Motuhoropapa Island Biosecurity and Petrel Banding

Report to Neureuter Family Trust
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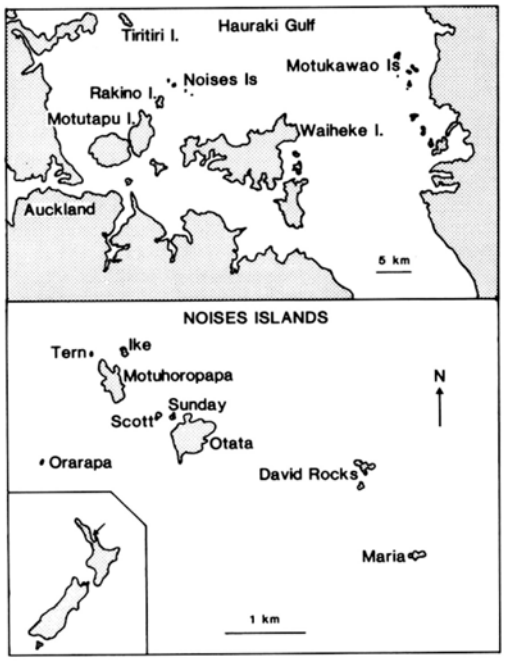
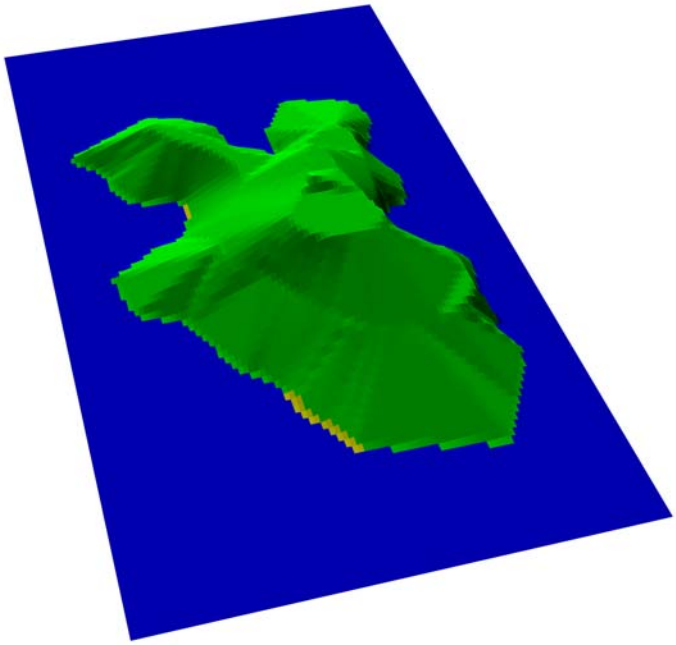
On the 11th – 14th September, 2006 James Russell, Joanne Peace (Massey University) and Mel Durrett (University of Alaska-Fairbanks) visited Motuhoropapa (36°42'S, 174°58'E; 9.5ha) in the Noises Group, 24km northeast of Auckland City in the Hauraki Gulf, to re-establish the island biosecurity network (for rodent reinvasion) and collect radio-tracking calibration data for previous studies (Russell *et al.* 2005). We also took the opportunity to band grey-faced petrels (*Pterodroma macroptera gouldi*) breeding on the island.





In January 1840 the islands of Motutapu, Motukurakia, Otata and Motuhoropapa were sold by Tara Te Irirangi, Te Haua and Te Waru of Ngati Tai to Thomas Maxwell. For this sale they received ten casks of powder, four double barrelled guns, eighty blankets, one case of muskets, six cloaks, 20 cartridge boxes, 5 caps, 5 pairs of trousers (black), 5 gown pieces and 5 shawls - H. H. Turton, 1882

Cameron (1988) gives an excellent history of the Noises Islands. Here I briefly recount the invasion history of the Noises by Norway rats. Norway rats invaded Otata Island around 1956, and were definitely present on Otata by late 1957 (Moors 1985a, b). In late 1959 Maria Island (1ha) was probably independently invaded by Norway rats (Merton 1960; Skegg 1963; Moors 1985a) and in November 1960 Norway rats were also found on the David Rocks (Merton 1960; Moors 1985a). Norway rats were confirmed on Motuhoropapa in 1962 (Skegg 1963). Forest and Bird sporadically laid warfarin from 1960-64 and the rats were eradicated (Merton 1963; Moors 1985b; Towns and Broome 2003). Phil Moors chose the Noises and particularly

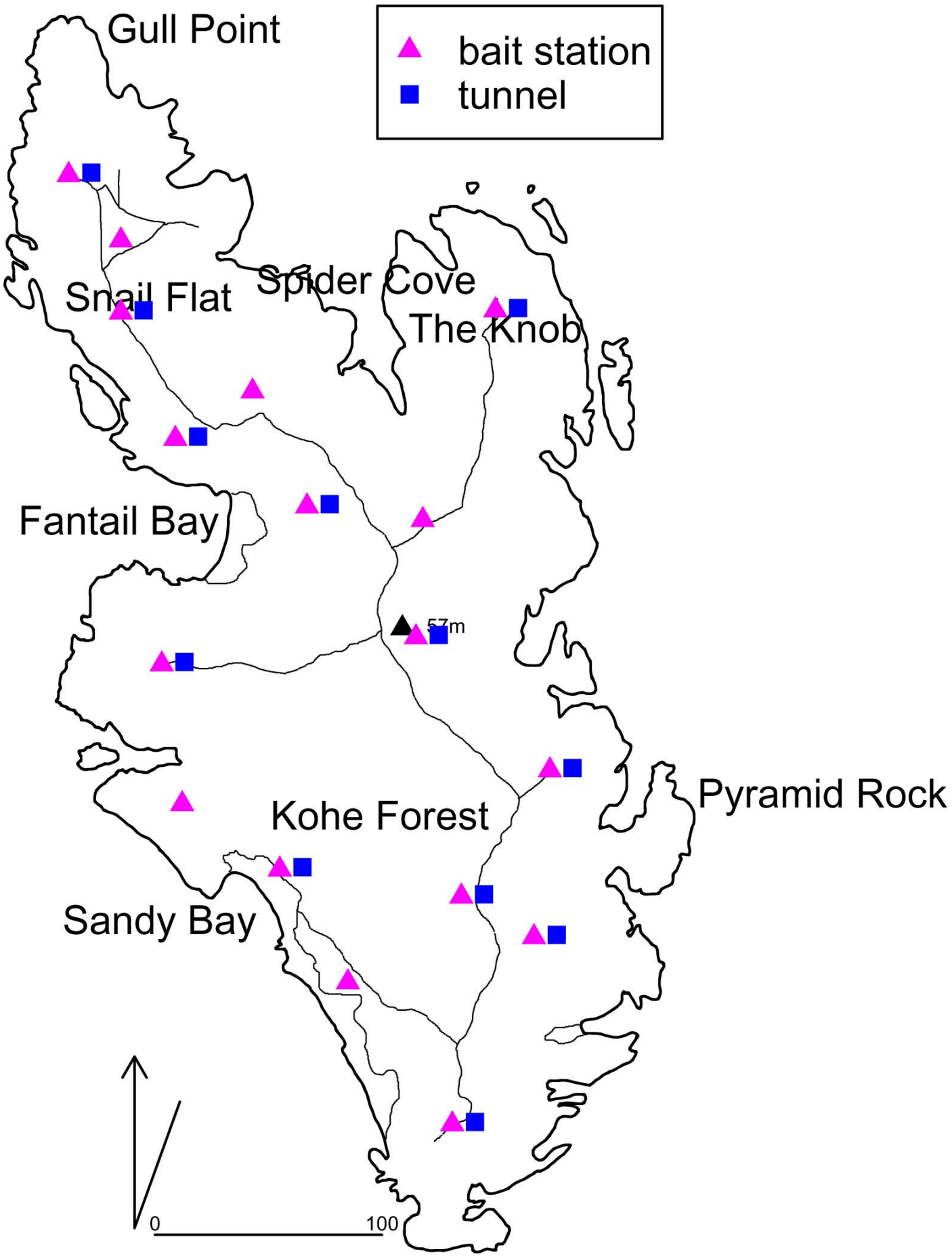
Motuhoropapa as a suitable site for Norway rat research and began work in August 1977 (Moors 1979). Phil Moors and Ian McFadden built the hut on Motuhoropapa during 1977-1978. During his snap-trapping study at the same time, Norway rats were probably eradicated from Motuhoropapa (Moors 1981). A major poisoning effort on Otata from August to September in 1979 probably also eradicated rats from this island (Moors 1981, 1985a). In February 1980 rodent sign was found on Motuhoropapa and by June 1980 sign was also found on Otata indicating a failed poisoning eradication or reinvasion (Moors 1981, 1985a). By January 1981 Norway rats were definitely present again on Motuhoropapa (Moors 1981, 1985a). This was the 2nd invasion of the main Noises Islands group (Motuhoropapa and Otata). In April 1981 a major poisoning campaign on both islands eradicated Norway rats (Moors 1985a, 1987). By February 1983 Norway rats had reinvaded Motuhoropapa, and a subsequent major poisoning effort in April 1984 once again probably eradicated the incumbent population (Moors 1987). This was the 3rd invasion of the Noises. In March 1987 a dead rat was found on Motuhoropapa and sign on two islets (Moors 1987), the 4th invasion of the Noises. Reference to a 1986 rat probably refers to this 1987 rat (from Hodsell 1988). In February 1991 rat sign was found on Otata and a Norway rat was trapped on Motuhoropapa (McFadden 1991). Rats were again eradicated from both islands in the Noises in 1991 (Cameron 1998). In 1992 the first eradication attempt on Rakino failed (Clout and Russell in press). In 1994 the smaller Noises islets were rebaited, and the islands once again declared rat-free (Cameron 1998). In 1996 rat sign was once again found on Motuhoropapa (Cameron 1998), and in 1997 rats were once again poisoned and probably eradicated (Cameron 1998; Wilson 2001). This constitutes the 5th invasion of the Noises. In 1997 a 2nd eradication attempt on Rakino was stopped due to lack of landowner support (Lee 1997; Clout and Russell in press). In 2001 both islands had been invaded for a 6th time (Wilson 2001), and eradication was undertaken from August to September 2001 by the New Zealand School of Outdoor Studies (Wilson 2001; Cook 2002). In May 2002 rat sign once again indicated reinvasion or eradication failure, a possible 7th invasion of the islands (Cook 2002). Norway rats were eradicated in late 2002, and Norway rats were also eradicated successfully from Rakino from August to September 2002 led by Steve Hix of Auckland Regional Council. From June to July 2003 a New Zealand School of Outdoor Studies island biosecurity check found no sign of rats (Jackson 2003). At this time University of Auckland rat invasion ecology researchers began their fieldwork experimentally releasing Norway rats onto rat-free Motuhoropapa (Russell *et al.* 2005).

In total the Noises group (Motuhoropapa and Otata) have been invaded possibly up to seven times (including the first in the late 1950s), assuming all eradications were successful and that rodent sign when detected was not just an incursion (e.g. Russell and Clout 2005). Given that the methods used on the Noises for eradication were the same as those being concurrently developed in Fiordland (Taylor and Thomas 1993) eradication was probably consistently achieved. The pattern of invasion was always of detecting rats first on Motuhoropapa, and then shortly after on Otata. Although it can never be proven, it seems most likely in hindsight that Norway rats were consistently swimming from Rakino (2.2km) with the assistance of the Hauraki Gulf tidal flow, and using Orarapa (The Haystack) as a stepping stone (McFadden 1991). The tidal flow of the Hauraki Gulf was probably also the mechanism by which Norway rats invaded Rakino sometime between the 1920s and 1970s, when the Auckland Harbour Board were disposing the city-wharves garbage into the sea behind Rangitoto (Auckland Harbour Board unpubl. letter).

Island Biosecurity

During the 1980s island biosecurity measures consisted of snap-traps intentionally left open on the island (often catching exotic passerines which rats fed on leaving characteristic sign), as well as gnaw sticks (Moors 1985a; McFadden 1991). Although these devices performed well for high density rat populations, as a biosecurity detection device they probably did not indicate rat presence until a population was already established. In 1988 thirty-three novaflow drain piping tubes were used as permanent biosecurity bait stations across the island (Hodsell 1988). These remain in the hut on the island and are probably still one of the best bait station types available (Spurr *et al.* in press). Information is sparse for the 1990s but when the School of Outdoor Studies maintained island biosecurity in 2001 a permanent grid of white plastic Philproof bait stations, tracking tunnels and candles was established across the island marked by pink triangles. GPS coordinates were recorded for all sites and these were checked annually (Cook 2002; Jackson 2003). As tracks became overgrown and different people maintained the system, stations became misplaced and renamed. At the commencement of research by the University of Auckland in 2003 there was no single accurate record for the location of all stations, but where found they were collected and stored off-site. Abandoned stations were discovered as more of the island was explored over the course of the research. These devices are not necessarily the most useful for detecting reinvasion however (Moors 1985a). During the research each of 16 known stations was replaced with a buried Mark IV Fenn trap under a single entrance black Philproof cover, remaining locked off until opened to catch intentionally released Norway rats. This system proved generally successful at catching rats. We reinstated 12 tracking tunnels and 17 bait stations at 17 sites across Motuhoropapa, marked by pink triangles. Some restructuring of pink triangles was undertaken to facilitate the entire system. Current numbering of pink triangles, bait stations and tracking tunnels with permanent marker pen no longer has any relevance. Each bait station or tracking tunnel had one blue chocolate lured Pestoff 0.02g/kg brodifacoum rodent block. Island biosecurity devices should ideally be checked and replenished twice yearly, once in summer and again in winter. Autumn is consistently the most likely time for swimming dispersal by Norway rats to the Noises (Moors 1987), though with Rakino rat-free the entire risk profile will now be different.

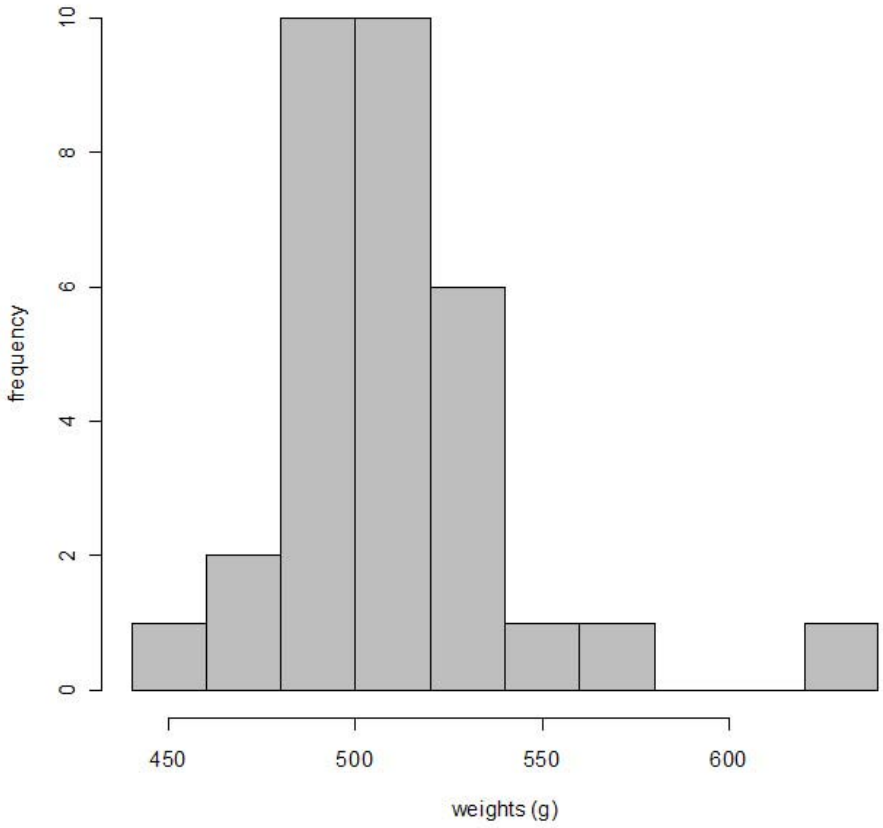
devices	*easting*	*northing*	*description*
BT	2685824	6499674	northern point
B	2685847	6499645	under hut
BT	2686012	6499614	end of the knob
BT	2685847	6499613	by pohutukawa on track
B	2685905	6499578	before razorback ridge
BT	2685871	6499557	beside corner of track
BT	2685929	6499527	above fantail bay from track
B	2685980	6499521	top of the knob
BT	2685977	6499469	by trig
BT	2685865	6499457	end of fantail point
BT	2686036	6499410	off corner of track
B	2685874	6499395	end of sandy point
BT	2685917	6499366	above sandy bay from beach
BT	2685997	6499354	beside track
BT	2686029	6499336	off track above petrel colony
B	2685947	6499316	above southern sandy bay from beach
BT	2685993	6499253	southern track above petrel colony


Gull Point
bait station
tunnel
Snail Flat
Spider Cove
The Knob
Fantail Bay
57m
Pyramid Rock
Kohe Forest
Sandy Bay
0
100

Grey-faced petrel banding

Active burrows of grey-faced petrels are scattered across the island, but concentrated colonies exist with the largest colony on the south-east of the island below pyramid rock, and smaller colonies on the southern point and on the point south of fantail bay (see also Cunningham and Moors 1985). However birds are often heard flying across the entire island and landing throughout it. Hodsell (1988) suggested commencing a banding study of the population on Motuhoropapa which is part of a larger meta-population of grey-faced petrels across the Hauraki Gulf (e.g. Tiritiri Matangi).

On 11th September three hours (2000 – 2300) were spent at the large south-eastern colony at petrel point, and 25 birds were weighed and banded by James Russell (E-205801-25). Calm, cloudless weather over the following nights meant most petrels stayed at sea, and on 13th September over three hours (2000 – 2300) only 7 birds were banded from both the south-eastern and southern colonies (E-205826-32). Birds were generally easy to catch and did not move far after release. Most birds responded to war-whopping. The population on Motuhoropapa during September constitutes breeders and some birds caught had emerged from burrows covered in dirt. Chicks were heard and observed in burrows. No previously banded birds were caught, despite the long-term banding program on neighbouring Tiritiri Matangi by Mel Galbraith. All banding was done under DOC banding officer Graeme Taylor's permit for the Hauraki Gulf.



Hut repairs

At the commencement of University of Auckland research the small four bunk hut on the Noises required some repairs. The skylight had collapsed and was replaced, with trimming of overhanging plants to allow more light into the hut. The entire inside of the hut was cleaned out. The rusted metal guttering was replaced with plastic, and holes in the roof were patched up from the inside. The support beam for the table was replaced, and the louvre windows which had rusted were also replaced. New foam mattresses with covers were added. Work which still requires undertaking is to repair a large rat-gnawed hole in one corner of the hut, consider replacing the kitchen bench with a suitably sized sink, and to consider the replacement of the polluted water-tank and support stand, with replacement of the entire piping system. This latter task is a substantial one. A log book recording visits and observations on the island was left in the hut.

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Addendum

James Russell, Mel Durrett and Sue Neureuter visited Motuhoropapa from 15th – 17th November to check on petrel breeding success and remove the hanging gardens. The 15th was a calm night and from 2130-2300 two chicks and one returning adult were banded at the largest south-eastern colony (E-205833-35), and a small number (approximately five) of other chicks were heard at the colony. During the day of the 16th the one chick previously located at the southern colony was relocated and banded (E-205836). This was the only chick found at this colony. The 16th was a stormy night and one chick and two adults were banded again at the south-eastern colony (E-205837-39). One other chick was located in the historically pegged #10 burrow, but was unable to be retrieved for banding. Burrows were very long (over 1.5m) and have probably been used continually at least since the research by Cunningham and Moors (1985). Study-holes were dug to remove chicks from burrows, and all burrows containing chicks were flagged with date and band number. Adults were similar in weight to those previously captured, while chicks ranged from 380g – 580g and were only beginning to develop outer primary feathers. Sue Neureuter commented that petrels were still seen outside burrows in late December suggesting this is when most chicks leave the burrows for summer. All colonies on Motuhoropapa previously identified in Cunningham and Moors (1985) were relocated except for the western colony over Sandy Bay which appears to have been abandoned. All other colonies appear active, but this is probably maintained by penguins and prospecting petrels maintaining a positive feedback on colony size. Penguins (approximately five) were located in a number of burrows. Two abandoned eggs were seen at the south-eastern colony, and one at the southern colony. Breeding success was overall very similar to that described by Cunningham and Moors (1985) with only a few pairs successfully raising chicks. All chicks but one came from the largest south-eastern colony, where historical pegs probably indicate previous chicks successfully fledging. Without any knowledge of annual survivorship it is not known whether the few chicks raised offset annual mortality in the population. The breeding success and interchange of birds on Otata is also not known. Thanks to J.D. and James who rescued us from the island during very poor conditions on the 17th November.