Protecting Pukunui on Rakiura

Update on the delivery of aerial predator control

9 September 2025

In this update:

- Phase 2 of the aerial 1080 operation was completed on 22 August 2025
- Monitoring results update
- Hunting and caution period information
- Bait and carcass monitoring is underway
- Water testing results following the 1080 bait application
- Deer repellent trials are underway
- Have questions about the operation? Contact **pukunui@doc.govt.nz**

A frosty sunrise at the Island Hill (Mason Bay) loadsite, where the team was based to deliver the aerial operation.

Pukunui or Southern New Zealand dotterel are one of the most threatened bird species in New Zealand, with just 105 remaining, largely because of predation by feral cats. The population has declined from 176 birds since 2020.

The Pukunui Recovery Project aims to rebuild the pukunui population to at least 300 birds by 2035. To support this goal, ground-based predator control has been complimented with aerial predator control using cereal bait, targeting key areas where pukunui breed and factoring in the large home ranges of feral cats.

By significantly reducing rats, possums, and feral cats in the treatment area, we hope to give pukunui the best possible chance of a successful breeding season this spring.

Phase one: ZIP Eradication trial – '1080 to Zero'

Zero Invasive Predators (ZIP) delivered an eradication trial across 6,500 hectares. The purpose of the trial was to test tools and techniques for complete removal of all target predators, including feral cats, possums, rats, and hedgehogs (if present). Insights from this work will provide learnings to inform the next steps of Predator Free Rakiura.

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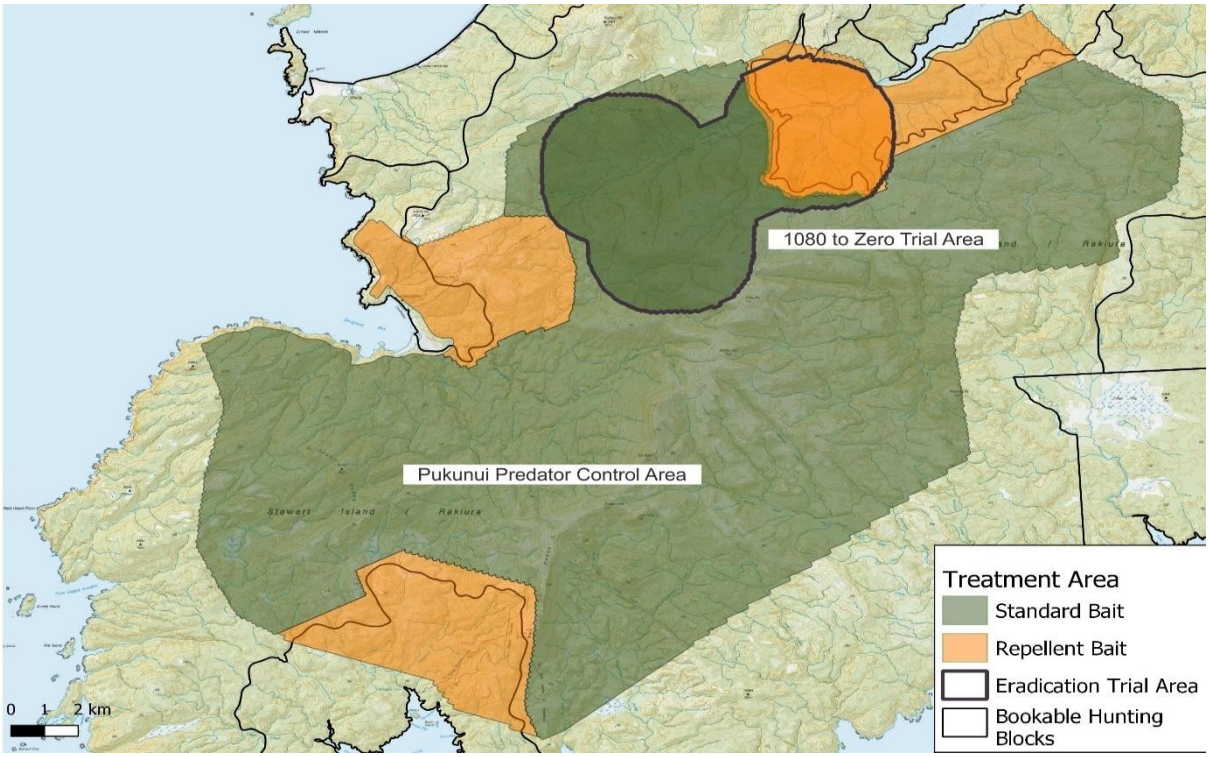
This ‘1080 to Zero’ eradication trial was delivered in two phases:

- **Phase 1:** ZIP applied two rounds of non-toxic prefeed, followed with an application of toxic bait at 4 kg per hectare.
- **Phase 2:** The same trial area was re-treated since it sits within the footprint of the larger 40,000 hectare aerial operation. As part of Phase 2 the 6,500-hectare trial area received another round of non-toxic prefeed, followed by toxic bait at 2 kg per hectare. The second application aimed to suppress any remaining predators and complete the trial.



Map showing the 6500 hectare ‘1080 to Zero’ Trial Area and 40,000 hectare pukunui predator control area.

Phase two: Pukunui protection aerial operation

In August 2025, the Department of Conservation (DOC) and ZIP successfully carried out Phase 2 of the aerial 1080 operation to protect pukunui and other native wildlife across approximately 40,000 hectares of Rakiura National Park, including the ‘1080 to Zero’ eradication trial area. Phase 2 consisted of one application of non-toxic pre-feed bait (delivered between 3 - 4 August 2025) and one application of toxic bait (delivered between 21 - 22 August 2025).

The map above shows the area where toxic bait was applied during Phase 2. This area was designed to cover key pukunui breeding sites, with a buffer of 5 km to account for the home ranges of feral cats and delay reinvasion to the sites where pukunui are breeding. The toxic cereal bait pellets used in this operation weighed 6 grams each, were dyed green and contained 1.5 grams of 1080 per kilogram of bait. They were applied at a target rate of 2kg per hectare across the 40,000-hectare treatment area.

The helicopters flew under calm conditions guided by GPS to ensure accurate coverage. The operation went smoothly, with no health or saftey incidents. All bait was sown in line with strict environmental standards, and signs were placed at track entrances as a reminder to take care while the caution period is in place.

Caution recommended around the treatment area when hunting

Standard cautions apply when hunting deer in bookable hunting blocks and the open hunting zone. Hunting is allowed following the operation; however, it is recommended that hunters not take meat for consumption from inside the treatment area or within 2 km of its boundary during the caution period. The current caution period began as soon as toxic bait was applied during Phase 2 on 21 August 2025 and will stay in place until poisoned carcasses fully break down—usually four to eight months. See the *Bait and carcass monitoring* section below for a description of how carcasses are monitored.

To see areas where a caution period is active, refer to the DOC Pesticide Summaries information:
https://www.doc.govt.nz/nature/pests-and-threats/pesticide-summaries/

Risks can be eliminated by following these rules:

- **DO NOT touch bait.**
- **WATCH children at all times.**
- **DO NOT EAT animals from this area or within the buffer zone outside the treatment boundary. The standard buffer zone is 2 km for deer.**

Observe the rules listed when you see warning signs about pesticides. The signs indicate that pesticide residues may still be present in baits and poisoned carcasses. When the warning signs are removed this means you can resume normal activities in the area.

Monitoring is underway

Water testing:

Water sample collection at Doughboy Creek, following the application of 1080 as part of the pukunui protection aerial 1080 operation.

In response to interest from the Rakiura community and others, an agreement was made to test for 1080 residue following aerial 1080 operations involving toxic bait application.

For Phase 1, water samples were taken from the Rakeahua River, just before it meets the sea. All results returned negative for 1080.

For Phase 2, water sampling was carried out at both Rakeahua River and Doughboy Creek, just before each meets the sea. Samples were collected at four intervals: before bait application (as a control), and then 2 hours, 8 hours, and 24 hours following bait application. All samples were immediately frozen and sent to Manaaki Whenua – Landcare Research for analysis.

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- All Phase 2 samples tested negative, except for two samples taken 8 hours post-application, which showed trace levels of 1080 just above the detection limit.
- Upon re-testing, both of the 8-hour samples returned negative results for 1080.
- The initial trace readings (0.17 ppb and 0.16 ppb) were 11.5 times lower than the Ministry of Health's safe limit of 2 ppb for drinking water.

With no persistence detected and all other samples returning negative results for 1080, there is no risk of contamination or toxicity to the aquatic environment.

Bait and carcass monitoring:

Bait and carcass monitoring is standard practice alongside aerial 1080 operations to inform the length of the caution period. This involves putting 1080 baits and carcasses of target species at representative sites in the treatment area, protected from interference by a cage but open to the elements. After an aerial operation, many pellet baits are eaten by possums and rodents. Any uneaten pellets break down naturally when exposed to moisture. Baits left on the ground become non-toxic once they have been exposed to around 200mm of rain. Without heavy rainfall, any remaining traces of 1080 within baits naturally break down over time, with concentrations dropping to undetectable levels within about 100 days.

For this operation, bait and carcass monitoring stations were set up at three sites for both Phase 1 and 2. These are first checked at four months after the operation (22 December 2025), which is the minimum length of time that a caution period is active. If carcasses have still not broken down, they are checked regularly from that point onwards. Only when full breakdown of the carcass is observed in these three monitoring sites— all soft tissue has disappeared and only bones, skin and fur remain— is warning signage removed from around the treatment area and the caution period lifted.

A caution period of 8 months has been estimated folloiwing this operation. If bait and carcass degradtion is faster than estimated, then the stand-down period may be reduced. However, it will not be shorter than the 4-month minumum caution period under the New Zealand Food Safety Authority requirements for 1080.

Monitoring the success of the Eradication trial: one step closer to Predator Free Rakiura

To measure the impact of the '1080 to Zero' trial, ZIP has deployed an extensive monitoring network across the 6,500-hectare treatment area. A total of 765 trail cameras have been installed in grids to detect any remaining predators and track changes over time. The map on the next page shows where ZIP have set up trail camera monitoring grids.

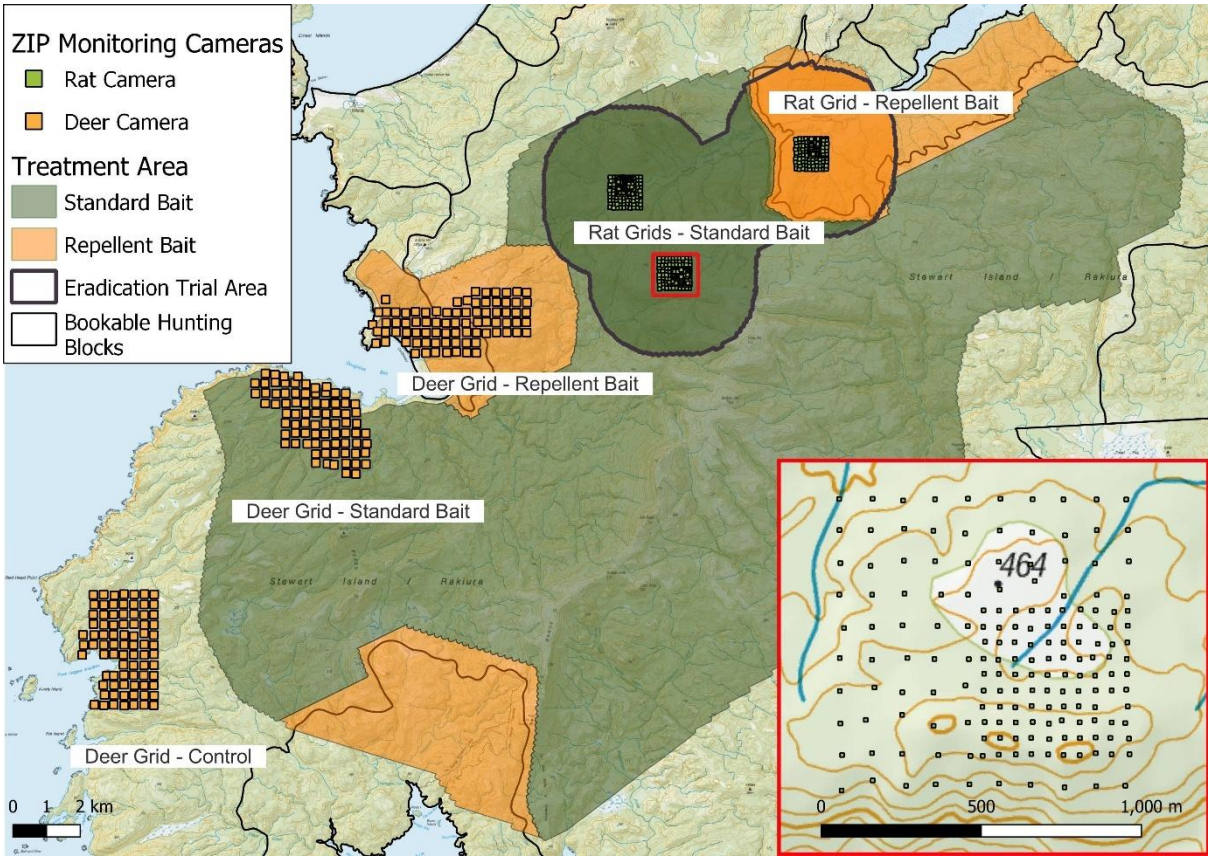
Servicing the full network is a major undertaking:

- Field teams spend several weeks visiting every camera to collect memory cards.
- Once retrieved, the data undergoes weeks of processing, including image sorting, tagging, and analysis.
    - Once cameras are serviced, the images on them must be 'classified'—that is, each image viewed and assigned to a target or non-target species. These detections are then used to create maps and graphs to understand differences before and after the toxin operation.
    - Each trail camera can have approximately 20,000 images when collected. This means that even after memory cards are collected from the cameras, it can take several weeks to classify images and analyse results from a grid. Classifying of images is completed by a mix of manual viewing of images & some AI filtering. Distinguishing between the three rat species—Norway rat, ship rat, and kiore (Pacific rat)—is especially challenging, as the differences between them are subtle.
- To build a robust dataset, ZIP completes two full checks of the network, generating hundreds of thousands of images — a volume that can take months to fully review.

This intensive monitoring effort supports two key trials being carried out as part of the eradication operation:

1. Can aerial 1080 bait completely remove target predators on Rakiura?

As part of the '1080 to Zero' eradication trial, ZIP is testing whether aerial baiting can completely remove all three rat species on Rakiura. To do this, intensively spaced grids of trail cameras have been installed across the trial block, each baited with mayonnaise to attract rats. Detecting every last individual is critical to measuring success, and setting up this monitoring network was a major effort — taking five staff members 13 days to install the ZIP rat trail camera grids.



Map showing the location of trail camera grids used by ZIP as part of the '1080-to-Zero' eradication trial.

2. How well does Prodeer deer repellent protect Rakiura's white-tailed deer during 1080 operations?

To assess the deer repellent's effectiveness, white-tailed deer are being monitored using trail cameras placed in areas with repellent, without repellent, and in a non-treatment zone. This will help determine whether Prodeer reduces deer by-kill and whether it affects bait uptake by rats. Installing the deer monitoring network took five staff members 13.5 days.

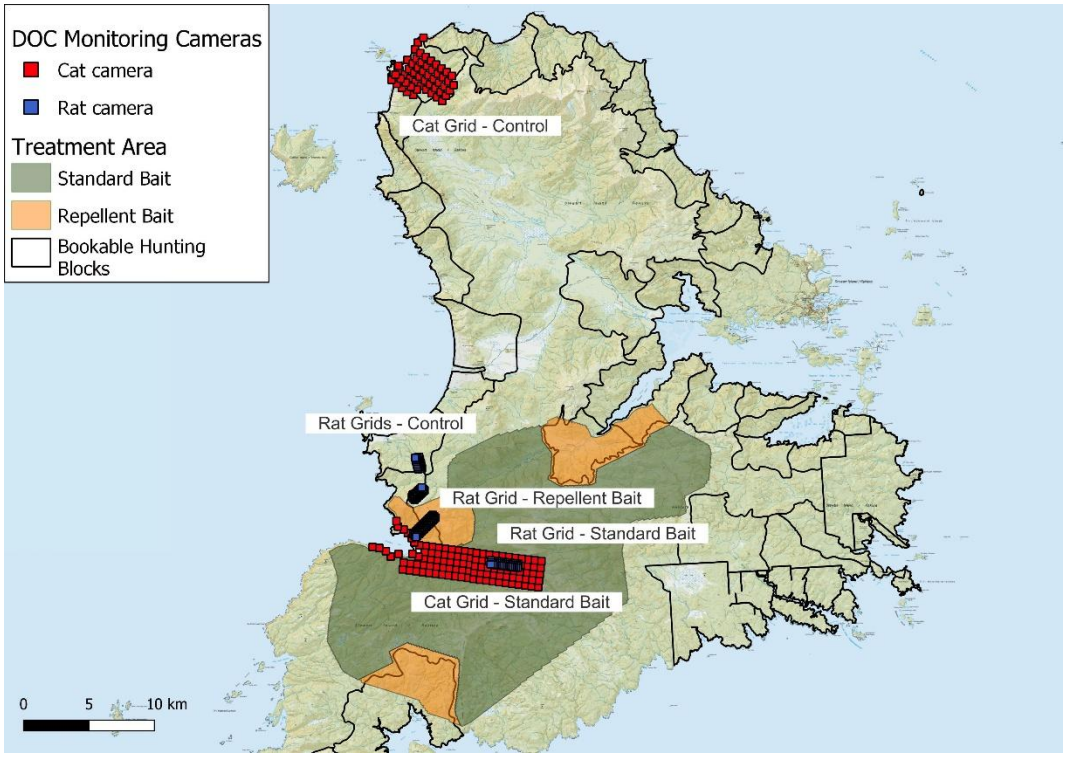
> Read about ZIP's 1080 to Zero eradication approach on the Predator Free Rakiura website: predatorfreerakiura.org.nz/about-us/stories/eradicating-rats-from-rakiura-trials-phase-1-complete

Monitoring the success of the pukunui protection aerial operation

DOC is monitoring predator activity to assess how successful the recent aerial 1080 operation (Phase 2) has been in lowering predator numbers. Trail cameras have been placed across the landscape — from sea level at Doughboy Bay right up to and over the mountain tops of the Tin Range. Cameras have also been set up outside

the treatment area, at East Ruggedy and inland from Mason Bay beach at Kilbride, so results between treated and untreated sites can be compared.

The first round of trail camera images taken before the operation have been reviewed. These photos will help determine the abundance of predators in the area before the 1080 was applied.
A second round of monitoring has also been completed, focusing on rat activity. That data is now being processed and will give us a clearer picture of rat abundance before the operation.



Map showing the location of trail camera grids used in the DOC monitoring programme for the pukunui aerial predator control operation.

Seven days after the Pukunui aerial operation, DOC staff began collecting memory cards from the trail camera network. Over a six-week period — depending on the weather — teams will return to both the treated areas and the comparison sites outside of the treatment area to collect post control data. This will help measure how effective the operation has been.

DOC trail cameras snapped over 500,000 images during pre-operational rat grid monitoring!

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Next steps: understanding results and outcomes

With trail camera networks deployed across both the 6,500 hectare ZIP '1080 to Zero' eradication trial area and the wider 40,000-hectare pukunui protection treatment area, the focus has now shifted to data collection, processing, and analysis.

Over the coming weeks:

- Field teams will continue servicing cameras and retrieving memory cards.
- Images will be sorted, tagged, and analysed to assess predator activity and presence.
- Since each species is tracked differently, results will come out in stages as the data is processed and analysed.

Initial results will be shared as the post-operational data is processed and analysed. DOC and ZIP will continue to share findings with the community as they're ready — helping build a clearer picture of how effective the operation has been.

For more information on this operation, including maps of the treatment area and FAQs, see the ZIP website: https://zip.org.nz/updates/2025/protecting-pukunui-on-rakiura

An adult Pukunui sits on its nest on the Tin Range (Sasha Roselli).

What does this mean for Pukunui?

The pukunui/Southern New Zealand dotterel population is monitored annually through flock counts conducted in April. These counts are an important tool for tracking trends in the population and will indicate the success of the 2025 pukunui breeding season.

Pukunui breeding success will guide future decisions about predator control methods.

In the longer term, achieving the vision of a Predator Free Rakiura would remove the need for future suppression operation efforts for pukunui—providing a safe environment where pukunui and other native species can recover and thrive.

What does this mean for Predator Free Rakiura?

The results from the ZIP '1080 to Zero' eradication trial will play a key role in shaping what comes next for Predator Free Rakiura. Insights from the trial, combined with continued engagement with the Rakiura community will inform future planning and direction for Predator Free Rakiura.

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