Animal Health Board

Milestone Report

Project Code and Title	R-80734 Investigation number 4166. Population dynamics of native wildlife at sites receiving aerial 1080 treatment to suppress predators – Ecological Costs and Benefits.	
Research Leader/s	Graeme Elliott Scientist Research & Development Group Department of Conservation	
Milestone	Annual report	
Proposed Completion Date of Milestone: 31 August 2010		**Actual Completion Date of Milestone:** 31 March 2011
Value of Milestone: $125,000		**Invoice Attached : Yes**

Summary

Study sites in South Westland, the Marlborough Sounds and the Tararuas have been selected and work has commenced in South Westland and in the Tararuas.

In South Westland quarterly rodent and mustelid monitoring has been undertaken, and bird counting using digital audio recorders was undertaken in January and February 2010 and the bird counts have been analysed.

In the Tararuas quarterly rodent and mustelid monitoring has been undertaken and bird counting using both people and digital audio recorders was undertaken in November 2010.

In the Marlborough Sounds only the site has been selected.

With only one year's data, and no 1080 operations yet there are no results to report. But one interesting finding has been that in South Westland where the study area includes two blocks in which 1080 has been regularly used, and one block where it has never been used, numbers of kaka, bellbird, tit and kakariki are significantly higher in the 1080 treated blocks than they area in the untreated block.

Commentary (*to include results from sampling, highlights, problems etc*)

Study site selection

In South Westland the chosen study area comprises two large (17,000 and 18,000ha) existing 1080 blocks that have been regularly poisoned in the last decade, and an area of

about 20,000ha in which no aerial 1080 has been used. The 3 blocks are in continuous forest ranging in altitude from sea level to about 800m. The forest comprises mixed beech podocarp forest (predominantly rimu and silver beech) at low altitudes, and silver beech at high altitudes.

The Tararua study site is the Department of Conservation's existing Project Kaka site. It comprises 3 blocks in the Tararua Ranges in which aerial 1080 will be used to control rodents, mustelids and possums, on a 3 year rotation and a 6 year rotation. There are also matched non-treatment blocks. The area has a continuous forest cover (except above the treeline) comprising podocard-tawa-kamahi forests at low altitudes, mixed podocarp-beech forests at mid altitudes, and pure beech forests at the highest altitudes.

The Marlborough Sounds study site comprises two forested adjoining 5000ha forested blocks (Mt Stanley and Editor Hill) in which possums have previously been controlled using aerial 1080. One block, Mt Stanley, is destined to receive further 1080 operations more frequently than in the past, while the Edit Hill block will no longer be treated. The two blocks occur on steep country ranging in altitude from sea level to 1000m. The forests comprise mixed beech-podocarp forests at low altitudes, with pure silver beech forests at high altitudes.

Small mammal monitoring

Tracking tunnel lines have been set up at all three locations and will be run quarterly. There are 54 lines in South Westland, 55 in the Tararuas and there will be 20 in the Marlborough Sounds. The tracking tunnels lines in South Westland and the Tararuas are already running quarterly, while those in the Marlborough Sounds will start in November 2010.

Bird Counting

In South Westland birds were counted using digital audio recorders at 300 locations, in 6 clusters, 2 in each of the 3 treatment blocks. Digital recorders were placed at random locations within the six clusters, and each recorder recorded from two microphones placed 30m apart. The counts were undertaken in January – March 2010, using a team of 4 workers. The digital recordings were then analysed back in the lab in Nelson by the same team of workers. Considerable development of the analysis methodology occurred while the counts were being analysed, and these developments will be implemented in future years and at the other sites. Features of the final analysis methodology include:

1. The counts are analysed blind: that is, the person counting the birds in the digital audio recordings does not know where the counts came from.
2. Although the digital recorders recorded continuously for 3 hours in the morning and three hours at night, we analysed only six, five-minute sections in the morning and six at night. A power analysis showed us that analysing this number of counts gave us sufficient power to detect small changes in abundance of even the least common birds.
3. The effect of differing observer skills can be eliminated by having at least some bird counts analysed by more than one person.

4. Different counting regimes were used for different species. For many species we were able to count the number of birds present in the five-minute count, and for these species we also measured the call volume on two channels and we plan to use these data to more reliably estimate bird densities using some recently developed mark-recapture analytical techniques[1]. For some species that occur in flocks it was not possible to count individuals so we scored their presence or absence in five one-minute segments during the count. Two species (bellbirds and silvereyes) were so abundant that we scored their presence/absence in ten one-second segments of the recordings.

In the Tararuas bird counts were undertaken at 340 sites using both digital audio recorders and people, and these will be compared to see which is best.

Changes in bird abundance between years in the presence/absence of aerial 1080 operations are the focus of this research, so with just one year's data we have little to report. However, we found significantly more kaka, bellbirds, tits and kakariki in the two South Westland blocks that have received recent 1080 treatment, than in the South Westland block that had never been treated. All the other birds occurred in about the same abundance in all three South Westland blocks. While this doesn't provide any compelling evidence that birds have benefitted from the use of aerial 1080, it does demonstrate that bird populations have not been decimated by the use of 1080.

We also found that most bird species are much less common in the Tararuas than they are in South Westland.



Graeme Elliott
August 2010

[1] Dawson, D.K.; Efford, M.G. 2009. Bird population density estimated from acoustic signals. Journal of Applied Ecology 46: 1201-1209.