Wee weasels may have big impact on native wildlife

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Credit: University of Otago

Imagine a murderous sausage with legs. Give it a heartbeat up to 300 beats per minute and a need to consume a third of its weight daily just to survive. What have you got? A weasel.

Lesser known than their infamous cousins the stoat (also members of the weasel family), weasels were also released to NZ in the 1800s in that great failed experiment to control rabbits. Thousands of the critters were set free all around the country and, in what is now a familiar story, they largely ignored the rabbits and set-to on native wildlife instead.

But while the impact of stoats on native wildlife is well documented, less is understood about the impacts of their weasley cousin. This predator appears less common and more patchily distributed in New Zealand compared to stoats. We know the two species can share the same habitat (as they do in Britain), but stoats are bigger and more aggressive (giving the weasels the push around), while weasels appear to be better hunters.

And weasels are wee. Smaller than stoats, many are lighter than the 100-gram "trigger weight" that sets off a standard DOC stoat trap. And with a much smaller home-range many weasels may never even encounter a trap in the landscape. These two facts combine to suggest that trapping grids designed to target stoats will catch just a small proportion of a population of weasels (skimming the cream off the top). In fact, the removal of their aggressive, bigger cousins through trapping could lead to scenarios that make conditions better for weasels. Indeed, some conservation programs record spikes of very high weasel numbers after trapping has been in place for several years.

We wanted to better understand the impacts that weasels might have on

threatened species at these sites. I joined with wildlife ecologist Dr. Jo Monks from the University of Otago—a specialist in the field of predator impacts on New Zealand geckos and skinks. We designed a small-scale pilot study to improve our understanding of the different impacts of stoats and weasels by looking at what each species preys upon. We focused on alpine ecosystems, piggybacking on a large-scale stoat trapping program happening on the scenic Routeburn Track in Mt Aspiring/Fiordland National Parks.

But due to the challenges of following a stoat around with a notebook we had to get clever about things. Borrowing from the playbook of those who study large carnivores (think wolves and bears), we used a biochemistry lab technique to assess the chemical signature of prey and understand the diets of weasels and stoats in this alpine setting.

This gave us three different "snapshots" of the possible diets and impacts of weasels and stoats—a kind of conceptual overview of the predator/prey dynamics in the ecosystem as a whole. The results? Well, both predators are bad news for wildlife—that much is clear. However, our small-scale results show weasels feeding higher up the food chain, with greater consumption of vulnerable groups of species like lizards and small birds.

There's plenty of evidence to show that networks of stoats traps are beneficial for native wildlife. If you're a wee bird that lays multiple eggs a year and has a lot of offspring (like the reigning bird of the year champ the pīwauwau/rock wren) you will benefit from stoat trapping. You're only vulnerable a few months a year (on the nest) and make enough babies that you can likely tolerate a spike in weasel numbers once in a while.

On the other hand, species like our sunbathing alpine geckos can take up to seven years before they've replaced themselves with offspring, and are

vulnerable year-round. A pest-fest of weasel numbers at any point during those seven years could mean they do not replace themselves and the species will decline. It's likely that a multi-species predator control approach is needed to prevent extinction in these species, and it's possible that for certain species, weasels could be more harmful than stoats.

This research highlights that we keep our eyes on the prize, and maintain a focus on the vulnerable native wildlife we're trying to protect. There are complex changes that can happen with the abundance and behaviors of mustelids when we remove competitors from an environment, and it's important to understand how these factors might play out for the native species we're trying to protect.

The results of our study, published in the *New Zealand Journal of Ecology*, suggest that monitoring the recovery of native species can give a better idea of success than simply counting how many stoats were killed, as we might not always get the result we expect. There are some great examples of native species monitoring programs in place, our results highlight this monitoring is crucial to achieving good outcomes and should be in place for any trapping program.

This is particularly true as we start protecting more and more non-forest ecosystems; to protecting a full range of endemic lizards, birds and insects. For example, as a ranger my great hope is that, as this great Predator Free New Zealand project matures, our fantastic networks of community trappers will develop into community ecologists. Moving beyond the counts of the pests killed, and onto the counts of the special species saved, all while developing a closer relationship with the natural world that surrounds us.

It is also clear that, if the ambitious Predator Free 2050 program aims to remove all mustelids from New Zealand (ferrets, weasels and stoats) we

will need to better understand the interplay between these species, and need tools (new trap designs and targeted grid layouts) that can control populations of the smaller weasels.

Our hope is that studies like this will help lead to better protection for some of our special species still in decline, like the stunning Mokopirakau gecko photographed last week near Lake McKenzie hut on the Routeburn track.

More information: Jamie McAulay and Joanne Monks, Interspecific variation in predation patterns of stoats and weasels in an alpine conservation programme, *New Zealand Journal of Ecology* (2023). DOI: 10.20417/nzjecol.47.3520. newzealandecology.org/nzje/3520

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