PROTECTING our NATIVE WILDLIFE

Department of Conservation
Te Papa Atawhai

NATURAL BORN KILLERS

Nine out of ten North Island brown kiwi chicks born in the wild will die before they are 1 year old.

This is the stark reality facing our vulnerable native species in their battle against imported predators.

Natural born killers such as stoats, rats, cats and possums exact a terrible toll on New Zealand's wildlife and forests.

Stoats, rats, cats and possums exact a terrible toll on New Zealand's wildlife and forests

Dozens of native bird species are fighting a desperate battle for survival against these introduced predators. There are fewer than 500 rowi (Okarito kiwi) living in the wild, and the total populations of species like takahē, kōkako, kakī (black stilt) and kākāriki karaka (orange-fronted parakeet) all number in their hundreds.

Stoats, rats and feral cats have helped push the kākāpō to the brink of extinction. This iconic flightless parrot now only survives in island sanctuaries cleared of pests through intensive predator-control campaigns.

In 2000, an explosion of rat populations in South Island beech forests wiped out mohua (yellowhead) from Mt Stokes in Marlborough and kākāriki karaka from Canterbury's North Hurunui.

Possums not only raid nests, taking eggs and chicks for protein, but also defoliate thousands of hectares of native forest. Species such as mistletoe and rātā have been completely eaten out from some parts of the West Coast.

Doing nothing is not an option. We have a duty to future New Zealanders to protect our natural heritage. We also have a large economic investment at stake—our $20 billion dollar tourism industry is built on the backdrop of our forests and our wildlife; and healthy, functioning ecosystems generate the stable soils, clean water, carbon storage and pollination benefits that our $12 billion agricultural sector trades on.

When we do act, the results speak for themselves. Studies show that targeted pest control campaigns can turn the tide for threatened species. North Island brown kiwi survival rates in the Tongariro Kiwi Sanctuary surged to almost 70 percent in the year following intensive predator control.

Doing nothing is not an option

We have already lost more than 40 bird species, three frogs, a bat, at least three lizards and numerous insect species. Of the 5819 New Zealand native plants and animals, more than half are classified as at risk, making our native wildlife amongst the most threatened on the planet.

If we fail to do all we can to protect our forests and our wildlife, what will our legacy be?

Introduced predators such as stoats and rats are a constant threat to native wildlife.

MORE THAN ONE WAY TO KILL A RAT

There's more than one way to kill a rat, a possum or a stoat. A wide range of techniques and tools are used to control pests, depending on the threats and the terrain you are dealing with.

Ground control—using traps, bait stations or culling—is the most widely used method, and can prove highly effective where the terrain is suitable and regular checks can be made.

Modern traps are humane, effective and designed to avoid harming native birds. The Department of Conservation (DOC) maintains a network of over 180 000 traps and spends more than $5 million per annum on stoat and rat trapping.

A wide range of techniques and tools are used to control pests

As part of the trapping programme, DOC also supports possum fur recovery in a number of regions, which can help supplement mainstream possum control initiatives. But even with high fur prices, consistently high numbers of possums are needed to make trapping economical. Furthermore, to ensure the protection of native species, possum numbers must be driven down to very low levels—less than five possums recovered from 100 traps—which is uneconomical for a fur recovery industry.

DOC uses a range of pest control methods, including traps and toxins.

Poison bait stations employ toxins such as 1080 gel, brodifacoum (also known as Talon®), diphacinone, cholecalciferol (Vitamin D) and potassium cyanide (Feratox). The choice of toxin depends on the specific pest target, the surrounding environment, and potential risk to native wildlife and human health.

DOC mostly uses ground control methods

Ground control methods are precise, but still pose some risk to non-target species such as native wildlife, dogs or farm stock. They are also labour-intensive and expensive. Despite this, with more than 400 000 hectares under management, ground control is DOC's most widely used pest control approach.

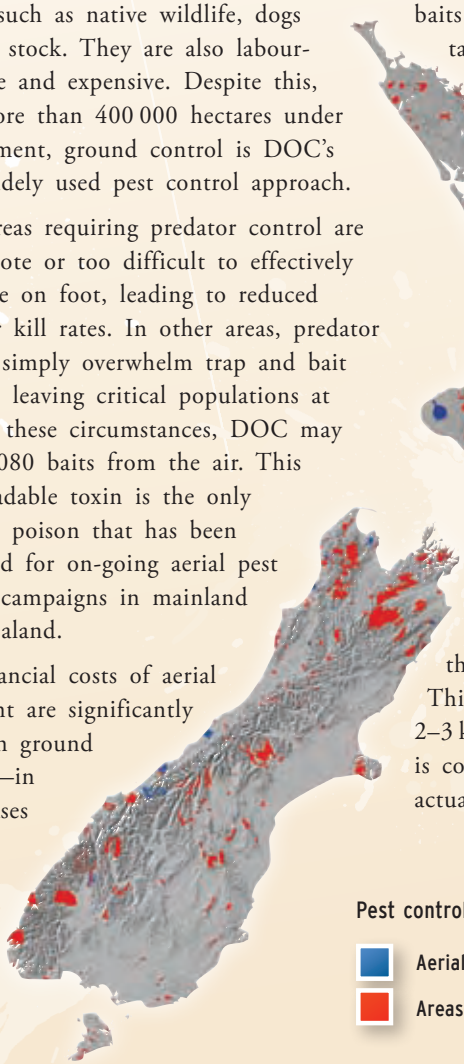
Some areas requiring predator control are too remote or too difficult to effectively negotiate on foot, leading to reduced predator kill rates. In other areas, predator plagues simply overwhelm trap and bait stations, leaving critical populations at risk. In these circumstances, DOC may apply 1080 baits from the air. This biodegradable toxin is the only effective poison that has been registered for on-going aerial pest control campaigns in mainland New Zealand.

The financial costs of aerial treatment are significantly less than ground control—in some cases less than a quarter. Nevertheless, DOC applies aerial 1080 over less than 2 percent (about 150 000 hectares) of the 8.6 million hectares of public conservation land.

For every hectare of aerial treatment, more than 2 hectares are covered by ground control operations.

DOC has fine-tuned and improved aerial application techniques over many years. Global Positioning Satellite (GPS) technology is now used to ensure baits are accurately and consistently targeted. The amount of bait applied has also been greatly reduced. In the early 1990s, up to 18 kg of bait per hectare was used. Today, sowing rates of 2–3 kg per hectare are now common, thanks to advances in application techniques to improve effectiveness and minimise risks to native species. Deer repellant can also be used to protect valued recreational species.

One individual 1080 bait is a maximum of 0.15 percent toxin; the rest is simply a carrot or cereal base. This means that, at today's sowing rates of 2–3 kg of bait per hectare, a treated hectare is covered with less than 1 teaspoon of actual toxin.



Pest control planned for the 2008/09 financial year

- Aerial pesticide operations
- Areas under sustained pest control

WHY 1080?

Compared with other toxins, biodegradable 1080 has proven to be effective, cheap and safe. It is also the least environmentally harmful or persistent toxin available, and remains the most effective option registered for ongoing aerial use on mainland New Zealand.

Sodium monofluoroacetate, or 1080, is a chemical reproduction of a naturally-occurring, biodegradable toxin that plants use to discourage browsing animals. It is found in Australian, South American and South African plants. Low concentrations are also found naturally in tea and New Zealand pūhā.

1080 is our most intensively-researched pest control toxin, and has been used in New Zealand since the 1950s. It disrupts the metabolic pathway by which animals extract energy from food, with death resulting from respiratory or heart failure.

Animals that consume a non-lethal dose excrete the toxin without harm, meaning 1080 cannot accumulate in a living food chain.

Under the damp conditions of a New Zealand forest, micro-organisms in the soil break down 1080 into harmless components. The toxin also rapidly dilutes in water, where it is also broken down by micro-organisms and aquatic plants to render it harmless.

The active ingredient in 1080 is a naturally-occurring, biodegradable toxin that plants use to discourage browsing animals

When correctly applied, 1080 is very effective. One aerial application can kill 98 percent of possums and more than 90 percent of rats in the targeted area. These successful knock-down rates provide vulnerable native birds with a crucial breeding window to raise chicks through to fledging, increasing their survival rate.

Low concentrations of 1080 are found naturally in tea and New Zealand puha

There are stringent requirements around the use of 1080. Local health authority approval is needed before every aerial 1080 operation and waterways must be closely monitored. Landcare Research has reviewed more than 2000 water samples taken after 1080 operations since 1990.

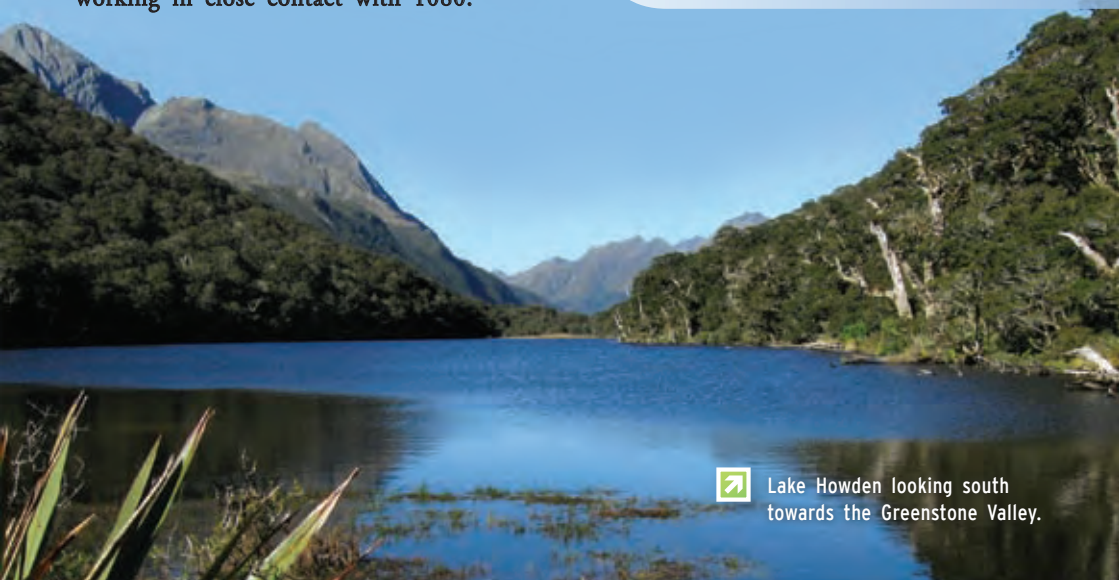
When carefully used, 1080 poses no significant risk to human health

Tests from reticulated water supplies show Ministry of Health drinking water standards of two parts of 1080 per billion parts of water have never been breached. A 60-kg human would need to drink about 60 000 L of water containing two parts of 1080 per billion in one sitting to consume a fatal dose.

When carefully used, 1080 poses no significant risk to human health. DOC follows strict safety guidelines to ensure the safety of the public and staff. Tests have shown no adverse impact on staff working in close contact with 1080.

INDEPENDENT REVIEW

In 2006, DOC and the Animal Health Board requested that the Environmental Risk Management Authority (ERMA) conduct an independent review of 1080 and reassess its use in New Zealand. The review considered volumes of scientific literature and expert evidence and heard more than 1400 submissions before approving 1080 for continued use. ERMA concluded that the 'continued use of 1080 has significant benefits for New Zealand's environment'. It also found that 'well-managed aerial operations posed a low risk to the native environment and to indigenous biodiversity'. The re-approval required that application techniques continue to be refined along with on-going research into alternative methods of pest control.



Lake Howden looking south towards the Greenstone Valley.

THE GREATER GOOD

More than 90 species of birds are found only in New Zealand, but aside from two species of bat, there are no native land mammals.

Mammals are very susceptible to 1080, but metabolic differences mean that birds and other animals such as insects are less vulnerable. As a result, 1080 is well suited for use in New Zealand to target introduced pests such as possums, stoats and rats. In other countries, conservation managers cannot apply 1080 without putting their own native mammals at risk. This is why New Zealand is often cited as the world's biggest user of the toxin.

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1080 operations have little or no impact on many of our native species. Independent studies on freshwater animals such as eel (tuna) and crayfish (kōura) have found no significant effect of the toxin, even when deliberately exposed to 1080 baits at ten times the quantity expected after aerial operations. These studies also showed that although eels that scavenged contaminated possum carcasses contained low levels of 1080, the eels excreted this naturally, with no discernible impact.

Native invertebrates are also at minimal risk from 1080. Direct counts and studies using pitfall traps to monitor ants, beetles, weevils, millipedes, mites, slugs, snails, spiders and cave wētā have shown no

significant change in population numbers after an aerial operation. Separate studies on giant and tree wētā also found no negative impacts from 1080.

While some plants can absorb small amounts of 1080, studies show they also process it naturally without impact. Research at Lincoln University found that levels of 1080 in plants were so low that a 70-kg person would need to eat over 2 tonnes of pūhā that had been exposed to 1080 baits in one sitting to put themselves at significant risk.

Studies have shown that birds such as kiwi, kākā and kōkako are not vulnerable to 1080. More than 200 kiwi have been monitored through 1080 operations—some for up to a year—and none have died as a result of 1080 poisoning.

Pest control benefits forests and allows native wildlife to thrive.

Photo: George Gibbs, Victoria University of Wellington

Some native birds—particularly smaller, lighter species such as tomtits (miromiro)—were susceptible to small fragments of carrot bait associated with early aerial 1080 operations. Consequently, DOC has made a number of management changes to minimise the risk of 1080 to vulnerable birds. This includes 'screening' to filter out small fragments, a shift from carrot towards cereal-based baits, and the replacement of raspberry lures with green dyes spiked with cinnamon. Recent research has shown that 1080 packaged in large cereal baits with cinnamon and applied at low sowing rates has little, if any, impact on tomtit populations.

Studies have shown that kiwi chick survival jumped to almost 70 percent in the year after aerial operations

Studies in the Tongariro Forest have shown that kiwi chick survival jumped from 27 percent to 69 percent in the year after aerial operations against predators, and fantail populations also recovered dramatically, with chick survival increasing from 10 percent to 48 percent.

Relatively few birds have died as a result of 1080 operations, and these losses are quickly outweighed by the boost to populations once the threat of predators is removed.

THE WAY FORWARD

Researchers are continually looking for new ways to effectively control predators and protect New Zealand's forests and wildlife. DOC and the Animal Health Board jointly spend more than $2 million a year working with universities, Crown Research Institutes and private companies to develop new methods of pest control.

This work includes trials to refine the use of 1080 and to continue to reduce the amount of the toxin needed for effective control. Projects are also underway investigating alternative species-specific toxins, new trapping methods, and fertility control in possums and stoats.

DOC and AHB jointly spend more than $2 million per year developing new methods of pest control

The development of a targeted stoat toxin, PAPP, is progressing well, in collaboration with pesticide manufacturer Connovation. PAPP, or paraaminopropiophenone, is a red blood cell toxicant that kills humanely and selectively. It does not persist in carcasses, eliminating the risk of secondary poisoning.

Other areas under study include a toxin that specifically targets the gut of possums—minimising risks to other species; and work continues on a group of alternative toxins, including encapsulated cyanide, cholecalciferol, diphacinone and zinc phosphide.

Landcare Research and AgResearch scientists, with the help of colleagues in other countries, are developing vaccines

aimed at blocking fertility in possums and disrupting the breeding cycle of stoats. The focus of this research is now shifting to the best mechanism for delivering the vaccine.

Healthy functioning ecosystems drive the tourism and agricultural industries powering our economy

All these projects hold promise in the campaign against predators. However, we cannot ever expect to totally eradicate these imported killers from New Zealand. Predator control requires a relentless commitment, using a range of different tools. DOC's goal is to protect and breathe life back into vulnerable populations and forests wherever possible.

Healthy functioning ecosystems deliver the stable soils, fresh water and landscapes that drive the tourism and agricultural industries powering our economy.

By taking action to protect our wildlife and our forests for future generations, every New Zealander will benefit.

SELF-SETTING TRAPS

Collaboration between DOC and the industrial design company Goodnature has led to the development of a range of innovative self-setting traps targeting stoats, rats and possums. A small gas cartridge triggers and then resets the trap up to 12 times—delivering a more efficient trap with big labour savings.

Photo: Tristen Tuckey, Blue Orb Charitable Trust
www.blueorb.org

NORTHLAND KIWI CHICKS KILLED BY STOATS
Stoats and cats are major contributors to the 95 percent of kiwi chicks that die before they are 6 months old.

FOR FURTHER INFORMATION SEE:

http://www.doc.govt.nz/conservation/threats-and-impacts/animal-pests/

http://www.ermanz.govt.nz/hs/1080resources/index.html

http://www.landcareresearch.co.nz/research/research_details.asp?Research_Content_ID=26

http://www.npca.org.nz/

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