Black Cockatoo Conservation Project: December 2017 update

The Black Cockatoo Conservation Project is pleased to provide the latest update on our black cockatoo releases and tracking, including updates on the movements of the wild Carnaby’s cockatoos tagged at the Coomallo Creek breeding grounds in November, and the first information about our new tagging operations in December during a fieldtrip to the Borden breeding grounds for Carnaby’s cockatoos.

Below is a summary of the innovative double-tag system which we are using to follow the released birds, followed by a summary of our focal birds’ movements for December 2017.

TRANSMITTERS attached to birds:
(1) Satellite transmitters – provide landscape-scale data on movement and location of the birds with accuracy to within 250m. These tags can remain operational for approximately a year, before being shed during the annual moult of the tail feathers to which the tags are attached.
(2) GPS transmitters – provide fine-scale data, including highly-accurate GPS locations, fine-scale movement and behavioural data. This research is the first trial of these GPS tags on free-ranging black cockatoos.

REPORT FOR DECEMBER 2017

(A) Sam Rycken’s PhD project

In November 2016 we released a group of six forest red-tailed black cockatoos (RTs) at Nannup, with four birds carrying tracking devices, to be monitored as part of Sam’s PhD research. The four birds with tags were:
RT 66 – Female
RT 67 – Male
RT 68 – Female
RT 69 – Female (Satellite transmitter only – GPS transmitter chewed prior to release)

In March 2017, a group of four rehabilitated Carnaby’s cockatoos was released at Albany, with two birds carrying tracking devices:
CC 63 – Female. Satellite tag only
CC 70 – Male. Satellite and GPS tags

In early June 2017, we released a group of rehabilitated forest red-tailed black cockatoos at Denmark, with four birds carrying transmitters:
RT 56 – satellite tag only
RT 65 – satellite and GPS tags
RT 66 – satellite and GPS tags
RT 67 – satellite and GPS tags

On 10th August 2017, we released a group of rehabilitated Carnaby’s cockatoos at Gingin, with four birds carrying transmitters:
CC 71, CC 73 and CC 59 – satellite tag only
CC 72 – satellite and GPS tags.

On 21st September 2017, we released a new group of nine rehabilitated forest red-tailed black cockatoos at Waroona, with four birds carrying transmitters:
RT 63 – satellite and GPS tags
RT 75 – satellite tag only (GPS tag destroyed by bird or its companions prior to the bird’s release)
RT 82 – satellite tag only (GPS tag destroyed prior to release)
RT 87 – satellite and GPS tags
For each release, information is provided below for each of the birds which have transmitters that remain operational and are providing movement information.

RED-TAILS RELEASED AT NANNUP
We are delighted to be able to provide a second straight month of updated information for RT 69, which, as we reported in the last circular, is from a group of rehabilitated birds that was released at the start of November 2016, and for which we may have expected all satellite transmitters to have been moulted out many months ago. In our last update, we were able to report that this female red-tail was detected roosting along the Sabina River around the Vasse Highway, before moving back to the forests between Baudin and Barabup. We have been able to continue to obtain updates on this female. During this month, she moved from the Baudin forest block where she had been spending time, and began roosting south of Busselton in the Spanish Settlers’ Reserve (Figure 1). RT 69’s satellite dataset represents the longest dataset so far produced as part of our research, and is an exceptional example of the potential of these tags.

Figure 1. Satellite movements for RT 69.
CARNABY’S COCKATOOS RELEASED AT ALBANY

CC 63 – In our previous update, we reported that CC 63’s satellite transmitter had, for two consecutive months, been giving location readings from a single small area, where CC 63 has previously spent a considerable amount of time in a flock of around 200 birds. The consistency of locations raised the possibility that the transmitter had been moulted out. This month, we can report that while the location data are still indicating the same location (a forest block east of Chester Pass Road and the Porongorup), there is clear evidence of movement (Figure 2); indicating not a moulted transmitter, but rather, that this may be a consistent roost site for CC 63 and its flock. The flock which CC 63 had joined has a known history of using a small number of consistent roosts in this area.

Figure 2: Movements of CC 63.

CC 70 – Transmissions are continuing from the same area of Mills Brook Reserve as in recent months, suggesting almost definitely that the satellite tag has been moulted out (Figure 3).

Figure 3: Satellite transmitter data for CC 70.
FOREST RED-TAILED BLACK COCKATOOS RELEASED AT DENMARK

RT 56 – Last month this bird was spending time on the lower side of Mt Lindesay near the end of Sunny Glenn Road; this month RT 56 has moved and now roosts and forages in Mount Lindesay National Park (Figure 4).

![Figure 4. Movement data for RT 56.](image)

RT 66 – This month, this bird has returned south of Limbourne Road, just east of Happy Valley Road – the area of the original release site (Figure 5).

![Figure 5. Movements for RT 66.](image)

CARNABY’S RELEASE AT GINGIN

CC 72 – Previously we reported that during Oct-November, CC 72 and a large part of its flock had travelled to and remained in Julimar State Forest, splitting into smaller sub-flocks and pairs, with observations including pair behaviour consistent with prospecting hollows in potential nesting trees (pre-breeding behaviour). Through December, CC 72 and the flock remained in Julimar State Forest. CC 72’s satellite tag indicated that it was roosting consistently in the same location and foraging in the immediate area: all consistent with breeding behaviour (Figure 6).
CC 59 – This bird had joined part of the Gingin flock that remained in Gingin while the rest of the flock left the area (potentially as part of a breeding migration; see notes for CC 72 above). The group that remains around Gingin includes at least 70 individuals. While Sam was able to observe extensive foraging for CC 59’s flock last month around Gingin, we do not have any data for CC 59 this month. We hope to provide an update next month.

FOREST RED-TAILED BLACK COCKATOOS RELEASED AT WAROONA
RT 75 – As described in the most recent circular, RT 75 is still foraging and roosting with the flock of at least 30 red-tails which it joined after its release, on the lower side of Nanga Brook Road, just east of the centre of Waroona (Figure 7).

RT 82 – We reported last month that this bird and its flock had moved out of Dwellingup to Jelcobine, where there are many small flocks of red-tails; but that recent data from the satellite tag indicated that it may have moulted out. During this month the tag is still transmitting from the same area of Jelcobine, suggesting strongly that tag loss through moultling of tail feather(s) has occurred (Figure 8).
In February 2017, we released 10 rehabilitated forest red-tailed black cockatoos (RTs) at Boddington. Of the 10 birds released, three were double-mounted with both satellite and GPS transmitters, and a fourth carried only a satellite transmitter. The four birds with tags were as follows.
RT 94 – Female
RT 95 – Female
RT 96 – Male
RT 84 – Female (Satellite transmitter only)

In November 2017, as detailed in the previous circular, we attached GPS and satellite transmitters to adult wild birds that had young (5+ week old) nestlings, at the Carnaby’s cockatoo breeding grounds at Coomallo Creek, to investigate the parents’ use of habitat in the breeding grounds. The three adult birds were:
CC 90 – Female
CC 91 – Female
CC 51 – Female
We also tagged a 76-day-old male nestling, which fledged three days later and began being tracked by PhD student Karen. This fledgling was:
CC 88 – Male

In December 2017, we undertook similar efforts to attach GPS and satellite transmitter attachments to wild birds, this time at the breeding grounds for Carnaby’s cockatoos in Borden. Full details of this most recent fieldtrip are provided below.

For these releases, information is provided below for birds which have transmitters that remain operational.

FOREST RED-TAILED BLACK COCKATOOS RELEASED AT BODDINTON

RT 96 – We reported previously that this male bird moved in October from the Youraling State Forest (where he had resided for the past six months) to the Bedfordale Hills, where he was observed spending time was with an adult female, with which he appeared to have formed a pair bond. They
browsed close together, spent a lot of time allopreshing, and the male was observed to feed the female, a behaviour only observed between adults in a pair bond (Karen discussed these observations with research team collaborator Rick Dawson). We noted last month that it is very encouraging to observe that a rehabilitated cockatoo has bonded with a wild bird within eight months of release. During November, RT 96 remained in the Bedfordale area; and we can again report that he has remained in this area (Figure 9).

![Figure 9. Map showing movements of RT 96.](image)

COOMALLO CREEK BREEDING GROUND- November fieldtrip
CC 90 - Our last GPS data from this bird were captured on the morning of December 1st. A visual observation on December 6th revealed that her GPS transmitter had been chewed. In total, we were able to capture 18 days of GPS data from this bird, which is very pleasing given the extensive behavioural and ecological information obtained. Karen observed CC 90 and her partner on the edge of their hollow at 7am on the morning of December 7th. A check of the hollow at 9.30am revealed that their nestling had fledged some time that morning. Usefully, CC 90’s satellite transmitter remains functional, and revealed that after leaving the breeding area she travelled north-west and reached a well-used roost at the Warradarge Roadhouse by December 12th (Figure 10). This roost has been used by at least four of our transmitter-attached birds this season; as well as one tracked bird from last season. From here, CC 90 moved north to the same farm in Warradarge used by our tagged fledgling CC 88 last month. Karen undertook a flock follow here, which revealed a large flock (200 birds) utilising a long row of pine trees on private property for roosting, and foraging on native vegetation in the South Eneabba Nature Reserve and in patches of retained habitat in surrounding farmland. They were also observed to feed on pine and canola.
Figure 10. Satellite data for CC 90, showing her movement away from the breeding area.

Figure 11. CC 90 visiting her hollow on December 7th, the morning her nestling fledged. Credit: K Riley.

CC 91 - The satellite tag for this bird ceased to function after Dec 6th; we suspect it may have been damaged by the bird. At that time, she had not yet left the breeding area following the death of her nestling in November (as reported in last month’s circular).

CC 51 - We were able to collect GPS data for CC51 until December 2nd, after which time she chewed her GPS transmitter. Similarly to CC 90, we were able to collect a total of 18 days of GPS data from CC 51, giving us large amounts of information on the foraging activity and behaviour of Carnaby’s cockatoos in the breeding grounds. The last two days of GPS data from CC 51 are depicted on the map below (Figure 12). They show she continued to utilise the main feeding areas to the east of the hollow.
including patches of native vegetation and canola. She also visited some remnant vegetation patches 9km west of the hollow.

Figure 12. GPS data for CC 51 for December 1\textsuperscript{st} and 2\textsuperscript{nd}. The GPS data show CC 51 foraging in the main feeding areas to the east of her hollow, as well as in some remnant patches 9km west of the breeding area.

Karen observed CC 51 at her hollow at 7am on the morning of December 7\textsuperscript{th} at the same time as she observed CC 90 (above). Interestingly, 9.30am that same morning, both hollows were empty, indicating that the nestlings fledged at roughly the same time.

CC 51’s satellite transmitter remains active, and the satellite data reveal she was also at the Warradarge roadhouse on December 12th (on the same night as CC 90, above). From here, she made her way north to Eneabba, where she roosted in eucalypts in the town centre. On November 20\textsuperscript{th} she had moved 15km east, and by December 21\textsuperscript{st} she had travelled 20km south to the Warradarge farm site used by CC 90 and CC 88.
Figure 13. Satellite data for CC 51 showing her movements away from the breeding area.

Figure 14. CC 51 and her partner visiting the hollow on December 7th, just before their nestling fledged. Credit: K Riley.
CC 88 – Our tracked fledgling spent most of the month of December at the Warradarge farm utilised by CC 51 and CC 90. He began and ended the month here, taking a short trip north to Eneabba and south to the Warradarge road house (Figure 15).

Figure 15. Satellite data for CC 88 showing movements for December.
Figure 16. Part of the large flock leaving the roost at the Warradarge farm at first light. Credit: K Riley.

Figure 17. A small group of Carnaby’s cockatoos at Warradarge farm utilise patches of native vegetation amongst canola fields. South Eneabba Nature Reserve in the background. Credit: K Riley.
BORDEN BREEDING GROUND – December fieldtrip

On December 11th, Murdoch University black cockatoo research team members Kris Warren, Jill Shephard, Jo Burston and Karen Riley spent three nights at the Borden breeding grounds for Carnaby’s cockatoos, with Rick Dawson and Chris Phillips from DBCA. This has been our most successful transmitter attachment trip to the breeding grounds so far, in terms of the amount of data we have been able to capture. Our aim was to attach GPS and satellite transmitters to adult birds (male or female) supporting nestlings. We have decided against any further transmitter attachments to fledglings, as the retention time has generally been quite short, most likely as a result of diligent preening by the parents.

The two wild birds which received transmitters (both satellite and GPS) were:
CC 56 – male
CC 57 - male

CC 56 - On our first night we were successful in trapping CC 56, a male with two nestlings aged 51 and 58 days (fledging is usually around 74 days). The transmitter attachment went very well, and CC 56 retained his transmitter through the whole of December.

CC 57 - On our second night in the field, we had two traps set up but were unsuccessful in trapping a bird. On the third night we trapped another male, CC 57, also with two nestlings, aged 42 and 49 days. As was the case with CC 56, the transmitter attachment went very smoothly, and CC 57 also retained his transmitter through the whole of December.

For both CC 56 and CC 57, foraging occurred mainly in a 300ha block of uncleared native vegetation 3km north of the breeding area (Figures 19-21). Here they foraged mainly on a variety of banksia and hakea species, as well as some eucalypt. They supplemented this with time spent foraging on canola, especially a pile of spilled canola 800m south of the main foraging area, and a few pine trees growing around a farmhouse in the north.
Figure 19. GPS data for CC 56 (red) and CC 57 (blue), for the period from transmitter attachment until December 31st.

Figure 20. Expanded Area A – The main foraging area located 3km north of the breeding area; a 300ha block of uncleared native vegetation. The movement data show the birds utilised the entirety of the remnant bush block.
Figure 21. Expanded Area B – Main breeding area showing location of hollows. The birds would visit the hollows in the morning and evening to provision the nestling and spent their nights roosting in the surrounding wandoo.

Figure 22. CC 56 – Silhouette at hollow, showing back mounted GPS transmitters. Credit: K Riley.
Figure 23. CC 57 (on the right) with his partner after a visit to the hollow. His back-mounted GPS transmitter is visible, as (faintly) is his satellite transmitter antenna, protruding beyond the end of the tail feathers. Credit: K Riley.

Figure 24. Carnaby’s cockatoo nestling held by DBCA wildlife officer Chris Phillips during leg banding by Rick Dawson. Credit K Riley.
We are very pleased with the quantity and quality of data obtained from our recent fieldtrips, and we look forward to bringing you the next update on our tagged black cockatoos and their flocks in a few weeks.