Ormiston Koala Population Monitoring & Community Engagement

February 2020 Progress Report

Prepared for:
Redland City Council

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Note that this is a preliminary report only, as most data that will be collected during this project is not available at this time. Please do not distribute, and please do not use or quote figures included in this report.

Project overview

This project is designed to feed into Redland City Council's (RCC) Koala Conservation Safe Neighbourhoods (KCSN) program, a major koala conservation initiative by RCC. The primary aim of the KCSN is to generate a higher sense of custodianship from residents toward their local koalas by informing, supporting, and empowering them to actively conserve koalas within urbanised landscapes. Central to the management of koalas within a KCSN will be ongoing monitoring of the local koala population. The monitoring will have a number of applied purposes, this includes understanding vital rates (survival, recruitment), disease incidence, frequency of exposure to threats (dogs, cars) and patch utilisation (tree visitation, movement). KCSN will heavily rely on a citizen science component to enable the ongoing monitoring of the local koala population.

Project deliverables – Year 2

| Deliverable	Date
Progress report (Milestone 5): • Report on all fieldwork undertaken since last report, with basic initial descriptive summary statistics. • Update data obtained from retrieved altimeter loggers • Summarise response to community engagement initiatives	End February 2020
Progress report (Milestone 6): • Summarise all fieldwork activities undertaken during 2019/20 financial year. • Proposal for community hand-over	30 June 2020
Progress/final report (Milestone 7)	31 Dec 2020 – this depend on date of koala collar retrieval as data analyses will require all data to be collected prior

Deliverable updates

Koala monitoring and telemetry data

Radio-tracking has continuously been performed at least one day per month for welfare checks of all collared koalas. During this process, all opportunistic sightings of uncollared koalas are also recorded (Figure 1). So far, at least 90 sightings of uncollared koalas have been recorded (note that the number of individual uncollared koalas this represents is unknown).

Up till now a total of 26 koalas were captured, of which 20 were released with GPS enabled devices (see Figure 2, Table 1). These devices were either real-time GPS trackers (that transmit GPS locations to a website) or on-board loggers recording all GPS points on the device worn by the koala, and retrieved at the end of the project or when a collar change occurs (hereafter GPS loggers). Most koalas (size allowing) were fitted with both a real-time GPS tracker to enable remote monitoring and a GPS logger as these devices provides higher temporal resolution (i.e. more data points, albeit over a shorter period of time). Eleven individuals were fitted with real-time GPS trackers type A (5 males, 6 females, Figure 3), 10 individuals were fitted with real-time GPS trackers type B (9 males and 1 female, Figure 4), and 17 individuals were fitted with GPS loggers (10 males, 7 females, Figure 5).
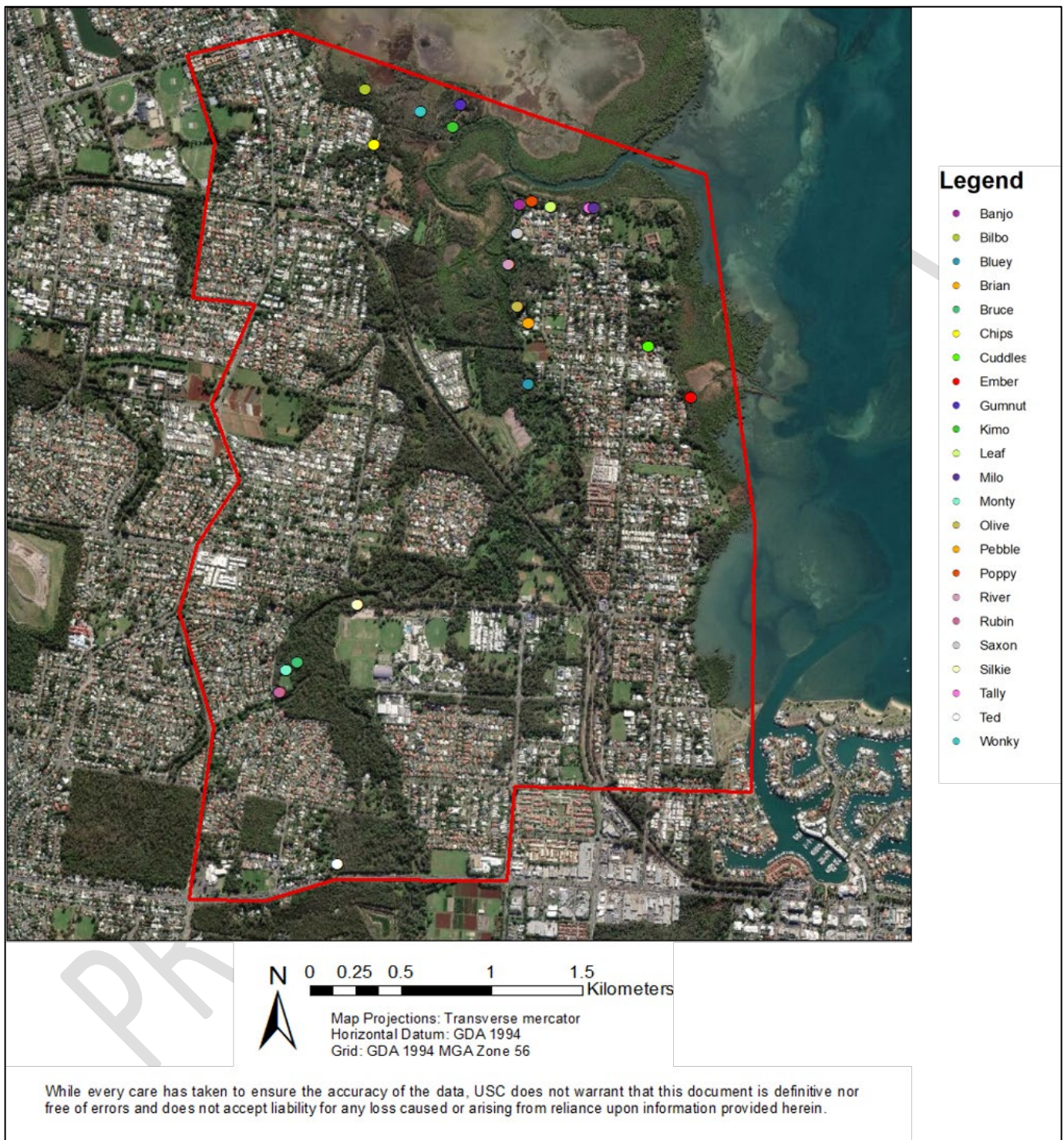
From koalas fitted with collars, we also have altimeter data from 14 individuals (see Table 2) The altimeter captures the vertical movement of individuals (see example Figure 6). We are currently still collecting data and preparing datasets for analysis.
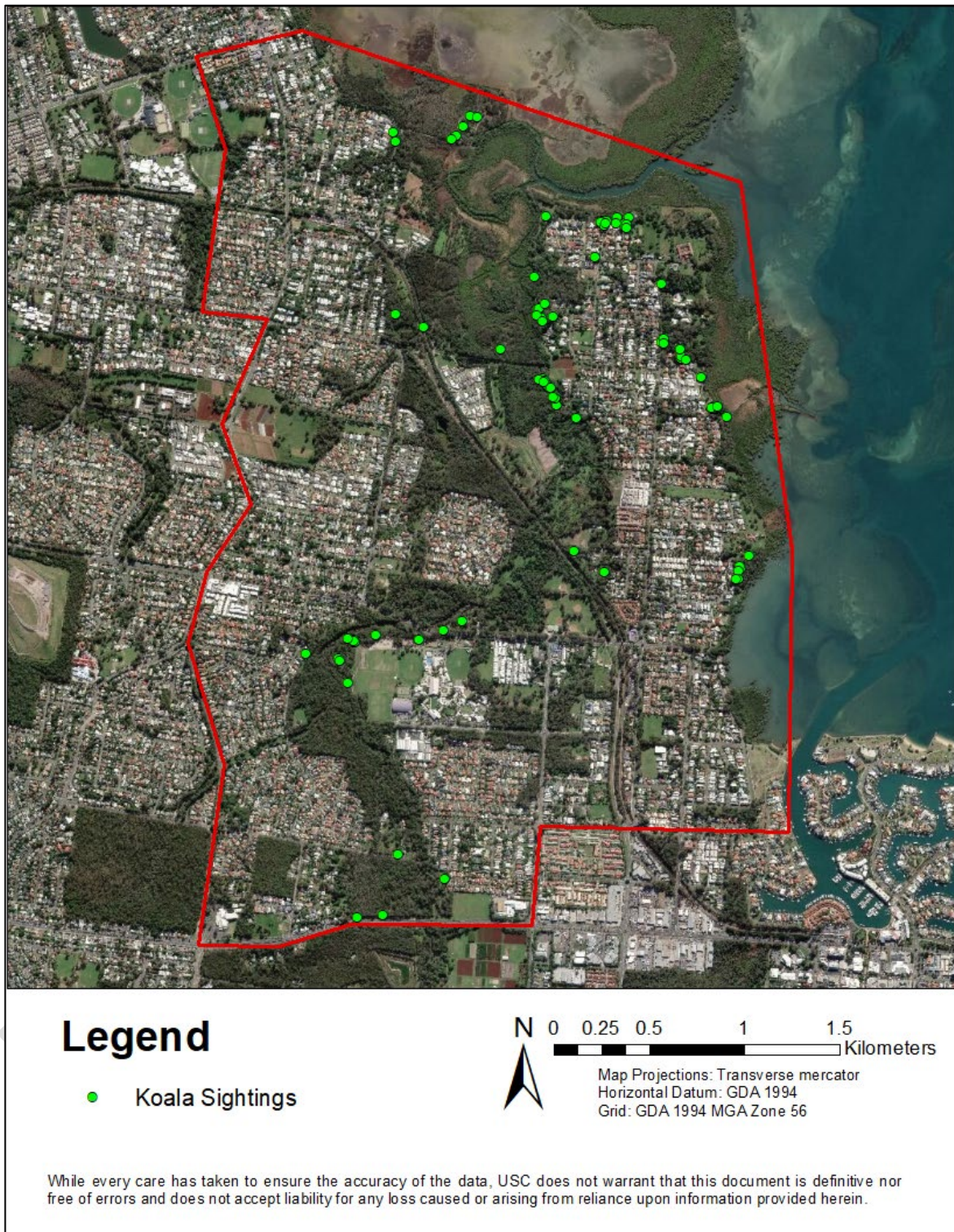
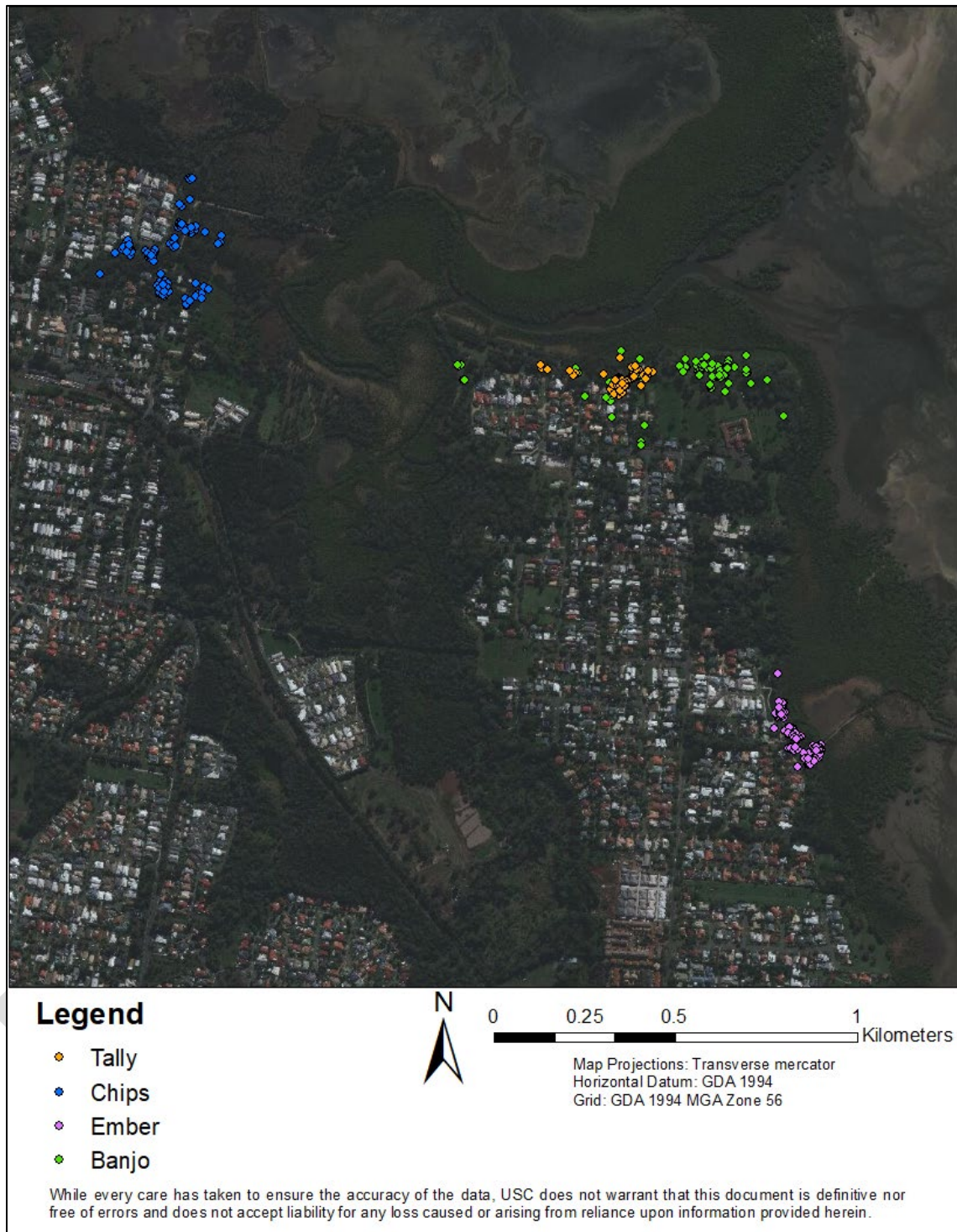**Figure 1** Recorded sightings of uncollared koalas

Figure 2 Locations of captured koalas during the project

**Table 1** Summary of GPS technology used on koalas, and the number of fixes and days logged for each.

| Koala name	Sex	Real-time GPS trackers type B no. fixes	Real-time GPS trackers type B no. days	Real-time GPS trackers type A no. fixes	Real-time GPS trackers type A no. days	GPS logger no. fixes	GPS logger no. days
Banjo	M	178	55	91	51	2068	59
Bilbo	M	276	101	-	-	-	-
Bluey	M	-	-	140	55	383	42
Brian	M	799	223	-	-	1377	44
Bruce	M	547	131	-	-	2220	77
Chips	M	-	-	136	69	561	31
Cuddles	F					1869	54
Ember	F	-	-	161	49	343	42
Gumnut	F	-	-	-	-	2880	79
Kimo	F	322	129	276	91	1188	62
Leaf	F	-	-	233	25	295	16
Lucky	M	14	11	-	-	455	18
Lulu	F	-	-	-	-	2588	59
Monty	M	395	124	-	-	290	8
Poppy	F	-	-	107	19	227	14
Rubin	M	395	124	-	-	3681	89
Silkie	F	-	-	240	69	-	-
Tally	F	-	-	151	63	-	-
Ted	M	161	59	53	17	1275	89
Wonky	M	133	37	196	63	389	28

Figure 3 Subset of individuals fitted with real-time GPS trackers type A
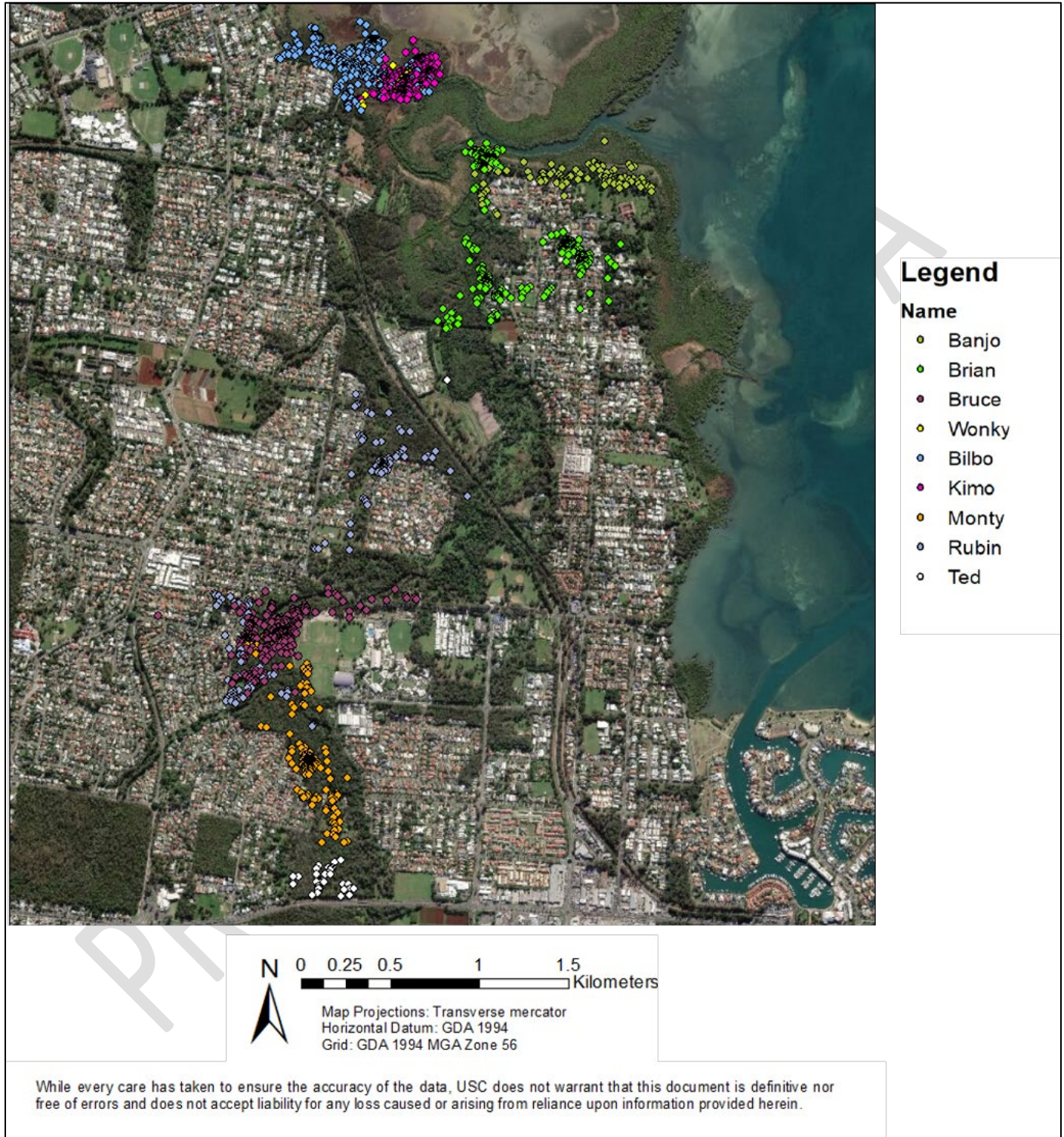
Figure 4 Subset of recorded samples of individuals fitted with real-time GPS trackers type B
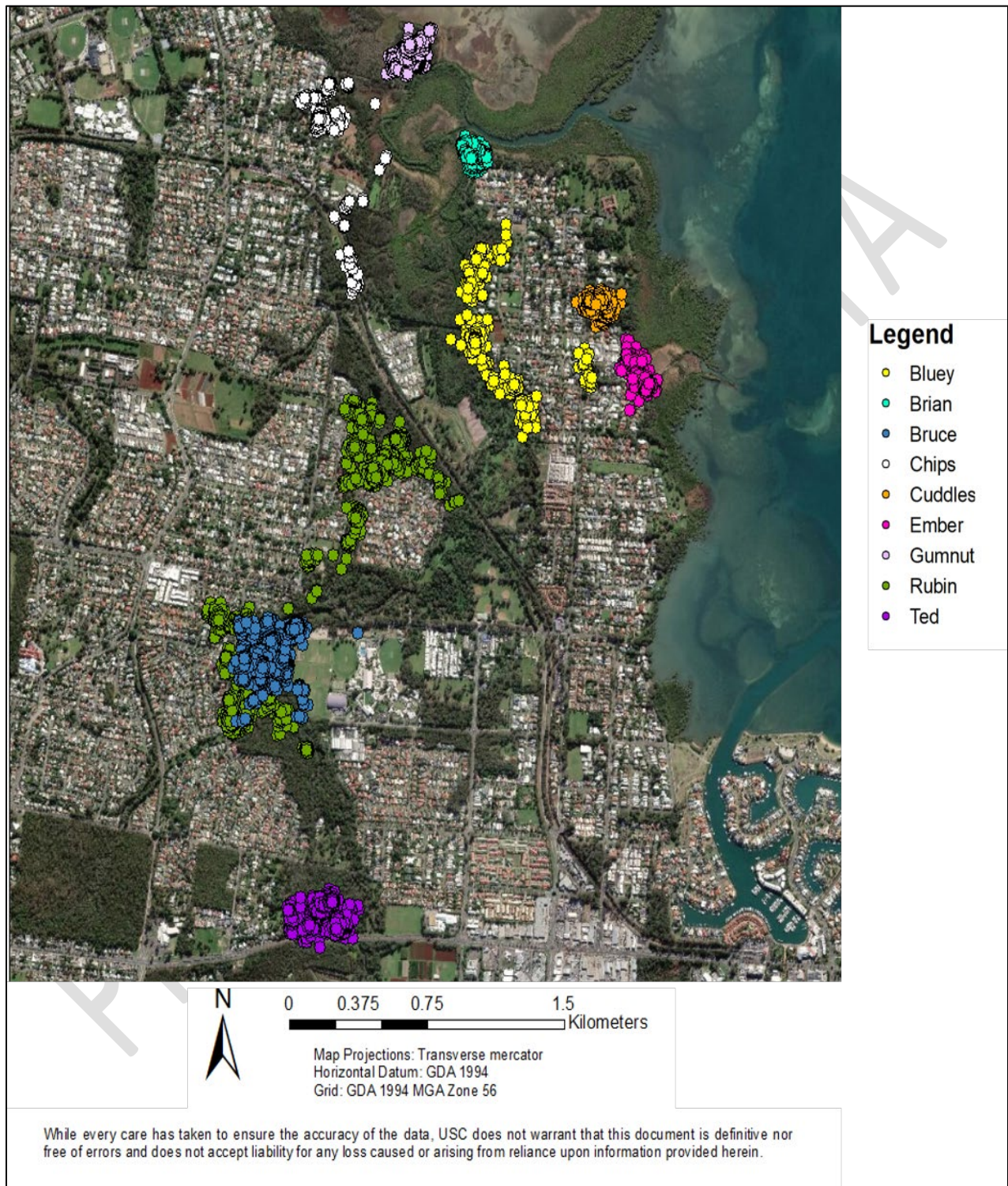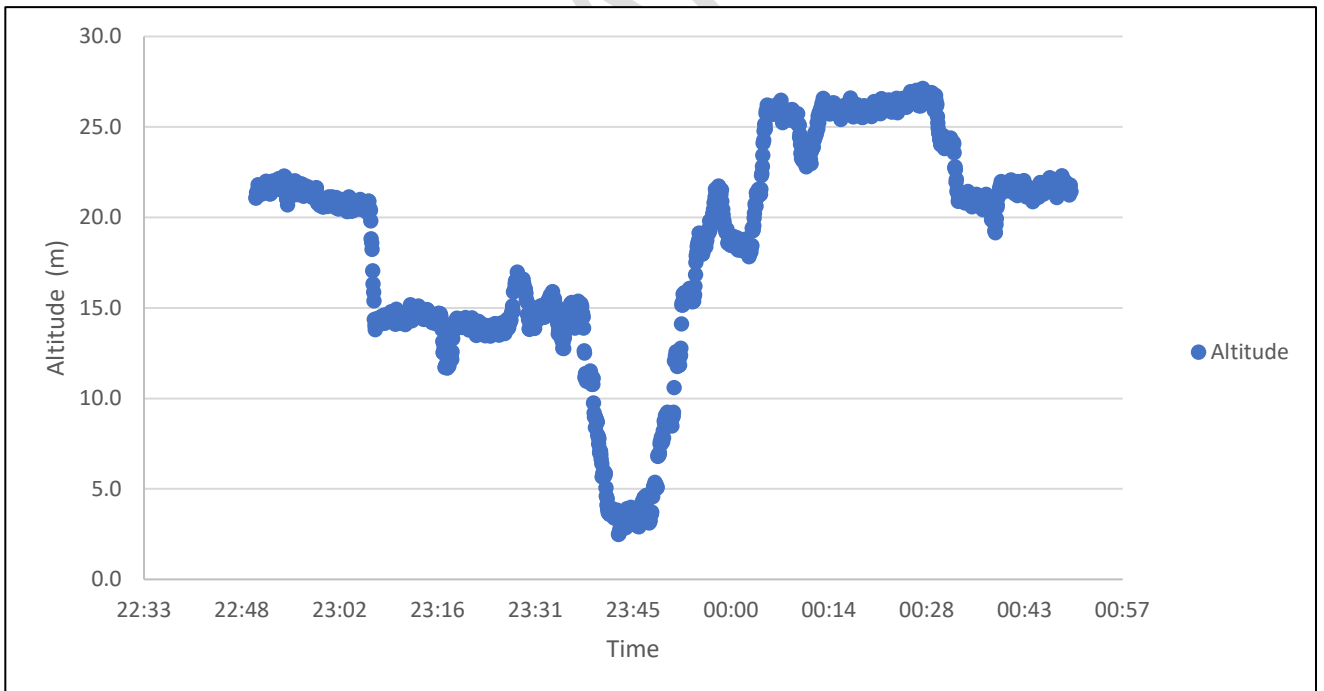
Figure 5 Recorded locations of individuals fitted with GPS loggers

**Table 2** Summary of individuals fitted with altimeter loggers

Koala name	Sex	Number of days_Altimeter
Banjo	M	4.2
Brian	M	5.4
Bruce	M	67.3
Chips	M	42.4
Gumnut	F	4.2
Kimo	F	38.5
Leaf	F	20.8
Lucky	M	8.2
Lulu	F	6.7
Monty	M	8.4
Rubin	M	42.4
Ted	M	46.6
Wonky	M	15.0
Bluey	M	42.4

Figure 6 Example of altimeter data from an adult male koala (Bruce).

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Meanwhile, DDC has tested all identified Bluetooth devices available on the market (Figure 7) and selected and modified one for outdoors conditions, chosen because it is solar-powered, small and light weight (suitable for ear tag deployment).
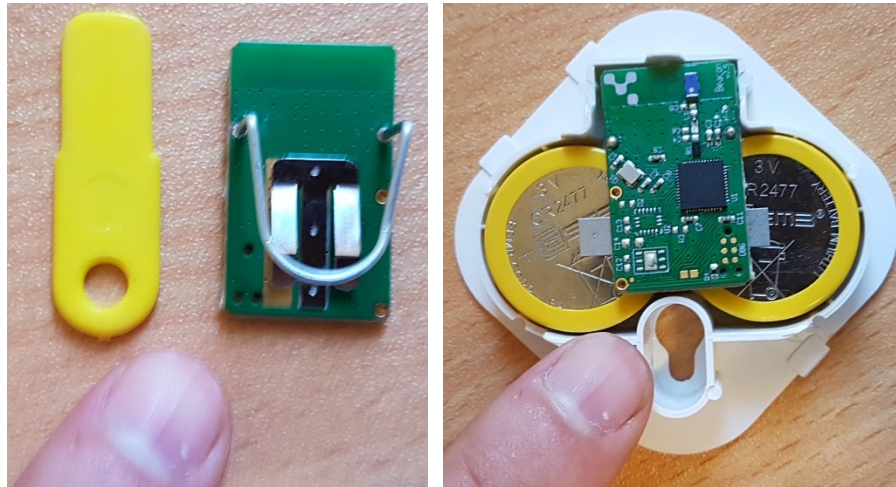

Figure 7 Example of Bluetooth device tested for potential on koala deployment

The DDC is continuing to work through issues arising from field-testing of these Bluetooth ear tags (28 tags deployed so far), this included:

- Insufficient signal range of the first deployment (Figure 8): resolved with the addition of an antenna (Figure 9).
- Detachment of glue from ear tag of the first deployment: resolved by potting/moulding slide-on attachment prior to gluing (Figure 9).
- Breakage of antenna (fighting, mating, etc.) of the second deployment.
- Solutions are being tested now for third Bluetooth deployment (thicker wire or stainless-steel braided wire).

The second design of ear tags were deployed on koalas in September/ October 2019 (Figure 10), therefore so far, duration is 6 months (we upgrade Bluetooth when we re-catch koalas). To test the durability of the new antenna, the tags need to be deployed in real-world conditions with koalas grooming, biting, pushing through vegetation etc. We probably will start knowing the durability of the third design 6 months post deployment in real conditions of the new Bluetooth ear tag.

Bluetooth ear tags are currently consistently getting reception on smartphones at least 20 metres from base of koalas' tree, which is perfect for interaction with an App. We are getting a signal 100% of the time we tested the ear tags during 9am-4pm. Depending on cloud cover etc, the beacon interval changes but not the strength of the signal, i.e. a citizen scientist would have to wait longer to detect the signal.
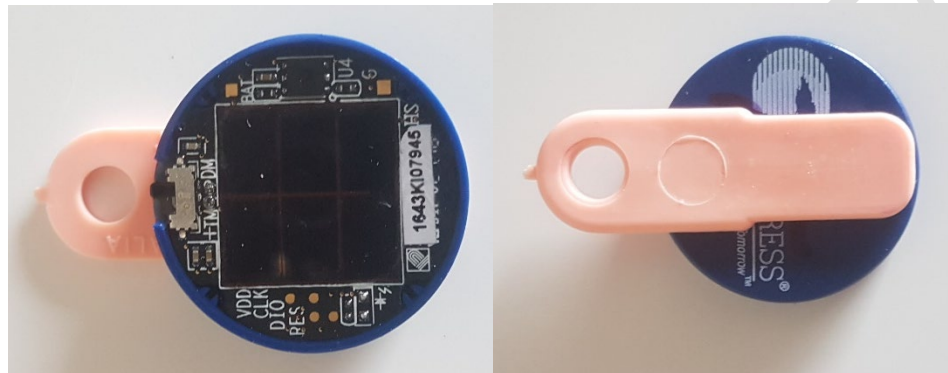
Figure 8 Bluetooth ear tags used during the first deployment
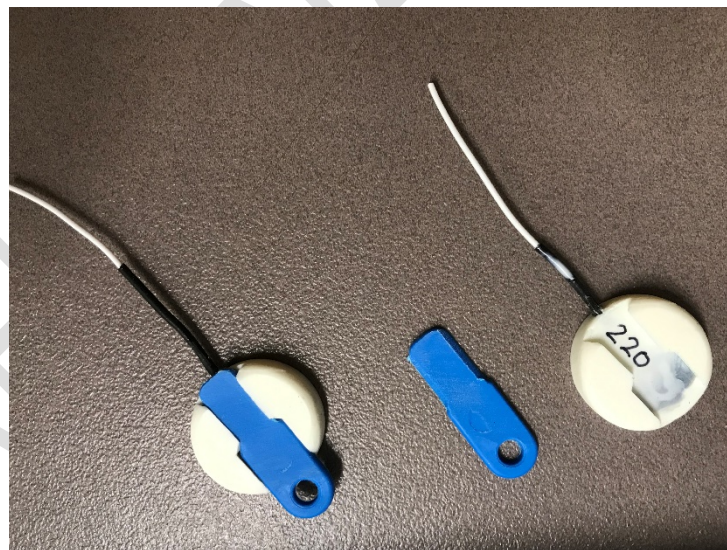
Figure 9 Bluetooth ear tags used during the second deployment, with the improvement of the addition of an antenna and potting/moulding a slide-on attachment prior to gluing

Figure 10 Bluetooth ear tags used during the second deployment as fitted on an Ormiston koala

Currently, the break down of ear tags is as follow:

- 10 tag are deployed and working 100%,

- 2 have a suspected broken antenna,

- 4 have combination of either drop tag or broken antenna,

- 2 have an unknown status (koalas not currently monitored because of dropped collar).

Population health and Koala veterinary examinations

Since the beginning of the project, a total of 33 veterinary examinations have been conducted for n the Ormiston KCSN project area to date (Appendix 1). Since the last report (June 2019), 11 new koalas joined the Ormiston cohort of monitored koalas. Two individuals (Ted and Ember) were transferred to Australia Zoo Wildlife Hospital for treatment for cystitis, and were returned and successfully released in their home range. Ember has a joey which appears to be in good health. In addition, Banjo was captured and found with nasal trauma, potentially from a fight or accident and was subsequently and successfully treated by AZWH.

Two individuals were euthanised for welfare reasons by AZWH. A female, Pebbles was presented at the clinic with a large mass in her forearm. AZWH diagnosed this as severe lymphoedema and

performed surgery. Sadly the tumour was very aggressive and rapidly grew back, and Pebbles was therefore euthanised, however her joey River was put into care and is currently thriving. Another female, Olive, was presented with purulent eyes. She was diagnosed as blind (potentially from head trauma) and had reproductive disease and could no longer be released in the wild.

Koala scat DNA analyses

From detection dog surveys conducted between the 20th March - 1st of May 2019, we collected 68 samples. DNA has successfully been extracted in-house from a total of 66 fresh koala scat samples (including collared koalas and technical replicates). DNA samples were filtered and duplicates removed, of which we confidently identified 29 individuals using genetics (Figure 11). From these individuals we identified 15 males and 14 females (Figure 12). We also detected seven cases of Chlamydia scats versus 22 cases where no Chlamydia was found (Figure 13).

Figure 11 Each star represents individual koalas identified by genetic analyses from scats found with detection dogs
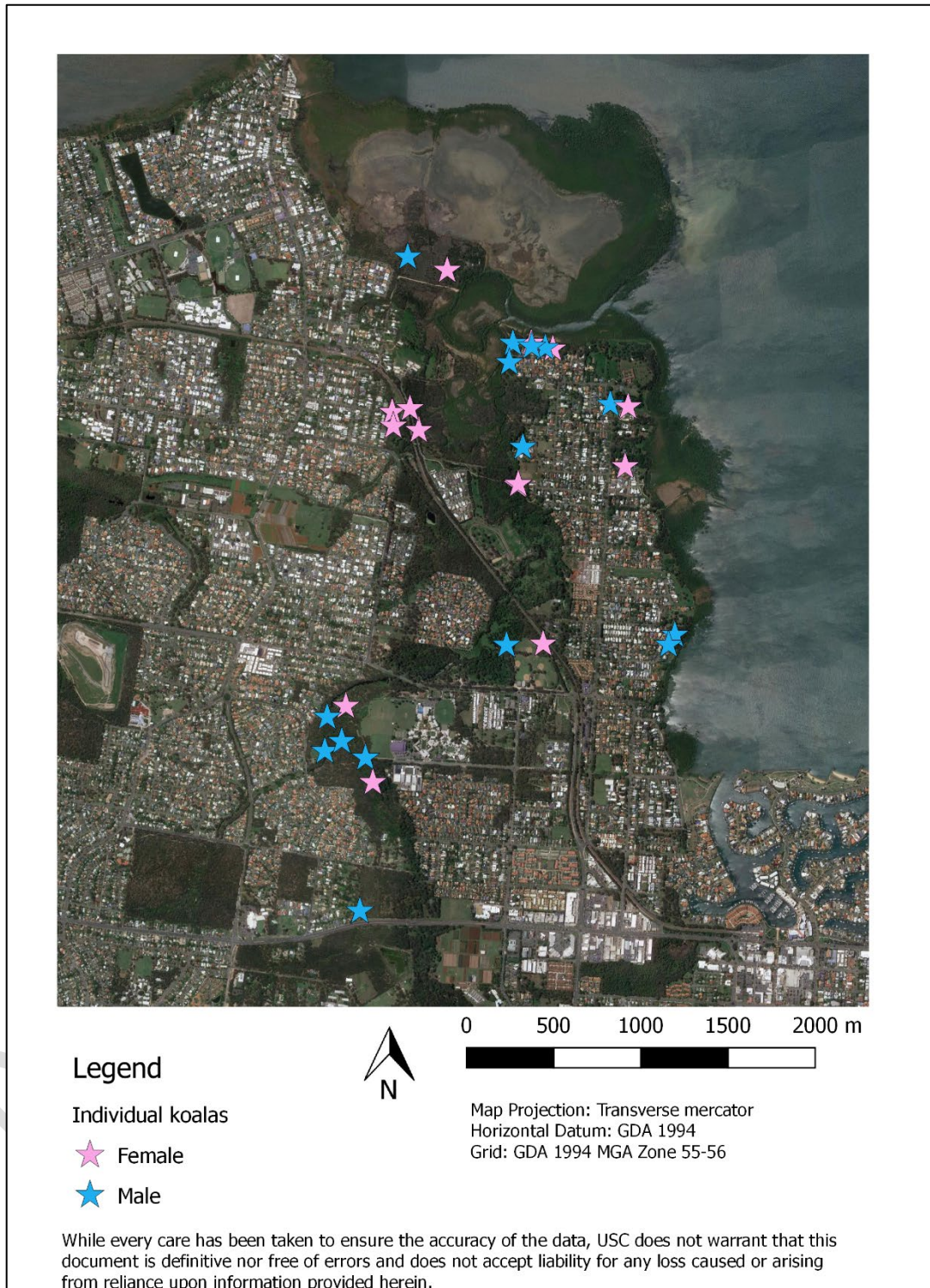
Figure 12 Sex of individuals determined by genetic analyses from scats during detection dog surveys

Figure 13 Presence of chlamydia tested in scats found during detection dog surveys

Drone surveys

At present we have conducted drone surveys for a total of 12 nights within Ormiston. These surveys have focused in 5 locations (see stats in Table 3). The drone surveys are conducted with a thermal camera and koala are counted as an attempt to establish population estimates.

We also tested the Bluetooth detection from the drone, and although proof of concept was obtained, fieldwork to test the accuracy of drone grid searches for locating tagged koalas via their Bluetooth beacons has been delayed due to the team being deployed in bushfire zones to rescue survivors.

Date	Project	Location	Searched Area_ha	Koalas_detected	Koala_density
15/06/2019	Ormiston	Montgomery	10.6	1	0.09
22/06/2019	Ormiston	Saw Mill	8.31	2	0.24
22/06/2019	Ormiston	Softball Grounds	16.6	2	0.12
5/07/2019	Ormiston	College	8.27	1	0.12
5/07/2019	Ormiston	McMillan	9.32	2	0.21
9/07/2019	Ormiston	McMillan	10.7	1	0.09
15/07/2019	Ormiston	Montgomery	9.67	1	0.10
15/07/2019	Ormiston	McMillan	10.9	1	0.09
20/07/2019	Ormiston	McMillan	15.2	1	0.07
24/07/2019	Ormiston	McMillan	11.2	1	0.09
21/08/2019	Ormiston	McMillan	11.2	2	0.18
14/10/2019	Ormiston	Saw Mill	12.8	0	0.00

Table 3 Summary of drone surveys and estimated koala density over area searched

Community consultation and engagement

A critical part to this project is to work toward the community in a Koala Conservation Safe Neighbourhood to become the custodian of their koalas. To do this, we are trialling ways to make koalas visible – once koalas are individuals with a story, and become neighbours, we believe that naturally people's behaviour will change to protect their koalas.

To make koalas visible, we proposed to RCC to equip them with Bluetooth technology, which would allow smartphones to interact with the Bluetooth koala ear tags and ultimately get

information about the koala through an App. However, due to budget constraints, the App could not be funded through RCC, and USC has been actively investigating sources of funding as well as partners to develop the App. The Engage Research Lab at USC (https://engageresearch.org/) has in principle agreed to deliver an App for Bluetooth / Citizen science and costed it at $25,000 per year for 3 years.

In the meantime, to continue building public interest without the App, we recommended to use the live GPS data to provide the public with near-real time information on where koalas were in any given week. We envisioned pages accessible in the RCC website for each koala giving their history, where people could post pictures, and check koala movements. This has not been possible until now due to RCC website restrictions. An alternative was to post updates on Indigiscapes Facebook page. DDC is working with RCC to provide regular updates on koala adventures and movements in the Ormiston Koala Conservation Safe Neighbourhood and was gaining attention through Facebook (Figure 14).
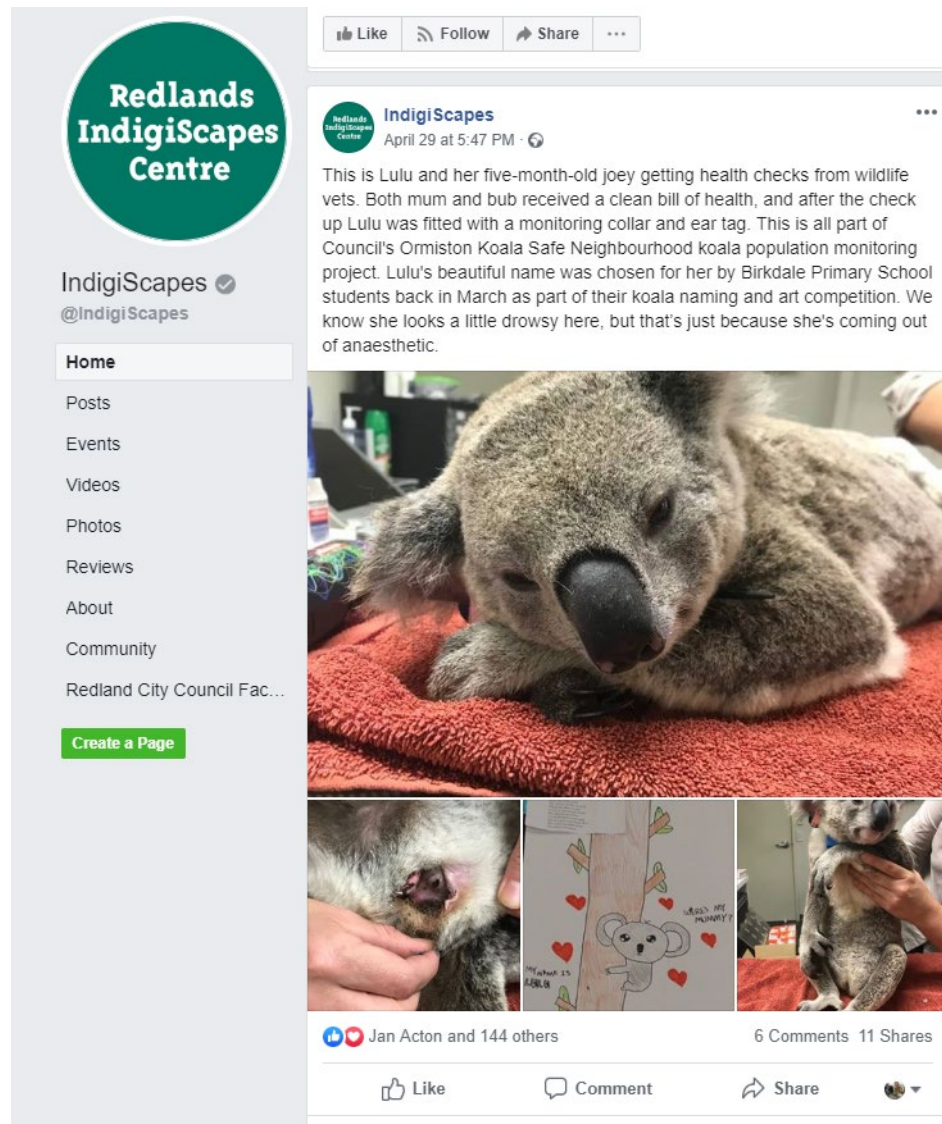
Figure 14 Example of the content provided by DDC on koala Lulu, that was then posted on Indigiscapes Facebook page (more examples in Appendix 2)

However, during 2019, dedicated RCC personnel were not available to post and monitor responses to posts. As an example, the DDC was either not tagged or other detection dog groups (unrelated to this project) were tagged in its place. Questions about the collars and animal welfare were left unanswered. The provision of content for social media was then stopped while RCC recruited a new person in charge of ensuring content accuracy and monitoring engagement. It has now resumed.
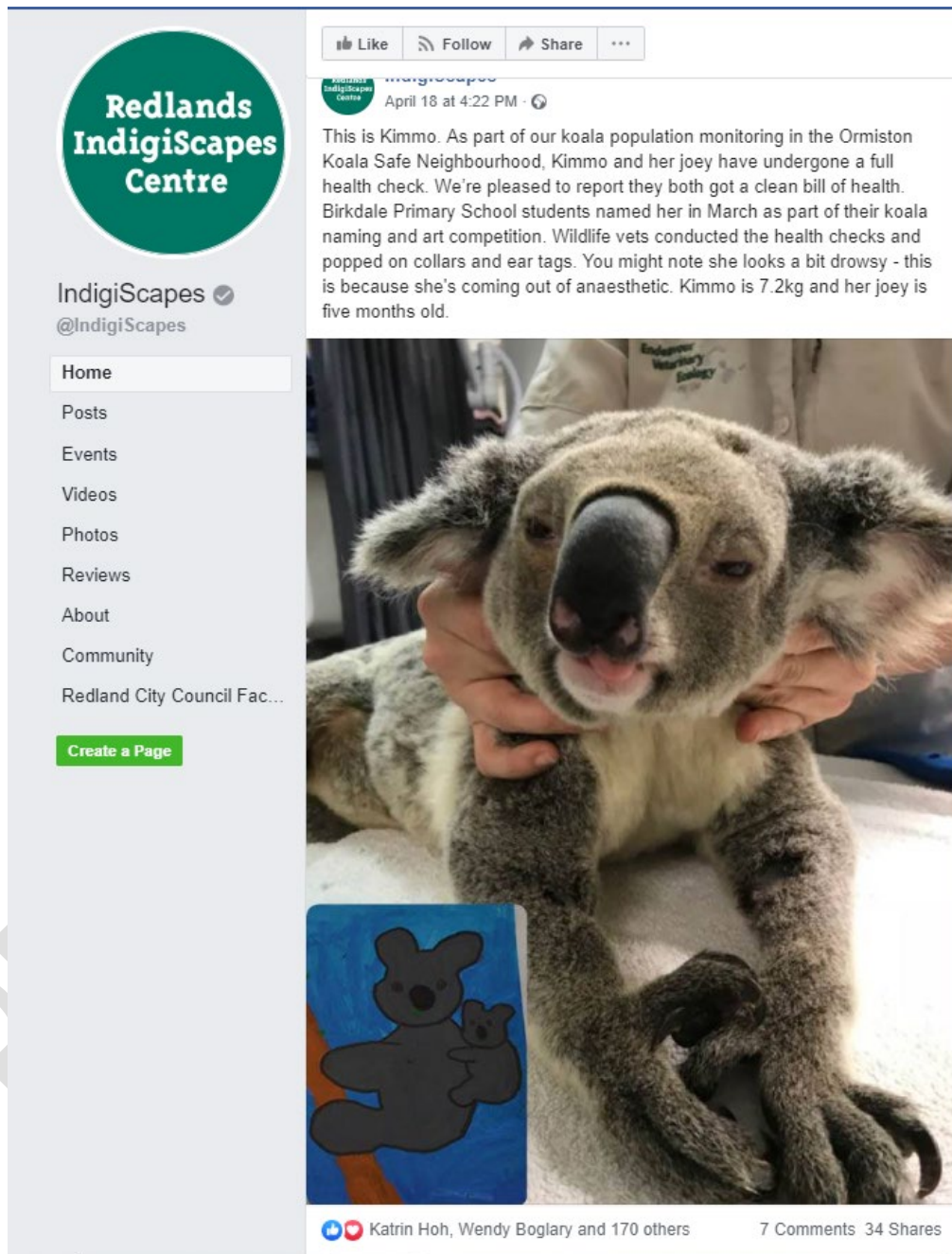
Bluetooth details were shared with trusted members of the public (five local koala enthusiasts in Ormiston). These are our first citizen scientists and strong supporters of the project who go on walks or observe koalas regularly in their backyards. These citizen scientists can currently read the ear tag number transmitted through Bluetooth to their phone, and then communicate with us to gain detailed history on a specific koala. The DDC is engaging with the Ormiston citizen scientists on a regular basis (an average 10 contacts per phone and email / week), this can be expended with appropriate support through RCC dedicated Facebook "Koala Safe Neighbourhood" pages. We envision that DDC and RCC will closely monitor and moderate the pages at first, slowly building local knowledge and expertise until local experts, or champions, in each KSCN are able to answer most questions and DDC / RCC role decreases in one neighbourhood, to focus on the next KCSN.

Appendix 1 - Summary of full veterinary health examinations by Endeavour Veterinary Ecology

Name	Sex	Date	Age first capture	Weight	Body condition
Brian	Male	17/04/2019	2.2	6.34	7
Brian	Male	18/09/2019		7.05	7
Lucky	Male	17/04/2019	6.5	6.68	5
Kimo	Female	17/04/2019	5	7.11	7
Kimo	Female	25/09/2019		6.61	6
Lulu	Female	24/04/2019	2.5	5.06	6
Gumnut	Female	24/04/2019	1.9	4.11	7
Banjo	Male	24/04/2019	4	8.43	8
Banjo	Male	23/10/2019		8.12	7
Banjo	Male	30/10/2019		7.51	6
Bruce	Male	01/05/2019	3.33	8.2	7
Bruce	Male	21/08/2019		8.67	8
Bruce	Male	30/10/2019		8.3	8
Ted	Male	01/05/2019	4	7.77	7
Ted	Male	21/08/2019		7.97	7
Ted	Male	16/10/2019		7.3	6
Cuddles	Female	01/05/2019	1.4	3.98	6
Monty	Male	01/05/2019	4	9.19	8
Rubin	Male	02/07/2019	2	5.72	6
Chips	Male	21/08/2019	2.5	7.8	6
Chips	Male	16/10/2019		8.22	6
Leaf	Female	21/08/2019	1.8	4.99	6
Poppy	Female	21/08/2019	4	5.46	6
Wonky	Male	18/09/2019	6.5	7.84	7
Wonky	Male	16/10/2019		7.61	7
Bilbo	Male	18/09/2019	5	8.66	8
Ember	Female	18/09/2019	3	6.98	6
Ember	Female	13/11/2019		6.56	6
Silkie	Female	25/09/2019	6.5	5.86	6
Pebbles	Female	25/09/2019	6.5	6.7	6
Milo	Male	30/10/2019	3.5	6.65	6
Bluey	Male	30/10/2019	2.5	7.0	7
Tally	Female	30/10/2019	6	5.97	6

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Appendix 2 - Examples of the content provided by DDC on koalas Kimo, Leaf, Poppy and Brian, that was then posted on Indigiscapes Facebook page
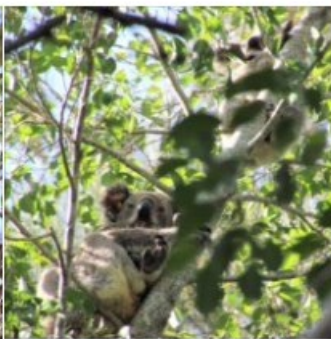

This is Kimmo. As part of our koala population monitoring in the Ormiston Koala Safe Neighbourhood, Kimmo and her joey have undergone a full health check. We're pleased to report they both got a clean bill of health. Birkdale Primary School students named her in March as part of their koala naming and art competition. Wildlife vets conducted the health checks and popped on collars and ear tags. You might note she looks a bit drowsy - this is because she's coming out of anaesthetic. Kimmo is 7.2kg and her joey is five months old.

IndigiScapes Centre

3 hrs · 🌐

Three of our mums Kimo, Leaf and Poppy are doing a great job this year 🐨 🐨

Koala joeys become "back-riders" from about 7-8 months old and then gradually gain independence. First, they'll practice climbing a little above their mother on the same branch, then to separate branches on the same tree, before gaining enough confidence to occasionally venture into their own neighbouring trees from about 11 months old.

Photo 1 - Kimo and her 11 month old male Joey at Bligh St.
Photo 2 - Poppy and her female joey relaxing in a shady fig tree at Stevens Place.
Photo 3 - Leaf's young joey out of pouch and in a bluegum at Stevens Place.

Please take care when driving at this time of year as our koalas are on the move 🐨 🐨

Julie Juvancz, Noni Green and 79 others   2 Comments 8 Shares

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IndigiScapes Centre

October 22 at 3:00 PM · 🌐

It looks like 🐨Brian may have lost the ongoing battles with another untagged male koala and is now tree-hopping through backyards towards Tolson Terrace.

If you live in this area, please keep your dogs in at night and stay alert on the roads to ensure he safely moves through your suburb. 💚

👍❤️😮 Emmie Lou, Jan Acton and 62 others   2 Comments 39 Shares

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IndigiScapes Centre
8 mins · 🌐

Brian continues to be a busy boy 🐨 If you look closely at the pic - 🔴 number one is where Brian has been most recently.

Have you seen Brian in your backyard?

👍😮 Heather Crawford, Emma Tolhurst and 2 others   1 Comment

👍 Like   💬 Comment   ↪ Share   👤 ▾

Most Relevant ▾

Write a comment...   😊 📷 GIF 🏷️

Chloe Hodges These images are so cool 😎
Like · Reply · 7m