



Advance, Invading Hordes!

Population growth and detectability of mice on Saddle Island

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With photographs by Sandra Anderson, Justine Stewart, Luciana Luna, Josie Galbraith



Te Haupa (Saddle) Island

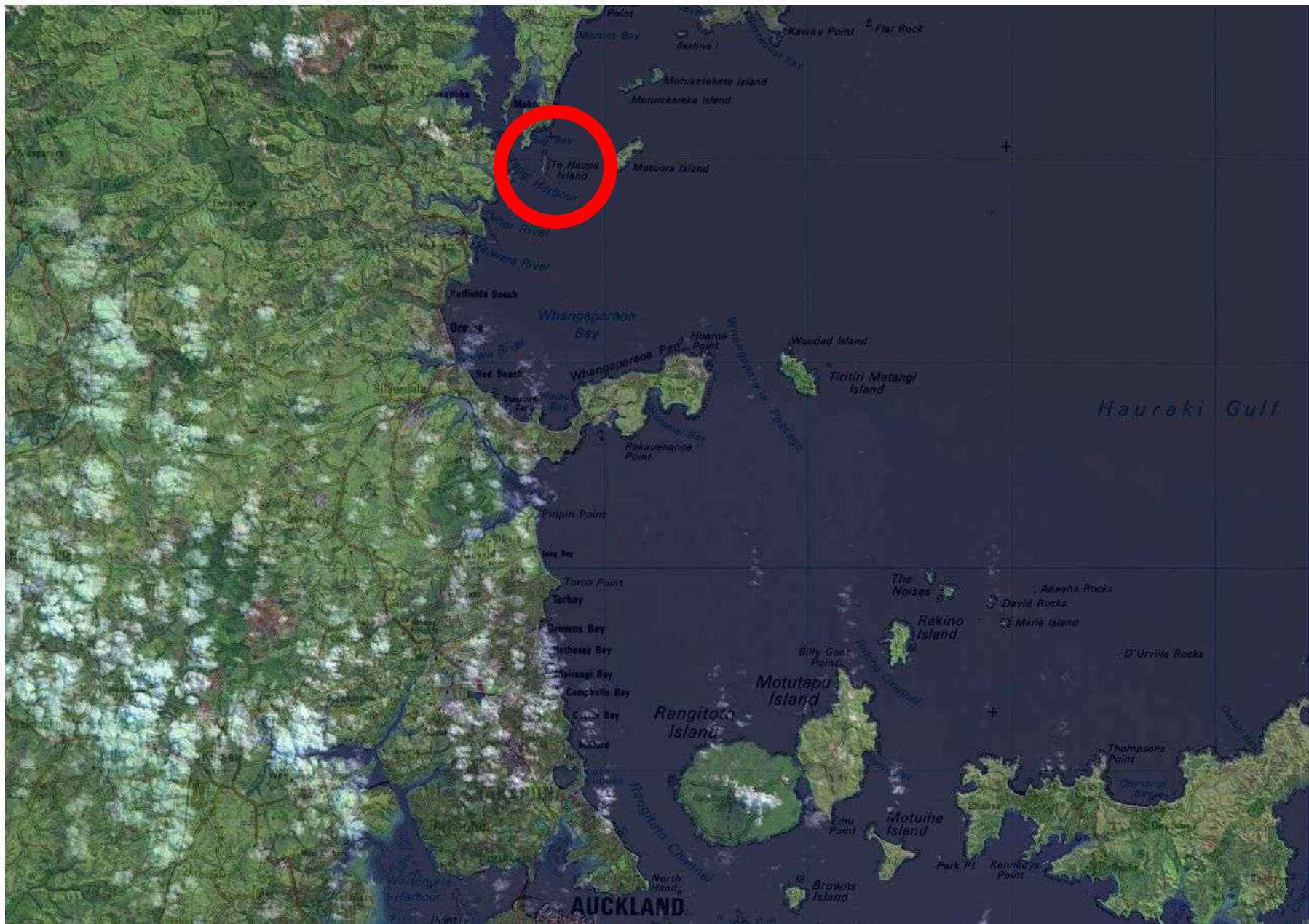
- 6 ha Scenic Reserve. Frequented by public

- Pohutukawa canopy, grey-faced petrel, moko skink

- Norway Rats eradicated 1989
mice detected (Tennyson and Taylor, 1999)

- Mice eradicated 2008
(Mackay *et al.*, n.d.)





The Invader



The House Mouse (*Mus musculus*)

Significant impacts on biodiversity worldwide and in NZ

Eradications often fail - 38% (Mackay *et al.*, 2007)

- 5% Norway rats (Howald *et al.*, 2007)

Eradication of competitors can lead to population irruption

Previous Research

- Jamie MacKay (PhD student), Mick Clout



- 4 nights tracking tunnels
- 2+ nights radio-tracking and trapping

Images by Jame MacKay



Images by Jame MacKay

Following on...

- What happens if you leave the mice on the island?



Research Questions

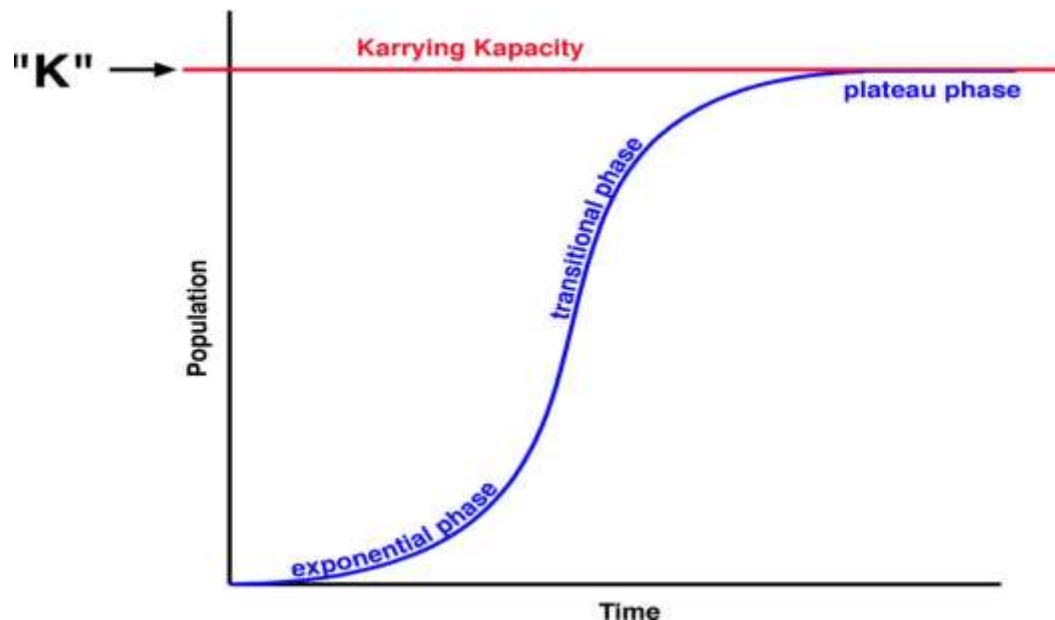
- 1. How quickly can a viable population of mice establish from one founding pair?
- 2. Are current methodologies for detecting island incursions effective? – test DOC standard procedures
- 3. How does the ranging behaviour of mice change with increasing density?

Population Growth

1 male and 1 female mouse trapped at Tawharanui
and released on Saddle Island on

8 December 2009

An invading population might be expected to follow a
logistical growth curve... does it?



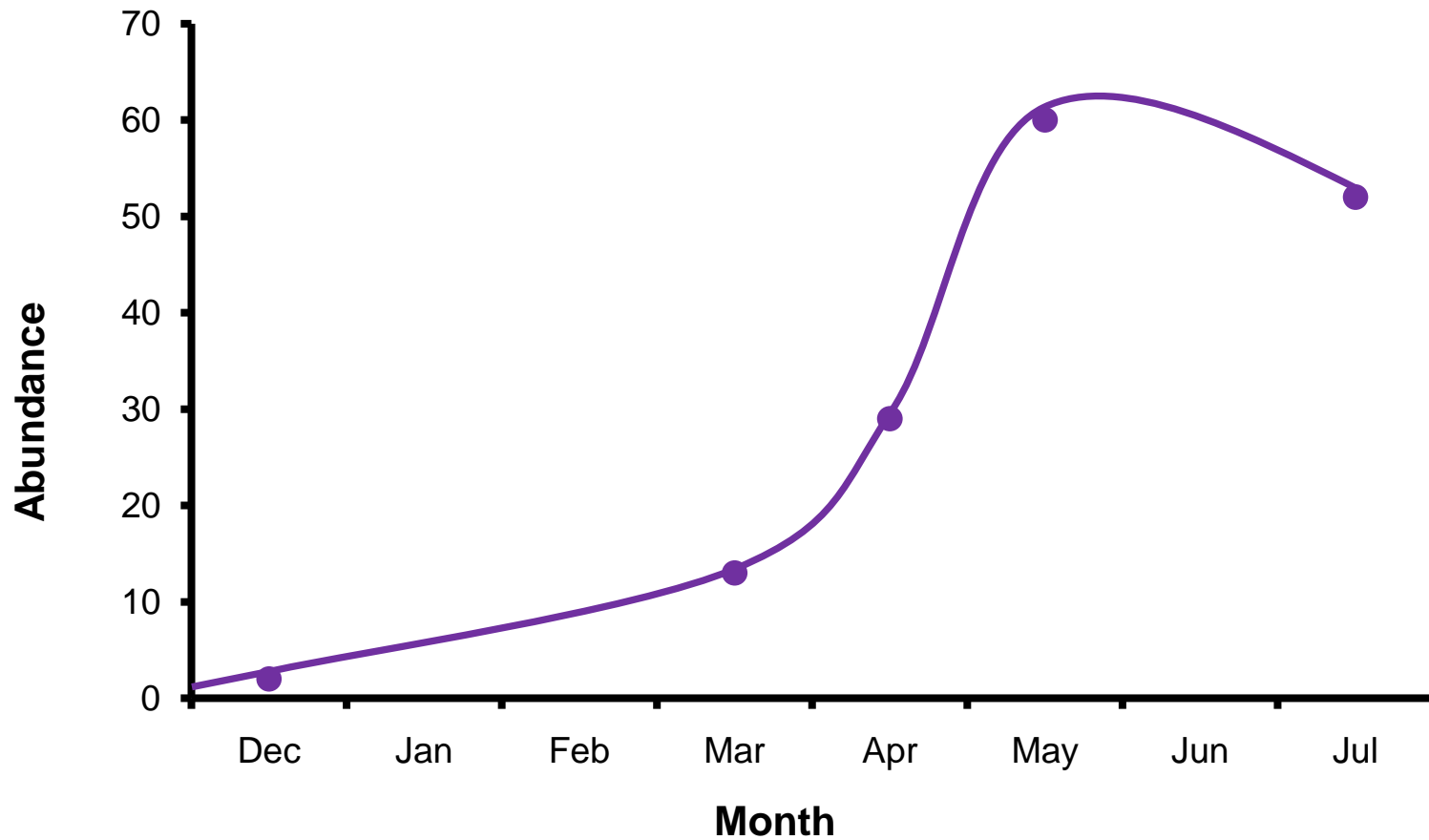
Population Growth

Monitor population size monthly for 6 months using capture-mark-recapture technique



Population Growth

Increase in mouse abundance from Dec 09 – Jul 10.



Detectability

DOC procedure for small islands – use **1-2 detection devices/ ha** in places open to invasion (E. Murphy, pers.comm.)

Set up 6 tracking tunnels and 6 wax tags along beach.

2 time periods: 1 month, 4 nights



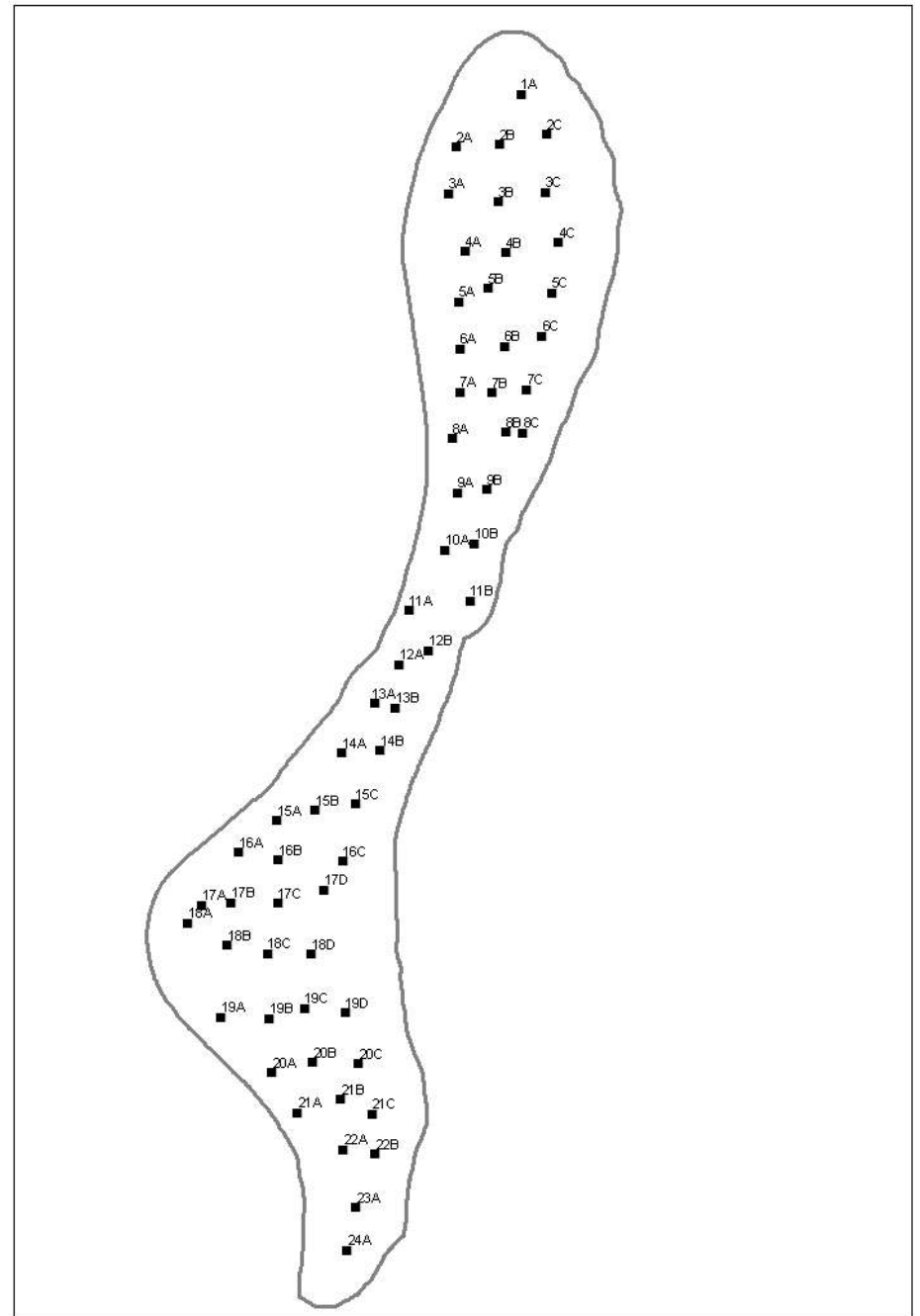
Detectability

- Detection methods appear to work well even at low densities,
 - In February-March, 45% of devices detected mice
-
- 1 month marginally better (79%) than 4 nights (61%)
 - Tracking tunnels performed better (90%) than wax tags (46%)



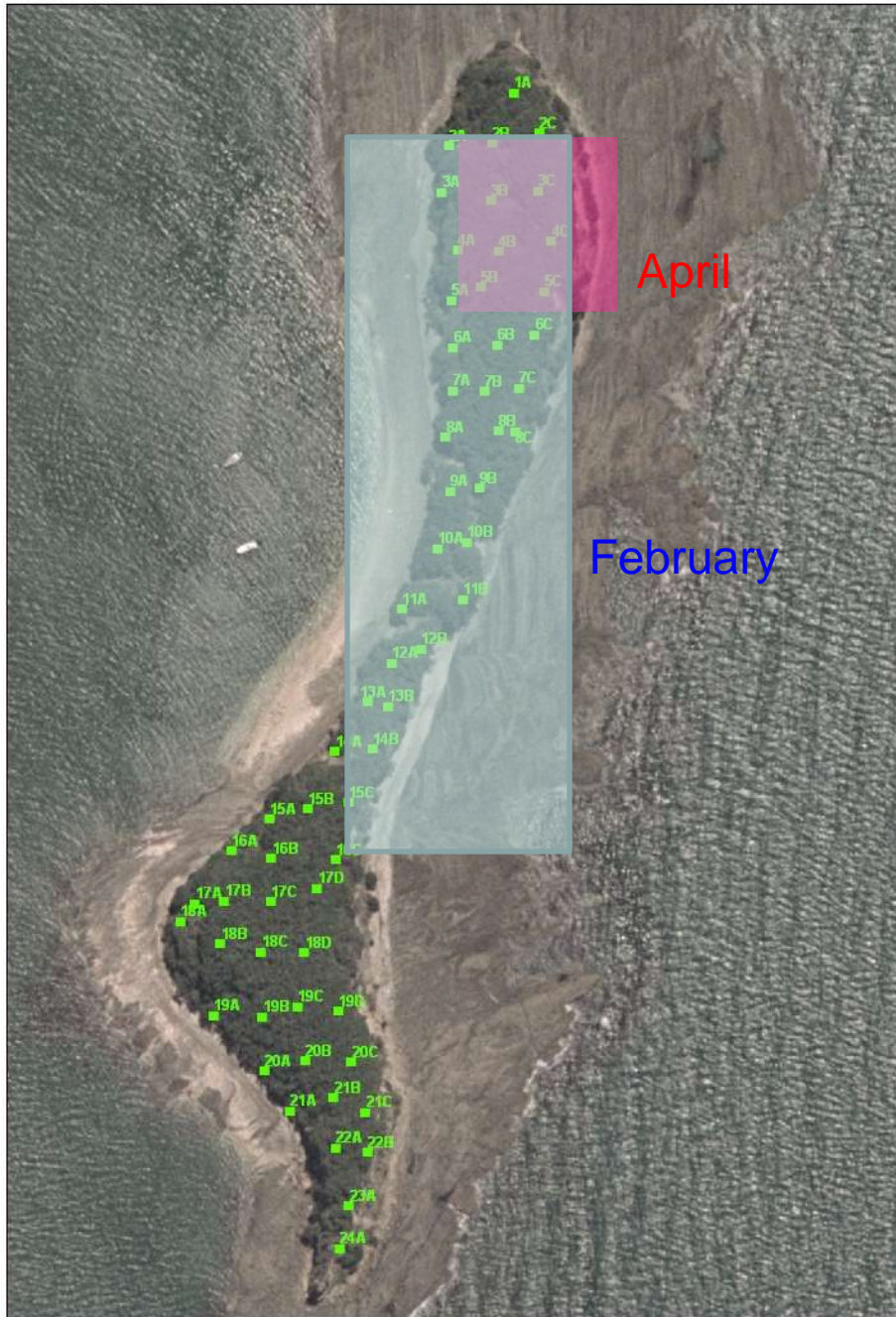
Movement

- 16 mice given unique toe-clips
- 62 tracking tunnels laid out in 25m grid across island
- Cards left out for a month between trips



Movements

- Preliminary results suggest mice restrict their ranging movements at higher density
- Example: Female #22



Wrapping up!

- ERADICATE!
- 7 nights trapping 8-14 August
- 3 toe-clipped “survivors” left to be tracked
- Follow up with brodifacoum across entire island



Conclusions

- The invading population of mice increased its abundance by 30x in just 5 months.
- Crucial that pest-free areas be frequently monitored
- Current detection methods appear adequate

Thank you!



Acknowledgements

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References

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