

Pacific rat *Rattus exulans* eradication by poison-baiting from the Chickens Islands, New Zealand

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SUMMARY

For The Chicken Islands group (New Zealand) a Pacific rat *Rattus exulans* eradication programme was undertaken in an attempt to establish a safe offshore haven for many rare native species. Eradication of the introduced rats was successful, and in response, populations of several native reptiles have increased and seabird fledging success has increased dramatically.

BACKGROUND

The Chickens Islands (also known as Marotere) are a group of small islands off the east coast of Whangarei, in the far north of New Zealand. There are three large islands in this group; the largest Lady Alice is 145 ha, Whatupuke is 102 ha, and Coppermine is 75 ha. These islands are home to many native animals and plants but were also inhabited by the introduced kiore or Pacific rat *Rattus exulans*. The rats preyed upon many native animals, the main species effected being tuatara *Sphenodon punctatus* (an endemic lizard), several species of skink and gecko, seabirds and many species of invertebrates. In addition the rats competed with many species for food and prevented the regeneration of several species of plants.

Department of Conservation (New Zealand) policy states that where it is feasible to remove rats from islands, they must be eradicated. It was decided that a rat eradication programme (through the use of poison-baiting) would be attempted for those islands in The Chicken Islands group that supported rats. In so doing, these islands would be established as a safe-haven for many of the country's rarest species.

ACTION

'Before & After' monitoring: A monitoring programme was established and initiated in 1992, two years prior to commencement of the rat eradication programme. This was undertaken to establish the size of the rat

population and to gather baseline data of the native species present, targeting those of special conservation concern. To gauge the effect of the poison-baiting, it was planned to undertake monitoring for two years after the eradication programme.

Seabird monitoring: Nest productivity of two breeding seabirds, Pycroft's petrel *Pterodroma pycrofti* and little shearwater *Puffinus assimilis*, were monitored over the two year period (1992/3) prior to the bait drop. It was found that nests had a fledging survival rate of around 20%.

Reptile monitoring: Tuatara numbers were monitored and body condition of the adults recorded. Juvenile tuataras were rare comprising only 2% of the population. This indicated that there was a very low rate of recruitment of young into the population. This was thought to be due to heavy predation by rats of tuatara eggs and hatchlings.

To monitor skinks and geckos, pitfall traps were used to record occurrence and measure abundance of the different species on the islands. There were five or six species of skink and one or two species of gecko (species numbers dependant upon taxonomy) inhabiting the islands at this time.

Poison-baiting: In 1994, after the two year monitoring period, poison-baiting on Lady Alice Island took place. The baits used were specially made up by a local company and consisted of cattle feed impregnated with the poison brodifacoum. The bait drop was carried

out by means of an aerial drop from a helicopter. There was approximately 8 kg of bait dropped per hectare, the bait being distributed from a bait bucket (similar to a helicopter water bucket used for putting out bush fires).

CONSEQUENCES

Success of rat eradication: Post poison-bait monitoring revealed that the rat eradication had been successful.

Mortality of native fauna: It is expected that small mortality of morepork *Ninox novaeseelandiae novaeseelandiae*, a native owl, resulted from the poison drop, as it was thought that they would probably prey on the dying rats, thus ingesting the poison. There was a small decline in the morepork population observed. This was the first aerial poison drop to be executed anywhere in the presence of tuatara but no tuatara mortality was noted.

Seabird nesting success: In the two years of monitoring after rat eradication Pycroft's petrel and little shearwater nest productivity and fledgling survival rate was 75% as opposed to the 20% when rats were present.

Reptile populations: The population of skinks and gecko greatly improved. The most

interesting observation was a significant change in the behaviour of some species. The Duvaucel's gecko *Hoplodactylus duvaucelii* (the largest of New Zealand's native geckos) had not before been observed in the pitfall traps set prior to rat eradication. This was due to the geckos inhabiting crevices or being high up in trees (as presumably these were the only individuals that avoided rat predation). With the rats gone they began to venture onto the forest floor, which in fact appeared to be their preferred foraging habitat.

Tuatara body condition on the island improved after rat eradication, presumably as there was less competition for food. The proportion of juveniles in the population increased dramatically from 2% prior to eradication to 43% two years after (there was no decline in the number of adults recorded).

Plant regeneration: Native plant regeneration was monitored by counting seedlings. For many species the numbers of seedlings observed increased after the rat eradication.

Long-term monitoring: Monitoring of selected native animals continued for 6 years after the eradication, with numbers continuing to rise.