

BLACK COCKATOO BREEDING, FEEDING AND ROOSTING HABITAT ASSESSMENT, TONKIN HIGHWAY EXTENSION.

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The purpose of the survey was to assess breeding, foraging, drinking and roosting habitat for three species of black cockatoos *Calyptorhynchus spp.* at The Tonkin Highway extension and identify if the survey area occurs within currently known foraging, and breeding areas

SPECIES BACKGROUND INFORMATION.

Three species of black cockatoo occur in the south west of Western Australia, Carnaby's Cockatoo *Calyptorhynchus latirostris*, Baudin's Cockatoo *C. baudinii* and the Forest Red-tailed Black Cockatoo (FRTBC) *C. 1argina naso*. Carnaby's and Baudin's Cockatoos are known collectively as 'white-tailed black cockatoos'.

Both Baudin's and Carnaby's Cockatoos are listed (Endangered) under the Western Australian Wildlife Conservation Act, and the Environmental Protection and Biodiversity Conservation Act (EPBC Act).

The FRTBC is listed as Vulnerable under the Western Australian Wildlife Conservation Act and the EPBC Act.

All three species are known from the general area of the survey.

The nearest confirmed breeding site of FRTBC is 8 km to the east in the Wungong Catchment though pairs have also been observed prospecting and chewing hollow entrances at Cardup Nature Reserve which lies 1.5 km to the east. There is also confirmed breeding of FRTBC in an artificial hollow at Serpentine

The nearest known Carnaby's Cockatoo breeding site is 10 km to the east in the Wungong Catchment.

Baudin's Cockatoo are known to breed in low numbers 16 km east in Wungong Catchment and 10 km south in Serpentine Hills area.

BREEDING HABITAT AT THE SURVEY AREA.

Trees which could provide breeding hollows at the survey area are Jarrah *Eucalyptus marginata*, Wandoo *E. wandoo*, Flooded Gum *E. rudis* and Marri *Corymbia calophylla*. These trees need to have reached a diameter at breast height (DBH) of at least 500mm (300mm for Wandoo) in order to be large enough to form a breeding hollow.

FORAGING HABITAT AT THE SURVEY AREA.

Species providing foraging habitat at the survey include Jarrah, Marri, Sheoak *Allocasuarina fraserianna*, Swamp Sheoak *Casuarina obesa*, *Banksia menziesii*, *B. ilicifolia* *hakea spp*, Balga *Xanthorrhoea priessii* and Cape Lilac *Melia azedarach*.

ROOSTING HABITAT AT THE SURVEY AREA.

Jarrah, Marri, Wandoo and exotic eucalypts at the survey area are all able to provide a roost for black cockatoos.

Important food species at the survey area and their general relevance to black cockatoos.

Jarrah – seeds taken by FRTBC and Carnaby's Cockatoos. There are also records of Baudin's Cockatoos feeding from Jarrah seeds but it is very unusual, also nectar and grubs are taken by Baudin's and Carnaby's Cockatoos.

Marri – seeds taken by all three species of black cockatoos, also nectar and grubs are taken by Baudin's and Carnaby's Cockatoos. This is the most important and well represented food species at the survey area.

Sheoak – seeds are taken by taken by FRTBC but it is poorly represented in the survey area.

Banksia menziesii - seeds, nectar and grubs taken by Baudins' and Carnaby's Cockatoos. *B.menziesii* is an important food species but is poorly represented in the survey area.

Banksia ilicifolia – seeds, nectar and grubs taken by Carnaby's and probably Baudin's Cockatoos. This is an important food species but is poorly represented with only a few trees in the southern of the survey area.

Balga *Xanthorrhoea priessii*. Grubs and nectar are taken by both Carnaby's and Baudin's Cockatoos.

Cape Lilac – seeds taken by FRTBC. Note this is an introduced species which is considered a weed but has become a seasonally important food for FRTBC on parts of the Swan Coastal Plain.

The survey area also contains exotic eucalypt species which may provide nectar to both Baudin's and Carnaby's Cockatoos.

Drinking sites.

Although no drinking sites are documented for the survey or surrounding areas it is expected water would be available throughout the year from gardens, farm dams, stock troughs and natural water bodies which are found throughout the Byford/Mundijong areas.

METHODS.

The area was surveyed between 16th April and 5th May 2019 20th. All trees at the survey area above 500mm DBH (300mm for Wandoo) were picked up using hand held GPS. Trees were also checked from ground level for the presence of suitable black cockatoo breeding hollows.

Feeding residues were recorded and picked up using hand held GPS.

Areas beneath possible roosting trees were searched for the presence of clipped leaves and branches which may indicate a roost. Evening searches for roosting sites were also undertaken.

A search of the Western Australian Museum database was undertaken to locate the nearest known black cockatoo breeding and roosting sites.

The 'Great Cocky Count' database (Birdlife Western Australia) was also used to locate the nearest known black cockatoo roosting sites.

RESULTS. Appendix A for individual results

Breeding habitat.

A total of 490 trees above the required DBH were located. 89 Flooded Gum, 20 Jarrah, two Wandoo and 379 Marri (Appendix B). A total of 22 hollows were located and of these 13 were potentially black cockatoo nesting hollows. Four of these hollows also had scarring in or near the hollow entrance which is typical of use by Galah's (Appendix C). The remaining nine hollows were either being used by Galah's at the time of the survey or were of a smaller size suitable for small parrots (Australian Ringneck). Introduced Rainbow Lorikeet were also observed at one hollow.

Foraging.

A total of 111 feeding residues from FRTBC and Baudin's Cockatoo were located.

FRTBC - feeding residues (85) from Marri were plentiful, easy to locate and ranged from brown to old and grey and possibly up to two years old.

Baudin's Cockatoo – feeding residues from Marri were noted at 24 locations. All residues were either brown or grey.

Roosting.

No roosting sites were located during the survey.

The nearest known roost sites of FRTBC are at Cardup Siding Rd, Cardup and Kiernan St, Mundijong located 1.8 km and 2.8 km respectively to the east of the survey area.

Sightings.

A single female FRTBC was seen during the survey.

Baudin's Cockatoos were noted feeding on seeds from Marri (just outside the survey area) and a pair were seen overhead.

Discussion.

A total of 490 trees at the survey reach the criteria to be classed as potential breeding trees - 500mm DBH or in the case of Wandoo 300mm. The most important of these are Jarrah and Marri (399 trees), particularly Marri. In the Jarrah/Marri forest Marri provides over 90% of black cockatoo breeding hollows (*Johnstone, Kirkby and Sarti 2011*). Flooded Gums (89 trees) were also present but they appear to provide very few breeding hollows. The author has first hand knowledge of over 500 black cockatoo breeding trees and only a single breeding hollow is known from Flooded Gum.

Marri feeding residues left behind by FRTBC and Baudin's Cockatoo were located throughout the survey area in suitable habitat. The remnant vegetation throughout the survey area is probably important foraging habitat for the local populations of these species. No feeding residues from Carnaby's Cockatoos were located but given the limited amount of their preferred banksia foraging habitat this was to be expected.

The lack of actual sightings of black cockatoos during the survey is not unexpected as FRTBC utilise these patches of remnant vegetation only when Marri has a productive seeding year (*Black Cockatoo Research Progress Report to dept of Housing 2015, WA Museum*). Baudin's Cockatoos tend to use this area of the Swan Coastal Plain between August and October before the bulk of the population return south to breed (*Johnstone and Kirkby 2008*).

Though it is possible the survey area could provide a roosting site for black cockatoos none were roosting there during the survey.

Appendix A – Raw Cockatoo Data

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
513	29/04/2019	403347	6432435	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
514	29/04/2019	403340	6432420	Flooded Gum	800	No access. Coordinates and DBH assessed from fenceline		
517	29/04/2019	403317	6432434	Flooded Gum	800	No access. Coordinates and DBH assessed from fenceline		
518	29/04/2019	403296	6432431	Flooded Gum	800	No access. Coordinates and DBH assessed from fenceline		
520	29/04/2019	403287	6432432	Flooded Gum	800	No access. Coordinates and DBH assessed from fenceline		
512	29/04/2019	403356	6432421	Flooded Gum	1000	No access. Coordinates and DBH assessed from fenceline		
516	29/04/2019	403318	6432434	Flooded Gum	1000	No access. Coordinates and DBH assessed from fenceline		
519	29/04/2019	403286	6432431	Flooded Gum	1000	No access. Coordinates and DBH assessed from fenceline		
521	29/04/2019	403308	6432347	Flooded Gum	1000	No access. Coordinates and DBH assessed from fenceline		
522	29/04/2019	403311	6432343	Flooded Gum	1000	No access. Coordinates and DBH assessed from fenceline		
515	29/04/2019	403331	6432434	Flooded Gum	1200	No access. Coordinates and DBH assessed from fenceline		
550	29/04/2019	403040	6428812	Flooded Gum	500, 500, 500, 500, 500	Feral bees		
253	25/04/2019	403311	6426072	Flooded Gum	600, 600			
47	16/04/2019	403174	6436060	Flooded Gum	900	Forks early into stems below 500mm		
591	29/04/2019	403061	6428518	Flooded Gum	200			
587	29/04/2019	403038	6428511	Flooded Gum	500			
589	29/04/2019	403041	6428510	Flooded Gum	500			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
590	29/04/2019	403048	6428510	Flooded Gum	700			
588	29/04/2019	403038	6428506	Flooded Gum	500			
468	29/04/2019	403063	6429859	Flooded Gum	1700	Multi stems below 500mm		
467	29/04/2019	403094	6429987	Flooded Gum	1750	Small hollow used by Galah	1	
217	24/04/2019	402803	6432963	Flooded Gum	1000	Trunk forks into 2 small stems below 500mm		
254	25/04/2019	403340	6426068	Flooded Gum	1000	Trunk forks into 2 small stems below 500mm		
259	25/04/2019	403436	6426055	Flooded Gum	1000	Trunk forks into 2 small stems below 500mm		
15	16/04/2019	403253	6432715	Flooded Gum	500			
1021	16/04/2019	403364	6432446	Flooded Gum	600			
1016	16/04/2019	403356	6432461	Flooded Gum	700			
220	25/04/2019	402630	6432955	Flooded Gum	1000			
507	29/04/2019	403273	6431455	Flooded Gum	500			
554	29/04/2019	403007	6428487	Flooded Gum	500			
558	29/04/2019	403016	6428481	Flooded Gum	500			
560	29/04/2019	403010	6428413	Flooded Gum	500			
561	29/04/2019	403010	6428413	Flooded Gum	500			
579	29/04/2019	402946	6428504	Flooded Gum	500			
537	29/04/2019	403321	6432772	Flooded Gum	600			
555	29/04/2019	403007	6428487	Flooded Gum	600			
564	29/04/2019	403011	6428354	Flooded Gum	600			
573	29/04/2019	402866	6428462	Flooded Gum	600			
581	29/04/2019	402939	6428483	Flooded Gum	600			
586	29/04/2019	403029	6428513	Flooded Gum	600			
600	29/04/2019	403017	6428070	Flooded Gum	600			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
551	29/04/2019	403020	6428520	Flooded Gum	650			
552	29/04/2019	403021	6428520	Flooded Gum	650			
585	29/04/2019	402986	6428499	Flooded Gum	650			
553	29/04/2019	403007	6428498	Flooded Gum	700			
556	29/04/2019	403021	6428489	Flooded Gum	700			
565	29/04/2019	403012	6428348	Flooded Gum	700			
572	29/04/2019	402870	6428455	Flooded Gum	700			
533	29/04/2019	403364	6432755	Flooded Gum	800			
536	29/04/2019	403327	6432769	Flooded Gum	800			
549	29/04/2019	402954	6428682	Flooded Gum	850			
469	29/04/2019	403102	6429830	Flooded Gum	900			
580	29/04/2019	402943	6428498	Flooded Gum	900			
524	29/04/2019	403285	6432778	Flooded Gum	1000			
532	29/04/2019	403380	6432760	Flooded Gum	1000			
538	29/04/2019	403311	6432770	Flooded Gum	1000			
566	29/04/2019	403019	6428336	Flooded Gum	1000			
583	29/04/2019	403002	6428506	Flooded Gum	1000			
526	29/04/2019	403331	6432781	Flooded Gum	1200			
563	29/04/2019	403014	6428358	Flooded Gum	1200			
567	29/04/2019	403022	6428338	Flooded Gum	2200			
534	29/04/2019	403332	6432762	Flooded Gum	600,500			
525	29/04/2019	403308	6432785	Flooded Gum	900,600	Feral bees and Galah's using this tree	1	
523	29/04/2019	403287	6432777	Flooded Gum	1000, 1000			
576	29/04/2019	402926	6428517	Flooded Gum	600,600,500,500			
570	29/04/2019	402994	6428404	Flooded Gum	500, 500, 500, 500, 500, 500			
562	29/04/2019	403025	6428397	Flooded Gum	550, 500			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
598	29/04/2019	403046	6428353	Flooded Gum	550, 500			
571	29/04/2019	402883	6428464	Flooded Gum	600, 500			
578	29/04/2019	402910	6428534	Flooded Gum	600, 500, 500			
596	29/04/2019	403063	6428377	Flooded Gum	600, 500, 500			
582	29/04/2019	402953	6428494	Flooded Gum	600, 500, 600, 500			
599	29/04/2019	403048	6428354	Flooded Gum	600, 600			
559	29/04/2019	403007	6428432	Flooded Gum	600, 600, 500			
584	29/04/2019	402999	6428499	Flooded Gum	700, 550			
577	29/04/2019	402924	6428519	Flooded Gum	700, 600			
597	29/04/2019	403043	6428386	Flooded Gum	900, 600, 500, 500			
1022	16/04/2019	403362	6432448	Flooded Gum	500, 400			
1034	16/04/2019	403330	6432458	Flooded Gum	1000, 500, 400, 300, 500			
1017	16/04/2019	403366	6432458	Flooded Gum	300, 300, 300, 250	Large at base but small then forms small multi stems		
1018	16/04/2019	403368	6432462	Flooded Gum	300,300,300,300,400	Large at base but small then forms small multi stems		
1015	16/04/2019	403349	6432458	Flooded Gum	300,300,300,300	Large at base but small then forms small multi stems		
1009	16/04/2019	403263	6432512	Flooded Gum	400, 400, 300, 300, 300	Large at base but small then forms small multi stems		
1031	16/04/2019	403345	6432448	Flooded Gum	400,400,300,300	Large at base but small then forms small multi stems		
46	16/04/2019	403171	6436109	Flooded Gum	400, 300, 400	Large at base but small then forms small multi stems		
45	16/04/2019	403172	6436126	Flooded Gum	400, 300 ,300	Large at base but small then forms small multi stems		
511	29/04/2019	403360	6432430	Flooded Gum dead	600	No access. Coordinates and DBH assessed from fenceline		

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
470	29/04/2019	403071	6429718	Flooded Gum. Dead	1100	Small hollow with Galah. Also larger hollow can be checked with camera but nearby feral bees need to be eradicated	2	1
343	26/04/2019	404257	6425180	Jarrah	1200	2 top entry hollow at 8m. Can be checked with pole camera but bees need to be eradicated first. 2 hives	2	2
117	22/04/2019	403304	6433640	Jarrah	1100			
122	22/04/2019	403280	6433621	Jarrah	1300			
123	22/04/2019	403266	6433576	Jarrah	1330			
408	26/04/2019	406029	6424867	Jarrah	600			
490	29/04/2019	403052	6429745	Jarrah	900			
491	29/04/2019	403091	6429589	Jarrah	550,500			
124	22/04/2019	403308	6433565	Jarrah. Dead	1000	Feral bees		
090	22/04/2019	403312	6435242	Jarrah. Dead	850			
143	22/04/2019	403364	6433494	Jarrah. Dead	900			
162	22/04/2019	403396	6433253	Jarrah. Dead	1000			
105	22/04/2019	403459	6434741	Jarrah. Dead				
207	24/04/2019	403617	6432976	Marri	700	Coordinates taken 3m to north because of drainage ditch		
168	22/04/2019	403407	6433315	Marri	1450	3 feral bee hives		
365	26/04/2019	406442	6424748	Marri	1100			
601	29/04/2019	402937	6427769	Marri	800	Chewed hollow top entry at 10m. Can be inspected with pole camera but bees need to be eradicated from nearby hollow	1	1

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
330	26/04/2019	403543	6425745	Marri	800	Coord innaccurate due to feral bees at base of tree. Galahs in higher hollow	1	
111	22/04/2019	403334	6433749	Marri	700	Feral bees		
283	25/04/2019	403965	6425940	Marri	600	Feral bees		
493	29/04/2019	403257	6431098	Marri	900	Feral bees		
634	2/05/2019	403271	6431912	Marri	600	Forks into small stems		
311	25/04/2019	403200	6434729	Marri	900	Forks 500, 300		
300	25/04/2019	403596	6426010	Marri	1000	Forks 500, 600		
293	25/04/2019	403653	6425976	Marri	1000	Forks 600, 300		
119	22/04/2019	403262	6433677	Marri	1200	Forks 600, 500, 300		
154	22/04/2019	403311	6433376	Marri	900, 500	Forks 900, 500		
592	29/04/2019	403254	6429380	Marri	1000			
466	29/04/2019	403410	6436152	Marri	500			
465	29/04/2019	403398	6436152	Marri	600			
067	22/04/2019	403284	6435744	Marri	600			
313	25/04/2019	403199	6434698	Marri	1000	Forms multi stems below 500mm DBH		
389	26/04/2019	406358	6424670	Marri	1000?	Possible hollow. Top entry probably Galah hollow. Has nearby Galah scars. 8m. Can be checked with camera but nearby bees must go first	1	1
164	22/04/2019	403435	6433270	Marri	700	Possible hollow. Top entry. 8m. Can be checked with camera but nearby bees be eradicated	1	1
171	22/04/2019	403426	6433343	Marri	300	Side entry hollow with no signs of use	1	1

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
611	29/04/2019	403043	6426929	Marri	800	Small chewed hollow . Galah nearby. Side entry. 10m. Can be checked with field camera but nearby bees must be eradicated.	1	1
200	24/04/2019	403924	6432978	Marri	500	Small hollow with no signs of use	1	
100	22/04/2019	403270	6434951	Marri	1100	Small hollow. Possibly Galah	1	
439	26/04/2019	403317	6434762	Marri	?	Small hollow. Too low and has no signs of use. Can be checked with pole camera but feral bees needs to be eradicated	1	1
163	22/04/2019	403403	6433284	Marri	900	Small hollows. Top and side entry but well chewed. Can be field checked with camera	2	2
620	29/04/2019	403466	6426092	Marri	1100	Stump		
447	26/04/2019	403298	6434784	Marri	1000	Stump - too low to provide a hollow		
203	24/04/2019	403708	6432979	Marri	500	Coordinates taken 3m to north because of drainage ditch		
205	24/04/2019	403656	6432976	Marri	500	Coordinates taken 3m to north because of drainage ditch		
206	24/04/2019	403628	6432975	Marri	500	Coordinates taken 3m to north because of drainage ditch		
208	24/04/2019	403590	6432976	Marri	550	Coordinates taken 3m to north because of drainage ditch		
202	24/04/2019	403718	6432979	Marri	600	Coordinates taken 3m to north because of drainage ditch		
212	24/04/2019	403031	6432965	Marri	500	Trunk forks into 2 small stems below 500mm dia		
183	24/04/2019	403307	6432981	Marri	570	Trunk forks into 2 small stems below 500mm dia		

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
187	24/04/2019	403442	6432982	Marri	600	Trunk forks into 2 small stems below 500mm dia		
194	24/04/2019	403680	6432987	Marri	600	Trunk forks into 2 small stems below 500mm dia		
215	24/04/2019	402919	6432962	Marri	600	Trunk forks into 2 small stems below 500mm dia		
218	24/04/2019	402683	6432959	Marri	600	Trunk forks into 2 small stems below 500mm dia		
191	24/04/2019	403530	6432985	Marri	700	Trunk forks into 2 small stems below 500mm dia		
184	24/04/2019	403383	6432984	Marri	750	Trunk forks into 2 small stems below 500mm dia		
199	24/04/2019	403931	6432981	Marri	870	Trunk forks into 2 small stems below 500mm dia		
189	24/04/2019	403501	6432980	Marri	900	Trunk forks into 2 small stems below 500mm dia		
291	25/04/2019	403690	6425970	Marri	650	Trunk forks into 2 small stems below 500mm dia		
292	25/04/2019	403678	6425971	Marri	650	Trunk forks into 2 small stems below 500mm dia		
243	25/04/2019	403113	6426050	Marri	700	Trunk forks into 2 small stems below 500mm dia		
307	25/04/2019	403527	6426018	Marri	750	Trunk forks into 2 small stems below 500mm dia		
280	25/04/2019	403919	6425959	Marri	800	Trunk forks into 2 small stems below 500mm dia		
301	25/04/2019	403579	6426006	Marri	800	Trunk forks into 2 small stems below 500mm dia		
282	25/04/2019	403953	6425945	Marri	900	Trunk forks into 2 small stems below 500mm dia		

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
321	25/04/2019	403161	6434751	Marri	?	Trunk forks into 2 small stems below 500mm dia		
412	26/04/2019	405994	6424831	Marri	600	Trunk forks into 2 small stems below 500mm dia		
346	26/04/2019	404215	6425183	Marri	700	Trunk forks into 2 small stems below 500mm dia		
417	26/04/2019	405958	6424805	Marri	700	Trunk forks into 2 small stems below 500mm dia		
399	26/04/2019	406043	6424850	Marri	800	Trunk forks into 2 small stems below 500mm dia		
372	26/04/2019	406343	6424380	Marri	900	Trunk forks into 2 small stems below 500mm dia		
461	26/04/2019	403260	6434718	Marri	900	Trunk forks into 2 small stems below 500mm dia		
411	26/04/2019	405996	6424837	Marri	600, 600			
323	25/04/2019	403144	6434758	Marri	550, 450			
337	26/04/2019	403664	6425689	Marri	600, 500			
629	2/05/2019	403285	6429336	Marri	650			
630	2/05/2019	403276	6429335	Marri	550			
631	2/05/2019	403248	6429337	Marri	550			
632	2/05/2019	403261	6429319	Marri	500			
633	2/05/2019	403269	6431950	Marri	500			
635	2/05/2019	403270	6431893	Marri	500			
636	2/05/2019	403269	6431873	Marri	550			
638	2/05/2019	403274	6431852	Marri	500			
653	3/05/2019	403188	6435701	Marri	300			
655	3/05/2019	403197	6435676	Marri	500			
656	3/05/2019	403195	6435638	Marri	850			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
659	3/05/2019	403191	6435616	Marri	650			
660	3/05/2019	403191	6435602	Marri	700			
661	3/05/2019	403192	6435590	Marri	650			
662	3/05/2019	403196	6435570	Marri	600, 550			
663	3/05/2019	403192	6435563	Marri	850			
664	3/05/2019	403194	6435531	Marri	500			
665	3/05/2019	403193	6435473	Marri	500			
668	3/05/2019	403199	6435358	Marri	700			
669	3/05/2019	403200	6435346	Marri	550			
670	3/05/2019	403197	6435335	Marri	900			
671	3/05/2019	403198	6435332	Marri	650			
672	3/05/2019	403201	6435328	Marri	600			
31	16/04/2019	403199	6435290	Marri	500			
34	16/04/2019	403188	6435700	Marri	550			
30	16/04/2019	403202	6435276	Marri	700			
35	16/04/2019	403188	6435816	Marri	750			
077	22/04/2019	403243	6435650	Marri	450			
079	22/04/2019	403225	6435592	Marri	450			
075	22/04/2019	403221	6435615	Marri	500			
099	22/04/2019	403300	6434955	Marri	500			
157	22/04/2019	403299	6433250	Marri	500			
091	22/04/2019	403305	6435256	Marri	520			
101	22/04/2019	403286	6434939	Marri	520			
160	22/04/2019	403344	6433267	Marri	520			
076	22/04/2019	403239	6435645	Marri	530			
098	22/04/2019	403274	6435227	Marri	530			
136	22/04/2019	403348	6433614	Marri	550			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
155	22/04/2019	403292	6433362	Marri	550			
128	22/04/2019	403307	6433525	Marri	570			
113	22/04/2019	403340	6433654	Marri	575			
084	22/04/2019	403234	6435502	Marri	580			
147	22/04/2019	403292	6433476	Marri	580			
056	22/04/2019	403180	6436218	Marri	600			
074	22/04/2019	403223	6435619	Marri	600			
078	22/04/2019	403233	6435590	Marri	600			
089	22/04/2019	403312	6435215	Marri	600			
112	22/04/2019	403251	6433740	Marri	600			
121	22/04/2019	403267	6433643	Marri	600			
139	22/04/2019	403372	6433628	Marri	600			
166	22/04/2019	403421	6433301	Marri	600			
095	22/04/2019	403227	6435307	Marri	620			
097	22/04/2019	403266	6435236	Marri	620			
126	22/04/2019	403312	6433565	Marri	620			
156	22/04/2019	403295	6433252	Marri	620			
071	22/04/2019	403242	6435670	Marri	650			
144	22/04/2019	403300	6433489	Marri	650			
159	22/04/2019	403337	6433241	Marri	650			
161	22/04/2019	403345	6433273	Marri	650			
167	22/04/2019	403414	6433303	Marri	650			
092	22/04/2019	403306	6435265	Marri	670			
081	22/04/2019	403217	6435555	Marri	680			
120	22/04/2019	403267	6433664	Marri	680			
138	22/04/2019	403356	6433623	Marri	680			
058	22/04/2019	403172	6436194	Marri	700			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
063	22/04/2019	403209	6435737	Marri	700			
064	22/04/2019	403210	6435699	Marri	700			
085	22/04/2019	403286	6435167	Marri	700			
093	22/04/2019	403301	6435272	Marri	700			
116	22/04/2019	403325	6433649	Marri	700			
131	22/04/2019	403344	6433523	Marri	700			
134	22/04/2019	403340	6433605	Marri	700			
146	22/04/2019	403295	6433490	Marri	700			
170	22/04/2019	403398	6433329	Marri	700			
118	22/04/2019	403277	6433661	Marri	730			
114	22/04/2019	403341	6433652	Marri	750			
115	22/04/2019	403337	6433651	Marri	750			
125	22/04/2019	403307	6433565	Marri	750			
094	22/04/2019	403245	6435302	Marri	770			
057	22/04/2019	403174	6436204	Marri	800			
069	22/04/2019	403318	6435737	Marri	800			
083	22/04/2019	403216	6435528	Marri	800			
149	22/04/2019	403304	6433472	Marri	800			
087	22/04/2019	403274	6435164	Marri	850			
103	22/04/2019	403300	6434921	Marri	850			
153	22/04/2019	403366	6433396	Marri	850			
070	22/04/2019	403243	6435678	Marri	870			
065	22/04/2019	403256	6435730	Marri	900			
066	22/04/2019	403262	6435728	Marri	900			
088	22/04/2019	403283	6435211	Marri	900			
127	22/04/2019	403318	6433533	Marri	900			
132	22/04/2019	403330	6433588	Marri	900			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
140	22/04/2019	403406	6433624	Marri	1000			
142	22/04/2019	403415	6433517	Marri	1000			
133	22/04/2019	403321	6433599	Marri	1050			
173	22/04/2019	403355	6433109	Marri	1100			
141	22/04/2019	403423	6433557	Marri	1200			
086	22/04/2019	403286	6435164	Marri	1300			
197	24/04/2019	404007	6432979	Marri	500			
209	24/04/2019	403478	6432973	Marri	500			
214	24/04/2019	402987	6432966	Marri	500			
196	24/04/2019	403766	6432991	Marri	550			
228	25/04/2019	403442	6426030	Marri	500			
236	25/04/2019	403232	6426057	Marri	500			
271	25/04/2019	403743	6425994	Marri	500			
224	25/04/2019	403483	6426019	Marri	550			
225	25/04/2019	403484	6426012	Marri	550			
227	25/04/2019	403462	6426022	Marri	550			
229	25/04/2019	403442	6426033	Marri	550			
241	25/04/2019	403191	6426072	Marri	550			
244	25/04/2019	403104	6426056	Marri	550			
275	25/04/2019	403807	6425952	Marri	550			
279	25/04/2019	403873	6425948	Marri	550			
294	25/04/2019	403639	6425986	Marri	550			
297	25/04/2019	403638	6426011	Marri	550			
304	25/04/2019	403554	6426021	Marri	550			
306	25/04/2019	403538	6426022	Marri	550			
314	25/04/2019	403163	6434708	Marri	550			
233	25/04/2019	403338	6426038	Marri	600			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
248	25/04/2019	403073	6426047	Marri	600			
270	25/04/2019	403727	6425986	Marri	600			
278	25/04/2019	403862	6425953	Marri	600			
290	25/04/2019	403694	6425997	Marri	600			
305	25/04/2019	403546	6426022	Marri	600			
308	25/04/2019	403540	6426002	Marri	600			
315	25/04/2019	403170	6434714	Marri	600			
318	25/04/2019	403176	6434733	Marri	600			
222	25/04/2019	403503	6426025	Marri	650			
223	25/04/2019	403490	6426021	Marri	650			
239	25/04/2019	403207	6426044	Marri	650			
246	25/04/2019	403078	6426065	Marri	650			
272	25/04/2019	403752	6425985	Marri	650			
273	25/04/2019	403775	6425980	Marri	650			
274	25/04/2019	403808	6425957	Marri	650			
288	25/04/2019	403850	6425981	Marri	650			
299	25/04/2019	403607	6426013	Marri	650			
303	25/04/2019	403567	6426024	Marri	650			
316	25/04/2019	403169	6434721	Marri	650			
231	25/04/2019	403380	6426020	Marri	700			
296	25/04/2019	403641	6426009	Marri	700			
302	25/04/2019	403576	6425994	Marri	700			
319	25/04/2019	403169	6434734	Marri	700			
242	25/04/2019	403188	6426066	Marri	750			
266	25/04/2019	403704	6426022	Marri	800			
268	25/04/2019	403720	6425996	Marri	800			
269	25/04/2019	403724	6425991	Marri	800			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
295	25/04/2019	403626	6425975	Marri	800			
247	25/04/2019	403072	6426055	Marri	900			
284	25/04/2019	404000	6425947	Marri	1000			
310	25/04/2019	403202	6434730	Marri	500, 300			
328	26/04/2019	403528	6425735	Marri	500			
332	26/04/2019	403555	6425750	Marri	500			
351	26/04/2019	403028	6426983	Marri	500			
377	26/04/2019	406332	6424347	Marri	500			
387	26/04/2019	406381	6424722	Marri	500			
388	26/04/2019	406376	6424728	Marri	500			
430	26/04/2019	403378	6434754	Marri	500			
431	26/04/2019	403382	6434758	Marri	500			
432	26/04/2019	403380	6434758	Marri	500			
434	26/04/2019	403362	6434767	Marri	500			
441	26/04/2019	403339	6434797	Marri	500			
452	26/04/2019	403256	6434792	Marri	500			
393	26/04/2019	406318	6424739	Marri	550			
433	26/04/2019	403364	6434757	Marri	550			
440	26/04/2019	403341	6434790	Marri	550			
445	26/04/2019	403300	6434796	Marri	550			
460	26/04/2019	403253	6434743	Marri	550			
369	26/04/2019	406370	6424293	Marri	550			
353	26/04/2019	402965	6427011	Marri	600			
374	26/04/2019	406334	6424364	Marri	600			
376	26/04/2019	406326	6424371	Marri	600			
416	26/04/2019	405951	6424799	Marri	600			
420	26/04/2019	403283	6434642	Marri	600			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
421	26/04/2019	403278	6434642	Marri	600			
423	26/04/2019	403309	6434647	Marri	600			
429	26/04/2019	403371	6434681	Marri	600			
435	26/04/2019	403366	6434772	Marri	600			
438	26/04/2019	403318	6434753	Marri	600			
453	26/04/2019	403251	6434793	Marri	600			
454	26/04/2019	403240	6434796	Marri	600			
457	26/04/2019	403236	6434746	Marri	600			
463	26/04/2019	403312	6434730	Marri	600			
362	26/04/2019	406468	6424782	Marri	600			
402	26/04/2019	406086	6424897	Marri	650			
426	26/04/2019	403336	6434728	Marri	650			
436	26/04/2019	403369	6434772	Marri	650			
437	26/04/2019	403367	6434773	Marri	650			
456	26/04/2019	403242	6434750	Marri	650			
462	26/04/2019	403283	6434724	Marri	650			
327	26/04/2019	403529	6425718	Marri	700			
329	26/04/2019	403538	6425746	Marri	700			
334	26/04/2019	403563	6425744	Marri	700			
335	26/04/2019	403612	6425729	Marri	700			
340	26/04/2019	403687	6425649	Marri	700			
345	26/04/2019	404271	6425184	Marri	700			
352	26/04/2019	402974	6427008	Marri	700			
361	26/04/2019	406470	6424798	Marri	700			
382	26/04/2019	406369	6424427	Marri	700			
397	26/04/2019	406042	6424848	Marri	700			
404	26/04/2019	406072	6424893	Marri	700			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
415	26/04/2019	405956	6424795	Marri	700			
442	26/04/2019	403319	6434794	Marri	700			
331	26/04/2019	403553	6425750	Marri	750			
386	26/04/2019	406380	6424726	Marri	750			
425	26/04/2019	403290	6434678	Marri	750			
444	26/04/2019	403305	6434793	Marri	750			
449	26/04/2019	403262	6434802	Marri	750			
451	26/04/2019	403262	6434790	Marri	750			
344	26/04/2019	404271	6425169	Marri	800			
375	26/04/2019	406330	6424368	Marri	800			
385	26/04/2019	406391	6424592	Marri	800			
400	26/04/2019	406094	6424908	Marri	800			
409	26/04/2019	406017	6424855	Marri	800			
443	26/04/2019	403310	6434796	Marri	800			
448	26/04/2019	403283	6434782	Marri	800			
450	26/04/2019	403262	6434803	Marri	800			
368	26/04/2019	406372	6424303	Marri	900			
383	26/04/2019	406361	6424498	Marri	900			
396	26/04/2019	406043	6424853	Marri	900			
403	26/04/2019	406080	6424908	Marri	900			
459	26/04/2019	403249	6434745	Marri	900			
428	26/04/2019	403367	6434687	Marri	950			
392	26/04/2019	406319	6424737	Marri	1000			
406	26/04/2019	406042	6424874	Marri	1000			
414	26/04/2019	405982	6424818	Marri	1000			
427	26/04/2019	403336	6434705	Marri	1000			
378	26/04/2019	406335	6424390	Marri	1100			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
391	26/04/2019	406345	6424730	Marri	1100			
418	26/04/2019	405947	6424785	Marri	1100			
419	26/04/2019	403288	6434649	Marri	1300			
379	26/04/2019	406347	6424418	Marri	1350			
395	26/04/2019	406202	6424732	Marri	1400			
475	29/04/2019	402998	6429428	Marri	500			
479	29/04/2019	403007	6429408	Marri	500			
485	29/04/2019	403029	6429379	Marri	500			
502	29/04/2019	403264	6431452	Marri	500			
503	29/04/2019	403267	6431426	Marri	500			
504	29/04/2019	403260	6431427	Marri	500			
527	29/04/2019	403398	6432764	Marri	500			
528	29/04/2019	403398	6432764	Marri	500			
529	29/04/2019	403413	6432762	Marri	500			
604	29/04/2019	403010	6426467	Marri	500			
606	29/04/2019	403013	6426492	Marri	500			
619	29/04/2019	403475	6426071	Marri	500			
473	29/04/2019	403006	6429443	Marri	550			
476	29/04/2019	403002	6429421	Marri	550			
483	29/04/2019	403023	6429376	Marri	550			
484	29/04/2019	403026	6429376	Marri	550			
486	29/04/2019	403030	6429378	Marri	550			
501	29/04/2019	403264	6431454	Marri	550			
505	29/04/2019	403256	6431440	Marri	550			
540	29/04/2019	403141	6429242	Marri	550			
544	29/04/2019	403062	6429212	Marri	550			
608	29/04/2019	403014	6426795	Marri	550			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
610	29/04/2019	403030	6426922	Marri	550			
621	29/04/2019	403487	6426097	Marri	550			
478	29/04/2019	403007	6429413	Marri	600			
481	29/04/2019	403019	6429387	Marri	600			
530	29/04/2019	403419	6432760	Marri	600			
541	29/04/2019	403133	6429221	Marri	600			
568	29/04/2019	403015	6428318	Marri	600			
595	29/04/2019	403021	6428111	Marri	600			
616	29/04/2019	403667	6426070	Marri	600			
472	29/04/2019	403007	6429449	Marri	650			
605	29/04/2019	403013	6426479	Marri	650			
607	29/04/2019	403001	6426782	Marri	650			
471	29/04/2019	403043	6429563	Marri	700			
480	29/04/2019	403018	6429391	Marri	700			
482	29/04/2019	403017	6429380	Marri	700			
603	29/04/2019	403120	6426424	Marri	700			
615	29/04/2019	403661	6426087	Marri	700			
500	29/04/2019	403269	6431455	Marri	750			
617	29/04/2019	403477	6426073	Marri	750			
494	29/04/2019	403262	6431180	Marri	800			
496	29/04/2019	403238	6431053	Marri	800			
497	29/04/2019	403249	6431031	Marri	800			
506	29/04/2019	403255	6431446	Marri	800			
569	29/04/2019	403024	6428322	Marri	800			
613	29/04/2019	403621	6426274	Marri	800			
623	29/04/2019	403385	6426056	Marri	800			
624	29/04/2019	403377	6426170	Marri	800			

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
625	29/04/2019	403378	6426169	Marri	800			
498	29/04/2019	403256	6431000	Marri	900			
531	29/04/2019	403422	6432759	Marri	900			
499	29/04/2019	403257	6431003	Marri	950			
594	29/04/2019	403020	6428111	Marri	1000			
618	29/04/2019	403476	6426068	Marri	1000			
492	29/04/2019	403101	6429613	Marri	600,550			
495	29/04/2019	403225	6431078	Marri	800,750			
612	29/04/2019	403615	6426312	Marri	100, 800			
508	29/04/2019	403360	6432452	Marri				
973	16/04/2019	402931	6429332	Marri	500			
539	29/04/2019	403168	6429247	Marri	600			
062	22/04/2019	403295	6435783	Marri	1100	Forks into 500, 600mm 300 dia		
964	16/04/2019	403013	6429331	Marri	700	Forks into 400, 300mm dia		
545	29/04/2019	402917	6429045	Marri dead	1000	2 top entry hollows. 300mm dia. Can be checked with camera	2	2
614	29/04/2019	403616	6426231	Marri dead	900	3 hollows. Galahs and ringnecks present. Very rotten dangerous tree	3	
175	22/04/2019	403374	6433034	Marri. Dead	500, 300	Forked 500, 300mm dia		
080	22/04/2019	403218	6435568	Marri. Dead	800	Rainbow Lorikeet nest		
204	24/04/2019	403680	6432978	Marri. Dead	900	Coordinates taken 3m to north because of drainage ditch		
276	25/04/2019	403834	6425956	Marri. Dead	900	Trunk forks into 2 small stems below 500mm dia		
277	25/04/2019	403850	6425954	Marri. Dead	900	Trunk forks into 2 small stems below 500mm dia		
458	26/04/2019	403241	6434745	Marri. Dead	900	Trunk forks into 2 small stems below 500mm dia		

Point ref	Date	Easting	Northing	Species	DBH (many multi stemmed)	Comments	Contains Hollow	Potential Suitable Hollow
510	29/04/2019	403360	6432434	Flooded Gum	700	No access. Coordinates and DBH assessed from fenceline		
654	3/05/2019	403194	6435685	Marri. Dead	600			
609	29/04/2019	402997	6426804	Marri. Dead	500			
602	29/04/2019	403111	6426417	Marri. Dead	600			
542	29/04/2019	403102	6429221	Marri. Dead	700			
151	22/04/2019	403395	6433406	Marri. Dead	500			
152	22/04/2019	403386	6433401	Marri. Dead	630			
165	22/04/2019	403426	6433286	Marri. Dead	650			
174	22/04/2019	403378	6433041	Marri. Dead	650			
176	22/04/2019	403391	6433028	Marri. Dead	1100			
158	22/04/2019	403300	6433218	Marri. Dead	1500			
464	26/04/2019	403248	6434624	Marri. Dead	650			
424	26/04/2019	403320	6434645	Marri. Dead	700			
339	26/04/2019	403668	6425700	Wandoo	700, 600, 400			
384	26/04/2019	406366	6424530	Wandoo?	500			

Appendix B – Black Cockatoo Trees with DBH>500mm

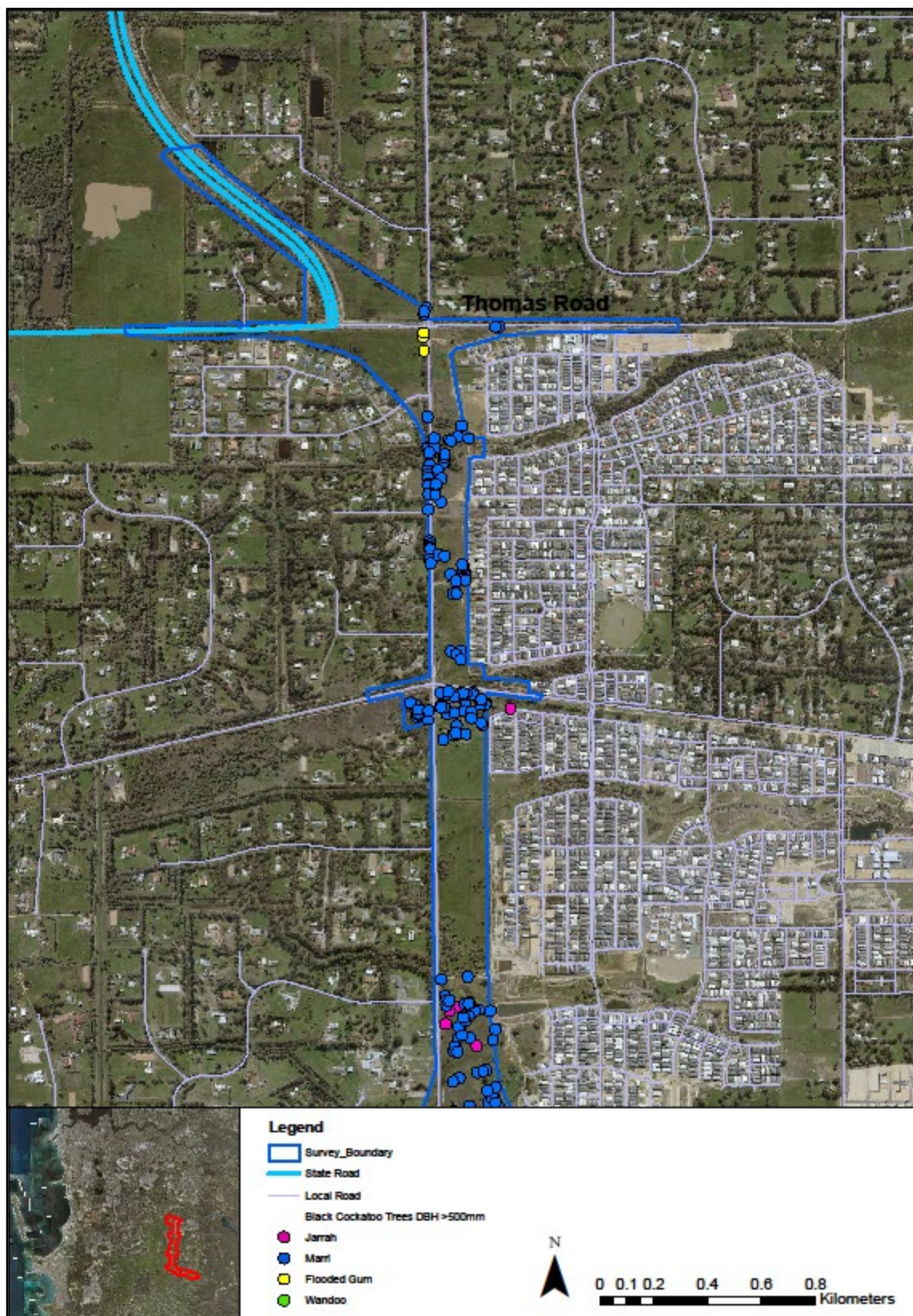


Figure 1 :Black Cockatoo Trees with DBH>500mm

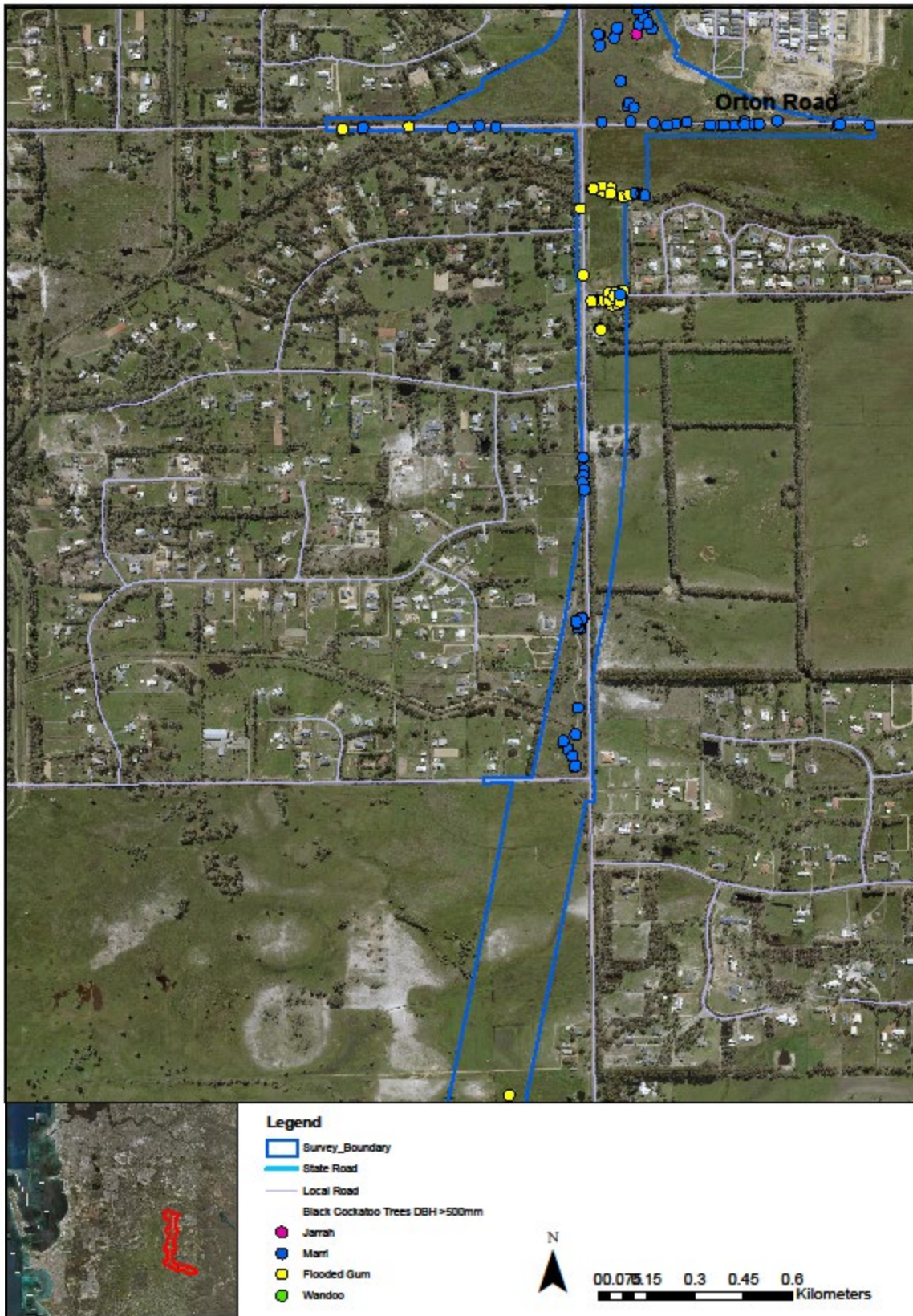


Figure 2 :Black Cockatoo Trees with DBH>500mm

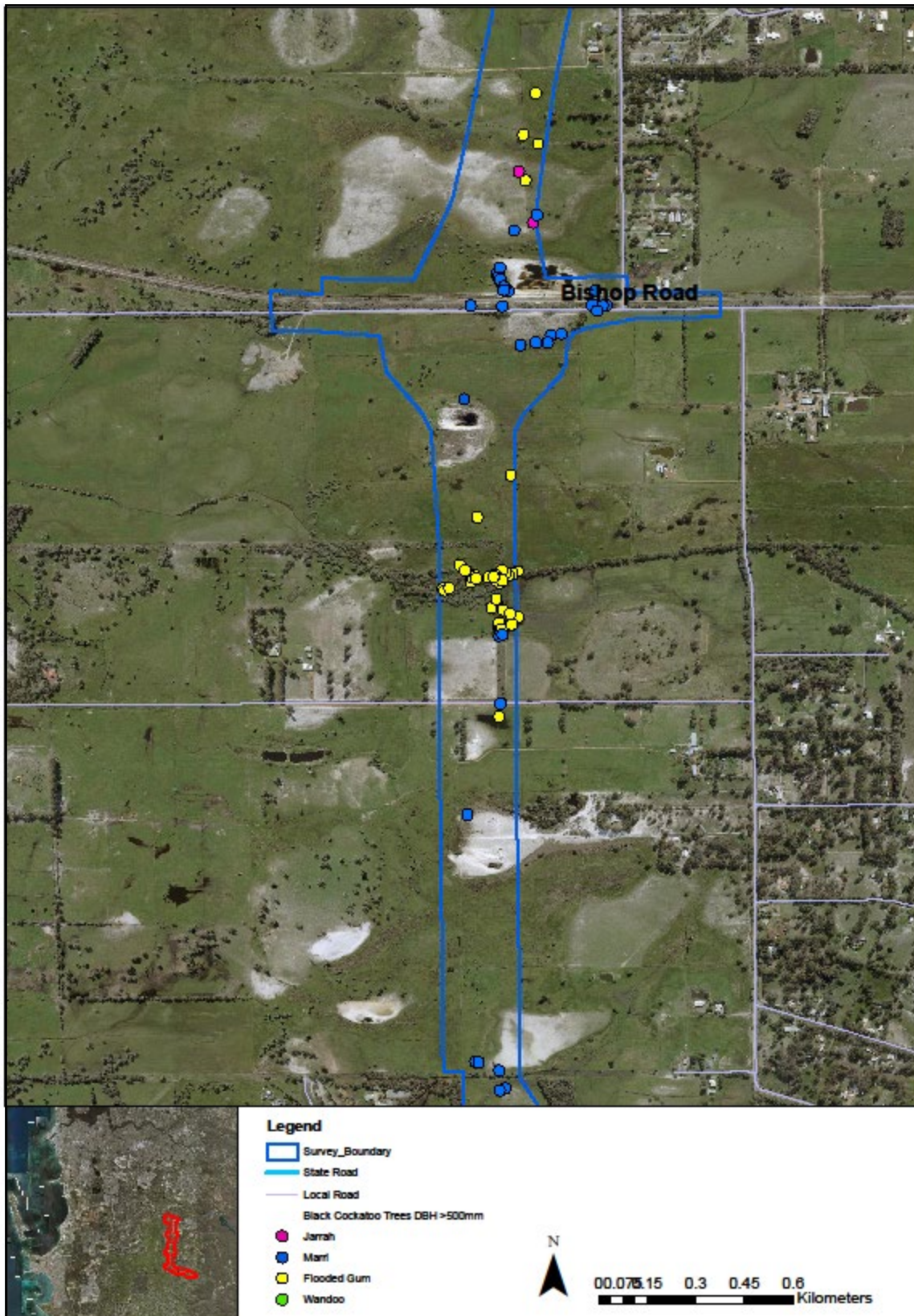


Figure 3 :Black Cockatoo Trees with DBH>500mm

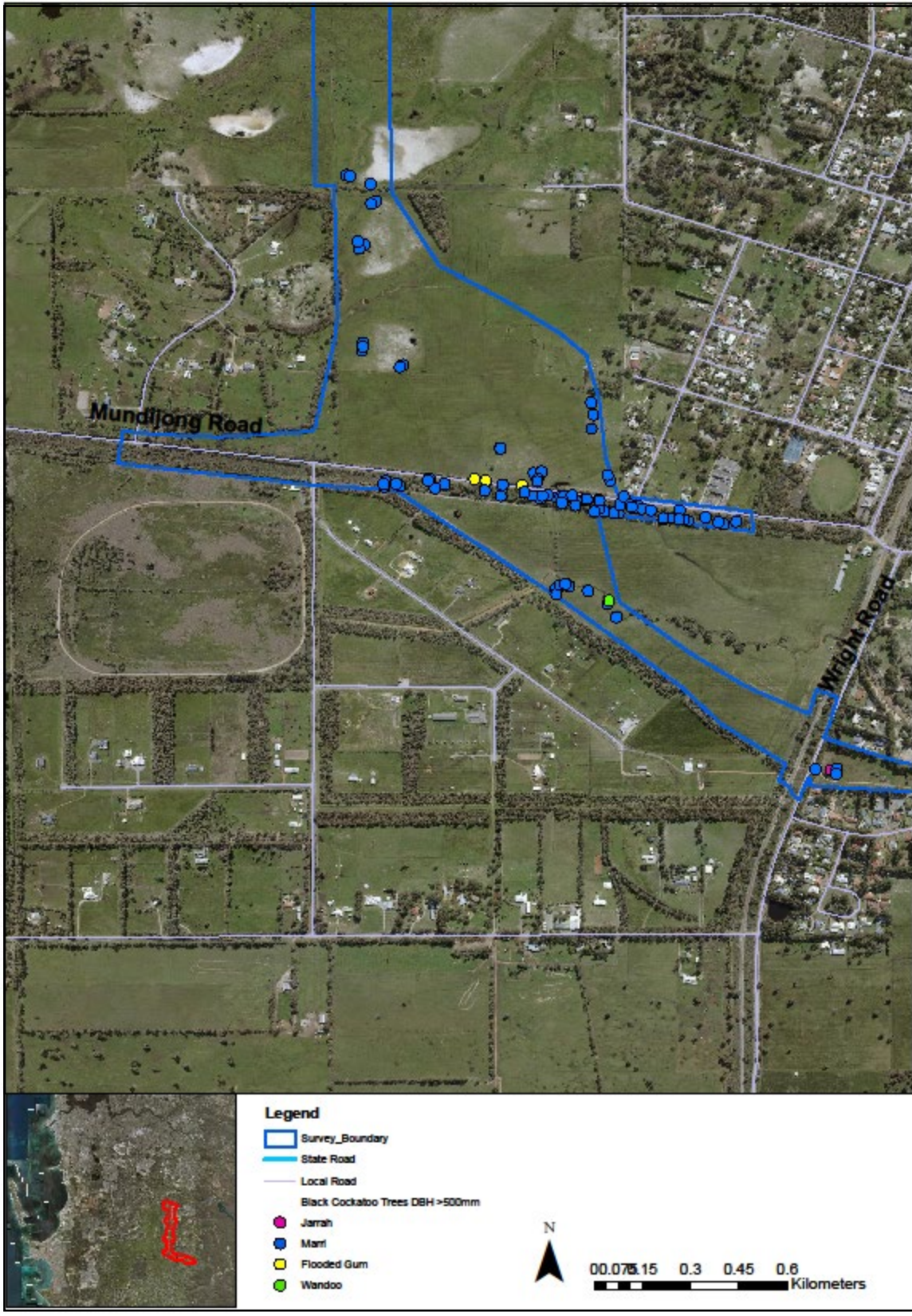


Figure 4 :Black Cockatoo Trees with DBH>500mm

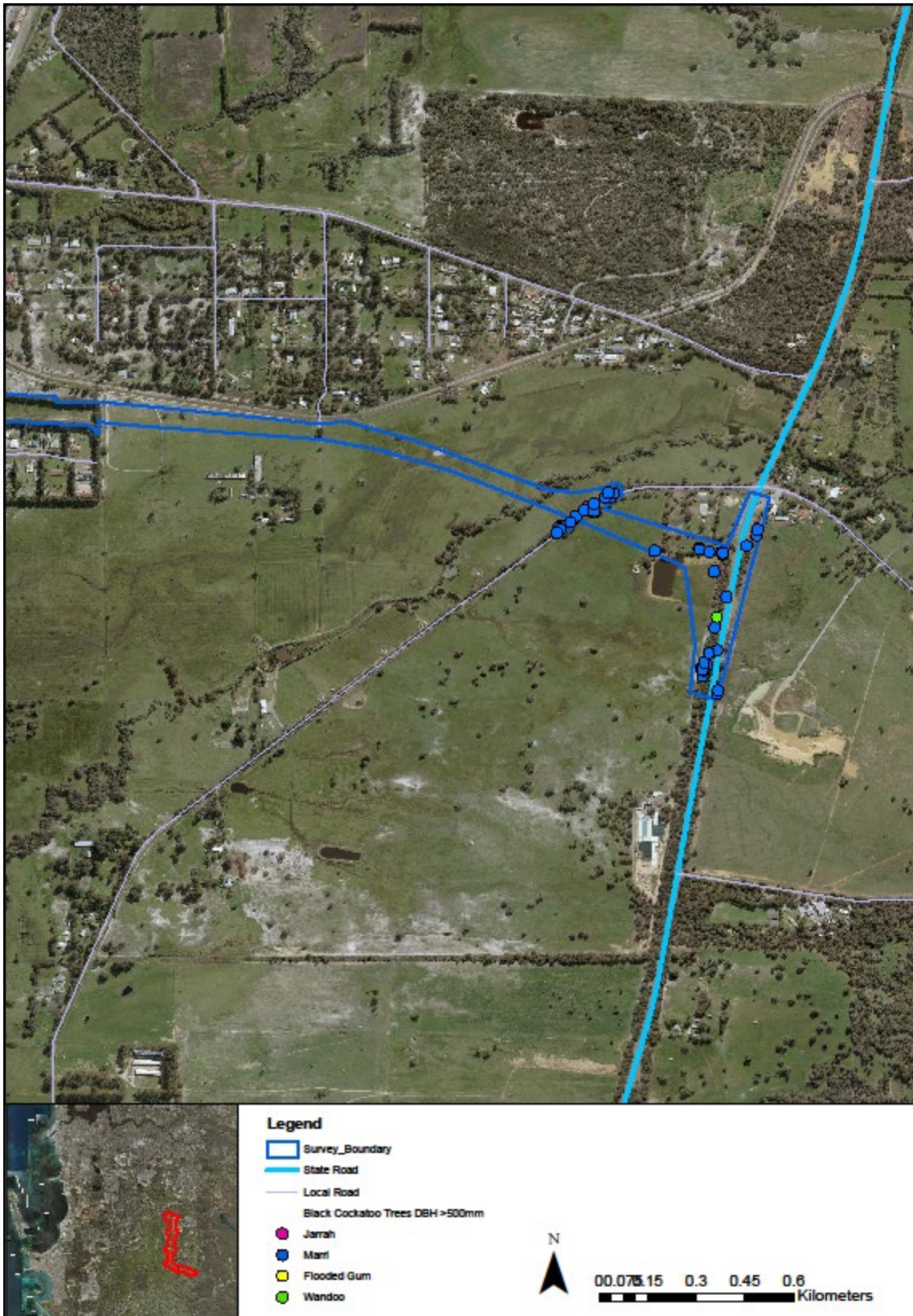


Figure 5 :Black Cockatoo Trees with DBH>500mm

Appendix C – Black Cockatoo Trees with Potential Hollows

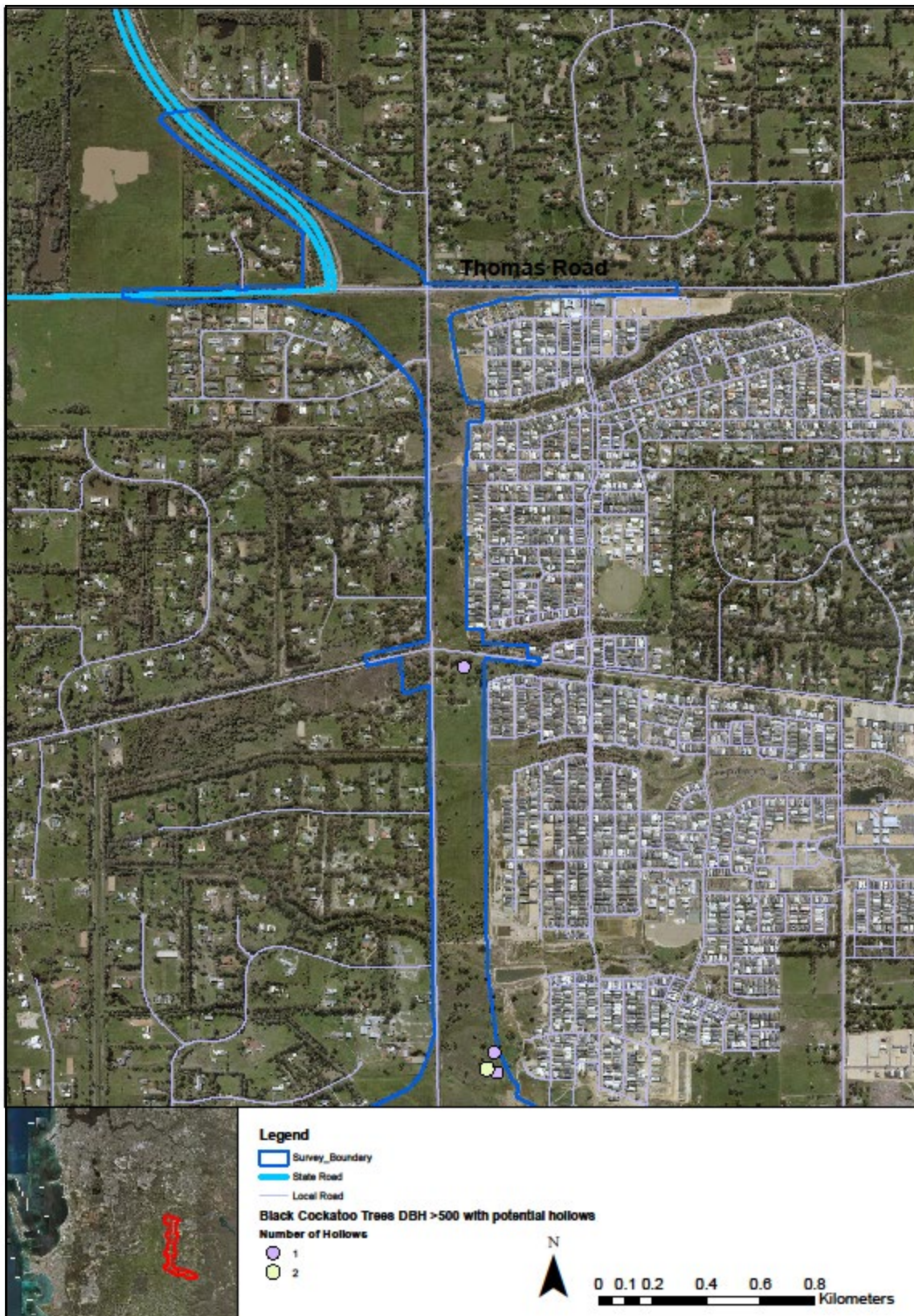


Figure 6: Black Cockatoo Trees with Potential Hollows

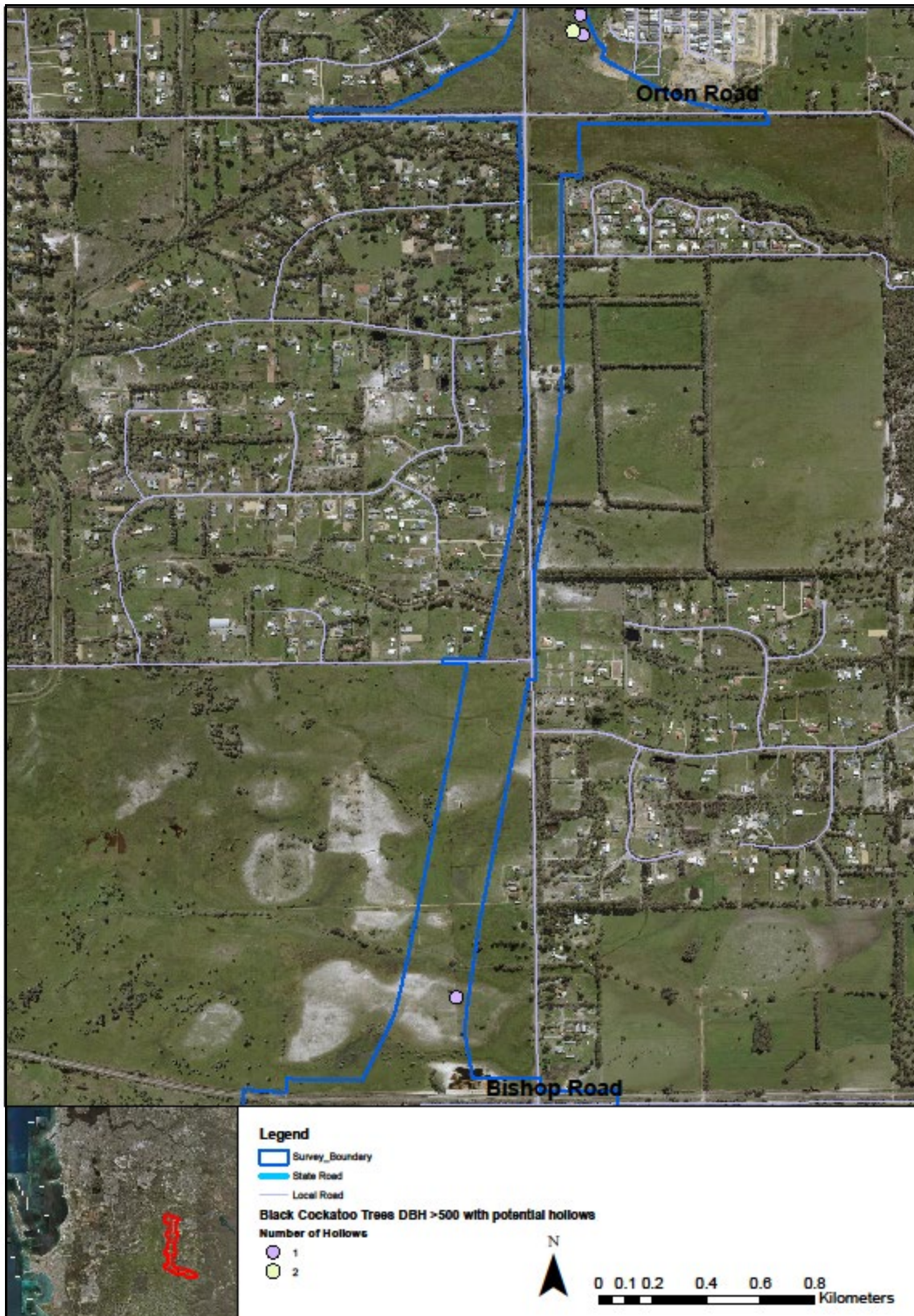


Figure 7: Black Cockatoo Trees with Potential Hollows



Figure 8: Black Cockatoo Trees with Potential Hollows

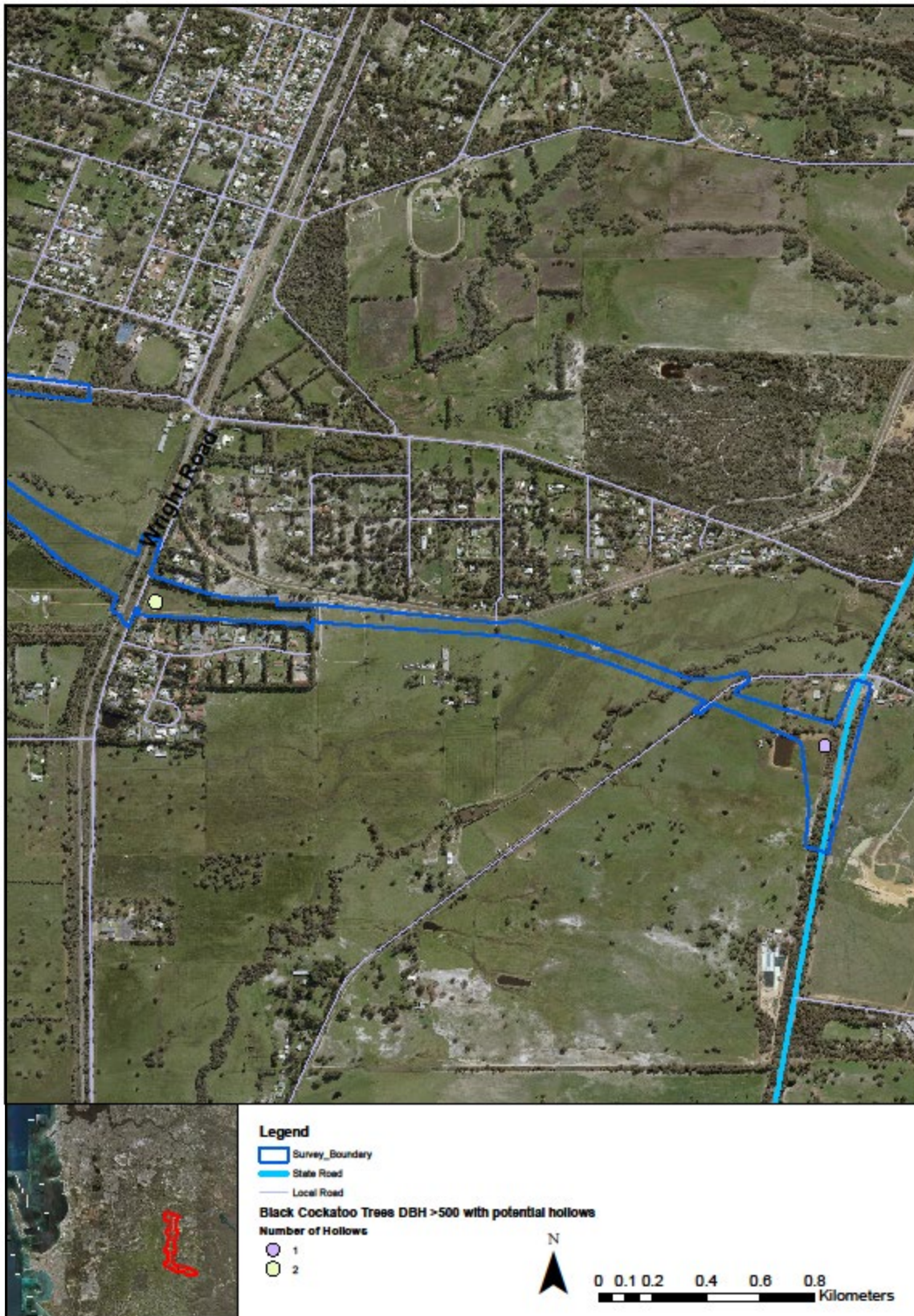


Figure 9: Black Cockatoo Trees with Potential Hollows