

The Million Dollar Mouse

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House mice remain more difficult to eradicate from islands than their larger *Rattus* relatives, and often remain when other pest species have been eradicated. Many of New Zealand's islands have been cleared of introduced mammals, remarkably including Campbell Island (11 400 hectares), but a number of 'challenges' remain including the main Antipodes Island (2 000 hectares) with mice and the main Auckland Island (46 000 hectares) with pigs, cats and mice. The Antipodes Islands, 872 km south east of New Zealand, are remote and only accessible by boat, hence rarely visited. Recent research has revealed that the mice most likely arrived with early shipwrecks rather than a government steamship as previously believed. The ecology of mice on the island is relatively unknown, which is concerning given recent evidence on Gough Island where gigantic mice have been found preying upon large seabirds, but in any case the impact of mice on island invertebrate and plants communities is persistently devastating.

The New Zealand National Institute of Water and Atmospheric Research (NIWA) have been undertaking a long-term study on Antipodes Island on the biology of white-chinned petrels, which are at the greatest risk of by-catch in fisheries. In January 2011 I was fortunate enough to be offered a berth on the final ship visiting Antipodes for one month in order to undertake a study of the mice and their impacts on Antipodes Island, in anticipation of any eradication. Previous unpublished research on mice had taken place in 1969, 1978 and 1995. I compiled this research and re-visited the same sites to undertake repeat surveys in order to look for long-term trends in the body-size of introduced mice, reliably investigate density, and undertake a bait uptake trial.

Mark-recapture live-trapping on a 7 by 7 grid of Longworth traps was undertaken in dense tall coastal tussock at Reef Point and on short cushion grasses on the elevated Northern Plains. Results were analysed with spatially explicit capture-recapture models (SECR) and density was estimated at 147 mice per hectare at the coast and 59 mice per hectare on the plateau. Mouse body-size was compared over forty years

and no change was detected, confirming that gigantism is not occurring on this island. Index trapping of mice was undertaken at five sites across the island and compared to pitfall trapping and litter sampling of invertebrates. Pitfall traps were dominated by coleoptera, diptera and araneae while litter samples were dominated by gastropods, with community structuring by habitat and altitude.

The most powerful evidence of the impact of mice came from comparison of litter samples between the main Antipodes Islands and the mouse-free offshore Archway Island. Scientists have only ever landed a handful of times on this treacherous offshore island, and we only stayed for 45 minutes. The mouse-free island's invertebrate community was dominated by large amphipods and collembola as well as unique species of other Orders such as coleoptera which were not found on the main island. This evidence strongly suggests that mice are having a considerable and ongoing impact on the community composition of invertebrates on the main Antipodes Island.

Results from a bait uptake trial found low risks to the endemic parakeet species and low risk to some gulls and skua, which was timely given that this year Gareth Morgan has proposed a philanthropic endeavour to fundraise for the eradication of mice from Antipodes Island. The 'million dollar mouse' program (<http://milliondollarmouse.org/>) aims to raise the million dollars needed to eradicate mice from Antipodes Island (about \$5 per mouse!). The New Zealand Department of Conservation will provide \$300,000 and Gareth Morgan will match all public contributions dollar for dollar. After six weeks of fundraising already one third of the money has been raised. For a complete history of the Antipodes Islands the excellent book "Straight through from London" by Rowley Taylor (ex DSIR) is recommended.

Thanks to DOC Southland Conservancy and NIWA for support of this trip, and Stephen Thorpe for identifying invertebrates. The results are now available online in the journal Polar Biology (DOI: 10.1007/s00300-012-1165-8).

Antipodes Island panorama, viewed from the boat on arrival.



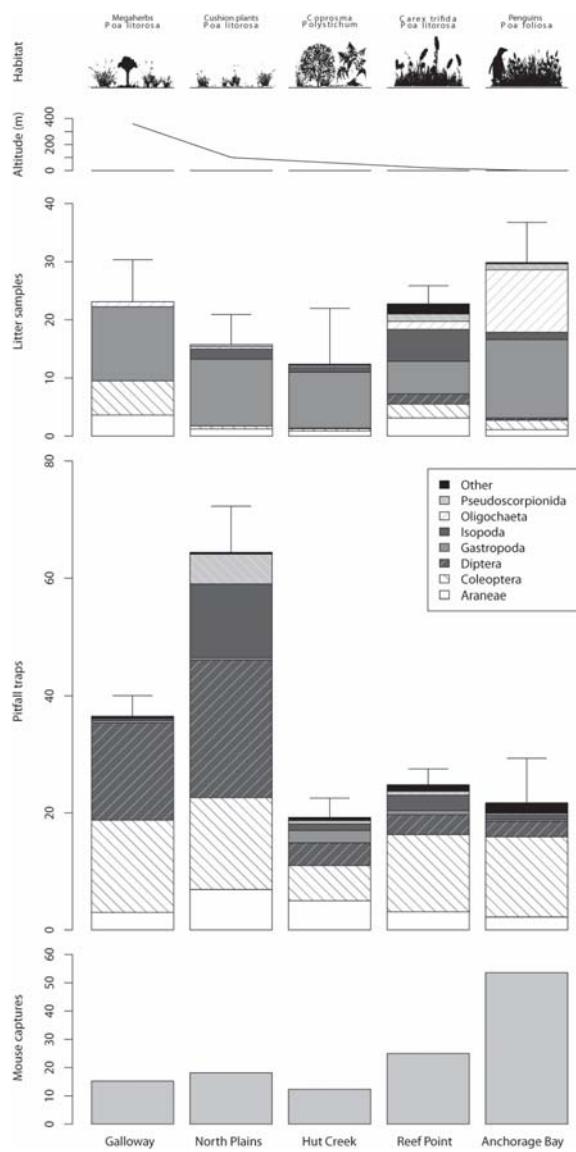
Continued from page 6

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The endemic, Antipodes Island parakeet.



From Russell in Polar Biology. Showing the relative abundances of mice and mean number of macro-invertebrates per trap/sample, at five locations on Antipodes Island.



Dr James Russell working in the 'castaway' laboratory.



A passing squall.



Historical photographs needed for our 25th Conference!

The committee wishes to celebrate the society's 25th conference by producing a slide show of images collected by members at conferences and on field trips over the last 25 years.

If you have interesting, spectacular, humorous, weird or intriguing images in digital format forward them to the conference convener, Terry Korn on tjkorn@bigpond.net.au

Please do not send any individual email packages greater than 6MB. If you have a large number of possible candidate images please send a disk or memory stick to Terry at: 11 Belmore Street, Dubbo, NSW 2830. (Terry cannot guarantee all images sent will be used!)