Using Drones to Survey Koalas

In the Biamanga – Gulaga Landscape

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NSW Koala Strategy

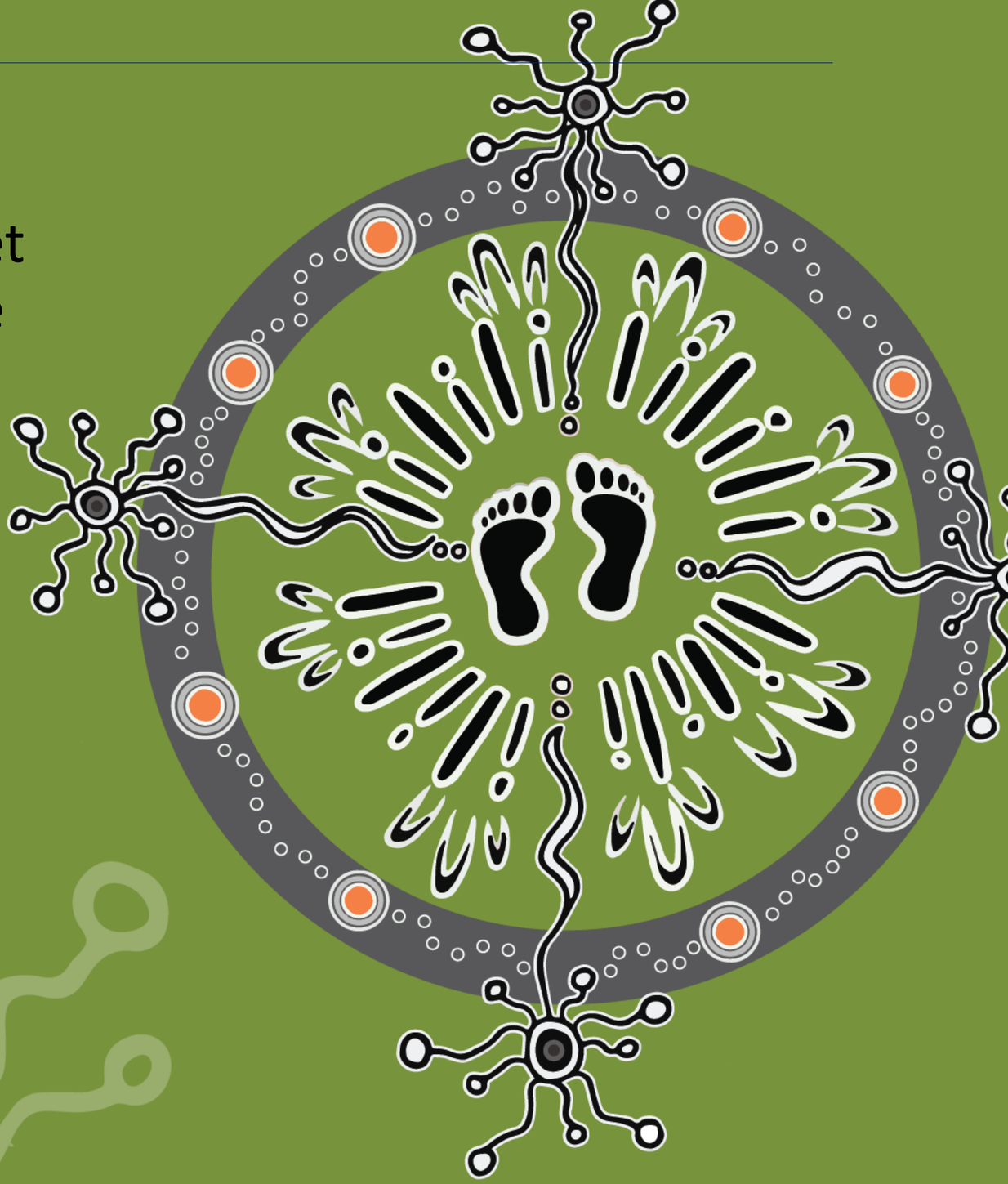
NSW GOVERNMENT

Acknowledgement of Country

We acknowledge that today we meet on the lands of the Djiringanj People of the Yuin Nation.

We acknowledge the Traditional Custodians of these lands and waterways.

We pay our respect to Elders past, present and emerging. We thank them for caring for these lands from deep time and continuing to look after Country today.



NSW GOVERNMENT

NSW Koala Strategy 2021 – 2026

The NSW Government is investing $193.3 million over 5 years towards doubling koala numbers in New South Wales by 2050.

Actions and opportunities under the Koala Strategy in priority locations

Habitat protection

Koala counts

Koala habitat restoration

Disease and population monitoring

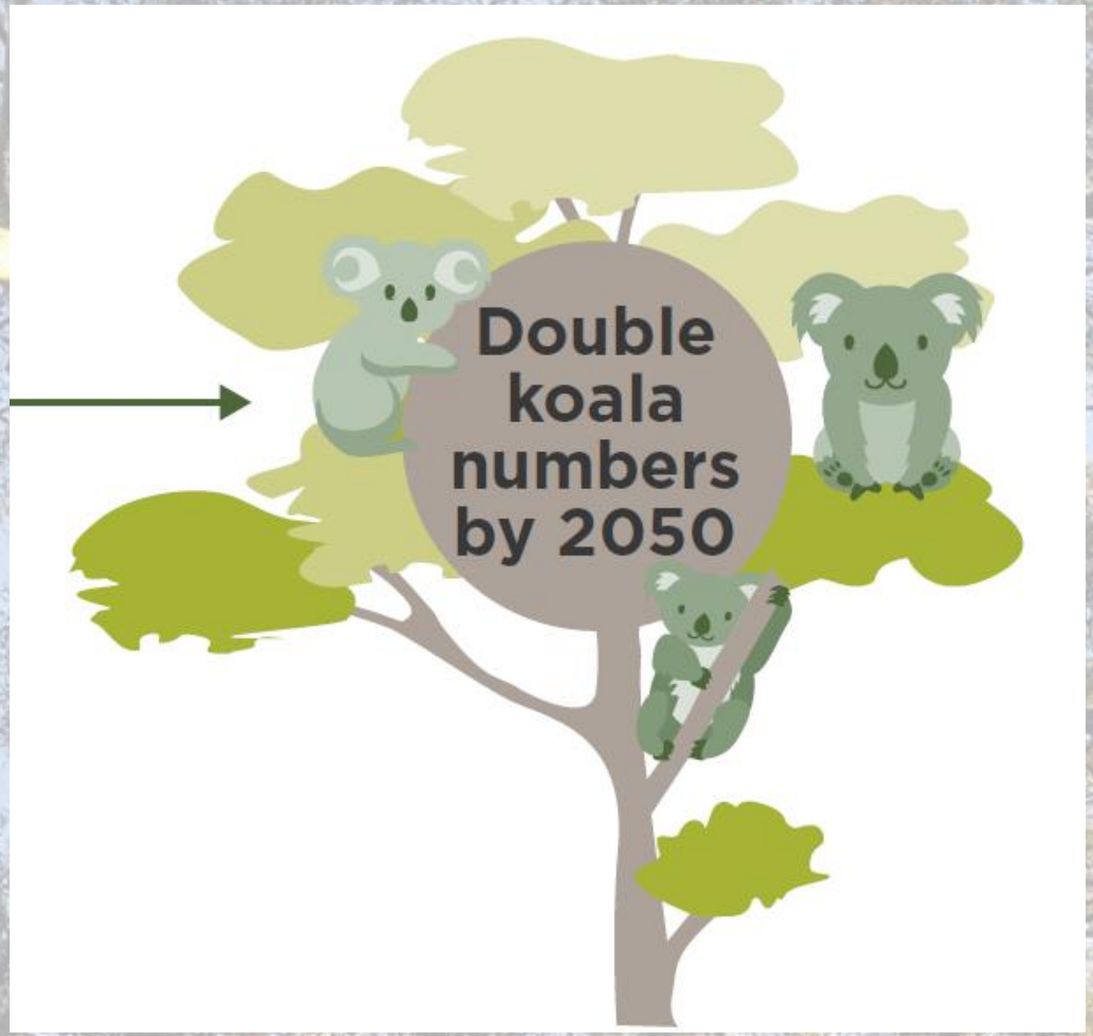
Regional partnerships

Research in areas of key knowledge gaps

Translocation

Addressing vehicle strike hot spots

Long term goals



Southern Yuin Partnership:

Working together on Koala Conservation in the Biamanga – Gulaga Cultural Landscape

Jess Bettanin & Dan Morgan

firesticks

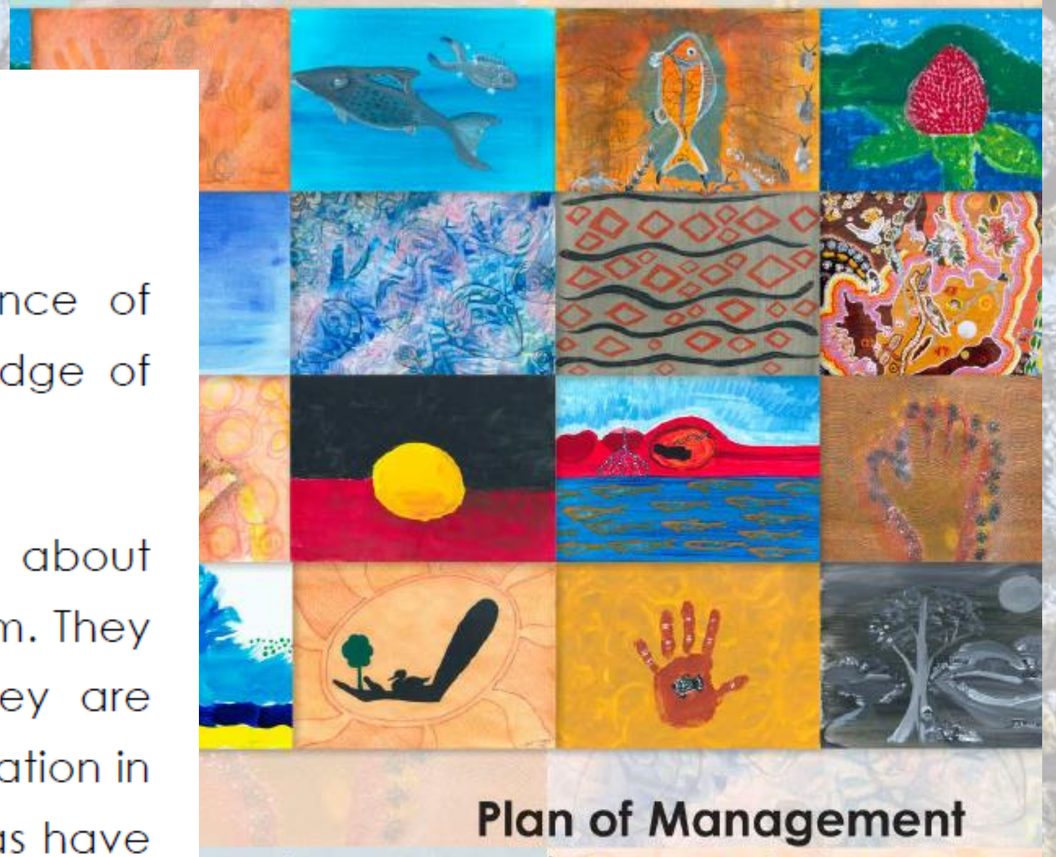
Cultural burning: healthy communities, healthy landscapes

Guraban / Gumbawaa

Things that we **DO** to manage native animals:

22. Within the Parks, survey the distribution and abundance of culturally important animal species to increase knowledge of the recovery of local populations.

23. The Boards will support efforts to improve knowledge about where koalas are and what Country is important for them. They will support monitoring programs that assess how they are going. The Boards will also support koala habitat rehabilitation in areas near to and between the Mountains so that koalas have more Country to expand into.



Koala Monitoring

Bega and Merrimans LALCS

firesticks

Cultural burning: healthy communities, healthy landscapes

ca.15 years of RGB-SAT surveys

Acoustic Monitoring

Programmed to record sounds in the forest at night. Deployed in koala breeding season.

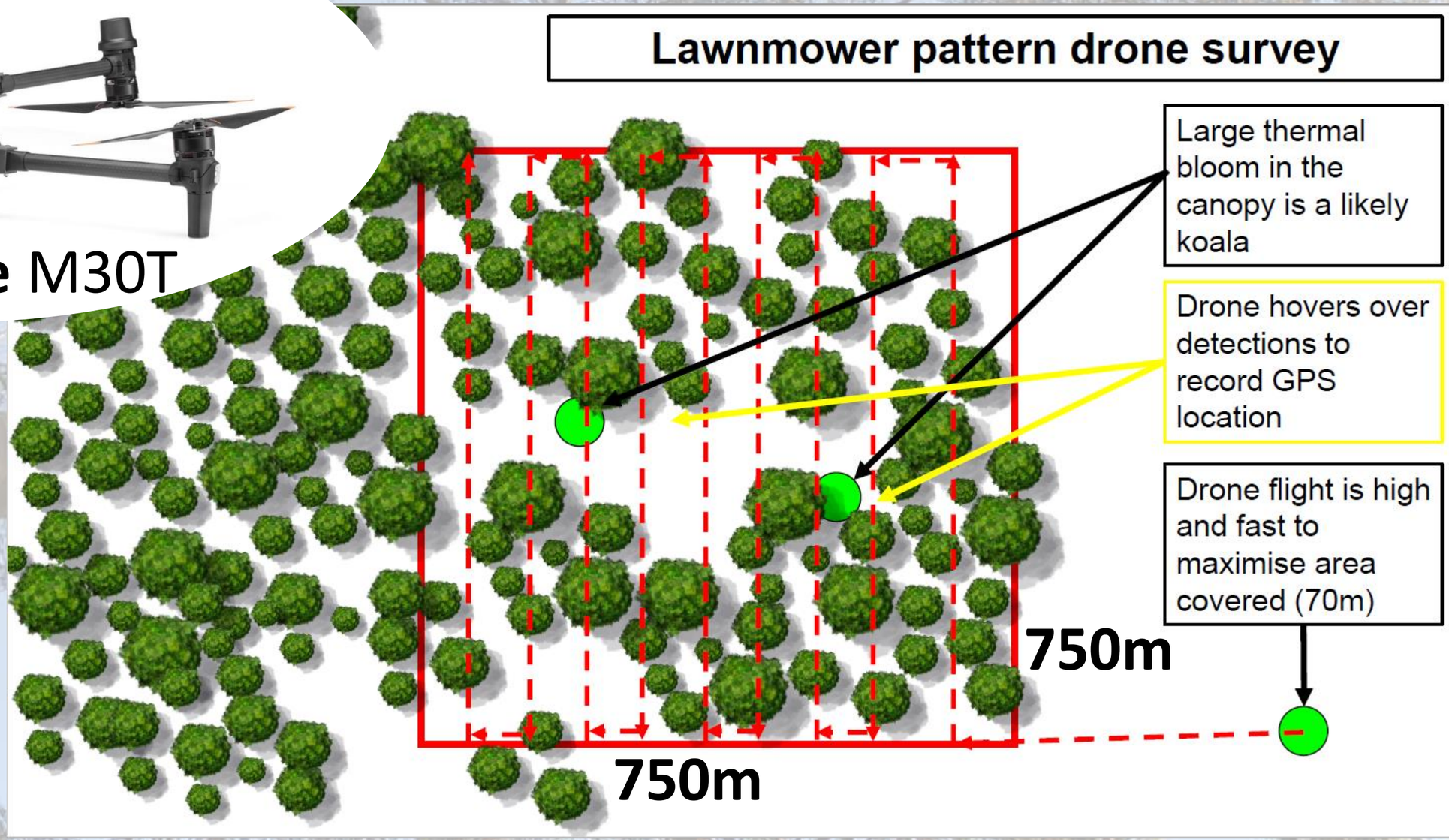
Need to process the data to identify koala bellows.

Used to determine Occupancy (*i.e.* presence / absence)

New way to find Koalas: Thermal Drones

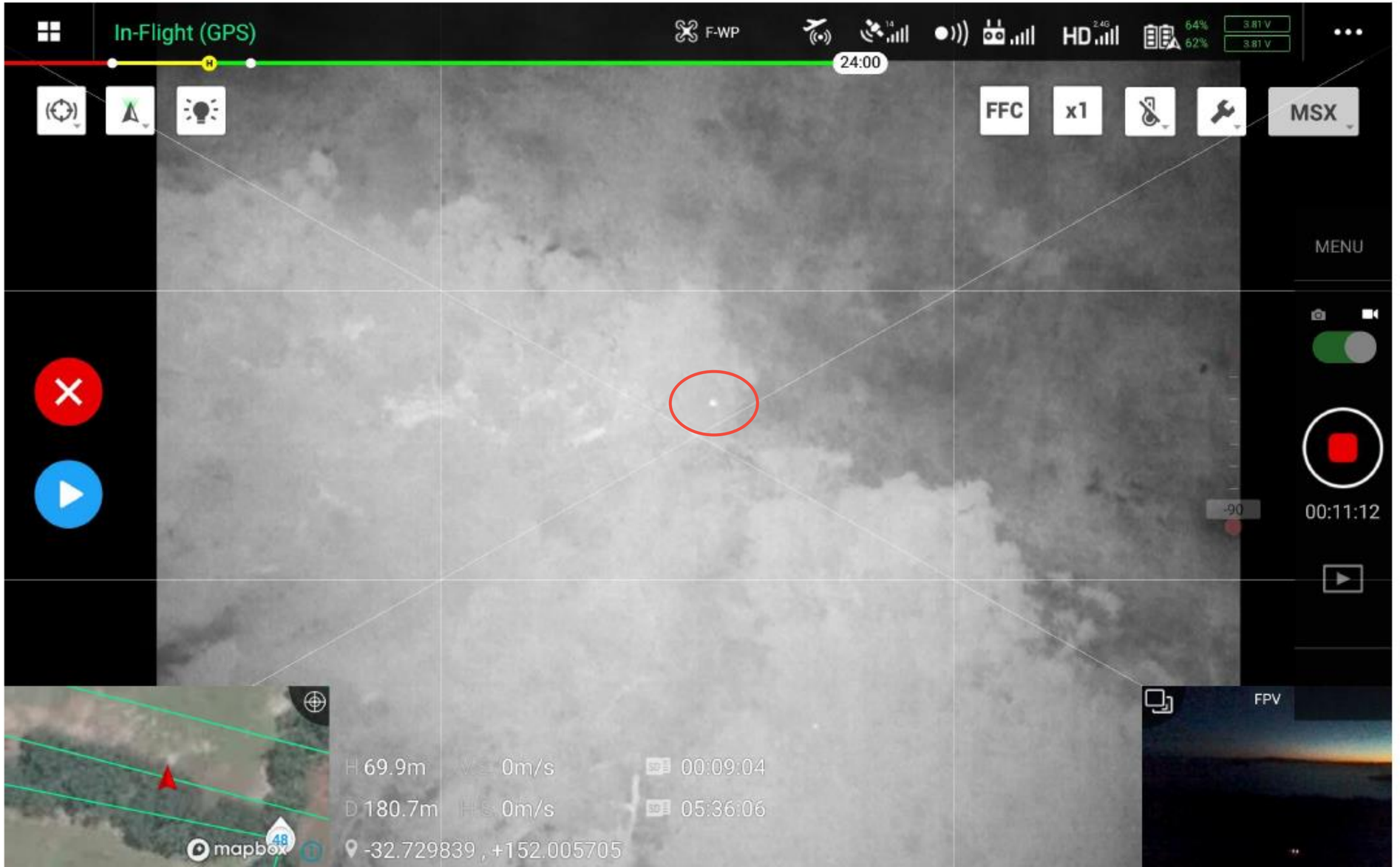
DJI Matrice M30T

DJI Mavic 2



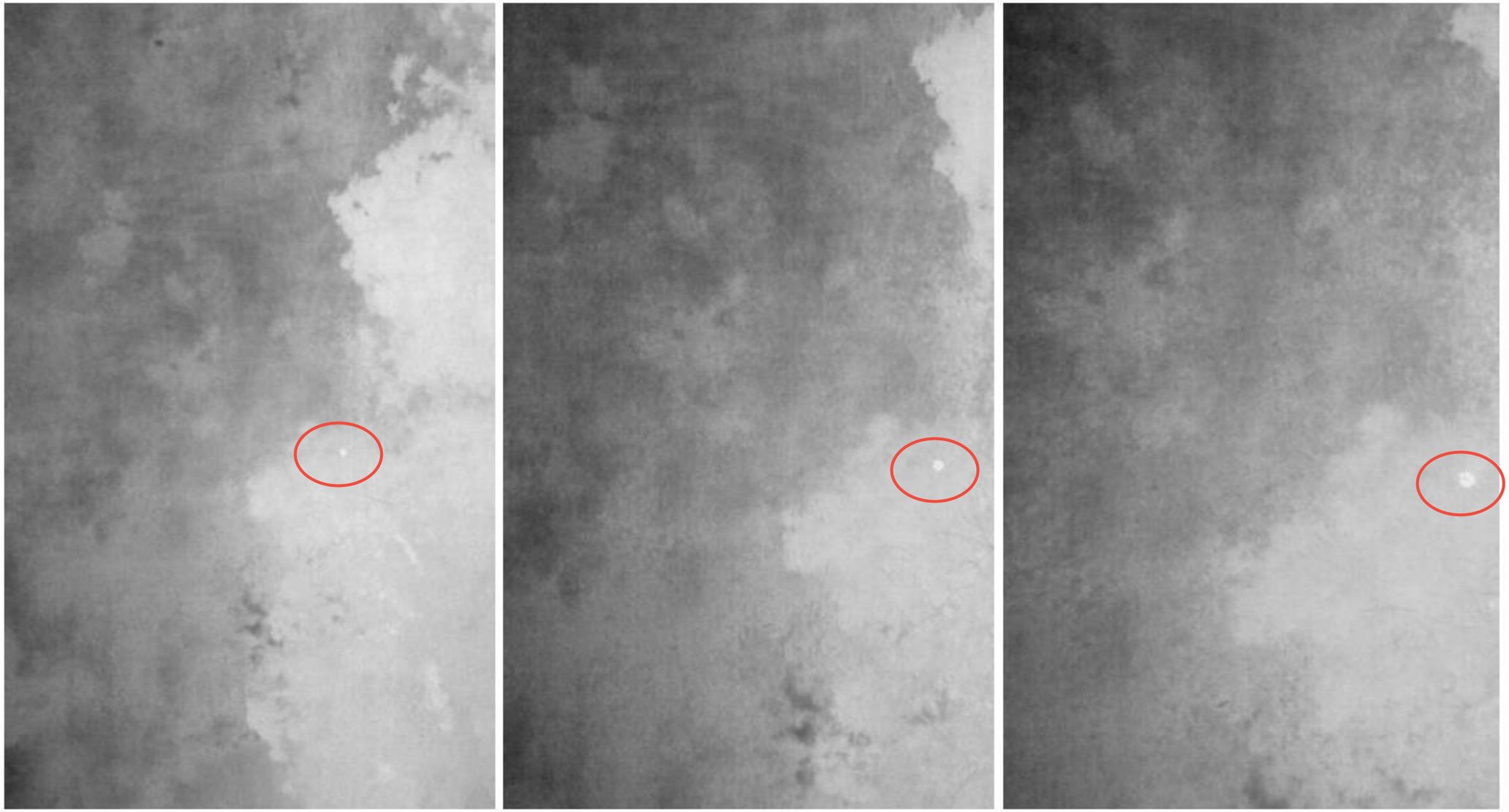
Footage:
Lachlan Hall & Sabrina Velasco

Large canopy thermal detection (koala?)



Altitude: 70m 50m 30m

- DJI XT2 thermal camera radiometric images
- Large thermal bloom in the canopy
- Various aircraft altitudes shown



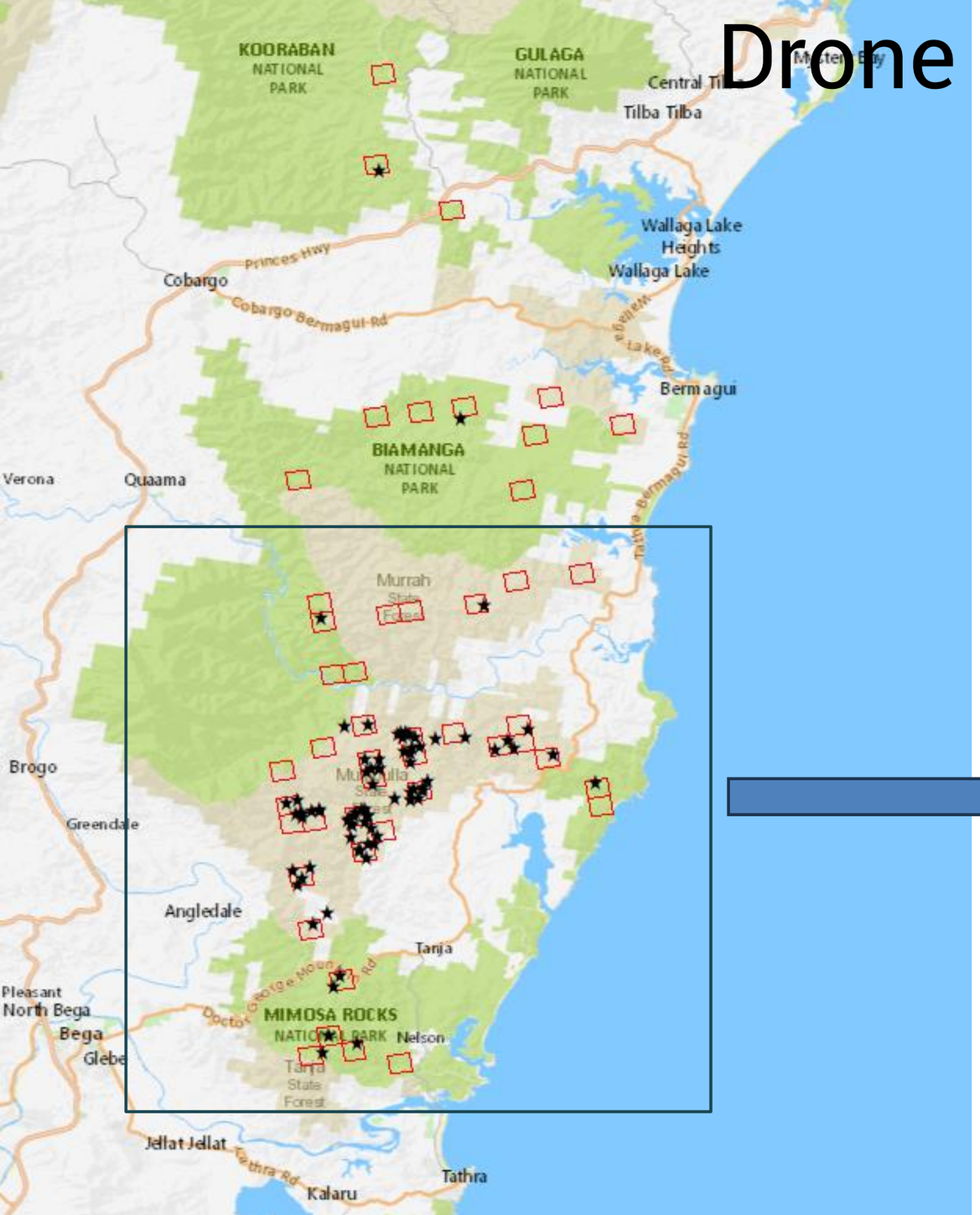
Colour image at 70m altitude

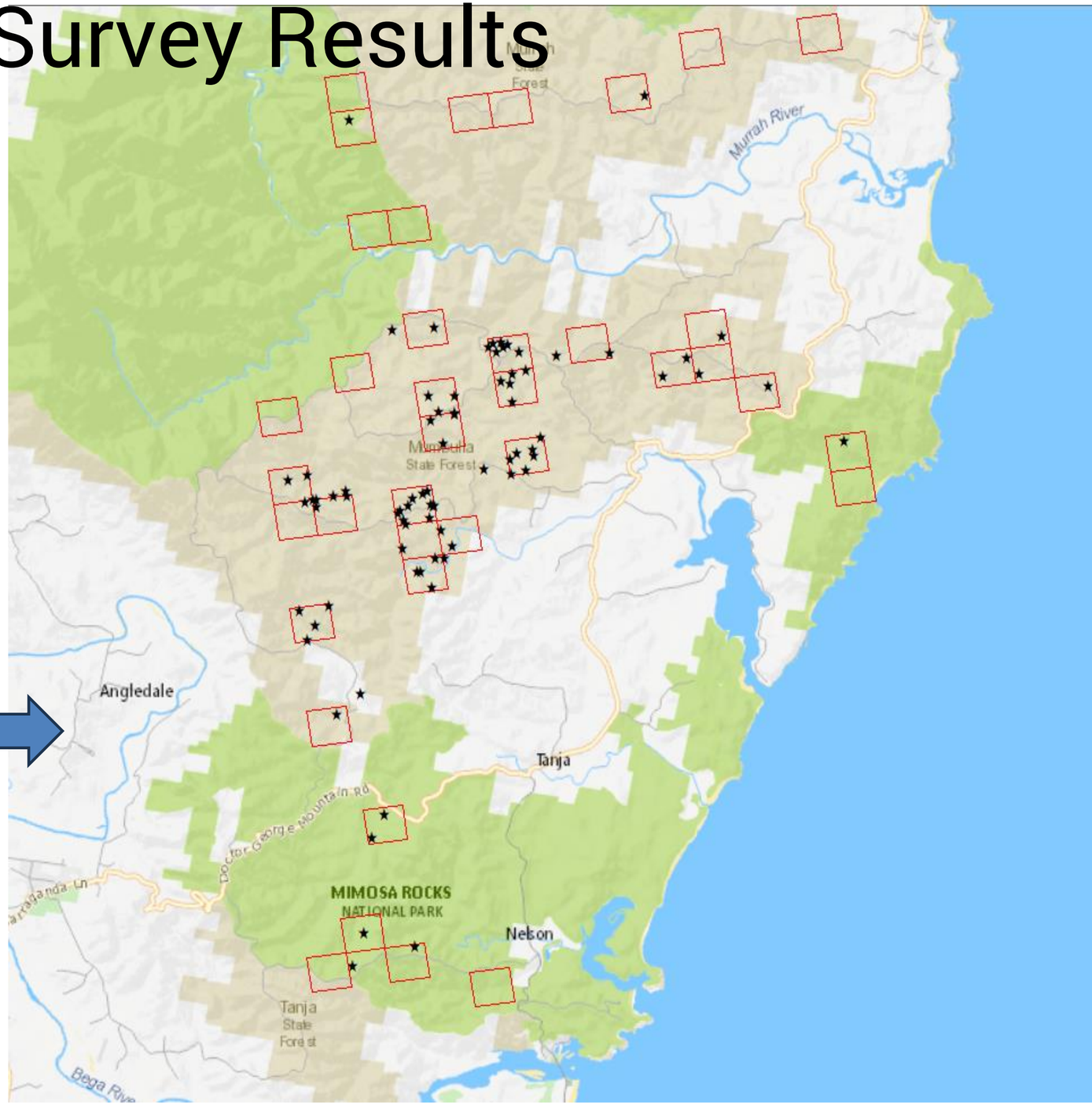
- DJI XT2 4k colour camera images
- Cannot identify animals based on colour alone
- Various aircraft altitudes shown

Colour image at 50m altitude

Colour image at 30m altitude

Drone Survey Results





Drone Survey Results (not for distribution)

- Nights surveyed = 17
- Grids flown = 50
- **Total number of koalas detected = 82**
  (in less than 5% of the landscape).

- Maximum koalas in single 750m x 750m grid = 11

Long Story Short

Mumbulla koala population is **much larger than previously estimated.**

(Chris Allen previously estimated population of 60-80 koalas from his scat survey work).

Thermal drone and bio-acoustic technology is telling us much more about this koala population than previously understood.

Other Arboreal Spp. on the Drone:

- Greater Gliders
- Yellow-bellied Gliders
- Sugar Gliders
- Feather-tail Gliders
- Diamond Python
- Bird spp.
- Glossy Black Cockatoo

Plus ground detections:

- Wombats
- Macropods
- Feral ungulates
- Fox / canines

Footage: Lachlan Hall & Sabrina Velasco

Take Home Messages

- Number of koalas in the Biamanga Gulaga landscape are much higher than we previously understood.

- Koalas continue to be present in Kooraban and Dignams Creek area.
  No recent evidence of koalas persisting on Gulaga – but we haven't really looked much.

- North of the Murrah where we have had the two big fires ('20 and '23) there is evidence that koalas are persisting but densities are low. We want to prioritise better understanding koalas in the North of the Murrah this year.

- Core habitat area between Murrah River and Mumbulla Creek and Dr George Mountain Rd. High densities in some parts of this area – but its also patchy.

Reference

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RESEARCH ARTICLE

Ecology and Evolution Open Access WILEY

Comparing the cost-effectiveness of drones, camera trapping and passive acoustic recorders in detecting changes in koala occupancy

Chad T. Beranek[1] | Darren Southwell[1] | Tim S. Jessop[2] | Benjamin Hope[2] | Veronica Fernandes Gama[2] | Nicole Gallahar[2] | Elliot Webb[2] | Brad Law[3] | Allen McIlwee[2] | Jared Wood[4] | Adam Roff[4] | Graeme Gillespie[2]

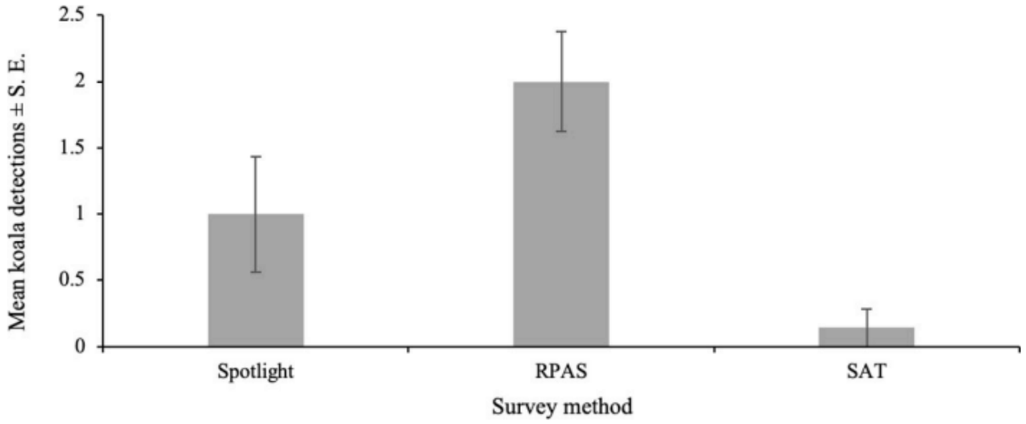

Fig 3. Mean koala (*Phascolarctos cinereus*) detections per survey by method (Spotlight, RPAS, SAT) across low density peri-urban sites in Port Stephens (n = 6 per method) and Gilead (n = 1 per method) on the east coast of NSW, Australia.

https://doi.org/10.1371/journal.pone.0242204.g003

PLOS ONE

RESEARCH ARTICLE

Real-time drone derived thermal imagery outperforms traditional survey methods for an arboreal forest mammal

Ryan R. Witt[1,2]*, Chad T. Beranek[1,2,3], Lachlan G. Howell[1,2], Shelby A. Ryan[1,2], John Clulow[1,2], Neil R. Jordan[4,5], Bob Denholm[3], Adam Roff[1,3]

Koala Records

NSW Seed Portal:

https://www.seed.nsw.gov.au/

Search for: ‘Koala records’

Click: Show on SEED Map