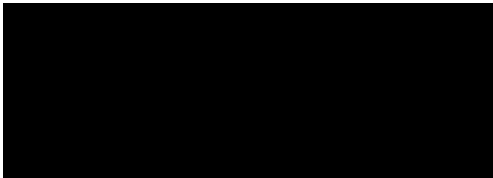


28 July 2022



Tēnā koe 

Thank you for your Official Information Act request to the Department of Conservation (the Department) and Minister of Conservation, both received on 30 June 2022. This response is a reply to both of these letters. You requested:

1. *“.... a 2014 study by Alix Larissa Gurau, “The diet of the NZ long-tailed bat, *Chalinolobus tuberculatus*” documents the opportunistic insect diet, and as is known, 1080 poison was initially developed as an insecticide. But there are no DOC studies looking at the negative impact of aerial 1080 on longtail bat colonies. Why not?”*
2. *“Since the research sent does not support DOC’s claim of benefit to kiwi, frogs and bats can we receive the research that does support your claim.”*
3. *“Therefore, **could you please forward to us a copy of the study’s protocol that includes these items**, so that we can correctly estimate the probable validity of the published conclusions”*

Your questions and our responses are listed below:

1. *“.... a 2014 study by Alix Larissa Gurau, “The diet of the NZ long-tailed bat, *Chalinolobus tuberculatus*” documents the opportunistic insect diet, and as is known, 1080 poison was initially developed as an insecticide. But there are no DOC studies looking at the negative impact of aerial 1080 on longtail bat colonies. Why not?”*

We are currently undertaking research on the long-term population trends of a few long-tailed bat colonies in response to predator control (including aerially-applied 1080) and how changes in population size affect the call rates gained from arrays of acoustic recorders. Research by us on the effects of pest control using aerially-applied 1080 on long-tailed bat populations (or any other species) is not designed to only discover positive effects as you suggest, rather, they are designed to detect change in populations, including decline, stasis, or growth.

2. *“Since the research sent does not support DOC’s claim of benefit to kiwi, frogs and bats can we receive the research that does support your claim.”*

The research we provided demonstrated the predator tracking rates required to achieve population level gains for kiwi, long-tailed bats and Archey’s frogs. This was regardless of the management prescription.

It is clear from the kiwi call rate counts at Moehau referenced in your letter, that the current prescription of stoat trapping and aerially-applied 1080 is working well, as the population is continuing to increase. You suggest that the results were better prior to aerially-applied 1080 complementing the trap network, as the kiwi population growth rates have slowed. Populations of any recovering species can’t continue to grow at the same rate forever, as resource limitations begin to have an effect as a population level heads towards carrying capacity. We would expect when the population of kiwi at Moehau reach carrying capacity that the population growth rate would be near zero but the number of pairs remain stable.

The long-tailed bat research results we provided to you showed that average tracking rates over time of less than 5% for rats was required to achieve population growth for South Island populations. From the very early stages of the North Island research, it appears that the average tracking rate for rats can be higher (10-20% tracking) in the more productive North Island forests, while still allowing long-tailed bat population growth, but this may change as the study continues.

The Archey’s frog research results we provided showed that average tracking rates over time of less than 10% for rats achieved population growth, and that no pest management resulted in declining Archey’s frog populations.

DOC’s National Pest Control Programme prioritises sites scheduled to receive aerially-applied 1080. One factor considered is the threat classification of the species ([Bats](#), [Amphibians](#), [Birds](#)) at each site and the anticipated return time required to achieve the desired conservation outcome. Moehau has been ranked as a site for the management of Archey’s frog and long-tailed bats. The latest tracking results for Moehau collected in April 2022 show a rat tracking rate of 50% which is well above the threshold required for the conservation of these species, and therefore justifies management with aerially-applied 1080. The efficacy of aerially-applied 1080 for rat control has been thoroughly assessed, most recently in this peer reviewed journal publication:
<https://onlinelibrary.wiley.com/doi/full/10.1111/emr.12227> .

In your letter to the Minister, you also raised some concerns about the validity of the statistical methods used in the draft paper we provided titled “Age dependant effects of rat control on Archey’s frog (*Leiopelma archeyi*) survival, recruitment, and abundance in Whareorino Conservation Area, New Zealand”, and asked:

3. *“Therefore, could you please forward to us a copy of the study’s protocol that includes these items, so that we can correctly estimate the probable validity of the published conclusions”*

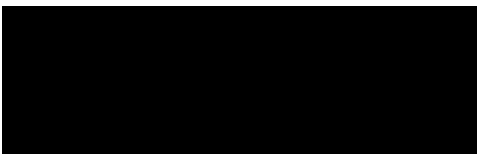


The study's data collection and statistical analysis protocols are described in the methods section in the draft paper, but there is no explicit statement of a hypothesis being tested. Many modern ecological studies do not explicitly test hypotheses, they instead use a model selection process to find the best explanation for a phenomenon – this is the approach taken in the frog paper. This approach is particularly appropriate and common in observational studies such as the frog paper, and less common in experimental studies. There is in any case an implicit hypothesis in the last paragraph of the introduction “In this paper we evaluate the effects of sustained rat control on the survival . . .”, which could be re-phrased as “In this paper we test the hypothesis that sustained rat control affected survival . . .”

In your letter to the Minister, you also implied that the statistical analysis in the draft frog paper was not objective. The statistical tools used to analyse frog survival and abundance are the most widely used tools for this sort of analysis. More subjective statistical conclusions are usually characterised by researchers exploring relationships between observed results and a large number of possible explanatory variables that had not been identified before the study started. This study only examined 3 important explanatory variables, time, treatment, and frog age. The mark-recapture models used in the study are complex and possible relationships between the explanatory variables and survival, transition between age strata, detectability, probability of migrating into the study area and probability of migrating out of the study area needed to be examined to find the best model. This led to the construction of a large number of statistical models to explore the possible effect of a small number of explanatory variables.

Please note that this letter (with your personal details removed) may be published on the Department's website.

Nāku noa, nā,



Meg Rutledge
Biodiversity Threats Director
Department of Conservation
Te Papa Atawhai