

Forest Winds- Phase 1 Koala Survey Report



Prepared for Forest Wind Pty Ltd.

**By University of the Sunshine Coast, Detection Dogs for
Conservation**

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Introduction

Scope of works

The University of Sunshine Coast, Detection Dogs for Conservation team was contracted to conduct koala surveys in areas proposed for a high voltage transmission line associated with a windfarm, to meet environmental approval requirements. The surveys were conducted to determine and map whether there are signs of koala presence within the proposed area of overhead transmission corridor and proposed access track and the transmission line corridor.

Methodology

Detection dogs are a powerful method to study koala presence / absence. Upon arrival at the survey sites ecological characteristics that might influence the detectability and decay of scats are recorded (e.g. wet areas will increase decay rates; therefore, scats will be detectable for a shorter amount of time). The detection dog was then fitted with a GPS collar, motivated with a tennis ball and given the command to search.

Systematic koala scat survey

The survey protocol followed the Koala Rapid Assessment Method (KRAM), which was adapted for use with a detection dog as per Cristescu et al. (2015). At each survey site, a random survey point was chosen and 30 trees in the vicinity of this point, with a diameter at breast height of more than 10 cm was searched for the presence of koala scats using trained detection dog Baxter. When scats were found, the number of scats within a one square meter quadrat, their age category (Table 1) and their size (based on scat width, Figure 2) were recorded as well as their GPS coordinates (GDA94). When only one size of scat and age class (see classification below) is present, the tree is considered less used than when scats of different age classes (indicative of repetitive visits) and sizes (indicative of different individuals) are present. The age of scats allowed us to classify sites as recently used or not.

At sites where systematic surveys were conducted, the habitat utilisation was described in terms of activity level (Phillips and Callaghan 2011), which was calculated by dividing the number of trees with scats by the total number of trees searched at the site.

Casual koala scat survey

The casual surveys are an excellent and fast way to determine whether koalas are present at a specific site. In the casual surveys, the dog is not constrained by the handler, and can follow its nose roaming over an area of up to two hectares within an approximate 30-minute timeframe, or until the handler deems the search to have covered the site thoroughly. The search duration is usually less than 30 minutes, and can be as short as a couple of minutes if koala scats are detected. The start point of the survey can be determined by the handler, or ecology team depending on terrain, vegetation cover and or targeted area of interest. The same scat details (age and size of scats) recorded for systematic surveys were recorded for casual surveys.

Scat Identification

Typical koala scats (Figure 1) have the following characteristics (Triggs 1996):

- symmetrical and bullet-shaped (not jelly-bean shaped);
- generally about 1.5 cm long by 0.5 cm wide (adult koala scat size);
- even-sized and especially fine particles;
- absence of insect parts (koalas do not eat insects); and
- very compact.



Figure 1 Typical koala scat shape found in the field

If the scat survey is positive (i.e. koala scats were detected at the site), the handler will proceed to the next survey site scheduled.

Table 1 Guide used to age koala scats in the field

Scat age categories	Days	Characteristics
1	1 day old or less	Very fresh (covered in mucus, wet)
2	Couple of days old	Fresh (shine and smell)
3	Couple of weeks	Medium fresh (shine or smelly when broken)
4	Months old	Old (no shine, no smell)
5	More than a few months	Very old and discoloured



Figure 2 Example of different koala scat sizes (width)

Incidental records

Researchers conducting the surveys were on the lookout for opportunistic / incidental spotting of koala scats and koalas.

When koalas / koala scats are located during opportunistic surveys, photographs of the animals / scats are taken. External signs of chlamydia infection, often referred to as *pink eyes* (for ocular infection / conjunctivitis) and *wet bottom* (for urinary tract infection) are recorded if seen.

Health and safety

The detection dogs work under strict Animal Ethics approvals (USC: ANA16113, ANA1494 and ANS1752) and QLD Government wildlife permits allowing the DDC to perform koala surveys using detection dogs and collect scats for genetic analysis (SPP WIF418590017, WISP18590117 and WITK18570117).

Limitations

The rate at which scats decay may vary significantly between sites due to varying ground layer structure, composition, moisture, sunlight, local weather events and invertebrate activity (Rhodes et al. 2011a, Cristescu et al. 2012). Decomposed scats may lose their unique scent mark and the dog may no longer detect it – however this has not been proven yet (Cristescu et al. 2015).

Failure to detect koala scats in an area does not necessarily indicate koalas are not using the area. Failure to detect koala scats may suggest either of the following:

- Koalas are not present in the area (i.e. true absence);
- Koalas occur in the area, however, scats were not detected (false negative) because:
 - scats were present at some stage but decayed and disappeared from the environment before the survey was conducted,
 - the dog did not detect the scat; and/or, the dog indicated the presence of a scat, but it was too decayed (fragments only, no scat)

Survey site and conditions

Surveys were carried out on the 25th-26th June 2019 in Neerdie State Forest 2. Access was obtained via Anderleigh Rd and Neerdie Rd by 4WD or on foot from tracks.

The team tried to cover the area as much was accessible. The terrain was relatively even, however some areas were too densely vegetated by Lantana to be surveyed by the detection dog and handler. In such cases, the team searched the closest area that was accessible.

On both days the weather conditions were variable. The team experienced intermittent showers to heavy down pour forcing teams to delay and or pause surveys. This resulted in substantial time delays, moreover the rains could also have contributed to the rapid decay of scats.

Survey Results

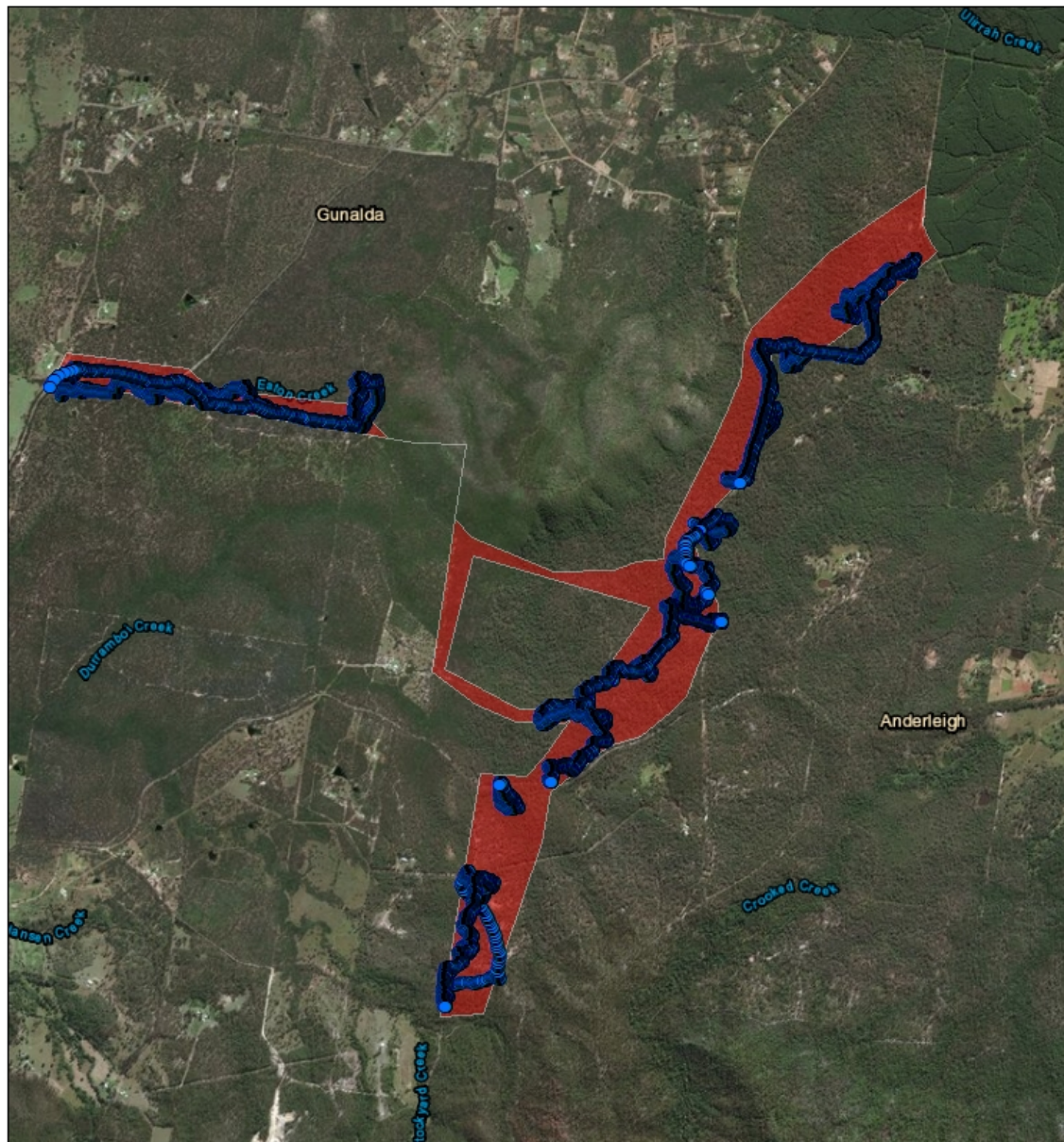
Handler and detection dog conducted searches at 28 sites over two days, covering as much of the survey area as possible (Figure 3). This consisted of 14 systematic surveys and 14 casual surveys (Table 2; Figure 4). Across surveys, the team found scats at a total of 6 survey site (Table 3). Across systematic surveys three scats were found at two locations, and during casual surveys 10 scats were found at four locations (Table 3). This suggests an estimated occupancy level of 22% of the area surveyed. Where systematic surveys were conducted, we estimated habitat utilisation to be low: between 0-6%. The age of scats found ranged from age category 2-5, suggesting variability in the time frames that koalas were present (Table 3; Figure 5).

Table 2 Location and type of survey conducted and whether koala scat was present

Survey Code	Survey Date	Easting	Northing	Scat Presence?	Survey type
190625BA1	25/06/2019	465253	7125497	Yes	Systematic
190625BA2	25/06/2019	465284	7125469	No	Casual
190625BA3	25/06/2019	465487	7125870	No	Systematic
190625BA4	25/06/2019	465510	7125915	No	Casual
190625BA5	25/06/2019	465625	7126278	No	Systematic
190625BA6	25/06/2019	465635	7126245	No	Casual
190625BA7	25/06/2019	465788	7126626	No	Systematic
190625BA8	25/06/2019	465768	7126609	Yes	Casual
190625BA9	25/06/2019	466162	7126945	Yes	Systematic
190625BA10	25/06/2019	466146	7127020	Yes	Casual
190625BA11	25/06/2019	466517	7127174	No	Systematic
190625BA12	25/06/2019	465214	7125538	No	Casual
190625BA13	25/06/2019	465139	7125038	No	Systematic
190625BA14	25/06/2019	465100	7125129	No	Casual
190626BA1	26/06/2019	461257	7126530	Yes	Casual
190626BA2	26/06/2019	465043	7125070	No	Systematic
190626BA3	26/06/2019	465009	7125058	No	Casual
190626BA4	26/06/2019	465058	7124679	No	Systematic
190626BA5	26/06/2019	464857	7124680	Yes	Casual
190626BA6	26/06/2019	464597	7124331	No	Systematic
190626BA7	26/06/2019	464553	7124359	No	Casual
190626BA8	26/06/2019	464276	7124035	No	Systematic
190626BA9	26/06/2019	464025	7123788	No	Systematic
190626BA10	26/06/2019	463760	7123340	No	Casual
190626BA11	26/06/2019	463884	7123317	No	Systematic
190626BA12	26/06/2019	463812	7123333	No	Casual
190626BA13	26/06/2019	463746	7122893	No	Systematic
190626BA14	26/06/2019	463775	7122907	No	Casual

Table 3 Location of koala scats found during surveys

Survey Code	Survey type	Scat age	Easting	Northing
190625BA1	Systematic	4	465273	7125488
190625BA1	Systematic	4	465272	7125493
190625BA8	Casual	5	466154	7126887
190625BA9	Systematic	4	466172	7126931
190625BA10	Casual	4	466173	7127017
190626BA5	Casual	2	464503	7124440
190626BA1	Casual	3	461681	7126406
190626BA1	Casual	2	461743	7126361
190626BA1	Casual	3	461754	7126363
190626BA1	Casual	3	461765	7126360
190626BA1	Casual	3	461973	7126360
190626BA1	Casual	3	462109	7126383
190626BA1	Casual	3	463116	7126457



Legend

- Dog tracks
- Study Area

0 0.5 1 2 3 Kilometers



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Figure 3 Area searched by DDC handler and detection dog over two days

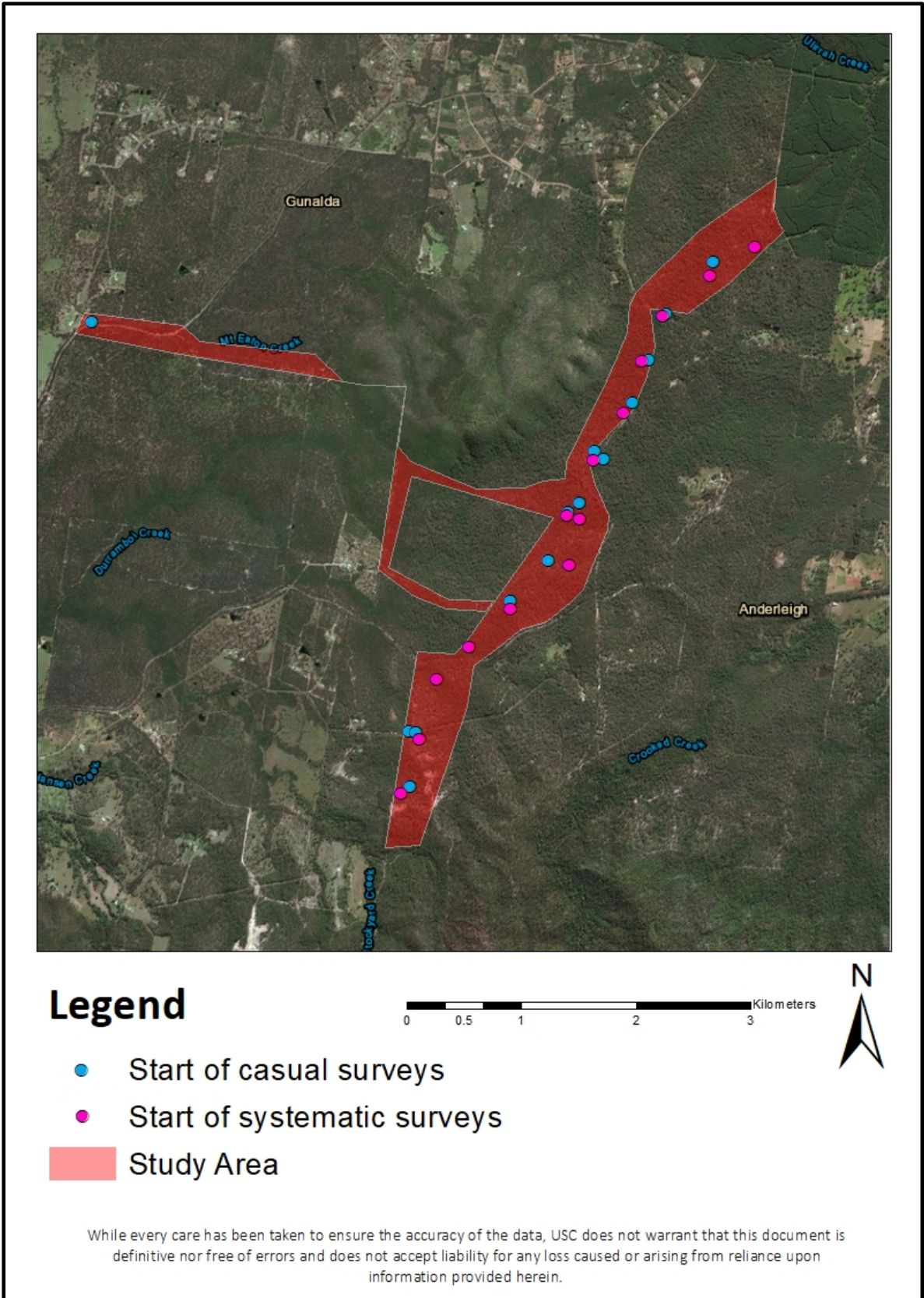
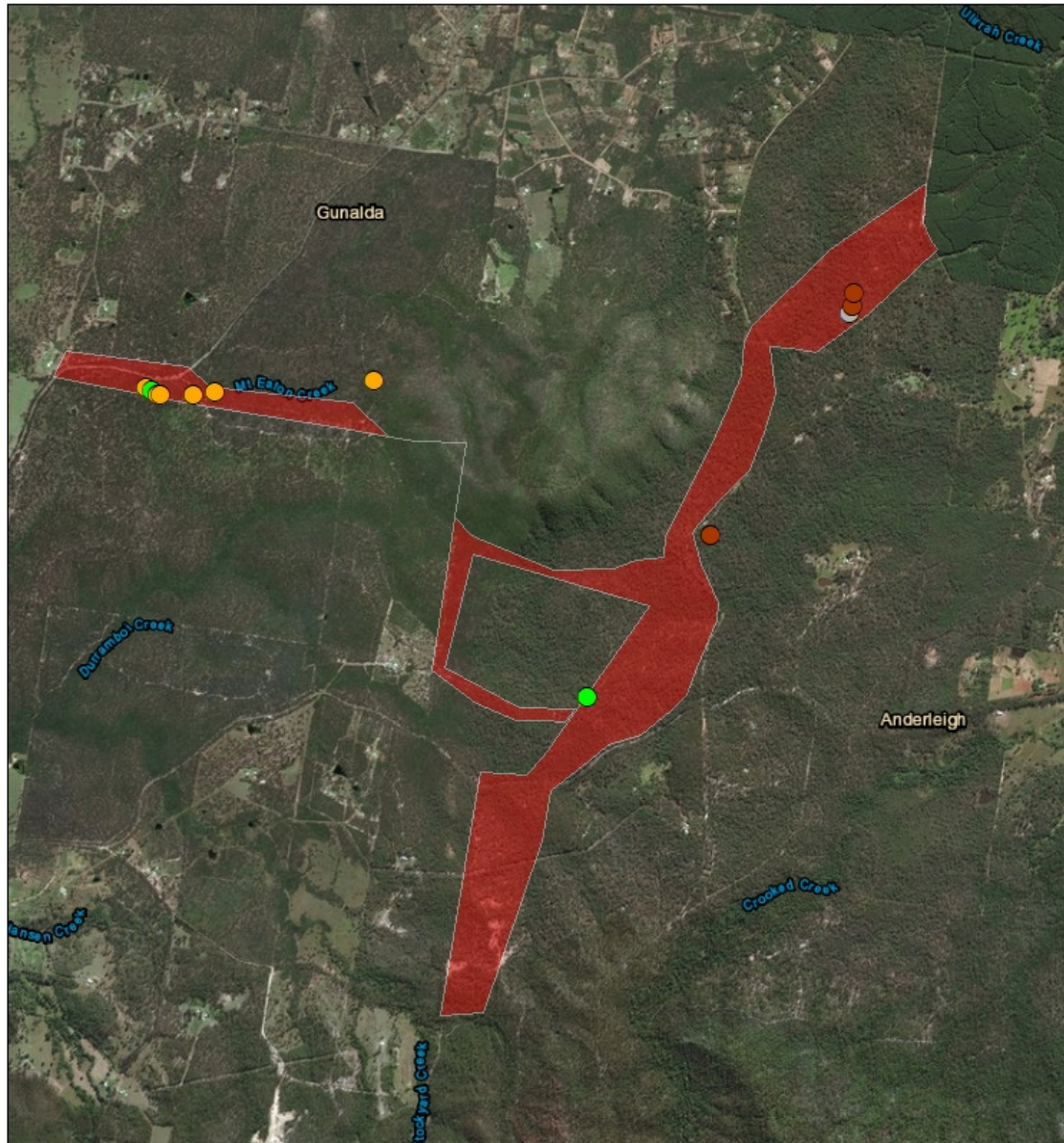


Figure 4 Start points of surveys conducted over the two days. Blue points indicate casual surveys, pink points indicate systematic surveys. Dog tracks in Figure 3 show extent of surveys.



Legend

Scat Age

- Fresh
- Medium Fresh
- Old
- Very Old
- Study Area

0 0.5 1 2 3 Kilometers

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Figure 5 Location and age of scats found during surveys.

Discussion/ Comments

From our findings it is certain koalas are present within the area of interest. The age range of scats found suggests that the area is used by koalas throughout the year, however the quantity of koala scats found, suggests koala activity level is low. The freshest scats were found in Neerdie State Forest 2, medium fresh scats were found close to and surrounding tracks off Neerdie Rd, while scats found north of Anderleigh Rd were categorised as old to very old (Figure 5).

As previously mentioned, various factors may influence the persistence of scats within the environment. During our surveys rain and dense vegetation made it difficult for the detection dog to search certain sites. For example, areas with high density of Lantana could only be searched around its perimeter. Heavy rain caused substantial delays resulting in a portion of the study area not being surveyed within the time frame (Figure 6). The rains could also have contributed to the degradation of scats and their scent, which could have impacted the search for the detection dog.

The current findings may not reflect variability according to seasons (i.e. weather and breeding) and with the data collected it is almost impossible to estimate koala population density without collecting genetic information. Extending searches and collecting genetic samples could provide a better understanding of population numbers and health.

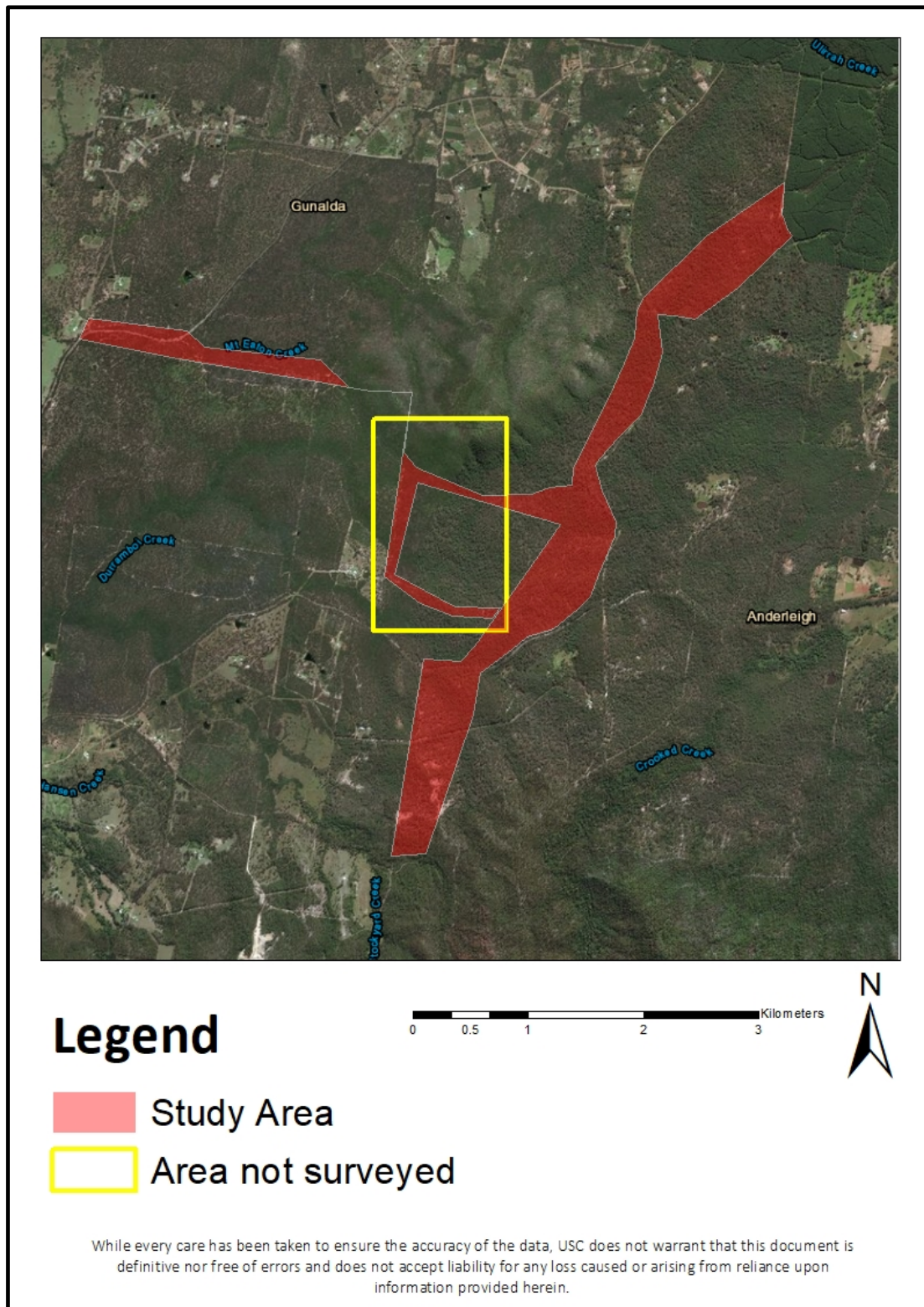


Figure 6 Highlighting areas that were not surveyed due to survey conditions resulting in time constraints



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