Year 2 Koala Population Survey Program

Koala Monitoring Program, Yarrabilba PDA

Prepared for: **Lend Lease Communities (Yarrabilba) Pty Ltd**
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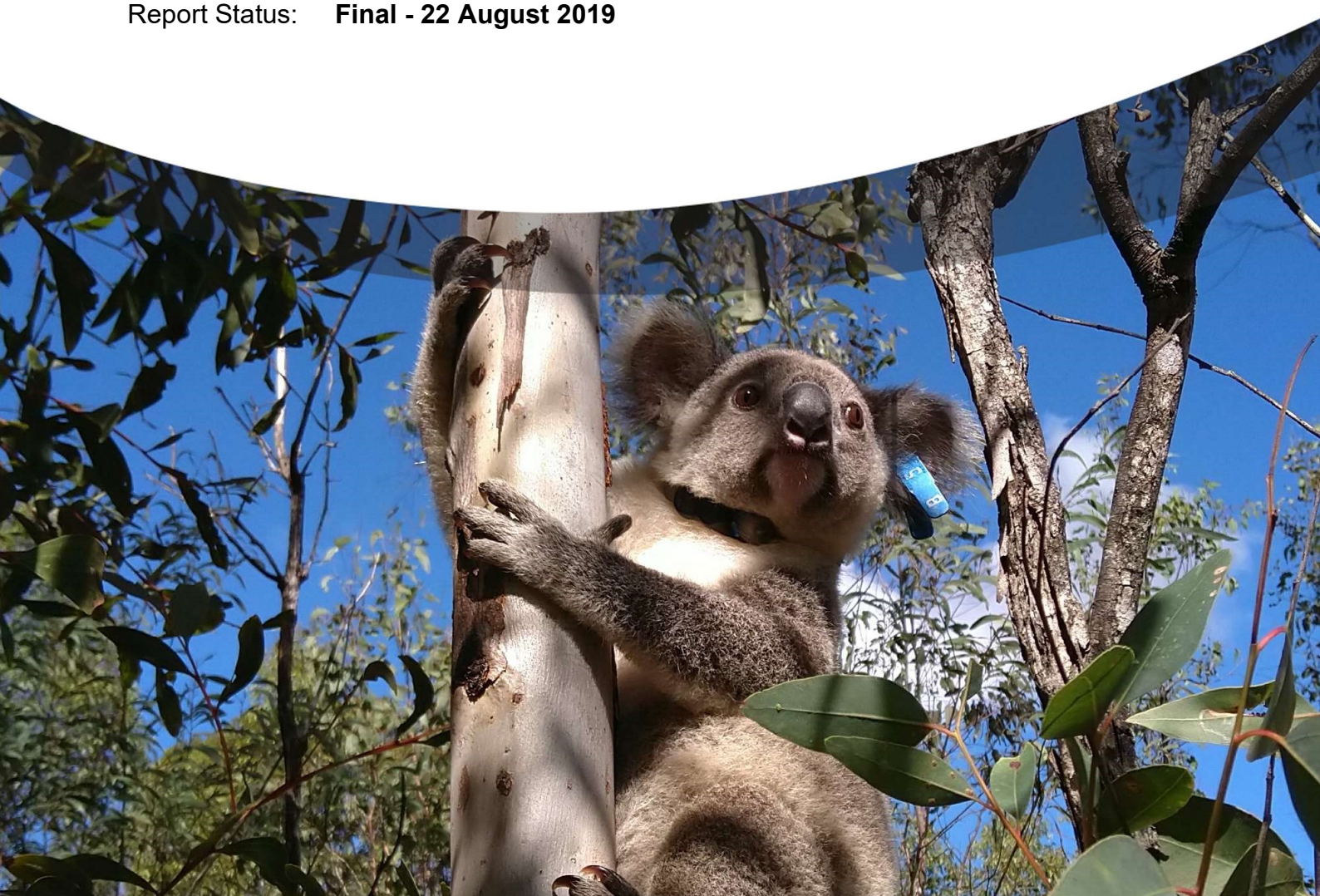

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Cover Photograph – Kevin (August 2019), UQ Koala Ecology Group

1. Introduction

A *Koala Monitoring Program*[1] has been developed collaboratively between Austecology, University of Queensland's Koala Ecology Group, and Professor Frank Carrick to ensure a robust, scientific, research program to comply with Condition 1b of the EPBC 2013/6791 Approval. The aims of the *Koala Monitoring Program* cover detailed investigations into the ecology, health, and population characteristics of koalas on the site.

In summary, the *Koala Monitoring Program* (KMP) comprises a field program extending over a 3-year period – September 2017 to October 2021, and includes the implementation of three field investigation streams, being:

1. The capture of koalas for the purpose of health assessments and to tag and / or attach monitoring collars in order to assess home range, dispersal into and out of the site, and habitat use. This work includes laboratory analyses of swabs taken from captured koalas in order assess koala health, and genetic diversity of koalas on the site.
2. A monthly program of fieldwork to radio-track koalas in order to visually assess koala condition and collect information on tree species usage.
3. Bi-annual systematic surveys across the site to investigate koala abundance and distribution.

This report presents the results of the 2019 bi-annual systematic surveys across the site.

[1] Austecology (2017). Koala Monitoring Program Yarrabilba UDA. Report prepared by Lindsay Agnew (Austecology) and Bill Ellis (University of Queensland's Koala Ecology Group).

2. Field Methodology

The aim of these field events was to provide a systematic survey across the site in order to collect data on koala presence and distribution.

Consistent with the KMP, the full extent of the Fauna Corridor and EPBCA Offset Areas were systematically surveyed, i.e. the priority survey footprint. Areas of green space adjoining these and the "inholding" of Wal's Block were also included as part of the priority survey footprint. Other separate areas of greenspace were surveyed to augment work within the priority survey footprint, as time permitted.

As directed within the KMP, surveys were implemented twice per year, commencing in February/March and six months later in August. The survey timing in August is considered to be important because at that time of the year koala joeys are still dependent, and with their mothers as either back-young or pouch-young, and are large enough to be detected by observers from the ground using binoculars if necessary[2].

The following provides a summary of the work undertaken as part of each event. Survey protocols implemented are regarded as consistent with best practice guidelines and methods used within the region, e.g. DoE 2014, Dique *et al* 2004, QEPA 2006, and DERM 2012.

A site inspection was undertaken on 25 March, with koala survey work being implemented throughout the period 26 to 30 March inclusive. In August, an inspection of key survey areas was undertaken on 11 August, and koala survey work being implemented throughout the period 12 to 16 August inclusive.

The average of the total survey team transect coverage for the March and August events was approximately 260 kilometers of foot survey transects. Each event provided a total of 15 survey person days. The study team for both events comprised Lindsay Agnew, Brian Coulter, and Heath Agnew.

The on-ground survey protocol provided a systematic and comprehensive search using observers working in unison, to move through habitat, following line transects and methodically searching all trees either side of the nominal centre line of their own transect for koala presence. Visual searches for koalas were augmented by visual scans for koala faecal pellets and diagnostic tree scratching (see **Figure 2-1**).

Surveyors were spaced approximately 50m to 60m apart either side of the nominal centre line of their own transect in order to minimize the potential for double counting from adjacent transects. One observer used a GPS device to maintain the designated transect direction, and to ensure suitable positioning/separation when undertaking a return transect in the opposite direction (parallel to the previous transect).

Observers regularly referenced their position (via visual and vocal cues) with other observers throughout each transect to maintain correct alignment of the survey transect. Observers cross-checked any koala observation with the relevant adjacent team member to confirm that the observation did not represent a double count. For any koala observation, the following was undertaken as a minimum: an assessment of the koala's condition, age and gender; GPS location recorded; and identification of the tree species and DBH in which the koala was observed.

There were no site access constraints which were considered to have any material impact to the success of either survey. Whilst overcast conditions prevailed on two survey days during the March event, these conditions were not considered to have a significant impact to the success of that survey. Conditions during the August event were clear and fine.

[2] The presence of observable young may also assist in estimating the proportion of adult breeding females and to monitor trends in breeding rates over time.

Figure 2-1 Signs of koala presence

Above left - Aged koala tree trunk scratching. **Above right** - Fresh tree trunk scratching made by Cain.

Below - Fresh and recent faecal pellets from Scarlet.

3. Survey Results

Figure 3-1 describes the location of Koala records from both 2019 survey events.

Attachment A provides a summary of the data for each koala observed during the 2019 survey program.

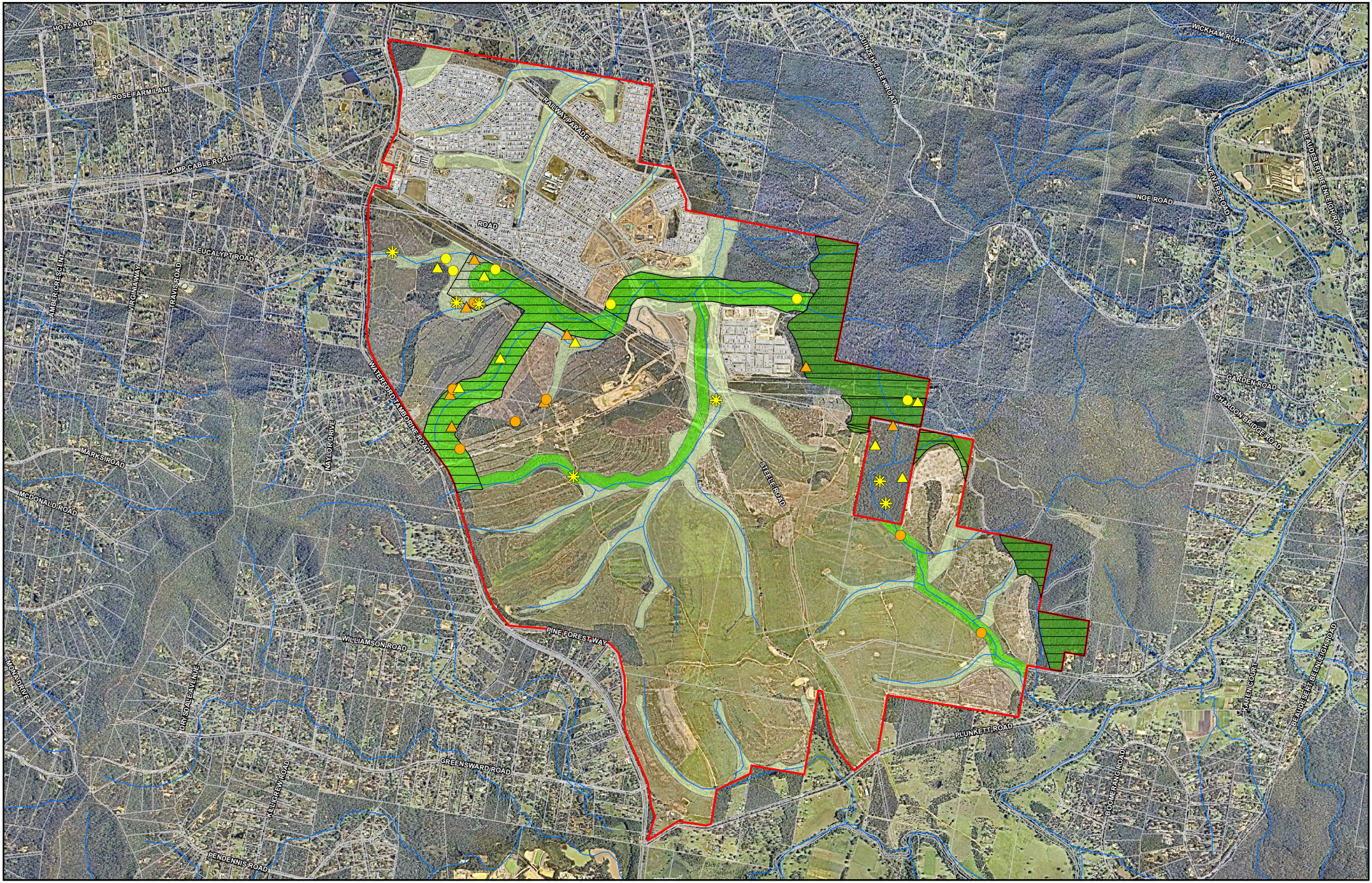
A total of 15 koalas were recorded during the March survey event (see **Attachment A**). This result included eight males and seven females. The majority of those observed were "cleanskins" with koalas recognisable by previous ear tagging, being the males Bomber and Lindsay, and the females being Scarlet and Meghan.

The majority of the Koalas observed appeared in good condition. Two Koalas exhibited stained rumps (Meghan from the central fauna corridor and a cleanskin female in Wal's Block), whilst a third animal appeared in poor condition (a female within the southern Fauna Corridor).

A total of 21 koalas were recorded during the August survey event (see **Attachment A**). Those observations included eight males and 13 females. Of the females recorded, seven were observed with joeys, with a further female suspected of carrying a joey in her pouch though this could not be confidently confirmed.

As with the results for the March event, the majority of the koalas observed were "cleanskins". Five Koalas were identifiable as a result of previous ear tagging, being the females Zara and Scarlet (with joey), and the males Cain, Heath, and Lindsay. Only one Koala was observed with a stained rump, being a female within Wal's Block, and suspected of being the female koala seen in a similar condition during the March event.

The distribution of 2019 Koala survey records (see **Figure 3-1**) is similar to that recorded during the 2018 survey program (see **Figure 3-2**).



austecology

Source:	Watercourses: Department of Environment and Resource Management, VMA Queensland Regrowth Other Watercourses Version 2.1 Cadastral Boundaries / Department of Natural Resources and Mines 2019 Corridors and Assessable Koala Habitat vegetation layers supplied by: Austecology 2014 Offset requirement: Land Lease 2014 Aerial photo: NearMap 2019
Disclaimer:	No warranty is given in relation to the data (including accuracy, reliability, completeness, currency or suitability) and no liability is accepted (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.
File:	File: Yarrabilba-OffsetMP-Fig3-1-SurveyResults-190821 Date: 21/08/2019

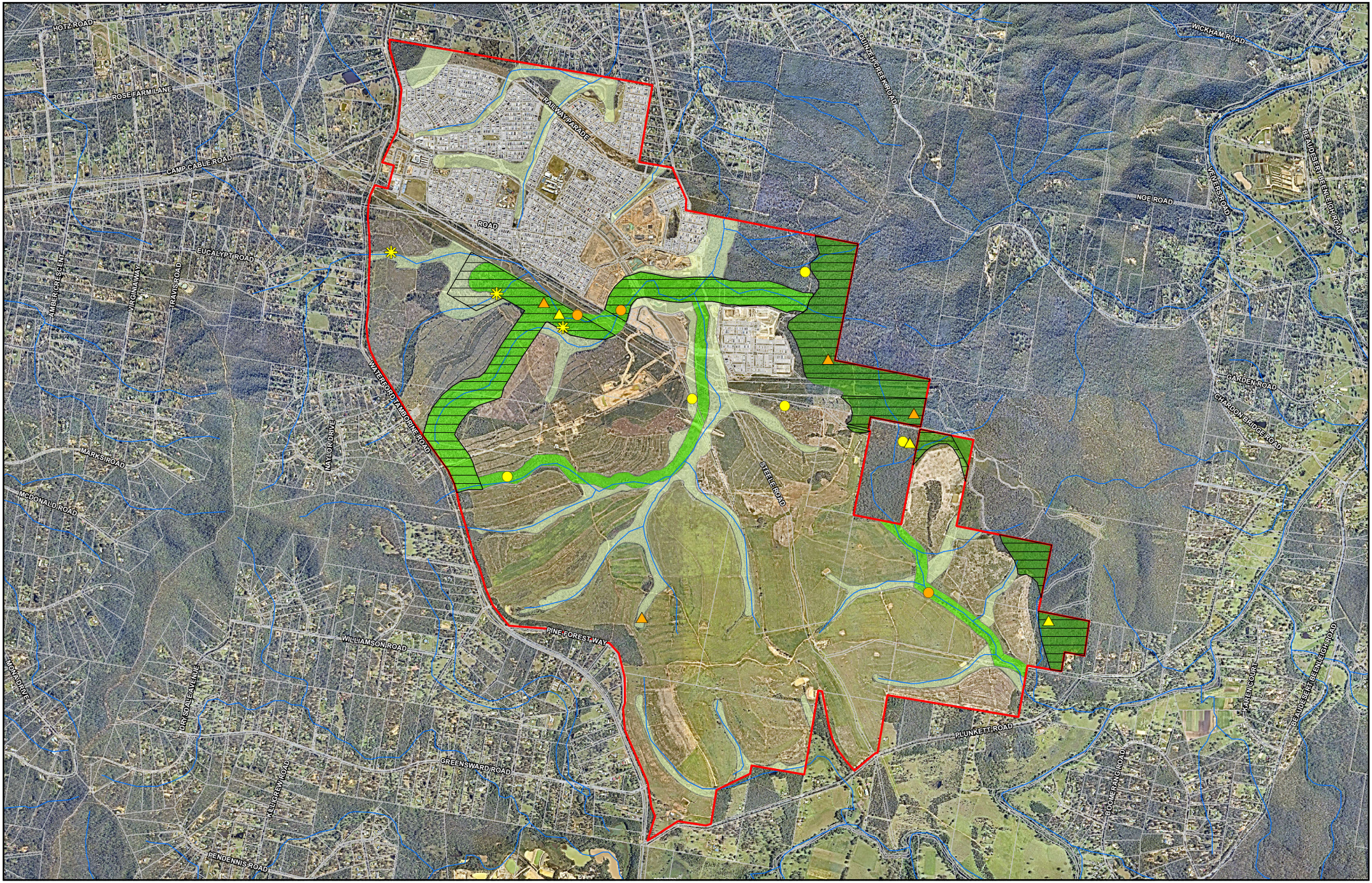
0 490 980 1,470 1,960
Meters
A4 Scale 1:40,000
Coordinate System: GDA 1994 MGA Zone 56 Projection: Transverse Mercator

- Yarrabilba Priority Development Area
- Watercourse
- Yarrabilba Offset Requirement under EPBC Act - 195ha
- Greenspace Corridor
- Fauna Corridor
- Environment Protection

March Survey
- March Males
- March Females

August Survey
- August Males
- August Females
- August Females & Joey

Figure 3-1:
Population Survey Results March and August 2019



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Source:	Watercourses: Department of Environment and Resource Management, VMA Queensland Regrowth Other Watercourses Version 2.1 Cadastral Boundaries / Department of Natural Resources and Mines 2019 Corridors and Assessable Koala Habitat vegetation layers supplied by: Austecology 2014 Offset requirement: Lend Lease 2014 Aerial photo: NearMap 2019
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Figure 3-2:

Population Survey Results March and August 2018

4. Observations and Conclusions

To date, four similar survey events have been implemented through Years 1 and 2 of the KMP. Each event has involved the same core personnel which provides consistency through the program. During each event, the same priority survey footprint has been systematically surveyed and employing the same set of protocols throughout – again, providing consistency between events. Whilst field conditions (principally weather) have differed, between events, the extent of difference has not been considered to have any material impact to the success of any of the survey events, or of such significance as to confidently contrast or explain differences in survey results.

It is clear that a notably higher number of Koalas were recorded during the August 2019 survey event. Furthermore, a comparatively higher proportion of the koalas observed were "cleanskins", i.e. Koalas which have not been captured and ear-tagged. The difference in the results of the August 2019 survey may, in part, be attributable to some cleanskin koalas moving into survey areas from surrounding patches of regrowth habitat which are outside greenspace areas and have not previously been subject to systematic surveys under the KMP.

These areas were dominated by vegetation which is not suitable as forage habitat for koalas (e.g. *Acacia* and *Pinus*), though did support a sparse presence of emergent tree species which are known to provide forage resources for koalas (e.g. *Eucalyptus* and *Corymbia*) (author, pers. obs.). This vegetation was thought to support a very low koala carrying capacity.

Patches of such vegetation were cleared progressively from December 2018 through to May 2019 (total combined area of approximately 95 ha). All vegetation clearing was subject to pre-clearing surveys and the on-going presence of two personnel with previous site familiarity and experience in koala surveys. Observations during that work indicate that possibly four koalas may have occurred within that vegetation, though the nature of their usage (residential or transient) could not be determined.

Whilst the abovementioned circumstances may have resulted in a small increase the total number of koalas observed during the August 2019 survey, it is a highly unlikely explanation for the very positive observations of the seven female koalas with joeys (a total of eight females with joeys when including Jean)[3].

The on-going implementation of management plan requirements for the EPBCA Offset Areas and the Fauna Corridor[4], including control programs for dogs and foxes, weed controls and habitat rehabilitation, fencing, and fire management, are all likely to be contributing positively to the improvement of habitat conditions and resources for koalas, and in turn, the quality and carrying capacity of those areas for koalas.

[3] Jean and joey were not observed during the population survey, though were observed a week later during the monthly monitoring event (21 August 2019).

[4] Consistent with the requirements of the EPBCA Offset Management Plan (Austecology 2015), Fauna Corridor Infrastructure Master Plan (Natura 2012), Habitat Rehabilitation Management Plan (Natura 2015), and Koala Management Plan Yarrabilba UDA (Austecology 2012).

5. References

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Natura (2015). Habitat Rehabilitation Management Plan. A report prepared by Natura Consulting for Lend Lease.

QEPA (2006). Policy 4 Koala survey methodology for site assessment. In: Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016, Queensland Environment Protection Agency and Queensland Parks and Wildlife Service, Brisbane.

Attachment A Koala Survey Records Summary

Date	Koala	Gender	Tree Species	DBH Size Class	Health Appearance	Comments	Easting	Northing
25/03/2019	Cleanskin	M	*E. tereticornis*	> 40cm	Eyes & rump appear clean.		510520.00 m E	6923838.00 m S
25/03/2019	Bomber	M	*E. major*	>30cm	Eyes & rump appear clean.		510452.00 m E	6923439.00 m S
25/03/2019	Scarlet	F	*E. crebra*	>30cm	Eyes & rump appear clean.		510516.14 m E	6923477.59 m S
25/03/2019	Lindsay	M	*C. intermedia*	>30cm	Eyes & rump appear clean.		511288.87 m E	6923214.15 m S
26/03/2019	Cleanskin	M	*E. major*	>40cm	Eyes & rump appear clean.		510316.63 m E	6922716.32 m S
26/03/2019	Meghan	F	*M. quinquenervia*	>20cm	Rump appeared stained	difficult to view eyes	510346.80 m E	6922759.07 m S
26/03/2019	Cleanskin	M	*C. intermedia*	>30cm	Eyes & rump appear clean.	large male	510330.76 m E	6922450.35 m S
26/03/2019	Cleanskin	F?	*E. major*	>30cm	Eyes & rump appear clean.		510399.76 m E	6922260.74 m S
26/03/2019	Cleanskin	F	*M. quinquenervia*	>20cm	Eyes & rump appear clean.	small female adult	511116.79 m E	6922674.07 m S
26/03/2019	Cleanskin	M	*E. tereticornis*	>40cm	Eyes & rump appear clean.	large male	511095.10 m E	6922650.60 m S
26/03/2019	Cleanskin	F?	*E. tereticornis*	>30cm	Eyes & rump appear clean.	very "fluffy" ears	510858.74 m E	6922488.67 m S
27/03/2019	Cleanskin	M	*E. siderophloia*	>30cm	Eyes & rump appear clean.	large male	513273.76 m E	6922947.62 m S
28/03/2019	Cleanskin	M	*E. tereticornis*	>40cm	Eyes & rump appear clean.		513995.65 m E	6922457.62 m S
28/03/2019	Cleanskin	F	*E. tereticornis*	>20cm	Poor condition	very dirty rump	514057.44 m E	6921543.67 m S
28/03/2019	Cleanskin	F?	*E. tereticornis*	>10cm	Poor condition		514729.82 m E	6920733.46 m S
12/08/2019	Cleanskin	F	*E. acmenoides*	>40cm	Eyes & rump appear clean.		513197.90 m E	6923505.09 m S
12/08/2019	Cleanskin	F	*E. crebra*	>30cm	Eyes & rump appear clean.		514116.65 m E	6922666.72 m S
12/08/2019	Cleanskin	M	*E. crebra*	>30cm	Eyes & rump appear clean.		514200.05 m E	6922657.34 m S
13/08/2019	Cleanskin	M	*E. major*	>40cm	Eyes & rump appear clean.		513846.00 m E	6922296.00 m S
13/08/2019	Cleanskin	M	*E. resinifera*	>40cm	Eyes & rump appear clean.		514072.76 m E	6922030.83 m S
13/08/2019	Cleanskin	F	*E. tereticornis*	>40cm	Eyes & rump appear clean.	with joey	513885.61 m E	6921997.82 m S
13/08/2019	Cleanskin	F	*E. major*	>40cm	Rump appeared stained	with joey	513934.64 m E	6921809.45 m S
13/08/2019	Cleanskin	F	*E. tereticornis*	>40cm	Eyes & rump appear clean.	with joey	512527.28 m E	6922663.94 m S

Date	Koala	Gender	Tree Species	DBH Size Class	Health Appearance	Comments	Easting	Northing
14/08/2019	Cleanskin	F	*E. tereticornis*	>40cm	Eyes & rump appear clean.	fluffy ears	510692.53 m E	6923751.67 m S
14/08/2019	Zara	F	*E. moluccana*	>40cm	Eyes & rump appear clean.		510282.82 m E	6923840.24 m S
14/08/2019	Cleanskin	F	*C. trachyphloia*	>40cm	Eyes & rump appear clean.	with joey	509839.64 m E	6923896.00 m S
14/08/2019	Cleanskin	F	*E. moluccana*	>30cm	Eyes & rump appear clean.	small adult	510341.83 m E	6923740.50 m S
14/08/2019	Cain	M	*E. moluccana*	>40cm	Eyes & rump appear clean.		510601.33 m E	6923699.28 m S
14/08/2019	Scarlet	F	*E. crebra*	>40cm	Eyes & rump appear clean.	with joey	510558.28 m E	6923463.38 m S
14/08/2019	Cleanskin	F	*E. moluccana*	>40cm	Eyes & rump appear clean.	with joey	510371.15 m E	6923474.62 m S
14/08/2019	Heath	M	*E. tereticornis*	>30c	Eyes & rump appear clean.		510735.17 m E	6923020.13 m S
14/08/2019	Cleanskin	M	*L. suaveolens*	>20cm	Eyes & rump appear clean.		510390.25 m E	6922776.74 m S
14/08/2019	Cleanskin	F	*E. racemosa*	>40cm	Eyes & rump appear clean.	with joey	511341.20 m E	6922029.78 m S
15/08/2019	Lindsay	M	*E. siderophloia*	>40cm	Eyes & rump appear clean.		511355.77 m E	6923152.49 m S
15/08/2019	Cleanskin	M	*E. moluccana*	>20cm	Eyes & rump appear clean.		510211.36 m E	6923766.38 m S
16/08/2019	Cleanskin	F	*E. moluccana*	>40cm	Eyes & rump appear clean.		511651.53 m E	6923462.37 m S