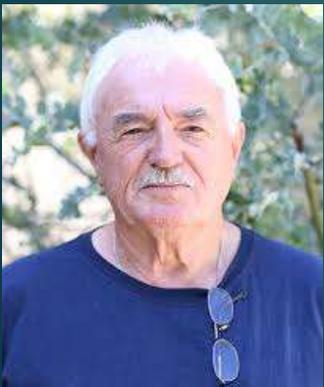


Natural history of the local goanna species, and how to conserve them

DON FLETCHER

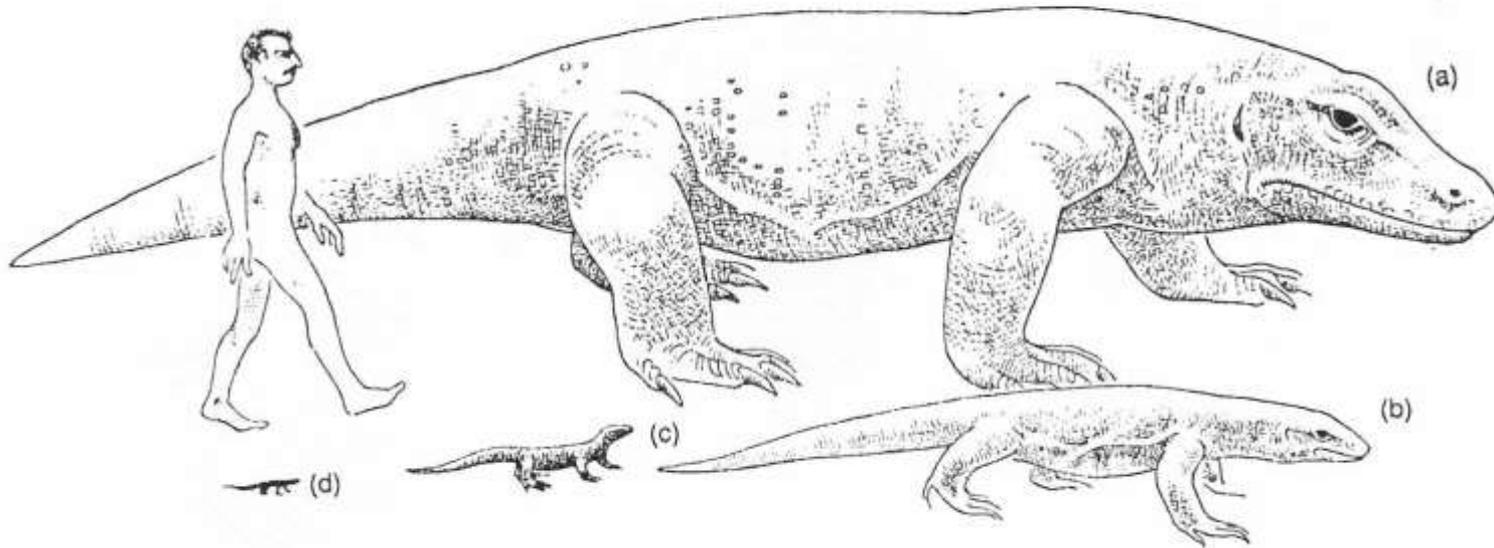
Acknowledgments:

- ▶ ACT National Parks Association (NPA) 
- ▶ Brian Green, IAE (wrote the book on goannas);
- ▶ Enzo Guarino, IAE (another guru);
- ▶ John Brickhill, Kevin McCue and other dedicated NPA volunteers
- ▶ Matthew Higgins (naturalist, historian and publicist for Rosy of Mt Ainslie)
- ▶ Conservation Research (Margaret Kitchin and staff incl Mel Snape and Kat Jenkins)



Goannas past and present

- ▶ 30 species in Australia, 14 in Asia, 4 in Africa (monitors/ varanids)
- ▶ Smallest goanna is <25 cm *Varanus brevicaudata*
- ▶ Largest goanna ***Megalania prisca*** (exterminated from E'n Australia ~30,000 years ago) 650 kg, 7.0m
- ▶ Largest living goanna is ***Varanus komodoensis*** 80kg 2.5m



Green and
King 1993

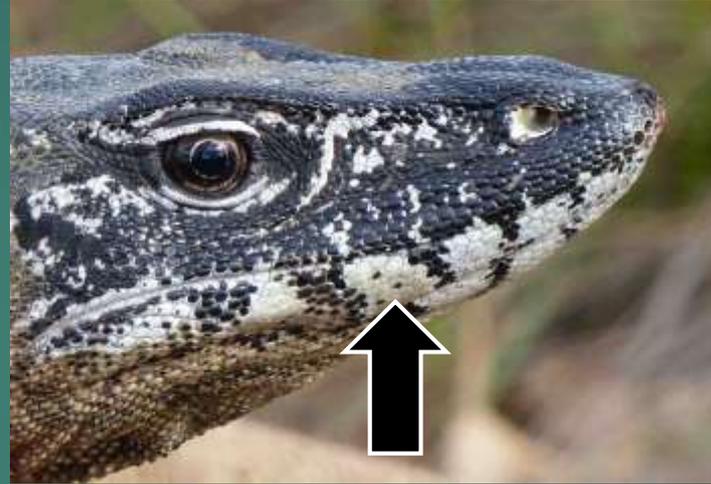
Two local goanna species

Tree Goanna or Lace Monitor *Varanus varius*



Broad stripes on lips and lower half of tail. Often climbs, rarely burrows.

Rosenberg's Goanna or Heath Monitor, *Varanus rosenbergi*



Narrow stripes on lips and lower half of tail. Rarely climbs. Often burrows.



- ▶ **Tree Goanna;**
- ▶ Common nationally;
- ▶ Reportedly up to 20 kg but generally 2-8 kg.
- ▶ National status: 'Secure'

- ▶ **Rosenberg's Goanna;**
- ▶ Generally not seen;
- ▶ Up to ~5 kg (?)
- ▶ 'Vulnerable' in NSW, Vic., SA. Declining.



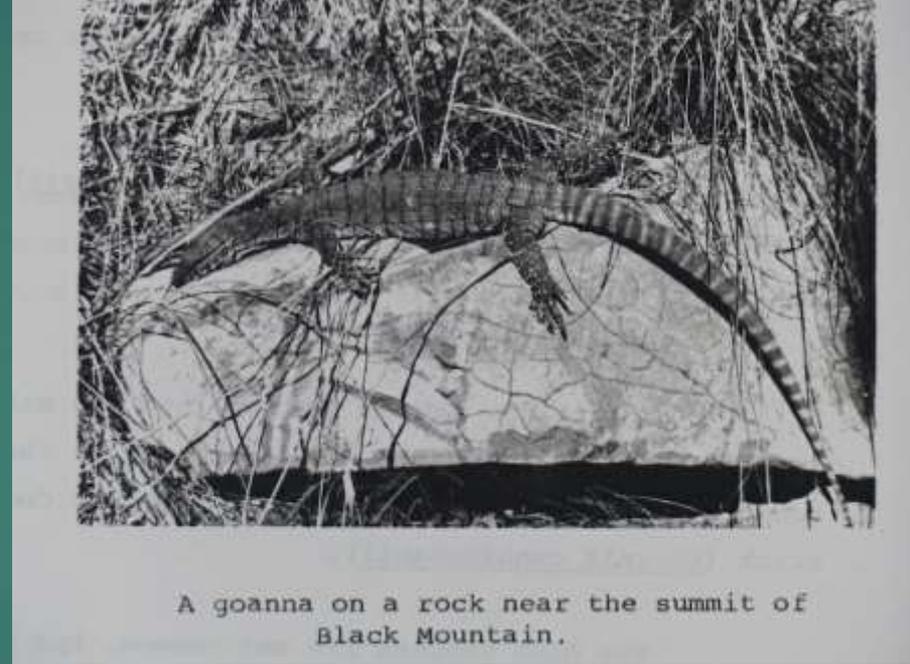
The presence of 2 goanna species in the ACT region was recognised in 1988.

ACT goanna conservation situation

- ▶ Both species were equally common around Canberra until the 1960s.



Tree Goannas
1967 and 2013



(Peter Coyne/ MH)

- ▶ ACT pattern now is reverse of the national:
 - ▶ Tree Goanna virtually extinct in the wild in the ACT;
 - ▶ Rosenberg's Goanna disappearing from CNP but still present in river corridors, and common in east of Namadgi.

Rosenberg's Goanna and Tree Goanna breeding

- ▶ M&F leave scent on ground near termite mounds and burrows in Dec-Jan. Mating.
- ▶ 8-16 eggs laid deep in *Nasutitermes* mound in Jan-Feb
- ▶ Nest guarded by female until sealed by termites
- ▶ Termites incubate the eggs through winter (Apr to Sep)
- ▶ Some tree goanna females dig to release young



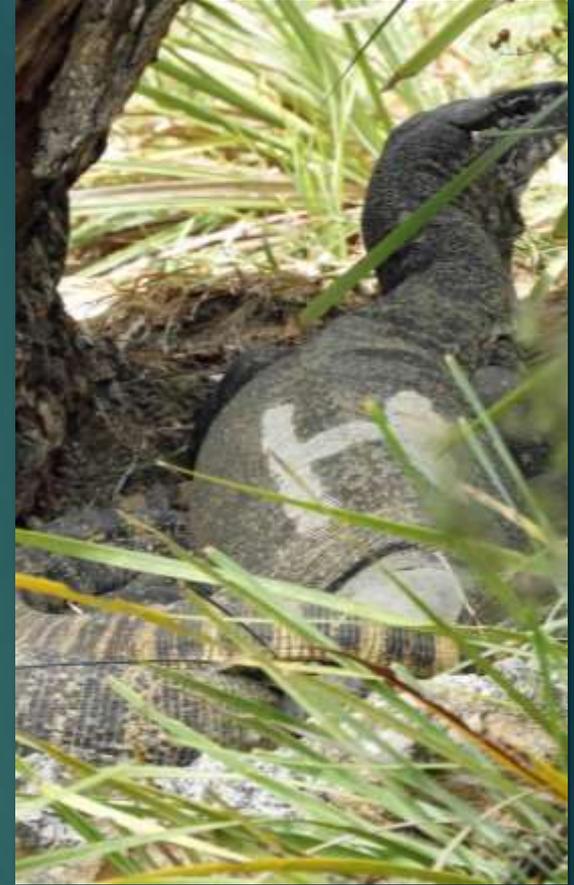
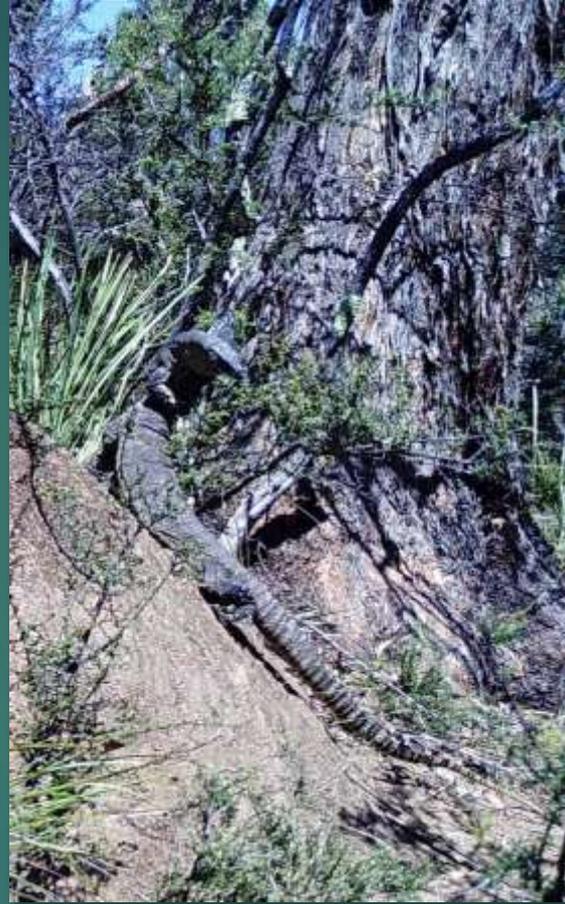
MH





trail cameras = game cameras = camera trapping
= wildlife cameras





Some females guard mounds until termites complete repairs after rain. Some males help.

Breeding cont.

- ▶ Hatchlings dig to the surface in spring.
- ▶ They forage in the surrounding area, meanwhile also eating termites, for 4-10 weeks until they leave the nest.







4-5 'lost years'

Ecology of Rosenberg's Goanna

- ▶ The diet of Rosenberg's Goanna is nearly half insects, nearly half small vertebrates. Will eat any animal from insects to rabbits. Tree goanna similar.
- ▶ Eggs are eaten by other goannas (but uncommonly)
- ▶ Juveniles are prey of a wide range of birds (heavy loss)
- ▶ Adults preyed upon by dingoes, foxes, WTE, human.



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- ▶ Juveniles are prey of a wide range of birds (heavy loss)
- ▶ Adults preyed upon by dingoes, foxes, WTE, human.
- ▶ Almost all hatchlings fail to survive. Adults probably live 20-40 years.
- Adults should be our priority for conservation.

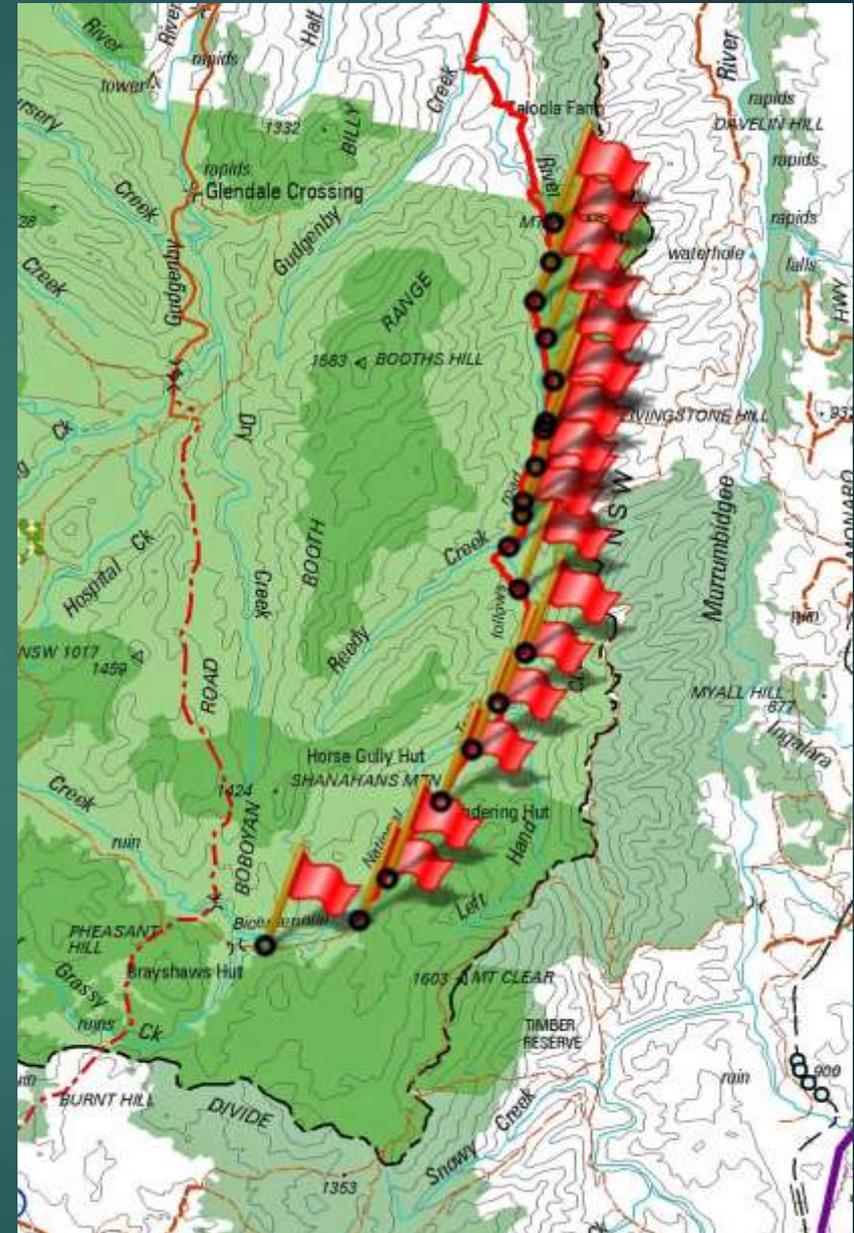


Preliminary research in Feb 2017

- ▶ (a) Pilot survey to find a research site
- ▶ (b) Evaluation of possible survey methods ...
(‘reptiles don’t trigger camera traps’)



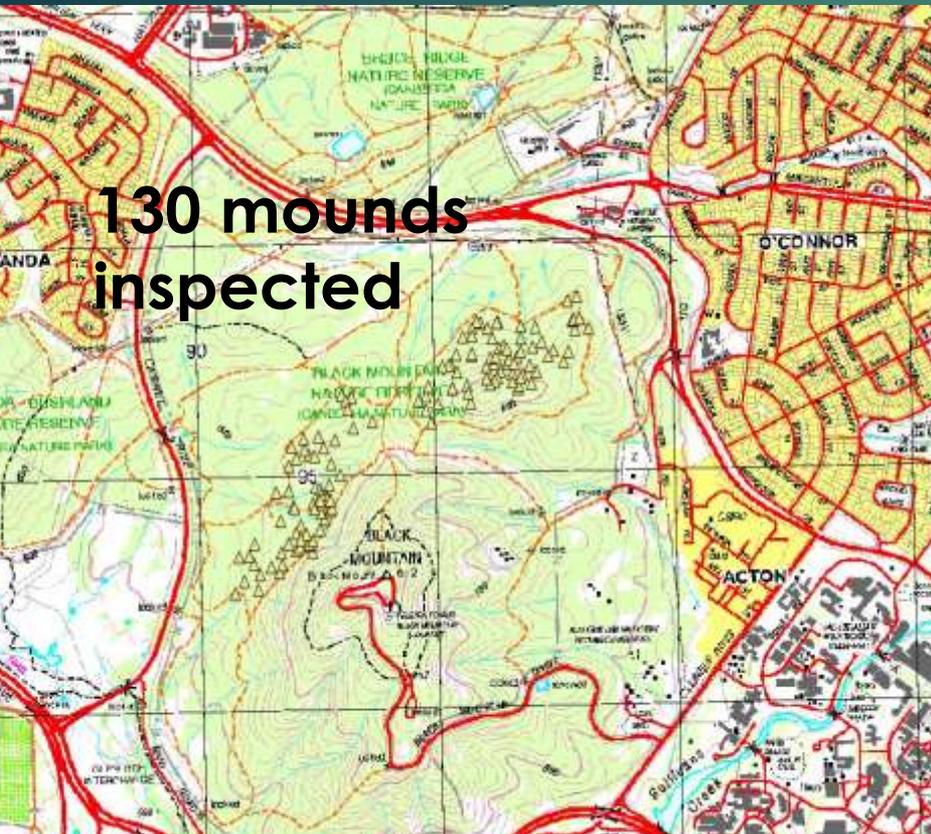
- ▶ (a) 19 trail cameras spaced out along the 30 km Nass Valley Fire Trail, baited with rabbit carcasses. No fox seen! Goannas visited 16 of the 19.

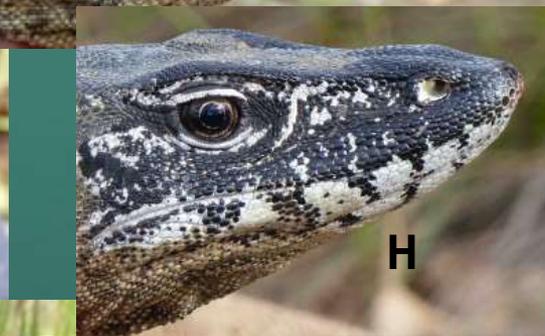
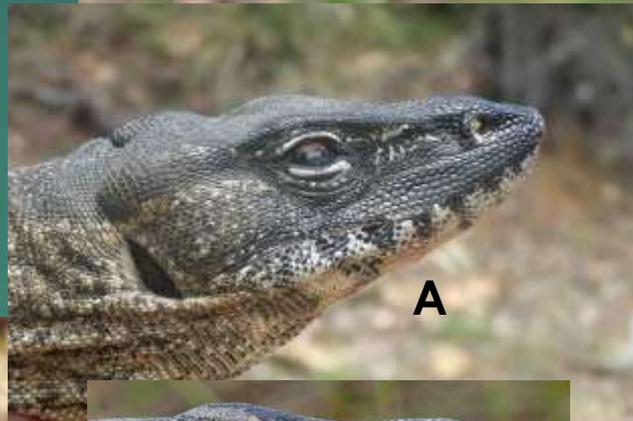


► (b) Comparison of survey methods

Termite mounds inspected for hatchling exit holes. High effort. Limited timing.

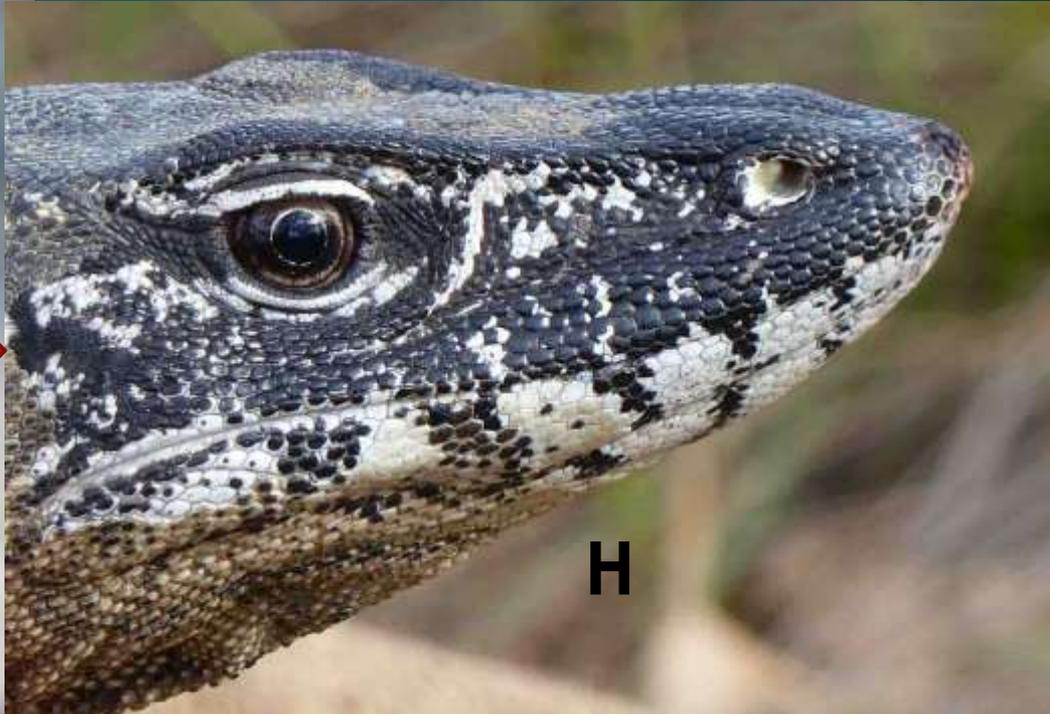
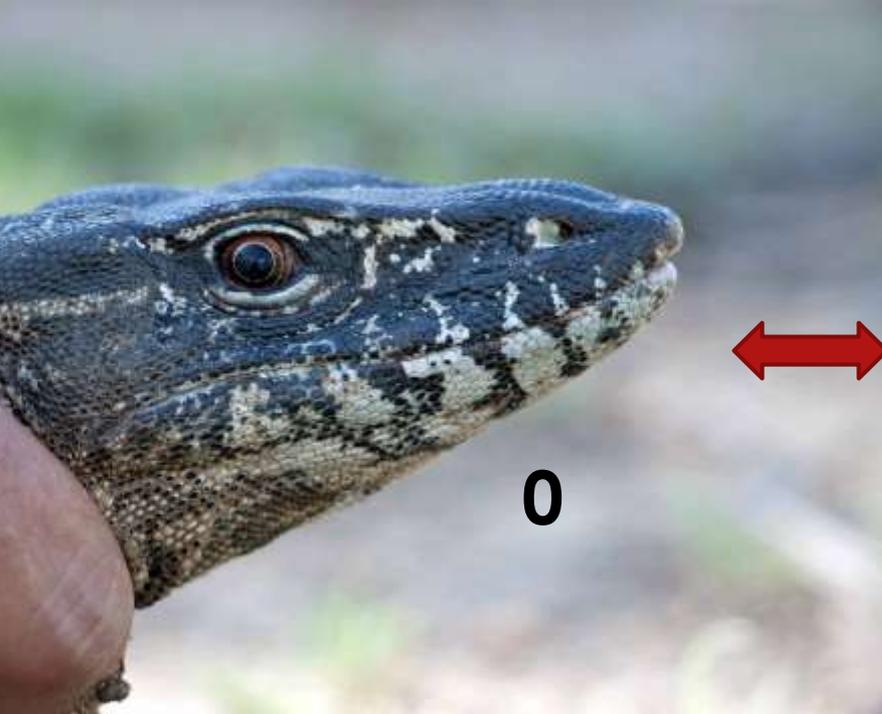
Trial with different brands of motion triggered cameras. Goannas can be camera trapped!



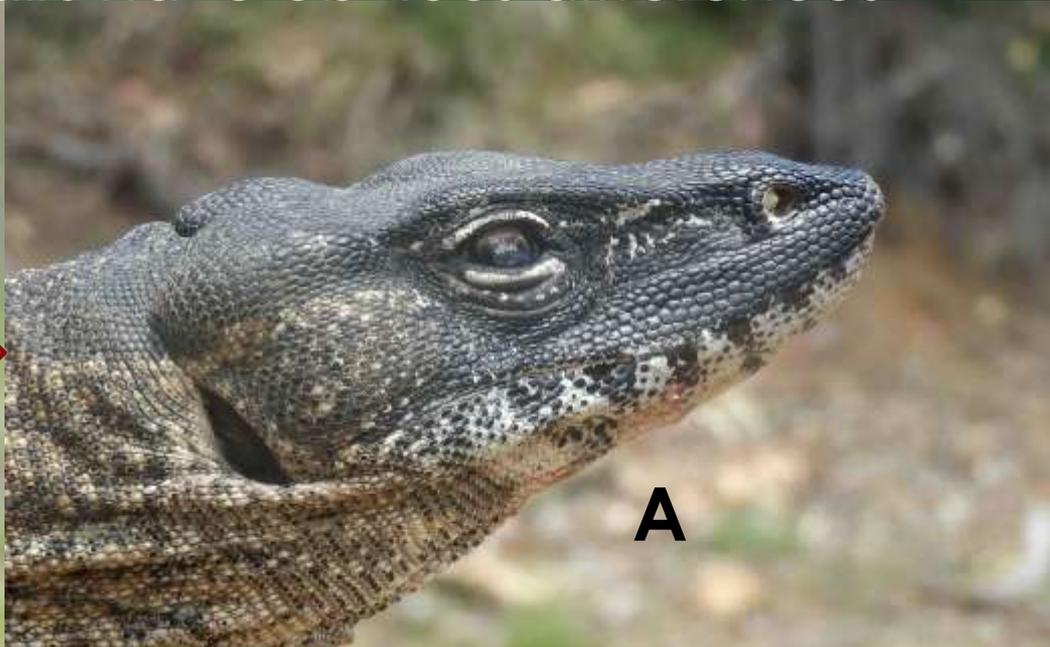
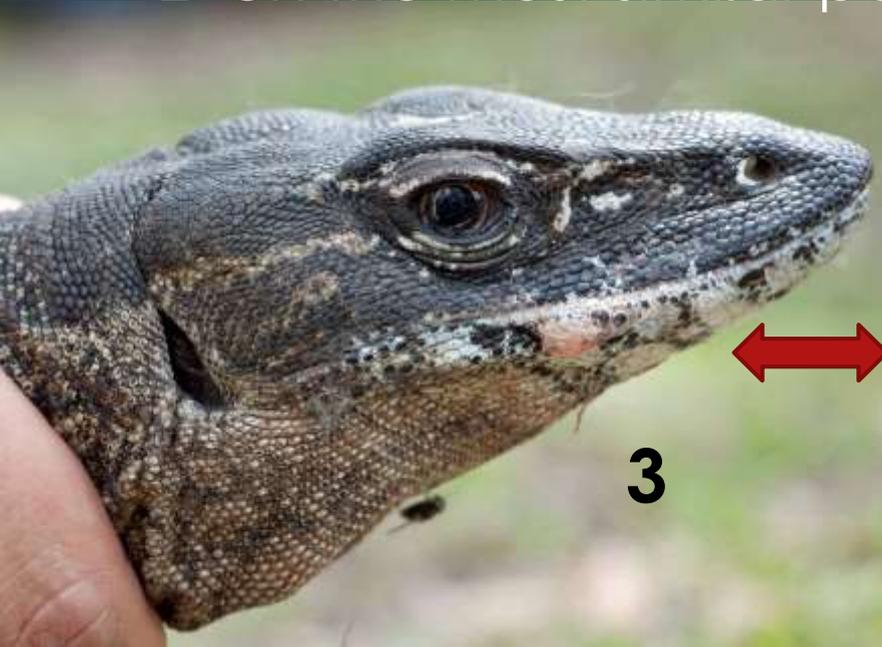


Faces are
unique





Even the most similar pairs have obvious differences



Can we measure population size?

- ▶ 20 sites, each with 3 cameras placed to record left and right faces, and any painted symbols on backs.
- ▶ Weekly replacement of bait (smelly chicken frames) for 3 weeks
- ▶ Cameras moved to new sites after first week



Results of camera survey

- ▶ Mark-resight method. Goanna faces recorded in first week are 'marked'. Any of these seen in later photos are 'recaptures'
- ▶ By the third week, every camera site had been visited by a goanna
- ▶ 420,000 photos, including 25,000 photos of goannas (6%)
- ▶ Still working out how many separate faces there are

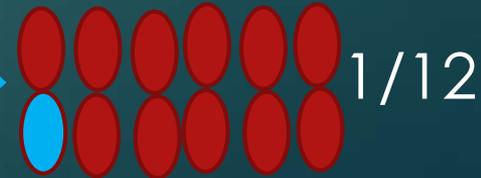
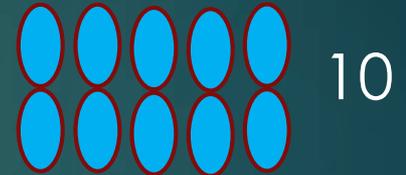
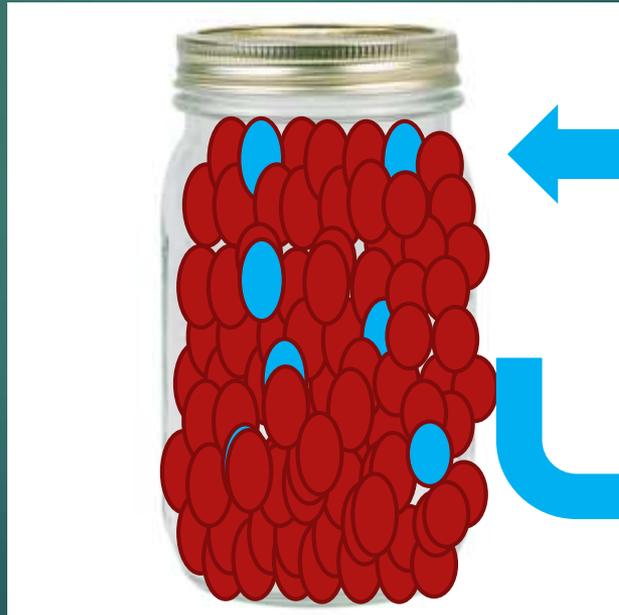
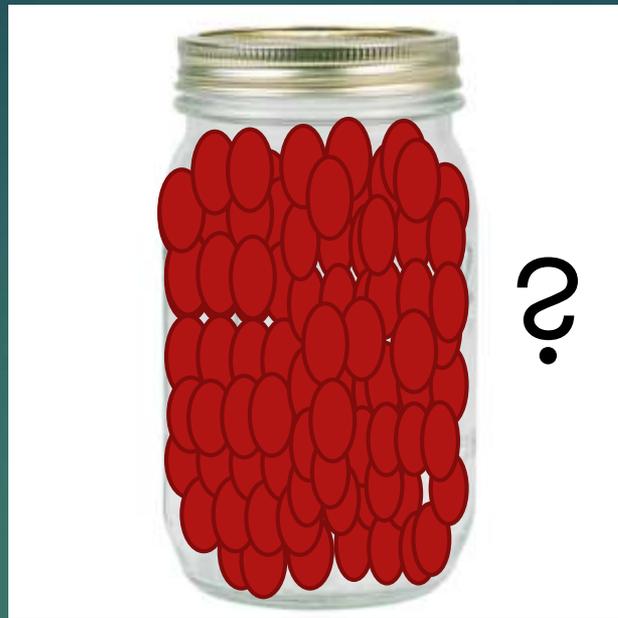


Mark-resight explained



REQUIRES:

Correctly recognise animals,
Closed population,
Unbiased sampling



$$N = 10 \times 12/1 = 120$$

Camera traps left at night burrows and nest mounds may help reveal social interactions.



Ltl Acorn



109F 043C

02/23/2018

14:35:35



Another investigation: Habitat use and Movements

- ▶ Pilot study in 2017-18 with two radio-linked GPS tracking packs purchased by the NPA
- ▶ Radio-linked GPS (not satellite-linked) OK because goannas have small home ranges
- ▶ Prior calibration on a pet goanna





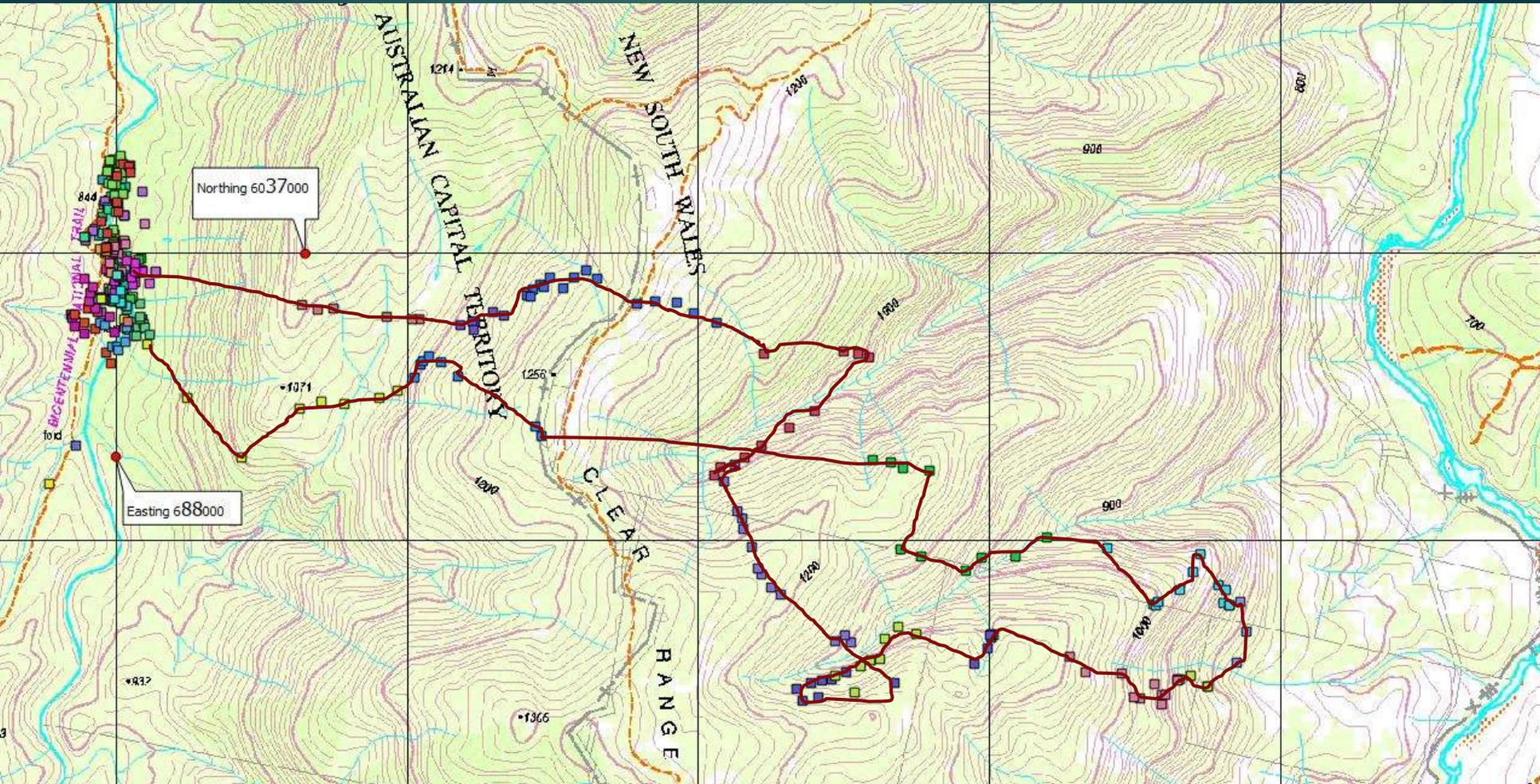
Current movements study



Tracking an underground animal

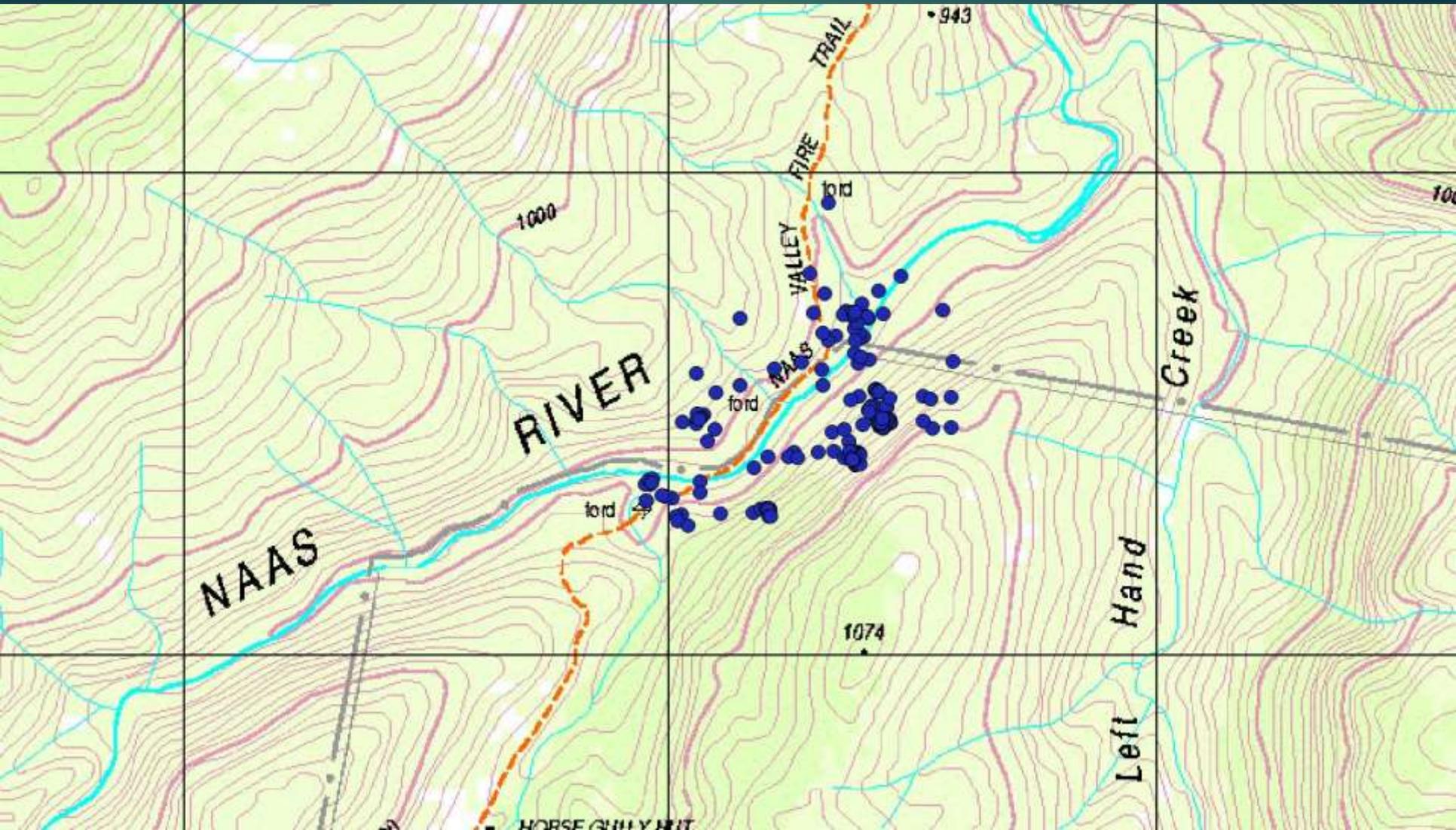


Current movements study



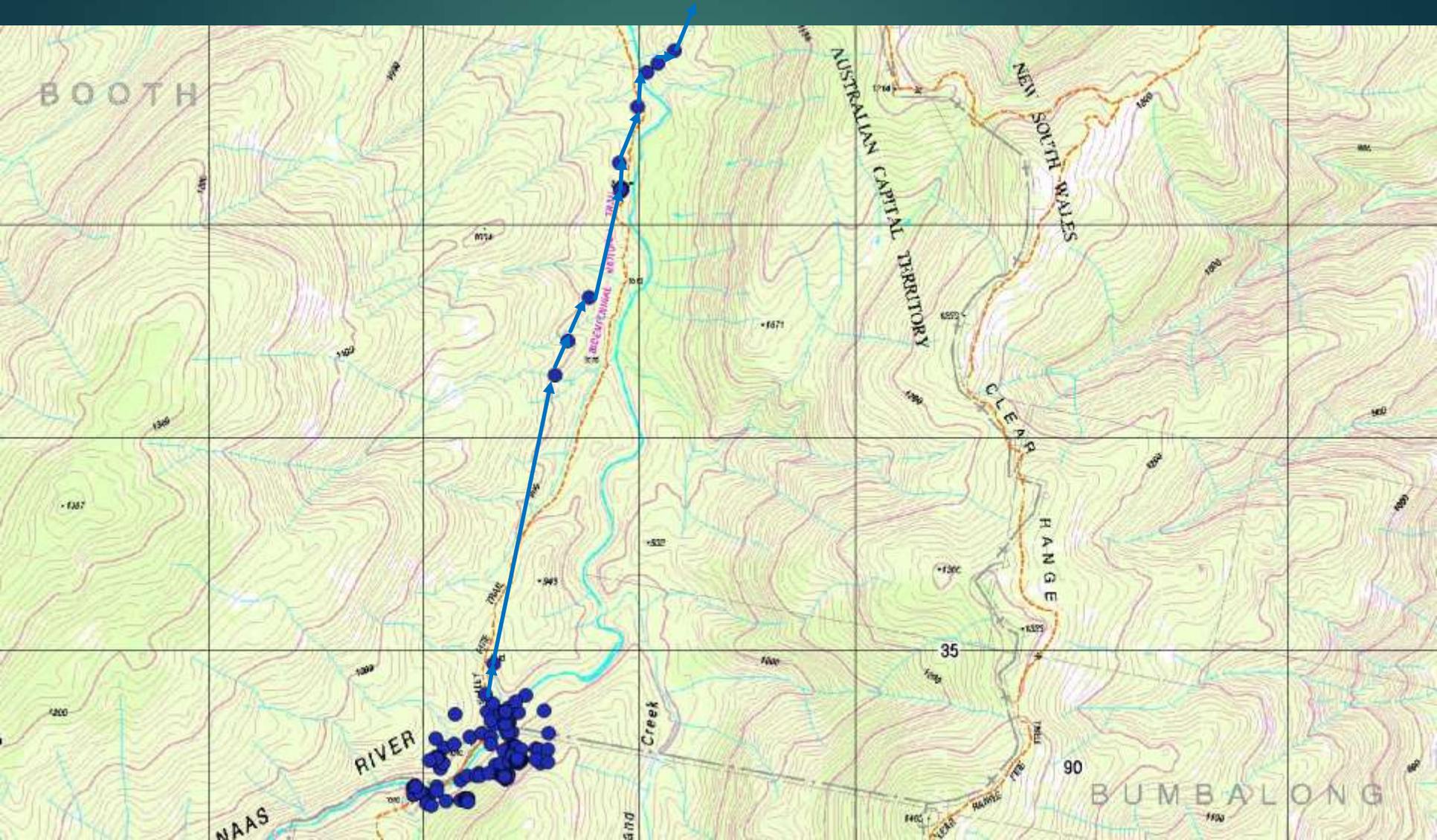
Results of movements study

G5 stayed near his capture place for a while



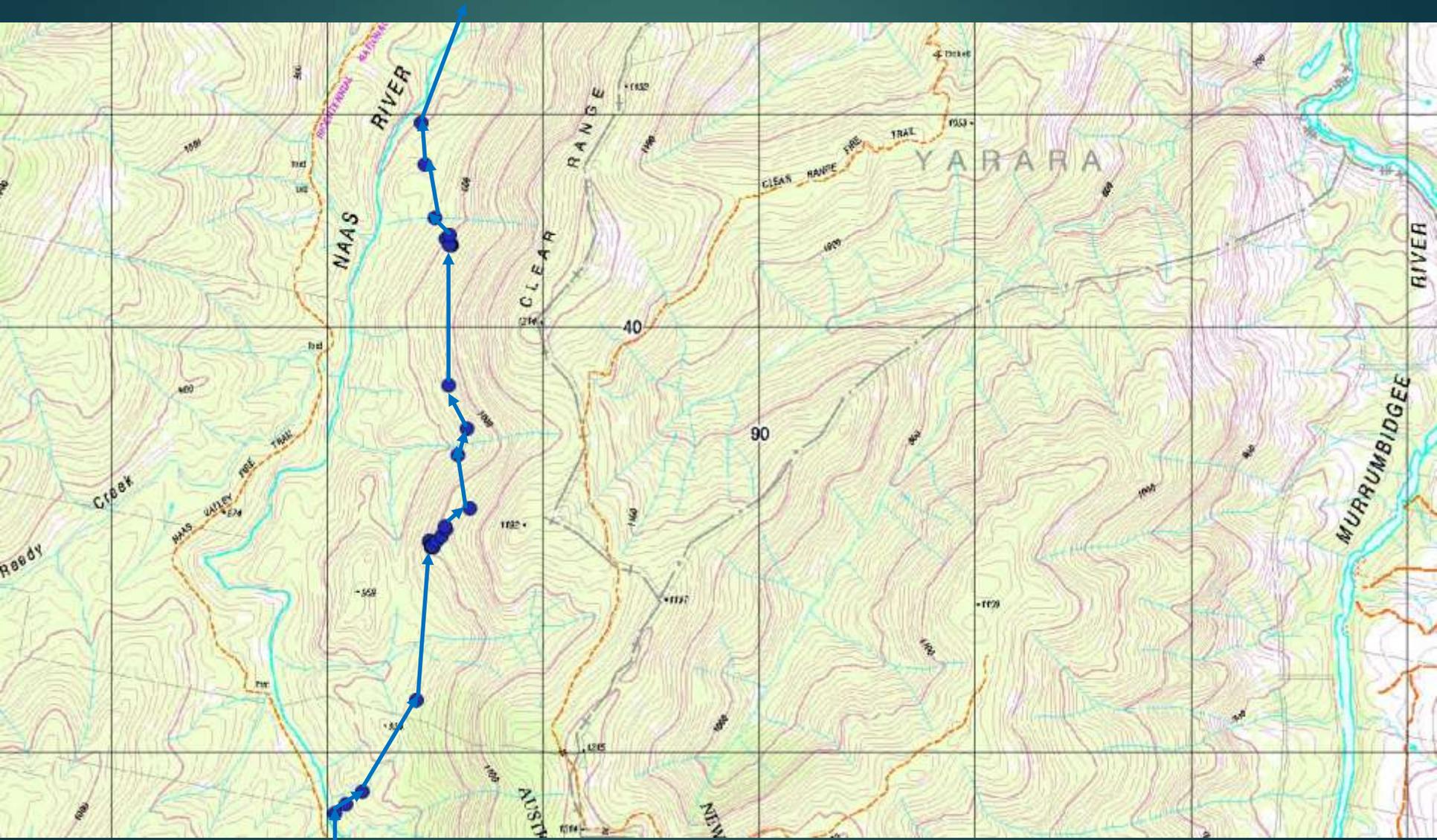
Results of movements study cont

Goanna 5 heads off!



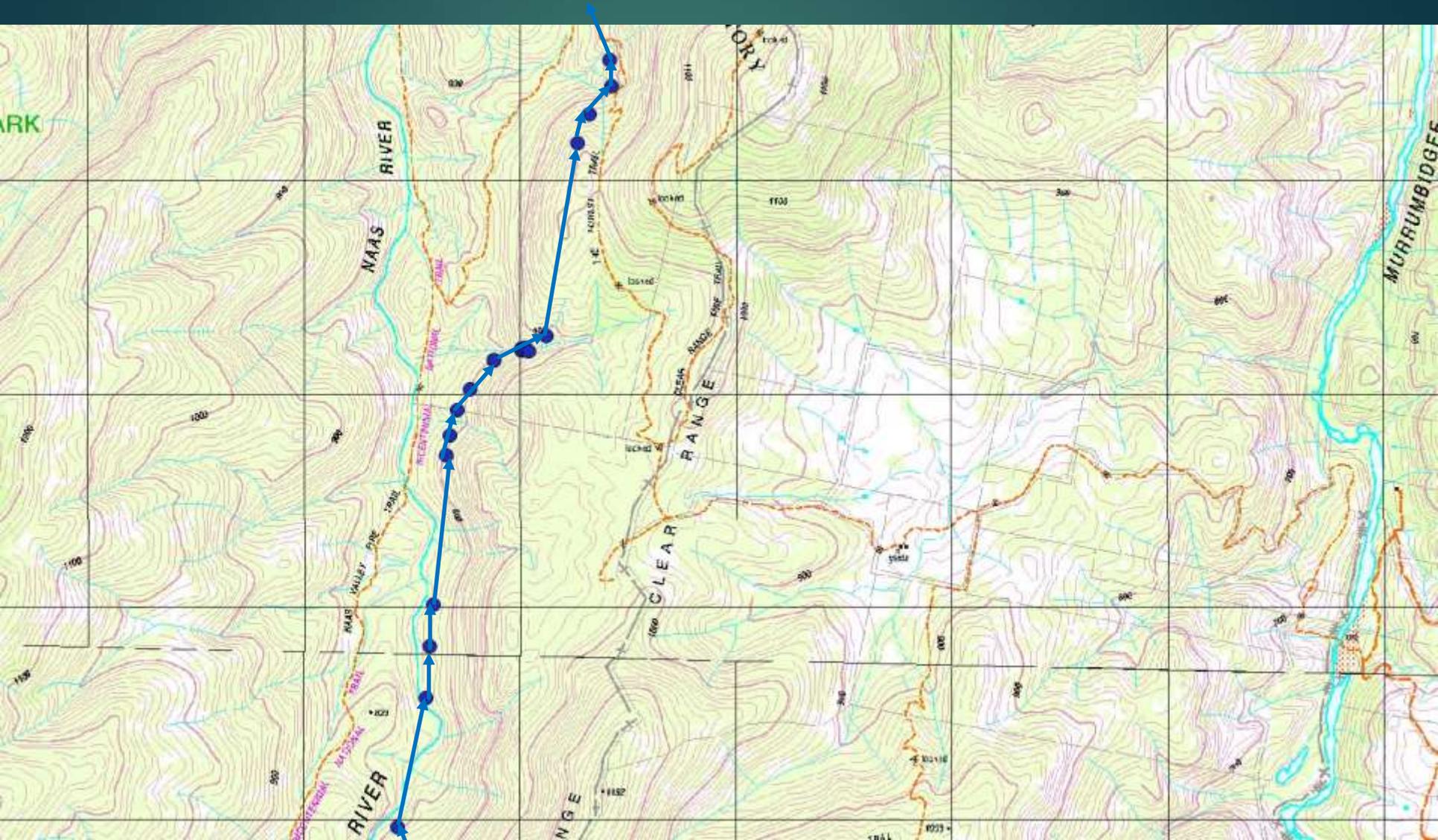
Results of movements study cont

Goanna 5 breaks the rules!



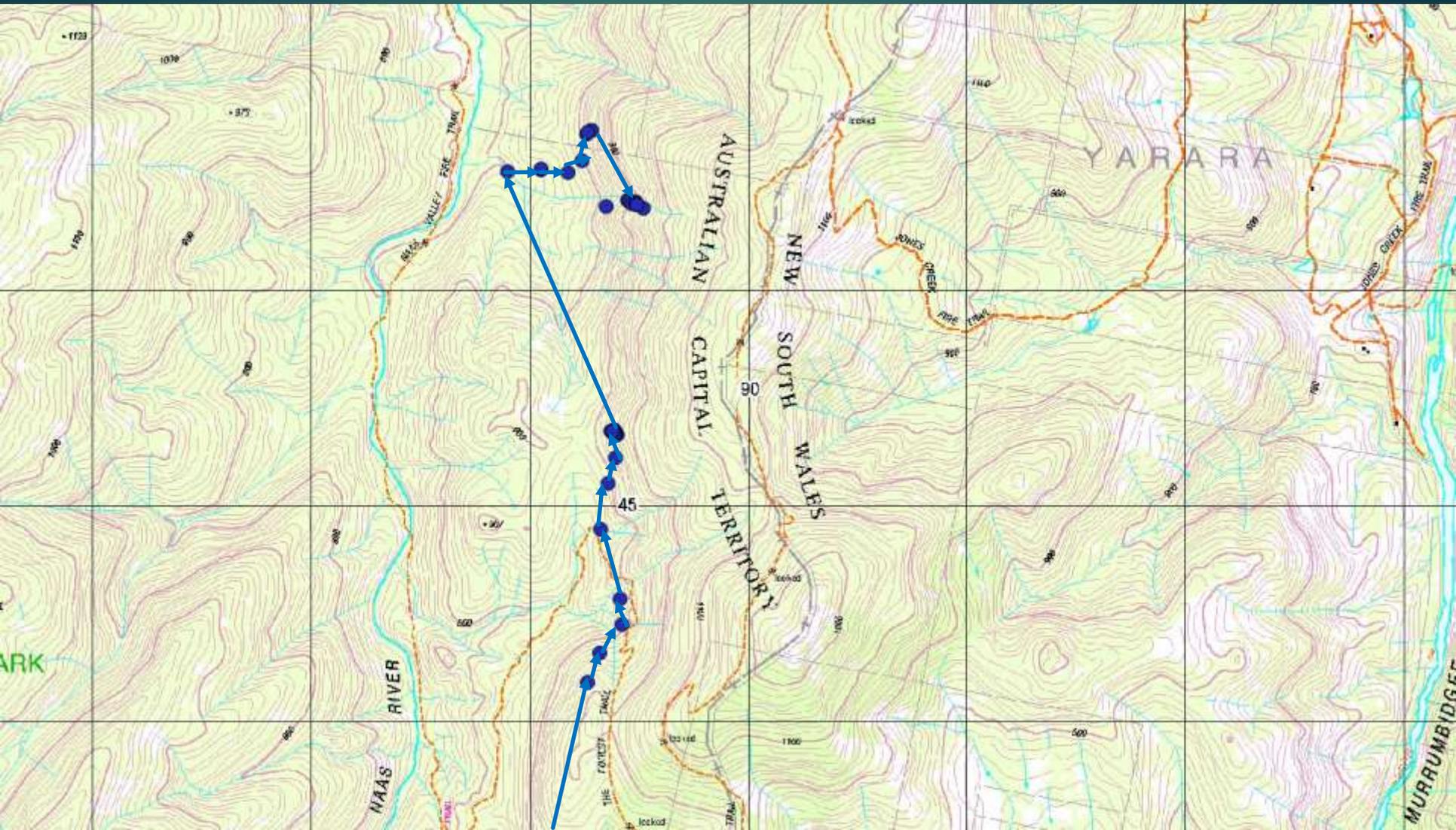
Results of movements study cont

Goanna 5 keeps on breaking the record!



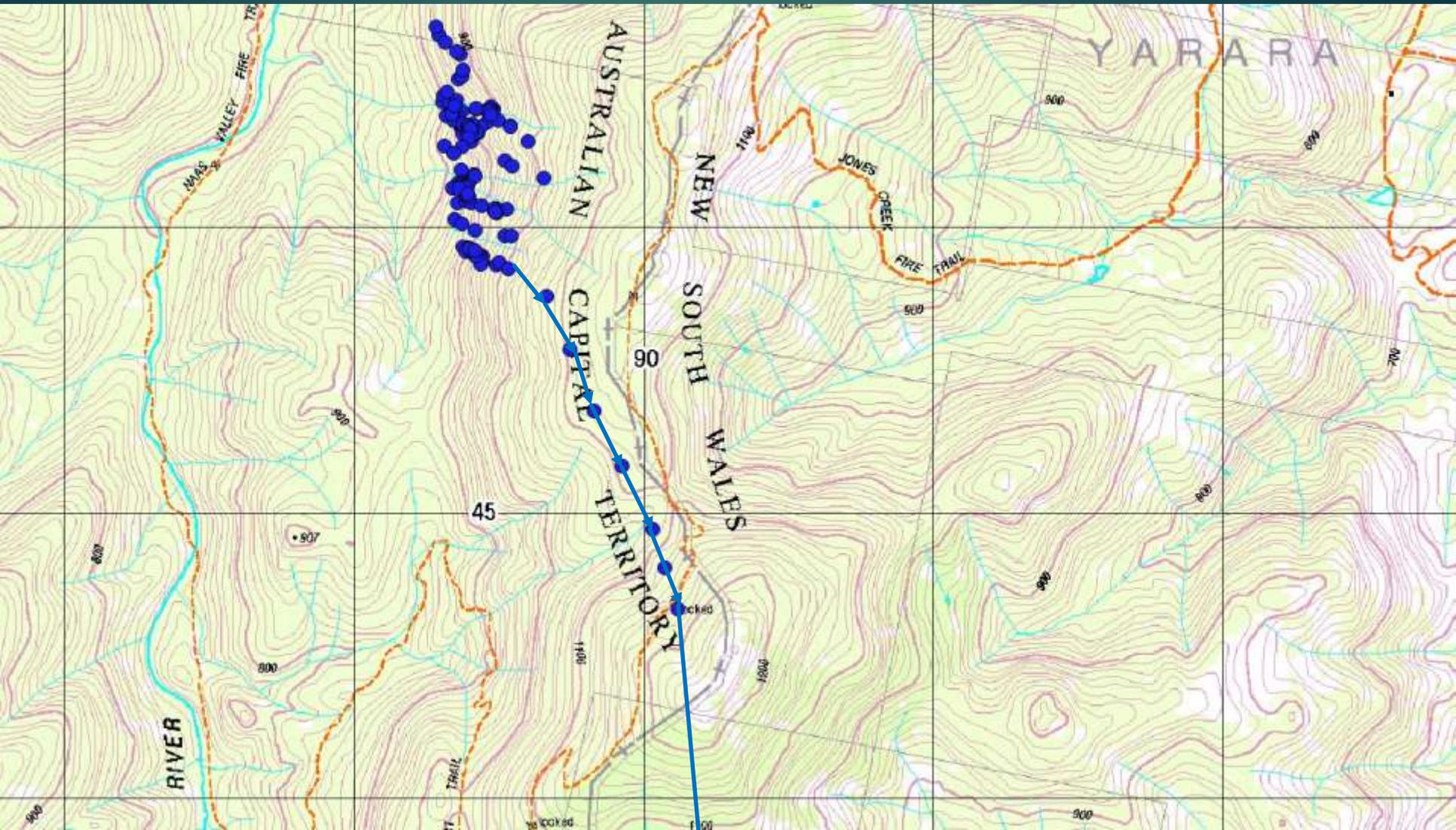
Results of movements study cont

Goanna 5 reaches his destination!



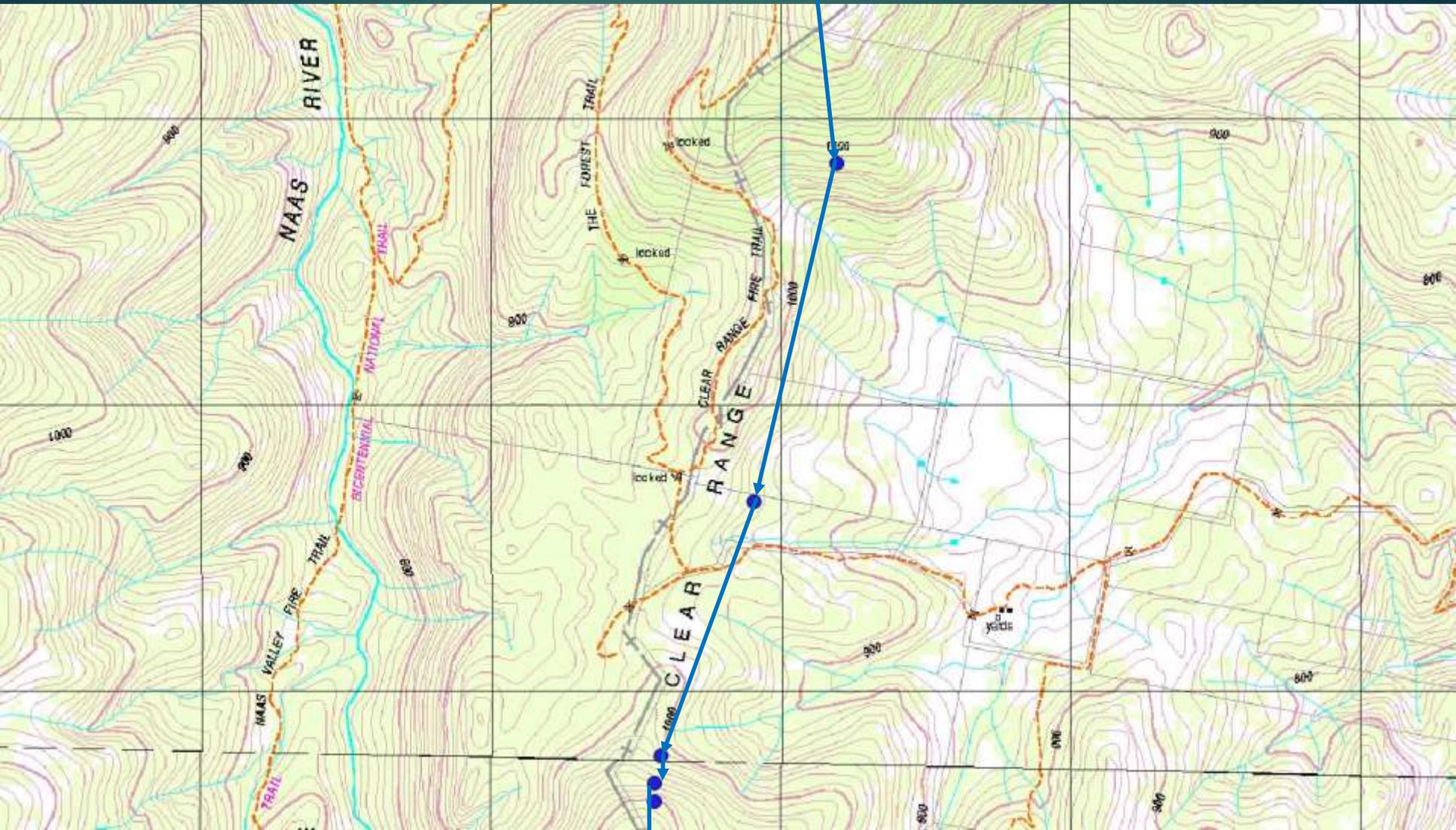
Results of movements study cont

Goanna 5 heads back south



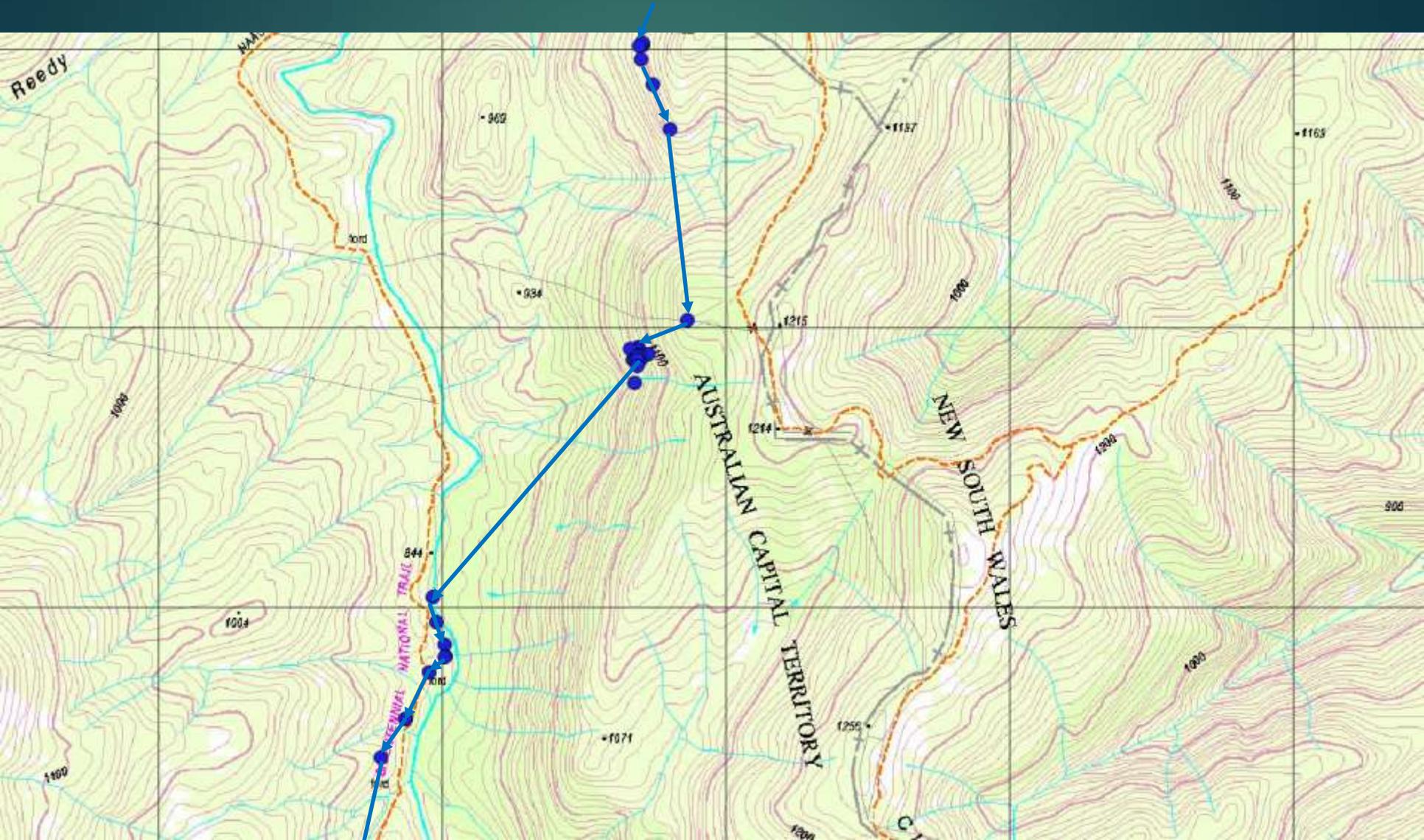
Results of movements study cont

Goanna 5 heads back south



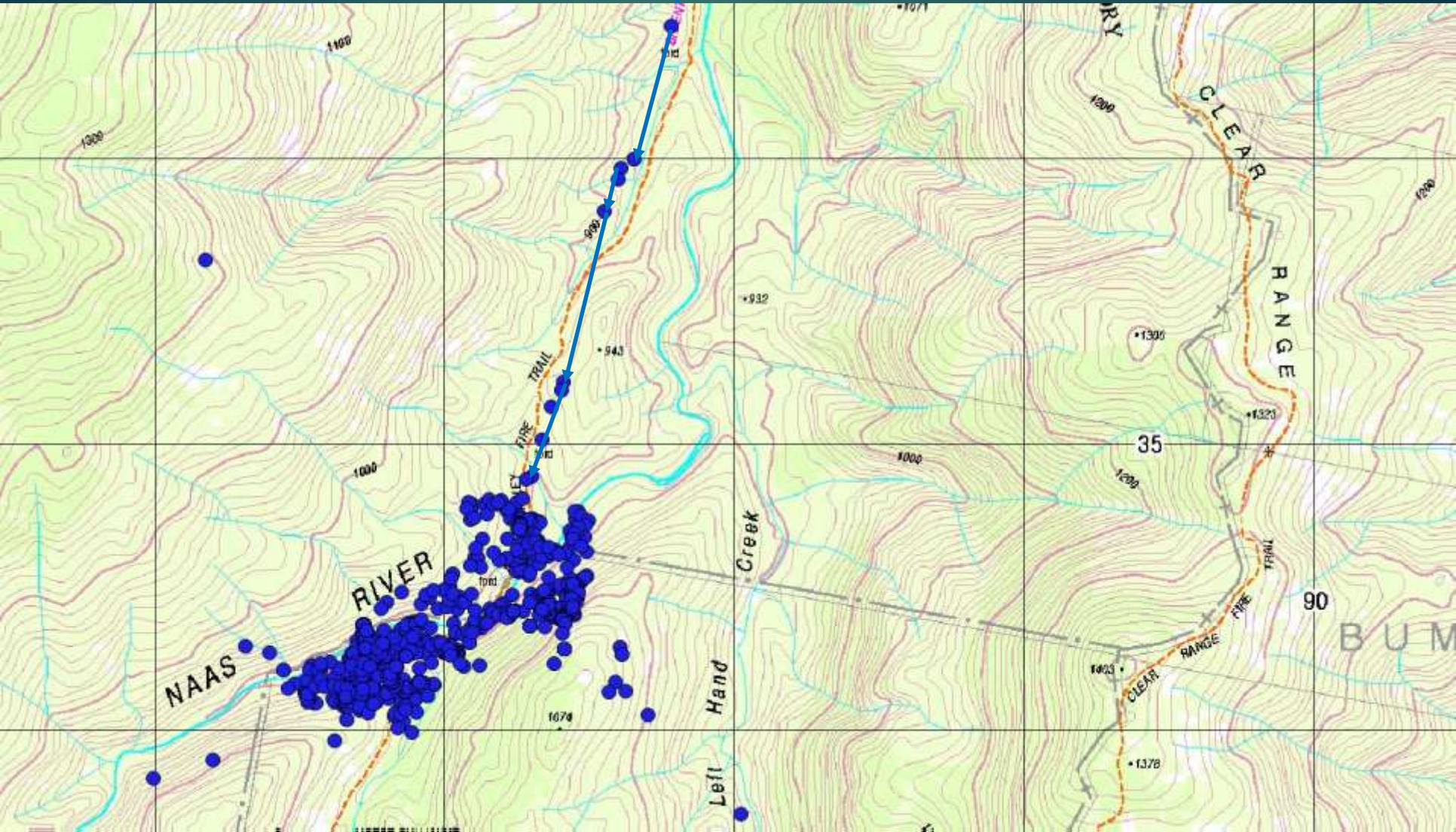
Results of movements study cont

Goanna 5 heads back south



Results of movements study cont

Goanna 5 returned south to the same place and remained there.



Goanna conservation (thoughts)

Principles:

1. Both goanna species comprise long-lived adults, which produce large numbers of young that experience high mortality. Therefore, focus on adult survival.
2. Think Habitat, Food, Predation

Applications:

1. Adult habitat: Protect fallen branches, and shrubby patches. (Bush Fire Management)
2. Adult food: Preserve ample ground layer vegetation that shelters abundant small vertebrates and insects
3. Adult predators: Reduce fox predation, exclude dogs, minimise human killing (properly enclose poultry yards).



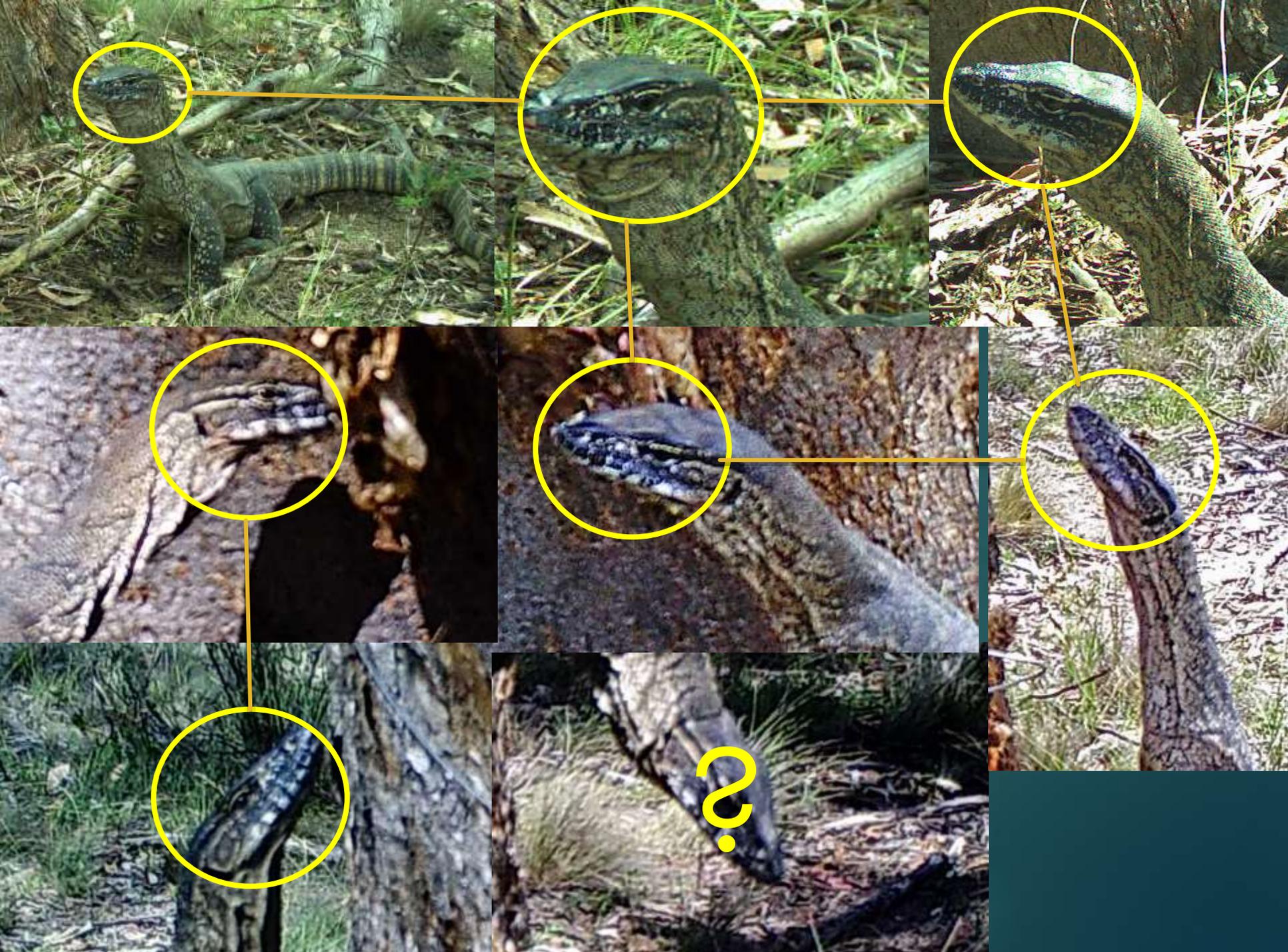
Thank you

don.fletcher@emailme.com.au

0428 48 9990







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Field work is only in summer (Nov-Feb).

Frequency of sightings of RG in CNM
1990-2017 (n=135)

