

Diving Petrels on Green Island, Mercury Group, in November 1990

According to P. Latham, co-ordinator of OSNZ beach patrols in the Bay of Plenty, fewer than usual Diving Petrels (*Pelecanoides urinatrix*) were found in 1990, whereas more than the usual numbers of some species such as Sooty Shearwaters (*Puffinus griseus*) were wrecked. Only 9 Diving Petrels were collected between June and mid-December 1990 (compare Powlesland 1987). The thought that perhaps the number of breeding Diving Petrels might be lower than in earlier years prompted us to revisit Green Island, Mercury Group, for the nights of 8 - 10 November 1990. Skegg (1963), Atkinson (1966), and Thoresen (1967, 1969) have described the ecology of Green Island.

METHODS

Counts of Diving Petrels were made in two ways, following the system used in 1966-67. First, we used a frequency index of Diving Petrels, counted with the aid of torchlight during the first hour after the first bird was seen or heard arriving at the island. Two counts were recorded each night, the two of us walking slowly in opposite directions around the accessible half of the island's perimeter.

Secondly, we measured plots with a 10 metre length of cord and counted the burrow entrances within each 100 m² plot. We used the same sectors of the island as in the 1966-67 survey (Thoresen 1967) without trying to determine actual occupancy.

RESULTS

TABLE 1 — Frequency index for Diving Petrels in 1990

Date	Low Count	High Count
8 Nov	52	110
9 Nov	120	275
10 Nov	193	285

(July 1967 counts after early breeding activity had peaked = 270 to 290)

By comparing photos, the burrow distribution and density seemed to be about the same as in 1966-67.

Other nocturnal species present in 1990 were seen in about the same numbers as recorded in 1966. These species were Flesh-footed Shearwaters (*Puffinus carneipes*) < 600 birds, Fluttering Shearwaters (*Puffinus gavia*), Little Shearwaters (*Puffinus assimilis*) numerous, and Northern Blue Penguins (*Eudyptula minor*), 5 birds seen on peripheral slopes in 1990 (8 pairs identified in 1966-67). On 9 November 1990 one penguin was found during the day in a burrow with a newly hatched chick.

DISCUSSION AND CONCLUSIONS

The higher counts of the frequency index for Diving Petrels match closely the index figures for July 1967, when the numbers stabilised. The reason for the differences between the low and high index figures may be that the counts were made by the two observers beginning their counts in opposite directions. Except for the first night, the higher counts were made by the

TABLE 2 — Burrow density per 100 m² in 1990

	1990	
1. Western slope and terrace	151	
2. North to NW cliffs (steep and rocky with minimal habitat)	< 25	(possible sites estimated from 5 birds heard calling from cliffs 1 hour after arrival)
3. Southwest talus slope (unstable sliding plot)	23	
4. Eastern slopes including shoulders — Plot A	120	
— Plot B	160	
5. Saddle of the island	150	
6. Plateau (Some flat areas of the plateau had few burrows)	163	
Total burrows = 792/ 600 m ² or 1.32/m ² . (As sector 2 was not measured we do not include the estimation in this total.)		

observer who began on the most densely populated eastern side of the island. By the time the second observer transected this eastern side many of the birds may have arrived, and so were not seen. An index figure is intended for comparison of different dates only and should not be used to estimate total numbers. The agreement of the higher numbers of the index between July 1967 and November 1990 merely indicates that breeding bird numbers were probably about the same.

The assumptions of the 1966-67 report were that 33% of the island was unsuitable for Diving Petrels and other burrowing species and that more than one-third of the burrows examined were unoccupied. This earlier report (Thoresen 1967) estimated, based on total occupied burrows, 2300 to 2580 birds. However, this was almost certainly an underestimate. Using the figure 50 suggested as average for the number of burrows per 100 m² and 16 188 m² for usable area, there would be a possible total of 8094 burrows, 68% of which (5342) were occupied. Therefore, a total for the island of 10 684 birds might have been reported for 1966-67. Initial impressions of observers tend to lead to reports of higher figures than actual head counts support. Least numbers may be closer to the true figures.

In November 1990, the total burrows we counted was 792 /600 m² or 1.32/ m². Assuming, as in 1967, that there is 16 188 m² of usable area and that 0.66 of the burrows counted are occupied by Diving Petrels (0.85 / m²), about 14 000 burrows may be occupied by 14 000 pairs of Diving Petrels (28 000 birds). This figure is close to Skegg's 1963 calculation of 15 000 pairs or 30 000 birds and represents the total possible number breeding on Green Island. Judging by the number of birds calling from burrows and the numbers counted on the ground an hour after arrival, at midnight, and at one hour before dawn, the figures arrived at by counting burrows may be far too high.

More accurate methods of determining populations of nocturnal burrow-nesting seabirds are needed. However, we venture to say that as many as

14 000 pairs of Diving Petrels were using Green Island in 1990, which is certainly no less than in 1966-67. Thus the reason for fewer Diving Petrels being washed up on Bay of Plenty beaches in 1990 is not that numbers are lower on Green Island. Monitoring of other colonies is needed as well as food availability, parasites, diseases and other forces of the environment examined.

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LITERATURE CITED

- ATKINSON, I.A.E. 1964. The flora, vegetation and soils of Middle and Green Islands, Mercury Islands Group. *NZ J. Bot.* 2:385-402.
- POWLESLAND, R.G. 1987. Seabirds found dead on New Zealand beaches in 1985, and a review of *Pterodroma* species recoveries since 1960. *Notornis* 34: 237-252.
- SKEGG, P.D.G. 1963. Birds of the Mercury Islands Group. *Notornis* 10:153-168.
- THORESEN, A.C. 1967. Ecological observations on Stanley and Green Islands, Mercury Group. *Notornis* 14: 182-200.
- THORESEN, A.C. 1969. Observations on the breeding behaviour of the Diving Petrel *Pelecanoides u. urinatrix* (Gmelin). *Notornis* 16:241-260.
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Petrels on the Mernoo Bank and Chatham Rise

From 17 January to 23 February 1991, I observed seabirds from a deep sea trawler fishing for hoki on the Mernoo Bank and Chatham Rise. Seabirds associated with this fishing activity were recorded for 13 days of fishing. These observations were recorded at positions between 42°40' - 43°57' S and 174°30' - 178°40' E.

Observations were made during trawling. I recorded the birds in flight, feeding or resting on the water in a 180° arc and within 500 m of the stern. Most observations were made between 1230 and 1730 hours.

During some observation periods, while fish were being processed in the vessel's factory, some fish not suitable for processing were discarded, attracting more scavenging seabirds to the vessel. The fish were dead by the time they were discarded. Due to a fish meal plant on board, only small quantities of offal and debris from processing were discharged.

The petrel species recorded and range of numbers observed are listed.

Regular - species present on 6 or more of the 13 days

Wandering Albatross (*Diomedea exulans*) up to 5, Salvin's Mollymawk (*D.*