



OUTCOME:
ZERO MICE



Saving our island biodiversity from introduced pests

The Auckland Islands (57,000 ha), in the New Zealand Subantarctic Islands, are a Nature Reserve, World Heritage site, and home to some of the world's most extraordinary natural heritage. There are over 400 plant and animal species here that are restricted to the New Zealand subantarctic region and more than 100 species of endemic flora and fauna.

Auckland Island (46,000 ha) has populations of feral pigs, cats and mice that have inflicted severe ecological damage over the past 150–200 years. After more than 25 years of conservation effort, it is the last island in the New Zealand subantarctic region where mammalian pests remain.

This project would be the largest attempted removal of mice in the world. The rebound of bird and invertebrate life following the removal of mice from Antipodes Island in 2016 highlights the conservation benefit for the ecosystem.



What's the problem?

Mice arrived on Auckland Island as stowaways on ships in the 1820s.

- ▶ Mice destroy native insect populations and compete with native birds for food.
- ▶ They are also known to prey on small and large seabirds, both chicks and adults, when they are the only predator, as seen on Marion and Gough Islands and Midway Atoll, where some albatross species have no successful breeding.
- ▶ The application rate of toxic bait will need to be lower than usual/best practice because of the large scale and remote location.
- ▶ Most mouse operations are carried out in winter. A summer operation would improve the logistical feasibility of spreading an estimated 500 to 600 tonnes of bait over longer daylight hours and more favourable weather. 880 hours of flying are estimated, requiring 6–8 helicopters.



Department of
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Te Papa Atawhai



Te Rūnanga o NGĀI TAHU

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Work already completed



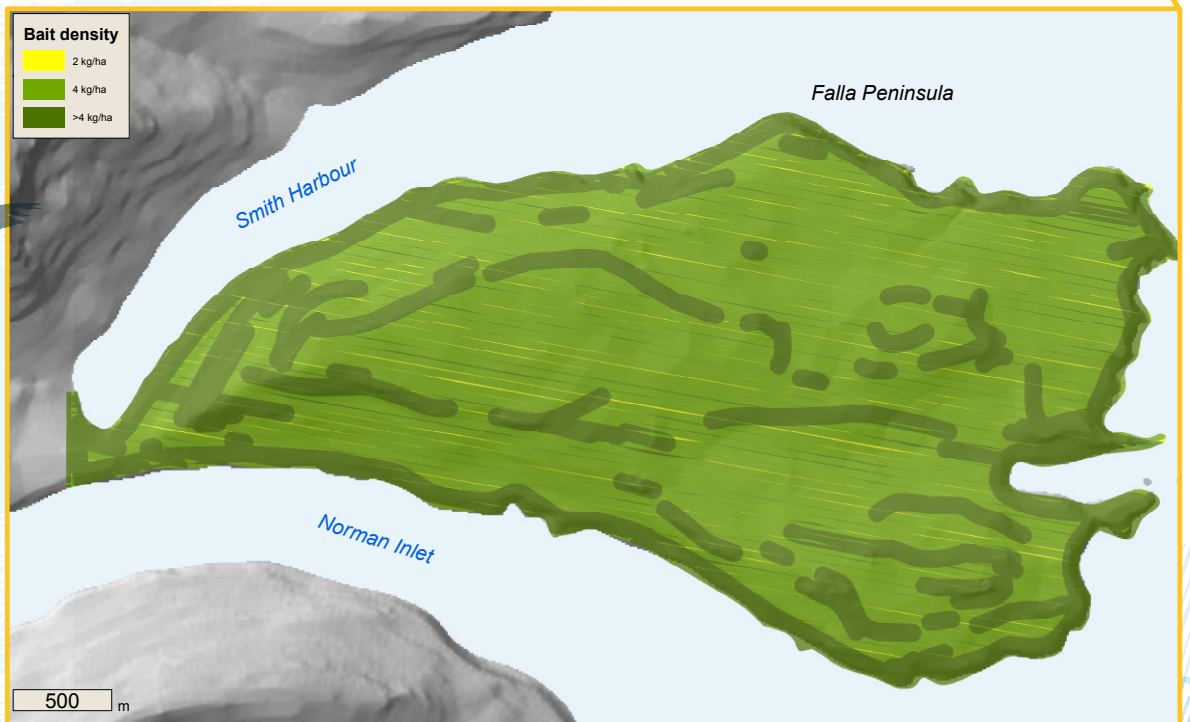
Trialed application of non-toxic bait with bio-tracer at a low application rate (4 kg/ha) in summer 2019 on Falla Peninsula.



Mice were eradicated from Adele Island (58 ha in Able Tasman National Park) in 2017, using a single application of 3 kg/ha of bait.

Maud Island (320 ha in Marlborough Sounds) will trial two applications of 4 kg/ha of bait to eradicate mice in winter 2019.

Mice eradicated from Antipodes Island (2012 ha) in 2016 using two applications 16 kg/ha and 8 kg/ha in challenging subantarctic conditions.

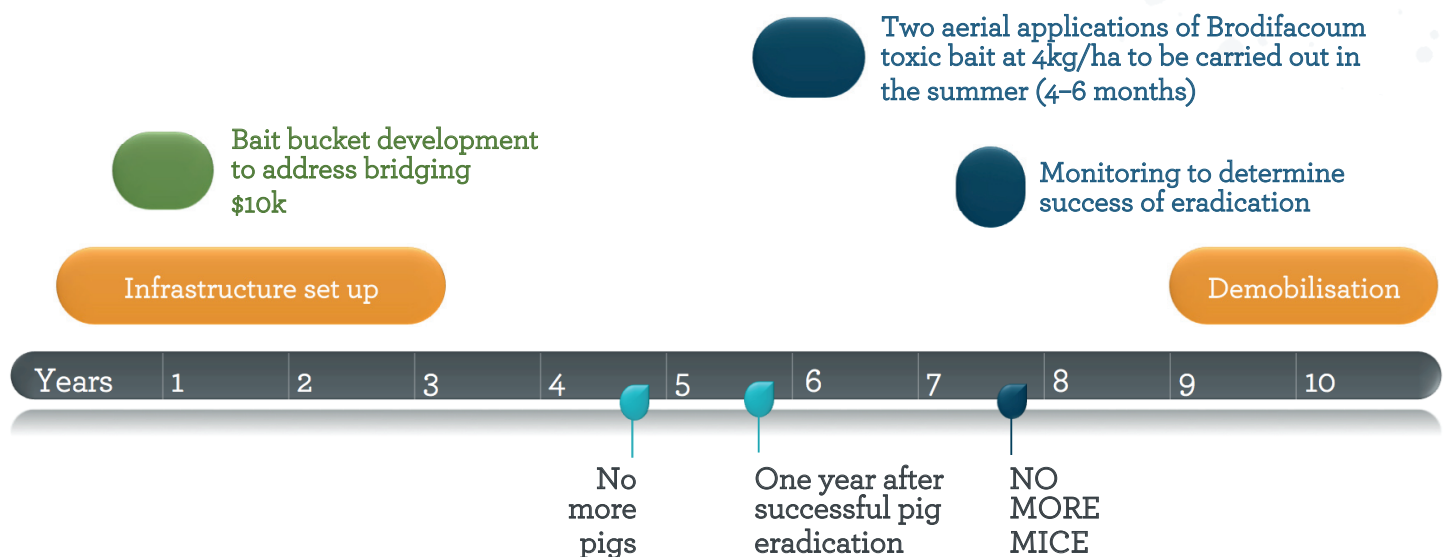


Key findings

- ▶ Mice were abundant and continuously breeding over summer. Population data was accurately recorded to compare with future measures to understand population dynamics.
- ▶ Two juveniles out of 232 mice (<1%) tested negative for bio-tracer but would be expected to be vulnerable to a second bait application several weeks later.
- ▶ Low bait application rate in summer resulted in good results with high uptake and response, showing low sow rates – with 2 well timed applications, should be able to put all mice at risk.
- ▶ Bridging (baits blocking the small bucket opening) and bait production quality (size) become an issue at low application rates.



Where to from here?



Mouse bait loading during summer trials *Photo: Finlay Cox*



Mouse tracking tunnel



Challenges and risks

- Comprehensive bait coverage across the island is required to achieve eradication but poor subantarctic weather reduces time available to carry out operations.
- Timing the second bait application before any mice that emerge from the nest after the first application start breeding.
- Procuring sufficient suitable operators, including helicopters and experienced baiting pilots while competing with other projects such as ‘Tia Kina Ngā Manu – Battle for Our Birds’.
- The extent of cliff habitat, which requires additional bait application in hazardous zones.
- Pigs must be eradicated before mouse programme commences.
- The supply chain for the delivery of 150 tonnes of helicopter fuel to Auckland Island including appropriate storage in transit, on the mainland and on the island.

Remaining uncertainties

- Impacts of tussock masting on bait uptake and operational timing.
- Timing transportation and storage of this quantity of bait on the mainland and on the island.
- Developing bait bucket technology to ensure consistent flow rate and avoid/identify bridging.
- Helicopter infrastructure and support.
- Frequency and quantity of suitable bait-spreading weather.

Benefits



Removing mice is likely to increase invertebrate abundance and diversity and, in turn, benefit ecosystem functions (e.g., return of pollinators, nutrient cycling).



Documented evidence shows that island ecosystems are sensitive to mouse predation, which decreases invertebrate numbers, species diversity and the community structure.



Based on evidence from mice eradication elsewhere, there will likely be a significant increase in small bird numbers, while predation on eggs and nesting chicks will likely decrease.



After removing rabbits and mice on Enderby Island, palatable plants, including tussocks and megaherbs showed almost immediate recovery.

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