

PAPP Project Update

August 2024

Background

The Department of Conservation is working with Connovation Ltd. to develop and register a ready-made bait containing the toxin PAPP (para-aminopropiophenone) to remove stoats, which are invasive predators in New Zealand.

Nationwide, predation of young kiwi, mainly by stoats, is currently the most important factor contributing to the continuing decline of mainland kiwi populations. Stoats are also a critical predator of a wide range of other threatened species, including takahē, black stilt/kaki, mohua, kākā and kea. Stoats are extremely efficient predators, killing any suitable prey they can find and caching the surplus for future use.

At present, kill-trapping is the main technique used for sustained control of stoats, but this is labour-intensive and can be expensive. Aerial predator control operations using 1080 can be an effective means of controlling stoats because they die from eating poisoned rodents. However, new control methods are needed to target stoats when and where there are few rodents.

What is PAPP?

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

Carnivores such as stoats are particularly sensitive to PAPP but most birds and other mammals (including

humans) are less so. PAPP has a low secondary poisoning risk and has an antidote. It is also considered humane, when compared to other vertebrate toxins.

PAPP was registered for use in NZ in a paste form in 2011, however the paste needs to be inserted into hand-made meatballs and is difficult and messy to use. The new ready-made bait consists of a rabbit-minced meat sausage with small (< 1mm) PAPP granules mixed in the meat.



PAPP hand-laid trials

We have now completed two hand-laid trials in the Borland Valley, Fiordland National Park. The Borland Valley was chosen for the trials, as it regularly has high stoat numbers.

Each trial covered about 1000ha, and baits were hand-laid on the forest floor. In Trial 1, baits were laid



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on a c.200m by 400m grid (1 bait per c.8ha, totalling 150 baits), and in Trial 2 a 120m by 400m grid (1 bait per c.4ha, totalling 242 baits).

Trial cameras monitored a proportion of the hand-laid baits to monitor bait take by stoats and non-target animals. Each trial had a pre-feed of non-toxic baits followed by 2 deployments of the toxic baits a week apart.

In the first trial, half the baits were monitored with cameras. We observed stoats taking at least 6 PAPP baits and weasels took another 3 in the first week. In the second week, stoats took 2 baits, and a weasel 1 bait. Camera footage from the second trial is still being processed.

For each trial, independent monitoring was undertaken before and after the hand-lay operations in both the 1000ha treated area and another, similar-sized untreated block in the vicinity. A camera baited with rabbit was placed at either end of 6 tracking tunnel lines in each area and left for a week to record visits by stoats. 'Visits' were considered separate events when at least 30 minutes apart, but may not always represent different stoats, as some records could be the same animal re-visiting.

Number of stoat visits at least 30 min apart

	Pre-Trial	Post-trial
1st Trial		
Treatment	17	0
Non-treatment	16	11
2nd Trial		
Treatment	26	1
Non-treatment	11	7

A Relative Activity Index was calculated from the mean number of visits per line over the 7-day period for each area.

Relative Activity Index (RAI ± SE) over 7 days

1st trial

RAI/7 days	Pre-trial	Post-trial
Treatment	2.83 ± 1.30	0
Non-treatment	2.67 ± 1.59	5.50 ± 1.65

2nd trial

RAI/7 days	Pre-trial	Post-trial
Treatment	4.33 ± 1.02	0.17 ± 0.17
Non-treatment	1.83 ± 0.70	1.17 ± 0.51

The trials were very successful, with no stoats recorded on the cameras after the first trial and only one stoat recorded following deployment of the PAPP baits in the second trial.



Photo: PAPP sausage baits, dyed green

Thanks to Mammalian Corrections Unit for carrying out the fieldwork described here.

What about non-target native species?

Three trials using a non-toxic version of these baits, distributed in a similar hand-laid method, have been undertaken previously in the Borland Valley, Rakiura, and the Mackenzie Basin, to assess non-target interactions with these baits. Although some pest species (cats, rats and possums) were observed removing/eating baits, the only native species found to eat baits during the previous Borland trial was the South Island robin/kakaruai. No consumption of baits by native species was observed during the Rakiura or

Mackenzie Basin trials. Kiwi were the only birds that interacted with baits on Rakiura; they sniffed, touched, or picked up baits, but did not consume any. In a trial by Pure Salt on Resolution Island however, kea and weka were seen consuming non-toxic sausage baits.

Next steps

We would like to trial the effectiveness of this bait when delivered aerially. This application method gives the highest chance of reaching all target animals in operations over large remote areas.

The decision on location for the trial is led primarily by mustelid monitoring results, as a high stoat population is essential to enable a reliable test of the bait. The Blue Mountains area in West Otago has had ongoing pest monitoring in place for many years, and regularly has high stoat numbers. We used trail cameras in June/July to assess stoat abundance and enough stoats were detected to be able to determine the effectiveness of the bait in an aerial trial. Depending on approvals, we are hoping for the trial to take place this October, otherwise it would be next autumn.

What process is being followed to ensure the trial is safe?

Trialling a new bait requires strict controls. Approval will need to be obtained from the Environmental Protection Authority (EPA) and Department of Conservation (DOC), and the bait needs to be provisionally registered by the Ministry for Primary Industries (MPI) under the Agricultural Compounds and Veterinary Medicines Act (ACVM). The local Medical Officer of Health will also be notified prior to trials taking place.



Key Facts: What you need to know.

What are the symptoms of poisoning?

After eating a PAPP bait, stoats become quiet and slightly uncoordinated, and death generally follows within two hours of receiving a lethal dose. PAPP toxicosis in stoats appears relatively rapid in comparison with other vertebrate pesticides and appears to be relatively humane.

Is there an antidote?

Yes, there is an antidote called methylene blue. For an animal that has ingested PAPP a 1% solution of methylene blue at a dose rate of 1-2 mg/kg is recommended, and a higher dose can be administered if necessary.

Can PAPP harm my dog?

Yes, PAPP is a poison that can affect dogs and if enough poison is ingested by your dog, then they could be at risk. However, the baits in this trial will be deployed individually from an aircraft (1 bait/ha) and will not contain enough PAPP to be lethal to the average dog. Dogs that receive a sub-lethal dose should make a full recovery within two to three hours.

Can my dog be affected by eating carcasses?

It is very unlikely that your dog would be affected by eating carcasses of an animal poisoned by PAPP, as any residual PAPP would be at a very low concentration.

Will PAPP contaminate the environment?

PAPP breaks down quickly, which means the risks of a build-up in the environment, or poisoning through consumption of contaminated carcasses, are low.

Overall Conclusions

We believe that the development of a ready-made PAPP bait as part of the suite of tools for protecting native species in New Zealand will be very useful. Critically, it will fill a gap for controlling stoats when and where rodent numbers are low (i.e., when secondary poisoning is less effective), and for targeting stoats in otherwise predator-free locations, e.g., during island incursions.

Have your say

The Department would like to hear how the proposed operation may affect you and what we can do to mitigate any effects that you anticipate.

If you would like more information, or wish to comment, or discuss the effects of the proposed trial, please contact:

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Map of the proposed study area in the Blue Mountains, West Otago

