More Birds in the Bush

An introduction to the webinar and the research programme

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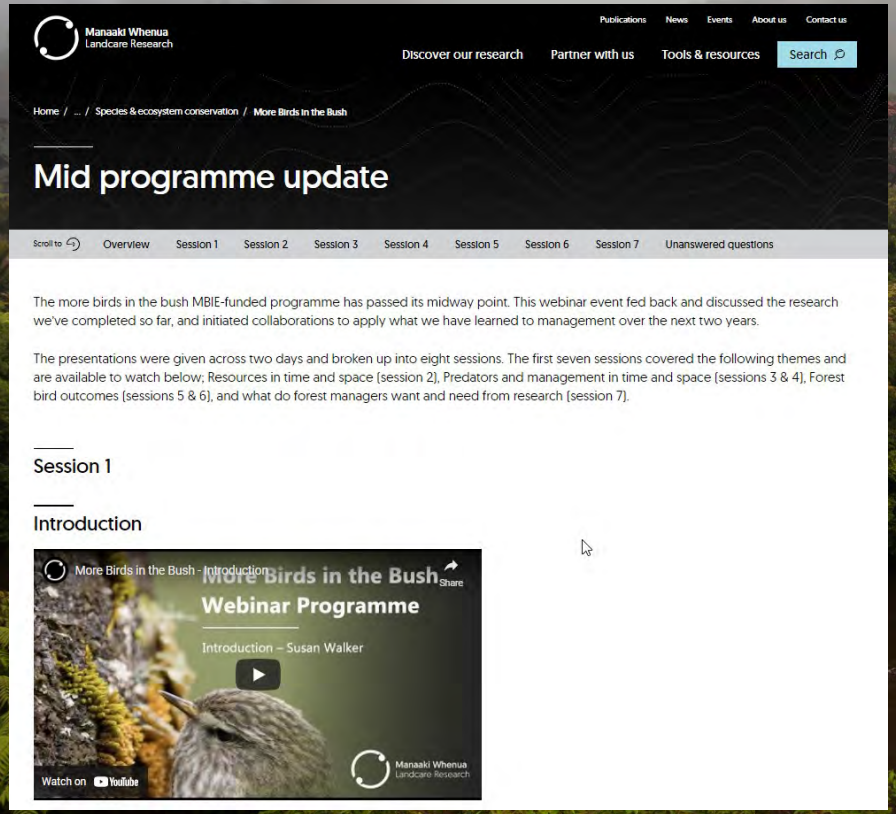
Landcare Research


Thanks!

This webinar

1. Overview of the programme
2. Highlights from the Lake Alabaster experiment
3. Forest ship rat dynamics and responses to aerial management
4. Where is this all heading? (applications)

Your questions



https://www.landcareresearch.co.nz/.../more-birds-in-the-bush/mid-programme-update/

This webinar

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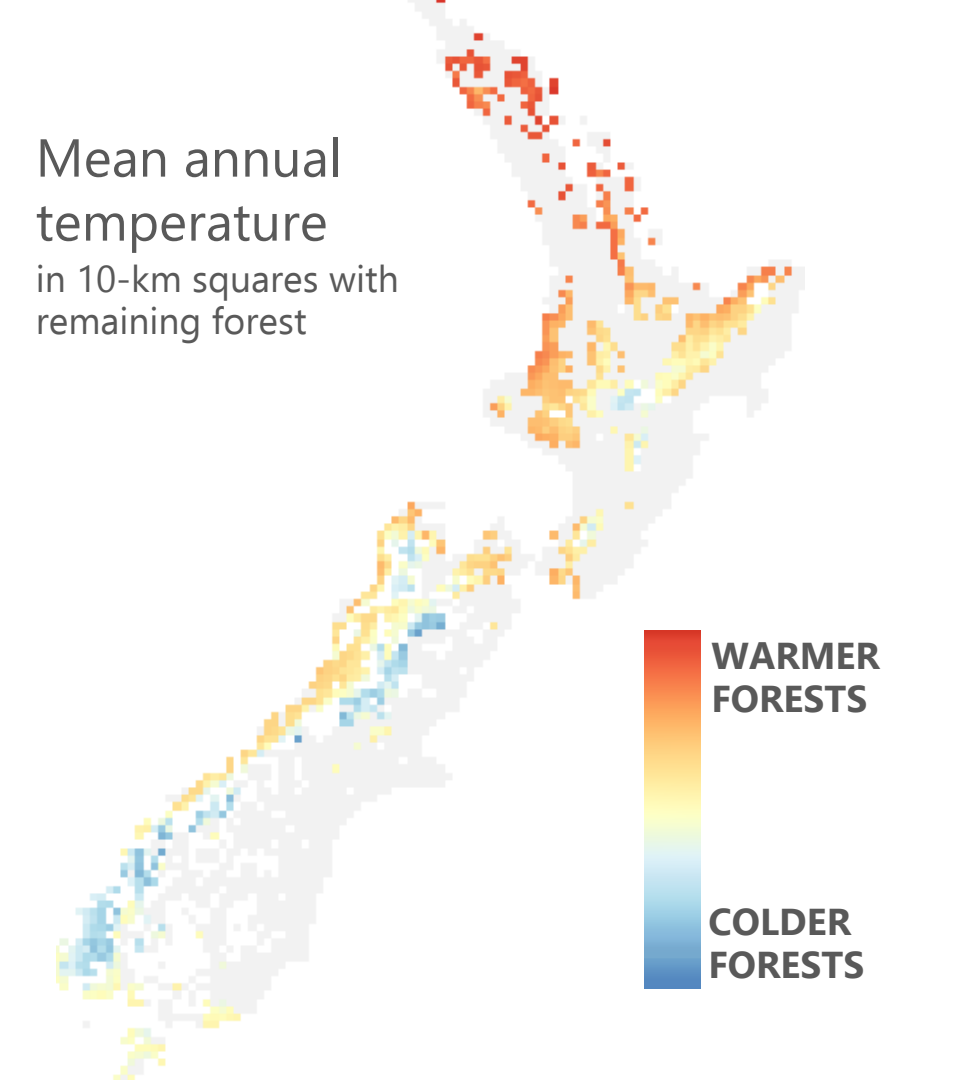
Your questions

Research aim

To create the ability to predict threats and forest bird
bird responses across all different forest types

So NZ can achieve
more birds in the bush



Temperature

The coldest beech forests of the south are ‘simple’

Warm forests
are richer and more complex

They should be more vibrant

more species, more food,
= more birds in the bush?

Cold forests are few

Temperature is increasing

Warmth favours ship rats

Food drivers of ship rat *and* bird populations across forests

1. Resources in time and space

How effective is our management?

2. Predators and management in time and space

How do birds in the bush
respond to
food,
predators,
and our management?

3. Forest bird outcomes

4. Applications to management (case studies)

Highlights from the Lake Alabaster experiment

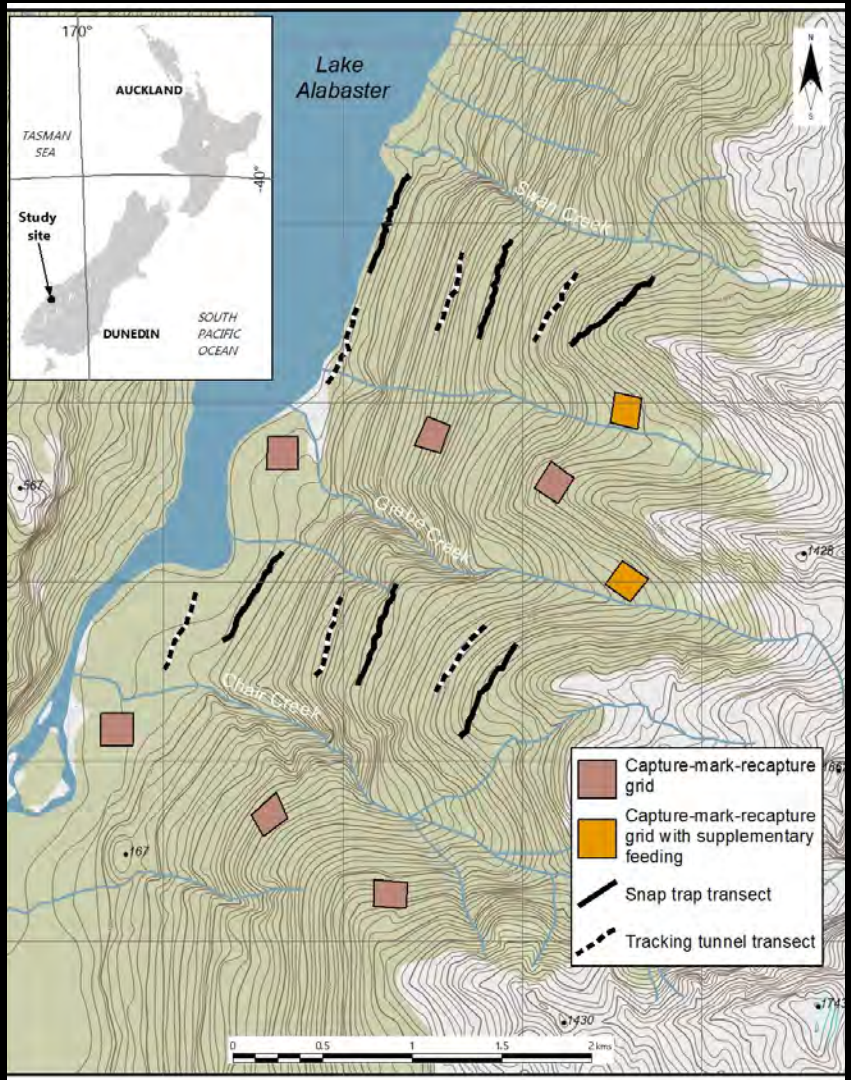
What limits ship rats in cold forests?

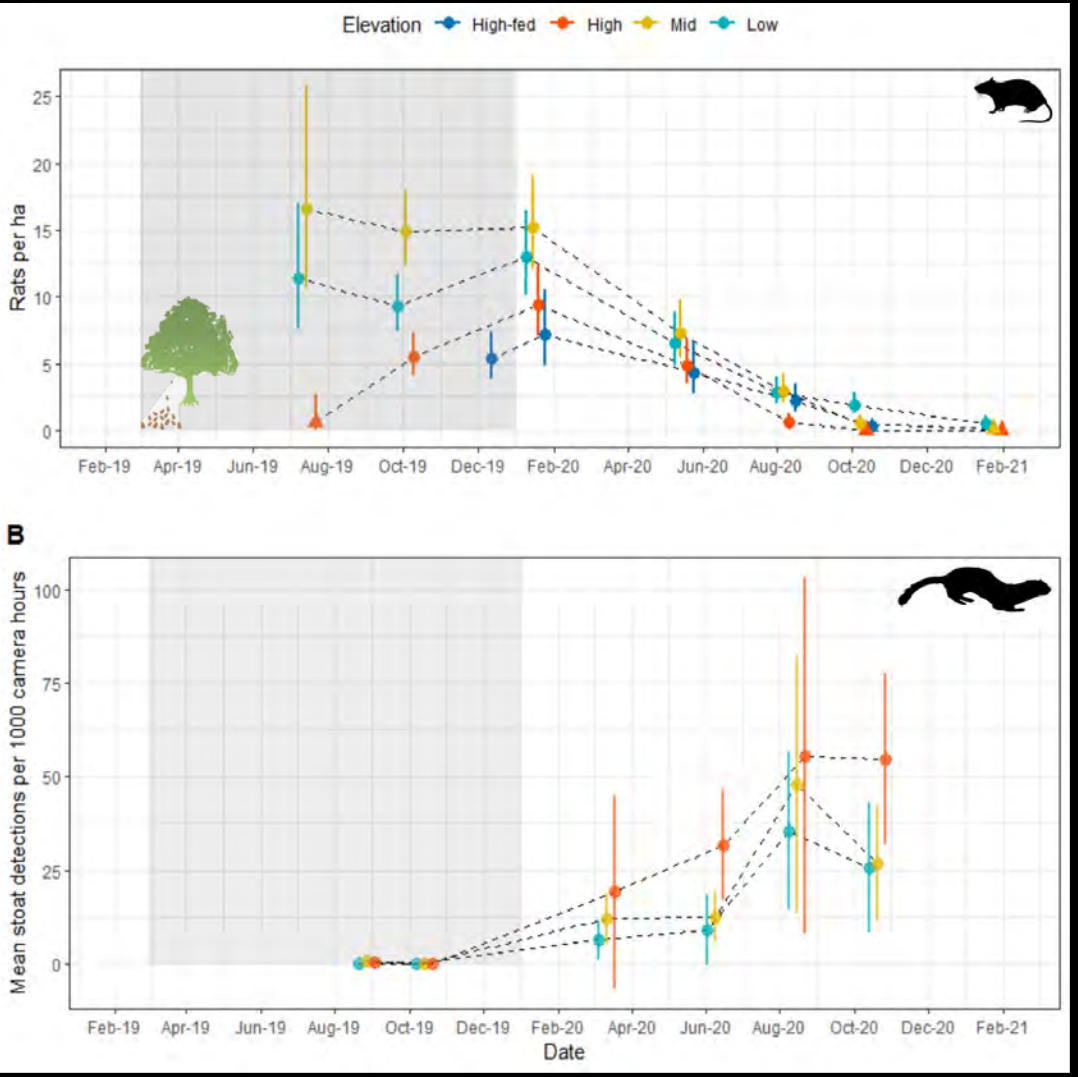
Jo Carpenter, James Griffiths, John Innes, Dean Anderson, Adrian Monks

Carpenter et al. 2022 Biological Invasions in press; Carpenter et al. submitted Ecosphere

Lake Alabaster, Fiordland

- Large beech mast autumn 2019.
- Study from July 2019 – January 2021.
- Quarterly ship rat density estimation (CMR) from 20 – 900 m asl.
- Supplementary food to two high elevation grids (January 2020 – September 2020).
- Indexed stoats, seeds and invertebrates.

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High-fed
High
Mid
Low
Rats per ha
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Dec-19
Feb-20
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B
Mean stoat detections per 1000 camera hours
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25
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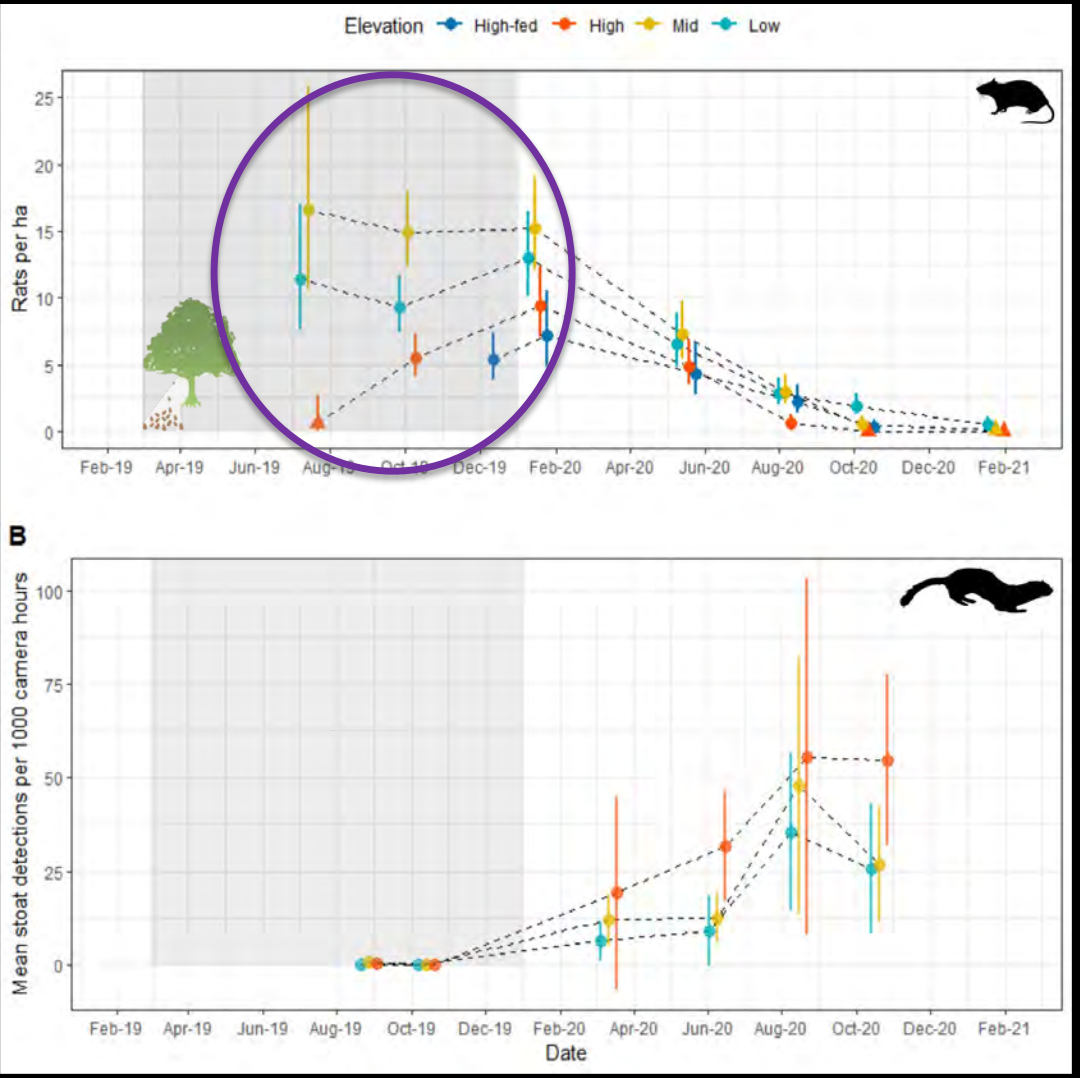
Date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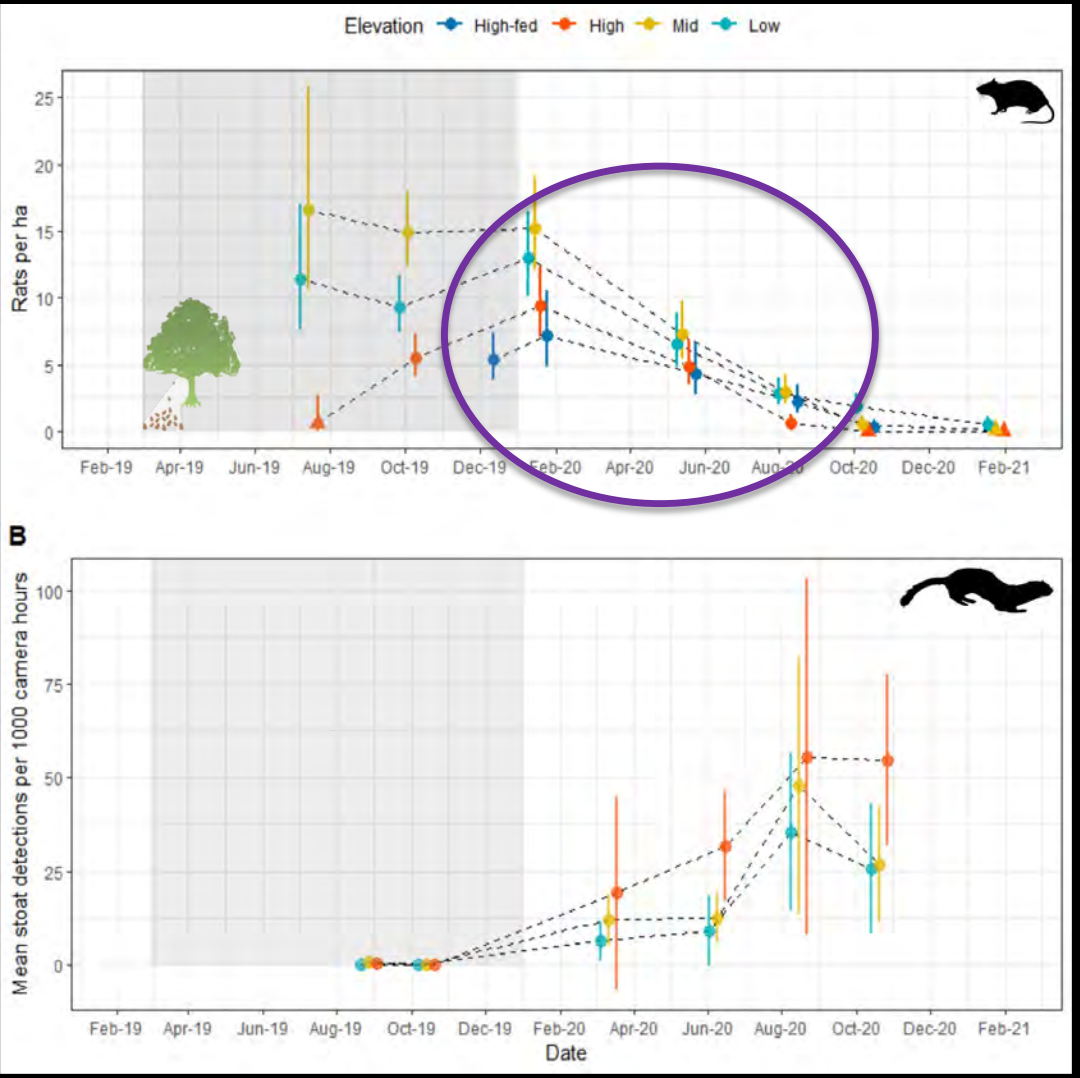
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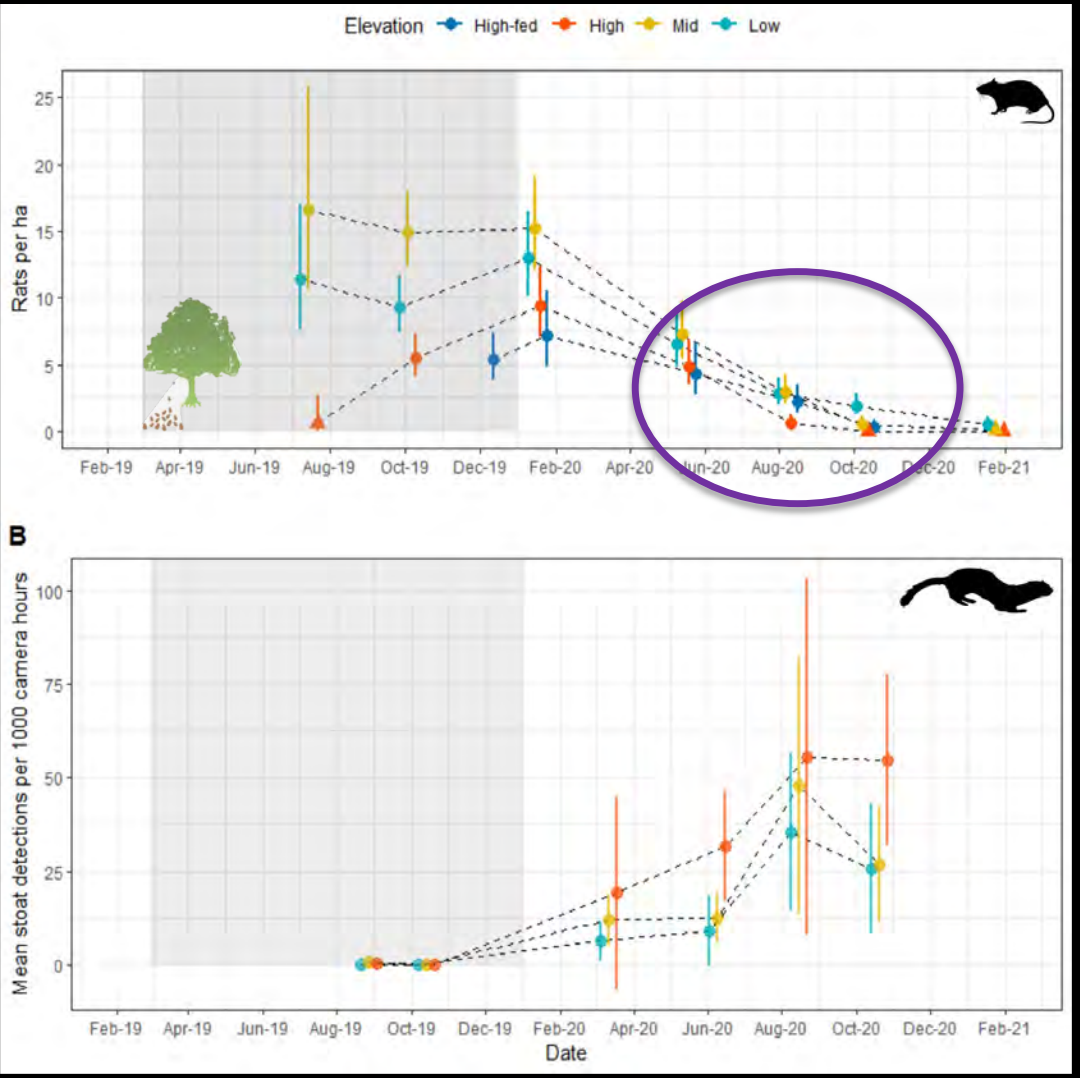
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Summary – Alabaster study

- Ship rat irruption at high elevation contingent on immigration.
  - 1.8 rats ha^{-1} without (modelled).
  - 6 to 10 rats ha^{-1} observed.
- Decline caused by food limitation and hastened by stoat predation.
- Direct impacts of temperature trumped by baseline food.

Ship rat dynamics and responses to aerial management

Our questions

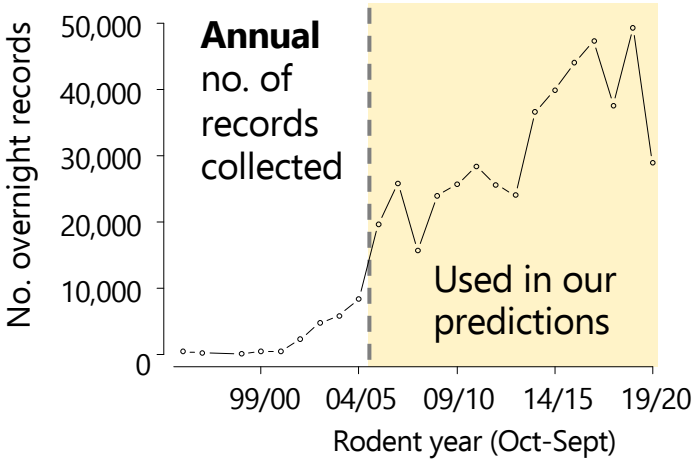
How are ship rat tracking rates affected by

1. Aerial management and ecosystem productivity?
2. Management regimes and control cycles?

Important to predict forest bird outcomes of management

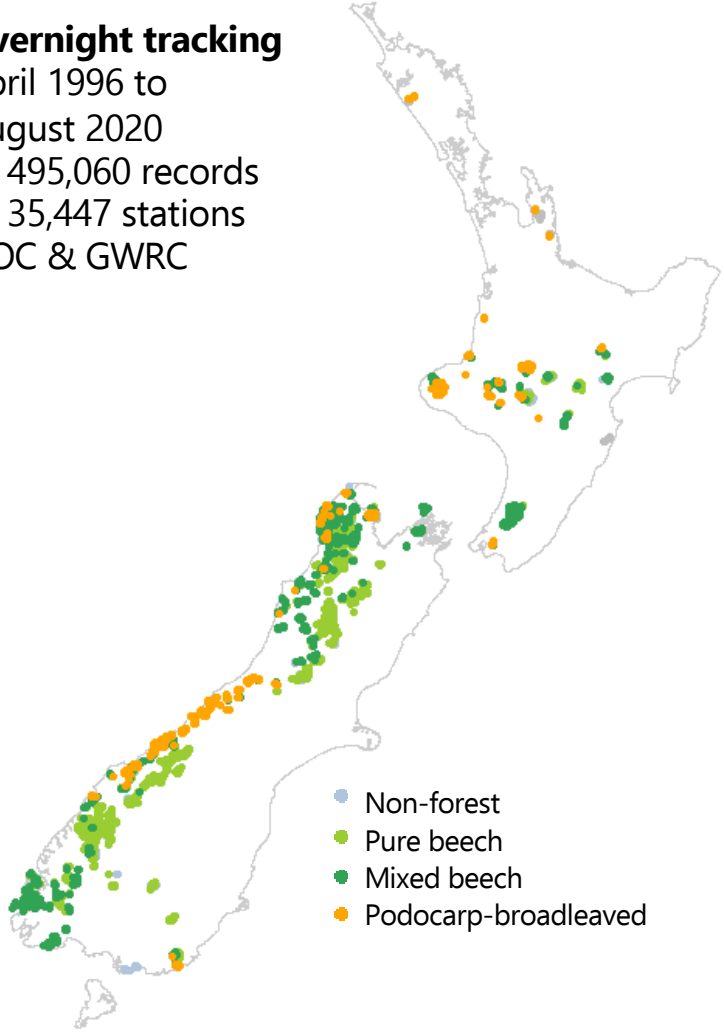
Data

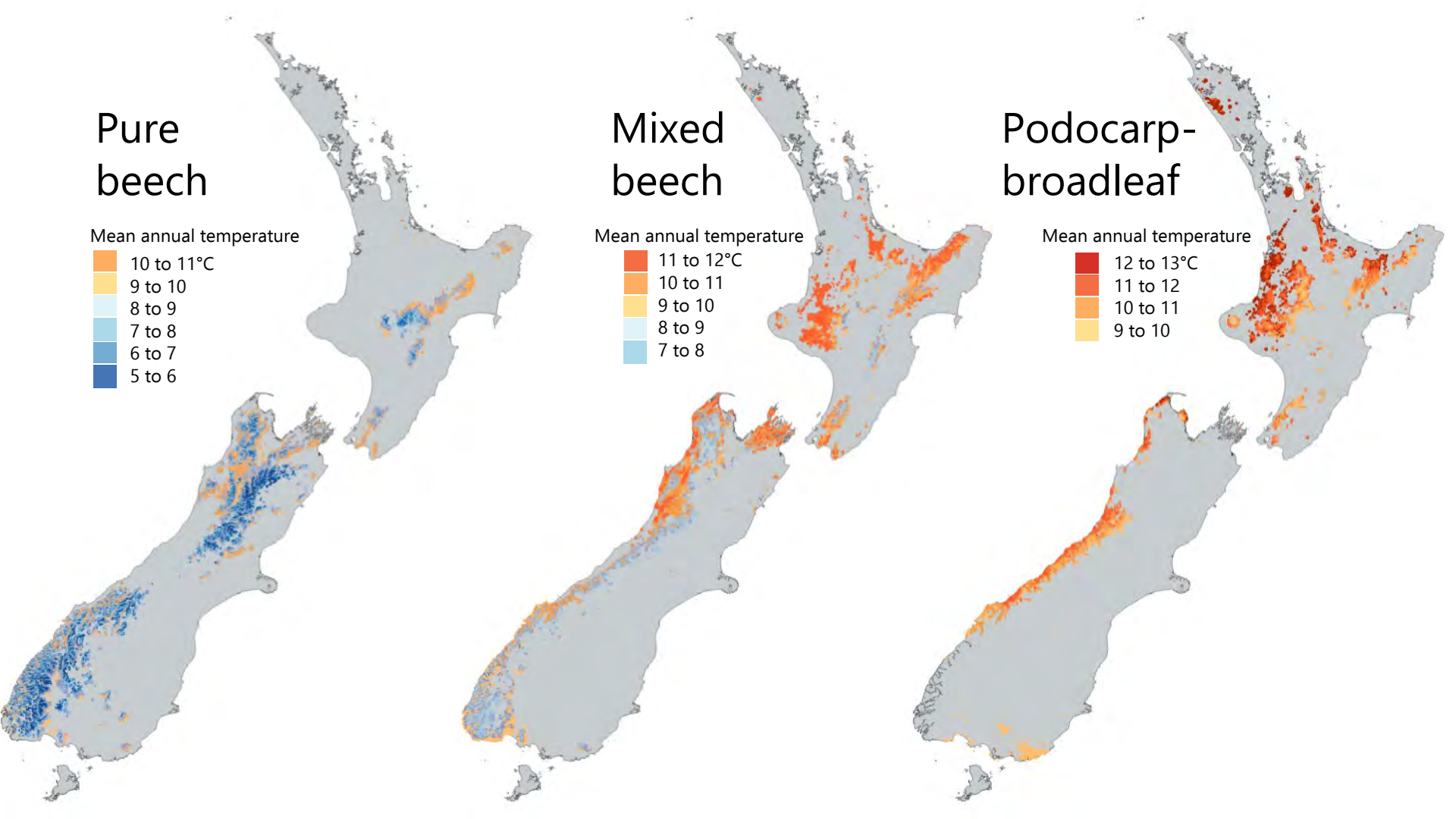
National database of overnight rodent tracking records



Overnight tracking
April 1996 to August 2020
- 495,060 records
- 35,447 stations

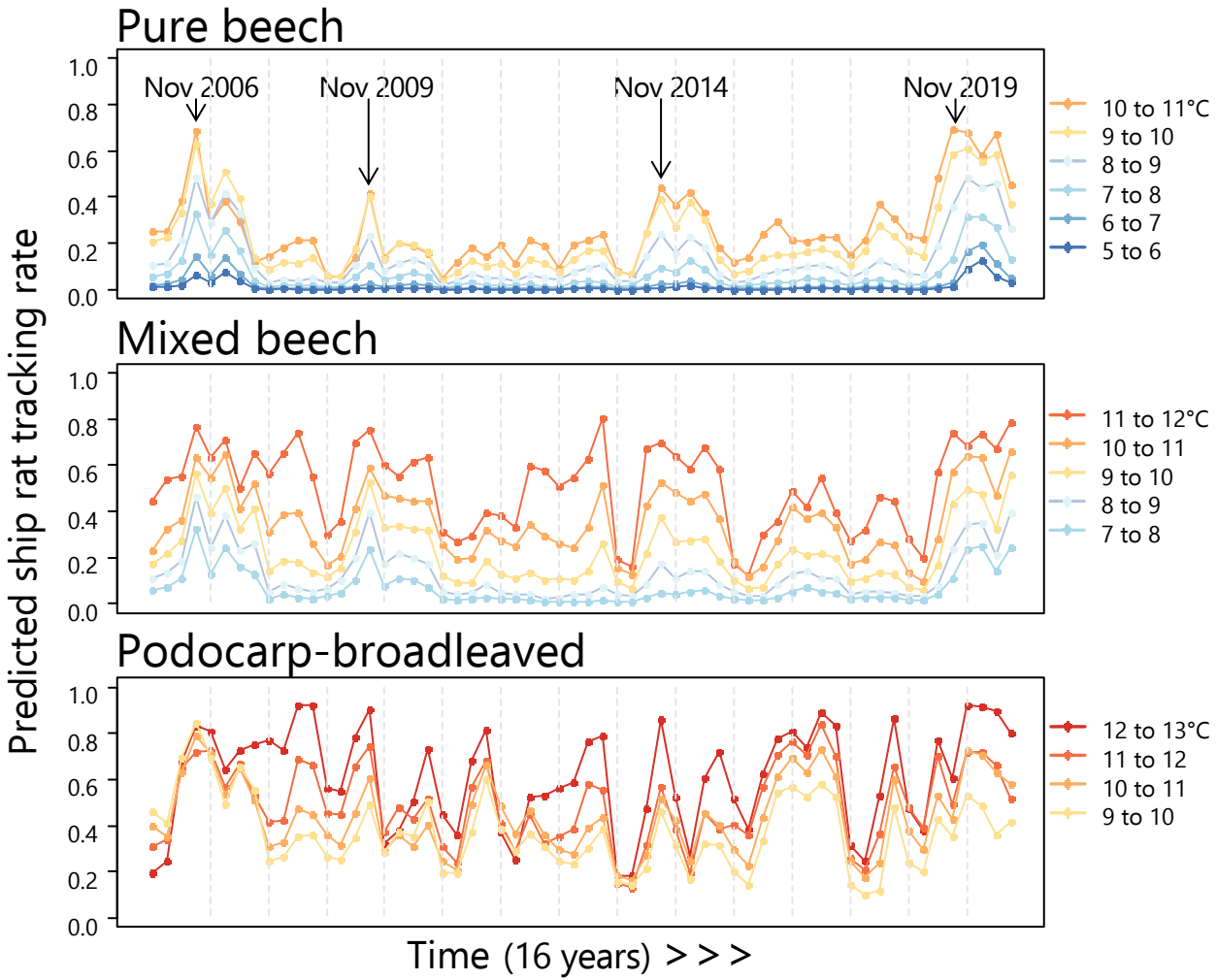
DOC & GWRC



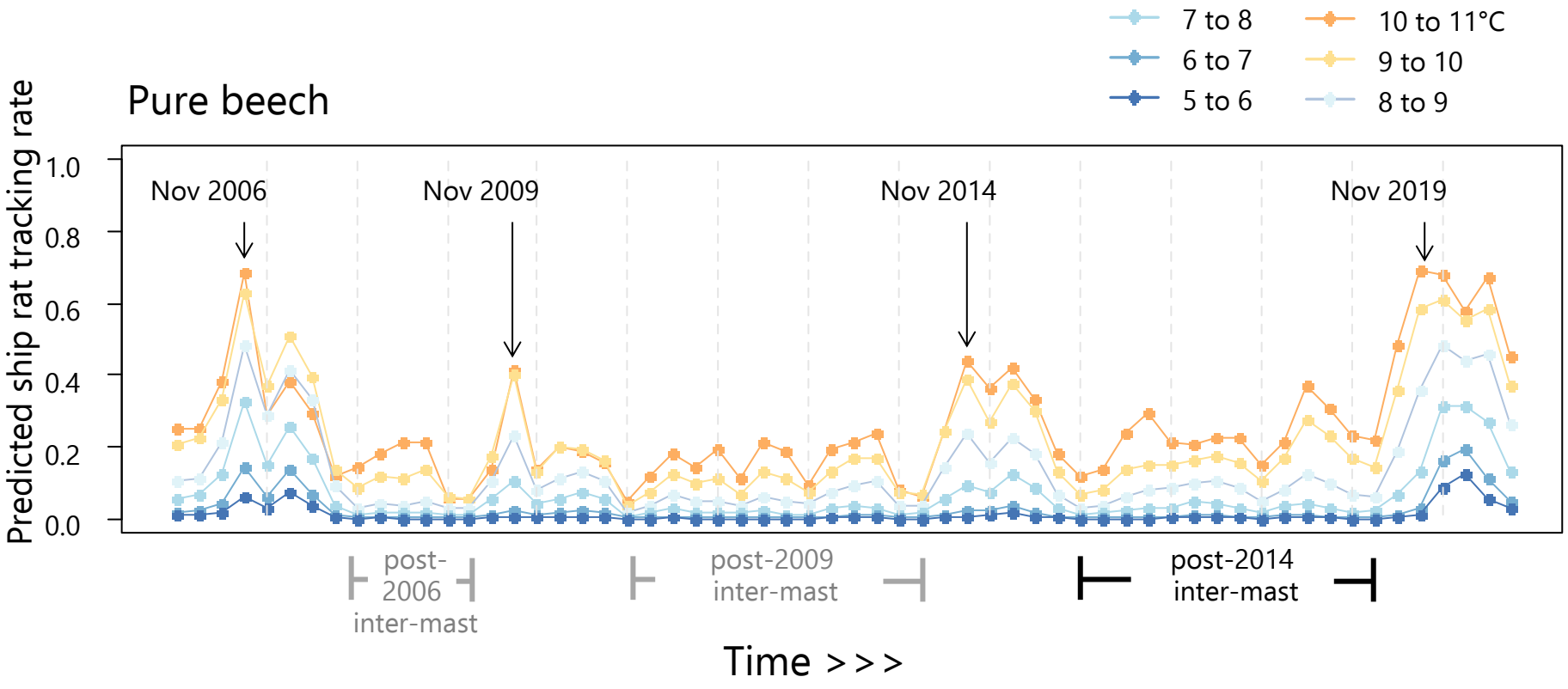

Pure beech
Mean annual temperature
10 to 11°C
9 to 10
8 to 9
7 to 8
6 to 7
5 to 6
Mixed beech
Mean annual temperature
11 to 12°C
10 to 11
9 to 10
8 to 9
7 to 8
Podocarp-broadleaf
Mean annual temperature
12 to 13°C
11 to 12
10 to 11
9 to 10

Unmanaged ship rat tracking rates

medians of predicted

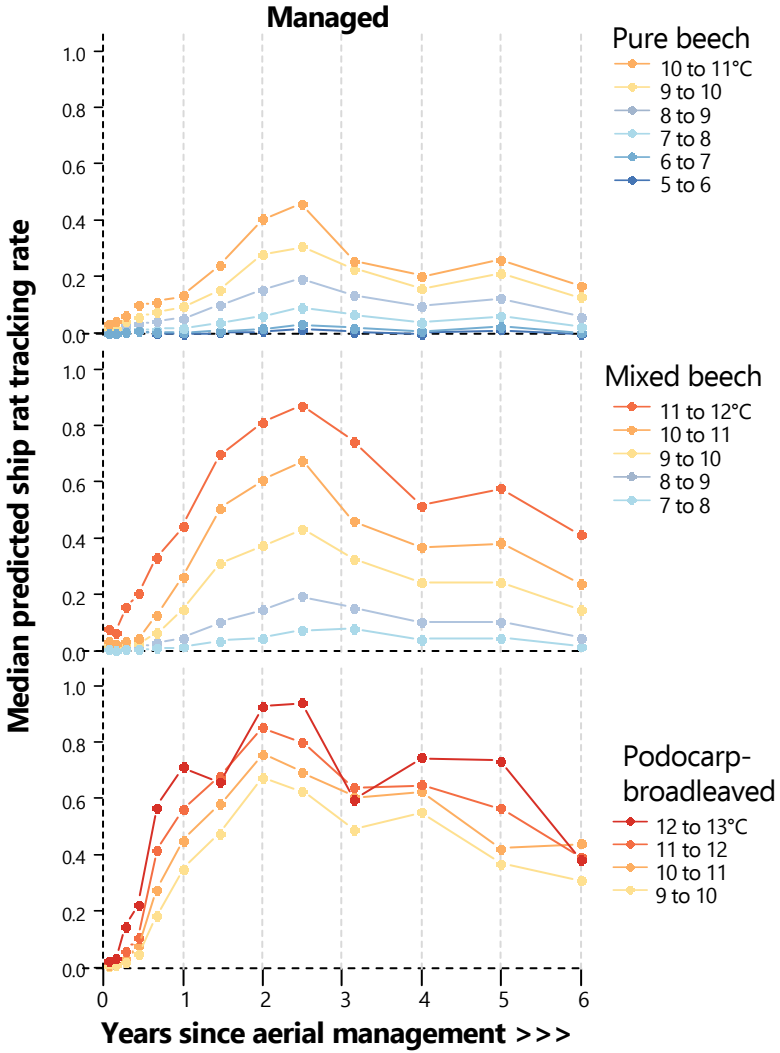


Rising ship rat population baselines?



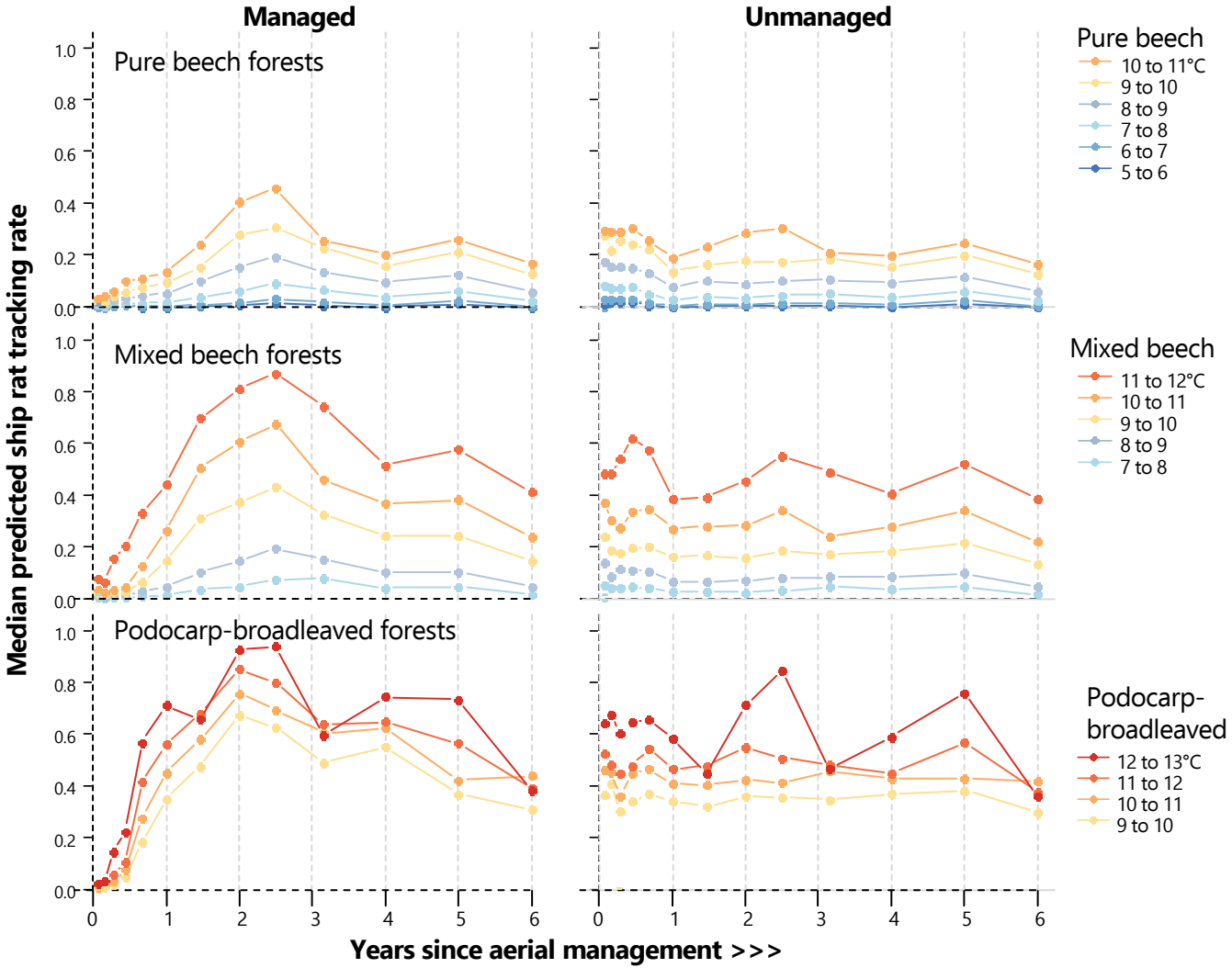
Managed ship rat tracking rates

medians of predicted 2005–2020



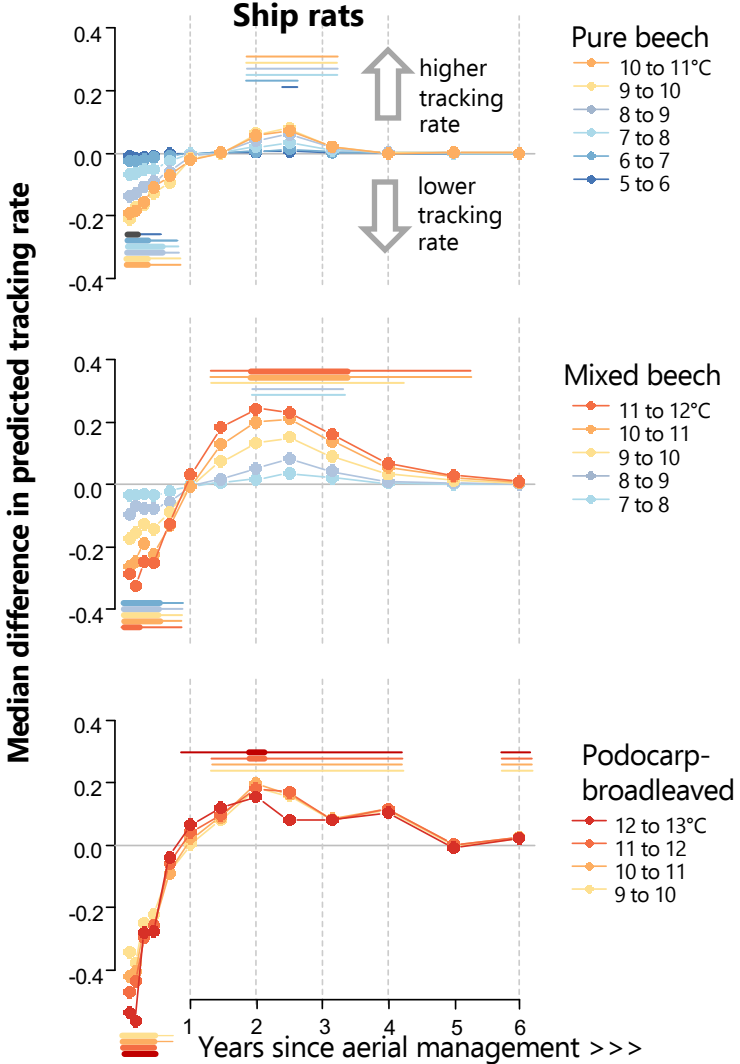
Managed *vs* unmanaged ship rat tracking rates

medians of predicted 2005–2020



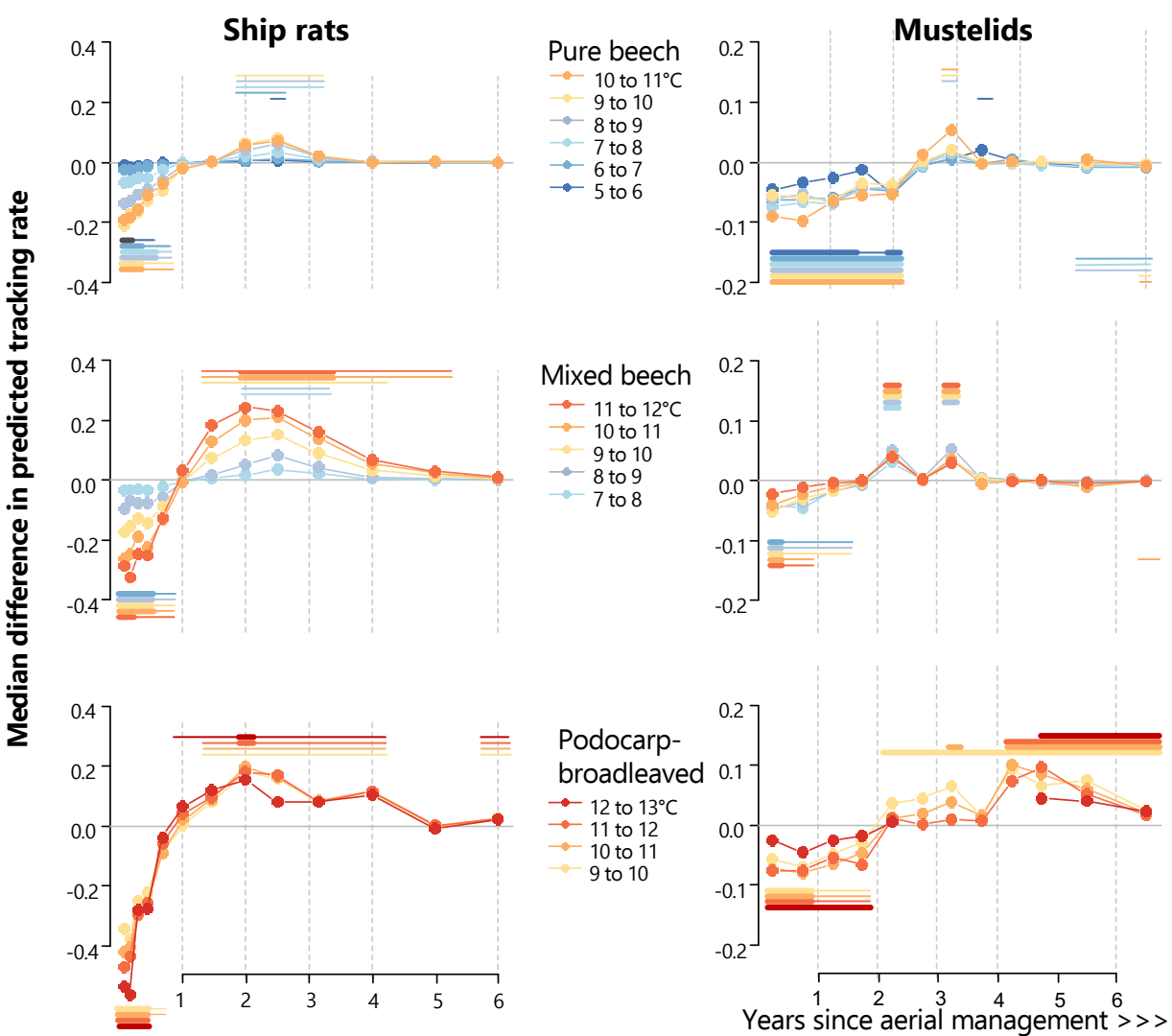
Difference made by aerial management

medians of predicted 2005–2020



Difference made to mustelid tracking rates

medians of predicted 2005–2020



Where is this
all heading?

Future directions – spatially-explicit management prescriptions for bird outcomes

- Pest management
  - When, where and how?
- Management under current and future climates.
- Outcomes of harvest
  - Translocation
  - Cultural

When best to intervene ?

How? The broad-scale model

Management

Food productivity

Survival Fecundity

Rat dynamics

More birds in the bush

More detail available from:

- https://www.landcareresearch.co.nz/discover-our-research/biodiversity/species-and-ecosystem-conservation/more-birds-in-the-bush/mid-programme-update/
- Multiple presentations about:
  - Roles of predation and resources in forest bird declines and limitation
  - Causes and consequences for ship rats of variation in food resources
  - Effectiveness and outcomes of aerial pest management
  - Factors affecting forest bird translocation success
  - Practitioner perspectives on research needs.