Landcare Research
Manaaki Whenua

Monitoring weta using tracking tunnels

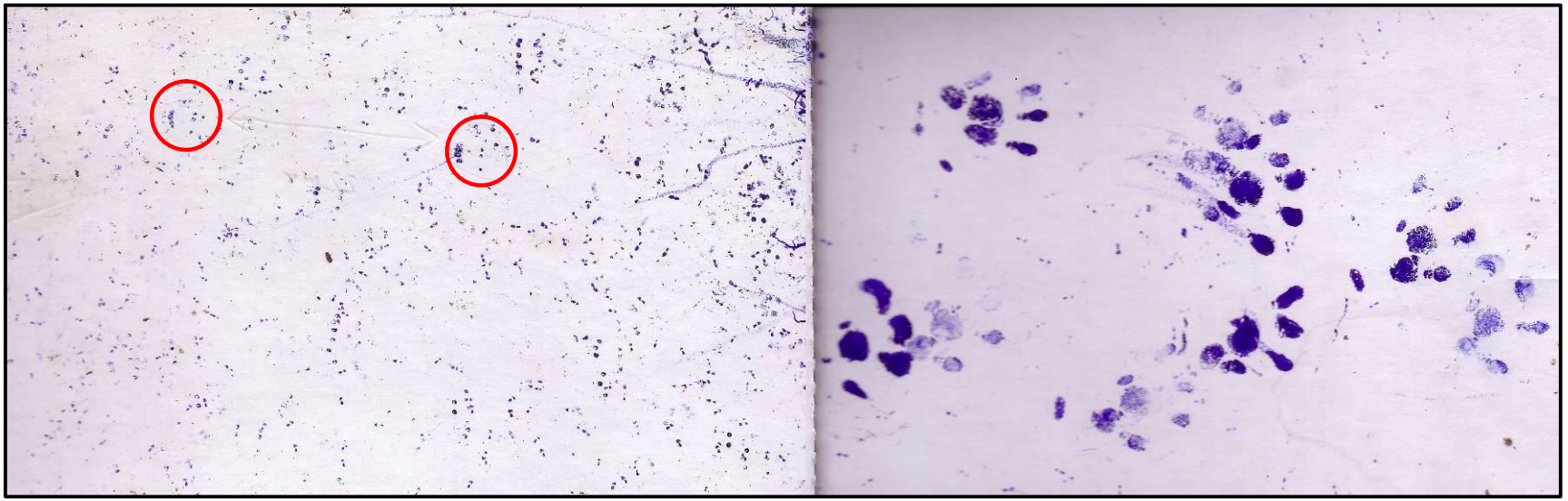
Corinne Watts, Danny Thornburrow & Ian Stringer

Giant weta

- *Deinacrida* – 11 species
- Large, bulky body, nocturnal, mostly solitary
- 3 ‘arboreal’, 8 ‘ground-dwelling’
- Threatened = introduced mammals and habitat disturbance
- **No monitoring tools** – for detecting weta, their distribution or abundance

Footprint tracking tunnels

- Index density of introduced mammals
- Routinely used in NZ



- Also records prints of insects
- Will weta use them? Particularly, arboreal species of giant weta?

Monitoring giant weta using TT

1. Will weta use tracking tunnels? If so…..
2. Can TT determine dispersal of translocated populations?
3. Can TT be used to estimate density of a weta popn?

Will weta use TT?
Test: Using wetapunga on LBI

1. Could wetapunga be detected using TT?

2. Do detection rates differ between baited (with peanut butter) vs unbaited tunnels?

3. From their footprints, could wetapunga be distinguished from other weta species present on LBI?

Watts et al. 2008. NZJE 32:92–97

Distinguishing between weta footprints

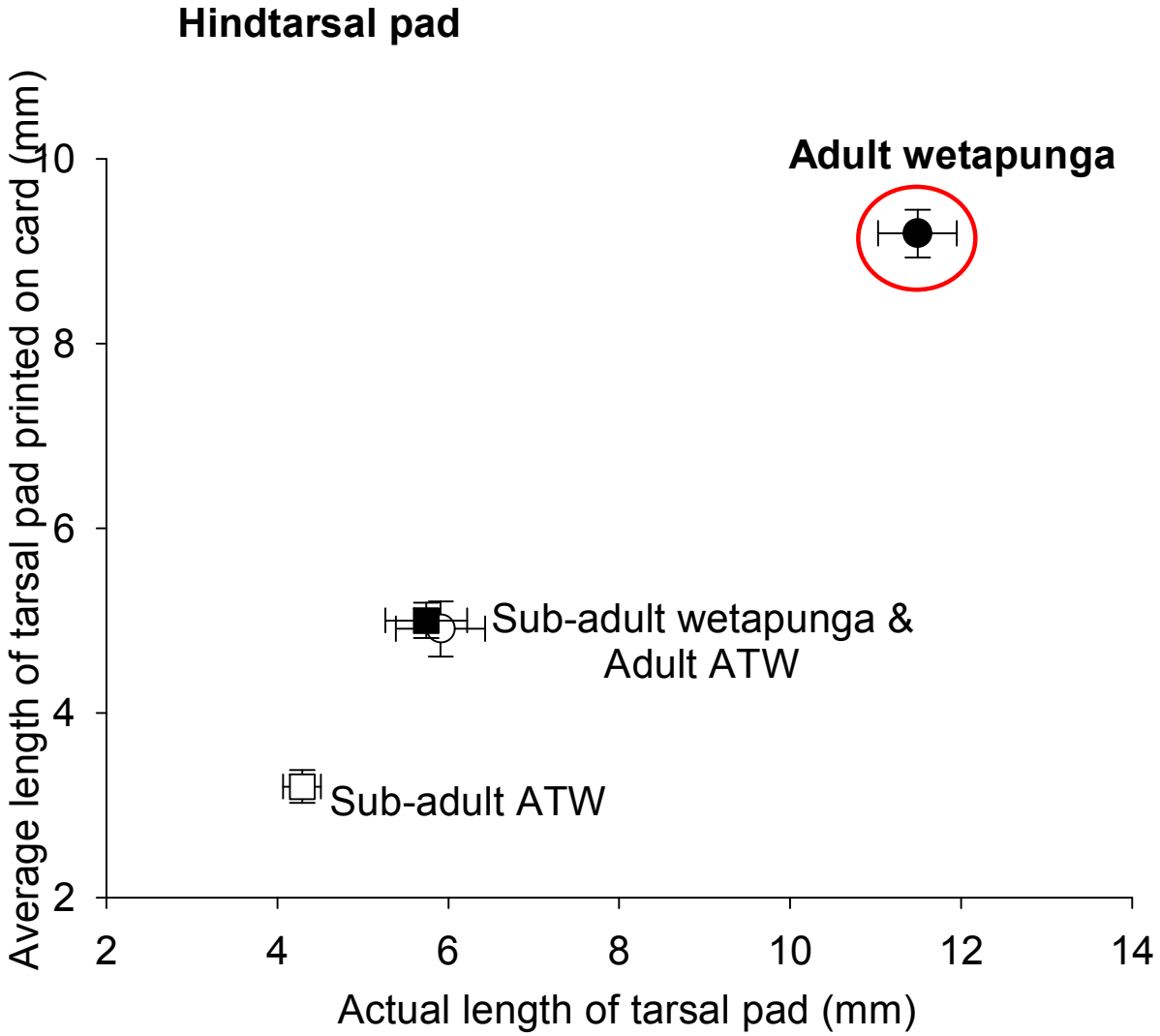
Vs

?

- Tarsal pads measured, footprinted & prints measured
- No ground weta found
- Wetapunga & Auckland tree weta
- Adults & sub-adults

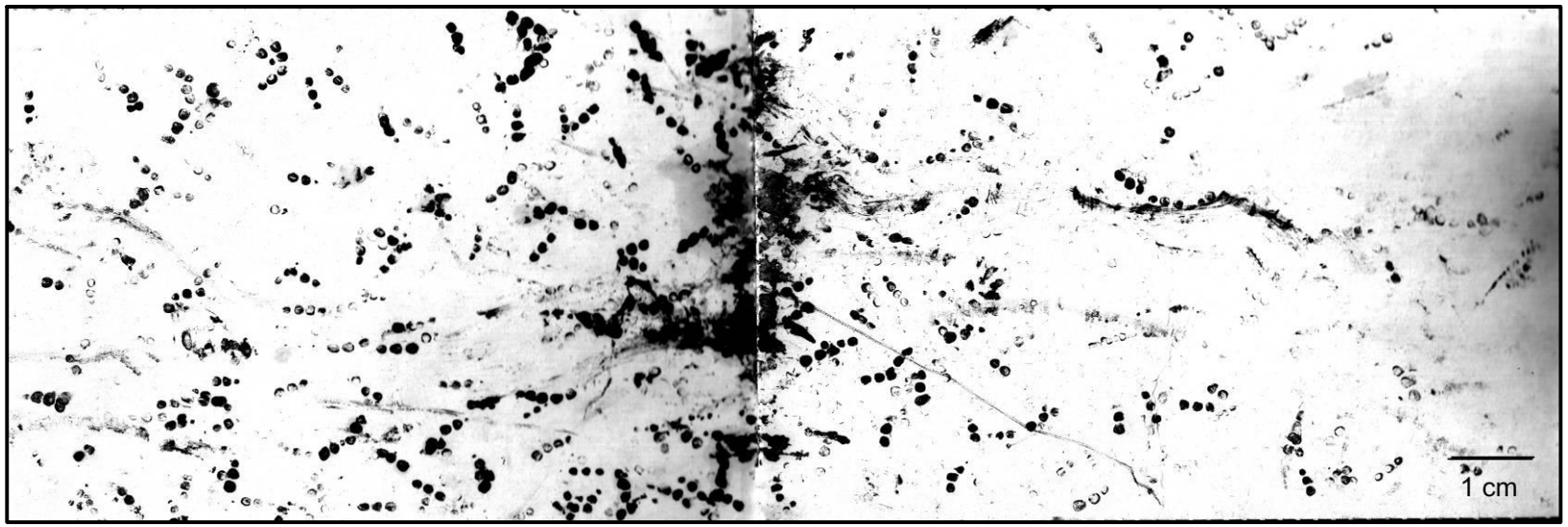
Distinguishing between footprints of wetapunga & ATW

- Adult wetapunga have significantly larger footprints



Tracking tunnel field trial

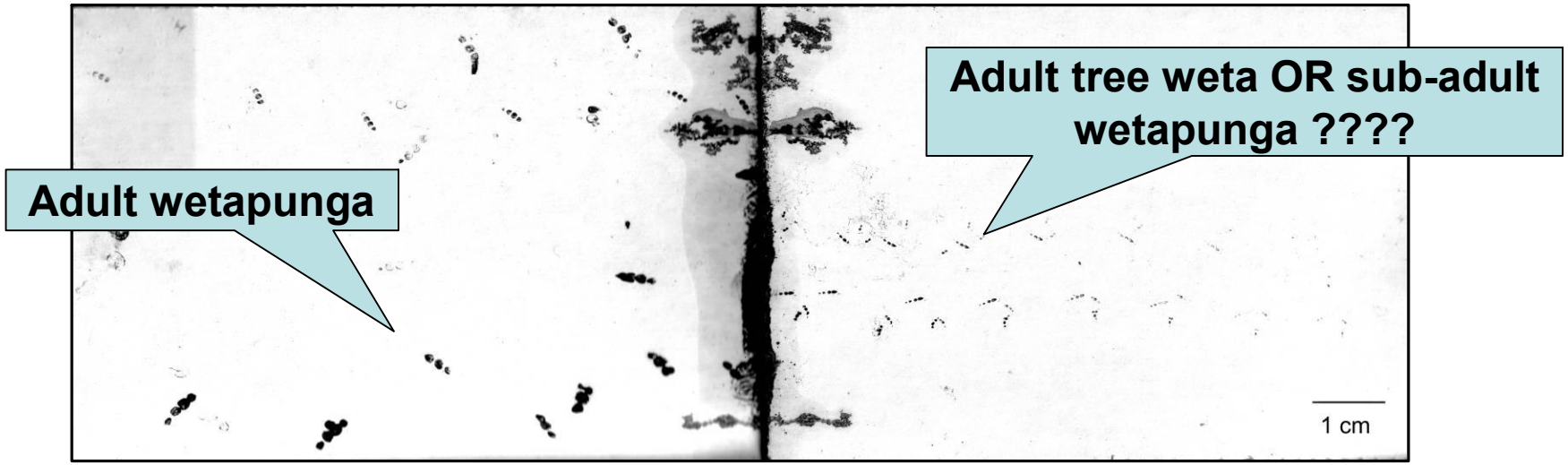
- 72% tracking rates for all weta
- 55% for adult wetapunga; 65% for other weta
- 89% of prints on 1st night



- ↑ tracking in baited tunnels vs unbaited tunnels
- ↑ tracking in tunnels on ground vs on branches

Summary LBI study

- Can distinguish adult wetapunga only



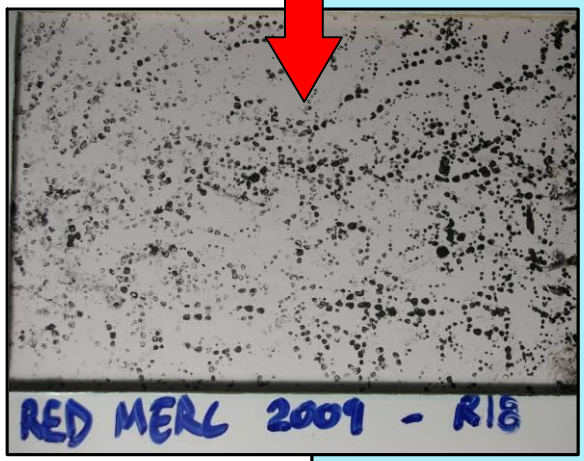
- TT detected adult wetapunga quickly (overnight)
- Higher tracking rates on ground
  - Adults active on ground
  - ↑ rates of wetapunga on ground during annual surveys after kiore eradication
- Baiting TT with peanut butter

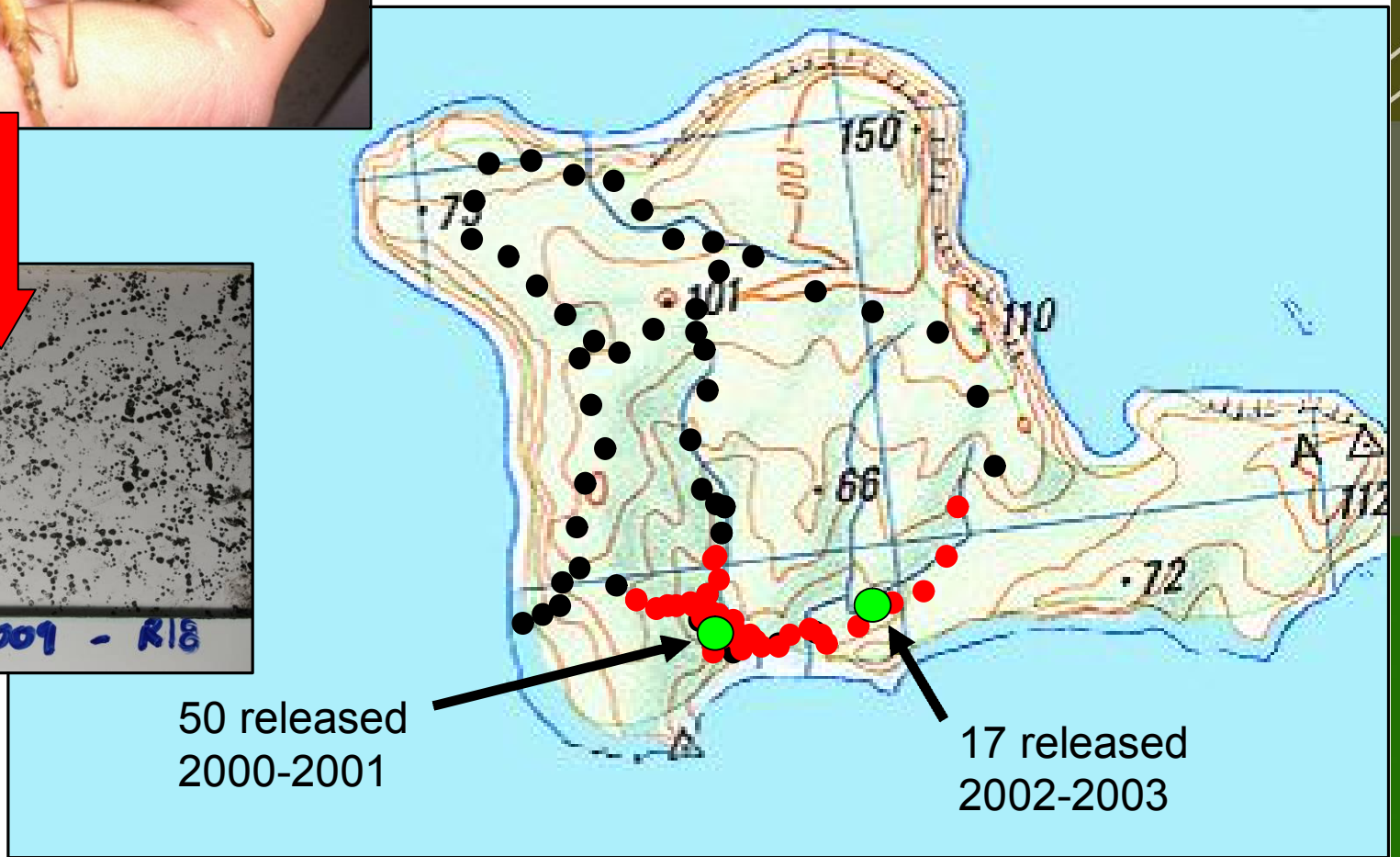
Monitoring giant weta using TT

1. Will weta use tracking tunnels? 
2. Can TT determine dispersal of translocated populations?
3. Can TT be used to estimate density of a weta popn?

Mercury Island tusked weta

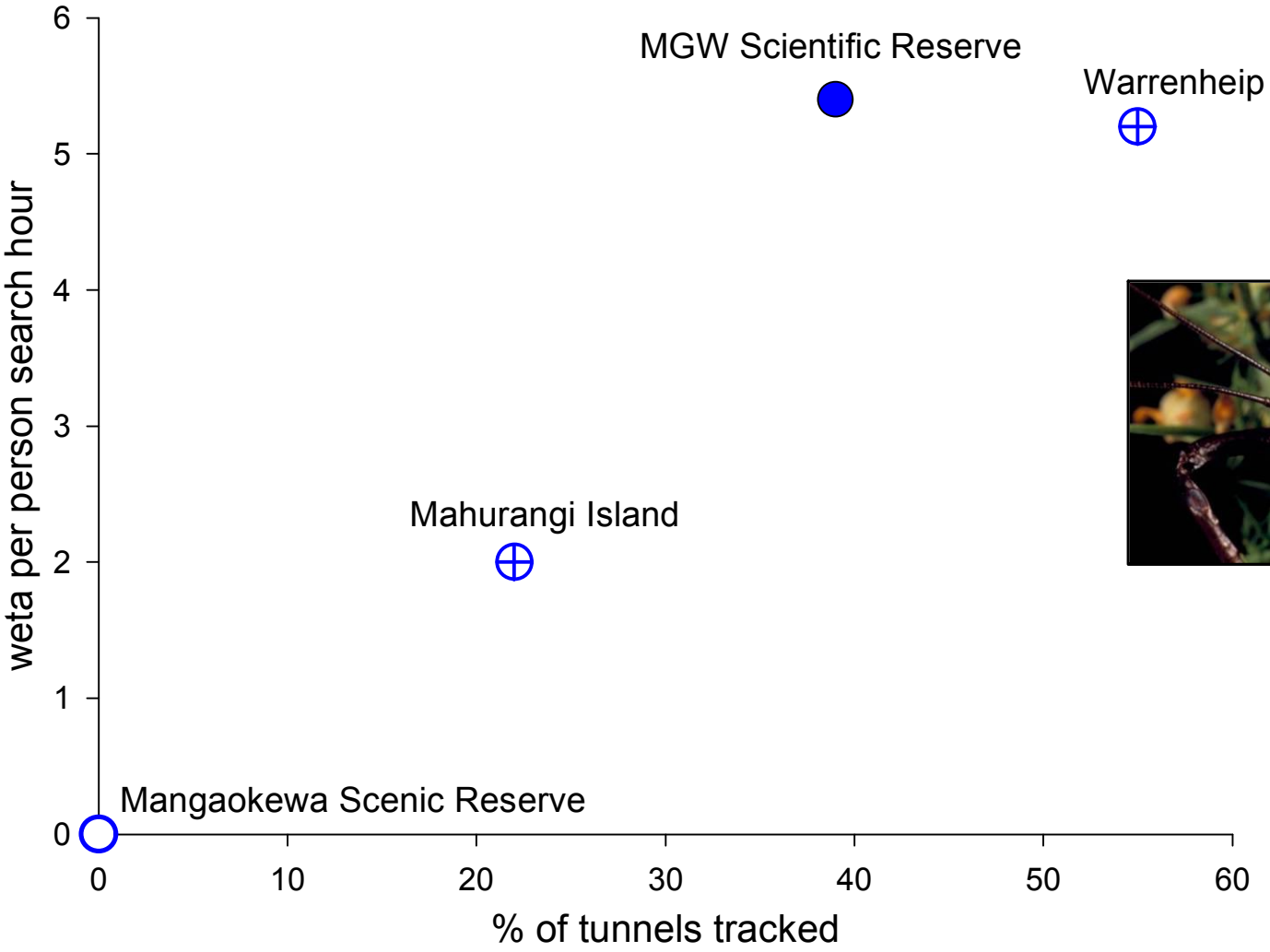
- Detect MITW at v low levels
- 54% tracking rates
- 225 m from release site





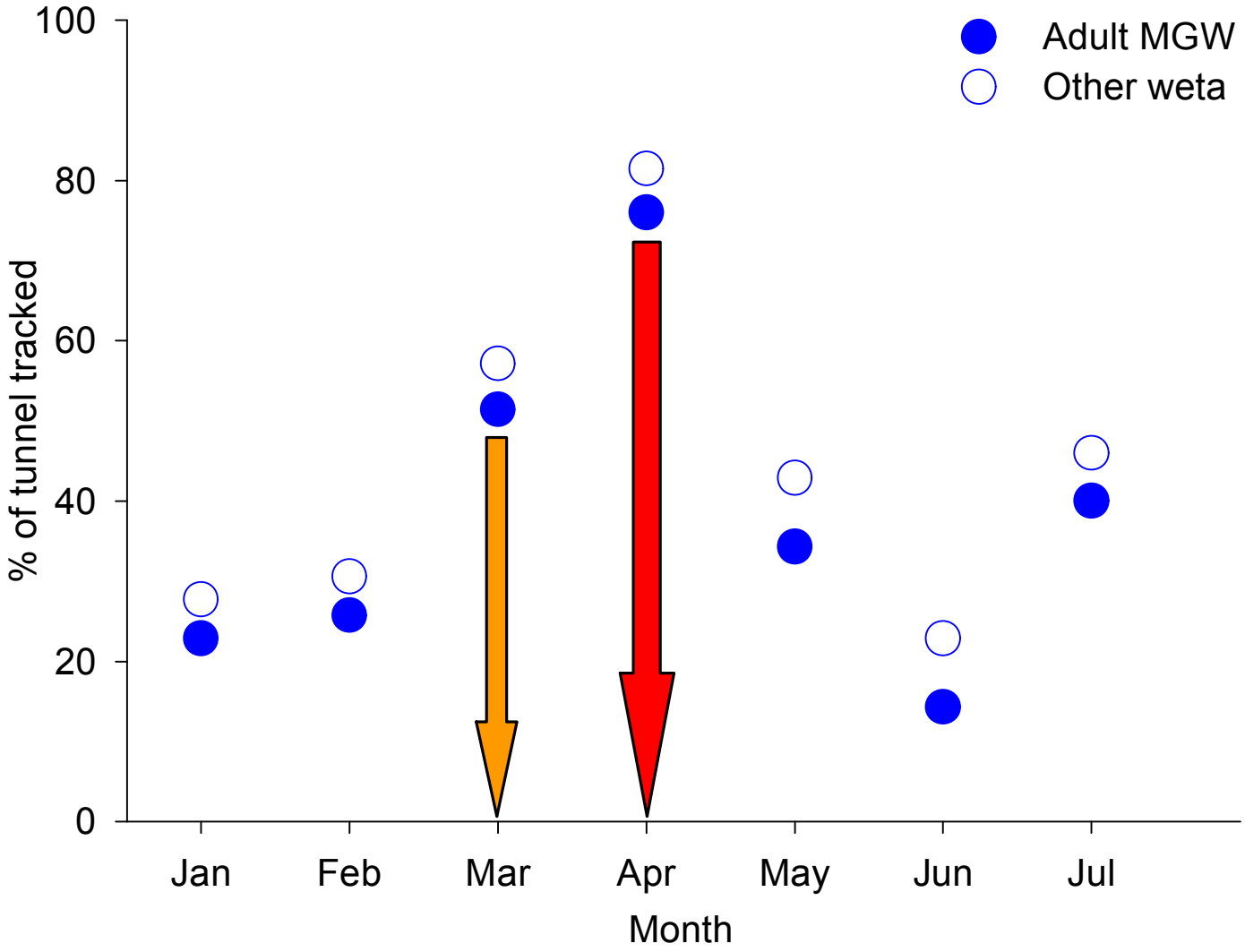
Mahoenui giant weta

- Transfers = 2,050 individuals in 32 releases at 7 locations
- Range of densities; mainland vs island location



Mahoenui giant weta

- ‘best’ time of year for TT – Warrenheip



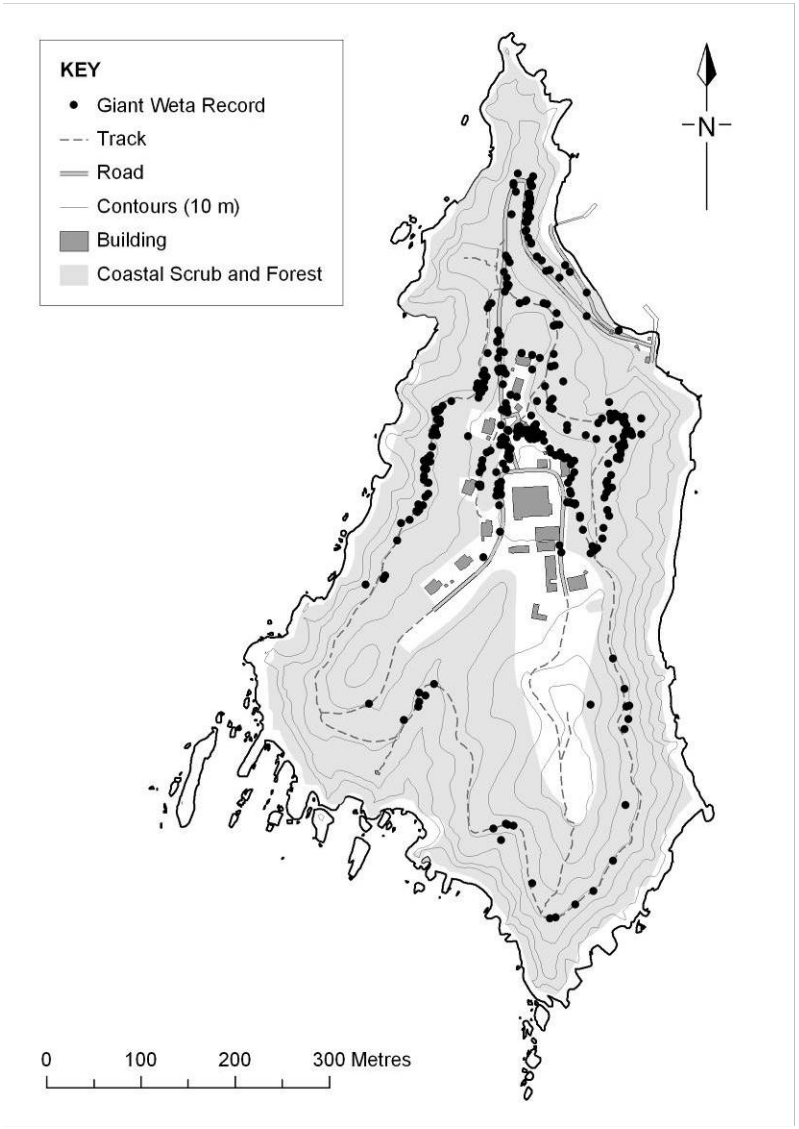
Can TT be used to estimate density of a weta popn?

Test: Cook Strait giant weta – Matiu-Somes Island

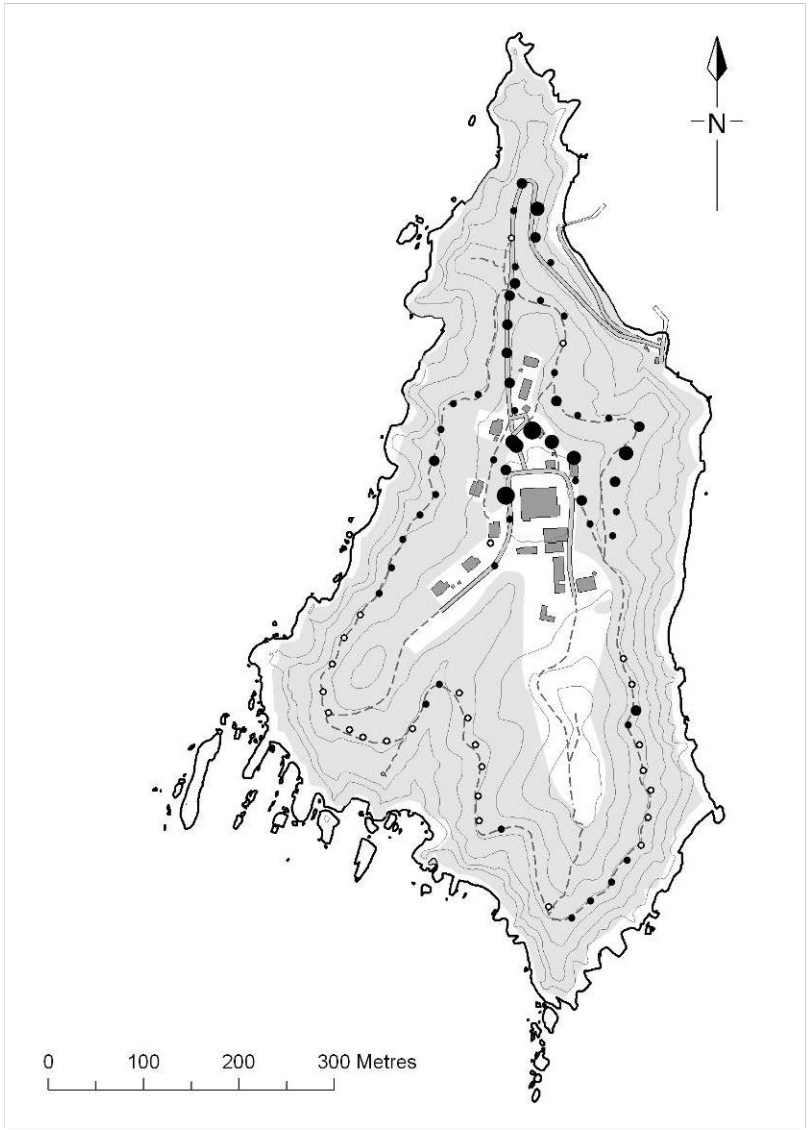
- Ground-dwelling giant weta
- 62 transferred to M-S Island in 1996

- TT – 50 m apart on tracks
- Same tracks search for weta
- Used mark-recapture
  - Tagged weta

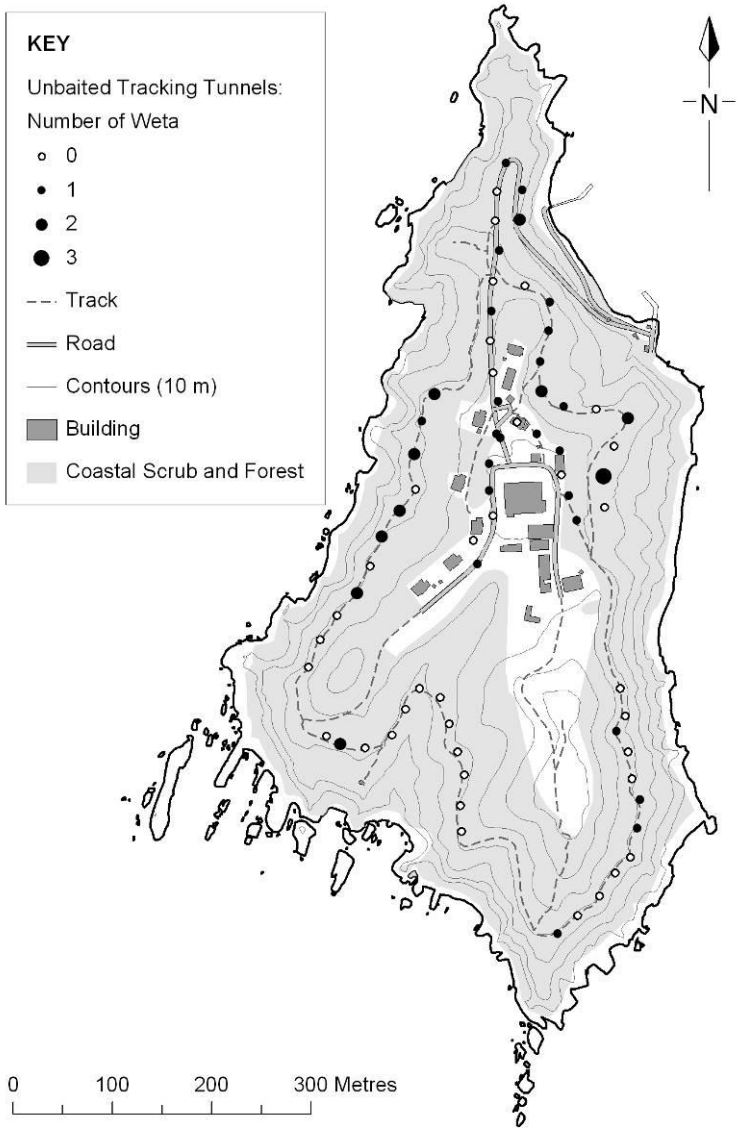
Adult giant weta observed at night



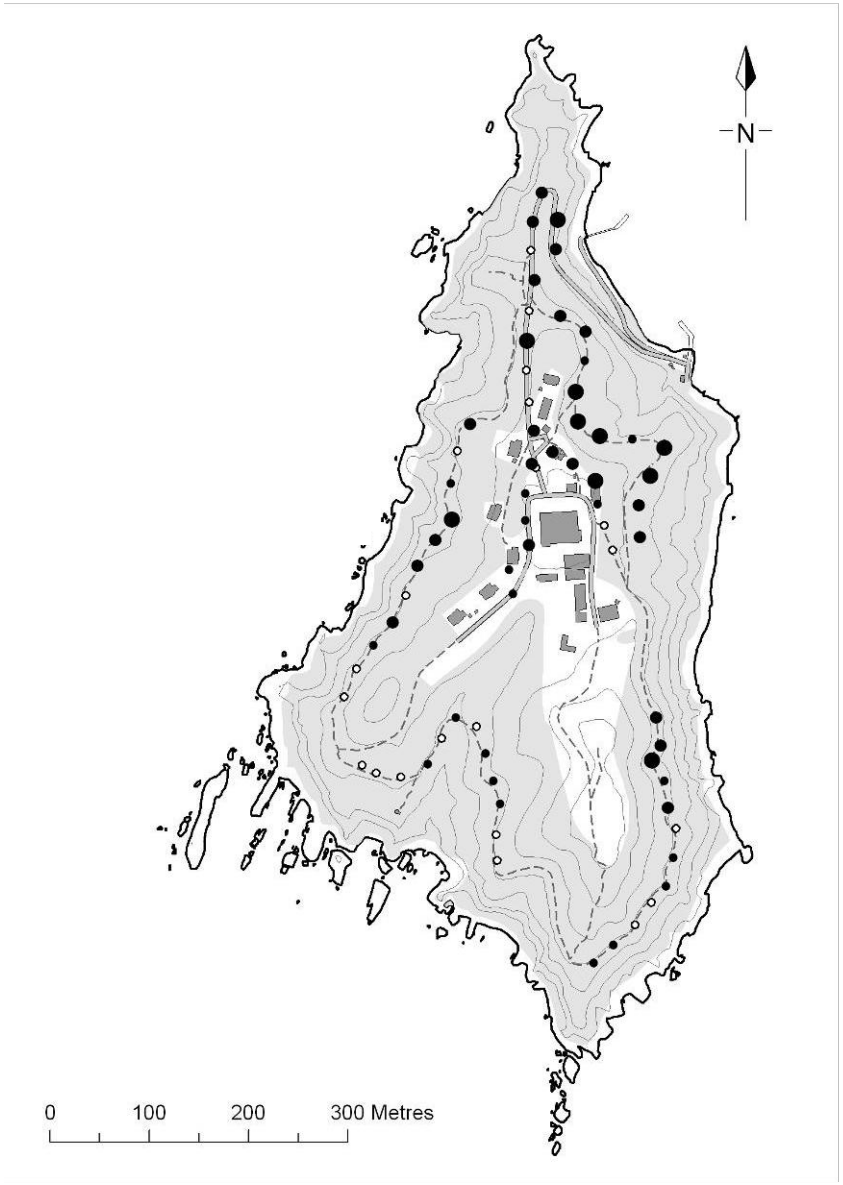
Adult giant weta detected in TT



Unbaited

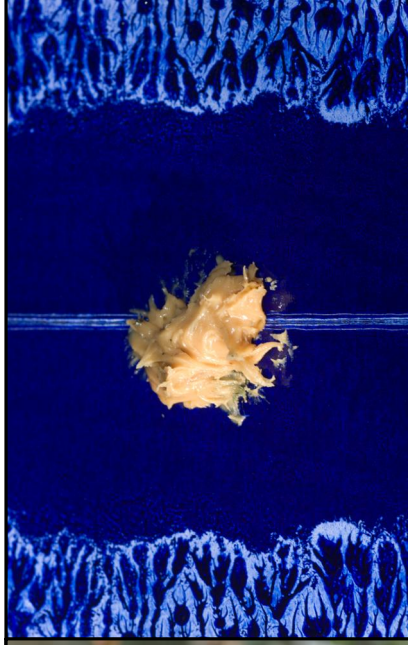


Baited with peanut butter



Summary - giant weta

- Distinguish adult giant weta from other weta species and life stages
- Can detect dispersal of translocated popns – at low levels
- March-April ‘best’ months to use TT to detect giant weta
- Density vs TT rates – activity varies with temp. = More research needed….



Using TT to monitor weta in sanctuaries

- TT widely used in sanctuaries to detect and monitor densities of introduced mammals
- Could they also be used to monitor weta popns?
  - Adult tree weta
  - Other weta
- Do they tell the same story as pitfall traps?

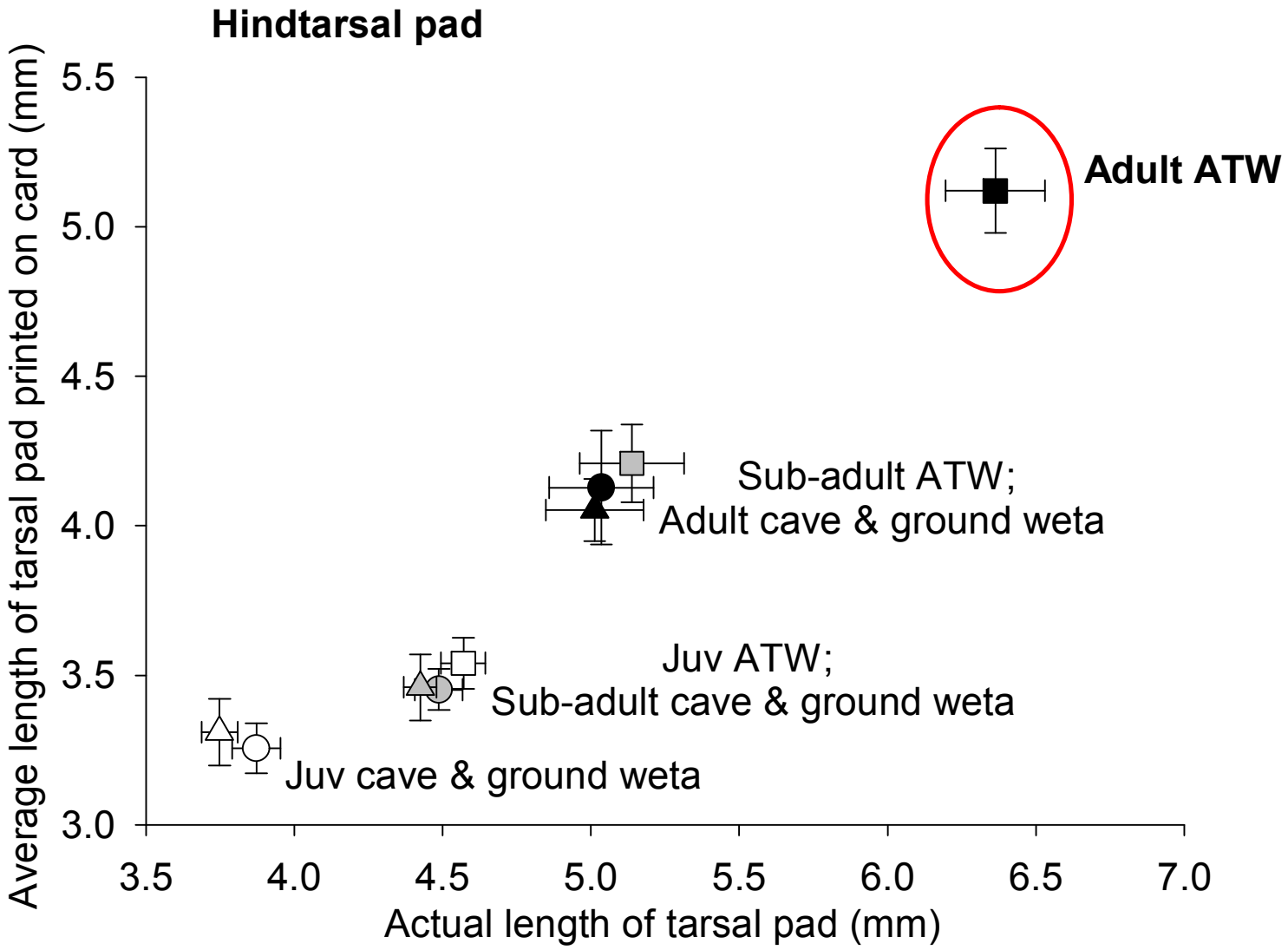
Test: Southern exclosure, Maungatautari

- Weta tarsal pads measured, footprinted & prints measured
  - Auckland tree weta (ATW)
  - Ground weta species
  - Cave weta species
  - Adults, sub-adults & juveniles

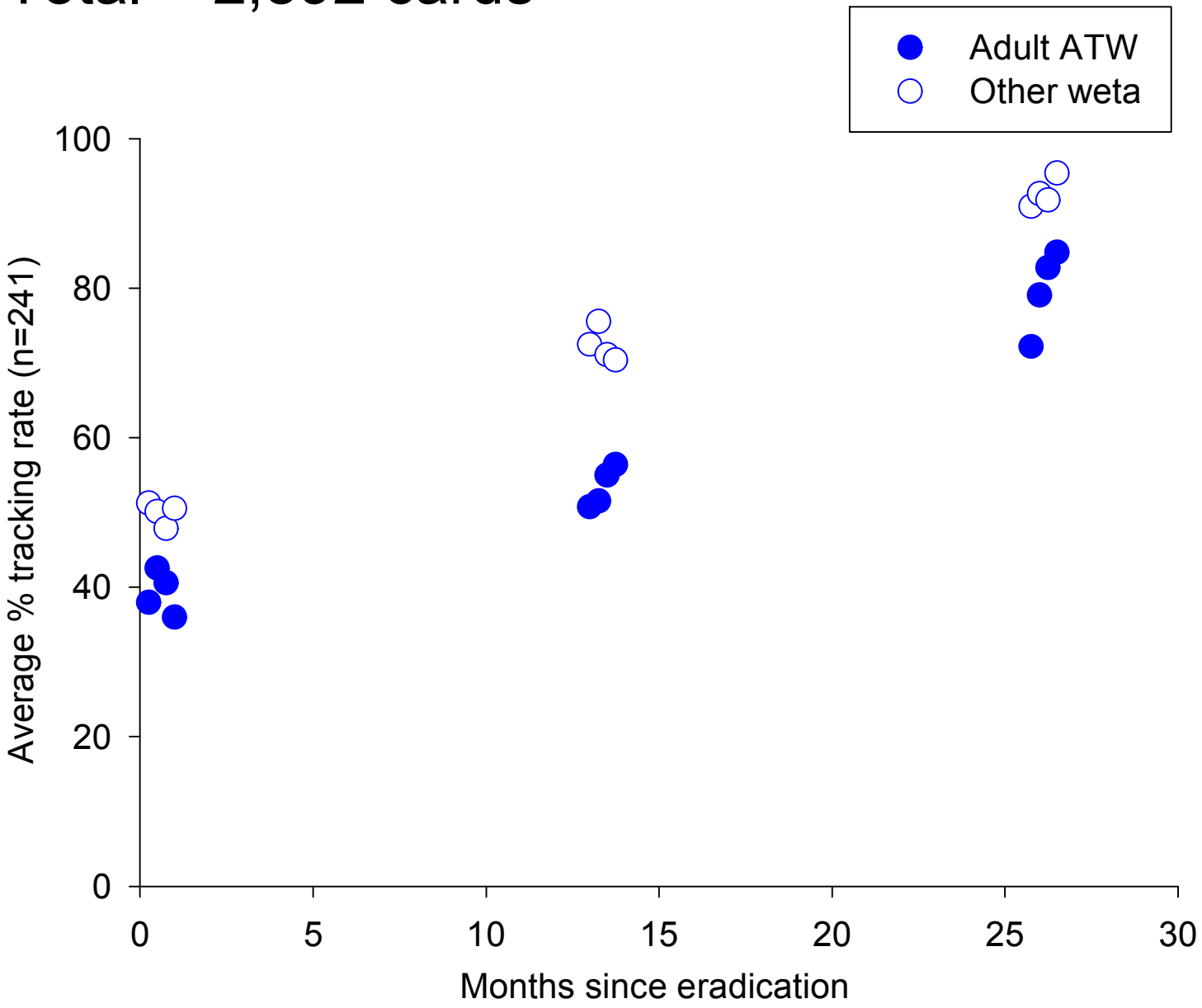
- Mammal eradication started Sept 04
- 241 tunnels at 50 m apart on grid, 0, 1 & 2 yrs after mammal eradication

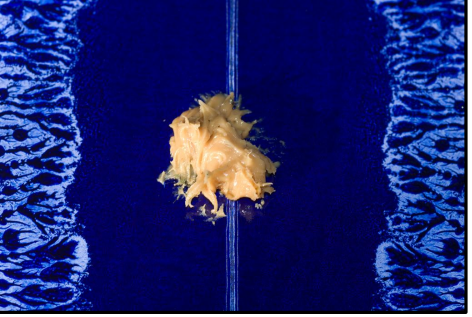
Distinguishing between weta footprints

- Adult ATW have significantly larger footprints



- Total = 2,892 cards





Summary

- ↑ tracking rates of weta since mammal eradication
- ↑ intensity of weta tracking since mammal eradication
- Pitfall trap data over same time shows ↑ in weta

= ↑ weta abundance

= change in behaviour – more active on ground?

Future Research

- Use of TT to monitor translocated giant weta e.g., MITW on islands, MGW at Maungatautari etc

- Relate weta popn density to TT rates – compare various species at different densities

Acknowledgements

- Funding:
  - FRST

- John Innes, Greg Sherley, Chris Green, George Gibbs, Bruce Burns, Neil Fitzgerald & Warren Agnew