



# Ring of Steel

## Localised management for black-fronted terns in the Waiau Toa

Amy Whitehead, Mike Bell, Baylee Connor-McClean, Rebecca Davies,  
Frances Schmechel, Ellery Mayence, Kerry Brown, Dan Burgin, Biz Bell



## Tarapirohe management on Upper Waiau Toa

Three years pre-management research (2012-2014)

- ~720 birds, with low hatching success & productivity

Five years of localised management (2015-2019)

- Island enhancement & ring trapping

Hypothesised that localised management would


- Reduce nest failures due to predation and flooding
- Improve nest survival and productivity



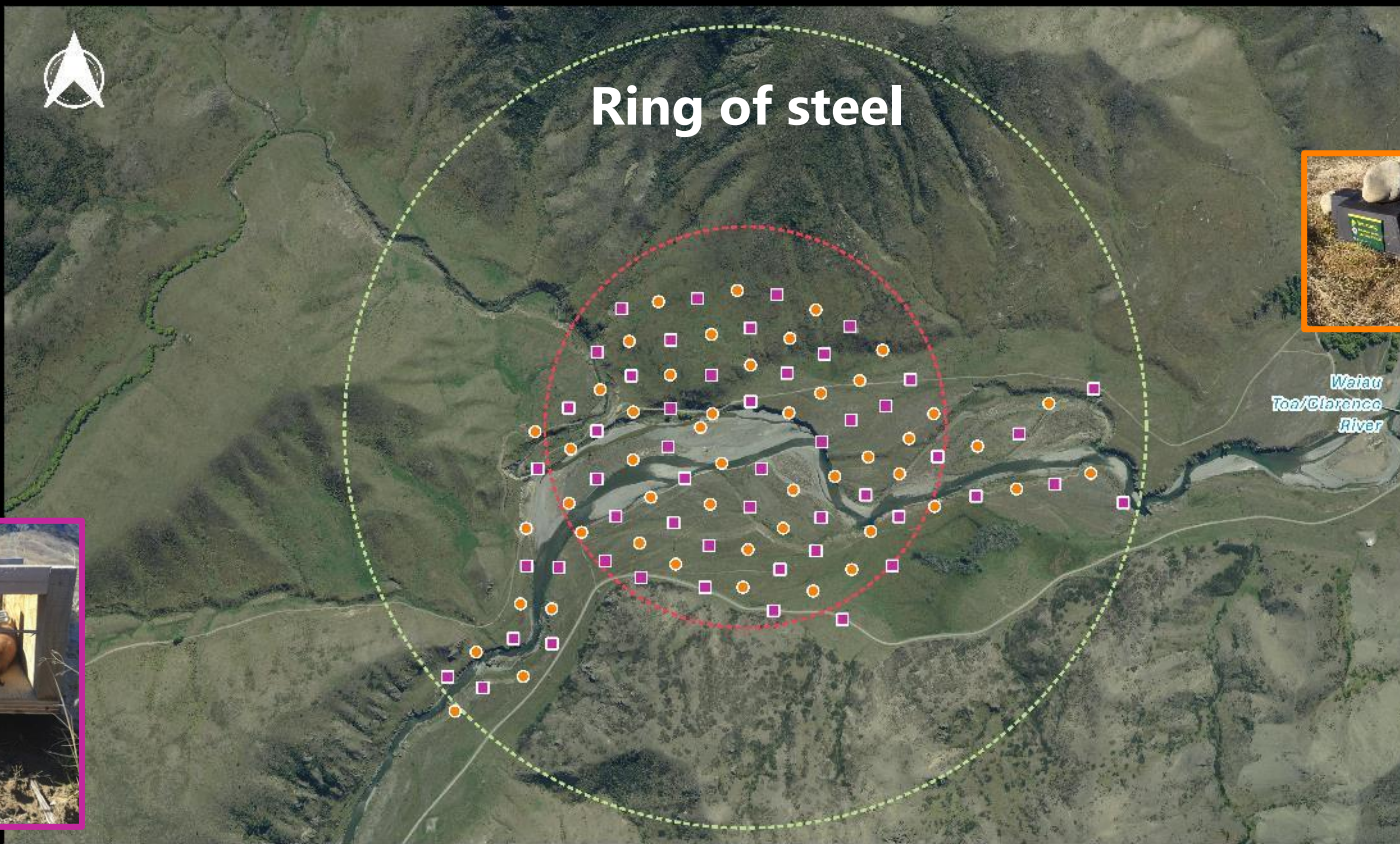


# Island enhancement

Improved three known breeding islands (March 2016)

- Deepen and widen channels
  - Mechanical weed removal
- 
- Annual weed control (spraying)
  - Island maintenance (April 2019)
    - Bush gully: channel widened & deepened
    - Swimming hole: channel deepened & surface scraped
    - Mitchell's Cutting: No work needed





<p><b>Traps</b></p> <ul style="list-style-type: none"><li>● DOC 150 + SA</li><li>■ DOC 250</li></ul>	<ul style="list-style-type: none"><li>1km Buffer</li><li>500m Buffer</li><li>River</li></ul>	<p><b>Predator trap layout at Bush Gully, Waiau Toa/Clarence River</b></p>	<p>0 250 500 m</p>
<p>Base Map © LINZ Aerial Imagery</p>			

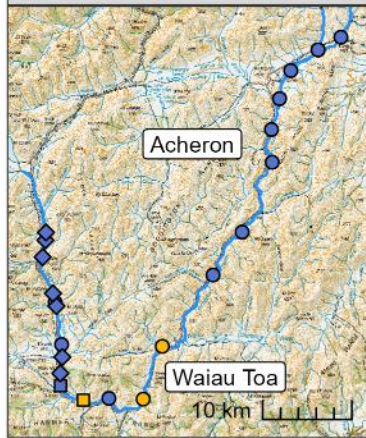


### Management

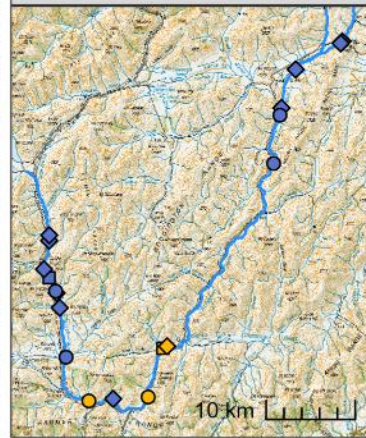
### Habitat

- Non treatment
- Treatment
- Island
- ◇ Both
- Mainland

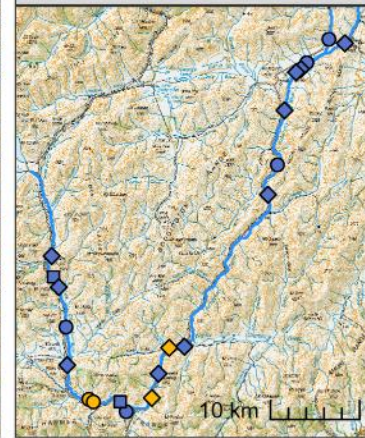
2015 - 2016



2016 - 2017



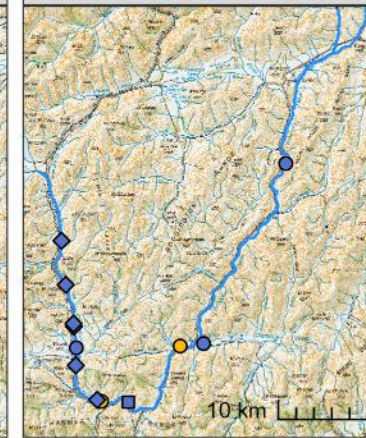
2017 - 2018



2018 - 2019

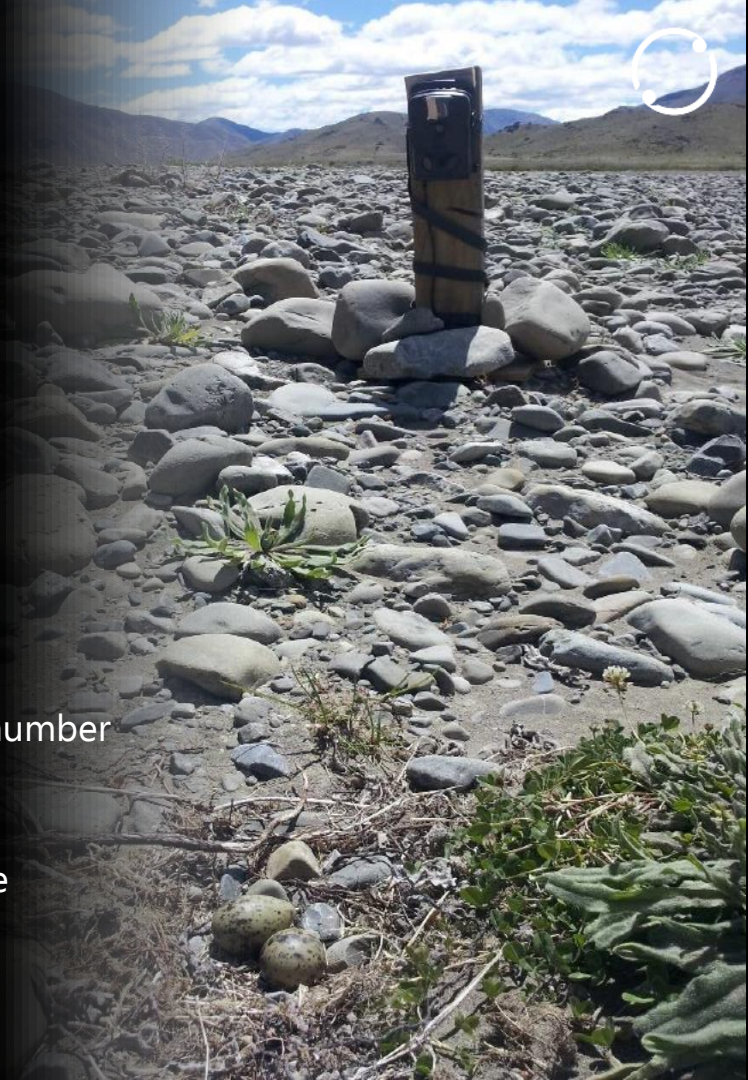


2019 - 2020



# Monitoring

- Walk-through river surveys
  - Mid-October to early November to locate colonies
  - To relocate failed colonies that may have moved
  - After significant flood events
  
- Nest & chick monitoring
  - All nests marked with cairn & mapped
  - Rechecked until failed or chicks left nest site
  - Nest status recorded on every visit, along with the number of chicks and fledglings
  
  - Camera surveillance to identify causes of nest failure

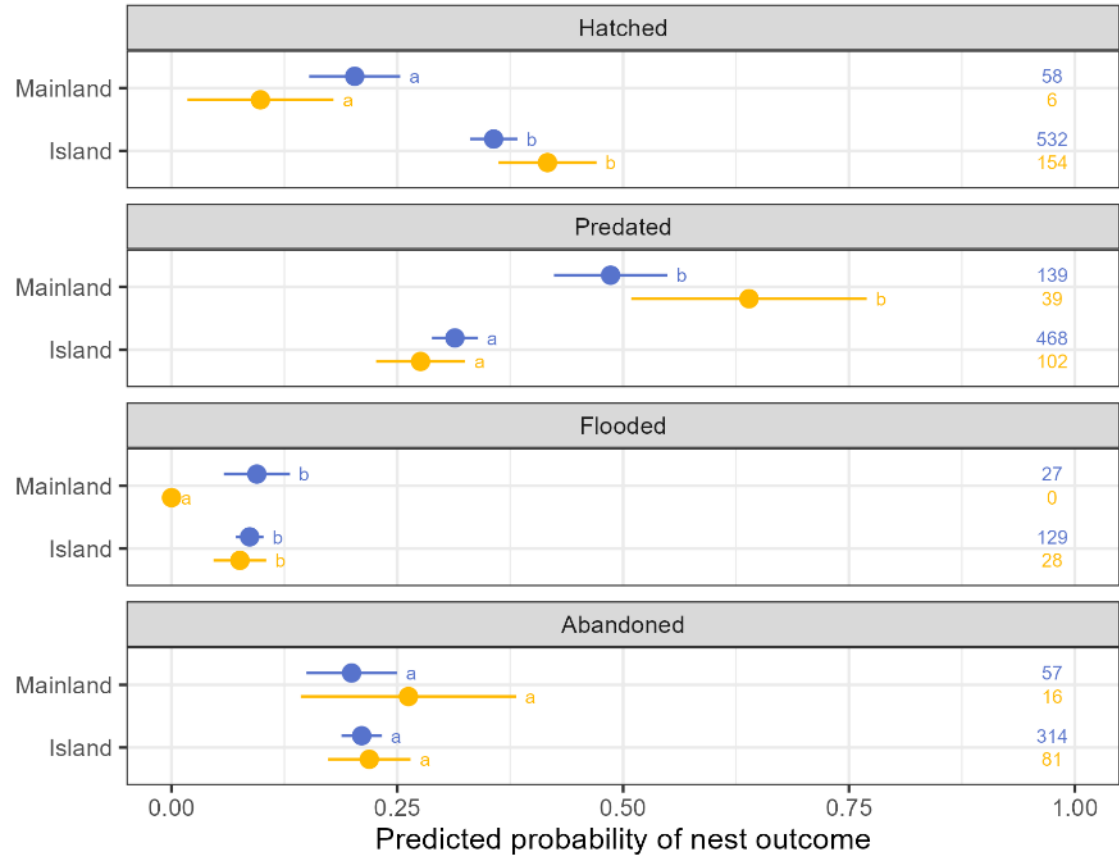


# Nest outcomes

- More nests hatch on islands
- Fewer nests predated on islands
- No difference in number of flooded or abandoned nests
- No effect of treatment on nest outcome



● Treatment ● Non treatment

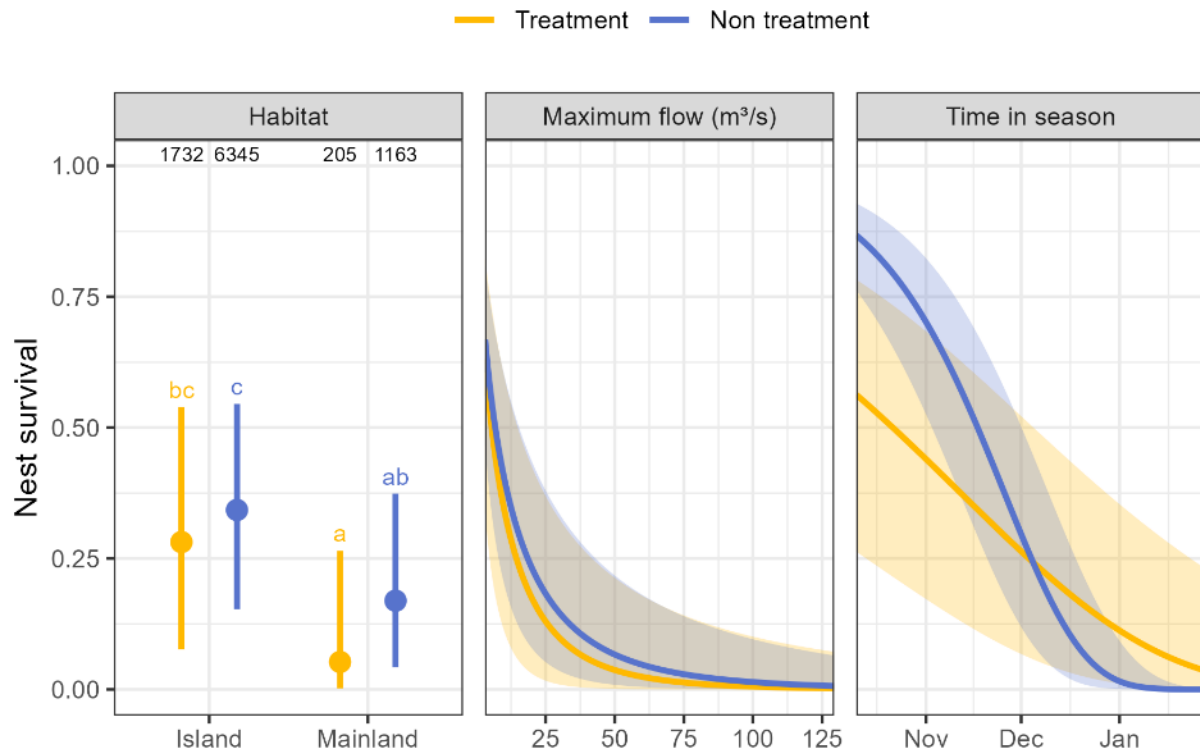




# Nest survival

- Better on islands than mainland colonies
- Declines with higher flows
- Worse later in the season

MANAAKI WHENUA - LANDCARE RESEARCH





# Causes of nest failure

346 filmed nest failure events

- Flooding = 45% of nest failures
- Harriers & cats also important (10%)



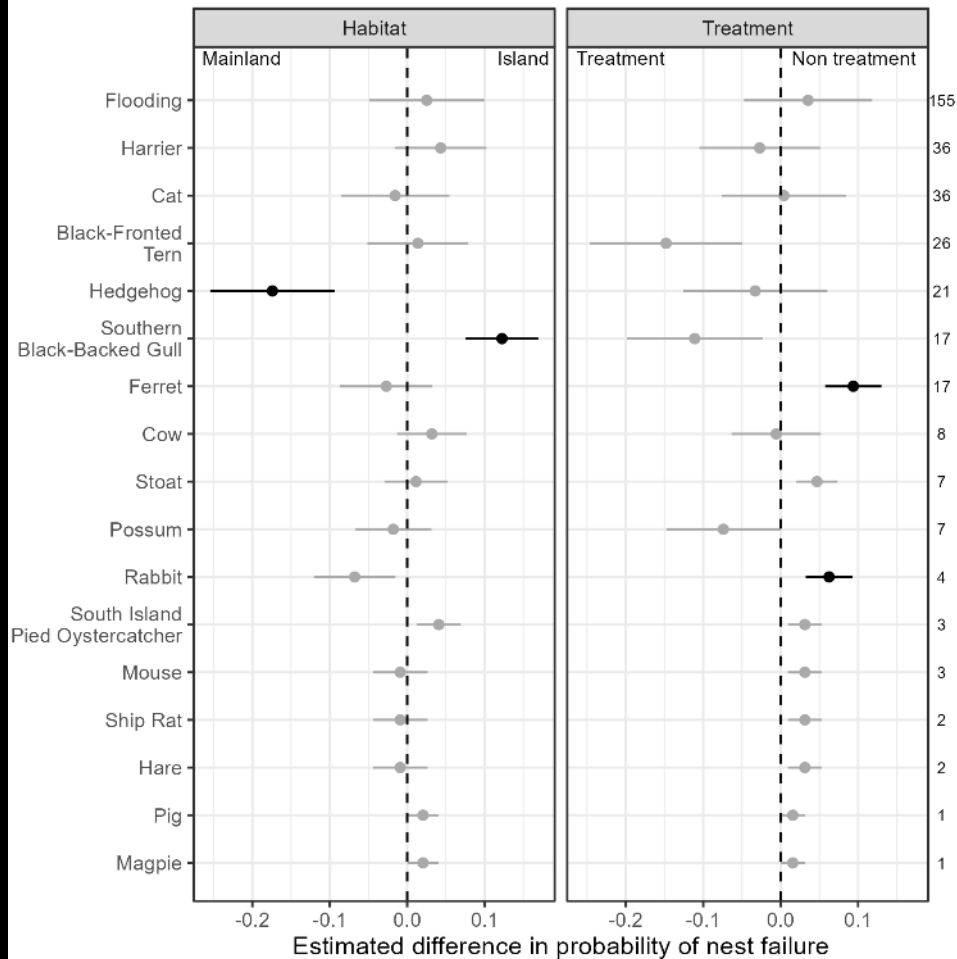
# Causes of nest failure

346 filmed nest failure events

- Flooding = 45% of nest failures
- Harriers & cats also important (10%)

More nest failures due to

- Hedgehogs for mainland nests
- SBBG for island nests
- Ferrets & rabbits for non-treatment nests







## Summary

- Ring of steel & island enhancements in the Waiau Toa did not appear improve BFT nest survival or productivity
- Nest survival higher and predation lower on islands compared to mainland sites
  - Lower predation by hedgehogs observed on islands
- Small number of treated colonies may reduce our ability to detect differences between treatments
- Difficulties assigning fledglings to habitat type due to changing river conditions





# Questions

© MANAĀKI WHENUA - LANDCARE RESEARCH

[whiteheadam@landcareresearch.co.nz](mailto:whiteheadam@landcareresearch.co.nz)

BIOECONOMY  
SCIENCE  
INSTITUTE



Manaaki Whenua  
Landcare Research



**WMIL** | Wildlife  
Management  
International



Department of  
Conservation  
*Te Papa Atawhai*