Koala Monitoring Program

Yarrabilba Priority Development Area

Koala Capture / Monitoring Event March 2019

Summary Report

Dr Bill Ellis taking measurements of female koala “Zara”

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Introduction

This report presents the latest findings from the Koala Monitoring Program that has been implemented for the Yarrabilba Priority Development Area by the Koala Ecology Group (University of Queensland) in partnership with Austecology. The Koala Monitoring Program has been developed to monitor koala health and use of koala habitat offsets under the Commonwealth's EPBC 2013/6791 Approval.

The *Koala Monitoring Program* comprises three key elements:

1. ***Koala Capture / Monitoring Events*** - This component of the program will involve fieldwork to catch, examine and tag selected koalas for monitoring purposes.
2. ***Koala Monitoring Events*** - This component is designed to track and establish the location of collared koalas in order to visually assess their well-being (using binoculars) as well as their tree use preferences.
3. ***Koala Population Survey Events*** – This component will provide a series of systematic transect searches throughout the full extent of the designated "Fauna Corridor", and the seven EPBCA Offset Areas.

During March 2019 a *Koala Capture / Monitoring Event* was conducted at the Yarrabilba site. The aims of the fieldtrip were to: 1. Radio-track collared koalas to visually check their well-being, 2. Visually check the condition of the tree-mounted LX base stations, 3. Attempt to catch koalas that need health checks/treatment, and 4. Search for new koalas at the site.

This report summarises the main findings from the recent koala capture/monitoring event.

Methodology

The koala monitoring event occurred from the 4th – 6th March 2019. The study team comprised three personnel from the Koala Ecology Group (Ben Barth, Bill Ellis, and Sean FitzGibbon).

At the time of the fieldtrip four koalas were collared, including three females (Jean, Sue-Bob, Zara) and one male (Lindsay). These koalas were located by radio-tracking using the unique VHF radio signal emitted from each collar. Two of these collared koalas were scheduled for recapture to assess their health and check that their collar was still fitting well.

Throughout the fieldtrip, habitat searches were conducted to try and locate new/untagged koalas ("cleanskins") at the site to tag and fit with collars. The nominated target habitat area within EPBCA Offset Area 1 was prioritised for these searches and when a koala was detected, suitability for capture was assessed. Capture attempts were made using the previously described methods, involving a tree climber and a ground support team implementing the extendable pole "flagging" method.

Captured koalas were restrained in a cloth bag in a cool location and processed at the site. Processing took approximately 45mins per animal, during which time the koala was briefly anaesthetised (5mins) to facilitate a basic health examination and the collection of body measurements, as well as eye and urogenital swabs for disease testing. Measurements included body weight, head length and width, testes width (males), and an assessment of tooth wear (to age the koala) and body condition (from 1 to 10; 1 = very poor condition, 10 = excellent condition).

Cleanskin koalas were fitted with a coloured ear tag stamped with a unique number, following previous protocols (right ear for females and left for males). A small stainless steel numbered tag was inserted in the opposite ear as back-up identification. It is important to note that the coloured tags are often visible from the ground, permitting easy identification of study animals by anyone that observes a koala at the site. Binoculars would be required if the koala was located high in a tree.

Cleanskin koalas were then fitted with collars to enable them to be radio-tracked (during Koala Monitoring Events) as well as monitored using the online Koala Tracker system (see http://trackkoalas.com.au/ for further information on this koala-specific tracking system). For koalas that were already collared, the collar fit was checked to ensure it was neither too tight nor loose.

After processing, captured koalas were allowed time to fully recover from anaesthesia before being released in the same tree from which they were captured. All procedures were in accordance with our current DES Scientific Purposes Permit and University of Queensland Animal Ethics Certificate.

Results & Discussion

A total of nine independent koalas were sighted during the March 2019 field trip, within the focal area of the Yarrabilba Priority Development Area (Fig. 1). Five were tagged koalas while the other four were ‘cleanskins’ (i.e. not previously caught and tagged). This represents the highest number of koalas seen in the focal area of the site during a *Koala Capture / Monitoring Event*.

Two of the cleanskin koalas were able to be captured; the first was an adult female (named Meghan) and the other was a sub-adult male (named Kevin). These new koalas were caught, examined, tagged and fitted with a tracking collar (see further details below). The other two cleanskins that were observed were young female koalas. Visual examination with binoculars suggested that they were healthy koalas (i.e. there were no visible signs of disease). An unsuccessful attempt was made to capture one of these individuals; the catch was aborted when the koala started behaving in a very nervous manner, jumping between branches in the crown of a large blue gum. The high temperature (>35 deg. C) also influenced our decision to abort the catch attempt, as koalas can overheat if they are too active under such environmental conditions.

The five tagged koalas that were sighted during the trip included three females (Jean, Sue-Bob, Zara) and two males (Lindsay, Cain). Three of these koalas (Cain, Lindsay, Zara) were no longer collared, but they were sighted, recaptured and fitted with collars again. Zara’s recently weaned young (Squeak) was not seen during searches of habitat in Zara’s immediate vicinity. Squeak was seen in trees close to Zara in January 2019, but it is likely that this sub-adult female koala has dispersed from its natal area.

In total, six independent koalas were captured during the March 2019 *Koala Capture / Monitoring Event*. Further details concerning the health and examination of these six koalas are provided below, with pictures taken during the fieldtrip. All tag and collar details are provided in Appendix 1.

The female koala named Jean was scheduled to be recaptured but this was not possible due to her occupying large trees on all days, which would have involved a risky catch effort. Despite not catching Jean, visual assessment with the aid of binoculars suggested that she had no signs of poor health and that her collar was still fitting well. We will attempt to re-catch Jean at the next opportunity.

Figure 1. Plot of the initial location of koalas that were sighted during the March 2019 fieldtrip, and the base stations that have been deployed to monitor their movements.

Zara (13304)

This female koala was uncollared at the start of the March fieldtrip but was sighted within her usual area of occupation on a northern branch of Quinzeh Creek. Habitat in her immediate vicinity was searched but there was no sign of her recently weaned young (Squeak), suggesting this juvenile koala may have dispersed. Zara was recaptured from a blue gum very near to base station 1.

The examination of Zara (Fig. 2) revealed she was in good condition (body score 8/10), which was a considerable improvement from her condition in October 2018 (6/10). The main reason for this change was likely to be the cessation of energetic demands associated with lactation and the rearing of a late-stage young.

We collected ocular and urogenital swabs collected from Zara to determine if she was infected with Chlamydia; the laboratory test results were negative. Given Zara's current good health we are hopeful that she will reproduce again this year.

Figure 2. Image of Drs Bill Ellis and Ben Barth measuring Zara's head length while anaesthetised (March 2019).

Cain (13488)

This large male koala was re-collared in January 2019. However, he dropped the collar shortly before the March 2019 fieldtrip; it was found on the ground in an area of dense regrowth, containing numerous small eucalypts.

Cain was sighted during the March fieldtrip while we were searching habitat within the focal area. He was situated up a tall gum-topped box within his usual area of occupation and was able to be flagged down by our tree climber and ground team. The examination revealed Cain was in fair condition (body score 6/10) and that he had no clinical signs of chlamydial disease. Ocular and urogenital swabs were collected and later tested negative for Chlamydia. Cain had gained substantial weight (450g) since he was last examined, in January 2019. He was again fitted with a tracking collar and released at the point of capture.

Figure 3. Image of the male koala Cain taken during the recent fieldtrip (March 2019), showing that both eyes are clear and free of chlamydial infection.

Lindsay (13497)

This male koala was discovered on the site in October 2018, at which time he was captured and fitted with a tracking collar (VHF-only). This collar subsequently tore free so during the March 2019 fieldtrip, we conducted habitat searches to try and locate Lindsay. He was found in a well-branched ironbark near base station 2 (Fig. 4). He responded well to flagging by the climber and then safely descended the main trunk where he was captured by the ground crew.

Lindsay was anaesthetised in the field so he could be closely examined. He had gained an impressive 1.2kg since October 2018, and was in good condition (body score 7/10). Laboratory testing of collected eye and urogenital swabs were negative for Chlamydia. Lindsay was fitted with a standard LX collar so that his movements can be monitored via the base stations and LX website.

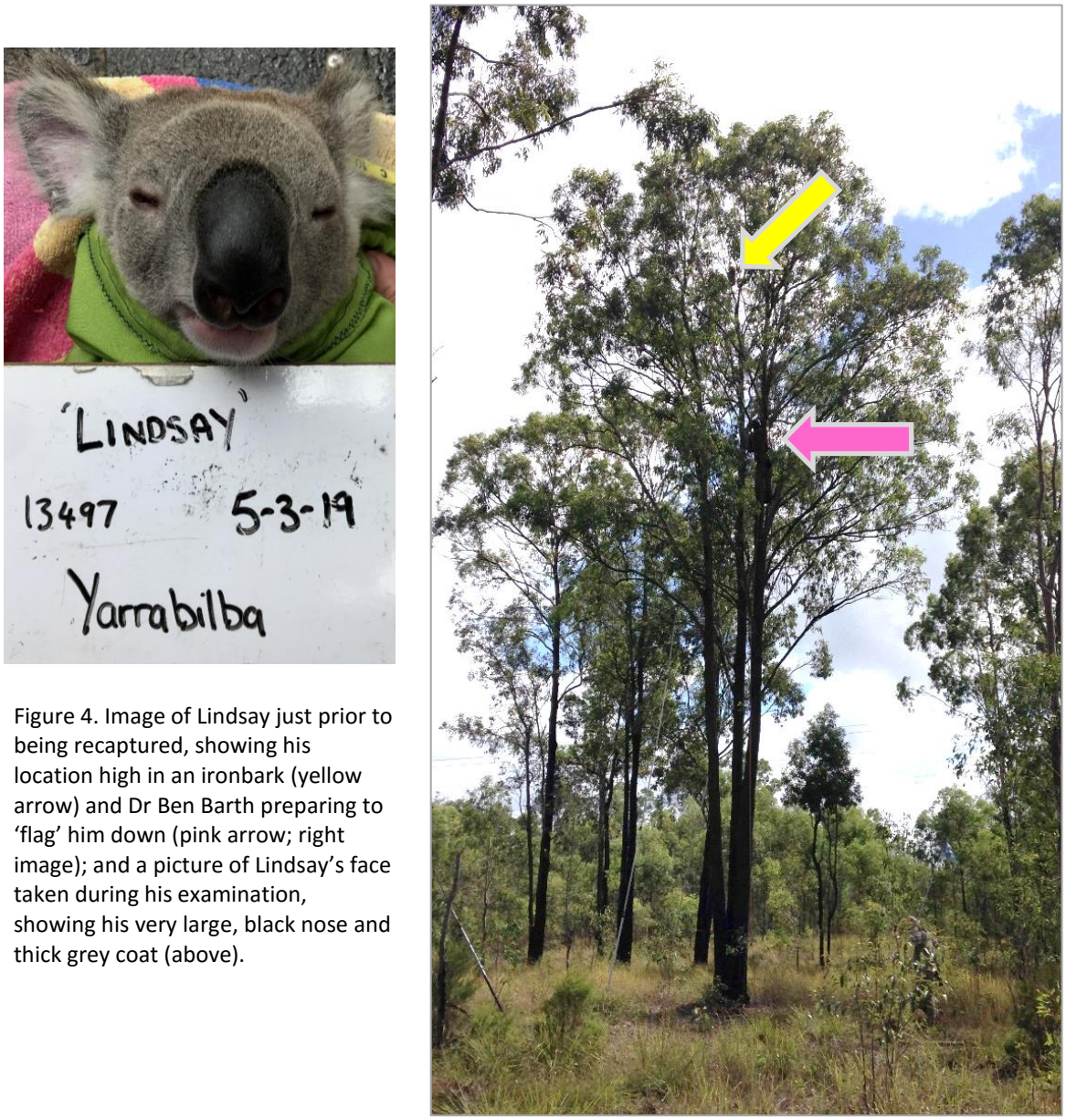

Figure 4. Image of Lindsay just prior to being recaptured, showing his location high in an ironbark (yellow arrow) and Dr Ben Barth preparing to 'flag' him down (pink arrow; right image); and a picture of Lindsay's face taken during his examination, showing his very large, black nose and thick grey coat (above).

Sue-Bob (13490)

This female koala was first captured at the site in October 2017. Despite being in poor condition ever since (body score 3-4), she successfully raised an offspring (Kevin) during 2018/19. During the March 2019 fieldtrip, Sue-Bob was recaptured and it was immediately apparent that she was in very poor condition. Her coat was brown rather than grey, and her fur was thinned around her face. Further, she moved very slowly during the catch, which was conducted as gently as possible. Sue-Bob had never returned positive chlamydial swab samples during the research program, but her health had clearly declined significantly; her body condition was rated 1/10.

The decision was made to remove the collar from Sue-Bob, given that she was in poor health and would likely not survive much longer. In addition, we had already obtained a large movement dataset for Sue-Bob, enabling her home range to accurately mapped.

Sue-Bob was de-collared and released back up the tree from which she was captured. The images below were taken at her release.

Figure 5. Image of Sue-Bob, showing the brown, thinned fur on her face and ears.

Kevin (12341)

This new sub-adult male koala was captured within 20m of Sue-Bob, near base station 1 (see Fig. 1). Given Kevin's small size (2.1kg) it is likely that he is Sue-Bob's recently weaned young. Kevin was given a thorough examination, including collection of a genetic biopsy sample and ocular and urogenital swabs. He was given a unique ear tag (light blue B5) in the left ear, and a small metal tag (UQ991) in the right ear.

Kevin was too small to fit with a standard LX collar. Instead, he was fitted with a lightweight VHF collar (65g) that will enable him to be radio-tracked. This collar was fitted very loosely because sub-adult koalas tend to grow rapidly; it is important to leave room to accommodate this size increase and minimise the risk of collar-related injury to the animal.

It is likely that Kevin will disperse from his natal area (i.e. the area occupied by his mother). Previous research in south-east Queensland has shown that young male koalas typically disperse more than 3km before establishing their own home range area. As such, it is possible that Kevin will disperse off the study site before the next fieldtrip. During this period, young koalas are exposed to a heightened risk of vehicle strike, dog attack and mis-adventure (e.g. falling into pools, dispersing into hostile environments).

Figure 6. Images of the new sub-adult male koala (Kevin) during examination and at release.

Meghan (12342)

This new adult female koala was captured from a blue gum within the more southerly branch of Quinzeh Creek. She weighed 5kg and had moderate wear of her teeth, suggesting she was approximately 4-6 years old. Meghan was fitted with a unique tag in each ear (right: light blue B3; left: UQ965). Due to the lack of muscle mass on her scapula ridges, she was scored 4/10 for body condition. An examination of Meghan's rump revealed discolouration, strongly suggestive of cystitis. We were unable to detect any obvious bursal cysts during palpation of the groins.

To confirm Meghan's health status, we collected ocular and urogenital swabs for laboratory testing. Meghan was fitted with an LX collar and released so that her movement could be monitored, while we awaited laboratory test results.

The laboratory testing of the collected urogenital swab sample revealed Meghan had a moderate chlamydial infection. This sexually transmitted bacterial pathogen can have devastating consequences for infected koalas, often causing disease that leads to a premature death. In females, chlamydial infection can cause bursal cysts in the reproductive tract, which usually results in the koala being unable to reproduce. In addition, such cysts are thought to cause considerable discomfort to the koala, especially as they can grow larger than a golf ball and females can have more than one cyst.

We recommend that during the next *Koala Capture / Monitoring Event*, Meghan be recaptured and taken into care for more detailed assessment and suitable treatment of her chlamydial infection. It is hoped that she has not yet developed bursal cysts (which cause infertility) and that she can be successfully treated with a course of antibiotics.

Meghan is the third koala that has returned a positive chlamydial test result. Although the results to date suggest that the koala population occupying the Yarrabilba Priority Development Area has a relatively low incidence of chlamydial infection, the previous case of Kobe (euthanised) highlights the seriousness of this bacterial pathogen. Chlamydial disease has been widely implicated in koala population declines throughout Queensland and New South Wales. Testing for chlamydial infection is an important part of the current monitoring program, and in 2019 we will be testing each individual more frequently to ensure that we are closely monitoring their health status.

Figure 7. Head and rump images of the new female koala (Meghan).

Conclusion

The *Koala Capture / Monitoring Event* conducted during March 2019 was the first for the year under the adopted Koala Monitoring Program. The fieldtrip was successful on many fronts:

- A total of nine independent koalas were sighted within the priority area - the highest number recorded during a capture/monitoring event thus far.
- Four cleanskin koalas were sighted and two were able to be captured, tagged and collared (Kevin and Meghan). Kevin is likely the offspring of Sue-Bob. The two cleanskins that were unable to be captured were young females that appeared to be healthy.
- Sue-Bob was captured and de-collared, owing to her poor health. It was clear from the brief examination that this adult female koala was in very poor condition and would likely not survive much longer. Fortunately, it seems she was able to successfully wean her young (Kevin) despite her failing health.
- The males Cain and Lindsay were re-sighted and re-collared, after they each dropped their collars since the last capture/monitoring event. Both males had gained a significant amount of weight since their last examinations.
- Ocular and urogenital swab samples were tested in the laboratory for the presence of *Chlamydia*. Four of the five koalas examined during the fieldtrip returned negative test results (Kevin, Cain, Lindsay, Zara). Unfortunately, the laboratory testing confirmed that Meghan has a moderate urogenital tract chlamydial infection. We plan to take her into care at the Australia Zoo Wildlife Hospital during the next *Koala Capture / Monitoring Event.*

At the end of the March 2019 fieldtrip, six koalas were fitted with collars (see Appendix 1). This was the first *Koala Capture / Monitoring Event* for 2019 under the renewed contract. The koalas that are currently collared will continue to be routinely radio-tracked under the *Koala Monitoring Events* component of the program until the end of the year.

Appendix 1. Summary of tag, collar and other details for all koalas that have been captured at the site to date (March 2019). Koalas fitted with collars at the end of the March 2019 fieldtrip are highlighted yellow.

UQ #	Name	Sex	Mass	Age	Left ear tag	Right ear tag	1st Capture	Latitude	Longitude	Frequency	Notes from latest trip (March 2019)
13007	Heath	M	3.83	2+	Orange F10	Yellow H10	17/05/2017	-27.8113490	153.1062150	not collared	Unsighted since first capture
13009	Caitlin	F	5.92	4	Pink 866	Yellow H6	18/05/2017	-27.8219730	153.1313310	not collared	Unsighted since first capture
13008	Bomber	M	9.28	5-10	Light Blue 621	Pink 886	18/05/2017	-27.8121970	153.1072190	149.5115	Unsighted since October 2018
13486	Jean	F	5.56	3-6	metal UQ800	Orange F15	9/10/2017	-27.8121559	153.1086764	150.8698	Sighted; not re-captured
13487	Emily	F	1.07	1	metal UQ724	metal UQ789	9/10/2017	-27.8121559	153.1086764	not collared	Unsighted since first capture
13488	Cain	M	8.07	2-4	Royal Blue G8	metal UQ796	9/10/2017	-27.8132431	153.1039776	150.8114	Recaptured and collared; good condition
13489	Scarlet	F	4.81	1-3	metal UQ753	Royal Blue G14	10/10/2017	-27.8110978	153.1049627	not collared	Sighted 6th and 7th August 2018, with back young
13490	Sue-Bob	F	5.66	5-10	metal UQ799	Orange F20	10/10/2017	-27.8122096	153.1063710	150.6902	Recaptured and de-collared; very poor condition
13495	Kobe	F	5.06	3-6	metal UQ175	Yellow C20	20/03/2018	-27.8137242	153.1169157	not collared	Taken to AZWH; euthanised (August 2018)

13304	Zara	F	6.17	5-10	Maroon A16	Yellow C4	6/06/2018	-27.8097031	153.1034546	149.5940	Recaptured and collared; good condition
13497	Lindsay	M	5.8	2-4	Yellow C10	metal UQ958	10/10/2018	-27.8170122	153.1096012	151.6380	First capture; good condition.
12341	Kevin	M	2.15	1-2	Light Blue B5	Metal UQ991	4/03/2019	-27.811086	153.104432	151.2820	First capture; good condition.
12342	Meghan	F	5.02	3-6	Metal UQ965	Light Blue B3	5/03/2019	-27.818168	153.108581	151.4830	First capture; good condition.