

# **Rat eradication on small islands in the Vava'u Group, Kingdom of Tonga**

**March 2003**



**Prepared for:**

New Zealand Agency for International Development, Tonga Visitors Bureau, Ministry of Land, Survey and Natural Resources, Department of Environment, Kingdom of Tonga

**Prepared by: D.M. Houston, Department of Conservation, New Zealand**

**Commissioned by: Tourism Resource Consultants, Wellington, New Zealand**

---

# Table of Contents

- [1 Executive Summary](#) ..... 2
- [2 Introduction](#) ..... 2
- [3 Objectives](#) ..... 2
- [4 Personnel](#) ..... 2
- [5 Schedule of activities](#) ..... 3
- [6 Maninira Rat Monitoring](#) ..... 3
- [7 Taula and Lualoli rat eradication](#) ..... 3
  - [7.1 Bait stations](#) ..... 3
  - [7.2 Baits and lures](#) ..... 3
  - [7.3 Operational monitoring](#) ..... 4
  - [7.4 Non-target impact](#) ..... 4
- [8 Quarantine](#) ..... 4
- [9 Incidental observations](#) ..... 4
- [10 Issues](#) ..... 5
- [11 Achievements](#) ..... 5
- [12 Recommendations](#) ..... 5
- [Acknowledgements](#) ..... 5
- [References](#) ..... 6

---

## 1 Executive Summary

In June/July 2002 the eradication of Pacific rats from Maninita Island in the Vava'u group of the Kingdom of Tonga was attempted using Brodifacoum pellets in bait stations. In December 2002, Maninita was revisited and rat trapping carried out to determine if rats were present. While no rats were caught and none were seen, further monitoring in June 2003 is recommended before the island is declared "rat free".

Using the same techniques used on Maninita, the eradication of rats on neighbouring Taula and Lua Loli was attempted. Despite poor weather delaying rebaiting visits to the islands, the operation thus far appears successful.

Permanent bait stations set up on Maninita to minimise the risk of rats re-invading the island were found to have been tampered with and evidence of booby chick harvesting was seen on Taula. Regular visits to the islands to maintain bait stations and maintain a presence are recommended.

## 2 Introduction

The three small islands of Maninita, Taula and Lua Loli in the south of Tonga's Vava'u group have been proposed as a protected area by the Tongan Department of Environment. In June/July 2002 the eradication of rats from Maninita Island was attempted using brodifacoum-based *Pestoff 20R* pellets in bait stations (Houston 2002). The operation went as planned and at the end of operation rats could not be detected by snap trapping.

Because of the possibility of substantially reducing, but not eradicating, rats from the island, follow-up visits after sufficient time has been given for the rats to breed (and thus reach detectable levels) are required. The success of the Maninita operation also needed to be evaluated before attempting rat eradication on neighbouring Taula and Lua Loli islands.

My visit was arranged to determine if rats were present on Maninita and, provided rats were not detected, assist in setting up an eradication programme on Taula and Lua Loli.

This project was managed by Tourism Resource Consultants and supported by the New Zealand Agency for International Development. The NZ Department of Conservation contributed staff expertise to the project.

## 3 Objectives

The objectives of this visit were to:

- Determine if rats were present on Maninita Island and, if not detected:
  - Assist Tongan counterparts in preparing Taula and Lua Loli for rat eradication
  - Transfer skills to Tongan counterparts.

## 4 Personnel

The project personnel were:

- Fine'eva Taumalolo, 'Utui, Vava'u
- Masau Tu'ivailala, Ovaka, Vava'u
- Dave Houston, Department of Conservation, Oamaru, New Zealand

## 5 Schedule of Activities

- Dec 9<sup>th</sup> Arrival on Maninita, rat traps laid
- Dec 10<sup>th</sup> Maninita rat traps checked and reset, moved camp to Taula, started marking and cutting bait station lines
- Dec 11<sup>th</sup> Checked and reset Maninita rat traps, continued cutting Taula station lines and installing bait stations
- Dec 12<sup>th</sup> Maninita rat traps checked and removed, permanent bait stations replaced and rebaited. Finished cutting lines and installing stations on Taula. Baited Tula bait stations, installed and baited stations on Lua Loli.
- Dec 13<sup>th</sup> Baits checked and replenished on Taula
- Dec 14<sup>th</sup> Baits checked and replenished on Taula and coconut added
- Dec 27<sup>th</sup> Baits checked and replenished
- Dec 28<sup>th</sup> Baits checked and replenished
- Dec 29<sup>th</sup> Baits checked and replenished
- Dec 30<sup>th</sup> Baits checked and replenished
- Jan 3<sup>rd</sup> Baits checked and replenished
- Jan 21<sup>st</sup> Bait stations removed, rat traps laid
- Jan 22<sup>nd</sup> Rats traps checked
- Jan 23<sup>rd</sup> Rat traps checked
- Jan 24<sup>th</sup> Rat traps checked and removed

## 6 Maninita Rat Monitoring

Simple rodent index lines (Cunningham and Moors 1983) were run on Maninita from Dec 9<sup>th</sup> to 11<sup>th</sup>. These used 25 pairs of rat snap-traps set approximately 20m apart and baited and placed as described in Houston 2002.

No rats were caught in the three nights of trapping on Maninita, nor were rats or rat-signs seen during the visits.

## 7 Taula and Lualoli Rat Eradication

### 7.1 Bait stations

The 4 litre black “liver pack” bait stations previously used on Maninita (Houston 2002) were redeployed on Taula and Lua Loli. This time lids for the pails were available and used throughout. The bait stations were placed at 25m spacings along lines cut across the island at 25m intervals.

### 7.2 Baits and lures

The baits used were 2g *Pestoff rodent bait 20R pellets* containing 0.002% Brodifacoum and supplied by Animal Control Products Ltd, Wanganui, New Zealand. The baits used were from the same shipment sent to Tonga in June and 50 baits were placed in each station per day. Any wet or soiled baits were replaced daily and all baits were completely replaced every three days during the first 10 days of the operation and every four days thereafter – weather permitting.



Figure 2. Bait station

The number of bait pellets available and the number consumed was monitored throughout the operation. Bait take on the first two nights was low at less than 100 (~1%) of those available. After the addition of roast coconut to the bait stations the nightly bait take increased to more than 2000 baits per night and then decreased as expected.

### 7.3 Operational monitoring

Rat monitoring was carried out on Taula for three nights from Dec 21<sup>st</sup> to 23<sup>rd</sup> - no rats were caught.

### 7.4 Non-target impact

During the bait station checks and other work about the islands, we kept a watch for birds or reptiles that might have been adversely affected by the poison baits. Crabs and other invertebrates are not susceptible to brodifacoum. No evidence of non-target poisoning was observed.

## 8 Quarantine

The installation of a number of permanent bait stations around the islands was planned to coincide with the cleanup operation. Unfortunately the baits and stations did not arrive in Vava'u in time and will be installed as soon as available.

The permanent bait stations on Maninita were found to have been stripped of baits and some of the stations piled up ready for removal. These stations have been resited and rebaited.

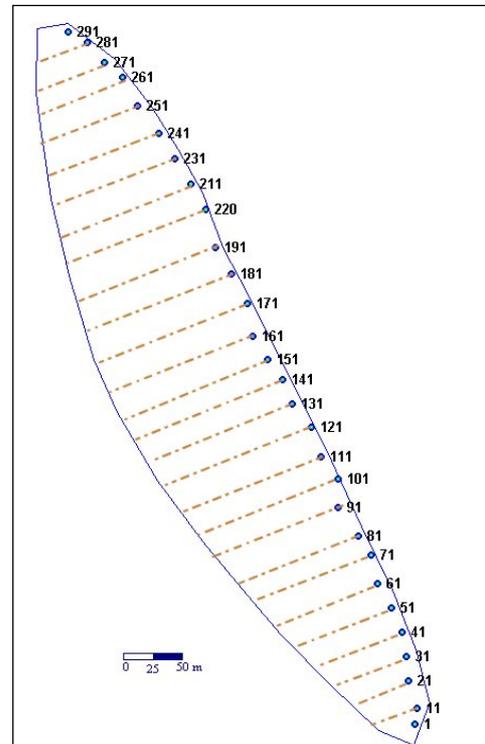


Figure 2. Bait station lines on Taula

## 9 Incidental Observations

- Blue-tailed skinks were seen on Taula in moderate numbers throughout the operation, but were still in low numbers on Maninita.
- Black-winged petrels were observed flying over Taula in courtship displays and a number of likely petrel burrows were found. Black-winged petrels were not previously known to be on this island.
- Evidence of the harvesting of booby chicks was seen in a midden on the Northern tip of the island. Anecdotal evidence indicates that harvesting of seabirds occurs on this island annually.
- Forest health on all islands had greatly improved since July 2002 with significant forest canopy regrowth having occurred.



Figure 3. Black-winged petrels in courtship flight

---

## 10 Issues

- The slow initial uptake of the bait may have been due to the attractiveness of the bait having been degraded by storage in the hot and humid conditions, pieces of roast coconut were added to each bait station on the third and subsequent days of baiting to enhance bait attractiveness.
- Some materials and equipment were again lost in transit resulting in materials having to be re-ordered from New Zealand.
- Access to all the islands was hampered by strong winds and high seas which resulted in some of the periods between rebaiting being longer than planned. It is not known what impact this might have on the outcome of the operation.
- Access to Lua Loli was difficult even in good conditions, resulting in bait stations being replenished less often than on Taula, however more baits (100) were made available in each station.
- Evidence of the harvesting of booby chicks was observed on Taula.
- Permanent bait stations on Maninita were disturbed and baits removed, seriously compromising the rat quarantine operation there.

## 11 Achievements

- Rats appear to have been eradicated from Maninita and there is a reasonable probability of their eradication from Taula and Lua Loli.
- The field skills necessary to carry out any future eradication and monitoring operations have been transferred.
- The presence of black-winged petrels on Taula was identified.
- No negative impact of the operation on non-target species was observed.

## 12 Recommendations

- A network of permanent bait stations on Maninita, Taula and Lua Loli should be maintained as a contingency against the reinvasion of rats.
- The bait stations should be checked and baits replaced if necessary every three months.
- If the concept of a protected area is to be pursued, regular visits to the islands should take place to maintain a presence, deter the taking of bird chicks and interference with bait stations. The establishment of bird-watching tours to these islands would assist with this objective as the operator(s) would have a vested interest in maintaining the values of the islands.
- Follow-up rat monitoring should occur on Taula during the winter of 2003. If possible, monitoring should also occur on Maninita at the same time.

## Acknowledgements

Many thanks are again due to 'Eva Taumalolo who not only cheerfully undertook the difficult tasks of cutting tracks through the dense scrub on Taula and endlessly baiting stations, but also invited me into his home to share his birthday feast. Thanks again to Allan and Lyn Bowe for their friendly logistical support. Thanks to our small boat operator Masau who not only delivered us safely ashore but also provided fresh fish each day.

Thanks also to the Tonga Visitors Bureau, the staff of the Department of Environment, the Ministry of Lands, Survey and Natural Resources and to the NZ High Commission for their support. Finally, thanks to the friendly people of Tonga who assisted this project in numerous ways and made my stay enjoyable.

---

## **References**

Anon 2001. A preliminary survey of the proposed Vava'u Southern islands (Maninita, Taula, Lualoli) protected area. Tourism Resource Consultants, Wellington.

Cunningham D. M. and Moors P.J. 1993. Guide to the identification and collection of New Zealand rodents. Department of Conservation, Wellington.

Houston, D. M. 2002. Eradicating rats from Maninita Island, Vava'u, Kingdom of Tonga. Tourism Resource Consultants, Wellington.

Watling, D. 2002. Baseline survey of Maninita Island, Vava'u, Kingdom of Tonga. Environment Consultants, Fiji.