Koala Population Survey Program 2021

Koala Monitoring Program, Yarrabilba PDA

Prepared for:	**Lend Lease Communities (Yarrabilba) Pty Ltd**
Prepared by:	**Lindsay Agnew, Austecology**
Report Status:	**Final - 27 September 2021**

Table of Contents

List of Figures

List of Attachments

Cover Photograph – Cleanskin adult female with large joey (January 2021) - 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 2021 bi-annual systematic surveys across the site.

2. Field Methodology

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.

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**).

---

[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.

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).

In March, the koala survey was implemented throughout the period 8 to 12 March inclusive. The survey event provided 14 survey person days. The study team comprised Heath Agnew, Sean FitzGibbon, Ed Meyer and Lindsay Agnew.

In September, the survey event was undertaken during the period 13 to 17 September inclusive. The survey team comprised Lindsay Agnew, Ed Meyer, Heath Agnew, and Georgina Andersen. That event provided 14 survey person days.

There were no site access constraints which were considered to have any material impact to the success of either survey. During the March event, rainfall on the mornings of Days 1 and 2 delayed survey initiation, though the remainder of both days were suitable for survey. There were no other weather impacts to the remainder of the survey period. Survey conditions during the September event were considered to be ideal (clear sky) and only minimal cloud cover late on Days 4 and 5.

Figure 2-1 Distinctive signs of koala presence

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

3. Survey Results

Figure 3-1 describes the location of koala records from both 2021 survey events.

Attachment A provides a summary of the data for each koala observed during the 2021 survey program.

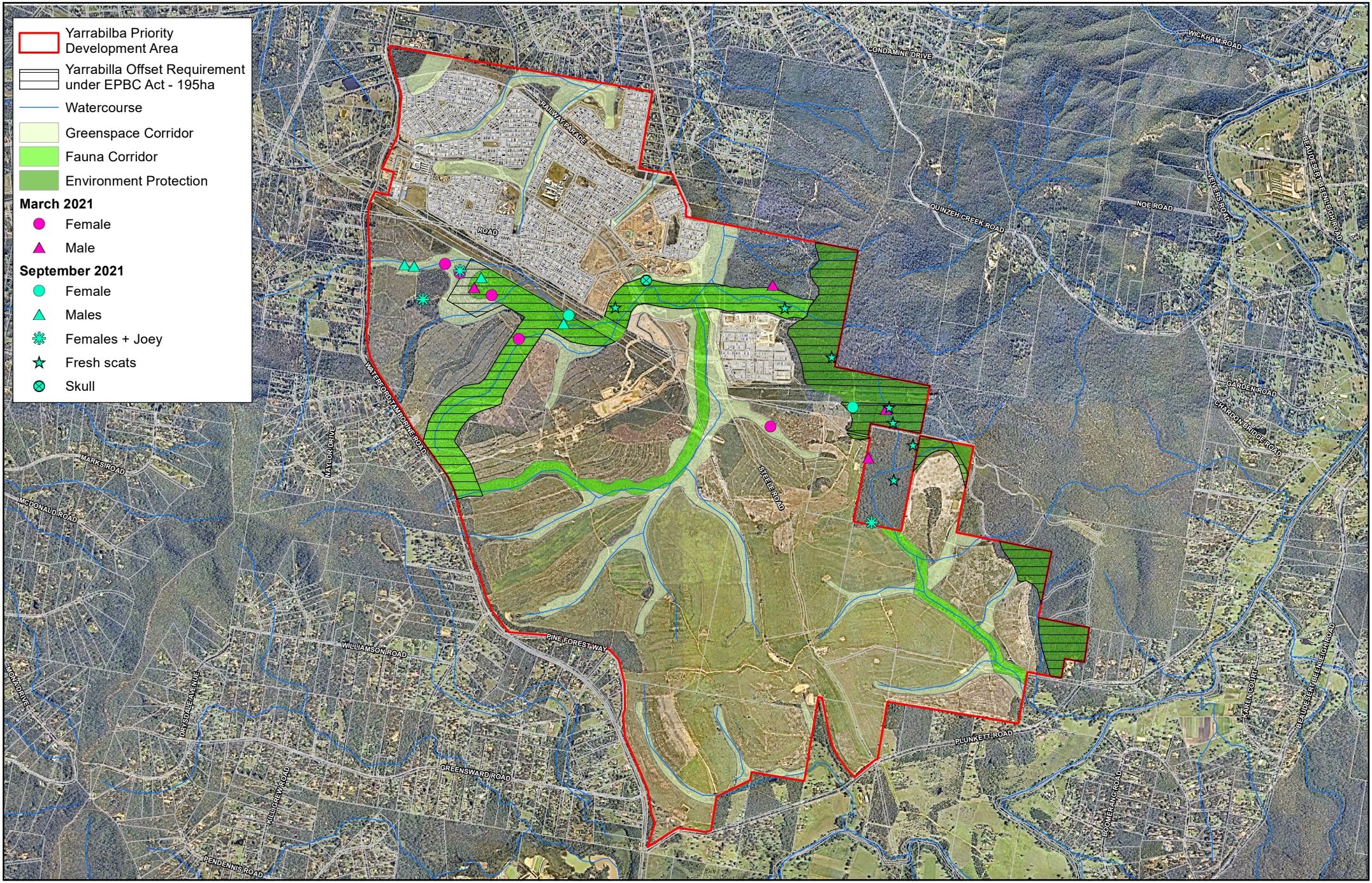
A total of 12 koalas were recorded during the March survey event (see **Attachment A**). This result included four males, and eight females. The majority of those observed were "cleanskins" with koalas recognisable by previous ear tagging, being the male Lucky, and the females being Zara, Millie Mae, and Nyunga. The majority of the koalas observed appeared in good condition.

A total of nine adult koalas and three joeys were recorded during the September survey event (see **Attachment A**). Those observations included four males and five females. Of the females recorded, two were observed with joeys (out of pouch), with a further female showing obvious signs of carrying a joey in her distended bulging pouch. 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.

As with the results for the September event, the majority of the koalas observed were "cleanskins". Three koalas were identifiable as a result of previous ear tagging, being the male Lucky, the male Lindsay, and the female Caitlin.

Caitlin was first captured and ear-tagged in May 2017 during initial stage of the program. There have been very few observations of her over the years and this current observation confirms she is one of the oldest female ear-tagged Koalas on the site. Interestingly, the last record of Caitlin was approximately four kilometres to the west.

The distribution of 2021 koala survey records (see **Figure 3-1**) is similar to that recorded during the 2018 to 2020 survey events in regard to distribution across the site (see **Figure 3-2**).



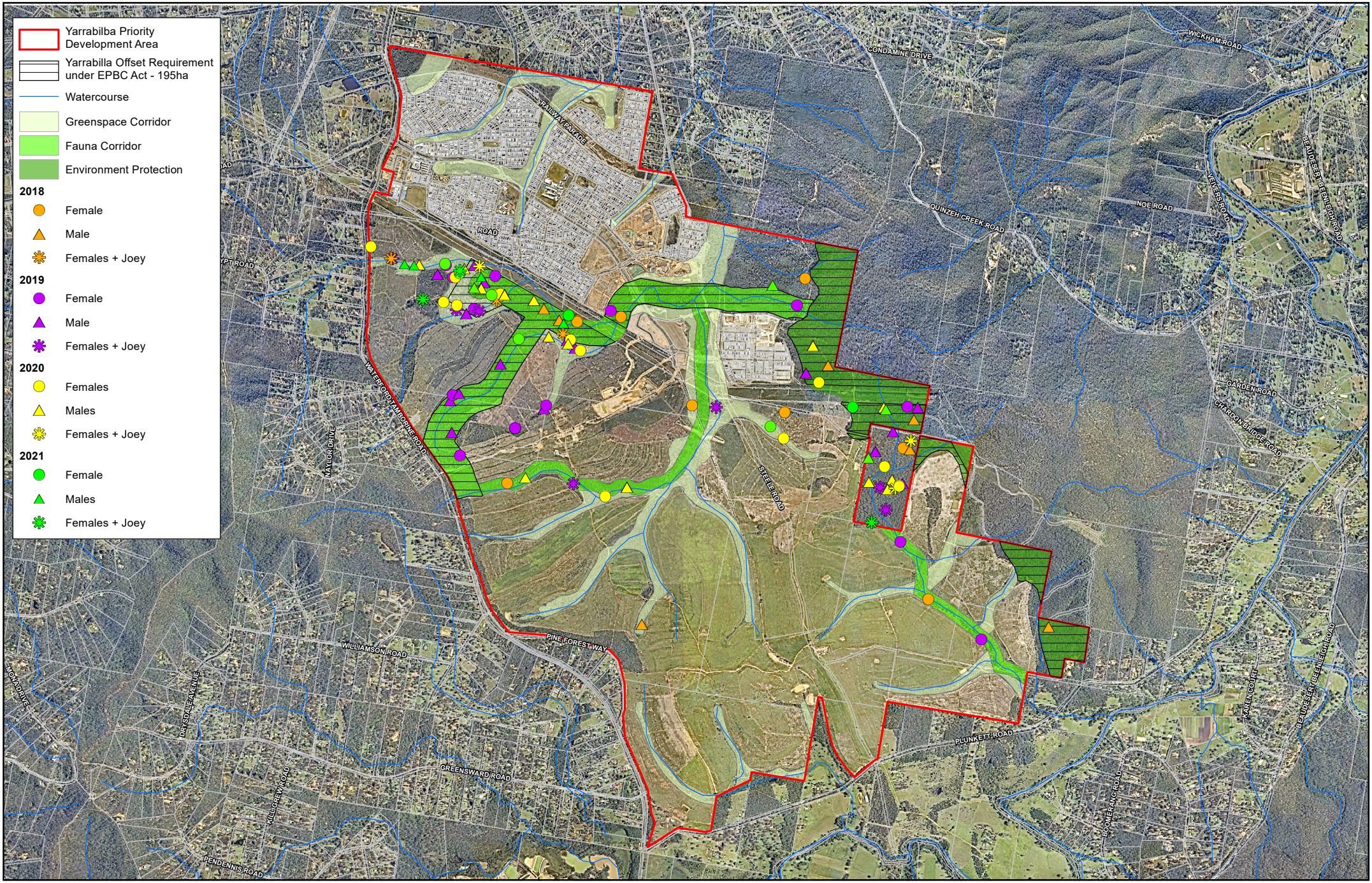
austecology

Source:	Watercourses: Department of Environment and Resource Management, VMA Queensland Regrowth Other Watercourses Version 2.1 Cadastral Boundaries / Department of Natural Resources and Mines 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-MarchSept2021-200924 Date: 24/09/2021

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 September 2021



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-Fig3-2-SurveyResults-2018-2019-2020-2021-200924 Date: 24/09/2021

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 2018, 2019, 2020, 2021

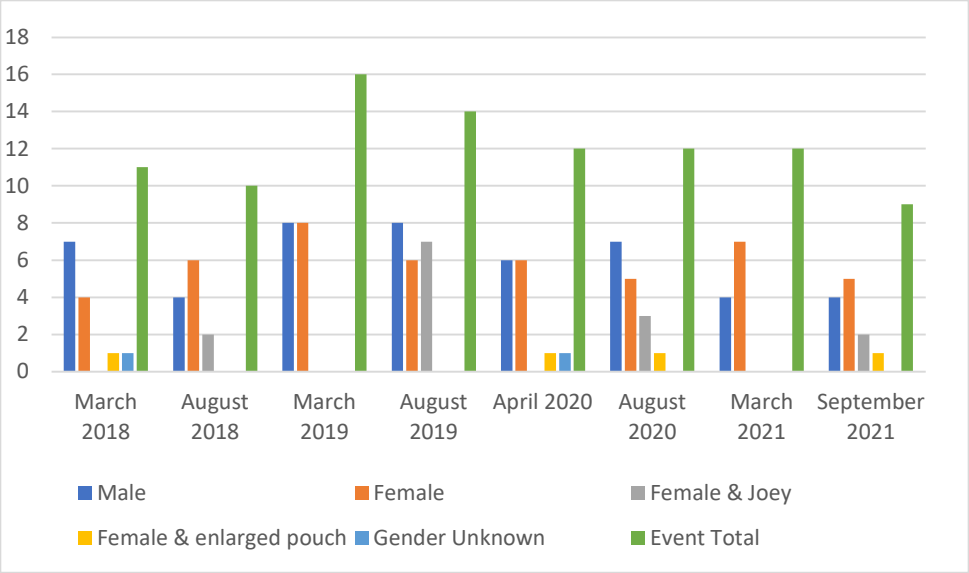
4. Observations and Conclusions

To date, eight similar survey events have been implemented over four years in the application 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 event records.

The 2021 March survey results are equivalent to that of March 2020, both representing about the average number of records of the set of the four late-summer events. The 2021 September survey results are lower than the total results for each of the other three similarly timed events (see survey result summaries in **Figure 4-1)**. Further, anecdotal evidence of fresh Koala faecal pellets indicated that such evidence was comparatively sparse as observed during the September 2021 event. Observations of three, possibly four female Koalas with joeys matches the most positive breeding success results to date.

Figure 4-1 Comparison of Koala Survey Results – 2018 to 2021



Whether the September 2021 results reflect natural patterns of population dynamics or otherwise, cannot be confidently explained by the data stream to date. Notably higher results for other surveys (both late-summer and late-winter) may have been influenced by other factors (see Austecology 2019).

For example, a notably higher number of koalas were recorded during 2019. It was thought that the difference between those and other annual results may, in part, have been attributable to a comparatively higher proportion of the koalas observed as 'cleanskins' moving into survey areas from surrounding patches of regrowth habitat which were outside greenspace areas and were not previously the subject to systematic surveys under the KMP.

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 Koala Survey Records Summary

Date	Koala	Gender	Tree species	Health Appearance	Comments	Easting	Northing
08/03/2021	cleanskin	M	*C. intermedia*	Eyes & rump appear clean.		512995.58 m E	6923674.91 m S
08/03/2021	cleanskin	M	*C. intermedia*	Eyes clear, slight rump staining.		513935.89 m E	6922643.34 m S
08/03/2021	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.		512977.09 m E	6922500.41 m S
09/03/2021	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.		510397.22 m E	6923773.02 m S
09/03/2021	Lucky	M	*E. moluccana*	Eyes & rump appear clean.		510517.08 m E	6923654.72 m S
09/03/2021	cleanskin	F	*E. tereticornis*	Eyes & rump appear clean.		510662.30 m E	6923592.78 m S
09/03/2021	cleanskin	F	*E. resinifera*	Eyes clear, slight rump staining.	High in tree; difficult to assess.	514036.00 m E	6922046.00 m S
10/03/2021	Millie Mae	F	*E. tereticornis*	Rump appeared lean.	High in tree; difficult to assess.	509888.00 m E	6923855.00 m S
10/03/2021	Zara	F	*E. fibrosa*	Eyes & rump appear clean.		510275.74 m E	6923848.78 m S
11/03/2021	cleanskin	F	*E. moluccana*	Eyes & rump appear clean.	Large female.	511676.97 m E	6923518.82 m S
12/03/2021	cleanskin	M	*E. crebra*	Eyes & rump appear clean.	Large male.	513791.25 m E	6922241.74 m S
15/09/2021	cleanskin	M	*E. moluccana*	Eyes & rump appear clean.		510018.07 m E	6923835.48 m S
15/09/2021	Lucky	M	*E. moluccana*	Some rump staining but not wet.		509938.79 m E	6923845.51 m S
15/09/2021	cleanskin	M	*E. tereticornis*	Eyes & rump appear clean.		510576.00 m E	6923741.00 m S
15/09/2021	cleanskin	F	*E. moluccana*	Eyes & rump appear clean.	With joey on belly.	510092.20 m E	6923558.60 m S
15/09/2021	cleanskin	F	*L. suaveolens*	Eyes & rump appear clean.	With joey on belly.	510399.01 m E	6923795.28 m S
16/09/2021	cleanskin	F	*E. crebra*	Eyes & rump appear clean.	Possible enlarged pouch; joey?	511302.84 m E	6923423.94 m S
16/09/2021	Lindsay	M	*E. fibrosa*	Eyes & rump appear clean.		511259.83 m E	6923355.96 m S

Date	Koala	Gender	Tree species	Health Appearance	Comments	Easting	Northing
17/09/2021	cleanskin	F	*E. carnea*	Eyes & rump appear clean.	Patch with no previous records.	513660.55 m E	6922661.49 m S
17/09/2021	Caitlin	F	*E. tereticornis*	Rump dirty & moderately wet.	Joey in bulging pouch.	513817.52 m E	6921701.03 m S