

PAPP Project Update

July 2021



Stoat (*Mustela erminea*) investigating a non-toxic bait during field trials in the Borland, taken from video footage. November 2020. Image: DOC

Background

The Department of Conservation's Biodiversity Team is working with project partner Connovation Ltd. to develop ways to use the toxin PAPP (para-aminopropiophenone) as a landscape control tool to remove stoats and feral cats, which are invasive predators in New Zealand.

Stoats and feral cats are key predators of some of New Zealand's most threatened bird, bat, reptile and insect species. Our unique native animals have not evolved defence mechanisms to escape predation from such introduced mammals, which can cause lasting and sometimes irreversible damage.

To protect the remaining populations of species such as kiwi, takahē, black stilt, pekapeka, and Otago skink, new landscape control tools are urgently needed to remove these predators from New Zealand's shores.

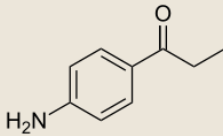
Current control methods – mainly trapping and use of 1080 baits – can be effective but have limitations. New tools are needed to remove predators at a landscape level, and PAPP-based tools will contribute to this.



Department of
Conservation
Te Papa Atawhai

What is PAPP?

PAPP, short for para-aminopropiophenone, is absorbed into the blood stream after being eaten and causes methemoglobinemia, which decreases the amount of oxygen red blood cells can carry. This leads to a reduction of oxygen to the brain, making the stoats and feral cats lethargic, sleepy and unconscious prior to death.



Carnivores such as stoats and feral cats are particularly sensitive to PAPP but birds and other mammals less so.

It has a low secondary poisoning risk, does not bioaccumulate, and has an antidote.

PAPP was registered for use in NZ in a paste form in 2011. However, the paste needs to be inserted into meat baits and can be difficult and messy to use.



Den contents of a Stoat (*Mustela erminea*)
Image: John Dowding

Objectives

The PAPP team is currently developing two easy-to-use sausage baits which contain PAPP paste, one to target stoats and one to target feral cats. The goal is to produce ready-made meat baits which can be presented in a bait station, hand-laid, or delivered by air. DOC is also working with Envico Technologies and Connovation Ltd on a resetting PAPP delivery device called the Spitfire.

PAPP Bait Development

Work is currently being undertaken to:

- Ensure consistency of PAPP particle size in baits: Connovation has purchased a milling machine and baits containing the finer PAPP will be used in captive trials to test efficacy prior to field trials taking place.
- Understand risk for non-target species: DOC is running non-toxic field trials to understand which non-target species, if any, are likely to eat the baits in the field.

Cultural Impact Assessment

DOC is planning to undertake a Cultural Impact Assessment of PAPP as a predator control tool. This should allow the project partners and regulatory authorities to better understand any implications of the tools for mana whenua.

DOC has engaged a consultant to design a roadmap in preparation for the main assessment. This initial piece of work should be available in August 2021. If you would like more information regarding this assessment, please contact Penny Wallace (PAPP Coordinator): pwallace@doc.govt.nz

Project Updates:

1. PAPP for Stoat Control

Objective: Ready-made toxic bait suitable for bait station, hand-laid and aerial use

Non-toxic trial in the Borland Valley, Southland

We conducted trials using hand-laid non-toxic baits in a 1000 ha area in the Borland Valley, Fiordland National Park, in November-December 2020. Trial objectives were to investigate the palatability of baits to both target and non-target species, describe how species interact with the baits, and identify any cause for concern regarding non-target animals' interactions with baits. Fifty 10g baits were hand-laid 500m apart, with a camera focused on each bait. Baits were left for 10 days, then replaced.

What we found: 56% of baits were taken by stoats, which is a great result. Stoats have large home ranges (c.100 ha), so individual stoats were likely taking multiple baits. New Zealand robins were seen near baits on 21 occasions and were twice seen eating some bait. No other native birds were seen eating baits, however, other species that did include cat, hedgehog, possum, blackbird, and song thrush. Data from this trial will inform the further development of baits and will support the registration process of the finalised formulation.

Next steps:

- Captive trials of PAPP baits for stoats are planned for winter 2021.
- Following these trials, the team will look to run toxic hand laid trials in spring/summer 2021/22.

2. PAPP for Feral Cat Control

Objective: Ready-made toxic bait suitable for bait station, hand-laid and aerial use

Gathering expert inputs

We distributed a questionnaire within DOC to better understand the need for a feral cat bait. From this feedback, the PAPP Technical Advisory Group (TAG) recommended a ready-made PAPP bait be developed and registered for bait station, hand-laid and aerial use.

Non-toxic trail on Rakiura

Non-toxic rabbit and chicken sausage baits were hand-laid on Rakiura/Stewart Island in March/April 2021 to check whether feral cats would find them, and which, if any, non-target species might interact with them. Initial analysis of footage indicates possums, rats, and feral cats ate baits. Although kiwi investigated the baits, they were not seen to eat them. Full results are due in July 2021. Thanks to the Rakiura staff and the NET team for undertaking this trial.



Sunrise on Rakiura Image: James Ware, DOC



Preparing baits Image: James Ware, DOC



Trial camera on bait Image: James Ware, DOC

Non-toxic trial in the Mackenzie Basin

The DOC Twizel office supported a non-toxic bait trial in the Mackenzie Basin. Chicken and rabbit sausage baits were hand-laid in June, and trail cameras were positioned to capture which animals ate the baits. Initial footage indicates stoats, feral cats, hedgehogs, and possums were present in the trial area. The trial has just finished, and results will be ready to share once the footage has been viewed. Many thanks to the Twizel office for their support in running this trial.

Next steps

A trial is planned to test the effectiveness of the PAPP baits on captive feral cats. Subject to the success of the captive trial, field trials of hand-laid toxic bait are planned for spring/summer 2021/22.

3. Stoat Spitfire Project

Objective: A self-resetting toxin device that can remain active in the field for up to one year without maintenance

The Spitfire is a self-resetting toxin device that squirts PAPP paste on to the belly of a stoat and relies on the stoat's strong grooming reflex. It has been in development for several years but recently received a boost in funding from Predator Free 2050 Ltd. The Spitfire can be deployed in hard-to-reach areas, and once finalised, should last in the field for up to one year without having to be checked or reloaded. It has been designed in partnership with Envico Technologies Ltd and Connovation Ltd.

Spitfire Updates

A toxin-free 3-D printed prototype of the Spitfire was trialled with captive kea to test its durability and to ensure that when in the field, wild kea would not be able to access the toxic paste (found in the centre of a loaded device). The kea showed interest in the Spitfire but did not cause significant damage. More importantly, they could not put their heads far into the tunnel, meaning that there should be little danger of wild kea accessing the toxin should they come across the Spitfire in the field.

Next steps

A further trial with captive kea will take place with the manufactured Spitfire device to ensure kea will not be at risk once it is deployed. Field trials of the Spitfire using toxic paste are planned for spring/summer 2021-22.



Further information For more information on the projects and tool development please contact Elaine Murphy, Principal Scientist (emurphy@doc.govt.nz) or Penny Wallace, PAPP Project Coordinator (pwallace@doc.govt.nz). Document reference: Doc-6676135.