Koala Population Survey Program 2022

Koala Monitoring Program, Yarrabilba PDA

Prepared for: **Lend Lease Communities (Yarrabilba) Pty Ltd**
Prepared by: **Lindsay Agnew, Austecology**
Report Status: **Final – 18 October 2022**

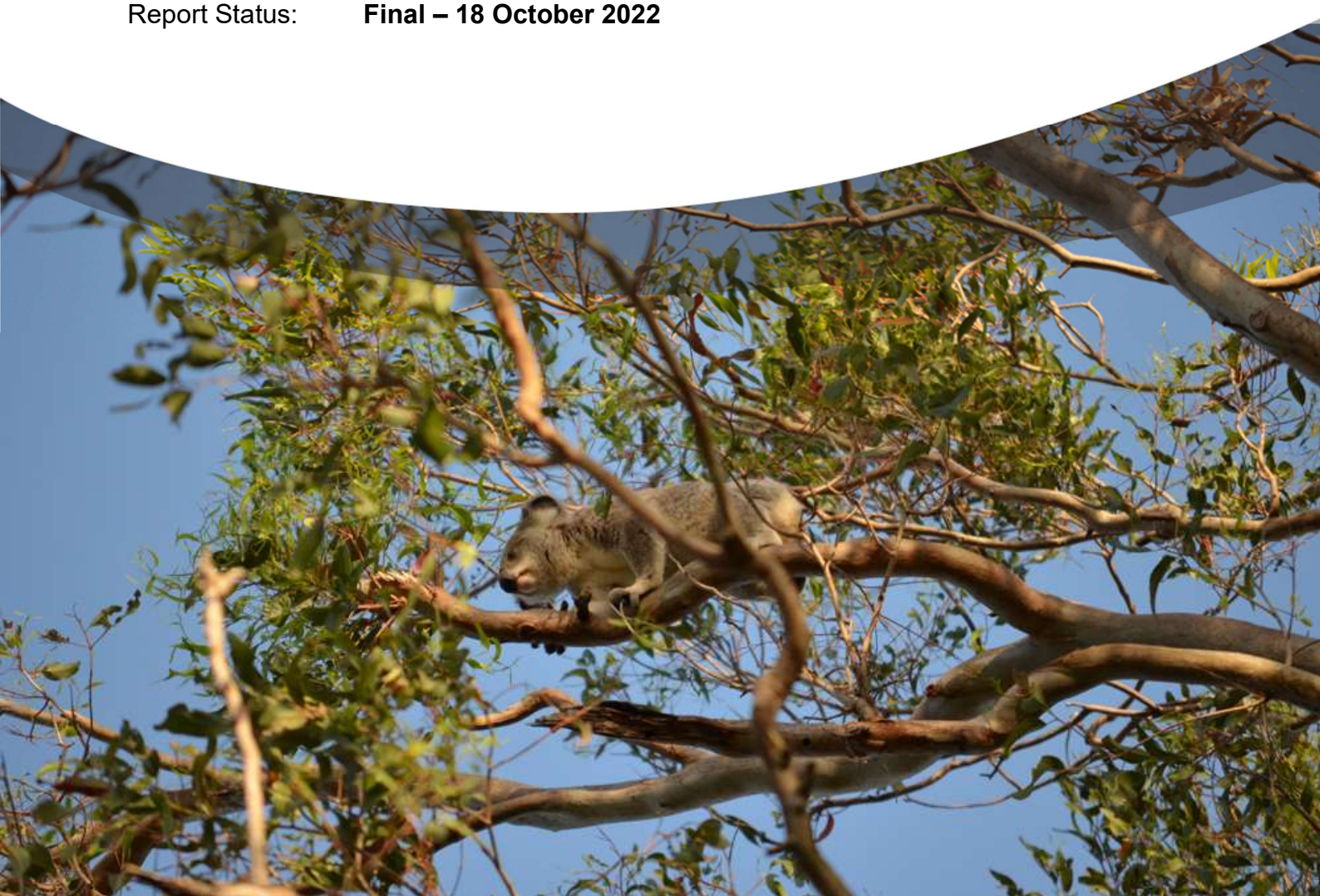


Table of Contents

List of Figures

List of Attachments

Cover Photograph – Cleanskin adult Koala - Heath Agnew

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 5-year period – September 2017 to October 2023, 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 2022 bi-annual systematic surveys across the site.

2. Field Methodology

2.1. Approach

The primary 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 March / early-April and six months later in August / early-September. The survey timing of the latter 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.

[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] 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.

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 30m to 50m apart either side of the nominal centre line of their own transect in order to minimize the potential for double counting from adjacent transects. Spacing between transects is agreed upon depending on the complexity or otherwise of the understorey and tree canopy (ease of visibility and suitable sight-lines). 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 / or vocal cues) with other observers throughout the progression of 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.

All personnel implementing the work were highly experienced in undertaking koala surveys. The average of the total survey team transect coverage for the each of the events was in excess of 200 kilometers of foot survey transects (as gauged by GPS tracks).

2.2. Timing and Personnel

In March, the koala survey was implemented throughout the period 21 to 25 March inclusive. The survey event provided 14 survey person days. The study team comprised Heath Agnew, Ed Meyer and Lindsay Agnew.

In September, the survey event was undertaken during the period 29 August to 2 September inclusive. The survey team comprised Lindsay Agnew, Ed Meyer, and Heath Agnew. That event provided 13 survey person days.

2.3. General

There were no site access constraints which were considered to have any material impact to the success of either survey. During the March event, preceding rainfall necessitated some changes to the usual approach within the section of the 'Fauna Corridor' to the north of the power easement, though coverage reflected that of previous surveys.

Heavy rainfall which preceded both survey events was a likely to have reduced the potential to detect faecal pellets (accelerated breakdown and / or remobilising of scats). The potential impact of this in regard to actual Koala detections is unclear. During past surveys, detection of fresh scat has led to locating a Koala, though this would account for one, or at best, two Koalas. There were no other weather impacts to the actual full implementation of field work coverage during either survey period.

Figure 2-1 Distinctive signs of koala presence

Above – Aged and fresh Koala faecal pellets. **Below -** Fresh koala tree trunk scratching.

3. Survey Results

Figure 3-1 describes the location of koala records from both 2022 survey events.

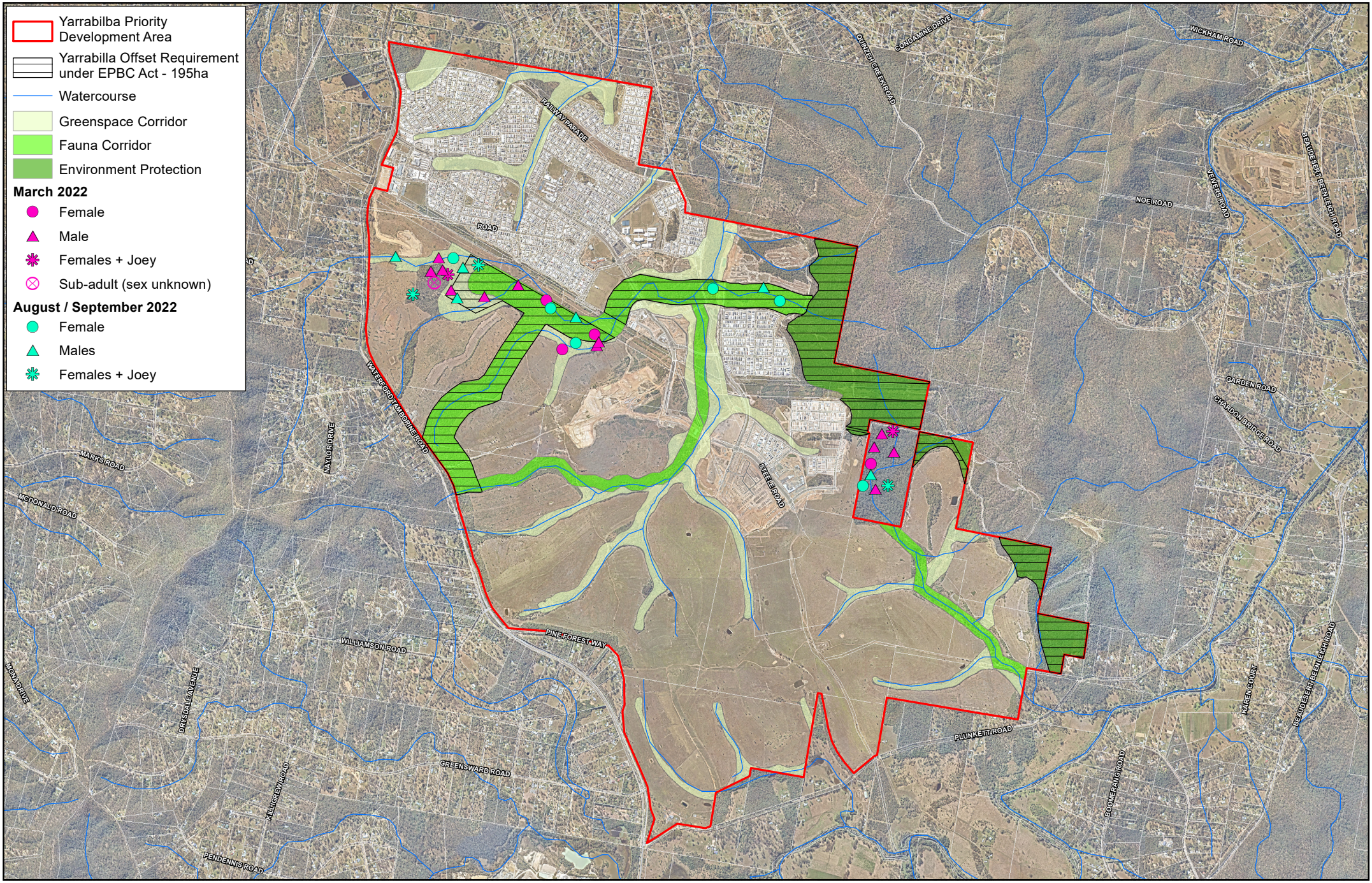
Attachment A provides a summary of the data for each koala observed during the 2022 survey program.

A total of 19 adult koalas were recorded during the March survey event (see **Attachment A**). This result included 12 males, four females, two females with joeys, and one individual (sex unknown). The majority of those observed were “cleanskins”. Koalas recognisable by previous ear tagging were the males Banjo, Bomber, Cain, Lindsay, Larrabee, and the females Gladys, and Nyunga. The majority of the koalas observed appeared in good condition.

A total of 15 adult koalas and three joeys were recorded during the September survey event (see **Attachment A**). Those observations included six males and nine females. Two of the females with joeys were observed with independent joeys, with the third, a very small female with back-young. A fourth female appeared to have a large bulging pouch indicting she was with joey, though her position within the complex canopy of a very large tree prevented views with which to confirm her breeding status.

Results for the September event were dominated by cleanskins, with only one Koala, Kamala, identifiable as a result of previous ear tagging.

The site distribution of the 2022 koala survey records (see **Figure 3-1**) is similar to that recorded during the 2018 to 2021 survey events in regard to distribution across the site (see **Figure 3-2**).



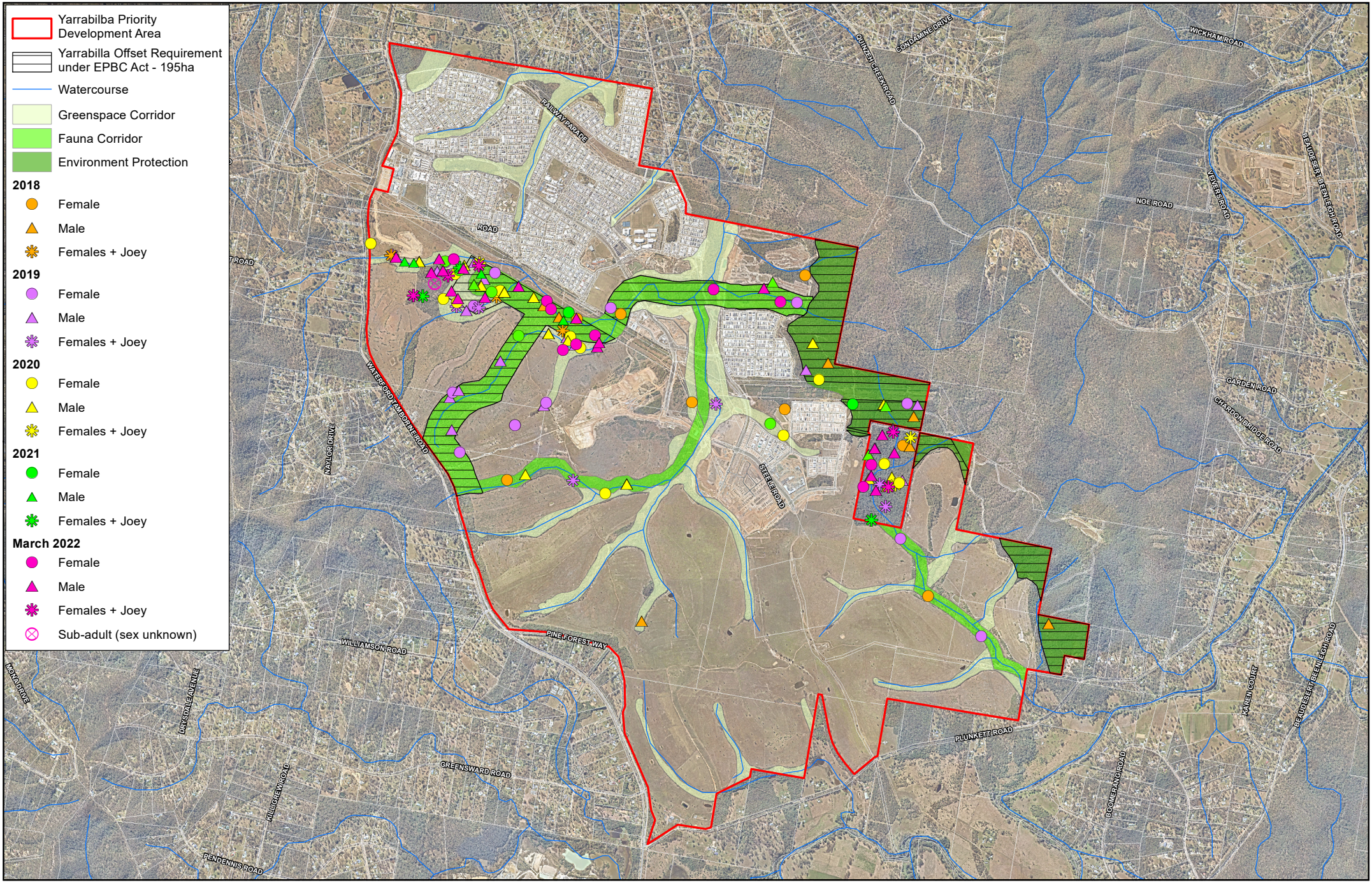
austecology

Source:	Watercourses: Department of Environment and Resource Management, VMA Queensland Regrowth Other Watercourses Version 2.1 Cadastral Boundaries / Department of Natural Resources and Mines 2022 Corridors and Assessable Koala Habitat vegetation layers supplied by: Austecology 2014 Offset requirement: Land Lease 2014 Aerial photo: NearMap 16/08/2022
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-MarchAugSept2022-221102 Date: 2/11/2022

0 500 1,000 1,500 2,000
Meters
A4 Scale 1:40,000
Coordinate System: GDA 1994 MGA Zone 56 Projection: Transverse Mercator

Yarrabilba Priority Development Area

Figure 3-1:
Population Survey Results - March and Aug. / Sept. 2022



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 2022 Corridors and Assessable Koala Habitat vegetation layers supplied by: Austecology 2014 Offset requirement: Lend Lease 2014 Aerial photo: NearMap 16/08/2022
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-Fig3-2-SurveyResults-2018-2022-221102 Date: 2/11/2022

0 500 1,000 1,500 2,000
Meters
A4 Scale 1:40,000
Coordinate System: GDA 1994 MGA Zone 56 Projection: Transverse Mercator

Yarrabilba Priority Development Area

Figure 3-2:
Population Survey Results 2018 to 2022

4. Observations and Conclusions

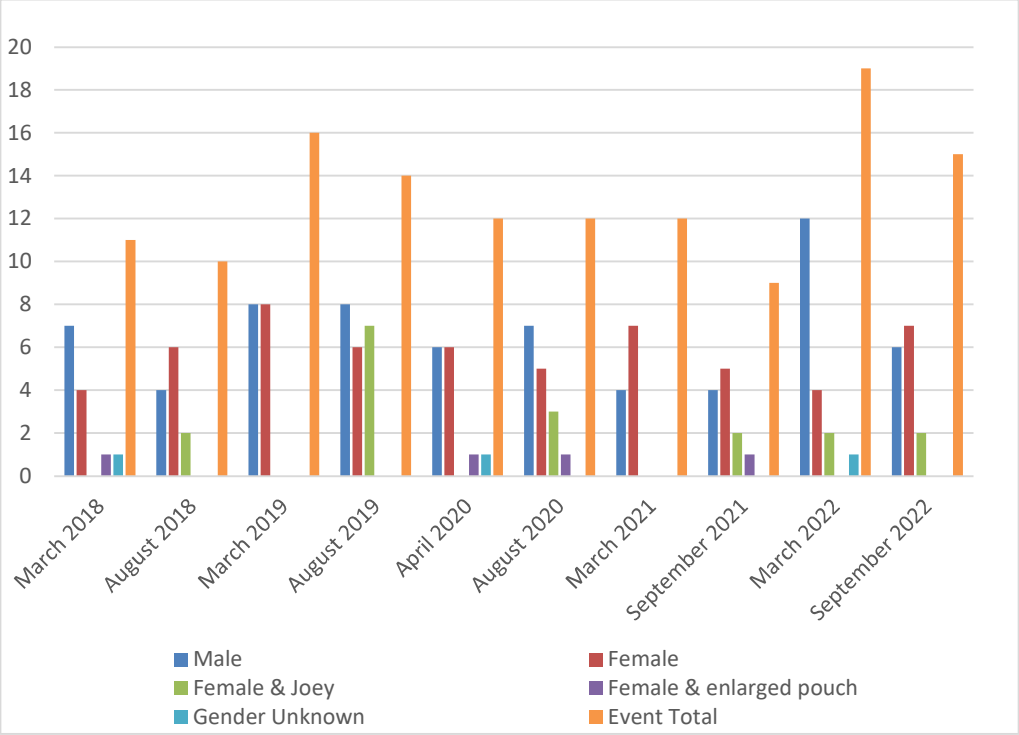
Ten similar survey events have been implemented over five years in the application the KMP (**Figure 4-1**). Each event has involved the same core personnel which provides consistency through the program. During each event, the same priority survey footprint has been systematically surveyed and employing 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 event records.

The 2022 March survey results provided the highest number of Koala recorded for any of the 10 survey events **(Figure 4-1)**. The difference 2022 March results and those of several other events represent about three or four animals and thus, are not interpreted as a significant difference, though nonetheless a positive result.

The continued observations – during both 2022 survey events- of female Koalas with joeys continues to demonstrate positive breeding success on the site.

Figure 4-1 Comparison of Koala Survey Results – 2018 to 2022



Koalas can be cryptic and difficult to detect. Whilst it is accepted that that despite a systematic field protocol being implemented by experienced observers, the survey event results are highly likely to be an underestimate of the abundance of koalas at the time of implementing the surveys, though this cannot explain variation between results of similarly timed surveys.

Site-wide koalas surveys are continuing to provide valuable context to koala radio-tracking sub-program, an important baseline for identifying key koala habitat and occurrence, and during the 2nd annual event, increasing the program capacity to monitor breeding success.

5. References

Austecology (2012). Koala Management Plan Yarrabilba UDA. Report prepared for Lend Lease Communities (Yarrabilba) Pty Ltd.

Austecology (2015). Offset Management Plan EPBC 2013/6791 Yarrabilba PDA. A report prepared by Austecology for Lend Lease Communities (Yarrabilba) Pty Ltd.

Austecology (2017). Koala Monitoring Plan Yarrabilba UDA. Report prepared by Lindsay Agnew (Austecology) and Bill Ellis (Koala Ecology Group, University of Queensland) for Lend Lease Communities (Yarrabilba) Pty Ltd.

Austecology (2019). Year 2 Koala Population Survey Program. Koala Monitoring Program, Yarrabilba PDA. A report prepared by Austecology for Lend Lease Communities (Yarrabilba) Pty Ltd.

DERM (2012). Koala Coast Koala Population Report 2010. Queensland Department of Environment and Resource Management, Brisbane.

Dique, D.S., H.J. Preece, J. Thompson & D.L. de Villiers (2004). Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management. Wildlife Research. 31:109-117.

DoE (2014). EPBC Act referral guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory). Department of the Environment, Commonwealth of Australia, Canberra.

Natura (2012). Fauna Corridor Infrastructure Master Plan. A report prepared by Natura Consulting for Lend Lease.

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 2022 Koala Survey Records Summary

Date	Koala	Gender	Tree species	Health Appearance	Comments	Easting	Northing
22/03/2022	cleanskin	M	*E. drepanophylla*	Eyes & rump appear clean.		513907.00 m E	6922407.00 m S
22/03/2022	cleanskin	M	*E. fibrosa*	Eyes & rump appear clean.	very large male	514007.00 m E	6922255.00 m S
22/03/2022	cleanskin	M	*E. major*	Rump appears clean.	One eye swollen	513854.00 m E	6921948.00 m S
22/03/2022	cleanskin	M	*E. major*	Rump stained.	Eyes seem unaffected.	513843.00 m E	6922296.00 m S
23/30/2022	Banjo	M	*E. molucanna*	Eyes & rump appear clean.		510259.00 m E	6923771.00 m S
23/30/2022	Bomber	M	*E. molucanna*	Eyes & rump appear clean.		510608.00 m E	6923548.00 m S
23/30/2022	cleanskin	M	*E. molucanna*	Eyes & rump appear clean.		510329.00 m E	6923601.00 m S
24/03/2022	cleanskin	M	*Pinus radiata*	Eyes & rump appear clean.		511539.00 m E	6923138.00 m S
23/30/2022	Cain	M	*E. tereticornis*	Eyes & rump appear clean.		510228.00 m E	6923867.00 m S
24/03/2022	cleanskin	M	*Pinus radiata*	Eyes & rump appear clean.	small young male	511556.00 m E	6923173.00 m S
24/03/2022	Lindsay	M	*E. crebra*	Eyes & rump appear clean.		510887.00 m E	6923641.00 m S
24/03/2022	Larabee	M	*E. molucanna*	Eyes & rump appear clean.		510161.00 m E	6923757.00 m S
22/03/2022	cleanskin	F	*E. renisfera*	Eyes & rump appear clean.		513998.00 m E	6922429.00 m S
22/03/2022	cleanskin	F	*E. drepanophylla*	Eyes & rump appear clean.	large adult with large joey	513817.00 m E	6922157.00 m S
24/03/2022	cleanskin	F	*E. fibrosa*	Eyes & rump appear clean.		511255.00 m E	6923110.00 m S
24/03/2022	Gladys	F	*E. molucanna*	Eyes & rump appear clean.	with large joey	510302.00 m E	6923729.00 m S
24/03/2022	Nyunga	F	*Pinus radiata*	Eyes & rump appear clean.		510302.00 m E	6923729.00 m S
25/03/2022	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.	young female	511522.00 m E	6923231.00 m S
25/03/2022	cleanskin	?	*E. molucanna*	Eyes & rump appear clean.	subadult - sex unknown	510190.00 m E	6923662.00 m S
30/08/2022	cleanskin	M	*E. fibrosa*	Eyes & rump appear clean.		513815.74 m E	6922067.38 m S
31/08/2022	cleanskin	M	*E. tereticornis*	Eyes & rump appear clean.		509868.69 m E	6923882.02 m S
31/08/2022	cleanskin	M	*E. crebra*	Eyes & rump appear clean.		510381.55 m E	6923538.08 m S
31/08/2022	cleanskin	M	*E. molucanna*	Eyes & rump appear clean.		510427.27 m E	6923788.50 m S
1/09/2022	cleanskin	M	*E. major*	Eyes & rump appear clean.		511366.34 m E	6923377.16 m S
2/09/2022	cleanskin	M	*E. major*	Eyes & rump appear clean.		512924.67 m E	6923624.27 m S
30/08/2022	cleanskin	F	*E. fibrosa*	Eyes & rump appear clean.		513750.57 m E	6921977.37 m S
30/08/2022	cleanskin	F	*E. fibrosa*	Eyes & rump appear clean.	with large joey	513958.00 m E	6921978.00 m S
31/08/2022	Kamala	F	*E. fibrosa*	Eyes & rump appear clean.		510350.81 m E	6923865.33 m S

Date	Koala	Gender	Tree species	Health Appearance	Comments	Easting	Northing
31/08/2022	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.	with independent joey	510556.82 m E	6923811.13 m S
31/08/2022	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.	small adult with small attached joey	510014.01 m E	6923566.56 m S
1/09/2022	cleanskin	F	*Pinus radiata*	Rump stained.	Eyes seem unaffected.	511158.47 m E	6923449.55 m S
1/09/2022	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.		511365.83 m E	6923161.69 m S
2/09/2022	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.		512505.98 m E	6923613.55 m S
2/09/2022	cleanskin	F	*E. renisfera*	Eyes & rump appear clean.		513061.40 m E	6923511.78 m S