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Possum movements in areas with few possums

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Today's talk……

- Outline why we are interested in possum movements in low density areas.
- Review what we already know.
- Describe new work in progress.

Traditional reasons for investigating possum movements

- Determine optimum bait/trap spacing during control.
- Calculate effects of reinvasion on population recovery times →repeat control.
- Investigate the consequences for the spread of wildlife diseases (**Tb**).

Possum movements in uncontrolled populations

- Adults are sedentary

- Home ranges: 1-4 ha:
  - Males 50% larger then female.
  - Larger in low density habitats.
  - Much larger on farmland.

- Sub-adult dispersal:
  - Mainly males; during breeding season.
  - Distances average c. 1-5 km.
  - Independent of density.

Possum movements at control boundaries (the "Vacuum Effect").

- Main findings
  - Few possums move into controlled areas.
  - Some home range displacement toward controlled area.
  - Sub-adult dispersal unaffected.

(Green & Coleman 1984, Brockie *et al*. 1991 Cowan & Rhodes 1992, Efford et al. 2000, Pech *et al.* 2010, 2012).

- However….
  - But rapid reinvasion at Lake McKerrow. (Nugent *et al*. 2008)

→ Habitat important?

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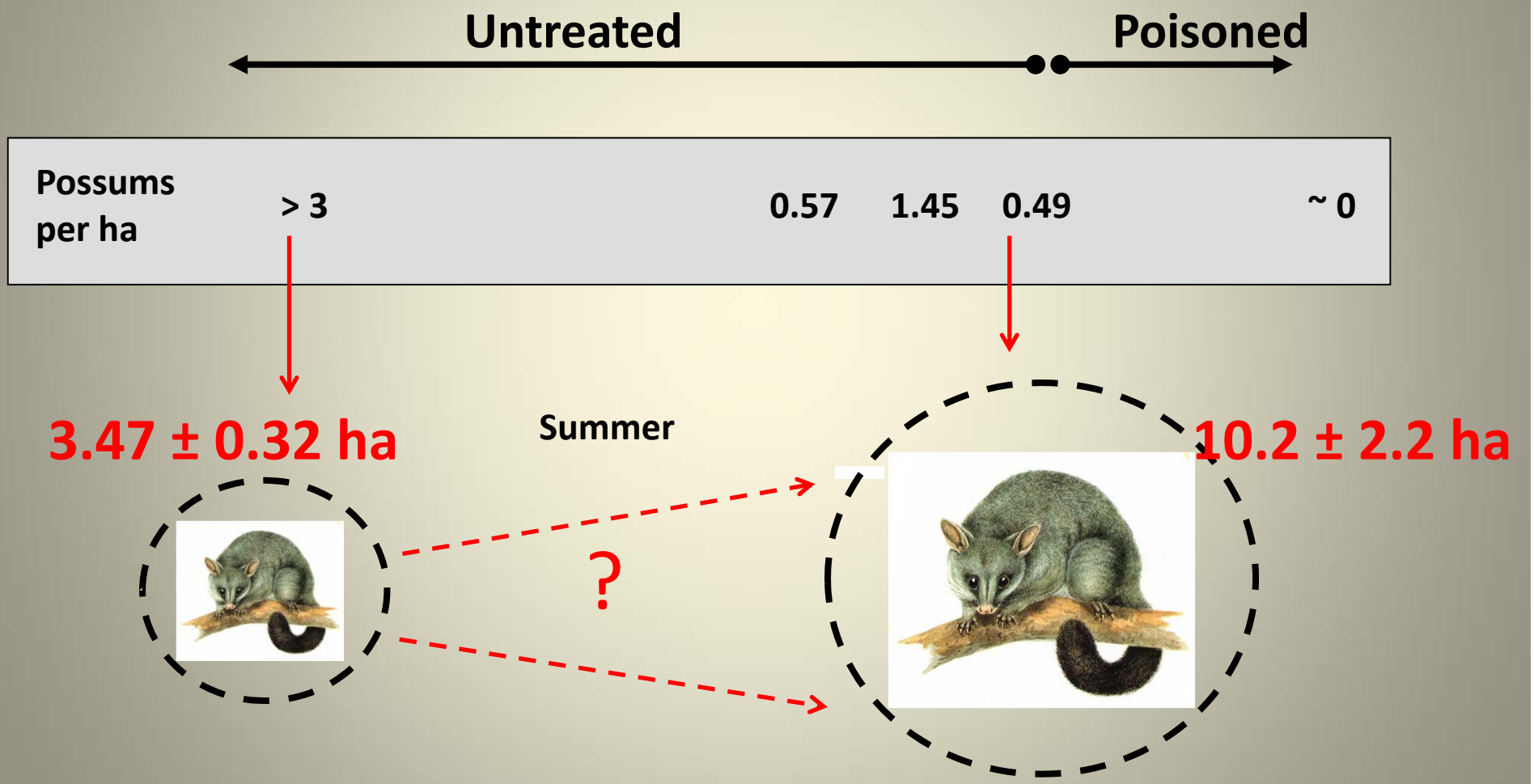
Kaimanawa possum home range size



(Pech *et al.* 2010)

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Possum home range fidelity within controlled areas

- Kapiti Island
  - 80% population reduction.
  - No adult possum range shifts.

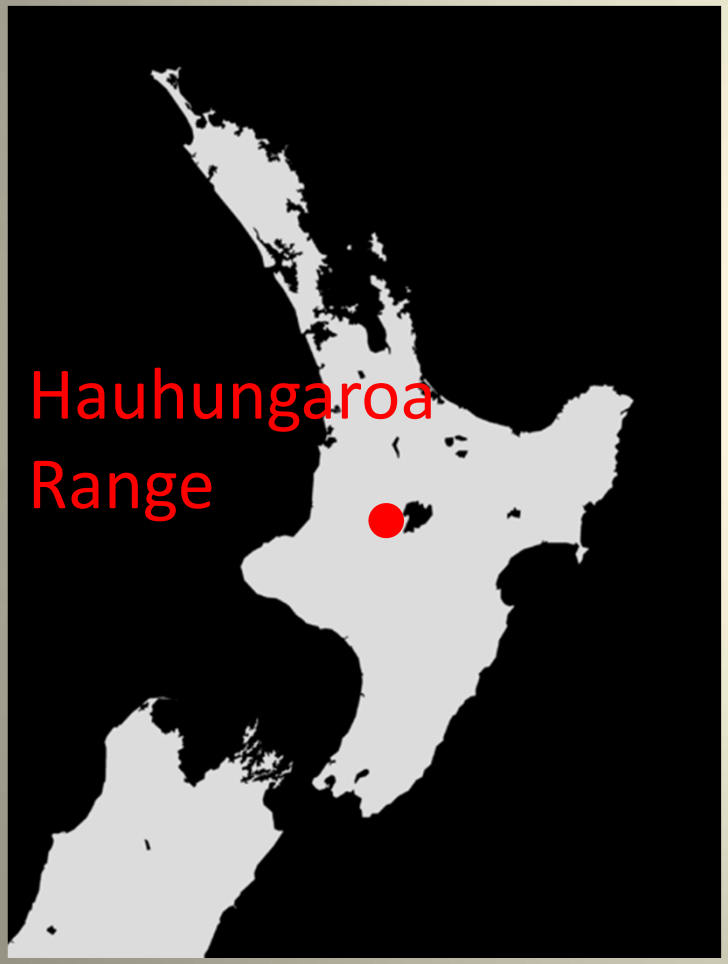
  (Cowan 1993)
- Farmland
  - 90% population reduction.
  - 1 out of 18 survivors shifted.

  (Brockie et al. 1997)

Why continue investigating possum movements?

- Managers now frequently operate in very low possum-density environments (<<1% RTC).
- Few previous movement studies from very low, post-control populations.
- "Detect and Mop-up" operations are frequently undertaken for disease surveillance and population control in low density populations.
  - Anecdotal evidence from these operations suggest possums are very mobile.
- Any changes in movement patterns will have consequences for Tb persistence.

Extreme low-density studies Hauhungaroa Range (2005-2008)



- Possums controlled: 1994, 2000, 2005, 2011
- Abundance in 2005: 0.05% RTC (0.01/ha).

  Survivors Isolated?
- 20 of 23 adult females (87%) breeding post control

  Re-aggregation of survivors?

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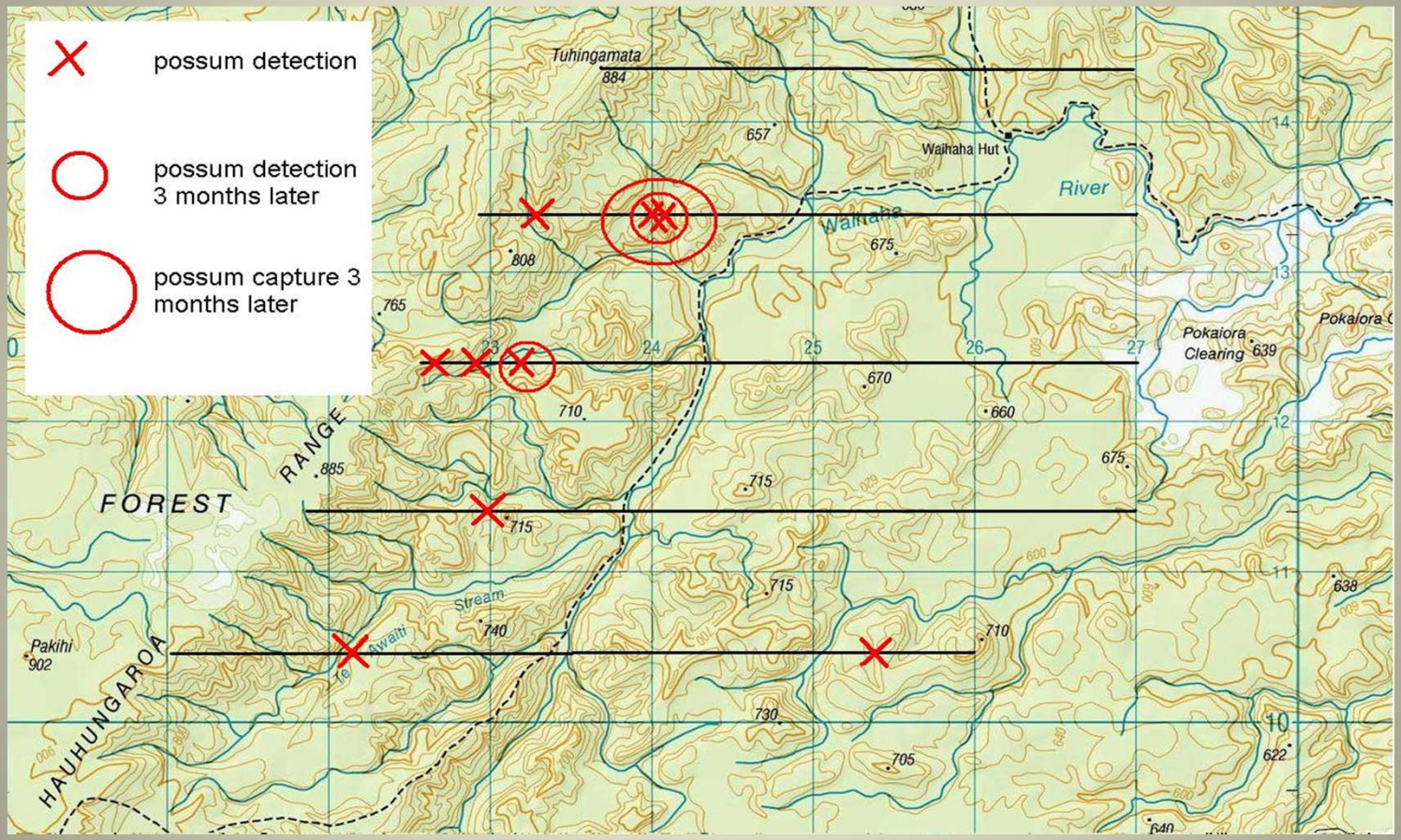
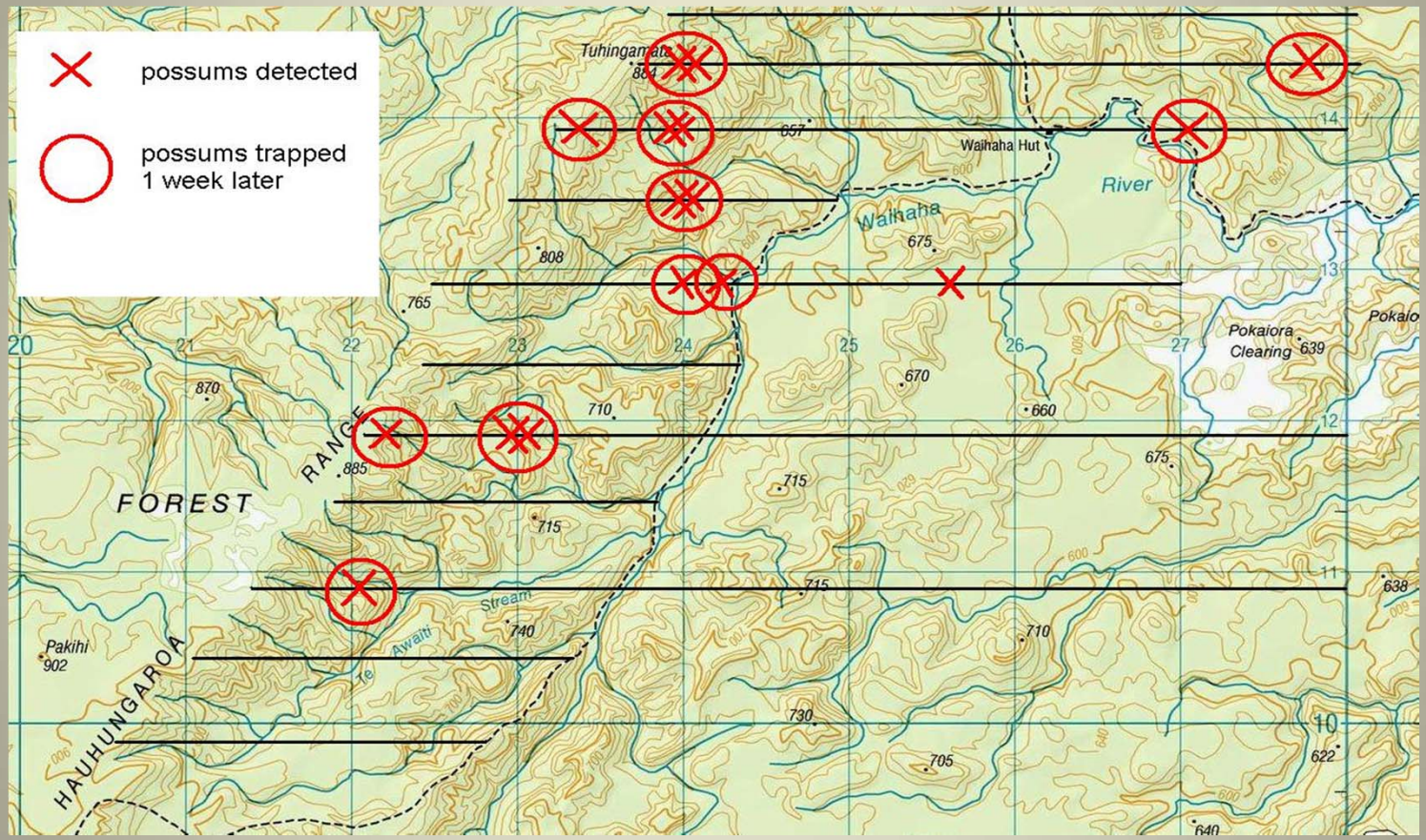
Chewcard detection and delayed trapping (Waihaha)



*** Delayed trapping = low success (possums have moved?)**

Chewcard detection and immediate trapping (Waihaha)



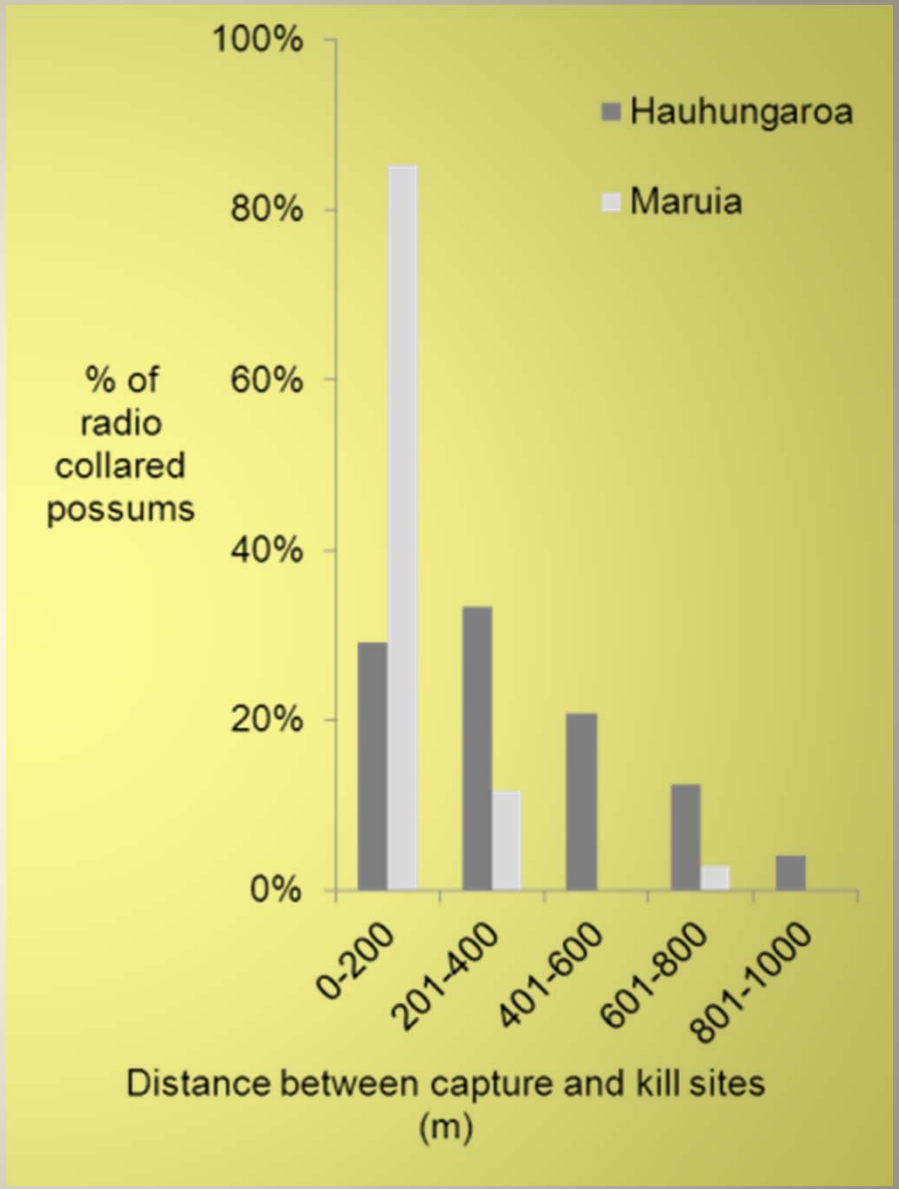
* **Quick follow-up trapping = high success**

Recapture distances of radio collared possums

- Longer distances in controlled populations.

Conclusion:

- Possums more mobile in controlled populations.



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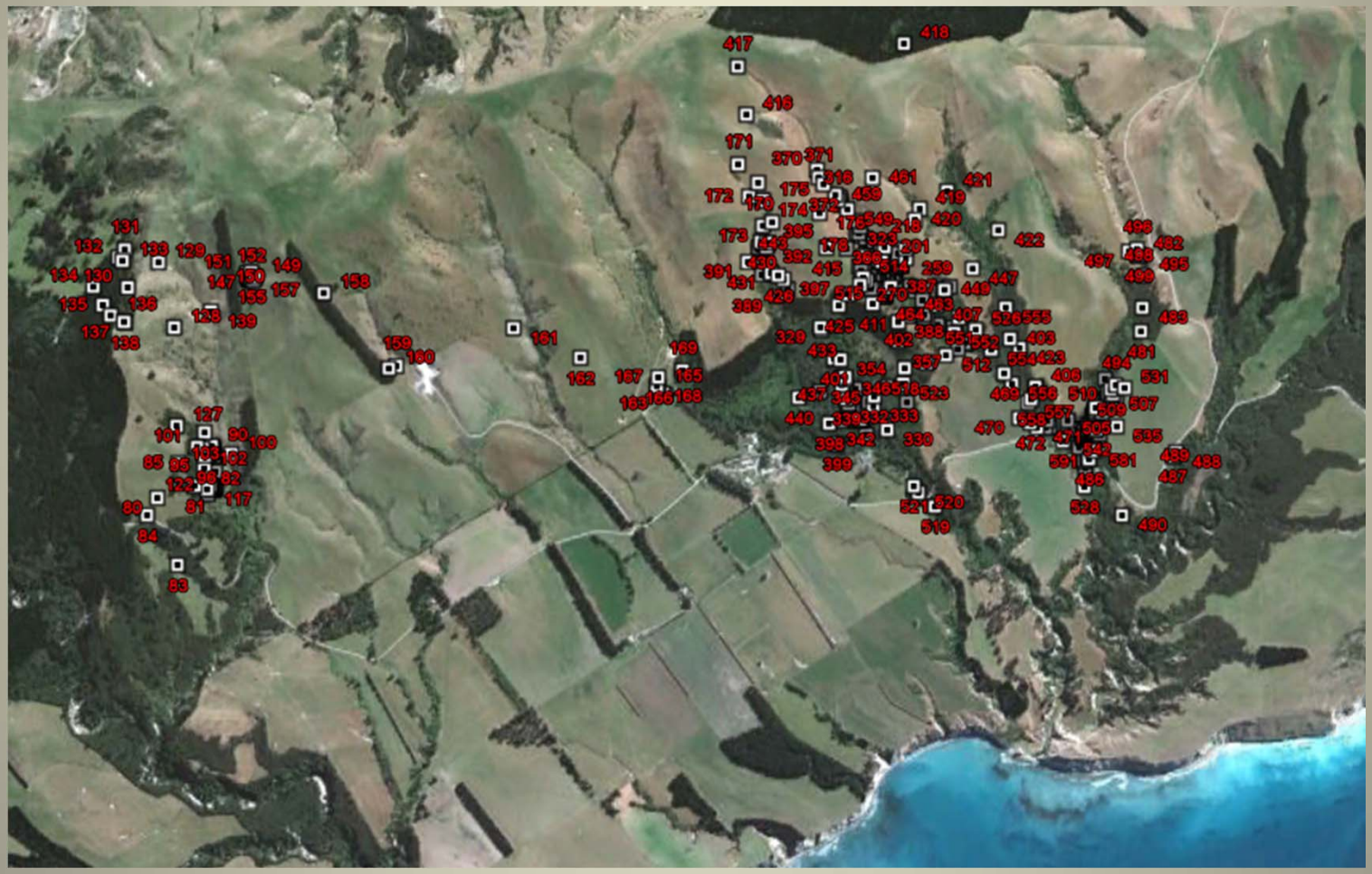
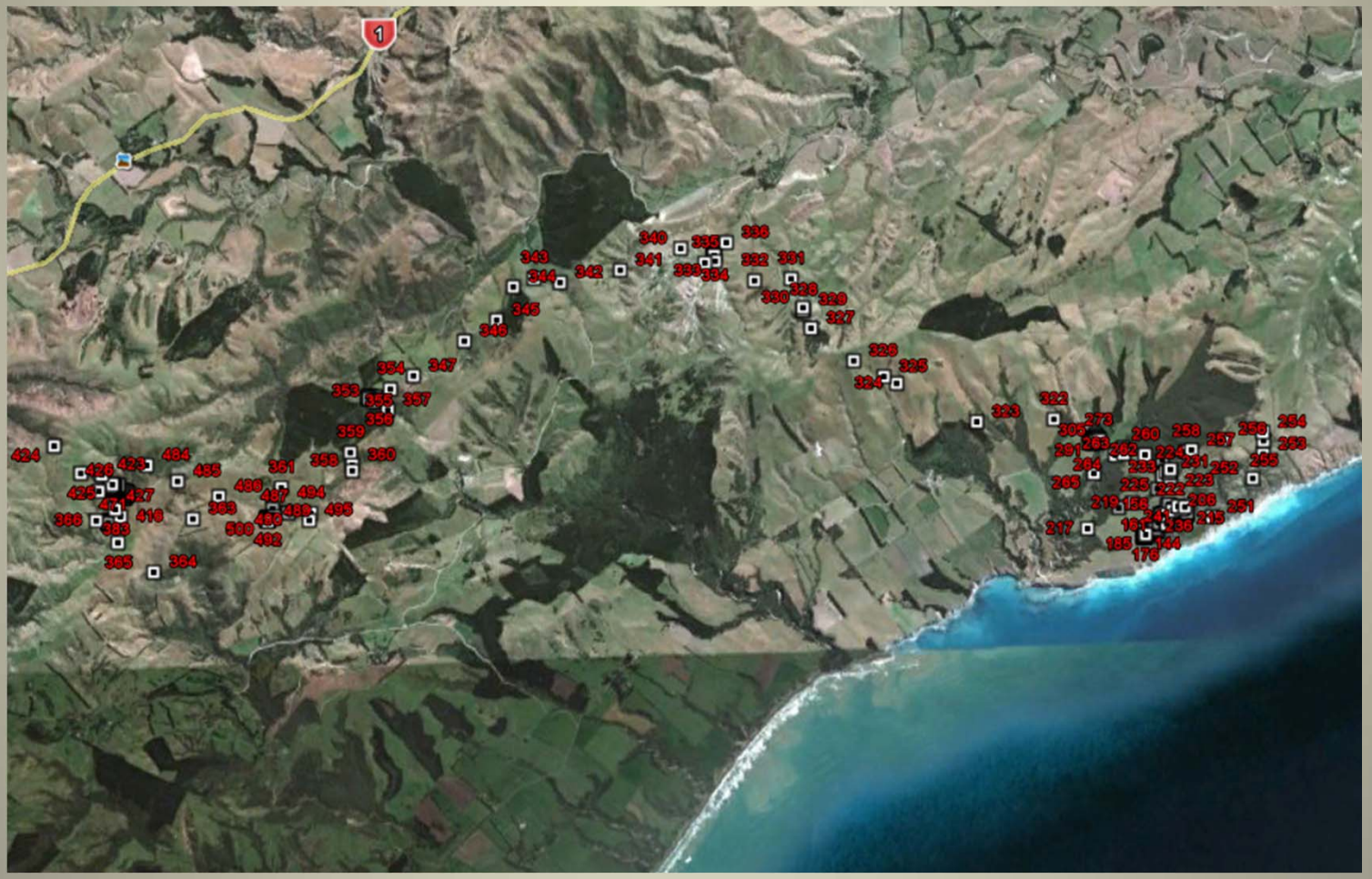
Translocated possums
Blythe Valley – *very low density*



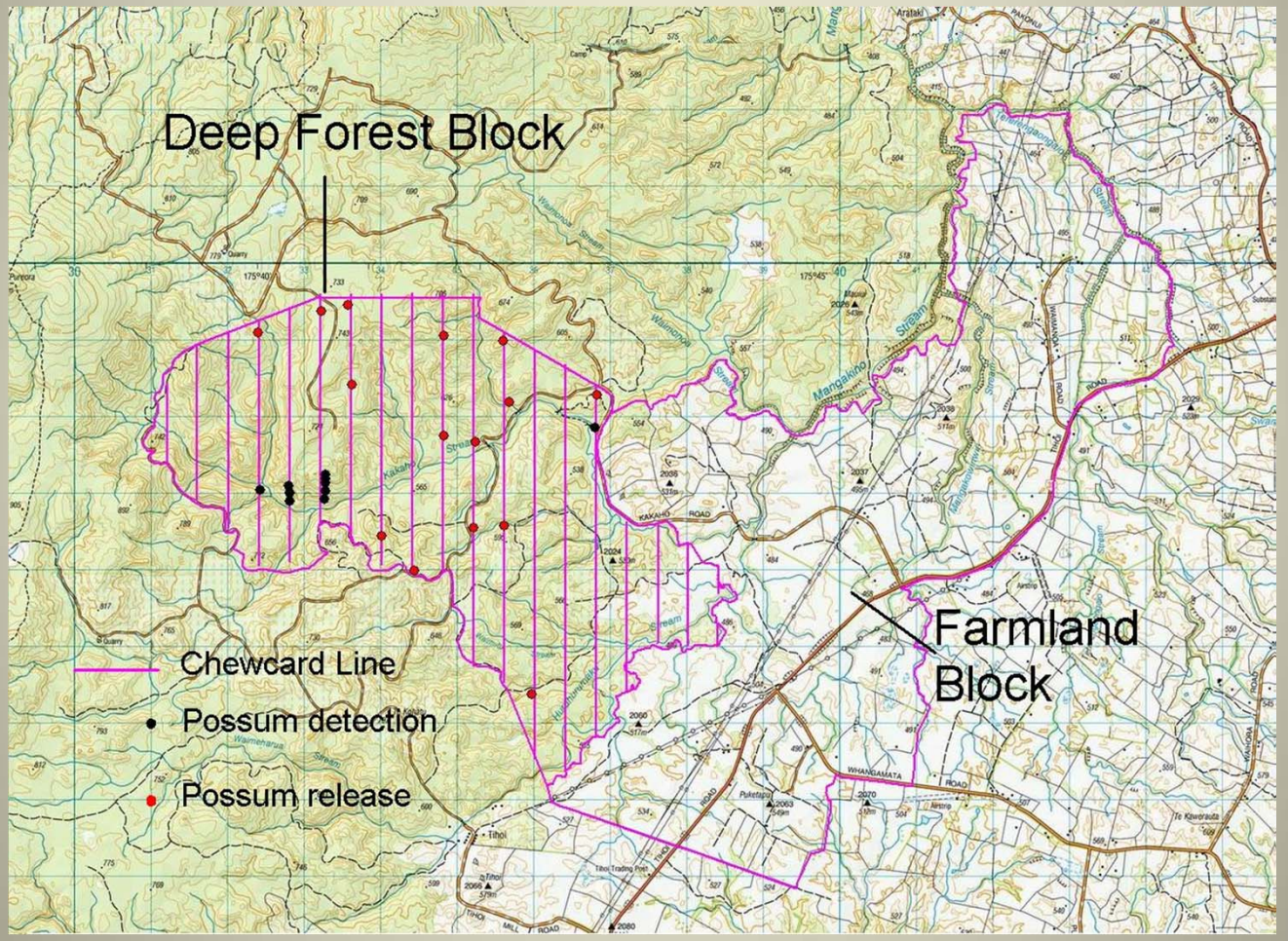
Average of max range length for 9 of 10 possums = 2.2km

Translocated possums
Blythe Valley – *very low density*



One possum moved 12 km within 2 weeks of release

New Possum Movement Study Hauhungaroa, 2012-2014



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Interim Conclusions

- Moderate levels of possum control have minimal effect on possum movement patterns.
- Intensive control has minimal effect on movement patterns at control boundaries.
- Survivors of intensive control may become non-sedentary, or greatly expand their ranging behaviour, at least until they re-aggregate. This could have significant consequence for Tb transmission and persistence.

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