

Factors that influence species' responses to aerial 1080 pest-mammal control in the lower North Island

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Predation on indigenous birds by invasive mammals is an internationally widespread problem and has been implicated in the historical decline of many species of New Zealand birds. Possums, ship rats and stoats are the main introduced predators of birds in New Zealand forests. Control of these pests is carried out by various agencies throughout New Zealand using lethal trapping and toxins. Operational specifications for control programmes and techniques for monitoring outcomes are continually being improved and updated research on the outcomes of modern operations on native birds is needed. Project Aorangi is a collaborative eco-restoration project located in the Wairarapa region of New Zealand, and the biodiversity outcomes of the management are being monitored by the Centre for Biodiversity and Restoration Ecology at Victoria University of Wellington. This monitoring project (begun in 2012) follows a Before-After-Control-Impact model to estimate the effects on ecosystem functioning of three-yearly pest-mammal control by TbFree NZ using aerial 1080. To capture the effects on bird abundance of the initial 1080 operation (August 2014) we identified bird calls from diurnal acoustic recordings collected with automatic recorders. To date we have analysed counts from 2012 to 2016 including 200 five-minute bird counts from the Aorangi Forest Park (treatment site) and 140 from the Rimutaka Forest Park (non-treatment site). Preliminary results show a strong, positive increase in call frequencies for tui, bellbird, whitehead and rifleman 1.5 years (two summers) after pest-mammal control, however populations of fantails, grey warblers and silvereyes apparently did not benefit from this control. Call frequencies for the largest species (kākā, kererū, kakariki) remained low across both treatments for these first four years. We aim to investigate factors that might influence the variable responses of bird species including bird size, competitive interactions, climate and a typical recovery of rat populations 1-2 years after control.