

Silent Movies

We know the victims' names from dusty old files: bush wren, laughing owl, piopio, South Island kokako. And as we sift through new evidence, one suspect keeps coming up: *Mustela erminea*

It's one of those grainy surveillance films, all blue and blurry, but the images are only too clear. Two kaka chicks, alone in a nest hole. Suddenly, a lithe, slender shape enters from stage left. Without pause, it strikes at the nearest of the chicks, going for the throat. As soon as the chick falls still, the murderer turns on its sibling, despatching it with a ruthless – frankly fearsome – efficiency.

The stoat then tries to make off with the corpses by climbing the vertical wall of the nest hole. It gets a surprisingly long way, considering it's probably lifting close to its own weight, but eventually gravity defeats it.

Undeterred, it begins digging, as if it had a B plan all along. In just minutes, it has an escape passage big enough to drag its victims through. The criminal has escaped.

Fast forward to the heart-rending return of the female kaka to her empty nest.

The killer returns. There's a standoff, a scuffle, but this time the stoat backs off the way it came in. Many kaka aren't so lucky. Incredibly, these featherweight assassins

will kill even adult females on the nest. A stoat might weigh 200 grams. A female kaka around 500.

This is happening all over the country, many times every day. And not just to kaka. To whio, mohua, brown teal, and our national symbol, the kiwi.

Elaine Murphy has put a huge amount of time into thinking of ways to destroy stoats, but she can't deny an admiration for them all the same.

"They're good predators," she says, "and attractive animals – they're very graceful.

"They're just in the wrong country. They're fine in Europe."

And there's the rub. Our native birds had ancient New Zealand to themselves – there were no predatory mammals to worry about. After millions of years of not being hunted, they took to walking about on the ground and nesting in holes and burrows, laying just one or two eggs, and not flying or running away when approached.

So when Europeans let stoats loose in New Zealand – ostensibly to control the rabbits they'd already released – no one should have been surprised when the stoats went straight past the swift rabbits and set about destroying our unique, defenceless native bird fauna instead.

Murphy, a Department of Conservation scientist, leads a \$6.6 million research programme charged with finding a solution for stoats. She says there are many reasons why we may never be rid of them.



Dr Elaine Murphy

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When we treat forests for possums with toxins like 1080, we also kill rats and stoats that eat the rats. But while possum numbers will sometimes take years to recover, rats – prodigious breeders – are back in just months. Stoats can breed only once a year, but they're quick to reinvade because they're highly mobile.

A rat, says Murphy, might have a home range of perhaps a hectare. "But stoats have a home range of 100 ha or more. One female we tracked in Fiordland travelled at least 54kms in less than a month."

Which means stoats quickly reinvade an area treated with 1080. They reinvaded Pureora within three months of an aerial 1080 operation. To buy any sort of lasting advantage, we'd have to treat truly vast areas.

Then there's their breeding biology. While they only give birth annually – around October – they can fine-tune their productivity to match the availability of food.

"They mate from October to December," explains Murphy, "but after conception the blastocyst (a pre-embryonic bundle of cells) can float around in the uterus, in a process called diapause, for nine months until it begins to develop around July-August."

"There could be 12 or 14 blastocysts in the uterus, they don't take any nutritional value. In a year of bad food supply they may not implant at all, they won't breed."

In other words, the female can somehow control how many young she has.

"But if there's lots of food," says Murphy, "they could give birth to 12 or 14 young, which are independent by December or January."

"So the numbers of stoats can increase dramatically in summer."

When that coincides with a good seeding or fruiting year for the forest trees – what ecologists call a mast year – mayhem ensues. Rats and mice vastly increase because of the extra food available; they even breed through the winter. The stoats, sensing abundant food, reach maximum



A stoat lies dead in a Fenn trap in Te Urewera National Park. New animal welfare laws may render the Fenn trap, long the mainstay of the pest control arsenal, redundant. Engineers and scientists are working together to develop an alternative.

productivity.

"That can lead to a number of disasters," says Murphy. "Over 1999–2001, we had two beech mast years in a row. Then we had a podocarp mast year on the West Coast."

Despite extensive trapping, only two kiwi chicks survived a slaughter in the Okarito Kiwi Sanctuary.

Stoats, on the other hand, take some killing. At present, the Department of Conservation mostly traps them, but it's laborious and less than effective. As Murphy points out, they're more than capable of killing their own fresh meat, so why would they be interested in a piece of fly-blown bait?

Which is why the stoat programme has put a lot of work into finding new, more attractive baits and lures. Landcare Research is experimenting with new ways to entice stoats to the trap, including capturing the smell of fresh rat and somehow embedding it in the bait.

Efforts are going into developing more humane traps



that are easier to set, particularly for volunteers who perhaps get to use them only once or twice a year.

The most hopeful development, according to Murphy, is a new-generation “predator poison”. One that can be spread from the air, is humane, and kills nothing but stoats, with the possible exceptions of ferrets, weasels and cats.

The key, she says, is to find the stoat’s “Achilles heel”, some unique physiological trait – it could be a metabolic pathway, for instance – that will make it susceptible, yet leave non-target species unharmed.

“We’re looking at chemicals that affect only mammalian predators,” says Murphy. “They work by inducing methaemoglobin. It’s sort of similar to carbon monoxide poisoning; it stops the red blood cells from being able to use oxygen.

“It’s a very humane way to die and very quick.”

She says there are lots of tests still to be done, and getting it registered for New Zealand use could take time, but it’s looking promising.

In the meantime, groups like Forest and Bird are calling for more widespread use of aerial 1080 to combat stoats.

“People are saying that we could be taking the fight over a much wider base with 1080, and to a certain point they’re right. But it’s only a short-term solution – you can’t rely on 1080 every year, because you get poison shyness. Or even resistance.

“So you can’t just rely on one toxin, you have to vary your techniques, keep them evolving. 1080 is a useful tool, but you can’t use it all the time. Every three or four years might be fine, but you couldn’t drop it in the same place every year.”

Murphy says we may never find a final solution to stoats, but that’s no reason to let up on control. “We just have to get in the mind-set of stoat control being a maintenance activity, just like doing track work, or cleaning toilets.”

For the time being at least, it looks like we’re stuck with stoats.

The Slim, Grim Reaper

If you designed a killing machine from scratch, it would probably still end up looking just like a stoat.

Eyes adapted for both day and night vision. Sharp claws, sharper teeth. Acute hearing and smell. Small enough to get into tiny burrows, and nimble enough to turn around and come back out.

Light enough to climb into the forest canopy and scamper from tree to tree across small connecting branches. And run back down headfirst.

There aren’t too many places safe from stoats – they can survive anywhere with sufficient prey. In New Zealand they can be found anywhere from sea level to beyond the tree line in native or exotic forest, scrub, dune land, tussock grass land and farm pastures.

They routinely swim out to nearshore islands, and one was seen swimming in Lake Taupo over a kilometre from shore.

Stoats are another lethal legacy of the European colonists’ passion for exotic introductions, in this case to control a previous folly.

By the early part of last century, it was becoming obvious that rabbits had not been an inspired import. Runholders complained that their numbers had exploded to plague proportions, and many were forced off their farms as rabbits devoured the pastures.

So farmers began pressuring the Government to import “natural enemies” of the rabbit, and in 1883 – despite the warnings of ornithologists – the Chief Rabbit Inspector recommended that stoats and weasels should be liberated, in addition to the ferrets which had already been let loose in huge numbers.

If rabbits were a silly question, stoats were an even more stupid answer. We know today that they played a part in a number of past extinctions, and continue to wreak havoc among our native birds.

Whio (blue duck), pateke (brown teal), mohua (yellowhead), kiwi and kaki (black stilt) are just some of those birds facing oblivion at the teeth and claws of stoats. Studies have shown they will hunt birds even when there is other prey, such as mice, rats and rabbits,



in abundance. They also take birds’ eggs, and lizards and insects are eaten all year round.

Stoats search in a systematic zigzag for prey, which is usually dispatched with a single bite to the back of the neck. They can kill prey many times their own size and weight (one was seen hanging from the neck of a Fiordland crested penguin).

Stoats will kill everything they can catch, even if they are well fed. They then cache the carcasses for later, a habit they evolved in their Northern Hemisphere home where prey like voles are subject to seasonal irruptions.

Victims’ nests may be taken over as dens, which in colder climes are then lined with the fur or feathers of their victims. A stoat will maintain several dens over a home range.

Females mate in early summer, but will not give birth until the following spring, delaying implantation for 9–10 months. Gestation lasts just 4 weeks. Up to 14 blind, deaf and barely furred young are born, which the female tends for about 12 weeks.

The female kits are sexually mature at just a few weeks old and are almost always pregnant when they leave the den. Family groups break up in summer and the young disperse widely at the very time newly hatched kiwi chicks are at their most vulnerable.

In uncontrolled areas, stoats are reckoned to kill over 50 per cent of kiwi chicks.