
Counting, killing and chasing mice on Saddle Island

Jamie MacKay

University of Auckland

Supervisors:

Mick Clout, University of Auckland

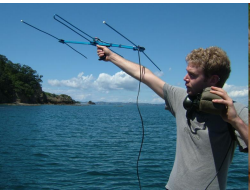
Mark Hauber, University of Auckland

Elaine Murphy, Department of Conservation



Overview

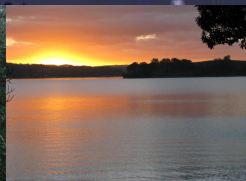
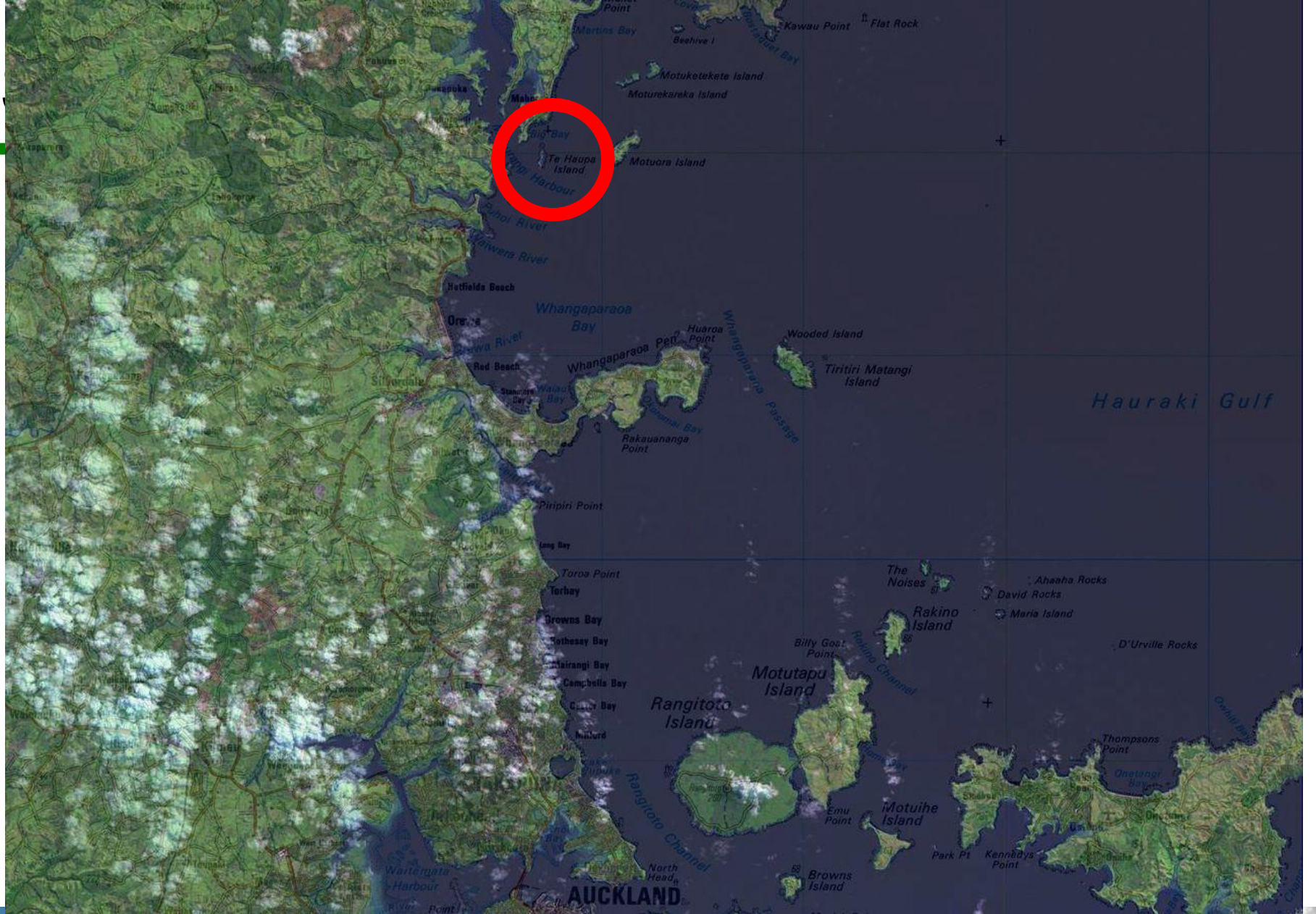
- Introduction
- Saddle Island
- Work completed so far
- Results
- Work underway
- Conclusions



Introduction

- Mice have been introduced worldwide
- Mice have a negative impact on ecosystems
 - Invertebrates, birds, reptiles and plants affected
- 38% of eradication attempts worldwide have failed (MacKay *et al.* 2007)
 - Only 5% of Norway rat eradication attempts have failed
- What causes this?
 - Studying a small population of mice to investigate possible reasons





Saddle Island

- 6ha forested island off Mahurangi, North of Auckland
- Norway rats eradicated in 1989 and mice appeared
 - Single male incursion detected and removed March 2008
- 25m grid established across whole island, 62 stations used for live trapping and poisoning



Saddle Island

- 6
- A
- M
- a
- 2
- 6
- p



th of
ce
ved
nd,



Saddle Island

- 6
- A
- M
- a
- 2
- 6
- p



th of
ce
ved
nd,

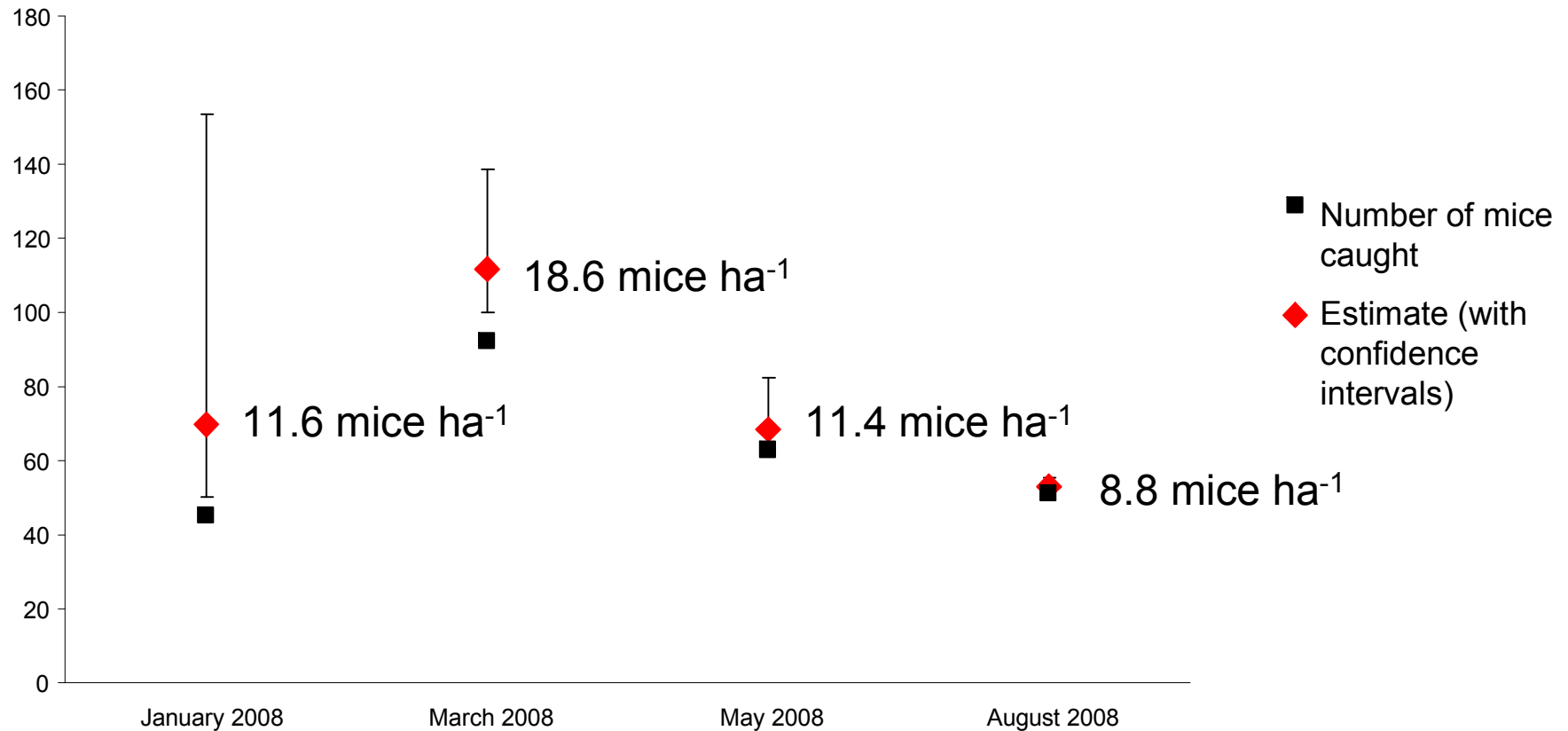


Work on Saddle Island

- Density estimates
 - Capture-Mark-Recapture Jan, Mar, May 2008
 - Removal trapping Aug 2008
- Radio-tracking
- Eradication
 - Trapping, poisoning and monitoring
 - Aug-Dec 2008
- Releases



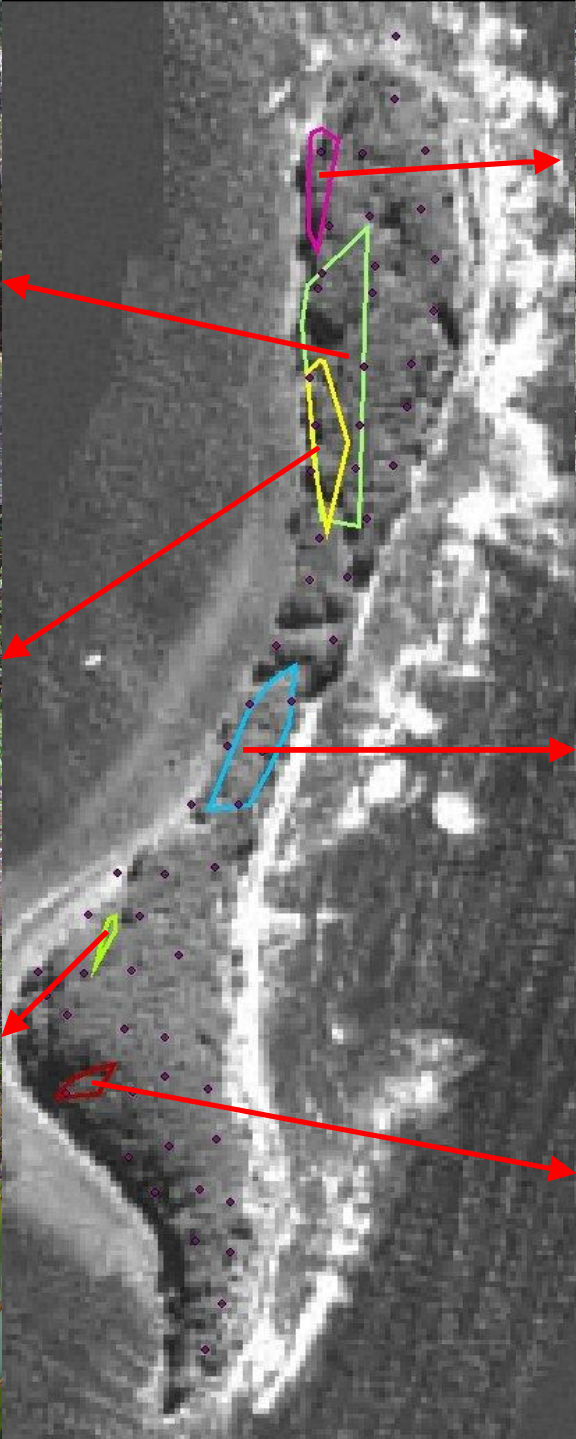
Results 1: Numbers of mice by session



Results 2: Movements

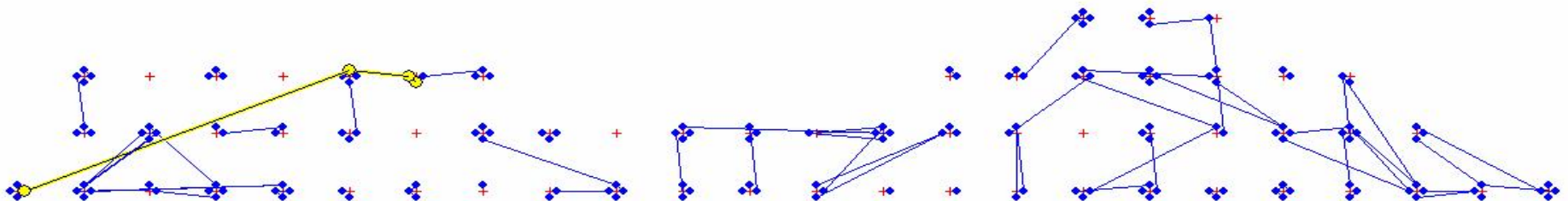
- Mouse locations recorded by GPS over 4 nights of radio-tracking
- 4 males and 2 females spread across island
- Effect of habitat on home ranges?





Results 2: Movements

- Mouse locations recorded by GPS over 4 nights of radio-tracking
- 4 males and 2 females spread across island
- Effect of habitat on home ranges?
- Average movements from live trapping over first 3 sessions 26.7m
- BUT – many animals only captured once
 - Jan-54%, March-48%, May-25%



Results 3: Eradication

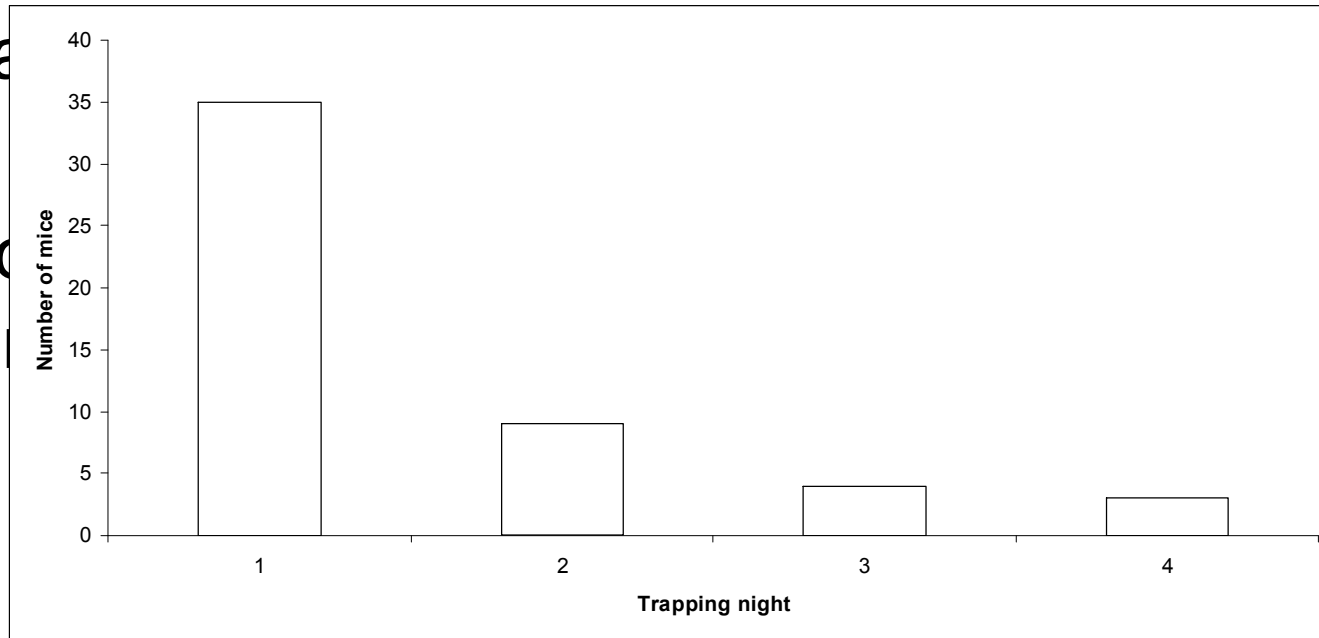
- 51 mice removed over 4 nights of trapping (4th-7th August)
 - Steep decline in numbers good for estimate
 - Removal estimate calculation 53 mice on island
- WaxTags left out on island at end of trapping
 - 18 chewed 12 days later when poison put out
- Brodifacoum wax blocks at each station, pellets hand spread on cliffs



Results 3: Eradication

- 51 mice removed over 4 nights of trapping (4th-7th August)
 - Steep decline in numbers good for estimate
 - Removal estimate calculation 53 mice on island

- Wa
-
- Bro
- ha



Results 4: Monitoring

- Bait stations checked 16th September
 - Bait take minimal
 - Only recorded in areas where WaxTags chewed
- No mice detected after September
- Rodent dog check December
 - One small area of possible mouse sign
 - Extensive trapping caught nothing
 - Rat footprints in tracking tunnel, no dog response



Results 4: I

- Bait station
 - Bait take
 - Only record chewed
- No mice d
- Rodent do
 - One sma
 - Extensi
 - Rat footp response

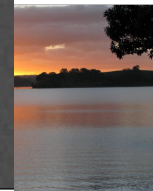
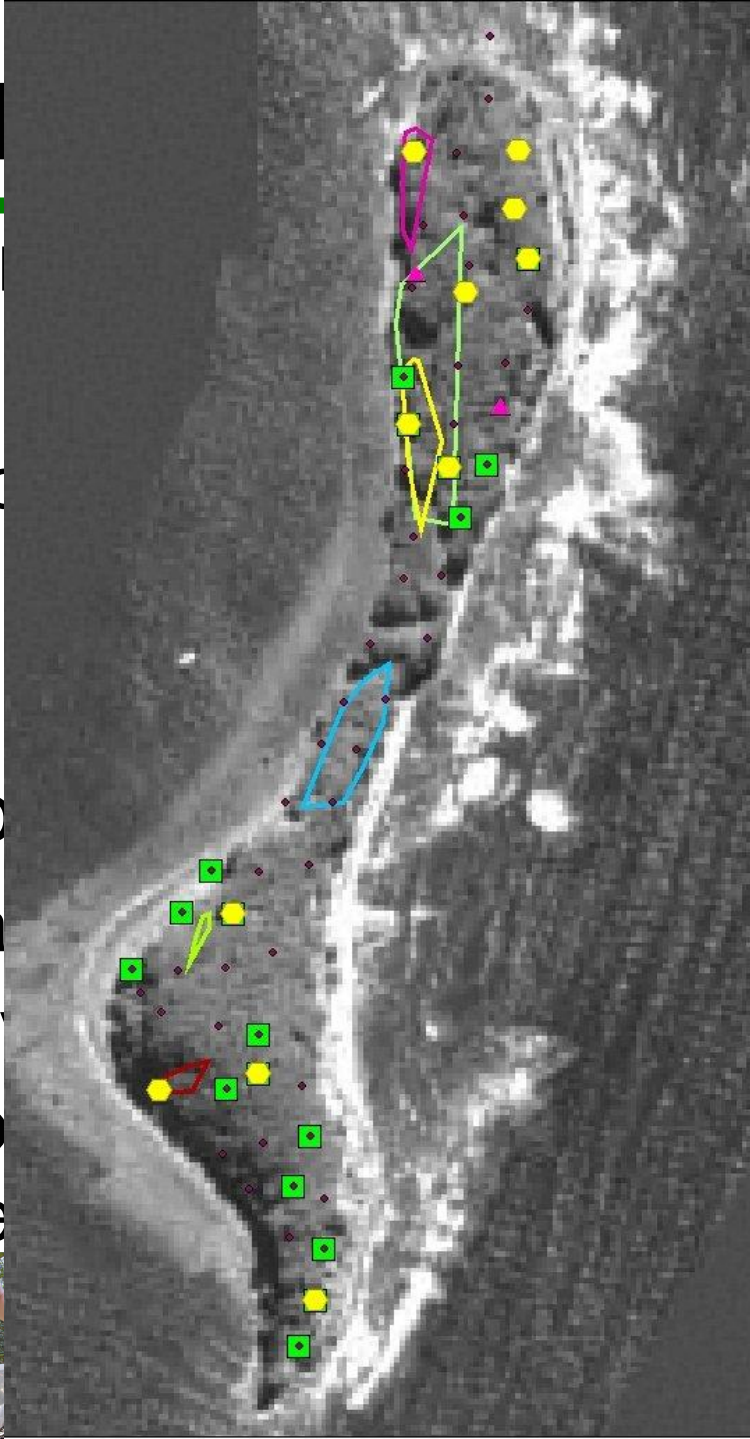
September

/axTags

nber

se sign

no dog



Results 5: Conflicting evidence

- WaxTag evidence suggested 5 or 6 mice left on island post-trapping
- Removal method estimate calculated 53 mice alive on island, 51 were removed
 - Could mouse movements increase as population decreases?



Results 5: C

- WaxTag ex
left on island
- Removal n
mice alive
– Could mo
population

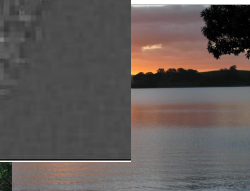
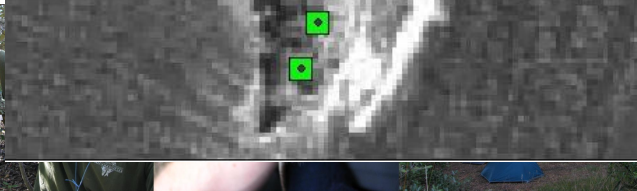
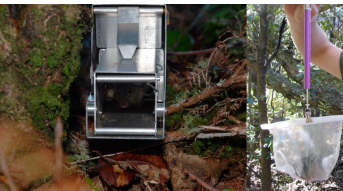
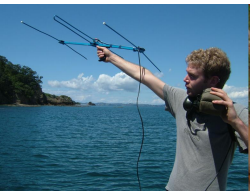
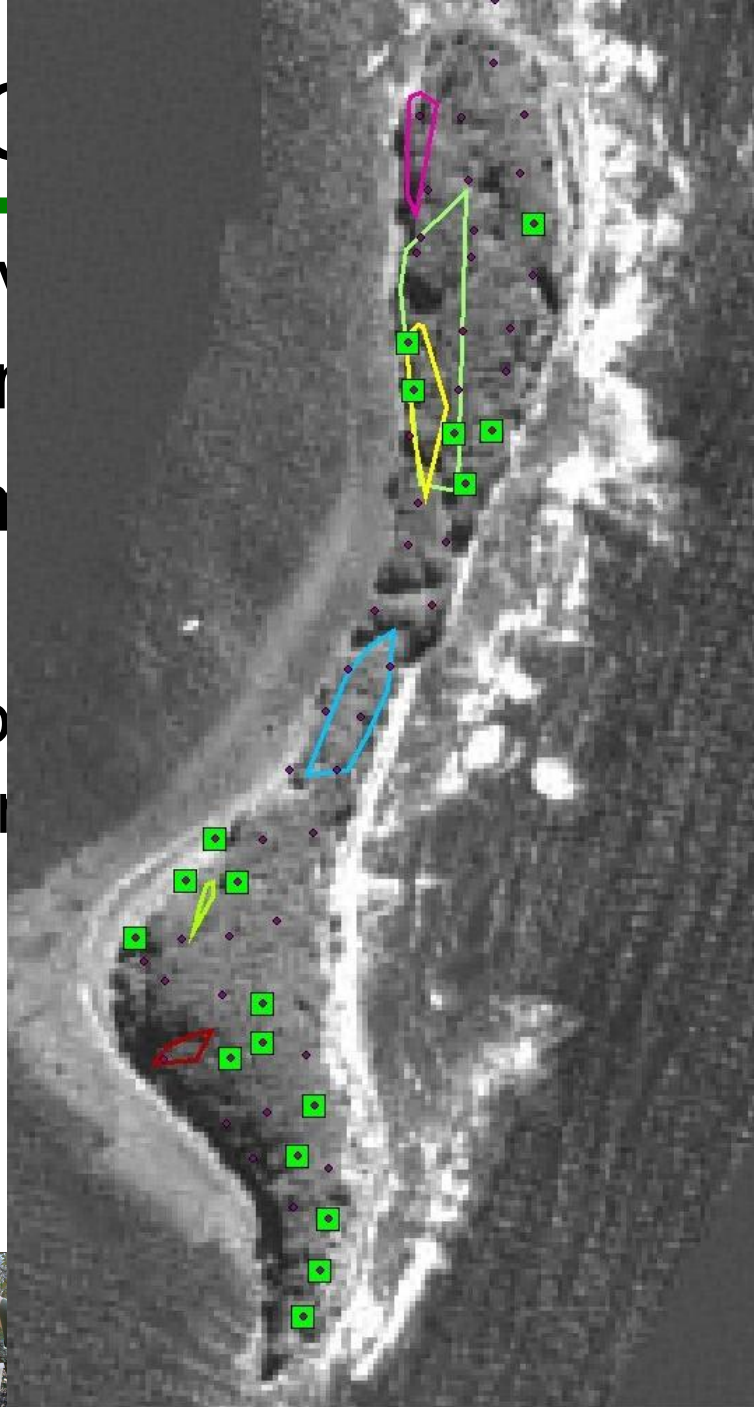
nce

5 or 6 mice

culated 53

removed

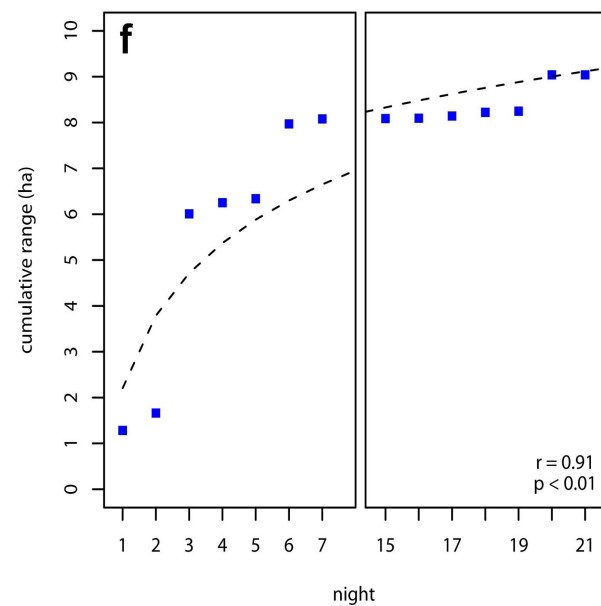
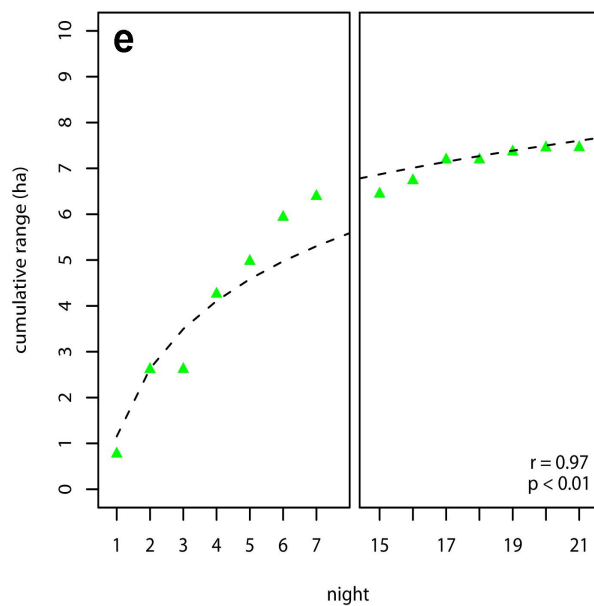
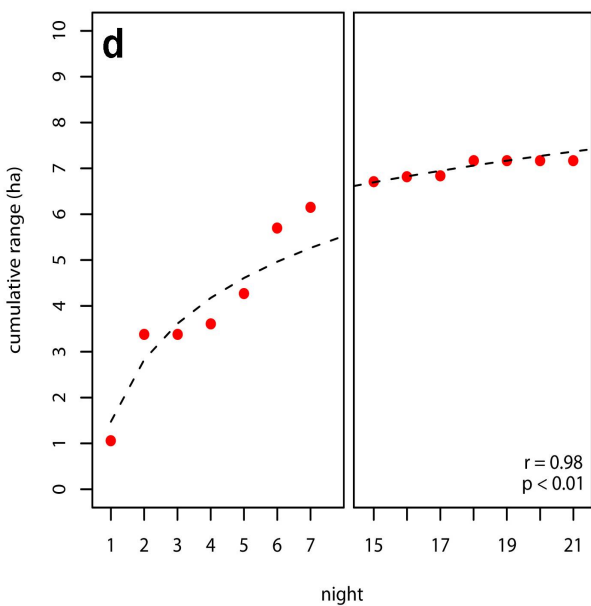
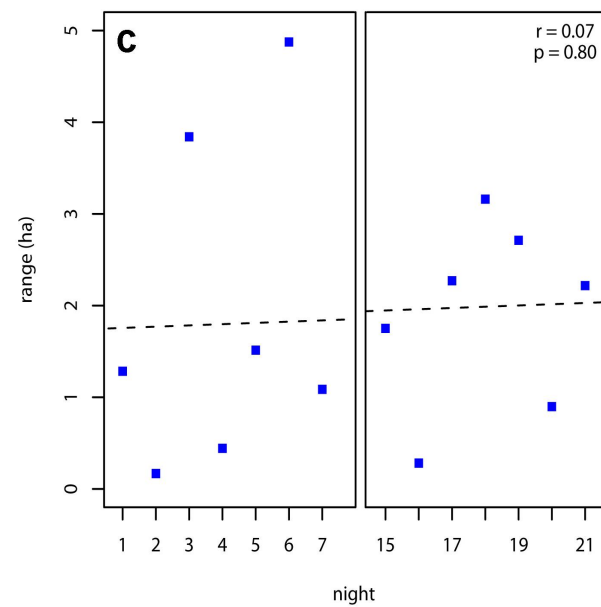
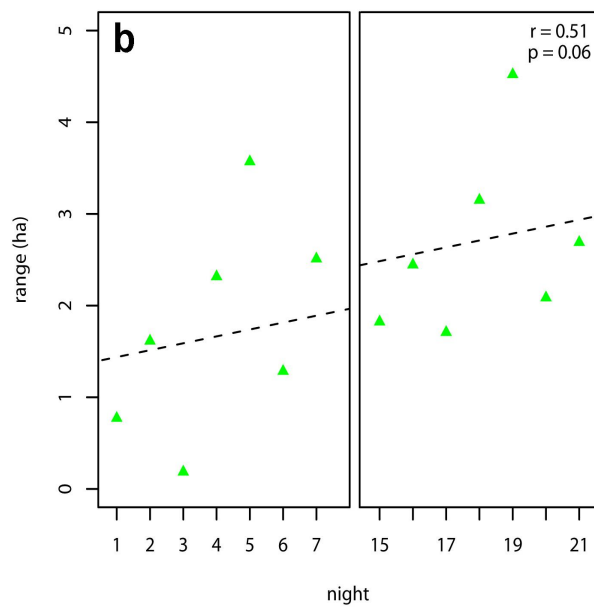
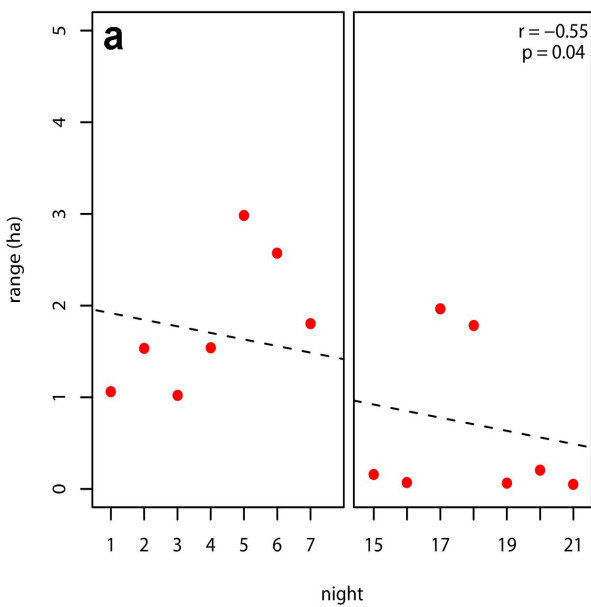
se as



Releases - Introduction

- Behaviour of mice at low population density important
 - Detecting eradication survivors
 - Detecting new invaders
- Lidicker (1966) found mice moved more as population declined following *Microtus* invasion in USA
 - Does the same thing happen when no other species are present?
- James Russell PhD work:





Releases – Questions

- Does the ranging behaviour of released animals differ from the behaviour of mice in pre-eradication populations?
- Do released animals use tracking tunnels?
- Are animals released at opposite ends of the island able to find each other?
 - Do animals stay close if they do find each other?
- Can released animals be eliminated?



Releases – Methods

- Male and female animal marked by toe clipping and fitted with radio-collar
- Three stages of tracking
 - 4 nights radio-tracking
 - 4 nights tracking tunnels
 - 2+ nights radio-tracking and trapping
- Toe clipping allows tracks to be assigned to individual animal



Releases – Methods

- Male and female animal marked by toe



Releases – Story so far

- Four releases completed
 - Animals released, tracked and removed
- Fifth planned for late August, catching mice at Tawharanui from Monday
- No analysis yet but animals are covering large distances



Conclusions

- Density peak of 18.6 mice/ha in March
 - Tawharanui peak 156.7 mice/ha in April (116.5 in March)
 - Mana Island peak 70 mice/ha in April
 - Bi-monthly trapping may have missed peak but still much lower than other mouse-only sites
- Mice tracked in winter move 25m+ in a night
 - Moving further than mice in higher density population in Tawharanui (>10m)
 - 25m bait station grid adequate for eradication
 - Need to compare movements to different grid sizes
- Removal trapping and poisoning of small island seems effective eradication tool
 - Would it scale up?
- Evidence of increased movement of individuals after population reduction



Acknowledgements

Thanks to all the people who have helped me
in the field

Funding from DOC, Sigma Xi, Rotary Club of
Newmarket and SBS

Tracking tunnels and cards from Connovation
Ltd., print reading help from John Innes,
population estimates assisted by Deb
Wilson and James Russell

