

1080: Chemotherapy or Holocaust for the NZ Ecosystem



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20 comments



*Pic: A chopper delivers its deadly load of 1080 ... Pic by Clyde Graf

Few topics have caused such a furore within the ranks of government, the conservation lobby and the NZ public in general as the 1080 issue. For many, 1080 is filed away in the memory banks as “old news” and indeed it has been in and out of the limelight since its first use in NZ in the 1950s. But one of the reasons that the 1080 issue does not go away is that it is continuing to be used in NZ forests.

Indeed, NZ uses more than 80% of the world supply of 1080 as it is now banned in Europe its use in the US is minimal. Moreover, 1080 application in NZ has dramatically escalated over the last 10 years, under the stewardship of the Department of Conservation (DOC). The biggest 1080 drop in NZ's history, comprehensively including all the major national park forest areas in the South Island, was carried out during 2014. Furthermore, its use is ongoing, with DOC planning to continue its high intensity airdrop campaign at 2-4 yearly intervals, with the aim of completely eradicating stoats, rats, possums and other predators and to return the NZ forests to their pristine state, “where native birdsong fills the air”. DOC has labeled the airdrop “The Battle of the Birds”, triggering memories of the glorious Battle of Britain. The burning question for all NZers is “Is this battle appropriate, can it be won and is the “collateral damage” (to use another wartime phrase) likely to be so severe we will wish we never embarked upon it?” The risk we run is that many species of native birds could be wiped out forever, and the entire NZ forest ecosystem be irreparably damaged.

Depending on your perspective, the use of 1080, or sodium fluoroacetate, constitutes either radical chemotherapy, where pain is necessary to allow the final laudable goal of pest eradication (a classic “ends justify the means” scenario), or a chemical onslaught analogous to the holocaust, with the potential to result in ecocide of the NZ bush.

Poisoning “non-target species” including native birds and insects

1080 is highly poisonous to all animals that function using aerobic metabolism (breathe oxygen in the air). This includes stoats, rats and possums as well as many birds, both native and introduced. It is also highly toxic to insects including bees. It disrupts metabolism by interfering with the “Kreb’s cycle”, a fundamental part of the metabolic process that underpins life in all vertebrates (including man) and many invertebrates. Some animals such as mammals are particularly susceptible to 1080 and this group includes native short-tailed bats, as well as predators such as stoats and possums listed above. However, it is well established that many native bird species including tomtits, fantails, the NZ robin, morepork and rifleman are also vulnerable to 1080, often ingested through eating insects and spiders on the forest floor. These insects or arthropods may take in lethal or repeated non-lethal doses of 1080 and can poison these small forest foraging birds. This is called “secondary poisoning” and has been documented to occur for up to 2 weeks after a 1080 drop. When deer are killed by 1080 (and they are very susceptible) residual poison may remain in their carcasses for >75 days, increasing the risks of secondary poisoning to scavengers. It was concern about this secondary poisoning that led to cessation of 1080 use in the US as follows: “sensitive non-target mammals and birds may consume lethal quantities of 1080 from poisoned baits or from consumption of organisms fatally poisoned with 1080 (EPA 1985)”. These sensitive non-target species included bees and insectivorous birds as well as livestock that were accidentally caught in the cross-fire.

In NZ, Kea have been found on several occasions to be highly vulnerable. As reported by the NZ Herald and Greymouth Star in 2013: “The Department of Conservation says five out of 39 monitored kea have died of poisoning during the first field study using a bird repellent in an aerial 1080 operation near Otira. DOC has been trialling

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repleants after a number of kea deaths from 1080 poisoning. In 2008 seven died in the Franz Josef and Fox Glacier area, and in 2011 seven more died at Okarito. DOC said today results from the recent Otira trial were “disappointing”. “Data on other native bird species are much harder to come by but an influential report by Spurr & Powlesland (1997) entitled “Impacts of aerial application of 1080 on non-target native fauna”, gives details of native birds that have been found dead after 1080 aerial drops and in many cases have been found to contain 1080. These species included weka, kaka, kea, morepork, rifleman, tomtits and NZ robin. The authors stated that more information was needed especially regarding effects on kiwi and weka given the fact that these species that forage on the forest floor are likely to be highly susceptible to secondary poisoning. Aquatic life is also likely to be vulnerable. DOC recently advised that anglers should not eat trout living in streams originating from forest in the central north island where 1080 had been dropped (NZ Herald Sept 27 2014).

Taken together, the evidence suggests that this “chemotherapy” is highly toxic to the ecosystem and dangerous to many native bird species. Is it worth the risk of using the aerial drop 1080 method to eliminate the stoats and possums that predate on the birds? In other words do we run the risk that “the operation was a success but the patient died?”

The effect of 1080 on predators

Nobody doubts that stoats and rats are bad for NZ native birds and the NZ bush in general. The reason given by DOC for the current “hyper-drive” of 1080 use is the recent 2014 beech mast season. When beech trees flower they produce large quantities of seed (masts). This occurs every 2 to 6 years and is triggered by a summer that is warmer than the previous one. Beech seed provides a productive boost and rodents proliferate. These in turn are eaten by stoats, which also then breed prolifically. Unfortunately, to prevent this breeding of stoats, aerial 1080 drops would need to continue forever at 2-6 yearly intervals.

Given that 1080 has been in use since the 1950s, surely there should be some evidence by now that rat and stoat numbers are dropping and native birds are “coming back” if this policy is successful? It is again remarkably difficult to find this information. Anecdotal evidence from Karamea residents after the 1080 drop in the Kahurangi National Park in 2008 suggested that rat numbers actually exploded when they repopulated an area where all their predators such as stoats were eliminated by poisoning. Dr Jo Pollard, BSc (Hons), PhD (Zoology) compiled quotes from NZ scientists on this paradoxical effect on rat populations from 1080 drops as follows: “Mean ship rat abundance indices increased nearly fivefold after possum control and remained high for up to 6 years...the typical outcome for most pulsed possum control is an uncontrolled ship rat population in the presence of a low-density possum population for most of the 3-7 year cycle” (Sweetapple & Nugent, 2007) and “Intermittent control of possums and ship rats may have the nett effect of increasing ship rats for most of the time.” (Innes et al. 2010). There is also evidence that genetically 1080-resistant strains of rat will emerge with repeated poisoning as this has been observed in laboratory rats. What about stoats? Pollard has described aerial 1080 as “a devastating failure” when it was trialed as a stoat control tool within the Tongariro Forest. The manager in question reported “Four months after an effective possum and rat knock-down by a 20,000-ha aerial 1080 operation over Tongariro Forest, stoats reappeared in the center of the forest and began killing kiwi chicks. So far, five of the 11 chicks have been predated, and all in the center of the treatment area”.

Changing predation patterns can also result in more NZ native birds dying after 1080 drops. Again this has been observed and faithfully reported in the scientific literature. Stoats respond to a decrease in the rat population after poisoning by switching to eating birds and invertebrates and the observation has been made that “stoats are likely to have the greatest effect on birds after successful 1080 poison operations”. The fact that stoats happily live adjacent to native forest regions and can easily repopulate from those non-poisoned areas gives the lie to any suggestion that ongoing 1080 drops in national parks will eliminate them. DOC’s reply to this recently has been to extend 1080 drops to the fringes of human habitation such as into the Hunua ranges near Auckland (a water catchment zone, raising another whole host of concerns). Walking a dog in a forest that has been treated with 1080 or even allowing it to run on adjacent land is fraught with danger for the animal. A recent DOC plan to drop 1080 on Mount Roy near Wanaka was only deferred recently by concerned, animal-loving residents.

Animal ethics

One of the groups most vociferously opposed to the use of 1080 are the animal rights campaigners. It is beyond doubt that death by 1080 is prolonged and pitiful, often lasting several days. In addition to wildlife, many cases have been reported where livestock, horses or dogs have been accidentally poisoned after a 1080 drop and devastated owners have had no choice but to euthanize these animals as there is no antidote. Is it ethically justifiable to poison any creatures in this way? Stringent codes of ethics have been formulated to protect the rights of animals used in medical research and these are upheld by animal ethics committees at all our major universities. Similarly, practices for slaughtering deer that have been farmed for their venison or velvet are tightly regulated. The NZ Animal Welfare Act of 1999 states that an offence is committed if an animal is killed “in such a manner that the animal suffers unreasonable or unnecessary pain or distress”. Why is this legislation ignored when animals including deer and native birds are killed in the wild by 1080? It seems as though these ethical considerations are laid aside when DOC strides into battle.

What about our tourism image? Clean and Green?

It is a little known but indisputable fact that 1080 drops have occurred in the direct vicinity of the Great Walks. The Routeburn and adjacent Dart and Caples valleys were targeted during 2014. These drops are not advertised or mentioned in written material in backcountry huts other than in a vague manner as “A range of pest control methods are used by DOC, depending on the scale and urgency of the pest problem”. Given that 1080 use has been banned in Europe and its very limited use in the US is tightly controlled, there could be consternation amongst our many foreign visitors if the scale of 1080 use in NZ was truly appreciated. It is also hardly credible that no notification is given after such airdrops, to advise that trampers should not drink water from streams in the area. Although the risk of direct contamination is low, a poisoned deer carcass could be lying upstream out of sight, tainting the water and causing a human health hazard. Perhaps there are pregnant trampers? 1080 is a known teratogen in mammals. While this has not been proven in humans due to the obvious lack of clinical trials, this could hardly be regarded as reassuring.

How could DOC be wrong?



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It is at first sight almost impossible to believe that DOC staff, who include highly regarded and well-intentioned scientists could be so wrong. This is the reason why the 1080 debate so often disintegrates into an expert-vs-expert confrontation that leaves the ordinary person none the wiser. Angry, gun-toting backcountry hunters clad in swannies and muddy boots do not look convincing when pitted against sombre scientists in the media. However, it is worth remembering that human history is littered with examples of the so-called intelligentsia being “wrong” for long periods of time, with sometimes appalling consequences. There are many medical examples ranging from the enthusiastic endorsement of smoking by physicians in the 1940s and 50s to the widespread use of thalidomide to treat morning sickness during the 50s and 60s. Large payouts to aggrieved patients have occurred more recently after certain arthritis drugs were found to be associated with premature cardiac death and the list goes on.

The scientific community underpinning DOC must include ecologists, zoologists, entymologists and botanists. Such individuals are surely more likely to “run with the pack” than risk not only job loss but widespread vilification and professional suicide if they take an unpopular stand. Thus, a collective blindness may ensue where nobody is prepared to raise their head above the parapet and argue. The old story of The Emperor’s New Clothes describes such a scenario. The fact that the 1080 pest eradication programme is now a 100 million dollar/ year industry does not help. It is hard to take a stand against such an entrenched view.

What else can be done?

We could leave things well alone. This would avoid the 1080-associated consequences of rat plagues and stoats prey-switching to native fauna. Eventually the ecosystem would return to the pre-1080 days when there were in fact birds in the NZ forests. Keas were very plentiful right up to the 1980s.

Stoats were originally released into the NZ bush in round 1870. Rats had been here a much longer time than that. Some sort of homeostasis must have become established over the first half of the 20th century and this is what would eventually return if the 1080 campaign was abandoned. Ground control (eg stoat trapping and cyanide at bait-stations to kill possums and rodents) remains an option. A bounty on stoat tails was a 1950s solution that could be re-examined. Nothing can achieve the coverage of the aerial 1080 drop but if it doesn’t actually work in the long term then there is no justification to continue. It is a little like the universally accepted technique of blood-letting in the Middle Ages. It conformed with the concepts of disease that were accepted at the time and continued for hundreds of years because of this. However, it must have actually contributed to the death of many patients.

Do the ends justify the means?

The “ends justify the means” was a phrase in common currency after the 2nd world war as commentators strove to make sense of the rise of the 3rd Reich and the slaughter of German Jews. It was a phrase that was used to justify the Nazi philosophy of eugenics whereby it was contended that the ends (purification of the Aryan race) justified whatever means were required to achieve it. Visitors to a Berlin Holocaust museum in Cora-Berliner-Straße can see for themselves how the methodical elimination of the Jewish people was achieved. Wall maps show the distribution of the 1200 concentration camps dotted around Germany in the early 1940s (many more having been established in the occupied countries). The impression given is of meticulous planning, which must have been conducted by many individuals who unquestioningly followed the party line. The 1080 drop maps that document the careful inclusion of the entire south island national park estate give a similar impression of thorough coverage and careful planning to an almost obsessional degree. If this results in the elimination of pests and the rebirth of birdsong in our forests how happy we will be, but the consequences if DOC is wrong are frankly appalling. Meanwhile our forests remain strangely silent.



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