Eradication of introduced mammals and reintroduction the tuatara *Sphenodon punctatus* to Motuhora/Whale Island, New Zealand

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SUMMARY

Following removal of Norway rats *Rattus norvegicus* and rabbits *Oryctolagus cuniculus* from Motuhora (Whale Island), 32 adult tuatara *Sphenodon punctatus* were introduced in 1996. They produced at least two clutches of offspring, and about 50 individuals were present when surveyed in 2005.

BACKGROUND

The tuatara *Sphenodon punctatus* is one of New Zealand's most endangered reptiles and is thought to live to 100 years of age or more. Tuatara have a very slow reproductive rate, they breed only once every two or so years and females lay between five to 10 eggs. However in areas where introduced predators such as rats *Rattus* spp. are present many eggs are predated.

Motuhora or Whale Island is a small (143 ha) offshore island 10 km north-east of Whakatane harbour in the Bay of Plenty. The tuatara became extinct on Motohora in the late 1980s due to predation and competition for food from introduced Norway rats *Rattus norvegicus*, and habitat disturbance and degradation caused by rabbits *Oryctolagus cuniculus*. Both mammals were introduced during the period of farming on the island. Rats *Rattus* spp. have been shown to extinguish tuatara populations on other small islands through predation and competition e.g. on Whenuakura Island tuatara were wiped out in the 1970s by Norway rats in less than a year.

In 1985 Motuhora was purchased by The Crown as it was considered a prime wildlife sanctuary for endangered species. Rat and rabbit eradication was the next logical step. Amongst other wildlife, there was a population of over 40,000 grey-faced petrel *Petrodroma macroptera gouldi* breeding on the island, but whose breeding success was considered compromised by rats preying on eggs and offspring.

ACTION

Eradication programme: The eradication programme began in 1985 using three methods: an aerial poison drop, manual bait distribution, and trapping using Ace Gin steal jaw leg-hold traps. The poison baits were died green to discourage other non-target species (mostly birds) from feeding on them. Several applications of the poison were used from 1985–1987. The aerial drops were particularly useful as there were many places inaccessible by foot. The poisons used were Brodifacoum (a total of 50 kg over areas showing signs of rabbit presence, broadcasted by hand); 1080 poison was applied to carrots (22 kg over the whole island, dropped by fixed wing aircraft); Bromodialone in the form of Rentokil 'Rid Rat' wax block bait (placed by hand during the grey-faced petrel fledging season when most adult birds had left the island); Bromodialone was also added to strawberry jam which was applied to areas with persistent rabbit sign (50 litres over the whole island). The hand broadcast baits were placed in bait stations set at 25 m grid intervals.

Monitoring: On 5 May 1987, a formal grid search of the island was carried out. The island was divided up into 12 manageable sections and searched along transect lines. Stations were set up to search for signs of rodents, these

were placed at 25 m intervals (the same intervals as bait stations) and closely monitored for faeces, feeding signs or burrows in an area of 6 m² around each station. Signs of rabbit were found in three locations but in the 190 rodent traps and the 96 vegetable oil-soaked indicator sticks there was no indication of rat presence.

Tuatara reintroduction: In 1996, 32 adult tuataras were reintroduced to Motuhora/Whale Island from Moutoki.

CONSEQUENCES

Mammal eradication: All rats were killed by the bait drops (the last rat sign was found on 2 September 1986) but a follow up was required for the rabbits. The last two rabbits were killed by leg-traps on 15 July 1987. The island remains completely free of introduced mammals. Rodent monitoring is ongoing but searches for rabbit signs were stopped one year after the last bait drop in 1987.

Recovery of tuatara: The mammal eradication has resulted in Motuhora providing an excellent habitat for a new colony of tuatara to become established. The rat eradication has effectively reduced predation pressure on tuatara eggs and young. The Motuhora tuatara colony was the first reintroduced colony of tuatara to have successfully bred. There have been at least two separate clutches of offspring as indicated by several different size juveniles observed on the island. Numbers of tuatara were estimated to be about 50 individuals in 2005.

Other wildlife: Other native wildlife on the island has also greatly benefited from the removal of rats and rabbits from their habitat. The native vegetation has recovered with the removal of rabbits through the reduction in grazing pressure.

For further information see:

Gaze P. (2001) Tuatara Recovery Plan. Threatened Species Recovery Plan 47. Department of Conservation, NZ – http://www.doc.govt.nz/Publications/004~Science-and-Research/Biodiversity-Recovery-Unit/PDF/TSRP47.pdf