

My name is Dr Joanna Pollard. I am an animal behaviour and welfare scientist with 18 years' research experience. I am opposed to the aerial application of 1080, because there is no sound evidence that this practice is necessary to either protect biodiversity or to control Tb.

In contrast, there is plenty of evidence that 1080 is inhumane and that its aerial application creates a huge risk to biodiversity.

Furthermore, I am appalled at the poor quality of the research on the effects of 1080. I am also disturbed that despite the lack of supporting science, the many identified risks, and vast gaps in knowledge, ERMA's report supports further aerial applications of 1080.

In 1997, a Ministry for the Environment report stated that only 30,000 of perhaps 80,000 of New Zealand's multicellular species have been identified. Most of the undescribed species are insects and fungi. The status of most of our species and ecosystems is not known.

What do we know about the effects of 1080 on our unique natural heritage?

Firstly, fungi:

These are not given any consideration in the application or ERMA report.

Secondly, Terrestrial plants

Field studies have demonstrated highly variable native plant uptake of 1080.

Effects of 1080 on native forest species have been described under "benefits of possum control". In the north island, positive effects were stated to have occurred in four types of native trees. However in over half of those studies, benefits were not seen or were only short-term. Monitoring methods for rata were found to be inadequate. Mistletoe improved only at extremely low possum numbers. In Marlborough, monitoring was confounded by concurrent goat control, other environmental factors and observer differences.

A review of these DoC monitoring reports identified many serious deficiencies: a lack of consistent methods, inappropriate timing, inaccurate possum monitoring, a lack of control sites, and failure to record fruiting and flowering despite their significance for regeneration and animal food.

Effects on aquatic life:

Very few studies have been carried out on New Zealand aquatic species.

Laboratory studies showed 1080 was taken up by aquatic plants, growth of duckweed was inhibited, and mosquito larvae were very sensitive to 1080. A handful of poorly described studies has shown that 1080 is toxic to algae, especially blue-green algae. Eels fed on possum tissue containing 1080 tested positive for several days, as did freshwater crayfish feeding on cereal baits. A field study was carried out which attempted to assess the effect of 1080 on native fish and invertebrates, but results were inconclusive due to theft of equipment, mortalities of caged fish attributed to high river flows, and failure to sample tissues of dead fish for 1080 residues. All monitoring of effects on aquatic invertebrates has been confounded by variation in flow conditions.

There has been no consideration of ecological communities in still water bodies such as swamps and ponds. Conceivably, a small pond community receiving a 1080 bait would be devastated, with the rapid removal of algae dramatically altering the habitat.

Effects on terrestrial invertebrates

On the basis of honeybee and ant data, 1080 is considered highly toxic to invertebrates. High levels of 1080 have been found in invertebrates which feed on baits. For example a tree weta was found to contain 66 mg/kg. As 1080 takes some time to take an effect, invertebrates can no doubt ingest large amounts before becoming debilitated. One debilitated, they will become easy prey for predators such as insectivorous birds.

In New Zealand, virtually all studies on effects of 1080 on terrestrial invertebrates have been rendered inconclusive for multiple reasons such as inadequate methodology, confounding

environmental effects, questionable storage methods, bait 1080 concentrations failing to reach targets, loss of samples, contamination of control plots with 1080 and contamination of control baits with 1080. For one genus only (giant land snails), 1080 poisoning to control possums has actually been associated with increased numbers, but only in two out of three studies.

Ironically, “the Meads report” on invertebrates was not approved by DoC for release on the basis of flaws in the methodology used, and the quality and interpretation of data!

Effects on Frogs and lizards

A few monitoring trials and a laboratory study have been performed on frogs. However, again poor scientific methodology has rendered the results useless.

No monitoring reports for native lizards are known, but they are known to eat cereal bait, and to be vulnerable to prey switching by cats and mustelids following rabbit control operations.

Effects on Bats: again little is known of the effects of 1080.

Effects on Birds

As noted by ERMA, numerous studies have monitored the effects of 1080 on native birds but in many cases, the conclusions that can be drawn are limited by a lack of pre-treatment monitoring, a lack of replication, lack of control sites, poor documentation, and inadequate and inconsistent monitoring techniques.

Only one or a few species have been monitored during operations so overall effects on bird ecology are unknown- however the more opportunistic, fecund species such as Mynas and rosellas will flourish after poisoning operations.

There has been an unaccountable lack of monitoring of dead birds following poisoning operations. A wide range of native birds have been killed, including moreporks from

secondary poisoning. The studies on birds mention difficulty with screening out small pieces of bait, despite best intentions.

Especially worrying to me is the interference with rare species- for instance the Westland weka which is considered to be in serious decline. Fifteen of these birds were radiotagged before a poisoning operation. Of these, 5 died before the operation, one went missing, one was left with its transmitter, and one was killed by a predator, leaving only 7 birds. Had the resources been spent on targeted pest control rather than interfering with the birds, more than likely all 15 would have survived.

Another source of concern for me is the blasé attitude shown by the Otago Regional Council which does not screen carrot bait used for rabbit control, as it considers that “native birds which could be deemed at risk, are not usually present in the type of country where rabbit control takes place”. Thus the vulnerability of inland bird species such as pipits and plovers, as well as lizards, is not recognized.

It seems inconceivable that ERMA feels justified in stating that “the beneficial effects on native flora and fauna from the use of 1080 are very significant and there is little uncertainty about their realization”.

As with all other evaluation of the effects of 1080, assessment of its effects on Maori people was also flawed by lack of effective methodology, being perceived as biased and unsympathetic, with abysmal recording techniques.

A lack of adequate monitoring was further emphasized when ERMA had difficulty in accessing information on kill rates achieved.

Regarding Tb control, very little evidence was presented to support the notion that aerial application of 1080 reduces the incidence of Tb in livestock.

In New Zealand very few humans are infected with Bovine Tb and the Ministry of Health attributes this to herd testing and pasteurisation of milk rather than possum control.

Furthermore Regional Public Health considers that if bovine Tb were prevalent among cattle it would not present a real risk to public health.

Several advantages of using ground-based cyanide control have gone unrecognized. Carcasses would be near bait stations allowing for ready recovery for furs, accurate monitoring of effects of the poison and identifying hotspots of Tb infection. It is stated that ground based control takes too long- but surely if more manpower is used the time taken will decrease. There are indications in ERMA's report that ground-based control can achieve extremely high percentage kill rates.

[i.e. The mean kill following pre-fed aerial operations using:

- 1.5 g/kg 1080 cereal pellets was 92.9% (n=23);

The mean kill for contained ground operations using:

- 1.5 g/kg 1080 cereal pellets in bait stations was 94.4% (n=4)

For rats, the kill rates for bait bag operations using 1.5 g/kg 1080 cereal pellets was 87.7% - 100%]

The assessment of a future without aerial 1080 drops is extremely narrow in scope. There is no attempt to address more imaginative solutions to pest control such as encouraging "eco-fur" enterprises, bounties or tourism based around possum hunting.

Finally, I would like to return to the inhumane nature of 1080, which causes on average about 9.5 hours of sickness compared to 3 minutes for cyanide. It is easy to trivialise effects into numbers and fail to comprehend what this really means. Those making decisions should be properly acquainted with the effects of 1080 and in my opinion, witness them first hand. The following observations are from Kate Littin's PhD thesis on effects of 1080 on possums.....

From about 4 h after poisoning until death all eight lethally dosed possums exhibited spasms involving the limbs or body. In five possums this activity increased in duration and severity. Possums vocalised during spasms, tremors or seizures. In two of these animals, vocalisation was loud and prolonged. (Squeaking, gasping and gagging noises

were also frequently heard during retching and terminal breathing.) Seizures included stiffening of limbs with hunching of the shoulders; jerks in limbs, head, abdomen or shoulder; leg paddling; rolling onto the back with a stiffened body; continuous body rolling; trembling; and rigidity of the entire body. Possums were sometimes propelled into the air by these movements.....

Dr Mark Fisher noted that the applicants had overlooked the suffering caused to individual animals by 1080 poisoning. He felt this failure of the public institutions involved was disconcerting. Considering the lack of rigor and objectivity in research and decisions on 1080, I feel that we are being severely let down by our public institutions.