

I do have a few questions, which I would appreciate your responses to. I am happy to phone you to discuss them, but you may prefer to answer them via email. They are as follows:

Question: You suggest ground based trapping, hunting and baiting, and encouragement of a possum fur and meat industry as alternatives to aerial 1080. Yet the region under threat from introduced predators is massive and much of it is untracked – how could such an approach achieve the scale of pest control necessary?

- **First very rugged cliff terrain is not the habitat of possums nor of other predators. Professional trappers can and do trap in steep terrain without tracks. And they are successful at it because they know the habitat and behaviour of possums. For example all of the Coromandel, while much of it is steep and untracked, can and has been trapped.**

The assumptions underlying your question are problematic at best. It is not known why some native bird populations are declining. DoC simply has not done the studies at all and much less in an unbiased way. At least as big as "introduced predators" is competition from feral birds and loss of habitat in a variety of ways.

There are few patches of New Zealand that could not be effectively trapped or baited with ground-based methods with a effort that even approximated DoC's aerial poisoning efforts. Both of the studies that we identified in the Testimony document sent to you included appropriate proportions of very rough country. From the data a worst case for simple contracted ground-based methods is perhaps a 20% premium/ha. We cannot imagine the kind of New Zealander who would not want to stop mass poisoning our forest ecosystems and killing substantial numbers of many native species (some endangered and threatened) for 20% ... the actual cost could be considerably less and actually cash positive (see the testimony).

As to the "massive" scale, obviously per-hectare costs scale linearly. Every cost estimate that we have reported is on a cost/hectare bases which implies that the job could likely be done for less than the \$100 million presently being expended.

The real point is however, that none of the alternatives have been systematically tried for decades and never with the determination that DoC and AHB put into their indiscriminate poisoning programs.

The effect of aerial 1080 on the main predators, stoats and feral cats, is negligible.

Worst, as we have repeatedly pointed out and as should be kept front of mind, aerial 1080 doesn't work, at least there is no credible scientific evidence that it works to improve the population status of so much as a single native species. NOT one. (see below)

Q: Further to the above, the encouragement of a possum trapping industry would not address the need to control rats and stoats. What is your proposal for these pests?

- **Stoats: aerial 1080 does nothing for the stoat problem. They are carnivores that don't eat the aerial carrot baits. If they die it is from eating intoxicated rats**

and birds. Evidence is that stoat populations after aerial 1080 drops can rise or fall depending on when one surveys. Not surprising to anyone not steeped in the ignorance and misrepresentation of DoC propaganda, it often causes increased native bird predation (see Murphy 1998).

- Of course, you could start dropping meat laced with 1080 in addition the cereal baits? Why not after all this is NZ? Why stop at the cereal eaters? Mass poisoning has been a panacea in NZ decades.
- Rats: It is not known how much effect rats have on native birds if left "unmanaged" (which is also true of possums for that matter). A very similar species to the ship rat has been here for 900 years. However what we do know is that 24 months after a 1080 drop there are three times greater the number of rats than prior (see Ruscoe 2008). Thus, DoC's aerial 1080 is making the rat problem much worse forcing our ecosystems through wild population swings in these wily animals that can out breed anything except insects. We also know that when the rat population is lowered for a few weeks after a 1080 drop, stoats switch their diets from rats to birds as their primary food (Murphy 1998). Some stoats die from secondary poisoning from rat carcasses, but not enough. The point of all this is that the dynamics and interactions are complex beyond anyone's ability to predict, much less by the simplistic reasoning and arguments offer up by aerial 1080's supporters.
- What is to be done then? The answer, as we have detailed in the Appraisal document is randomized, blind, controlled, adequately replicated experiments that follow a cross-section of species. It is the only way to settle this argument definitively, but it will not happen. Why? ... two things: 1) the public's and the media's ignorance and 2) our general unwillingness to recognize the potentially distorting effects of DoC/AHB's financial incentives. In our view, it won't happen and has not happened despite the urging of us and others, because in might kill the goose that laid DoC's \$100 million/year egg.
- I don't pretend to know the answer for all of New Zealand's real and made up "pest" problems (including the one that you have not mentioned, that may be the most significant of the lot, and that DoC and its media marionettes chose to ignore, i.e, feral cats). The "pest" problem in NZ is a moving target and it is just possible that there will not be solution.
- What would I do?

I would start by doing properly designed studies to determine why some bird populations are declining.

Second, I would test the promising ameliorations as determined by neutral scientists, including some international, (using what one might call anti-Innes study design) what works and what does not, so that methods and techniques could build reliability on previously established facts. In a few decades, these kinds of techniques took childhood leukaemia from being a disease 95% fatal to one that is 95% curable. The research done by DoC to date is almost entirely biased, self-serving, filled with design and statistical errors, and consequently simply has virtually no chance of doing anything other than reinforcing already existing prejudices.

Third, I would insist upon researchers who are financially independent of the benefiting bureaucracies, unlike the current situation with Westbrooke, Powlesland, Spurr, Innes, etc. The research produced by these captive researchers is so obviously biased that it would not be believable even if it were competently designed, which it is not.

Fourth, I would institute captive breeding and release programs that would insure species survival (like every sane country in the world is doing) until competitor and predator control methods can be improved enough that the populations might become self sustaining.

Fifth, I would admit that it is possible that the full panoply of native species will never again be sustainable outside of true island sanctuaries, free from humans. My approach would be to concentrate on places where competitors and predators can truly be exterminated without reinvasion.

What I would not do is continue bombing the cities to kill the “criminals”.

- Finally, eventually NZ, like most everywhere else, e.g. Hawaii, will realize that we are not going to be able to turn back the clock. We, humans, have screwed the world up, and it is getting worse every day, and we simply cannot un-screw it, certainly not by bludgeoning indiscriminately with poison. By using irrational and almost certainly counter-productive methods like aerial 1080, we are with high probability making the problem worse. (See below)

Question: You say there is no credible scientific evidence that use of aerial 1080 has benefited a single species. Does this mean you reject statements from, for instance, John Innes of Landcare, who says it has assisted with kokako recovery work, DOC's statement that Kiwi chick survival rates in Tongariro increased from 25% to 50% following aerial 1080, and improved mohua nesting success in the Catlins and Dart following aerial 1080 operations?

- First and most important point is that the above observations represent a standard of methodology and evidence that experience has shown does not produce reliable results and do not meet minimal criteria for reproducibility. Equally important, they do not prove causal relationships. This is a fundamental difference between us and the advocates of aerial 1080. We need to know that aerial 1080 is the CAUSE of the claimed benefit and that the benefit extends to the ecosystem as a whole. There are too many to count examples of cases where studies done by financially incited researchers and institutions at this level of methodological quality have led to results that were later disproven when proper studies were done. Thus, we put little value on this kind of uncontrolled observations and essentially anecdotal studies, especially when the claims are so narrowly focused and what DoC is doing is bludgeoning the whole ecosystem
- Given even a minimal standard of study design, the Innes "study" proves essentially nothing, much less about the causal efficacy of aerial 1080. It is a perfect example of what can best be called junk science, i.e., no control; none at all! It is filled with methodological errors. It entirely fails to use design techniques that allow one to draw causal conclusions, e.g., the use of aerial 1080 causes kokako populations to rise. Even making allowance for all those

problems, the data don't even suggest that aerial 1080 could account for population increase (in the only one of three areas in which it was tried). For one thing the population increase occurred almost four years after aerial 1080 was discontinued (as everyone should know since we have been pointing it out for years), and this is not withstanding Innes' retrospective rationalization for the delay in population rise or the fact that it has been maintained subsequently without aerial 1080.

What the "study" does suggest, but not prove, is that an intensive campaign of ground-based efforts (most of what was done at Mapara anyway), might actually work. Too bad the study was designed so poorly that one cannot even draw that attractive conclusion.

- We don't know why kiwi populations appeared to increase in Tongariro. There was no control, let alone a randomized control, proper statistical analysis, repetition, etc., that would allow one to draw a causal conclusion. There are numerous alternate explanations. Biased and selective reporting: DoC only reports the good news and misrepresents and suppresses the bad. There are numerous examples. In fact given DoC's proclivity of bias, suppression, and misrepresentation, it is astounding that we know as much as we do.

What happened to other species? Are the increases or decreases statistically and biologically significant? What would have happened if ground-based control had been done that does not kill half the invertebrate populations and large numbers of native birds? Does fledgling success translate into population success? We know not usually. I could go on for pages of all the alternative explanations and potentially despoiling possibilities, but what is the point? It must be aerial 1080 despite all the counter evidence, unexamined species, lack of control, lack of randomization, lack of protocol, absence of confidence intervals, biased observers, financially interested sponsors.

Believing this kind of evidence is comparable to believe a pharmaceutical company that its cancer drug works when it was test on 3 patients by the drug company itself and the results were thought to be 20% better. Such a claim would not even get in the door in the lowest of journals and no country in its right mind would approve or pay for such a drug. Any we have bought such evidence at a price of \$100 million/year.

- **Anecdotal studies by John Innes do not constitute scientific evidence of population benefit. In addition neither chick survival rates nor improved nesting success constitute scientific evidence of population benefit. One has to look at the science, not at what DoC and their financially captive scientists state about the science. Look at the kokako study results (the data as reported, not what the scientists say that is says). The answer is clear.**

You cite “overwhelming evidence” of harm to robins, wekas, tomtits, fernbirds, and moreporks. But there is also evidence that, despite fatalities from 1080, the populations of robins and tomtits have improved in the absence of predators,

- Not so! We have dealt with this claim definitively in Poisoning Paradise, and yet we continue to see that is being systematically passed around by DoC and F&B as though it were a pearl of great wisdom.
- No published study shows a population benefit to tomtits (unless you count DoC field workers' anecdotes), much less a well designed study.
- The robin studies are the only published bit of controlled evidence that showed even a hint of positive population effect ... unfortunately, the authors did not do (or at least publish) a statistical test on the alleged improvement ... we did the statistical test (upon which, incidentally, any self-respecting high school science project would have insisted), and guess what? There is a 60% chance that the slight apparent improvement in robin population over one season (not all three studied) was by chance. That is presumably why DoC sponsored "scientists" did not publish the statistical test results, as they did for other parts of the same study. The alternative is to assume that they are really that ignorant that such an omission would imply. (I don't see how the case admits of a third explanation.)

The authors must have know that they would be laughed at even in New Zealand. Perhaps that is not entirely correct. DoC continues to this day to circulate a "critique" of PP that include the absurd claim that the Robin study showed a population benefit to robin. The recipients of this critique are not laughing. You are asking us to explain again a claim that would not slip by a good high school science teacher or get into a respectable journal in most of the world.

In consequence of this relentlessly repeated public testimony to scientific incompetence or misrepresentation (take your choice) as a country, we are mass poisoning our environment on the basis of one never-repeated study of one species that failed even to use the most elementary statistical standards. I can hardly believe that people exist who would suggest that the Robin study shows a benefit to Robin populations. How can we as a nation be so ignorant (I am sorry, but there really is no other term for it) and yet so self-confident.

Question: and that kiwi, kokako and kaka have low risk of death from 1080.

- That is probably true, but it is not zero at least for kakas (see the confidence intervals on our graph and in Veltman's paper). Given their ecological niches and diets it is not surprising as it is also not surprising that there is a high risk of death for the 8-10 species that we are reducing by 30% or so of the populations every three years ... Veltman did the best study (similar to our own little effort) within the limitations of their analysis, which was more designed to obscure the shocking death rate among some native species than to enlighten.
- But let's follow your logic. You have found three species that you are probably not killing in large numbers ... whoopi ... congratulations ... that is a relief, and a very good reason to mass poison our forests: we are not killing everything ... good work!. Our question is this: how many species are you willing to indiscriminately decimate and, collaterally damage, on the basis of a

60% chance in a poorly done, biased, unrepeatable study that you might, be helping one species ... may be. I just keep wondering, what the hell you are thinking.

Question: Also, ERMA reports no kea deaths in a monitored operation; and no deaths of monitored parakeets in a 1080 operation in Westland. Do such results alter your view on the overall impact of aerial 1080?

- **In 2008, it was reported that 7 out of 17 kea with radio transmitters were killed on Fox Glacier by a DoC aerial 1080 drop. All of the data in the graph in my paper were based on monitored studies sponsored by DoC (including kea). The confidence intervals are big because of the paucity of such studies, and this should give us serious pause. Since keas are being killed by 1080 then some of the other species you cite are most likely also being killed.**
- DoC was trying to suppress the report of the Kea deaths when it was leaked. Otherwise, we would not know about that one either. Does that alter YOUR view of the overall impact of aerial 1080? It shouldn't because it was a single observation without controls, randomization, etc., but it should alter your view of DoC's veracity and trustworthiness.
- We studied the ERMA submission carefully in our Appraisal paper and found that 57% of pages contained error of fact, omission, misrepresentation or commission. In addition, DoC/AHB actively set out in their ERMA submission to misrepresent what they knew to be true about aerial 1080. This is clear from the minutes of the steering committee obtained under an OIA.
- So we would have to answer, that no, that kind of anecdote does not change our minds, but we have stated clearly what would change our minds: statistically and methodologically sound evidence. We are scientists. That is our credo. However, given the extraordinary nature of DoC claim, which contradicts much of what we know about how ecosystems behave, it would take pretty damned good evidence, of the type described here and in detail in the Appraisal document.