Koala Monitoring Program

Yarrabilba Priority Development Area

Koala Capture / Monitoring Event October 2018

Summary Report

Picture of female “Zara”

Prepared by:
Koala Ecology Group
University of Queensland
St Lucia QLD 4072

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 October 2018 the fifth *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 fifth koala monitoring event occurred from the 8th – 10th October 2018. The study team comprised four personnel, three from the Koala Ecology Group (Ben Barth, Bill Ellis, and Sean FitzGibbon) and one from Austecology (Heath Agnew).

At the time of the fieldtrip four koalas were collared, including three females (Jean, Sue-Bob, Zara) and one male (Bomber). These koalas were located by radio-tracking using the unique VHF radio signal emitted from each collar. One of these collared koalas was 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 six adult koalas were sighted during the October field trip, within the focal area of the Yarrabilba Priority Development Area (Fig. 1). This included one new male which was found while searching habitat along a branch of Quinzeh Creek. This male (named Lindsay) was caught, examined and fitted with a tracking collar (see further details below).

The other five koalas that were sighted during the trip had all previously been caught and fitted with ear tags and collars. These individuals included three females (Jean, Sue-Bob, Zara) and two males (Bomber, Cain). Two of these koalas (Cain and Zara) were no longer collared, as the collars had fallen free after tearing at the weak link (presumably when the koalas became snagged). It was pleasing to find these individuals again and re-collar them so that their movements and health could be monitored. Zara was still carrying her back young which was large enough to fit with an ear tag. It has been named Squeak (see further details below).

Sue-Bob and Bomber were found within their usual areas of occupation. They were radio-tracked daily but they were not scheduled for recapture. Tracking revealed that Sue-Bob was still carrying her young, which could be seen on her back.

Jean was radio-tracked and found to be further west than usual in an area dominated by exotic pines (Fig.1). We attempted to re-catch her and her large back young but were unsuccessful. The catch effort was aborted because Jean quickly became jumpy, which put her young at risk. Despite not catching Jean, our climber in the adjacent tree could see 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 October 2018 fieldtrip, and the base stations that have been deployed to monitor their movements.

In total, three adult koalas and one juvenile koala were captured during the October *Koala Capture / Monitoring Event*. Further details concerning the health and examination of these four koalas are provided below, with pictures that were taken during the October fieldtrip. A complete set of tag and collar details are provided in Appendix 1. Information is also provided below on the female koala named Kobe, that was taken into care during the previous field trip (August 2018) due to her chlamydial infection.

Zara (13304) and Squeak (13496)

This female koala was first found and captured in June 2018 on a northern branch of Quinzeh Creek. At that time she was carrying a pouch young estimated to be 3.5-months old. Zara was re-examined in August but she then dropped her collar soon after. During the October fieldtrip she was sighted in a large ironbark near to her original point of capture. She was recaptured along with her large, female back young, which was named Squeak (Figures 2 & 3). Zara's body condition had reduced since August from 8/10 to 6/10; this was most likely due, in large part, to the energetic demands of rearing a large young. The female young (Squeak) was in excellent condition (9.5/10) and weighed close to 1kg. She was large enough to fit a small metal tag to one of her ears, to aid identification in the future. We estimate that Squeak will remain with her mother until at least February 2019.

Figure 2. Image of Zara (left) taken during her recent health examination (October 2018).

Figure 3. Image of Zara's female back young Squeak (right), taken during her recent examination (October 2018).

Cain (13488)

This large male koala was last caught in March 2018, at which time he was in good condition (7.5/10) and was fitted with a tracking collar. In mid-April, Cain's collar became snagged on a branch of an ironbark and tore free (the weak link broke, allowing the koala to move on). The collar was later recovered from up the tree where it was firmly lodged. Cain had not been seen at the site since.

During the October fieldtrip Cain was re-sighted at the western edge of the site (Fig. 1) during habitat searches along the northern branch of Quinzeh Creek. He was successfully flagged to the ground from an exotic pine tree and captured. Cain was given a health check and fitted with a tracking collar (Fig. 4). He was still in good condition (7/10) and weighed just over 8kg, making him a very large adult male. Cain showed no clinical signs of chlamydial disease, suggesting that his treatment at Australia Zoo Wildlife Hospital in late 2017 has had lasting benefit.

Figure 4. Images of the male named Cain taken during the recent fieldtrip (October 2018). Under anaesthetic the large sternal gland on Cain's chest was visually obvious (top left image); both eyes were clear and free of signs of chlamydial infection (bottom left). After recovering from anaesthesia, Cain was collared and released up a food tree on Quinzeh Creek. He was radio-tracked the following day and was found to have moved approximately 200m to the east.

Lindsay (13497)

This new male koala was found while searching habitat along a branch of Quinzeh Creek. He was located in the outer edge of a large, well-branched blue gum. 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 (Fig. 5). He had only a small amount of wear on his teeth which suggests he is between 2 to 4 years old. He weighed 5.8kg, was in very good body condition (8/10) and showed no signs of disease or poor health. Lindsay was fitted with a small metal tag (UQ958) in his right ear and a plastic tag (yellow C20) in his left ear. He was also fitted with a VHF tracking collar that will allow his movements to be monitored via radio-tracking (Note: this collar does not link to the base stations and so does not upload to the LX website).

Figure 5. Images of Lindsay taken after his first capture (October 2018). Under anaesthesia (above) this young male was found to be in very good condition, as evidenced by his healthy pelage and muscle mass on his shoulders. He was later released into the same large blue gum from which he was captured (right).

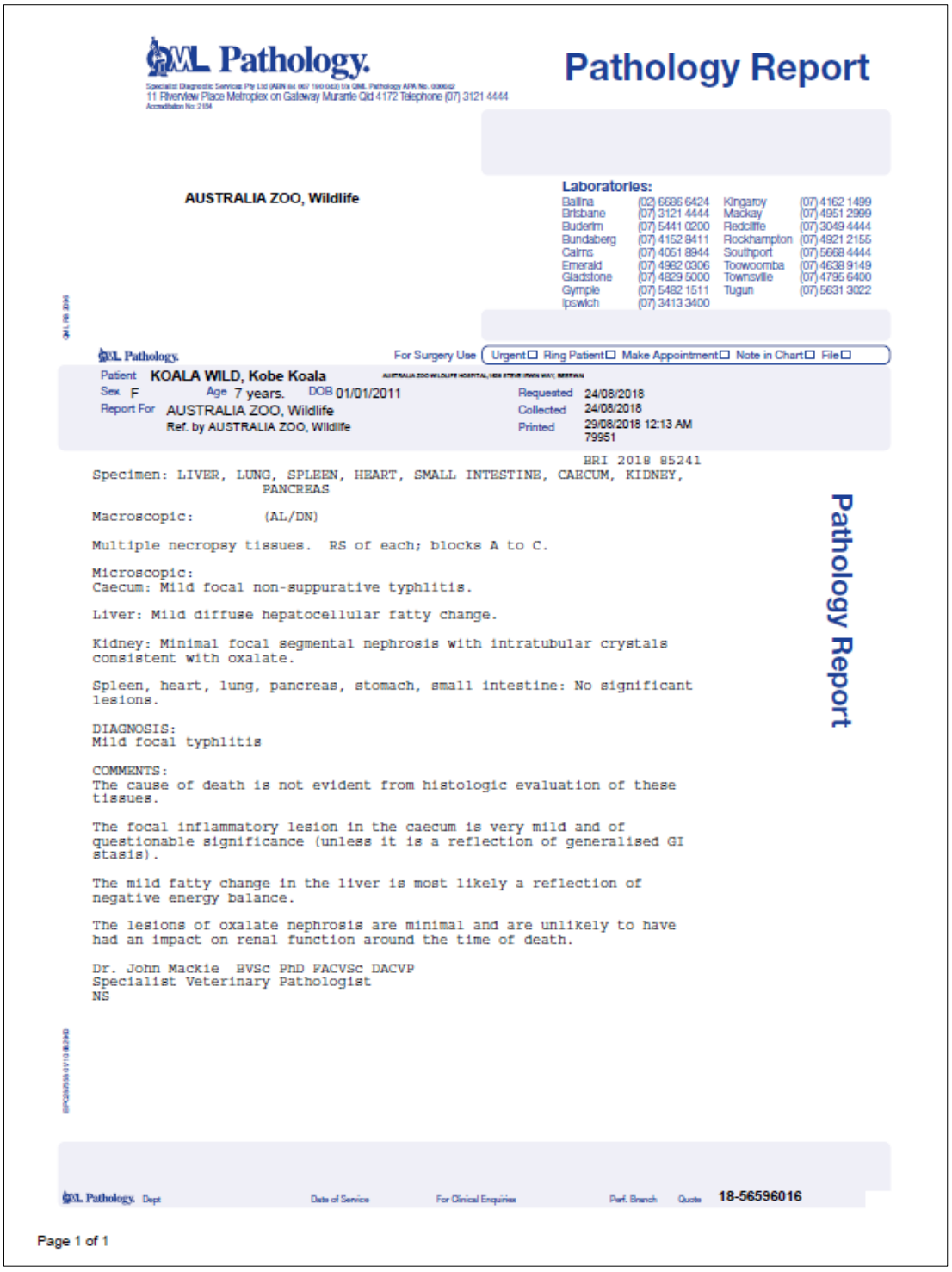
Kobe (13495)

This middle-aged female koala was first captured at the site in March 2018. Laboratory testing of the collected urogenital swab sample revealed Kobe had a serious 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.

During the August 2018 fieldtrip, Kobe was re-captured and taken to Australia Zoo Wildlife Hospital (AZWH) for closer examination and treatment. Unfortunately, ultrasound examination confirmed the presence of bursal cysts (each 2cm dia.) on both sides of her reproductive tract (Fig. 6). Despite the poor prognosis, the staff at AZWH commenced a course of antibiotic treatment on Kobe in the hope that the cysts may reduce, although such a physiological response was considered highly unlikely. Sadly, Kobe was found dead in her enclosure soon after commencing treatment. The cause of death was not apparent so the veterinarian performed a necropsy and sent samples for pathological analysis (Fig. 7).

The final report from the veterinarian stated: "*In summary, the lesions that I found on post-mortem (necrotic lesion on the caecum, and some minor changes in the kidney tissue consistent with oxalate nephrosis) are unlikely to have individually led to her death, based on these histopathology results. Unfortunately, an exact cause of death cannot be ascertained, but I suspect that the cold, her poor appetite and stressed behaviour (pacing on the ground of her enclosure a lot) may have all contributed (as well as the minor changes reported in the pathology report) to a drop in body temperature and blood sugar that she couldn't recover from, leading to her death. This unfortunately cannot be confirmed with pathology, but I have seen this occur suddenly in koalas in the past. It is likely that the chlamydial infection was also having a slow but detrimental impact on her health.*"

Figure 6. Image of Kobe (left) and the ultrasound of her reproductive tract (right), showing the bilateral bursal cysts (black cavities containing text).



QML Pathology

Specialist Diagnostic Services Pty Ltd (ABN 64 067 190 040) t/a QML Pathology APA No. 9000642
11 Riverview Place Metroplex on Gateway Murarrie Qld 4172 Telephone (07) 3121 4444
Accreditation No: 2154

Pathology Report

AUSTRALIA ZOO, Wildlife

Laboratories:

Ballina	(02) 6686 6424	Kingaroy	(07) 4162 1499
Brisbane	(07) 3121 4444	Mackay	(07) 4951 2999
Buderim	(07) 5441 0200	Redcliffe	(07) 3049 4444
Bundaberg	(07) 4152 8411	Rockhampton	(07) 4921 2155
Cairns	(07) 4051 8944	Southport	(07) 5668 4444
Emerald	(07) 4982 0306	Toowoomba	(07) 4638 9149
Gladstone	(07) 4829 5000	Townsville	(07) 4796 6400
Gympie	(07) 5482 1511	Tugun	(07) 5631 3022
Ipswich	(07) 3413 3400		

QML Pathology. For Surgery Use: Urgent ☐ Ring Patient ☐ Make Appointment ☐ Note in Chart ☐ File ☐

Patient **KOALA WILD, Kobe Koala**
Sex F Age 7 years. DOB 01/01/2011
Report For AUSTRALIA ZOO, Wildlife
Ref. by AUSTRALIA ZOO, Wildlife

Requested 24/08/2018
Collected 24/08/2018
Printed 29/08/2018 12:13 AM
79951

BRI 2018 85241

Specimen: LIVER, LUNG, SPLEEN, HEART, SMALL INTESTINE, CAECUM, KIDNEY, PANCREAS

Macroscopic: (AL/DN)

Multiple necropsy tissues. RS of each; blocks A to C.

Microscopic:
Caecum: Mild focal non-suppurative typhlitis.

Liver: Mild diffuse hepatocellular fatty change.

Kidney: Minimal focal segmental nephrosis with intratubular crystals consistent with oxalate.

Spleen, heart, lung, pancreas, stomach, small intestine: No significant lesions.

DIAGNOSIS:
Mild focal typhlitis

COMMENTS:
The cause of death is not evident from histologic evaluation of these tissues.

The focal inflammatory lesion in the caecum is very mild and of questionable significance (unless it is a reflection of generalised GI stasis).

The mild fatty change in the liver is most likely a reflection of negative energy balance.

The lesions of oxalate nephrosis are minimal and are unlikely to have had an impact on renal function around the time of death.

Dr. John Mackie BVSc PhD FACVSc DACVP
Specialist Veterinary Pathologist
NS

Pathology Report

QML Pathology. Dept | Date of Service | For Clinical Enquiries | Perf. Branch | Quote 18-56596016

Page 1 of 1

Figure 7. Patholgy report for female koala named Kobe, following her death while undergoing treatment for chlamydial infection.

Kobe is the first known death of a koala from the Yarrabilba study site under the current monitoring program. This unfortunate outcome was largely the result of her serious chlamydial infection, which had resulted in the development of bilateral bursal cysts in her reproductive tract, and the subsequent attempt to treat her in captivity. Kobe was the second koala to have tested positive for *Chlamydia* at the Yarrabilba site; the other was the male koala Cain. He had a unilateral eye infection that was successfully treated at AZWH, and he was then returned to the site and monitored. At his recent capture (October 2018) Cain's eyes appeared clear and free of obvious chlamydial infection.

Although the results to date suggest that the koala population occupying the Yarrabilba Priority Development Area has a relatively low incidence of chlamydial infection, Kobe's case 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 we recommend that testing be conducted more frequently in the future (i.e. at each capture rather than just initial capture).

Conclusion

The *Koala Capture / Monitoring Event* conducted during October 2018 was the fifth under the adopted Koala Monitoring Program. The fieldtrip was very successful on many fronts:

- A total of six adult koalas were sighted within the priority area, including three females with young (Zara, Sue-Bob, Jean).
- Zara's young (named Squeak) was large enough to be given an ear tag, which will assist with identification in the future (i.e. if this young female settles on the site when it becomes independent).
- The male named Cain, which had not been seen since dropping his collar in mid-April, was re-discovered at the western edge of the site. He was found to be in good condition and was once again fitted with a tracking collar.
- A new healthy young male (named Lindsay) was found and collared. He was fitted with a VHF tracking collar that will allow him to be radio-tracked.

At the end of the October 2018 fieldtrip, six koalas were fitted with collars (see Appendix 1). This was the last *Koala Capture / Monitoring Event* under the current contract. We hope to renew the agreement so that we can continue this important koala monitoring study in 2019. 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 (October 2018). Koalas that are currently collared are highlighted blue.

UQ #	Name	Sex	Mass	Age	Left ear tag	Right ear tag	1st Capture	Latitude	Longitude	Frequency	Notes from latest fieldtrip (October 2018)
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	Sighted during fieldtrip; not re-captured
13486	Jean	F	5.56	3-6	metal UQ800	Orange F15	9/10/2017	-27.8121559	153.1086764	150.8698	Sighted with back young; not re-captured
13487	Emily	F	1.065	1	metal UQ724	metal UQ789	9/10/2017	-27.8121559	153.1086764	not collared	Unsighted since first capture
13488	Cain	M	8.073	2-4	Royal Blue G8	metal UQ796	9/10/2017	-27.8132431	153.1039776	150.8114	Recaptured and collared; good condition
13489	Scarlet	F	4.805	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	5.655	5-10	metal UQ799	Orange F20	10/10/2017	-27.8122096	153.1063710	150.6902	Sighted with back young; not re-captured
13495	Kobe	F	5.055	3-6	metal UQ175	Yellow C20	20/03/2018	-27.8137242	153.1169157	not collared	Taken to AZWH for treatment (August 2018)
13304	Zara	F	6.17	5-10	Maroon A16	Yellow C4	6/06/2018	-27.8097031	153.1034546	149.5940	Recaptured (w young) and collared; fair 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.