



Koala *Phascolarctos cinereus* surveys in the Australian Capital Territory, 2018

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1 Executive Summary

Capital Ecology was commissioned by the Environment, Planning and Sustainable Development Directorate (EPSDD) of the ACT Government to carry out a series of surveys for Koala *Phascolarctos cinereus* throughout the ACT.

Capital Ecology surveyed 42 sites within the ACT. No confirmed sightings or evidence of koala habitation (such as scats or characteristic scratch marks) were found.

While the results of these surveys suggest that there are no koalas in the ACT, a relatively small number of sites (42) and trees (1,260 in total) were surveyed. While the best possible survey sites were selected for this study, it is possible that koalas are present in the ACT and were not detected. If further surveys are required, Capital Ecology recommends acoustic surveys be completed during the breeding season at those sites identified in this report as 'high' koala habitat quality/potential.

2 Introduction

On 2 May 2012 the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) was listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)¹. With this listing the ACT Government became obliged to manage and conserve its koala population. The first step in this process was to determine if there is an extant population of the koala in the ACT, and if so, ascertain its distribution and density. Accordingly, Capital Ecology was commissioned by the Environment, Planning and Sustainable Development Directorate (EPSDD) of the ACT Government to carry out a series of surveys for the koala throughout the ACT.

The below introductory text comes directly from information provided to Capital Ecology by Conservation Research of the EPSDD².

Koalas are listed as a species occurring within the ACT although their cryptic nature and presumed low density has resulted in few confirmed records of the species in the last 40 years. In fact, no direct observations of koalas or koala sign have been made outside of captive populations in the ACT since 1990. The ACT represents the edge of the koala's natural range, although low to very low densities of koalas have recently been reported in nearby areas of NSW. Whilst it is likely that the population of koalas has always been low within the ACT, a targeted survey is required to provide updated information on the presence and distribution of the species within the ACT such that appropriate conservation efforts can be made.

Surveys for koalas generally rely on indirect detection methods such as scat or scratch mark surveys, rather than direct observations of individual animals. In areas where koalas are considered to occur only at low densities, surveys are generally targeted to areas where koalas are considered most likely to be detected. Whilst a number of surveys from across the national range of the species have demonstrated that koalas utilise a range of forest types and occur across topographical gradients (e.g. Curtin et al. 2001), targeted surveys from areas of NSW surrounding the ACT provide some background information on preferred food trees occurring in the area which will be utilised to maximise the chances of detecting koalas where they occur within the ACT.

¹ Visit the Koala Listing at the [Department of the Environment and Energy Website](#)

² *ACT Koala Survey 2017*. Draft guidelines for survey provided to Capital Ecology by Dr. Melissa Snape (Conservation Research, ACT Government), June 2017.

3 Methods

Detailed survey methods were supplied by ACT Conservation Research³ and are presented below. These methods were not altered by Capital Ecology during the 2018 koala surveys.

Seven (7) survey sites, all located within Namadgi National Park, were not surveyed (refer Figure 1). These sites were not surveyed due to high access difficulty, as all were located over 1 km from a serviceable track through thick vegetation and difficult terrain.

Six (6) survey sites were moved from the original location provided by ACT Conservation Research, as the original location had high access difficulty. These were survey sites 25, 31, 44, 47, 58 and 61. New survey sites were located near the original survey site and were selected based on the criteria outlined in the methods.

Fifteen (15) survey sites located on Commonwealth owned Defence land were not surveyed (refer Figure 1, survey sites located in the north-east ACT).

3.1 ACT Conservation Research Survey Method

The 'Regularised Grid-based Spot Assessment Technique' (RG-bSAT) is a tree based sampling method which provides presence/absence data for koalas as well as data regarding habitat usage/preference. Unlike the standard 'Spot Assessment Technique' (SAT), where 'focal trees' are chosen based on a number of criteria, the RG-bSAT utilises grid intersect points to identify the centre of each SAT plot. It is recognised as an appropriate technique for surveying for koala across a range of habitat types, although the relative detectability of scats across sites or vegetation strata is an important consideration. The technique is endorsed by the *EPBC Act referral guidelines for the vulnerable koala: combined populations of Queensland, New South Wales and the Australian Capital Territory* (Australian Government 2014).

3.1.2 Survey Area Selection

Survey effort was targeted towards areas identified as most likely koala habitat, based on vegetation mapping of preferred food trees and fire history (Law et al. 2017). A recent study undertaken in nearby areas of NSW targeted survey effort toward larger (generally > 500 ha) areas of relatively undisturbed native vegetation in which the following eucalypts predominated:

- Brittle gum *Eucalyptus mannifera*, Scribbly gum *E. rossii* and the Ribbon gum *E. viminalis*, the main species identified in the adjoining Cooma-Monaro LGA as being preferred by koalas (Martin and Phillips 2015).
- Candlebark *E. rubida*; Yellow box *E. meliodora*; Blakley's red gum *E. blakeleyi*, Apple-topped box *E. bridgesiana*, Maidens gum *E. maideni* and Forest red gum *E. tereticornis*, these being other species identified in the NSW Koala Recovery Plan⁴ as primary or secondary koala browse species.

³ ACT Koala Survey 2017. Draft guidelines for survey provided to Capital Ecology by Dr. Melissa Snape (Conservation Research, ACT Government), June 2017.

⁴ Department of Environment and Climate Change NSW (2008). *Recovery plan for the koala (Phascolarctos cinereus)*. November 2008.

- Narrow-leafed peppermint *E. radiata*, and Silvertop ash *E. sieberi* identified in SENSW as potentially important (Cork 1995, Joliffe et al. 2013, NSW Office of Environment and Heritage 2016).

As such, polygons were created using Geographic Information System (GIS) software to identify areas where vegetation communities containing preferred food trees (p14, u152, u191 and u52; ACT Government 2017) co-occurred with areas mapped as having had low or moderate fire severity during the 2003 wildfires (Barrett 2006). Whilst Law et al. (2017) identified soil type and digital elevation model (DEM) as two other key predictors in the distribution of koalas at the landscape level, these were not considered in the final mapping of priority areas for survey due to vegetation community being considered to some degree to act as a surrogate for each, and due to the inclusion of these additional variables resulting in the survey area becoming overly restricted.

3.1.3 Grid-Site Selection

The surveys in this report use the RG-bSAT as the primary assessment method (Phillips and Hopkins 2007, Allen et al. 2010, Allen 2014, Phillips et al. submitted). A one kilometre grid was superimposed over the identified priority survey areas in ArcMap (10.4) enabling the systematic yet random selection of sites to be assessed using the SAT approach. This method is consistent with methods used in surrounding areas of NSW and will enable ACT data to feed into landscape-scale predictive models of koala habitat in the region.

3.1.4 Grid-Site Assessments

Grid-sites were located in the field using a GPS navigator and 1:25,000 topographic maps. At each site 30 trees >150 mm diameter at breast height (DBH) were sampled, comprising a centre tree (around which the survey was focused) and the 29 nearest neighbours. Trees were identified to species and the surrounding litter searched for koala faecal pellets to a distance of 100 mm out from the trunk of each tree. A maximum of two person minutes/tree were dedicated to the faecal pellet search. The search at each tree concluded once a single koala faecal pellet was detected or when the maximum search time had expired, whichever happened first. If the location of faecal pellets fell within overlapping search areas brought about by two or more trees growing in close proximity to each other, both were positively scored for the pellet(s). The species and DBH of each tree was recorded as well as the radius of the search site (i.e. the distance to the tree furthest from the centre tree). Incidental observations of koala scratch marks, pellets outside of the survey area and/or urine stains were recorded, if present.

Additional field data were collected consistent with the approach undertaken in neighbouring areas of NSW (NSW OEH, in prep.). The accessibility of sites (e.g. their distance from walking or vehicle tracks) was considered in prioritising sites for survey.

4 Results

In total, 42 sites were surveyed for signs of koala presence (Table 1). As 30 trees were surveyed per site, the total number of trees surveyed was 1,260. No koalas or evidence of koala habitation (such as scats or characteristic scratch marks) were found.

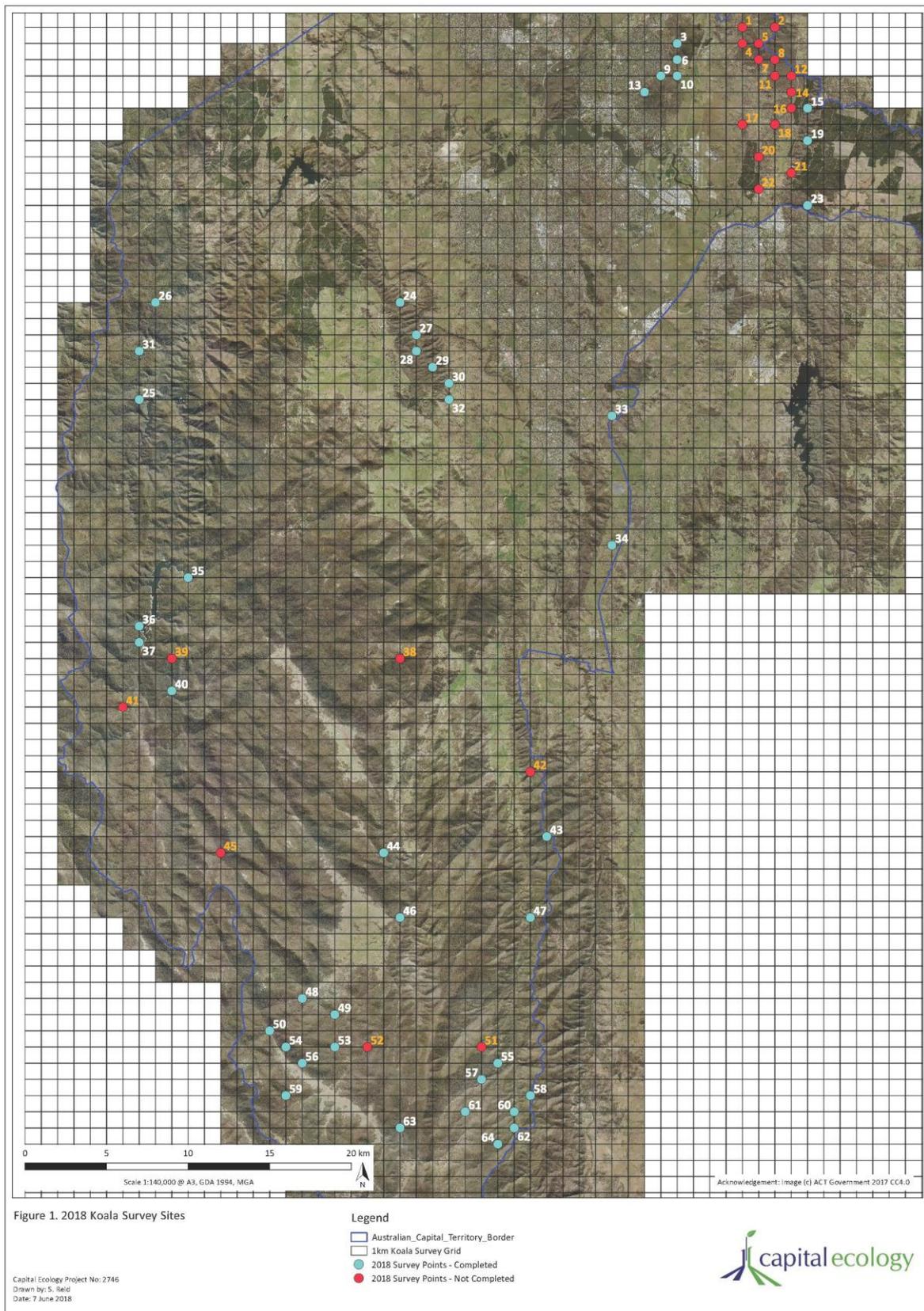
Capital Ecology classified each survey site's quality/potential as koala habitat. This classification was based on eucalyptus species, vegetation structure (the presence and condition of strata), and the overall intactness of the vegetation within and surrounding the survey site. This information is included in Table 1. In general, lowland survey sites were classified as low to moderate, while those sites located in more remote and undisturbed areas were classified as moderate to high.

Table 1. Survey site summary.

Site ID	Date Surveyed	Easting	Northing	Dominant Eucalyptus Species	Koala Habitat Quality/Potential
3	1/06/2018	698000	6098000	<i>E. rossii</i> <i>E. mannifera</i>	Moderate
6	1/06/2018	698000	6097000	<i>E. bridgesiana</i> <i>E. melliodora</i>	Low
9	1/06/2018	697000	6096000	<i>E. polyanthemos</i>	Low
10	1/06/2018	698000	6096000	<i>E. rossii</i>	Moderate
13	1/06/2018	696000	6095000	<i>E. rossii</i>	Moderate
15	25/05/2018	706000	6094000	<i>E. macrorhyncha</i> <i>E. polyanthemos</i> <i>E. rossii</i>	Moderate
19	25/05/2018	706000	6092000	<i>E. macrorhyncha</i> <i>E. rossii</i>	Moderate
23	25/05/2018	706000	6088000	<i>E. macrorhyncha</i>	Low
24	29/03/2018	681000	6082000	<i>E. rossii</i>	Moderate
25	9/05/2018	665000	6076000	<i>E. dalrympleana</i> <i>E. radiata</i>	High
26	9/05/2018	666000	6082000	<i>E. dalrympleana</i> <i>E. viminalis</i>	High
27	29/03/2018	682000	6080000	<i>E. nortonii</i> <i>E. polyanthemos</i> <i>E. rossii</i>	Moderate
28	29/03/2018	682000	6079000	<i>E. macrorhyncha</i> <i>E. rossii</i>	Moderate
29	29/03/2018	683000	6078000	<i>E. polyanthemos</i>	Low
30	29/03/2018	684000	6077000	<i>E. polyanthemos</i>	Low
31	9/05/2018	665000	6079000	<i>E. viminalis</i>	High
32	29/03/2018	684000	6076000	<i>E. melliodora</i>	Low
33	25/05/2018	694000	6075000	<i>E. rossii</i>	Moderate
34	25/05/2018	694000	6067000	<i>E. nortonii</i> <i>E. rossii</i>	Low
35	19/04/2018	668000	6065000	<i>E. radiata</i> <i>E. viminalis</i>	High
36	19/04/2018	665000	6062000	<i>E. viminalis</i>	High
37	19/04/2018	665000	6061000	<i>E. radiata</i> <i>E. viminalis</i>	High

Site ID	Date Surveyed	Easting	Northing	Dominant Eucalyptus Species	Koala Habitat Quality/Potential
40	19/04/2018	667000	6058000	<i>E. radiata</i> <i>E. viminalis</i>	High
43	13/04/2018	690000	6049000	<i>E. pauciflora</i> <i>E. dalrympleana</i>	High
44	3/05/2018	680000	6048000	<i>E. viminalis</i>	High
46	3/05/2018	681000	6044000	<i>E. viminalis</i>	High
47	13/04/2018	689000	6044000	<i>E. bridgesiana</i> <i>E. melliodora</i> <i>E. radiata</i>	Moderate
48	3/05/2018	675000	6039000	<i>E. radiata</i> <i>E. viminalis</i>	High
49	2/05/2018	677000	6038000	<i>E. dalrympleana</i> <i>E. radiata</i> <i>E. viminalis</i>	High
50	2/05/2018	673000	6037000	<i>E. dalrympleana</i> <i>E. pauciflora</i>	High
53	2/05/2018	677000	6036000	<i>E. viminalis</i>	High
54	2/05/2018	674000	6036000	<i>E. dalrympleana</i>	High
55	13/04/2018	687000	6035000	<i>E. bridgesiana</i> <i>E. radiata</i>	Moderate
56	2/05/2018	675000	6035000	<i>E. dalrympleana</i> <i>E. viminalis</i>	High
57	13/04/2018	686000	6034000	<i>E. bridgesiana</i> <i>E. dalrympleana</i>	High
58	6/04/2018	689000	6033000	<i>E. viminalis</i>	High
59	2/05/2018	674000	6033000	<i>E. viminalis</i>	High
60	6/04/2018	688000	6032000	<i>E. viminalis</i>	High
61	2/05/2018	685000	6032000	<i>E. dalrympleana</i> <i>E. radiata</i>	High
62	6/04/2018	688000	6031000	<i>E. pauciflora</i> <i>E. viminalis</i>	High
63	3/05/2018	681000	6031000	<i>E. viminalis</i>	High
64	6/04/2018	687000	6030000	<i>E. viminalis</i>	High

Figure 1. 2018 Koala Survey Sites



5 Discussion

Capital Ecology was commissioned by ACT Conservation Research to perform surveys for koala throughout the ACT. No koalas or signs of koala habitation (such as scats or characteristic scratch marks) were found.

While the results of these surveys suggest that there are no koalas in the ACT, it must be noted that a relatively small number of sites (42) and trees (1,260 in total) were surveyed. While the best possible survey sites were selected for this study (based on appropriate food species, low fire damage history and proximity to water), it is possible that koalas are present in the ACT and were not detected. In terms of limitations of the methodology employed during these surveys, the 'Regularised Grid-based Spot Assessment Technique' (RG-bSAT) requirement that survey sites be located at the intersection of predetermined grid lines often precluded looking in nearby, potentially higher quality areas.

If further surveys are required, Capital Ecology recommends acoustic surveys be completed during the breeding season at those survey sites identified in this report as 'high' koala habitat quality/potential. This method could survey a wider area over a longer period of time and would be a more robust manner in which to determine koala presence/absence in areas where the species is likely to occur at only low population density.

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