habitat Loss

Artificial nest-boxes for black cockatoos are often used to offset habitat loss when the removal of potentially suitable black cockatoo nest-trees cannot be avoided. As such, conditions 5(e) and 5(f) of DWER's clearing permit stated:

For each black cockatoo breeding tree identified that cannot be avoided, the permit holder must install an artificial black cockatoo nest hollow.

Each artificial black cockatoo nesting hollow required by condition 5(e) must be installed prior to commencement of any clearing activities otherwise authorised under this permit.

Holcim plans to purchase three (3) nest-boxes, and received permission from DWER to install them within a proposed conservation covenant to be placed within their lease at Lot 3 Mills Road East, Gosnells. Therefore, directly after the habitat tree assessment on 10th March 2021, a survey aiming to identify equivalent habitat containing trees suitable to host black cockatoo nest-boxes at the site was also carried out. This survey involved driving the southern, eastern and northern boundary, and one internal access track, of the area marked 'Holcim Quarry Study Area' by Bamford (2017), and assessing the habitat visually.

The survey identified an area of open Jarrah / Marri woodland bordering open Wandoo woodland (VSAs 1 and 2 in Bamford, 2017, respectively) approximately 600m north of the habitat in which potential nest-trees (Trees 1 and 2 in Table 1) were situated (Figure 5). This area was outside that cross-hatched yellow on Figure 1 of Schedule 1. The habitat here was comparable to the area proposed for clearing because it contained mixed Jarrah / Marri woodland on sloping ground (Figure 6), and it also incorporated a tract of open Wandoo woodland, with the host trees similarly distributed to nest-trees in the proposed clearing zone. The locations of three (3) 'host trees' potentially suitable for nest-boxes are shown in Table 2 and Figure 6. Details of these trees are as follows:

Table 2. Characteristics of 3 trees suitable to host artificial black cockatoo nest-boxes, identified during survey at Holcim Quarry on 10th March 2021.

Tree / Box No.	Easting	Northing	approx. DBH (mm)	Species
1	409267	6451563	800mm	Jarrah <i>Eucalyptus marginata</i>
2	409190	6451571	400mm	Wandoo <i>Eucalyptus wandoo</i>
3	409216	6451527	900mm	Jarrah <i>Eucalyptus marginata</i>

The location in which the three artificial nest-boxes are to be installed lies within a 1km radius of potential nest Trees 1 and 2. This is important because Groom (2010) found >70% of 55 artificial hollows used by Carnaby's Cockatoo were located within 1km of breeding records in natural hollows. This will result in a situation where cockatoos potentially nesting in Trees 1 and 2 have a good chance of locating the artificial hollows used to offset their loss. As a further step towards conserving cockatoo nesting habitat, all boxes will be installed within a conservation covenant, as arranged with DWER.

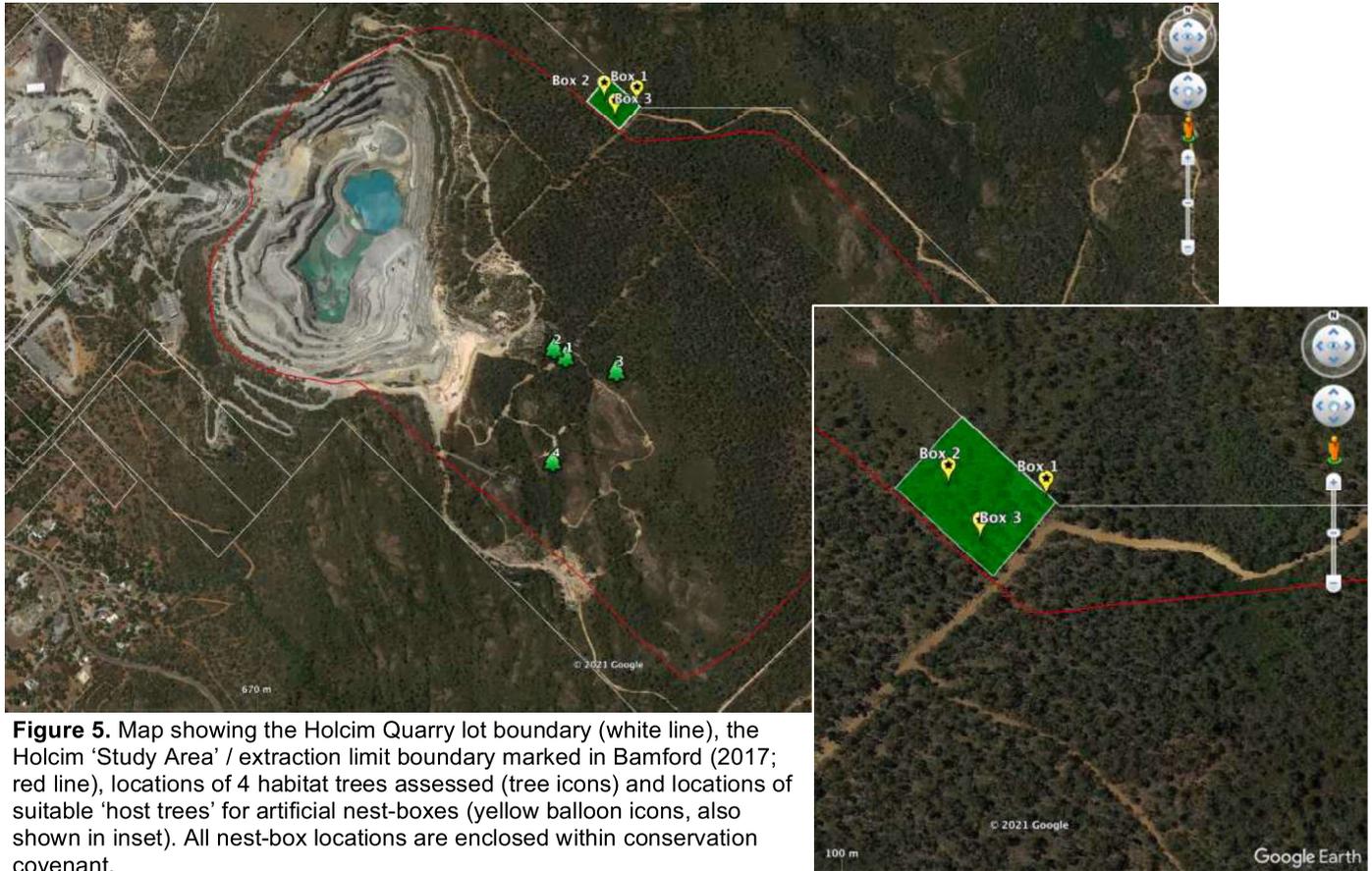


Figure 5. Map showing the Holcim Quarry lot boundary (white line), the Holcim 'Study Area' / extraction limit boundary marked in Bamford (2017; red line), locations of 4 habitat trees assessed (tree icons) and locations of suitable 'host trees' for artificial nest-boxes (yellow balloon icons, also shown in inset). All nest-box locations are enclosed within conservation covenant.

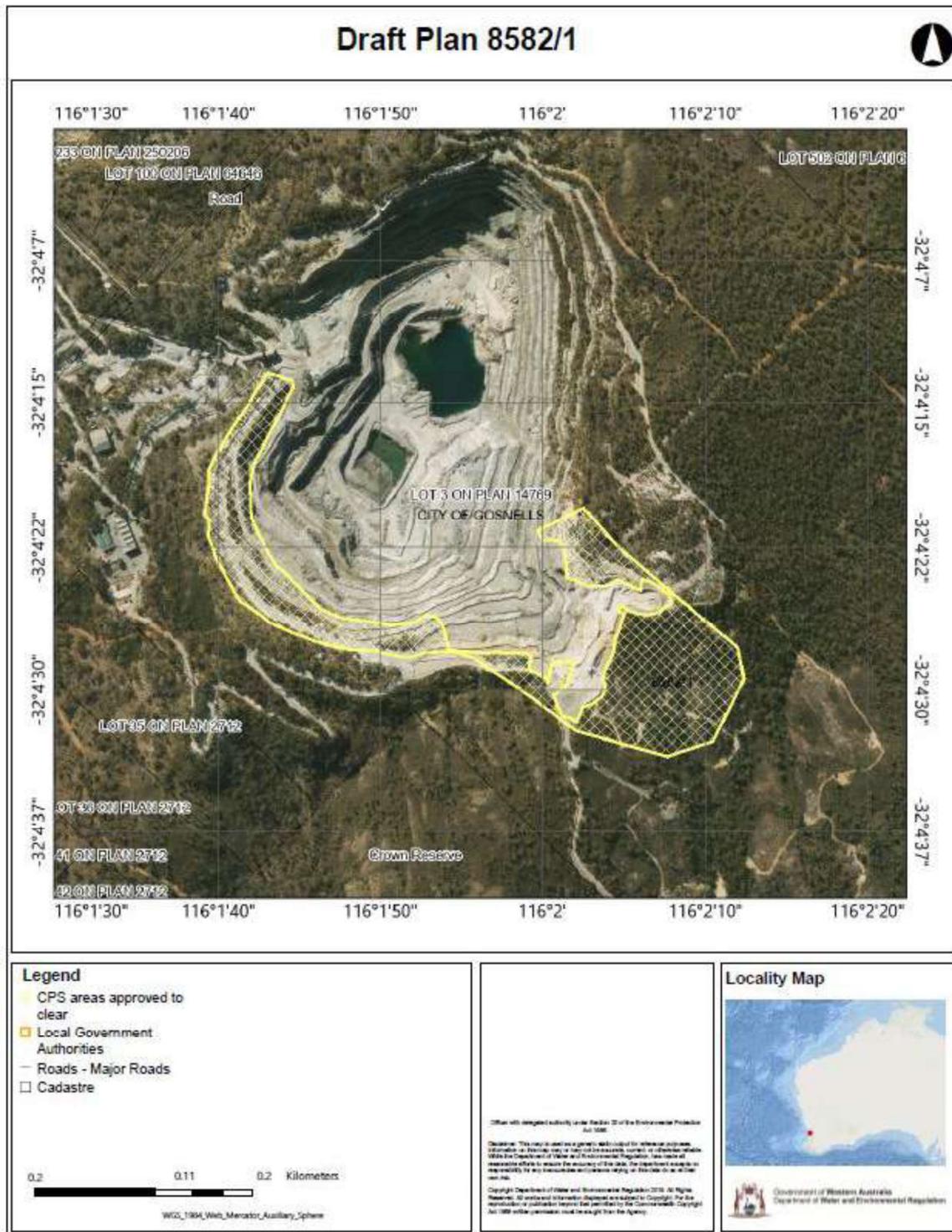


Figure 6. Example of open Jarrah / Marri woodland (VSA 1 in Bamford, 2017) located ~600m north of equivalent habitat in which potential black cockatoo nest trees were located at Holcim's Quarry, Lot 3 Mills Road East, Gosnells.

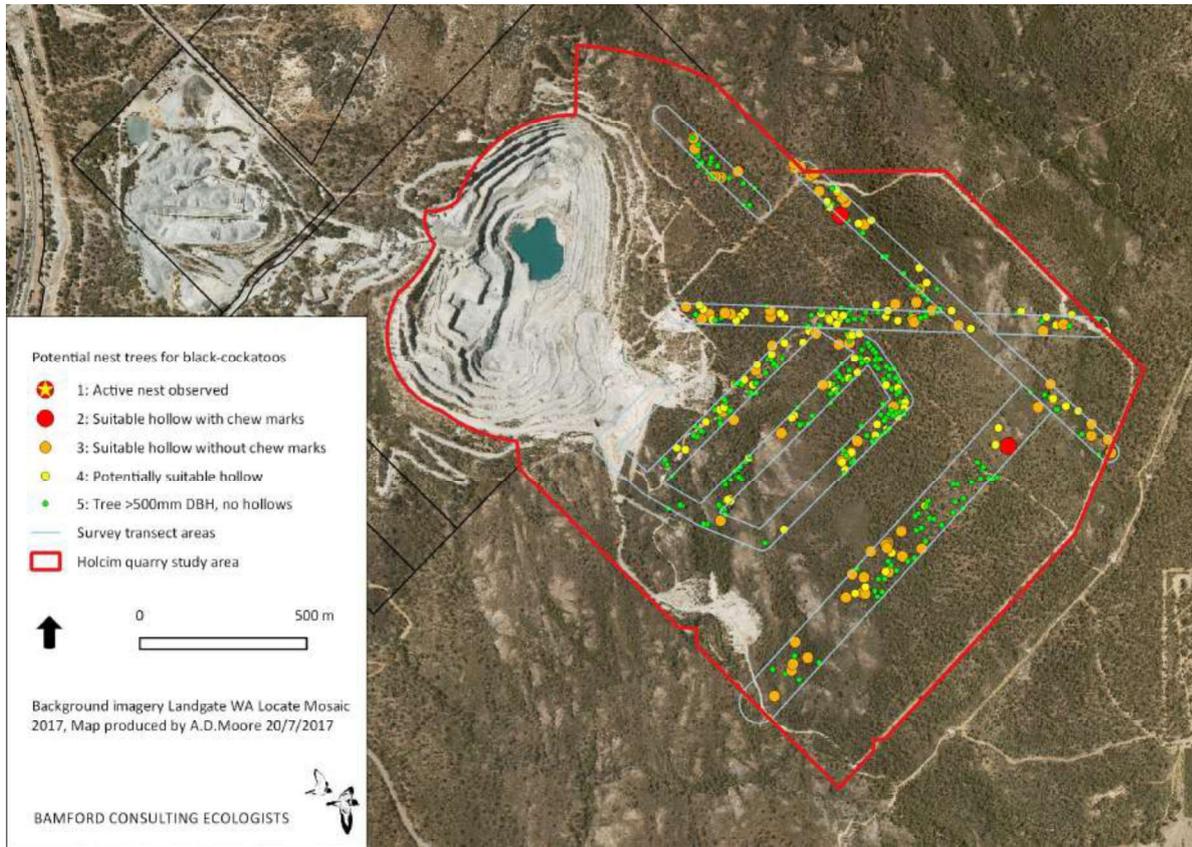
References

- Bamford (2017) Holcim Gosnells Quarry – Fauna Assessment of the Quarry Area, July 2017. Unpublished report for Holcim (Australia) Pty Ltd prepared by M.J. & A.R. Bamford Consulting Ecologists.
- Department of Water and Environmental Regulation (2019) Holcim Gosnells Quarry – CPS 8582/1 Preliminary Assessment Report, unpublished application by Holcim Pty Ltd.
- Groom, C. (2010) Artificial Hollows for Carnaby's Cockatoo. An investigation of the placement, use, monitoring and maintenance requirements of artificial hollows for Carnaby's black cockatoo. Unpublished report by the Department of Biodiversity, Conservation and Attractions, Perth. WA.

Appendix 1: Map of the application area used in Holcim’s Preliminary Assessment Report. The area cross-hatched yellow indicates the area authorised to be cleared.



Appendix 2: . Potential breeding trees found in the survey transects conducted by Bamford (2017), showing associated ratings. Rating scores are as follows: green – 5, yellow – 4, orange – 3 and red – 2. No trees were given a score of 1 (i.e. no trees confirmed with active nests).



Appendix 3

*Definitions assigned to habitat trees assigned by Bamford Consulting Ecologists, as presented in (Bamford) 2017:

1. Active nest observed; adult (or immature) bird seen entering or emerging from hollow.
2. Hollow of suitable size and angle (i.e. near-vertical) visible with chew marks around entrance. While it cannot with certainty be assumed that such chew marks were made by a black-cockatoo, they indicate activity of a parrot at a hollow potentially suitable for use by black-cockatoos.
3. Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).
4. Tree with large hollows or broken branches that might contain large hollows but hollows or potential hollows are not vertical or near-vertical; thus a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by black-cockatoos.
5. Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.



Figure 1 – Gosnells Quarry; Location of Black Cockatoo Breeding Trees Inspected and CPS 8582/1 Boundary