

Appendix D

Koala Detection Dog Survey Report

Koala survey using detection dogs

Beerburrum to Nambour Rail Upgrade



Prepared for Department of Transport and Main Roads

By Detection Dogs for Conservation, University of the Sunshine Coast

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1- Scope of works

The University of Sunshine Coast, Detection Dogs for Conservation (DDC) team was contracted by the Department of Transport and Main Roads (TMR) to conduct koala surveys using detection dogs across potential koala habitat within the proposed Beerburrum to Nambour Rail Upgrade (the Project) project area. The aim was to conduct casual surveys within the Project area to determine and map whether there were signs of koala presence, i.e. koala scats.

2- Methodology

2.1 Detection dogs and casual surveys

Detection dogs are a powerful method to study koala presence / absence, having been showed to be more accurate and efficient than human surveys to locate koala scats (Cristescu et al. 2015). We therefore used this methodology, which can lead to more robust data, and therefore more supported management decisions, for koala (Cristescu et al. 2019). Detection dog surveys were conducted within the Project area on 30th July 2020, 3rd August 2020 and 5th August 2020 using detection dogs Baxter and Maya. Both Baxter and Maya have been tested for accuracy and have conducted more than 2,500 koala scat surveys between them in their deployment thus far. The dogs were worked in parallel by their handler and covered different area at each site.

Upon arrival at the survey sites, ecological characteristics that might influence the detectability and decay of scats are recorded (e.g. wet areas and fire will increase decay rates; therefore, scats will be detectable for a shorter amount of time (Cristescu et al. 2012)).

The casual survey technique was used for this Project. The casual surveys are the fastest way to determine whether koalas are present at a specific site. In a casual survey, the dog is not constrained by the handler, and can freely follow its nose. Handlers focused their searches in areas with tree cover to maximise targeting potential koala habitat.

The detection dogs were fitted with a GPS collar to record the survey tracks and therefore record the search area. If a scat was found, age and size were recorded, and a GPS position taken. The age of koala scats is defined as per Table 1.

Table 1 Guide used to age koala scats in the field

Scat age categories	Age	Characteristics
1	One 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

2.2 Scat Identification

Typical koala scats (Figure 1, Figure 2) 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



Figure 2. Example of different koala scat sizes (width)

2.3 Incidental records

Researchers conducting the surveys also noted any opportunistic / incidental sightings of koalas and scats.

2.4 Permits

The detection dogs work under strict Animal Ethics approvals (USC: ANA16113, ANA18123, ANS1752) and Queensland Government wildlife permits allowing the DDC to perform surveys using detection dogs and collect scats for genetic analysis (SPP WIF418590017, WISP18590117 and WITK18570117). DDC undertook the surveys in accordance with a Letter of Authority and Permit to Collect granted to TMR from the Department of Science, valid until 31 August 2020, issued under Section 9 of the *Nature Conservation (Administration) Regulation 2017* and Section 131 of the *Nature Conservation (Protected Areas Management) Regulation 2017*, and Section 56 of the *Forestry Act 1959*.

2.5 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. Decomposed scats may lose their unique scent mark and the dog may no longer detect it – however this has not been proven yet.

Failure to detect 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) to be confirmed.

3 - Results

The detection dog teams covered a total transect length of approx. 34.2 km during the three days of surveys within the Project Area between Beerburrum and Landsborough in a total of 59 individual land parcels and adjoining vegetated areas, as determined by TMR. The survey tracks in each of the sites are presented in Figures 3 to 7. Note that in cases where the dog tracks (in yellow) do not cover the entire Project area (in red), this was due to either 1) no access permission, 2) area under water, 3) one area of thick bamboo, or no trees (vegetation had been removed between the time the aerial imagery was taken, and the time of the survey). There was no evidence of koala presence found during the surveys (no scat, or individual koala).

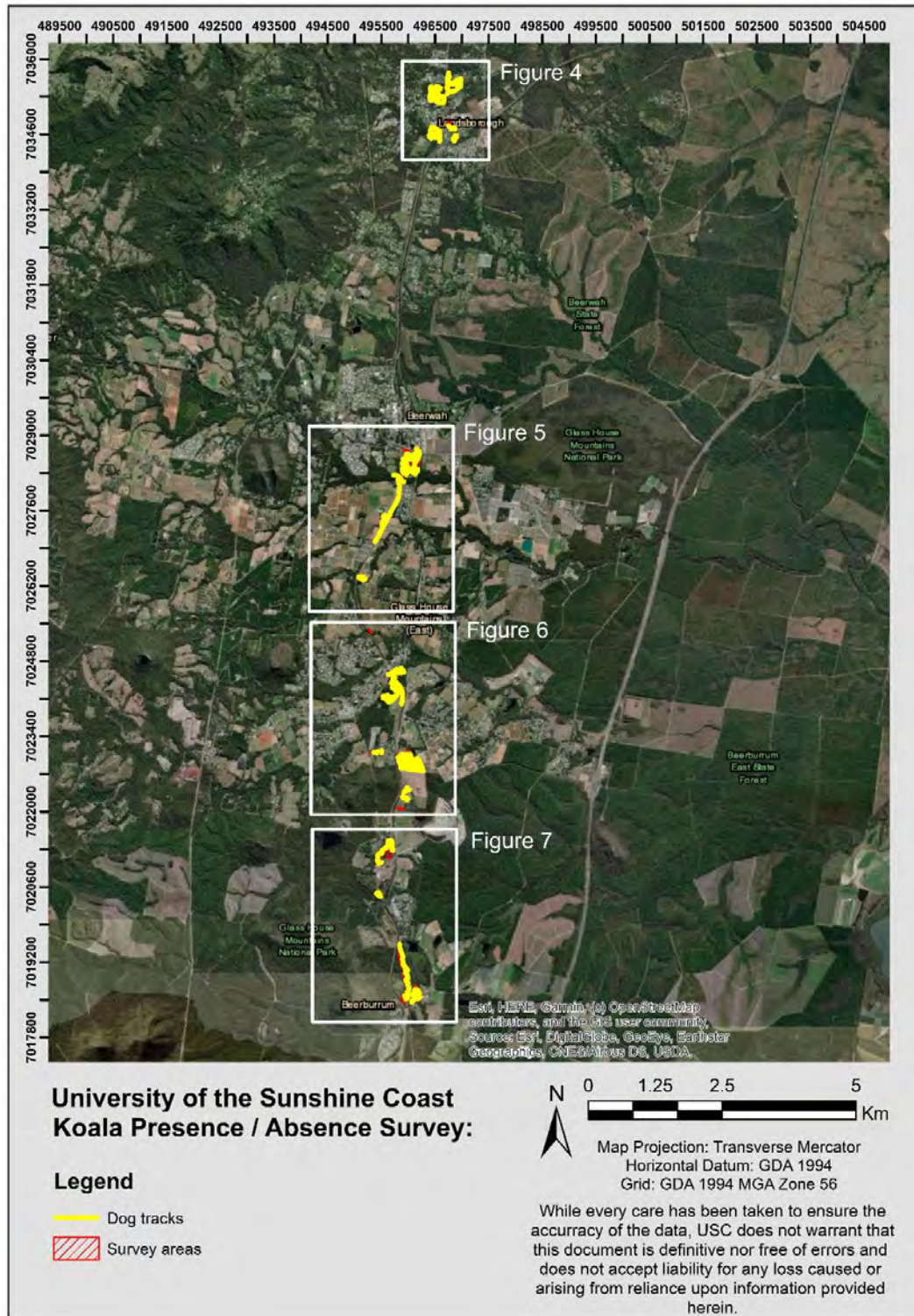


Figure 3. Koala scat survey using detection dogs over the course of the whole project.

Subsequent maps have been identified in white.

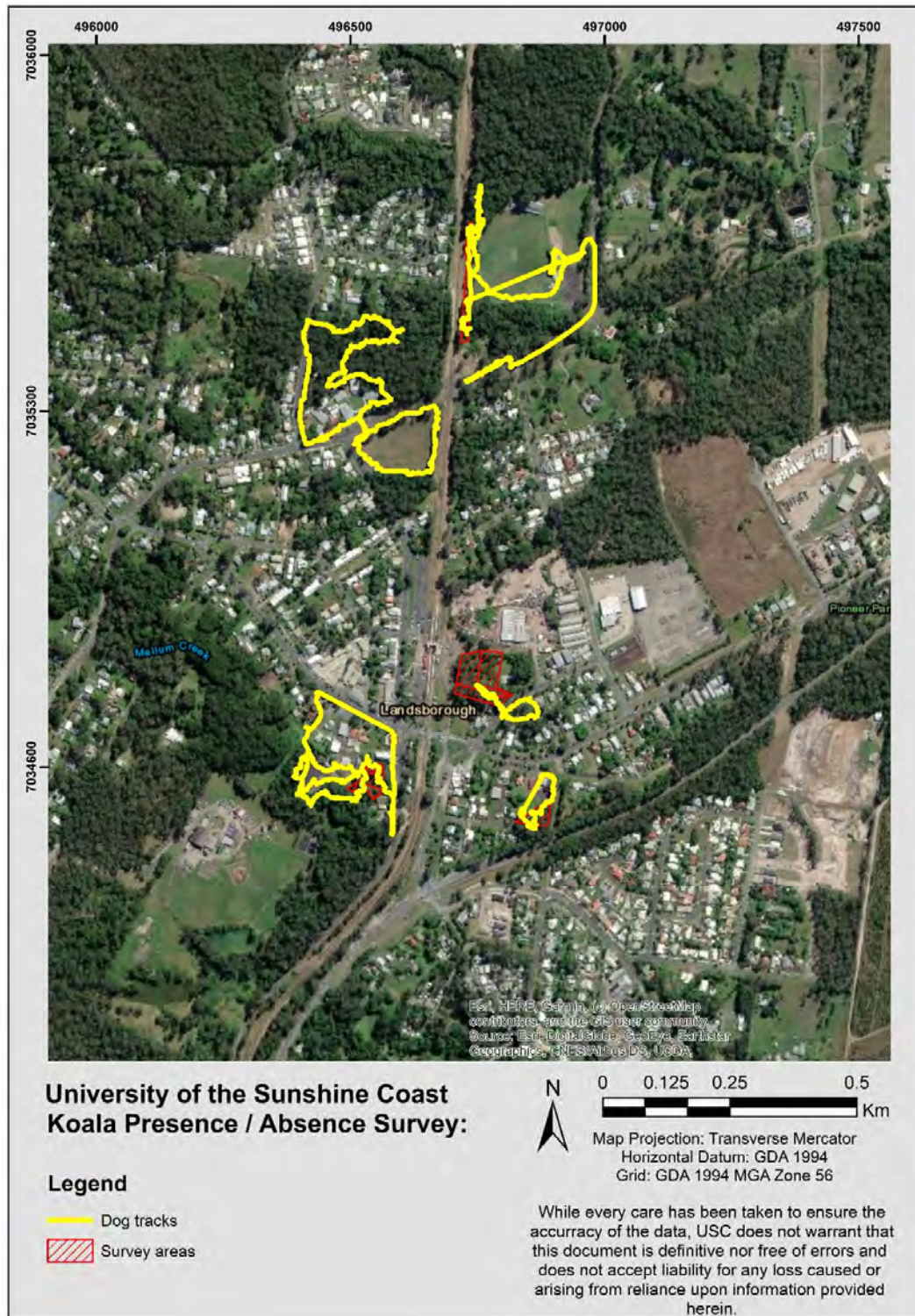


Figure 4. Koala scat survey using detection dog - Landsborough

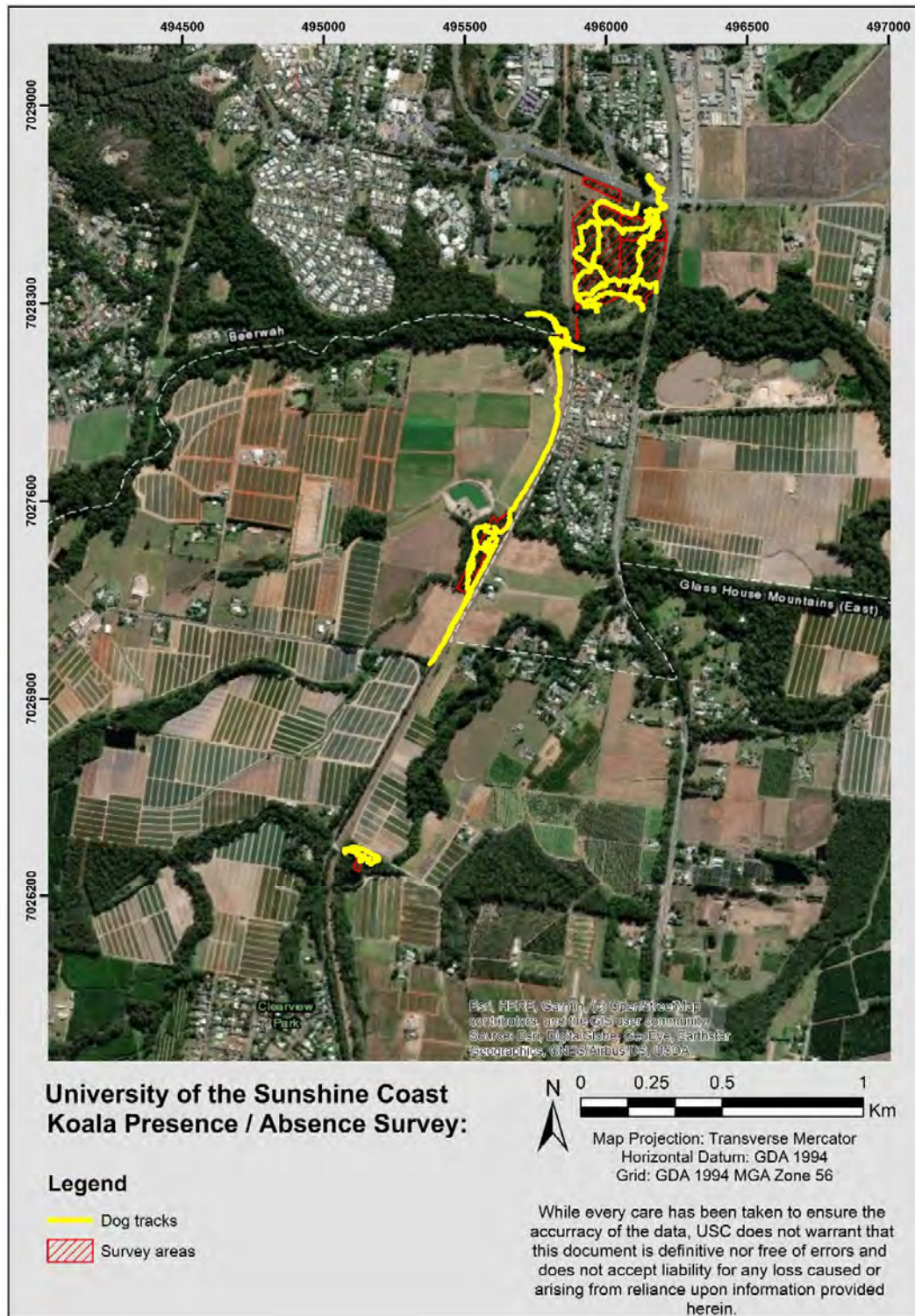


Figure 5. Koala scat survey using detection dog - Beerwah

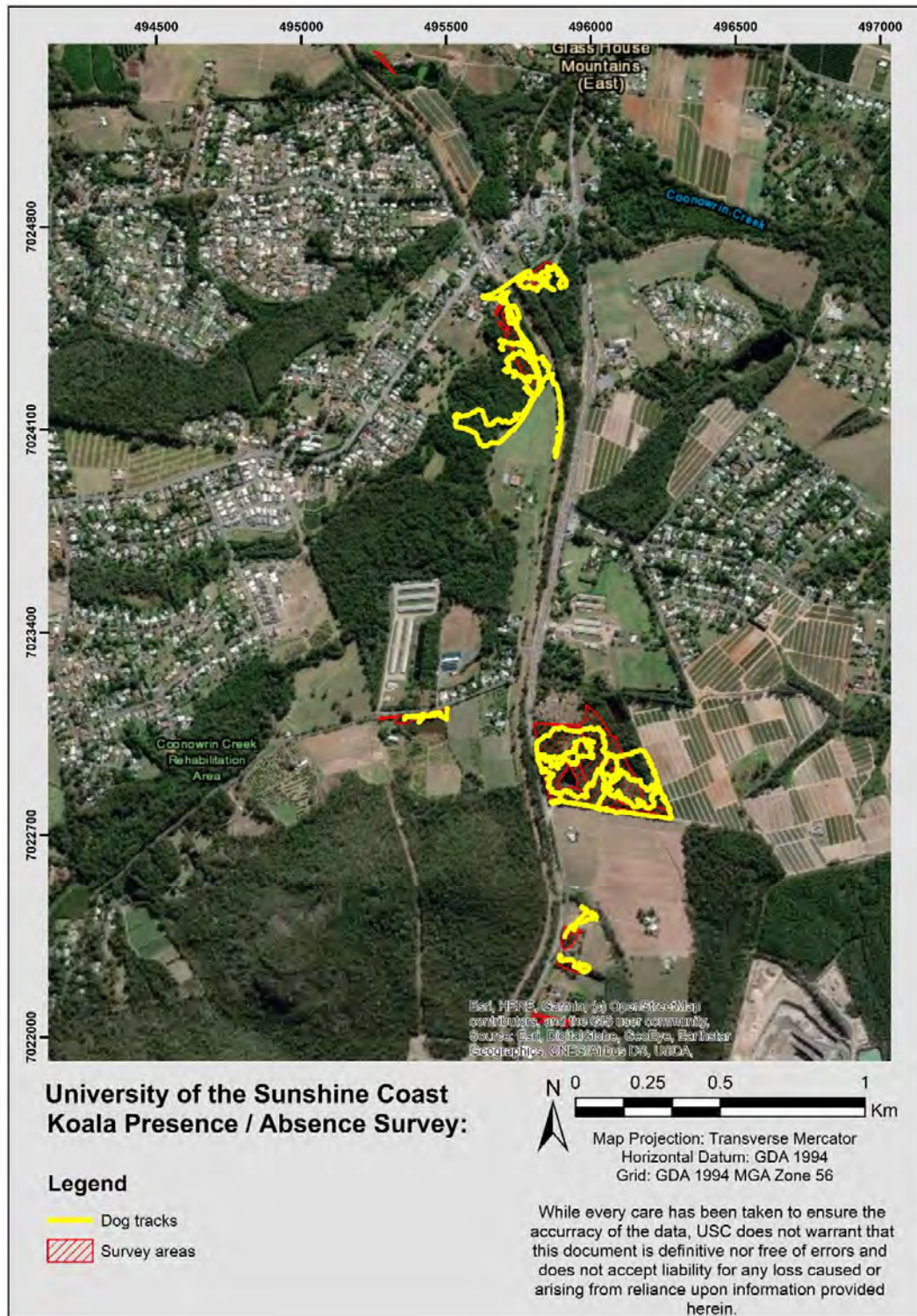


Figure 6. Koala scat survey using detection dog – Glasshouse Mountains

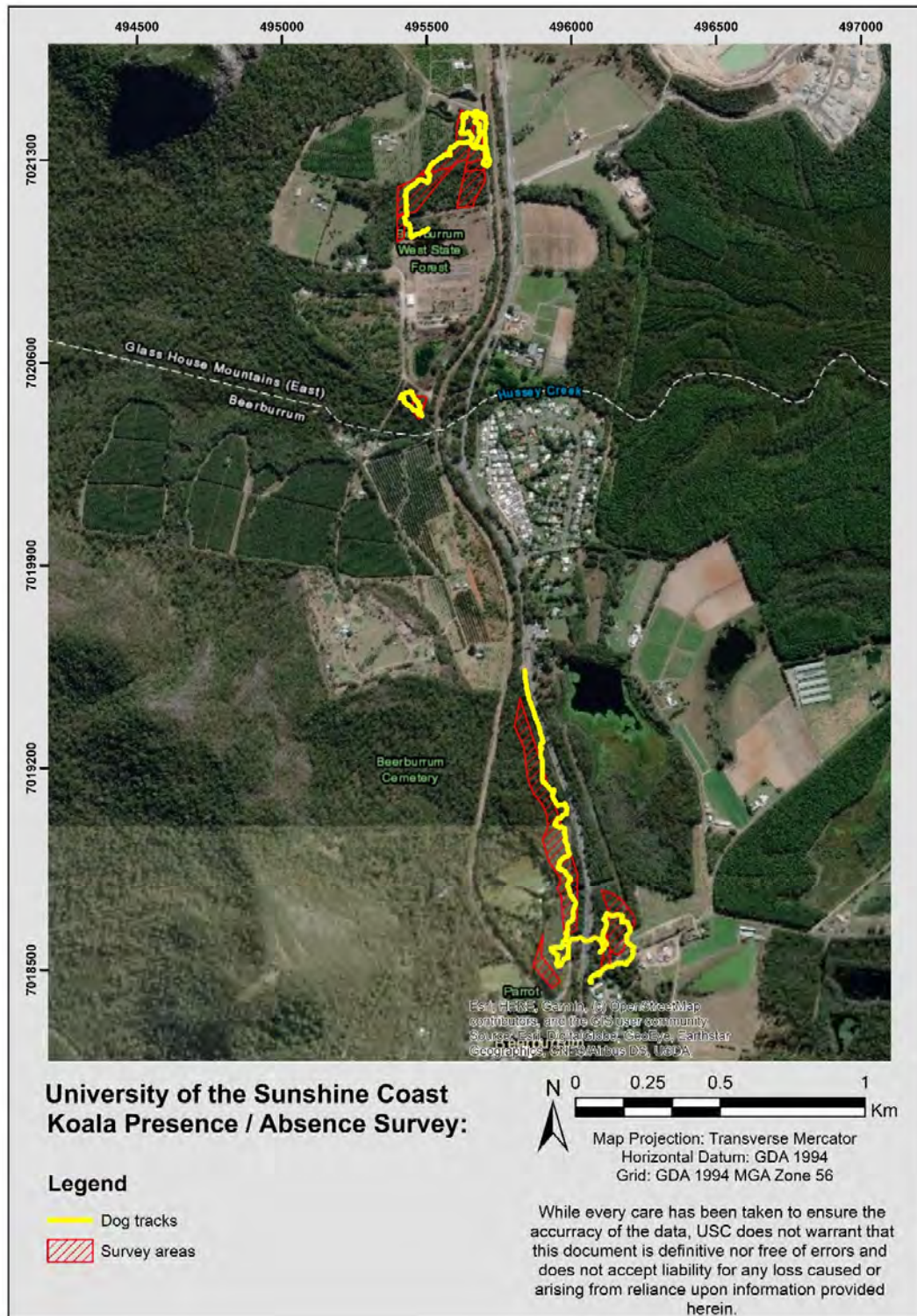


Figure 7. Koala scat survey using detection dog - Beerburum

3 - Discussion and Comments

Much of the habitat searched was densely vegetated, with significant amounts of ground cover that can limit air flow for detection dog search (refer to Figure 8). Several sites showed signs of fire and water logging which may cause rapid scat decay. However, taking these limitations into consideration, given the extensive coverage of the site and the use of detection dogs, from the absence of koala scats from any site, it is likely that koalas have not been in the area surveyed over the last several months. If koalas are present in the surrounding area, it's likely they occur in low densities.

During the survey the team noted evidence of wild dogs within the State Forest, which could represent a high level of threat to koalas - dog predation can cause native animal populations to decline. In one koala population, researchers found that dog predation was the primary cause of koala mortality (Beyer et al. 2018).

Note that the sites were surveyed on only one occasion; therefore, the presence / absence results presented in this report provide a snapshot of the koala use of the sites during this period and in recent past. Indeed, koala use of any area can change seasonally [as koala movements vary with time (Ellis, Melzer et al. 2009)]. However, the team had the opportunity to talk to a handful of landholders, the majority stating that they had not seen koalas in the surveyed area. For those who had spotted a koala, it was noted that this was not in a recent timeframe.



Figure 8. Typical vegetation in survey area.

4. References

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