

## Tri-trophic interactions in conservation biology: will poisoning stoats (*Mustela erminea*) aid forest plant reproduction?

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Recent work at Craigieburn has shown that the endemic bird-pollinated mistletoe (*Peraxilla tetrapetala*) is pollen-limited. *P. tetrapetala* has flowers which open when a bird, or occasionally one of three species of native bees, twists the top of the bud. At Craigieburn, where bellbirds (*Anthornis melanura*) are the major pollinators, we have found previously that there are insufficient visits from birds to ensure full fruit set. Low densities of bellbirds at Craigieburn is one likely reason why there are few visits to the mistletoes. Bellbirds appear not to be food limited at this site so we have begun to investigate whether their numbers are limited by predation. We ask: Can we expect to increase reproductive success of mistletoes by

controlling predators – an effect that runs across 3 trophic levels? To begin to answer this question, we have started monitoring bellbird nests at Craigieburn with time-lapse infrared video cameras. This is designed to work in with a forthcoming trial stoat (*Mustela erminea*) poisoning operation by the Department of Conservation which will cover part of the bellbird study area. Of the 12 bellbird nests monitored during the 1999/2000 breeding season, 6 (50%) successfully fledged chicks. The 6 failed nests included the first clearly videotaped stoat predation event at a forest bird nest in New Zealand. However, stoats were only one of a number of nest predators we observed.

## Interactions between *Aspergillus* and hihi (*Notiomystis cincta*) on Mokoia and Little Barrier Islands

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During September 1994, 20 adult male and 20 adult female hihi (or stitchbird, *Notiomystis cincta*) were translocated from Little Barrier Island to Mokoia Island. Six years on, the hihi population on Mokoia has been reduced to 7 breeding females, about 14 males, and 5-9 fledglings. From 1995 to 1997, 44% of hihi on Mokoia were reported to be showing clinical signs of illness suggestive of aspergillosis before death or disappearance. Additionally, post-mortem examination of 6 dead hihi on

Mokoia from 1995-1997 identified the fungal disease aspergillosis as the most common cause of death.

During November 1999, after identifying aspergillosis in cicadas on Mokoia, my PhD project studying fungal diseases in cicadas was redirected towards a study on the ecology of *Aspergillus* in relation to forest succession and the hihi nesting environment on Mokoia and Little Barrier Islands.