

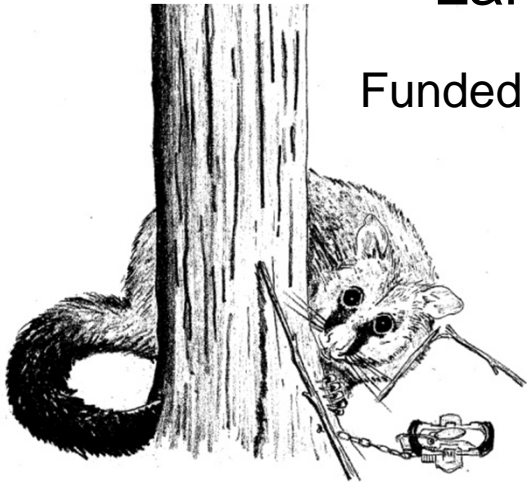


**Landcare Research**  
**Manaaki Whenua**

# Possum encounter and interaction rates

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# Background theory...1

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Capture or detection probability can be partitioned into encounter and interaction probabilities.

$$P(\text{capture}) = P(\text{encounter}) * P(\text{interaction}|\text{encounter})$$

# Background theory...2

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- Steve Ball et al, 2005.
  - Prob encounter = 0.12
  - Prob interaction|encounter = 0.44
  - $g_0 = 0.05$

That is: if a trap is set at the centre of a possums home range there is only a 5% chance of catching it on any one night.

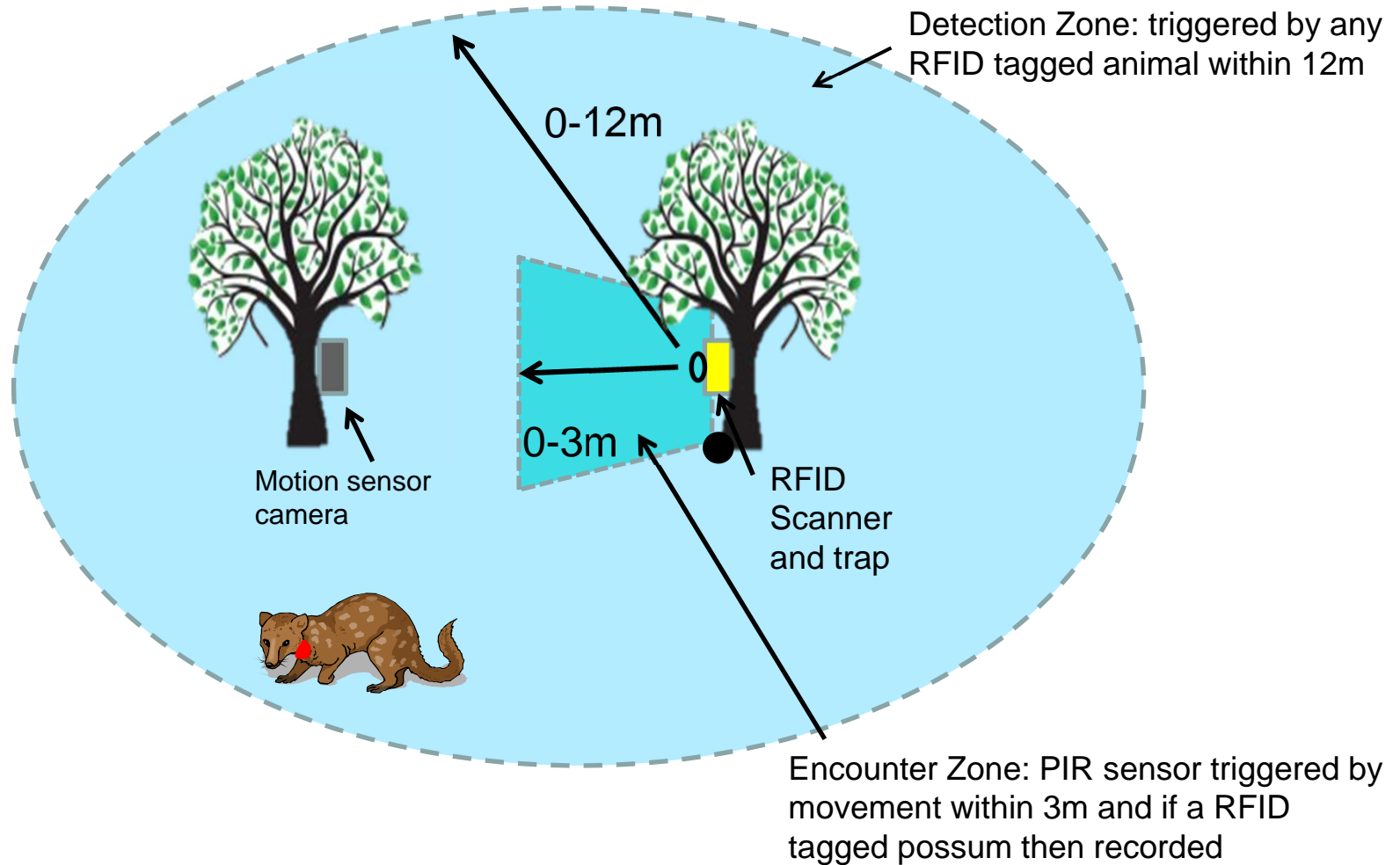
# Methods

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- 16 possums had active RFID tags attached (10 of these had GPS collars).
- Each trap site (11) had:
  - RFID sensor
  - Motion sensing camera (trail camera)
  - Each trap was fixed open with the trigger linked to a RFID tag and a LED to record when a possum “triggered” a trap.



# Detection System





# Trap treatments

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Standard  
NPCA protocol



Hazed  
(fenced)



Covered



# Results...1

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Probability of an encounter  
given a detection at 12m



0.66 (79/119)



0.63 (95/151)



0.60 (73/121)





# Results...2

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Probability of a capture  
given an encounter



0.21 (6/29)



0.34 (10/29)



0.40 (10/25)



# Results...3

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Probability of a capture given one or more encounters/night



0.33 (6/18)



0.43 (10/23)

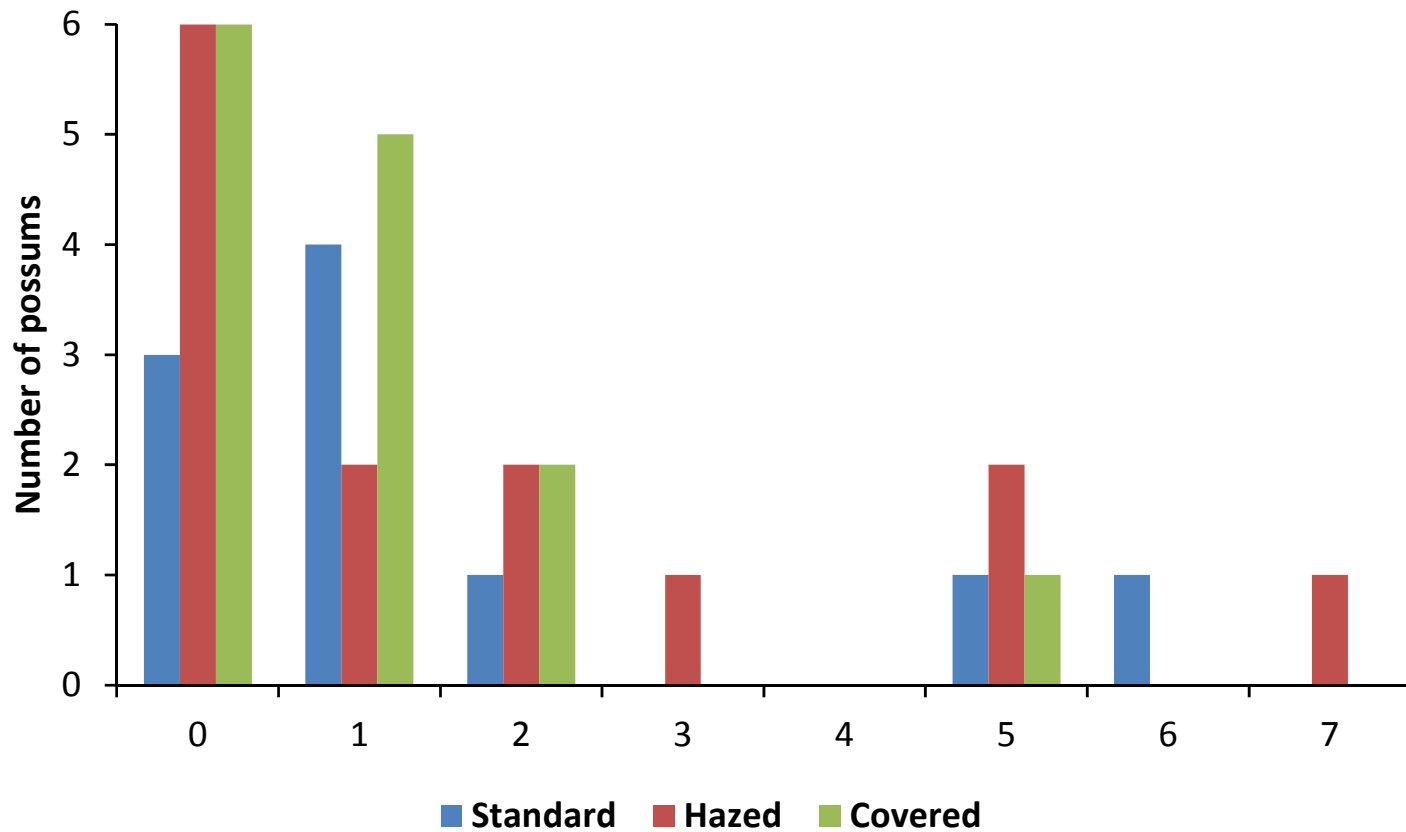


0.48 (10/21)



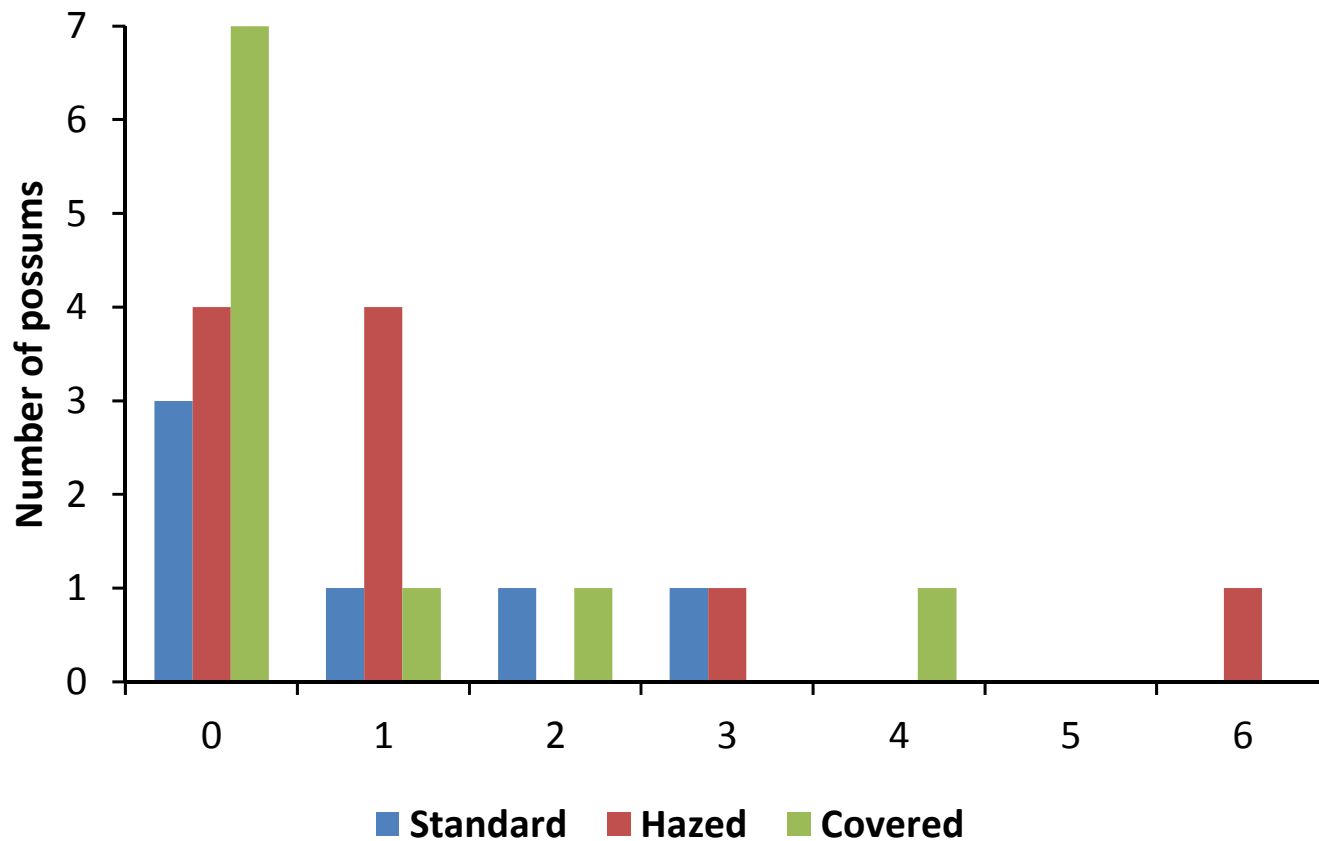
# Number of nights to first encounter

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# Number of nights between first encounter & first capture

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# Conclusions...1

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- Many possum visits to trap sites did not result in a capture.
- Nights between first encounter and first capture varied between 0 and 6.
- Hazing and covering traps increased the probability of an interaction given an encounter.

# Conclusion...2

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- g0 generated from GPS data.
- Future trials to look at density effect – i.e. do encounter and interaction probabilities change when possum densities are reduced?
- Helen Nathan (PhD student – Auckland Uni) starting similar trials on ship rats – tracking tunnels, trap tunnels, bait stations.

# Acknowledgements

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