Museum; to Mrs. Lois Wagener and Mr. H. R. McKenzie for helping me with local data; to Mr. C. J. Robertson for providing information on banding recoveries; to Mr. A. T. Edgar who sent notes from Northland and to other local observers who are mentioned in the text.

REFERENCES

1943, Serventy, D. L.: The white phase of the Giant Petrel in Australia. Emu 42, 167-169.
1954, Downes, Gwynn & Howard: Banding of Giant Petrels at Heard and Macquarie Islands. Emu 54, 257-262.
1955, Davenport & Sibson: Notes on Two Rare Petrels. Notornis 6, 115-117.
1956, Howard, P. F.: Banding of Giant Petrels at Heard Island and Macquarie Island. Emu 56, 401-404.
1958, Stonehouse, B.: Notes on the ringing and the breeding distribution of the Giant Petrel. Ibis 100, 204-208.
1961, Tickell & Scotland: Recoveries of Giant Petrels. Ibis 103a, 260-266.
1966, Bourne & Warham: Geographical Variation in Giant Petrels. Ardea 54, 45-67.
1956-1964, Banding Reports of O.S.N.Z. and Dominion Museum.

★

SEABIRDS FOUND DEAD IN NEW ZEALAND IN 1964

By M. J. IMBER and B. W. BOESON†*

ABSTRACT

During 1964, 45 members patrolled a total of 988 miles of coast and found 1,236 dead seabirds of 44 species. Mortality was highest in January and November, especially on some coasts exposed to westerly winds which were vigorous and prolonged in those months; on eastern coasts mortality was low throughout the year. There were no major wrecks. Fairy Prions **(Pachyptila turtur)** and Sooty Shearwaters **(Puffinus griseus)** were, typically, the most abundant species, especially on western beaches of the North Island in November. Unusual species included Silver-grey Fulmar **(Fulmarus glacialoides)**, Black-winged Petrel **(Pterodroma hypoleuca nigripennis)**, Scoty Tern **(Sterna fuscata)** and Little Whimbrei **(Numenius minutus)**.

INTRODUCTION

This report differs from the earlier ones — listed by Boeson (1965) — in that records of gannets, shags, gulls and terns are tabulated in the same detail as for penguins and petrels; further, the records are grouped into 15 geographical zones instead of 18. The former zones of North Cape, Hawkes Bay and West Nelson have been deleted and their coastlines allocated among adjacent zones (Fig. 1).

RESULTS

During 1964, 45 people took part in the scheme. Their results are presented in Tables 1 to 5. Not included in these tables are 36 miscellaneous specimens among which the only one of particular interest was a Little Whimbrel *(Numenius minutus)* found in November on the Wellington West coast. The others were 6 Rock Pigeons, 6 Sparrows, 4 Magpies, 3 S.I. Pied Oystercatchers, 3 Greenfinches, 2 Black Swans, and 1 Bittern, Reef Heron, White-faced Heron, Northern Oystercatcher, Pukeko, Californian Quail, Shoveler, Paradise Duck, Starling, Blackbird and Goldfinch.

In Table 1 there are two measures of distance. 'Miles travelled' is the sum of the distances walked (or driven) by patrollers. 'Miles covered' is the length of coast actually inspected by patrollers. The

* Wildlife Service, Department of Internal Affairs, Wellington.
† P.O. Box 30, Carterton.

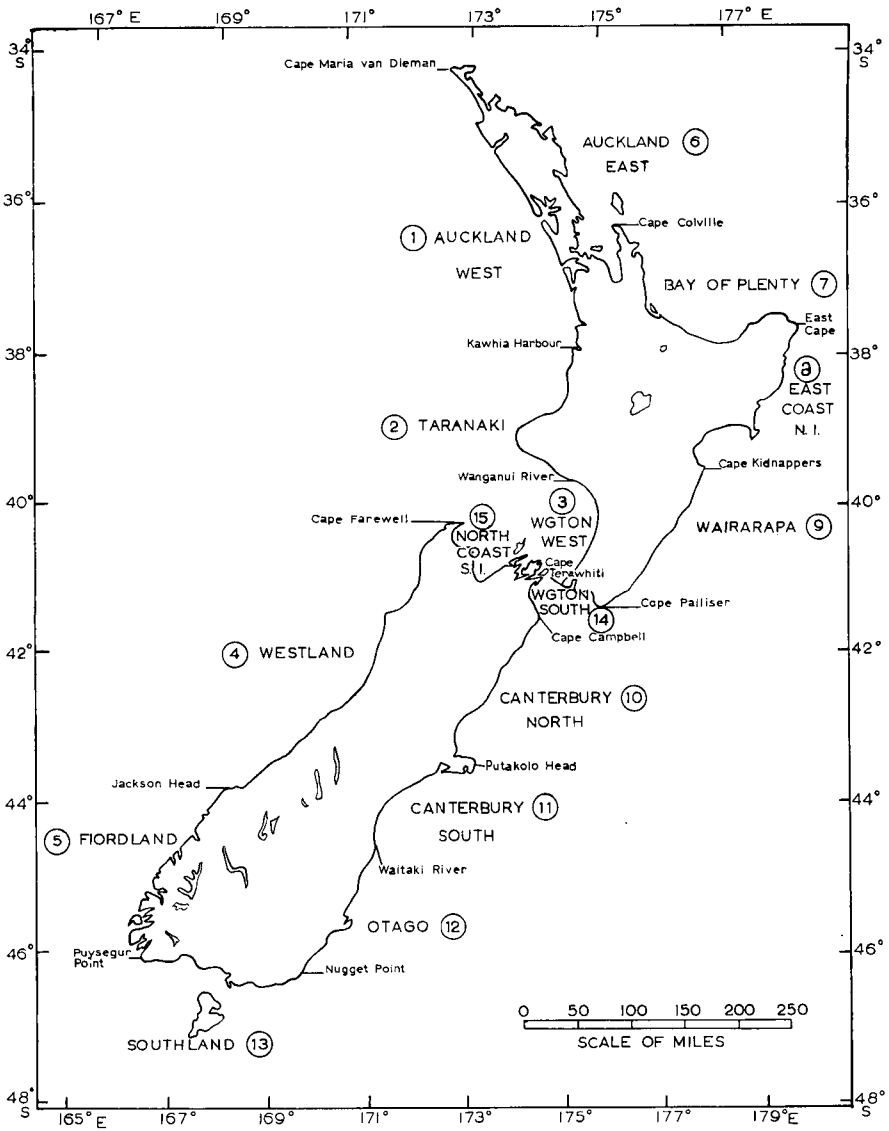

FIGURE 1 — New Zealand, showing the 15 sections of coastline within which Beach Patrols have been grouped.

latter adjustment enables better comparisons of data from coasts where repetitive patrolling was frequent with data from coasts where it was not.

Valuable data are obtained where a particular beach is examined monthly or more often during the year. If all dead birds are removed

TABLE 1: Numbers of Dead Seabirds Recorded and Miles Patrolled on Each Coast in 1964†

Coast	Code	NUMBERS OF DEAD SEABIRDS AND MILES COVERED EACH MONTH												Total Miles		Total Birds	Birds / Mile*
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Trav.	Cov.		
Auckland West	AW					1/14		27/29	55/44	27/29	30/33	128/32		361	181	268	1.5
Taranaki	T	2/2				9/13		4/8		17/10		3/1		41	34	35	1.0
Wellington West	WW	99/15	34/10	15/5	0/3	0/3	2/6	16/9	39/18	48/24		331/20	3/3	144	116	587	5.1
Westland	WD									0/1			1/7	8	8	1	0.1
Auckland East	AE	44/9			0/2	0/3	1/2							16	16	45	2.8
Bay of Plenty	BP	15/11	19/4	7/3	4/3	2/3	5/3	2/3	12/9	1/3		4/2	17/10	129	54	88	1.6
East Coast Nth. Isl.	EC				1/3								2/5	8	8	3	0.4
Wairarapa	WA							0/3						3	3	0	0.0
Canterbury North	CN	3/5	7/3	14/13	6/6	8/9	1/7	0/7	0/3	5/4	2/3	6/3	0/3	87	66	52	0.8
Canterbury South	CS	9/1		1/3					0/2					6	6	10	1.7
Otago	O	12/18	0/6	11/7	2/6	2/6	0/3	2/4	0/3	1/5	0/3	1/2	0/2	69	65	31	0.5
Southland	S		32/3	12/10	12/7	5/3	1/3	0/3	1/3	9/4	10/3	4/4	3/3	49	46	89	1.9
Wellington South	WS	0/2	4/6		0/1	0/1	4/8	1/2	3/7	5/8	3/1	2/3	0/2	54	41	22	0.5
North Coast Sth. Isl.	NS				1/4			1/4				0/4	3/1	13	13	5	0.4
Total Miles Travelled		90	60	48	51	62	42	142	190	106	75	83	39	988			
Total Miles Covered		63	32	41	35	55	32	72	89	88	43	71	36		657		
Total Birds		184	96	60	26	27	14	53	110	113	45	479	29			1,236	
Birds / Mile*		2.9	3.0	1.5	0.7	0.5	0.4	0.7	1.2	1.3	1.0	6.7	0.8				1.9

*Miles Covered

† There were no records for Fiordland coast.

from the beach each time (as they should be), then subsequent patrols yield only birds cast ashore in the intervening period, except for any covered or uncovered by moving sand. During 1964 certain beaches in Bay of Plenty (M. Hodgkins), Canterbury North (D. G. Dawson), Otago (W. T. Poppelwell) and Southland (Mrs. M. L. Barlow) were patrolled throughout the year and one Wellington West coast beach was examined less frequently by several observers (D.E.C., W.J.P., M.J.I.). The results are presented in Table 5. Comparison of Tables 1 and 5 shows that erratic patrols of many beaches in a zone, provided that they are well distributed throughout the year, give results reasonably similar to those from regularly patrolled beaches (note that 'birds/mile' in Table 1 corresponds with 'birds/mile/month' in Table 5).

Although Table 2 lists species infrequently found dead, several of these are nevertheless commonly seen alive on some coasts (for example Giant Petrels *M. giganteus,* the Shags *Phalacrocorax* spp., and Caspian Terns *H. caspia).* Rarely-reported species include the Chatham Island Mollymawk *D. cauta eremita,* Silver-grey Fulmar *F. glacialoides,* Black-winged Petrel *P. hypoleuca nigripennis* (fourth North Island record), and Sooty Tern *S. fuscata.*

TABLE 2: Seabirds of which from 1 - 5 Specimens were found Dead in 1964. Coast and Month of Discovery Given

Species or Subspecies	Number Found	Coast(s)	Month(s)
Diomedea sp.*	3	WW, BP,CN	1; 6; 5
exulans	1	AW	8
epomophora	1	AW	7
melanophris	3	T[2], WS	5; 6
chrysostoma	1	AW	8
cauta eremita	1	AW	8
Phoebetria			
palpebrata	1	AW	8
Macronectes			
giganteus	4	AW[2], WS,S	7, 8; 11; 4
Fulmarus			
glacialoides	1	WW	11
Pachyptila			
desolata banksi	2	WW, WS	7; 6
belcheri	2	T, WW	5; 9
Puffinus			
tenuirostris	4	AW, T, WW[2]	10; 5; 1
Procellaria			
cinerea	1	BP	12
aequinoctialis	1	AW	10
Pterodroma			
inexpectata	3	WW[2], S	2, 11; 2
brevirostris	1	AW	9
cooki	4	AW, AE, BP[2]	10; 1; 12
hypoleuca nigripennis	1	WW	3
Pelagodroma			
marina	3	AE, BP, CN	1; 1; 11
Phalacrocorax			
carbo	3	T, CN, S	11; 9; 5
varius	2	AW, CN	9; 6
melanoleucos brevirostris	3	BP[2],O	5, 6; 4
carunculatus chalconotus	4	O, S[3]	3; 2, 3, 5
Hydroprogne			
caspia	1	CN	5
Sterna			
fuscata	1	T	1
TOTAL	52		

*Species not identified

TABLE 3: Coastal Distribution of the More Common Seabirds Found Dead in 1964

Species or Subspecies	AW	T	WW	COAST WD	COAST AE	BP	EC	CN	CS	O	S	WS	NS	Total Birds
Eudyptula minor	27	5	28	.	23	19	.	1	.	.	7	1	2	113
albosignata	(1)	.	.	.	.	.	.	5	9	.	.	.	.	15
Diomedea cauta cauta	.	.	.	.	.	.	.	1	.	.	3	1	1	6
Daption capensis	4	.	2	.	.	1	.	.	.	.	.	2	.	9
Pachyptila sp.*	2	1	37	.	.	.	.	1	.	2	7	.	.	50
vittata	1	.	4	.	.	.	.	.	.	.	1	.	.	6
salvini	6	.	8	.	.	.	.	.	.	.	2	.	.	16
turtur	46	15	261	.	.	1	1	.	.	.	1	1	.	326
Puffinus sp.*	.	.	.	.	2	1	.	.	.	.	.	.	.	3
carneipes	.	.	1	.	3	19	.	.	.	.	.	.	.	23
bulleri	2	.	17	.	.	2	.	.	.	.	.	.	.	21
griseus	132	1	158	1	5	6	.	5	1	2	23	.	1	335
gavia gavia	11	2	10	.	5	5	1	.	.	.	.	1	.	35
gavia huttoni	.	.	1	.	.	.	.	8	.	.	.	.	.	9
assimilis	2	.	5	.	.	1	.	.	.	.	.	.	.	8
Pterodroma macroptera	.	1	.	.	.	6	.	.	.	.	.	.	.	7
lessoni	6	.	1	.	.	.	.	.	.	.	.	.	.	7
Pelecanoides urinatrix	2	1	21	.	.	9	.	.	.	.	4	2	.	39
Sula bassana serrator	9	2	3	.	2	1	1	.	.	.	.	1	.	19
Phalacrocorax punctatus	.	1	.	.	.	.	.	6	.	4	3	.	.	14
Larus dominicanus	4	.	12	.	.	1	.	11	.	17	25	8	1	79
novaehollandiae	.	.	6	.	2	6	.	4	.	.	6	2	.	26
bulleri	.	.	.	.	.	.	.	1	.	4	1	.	.	6
Sterna striata	1	.	3	.	1	3	.	4	.	.	.	.	.	12
TOTALS	256	29	578	1	43	81	3	47	10	29	83	19	5	1184

*Species not identified
() Not confirmed.

TABLE 4: Monthly Distribution of the More Common Seabirds Found Dead in 1964

Species or Subspecies	1	2	3	4	MONTH 5	6	7	8	9	10	11	12	Total Birds
Eudyptula minor	28	12	2	1	2	1	4	29	9	2	16	7	113
albosignata	10	2	2	.	.	.	.	(1)	.	.	.	.	15
Diomedea cauta cauta	.	2	1	1	1	.	.	.	1	.	.	.	6
Daption capensis	.	.	.	.	.	.	2	3	3	.	1	.	9
Pachyptila sp.*	16	18	.	.	2	.	2	8	.	.	4	.	50
vittata	1	.	.	.	.	.	.	1	2	1	1	.	6
salvini	.	.	.	.	.	.	9	4	.	3	.	.	16
turtur	24	5	5	.	.	1	16	37	61	4	172	1	326
Puffinus sp.*	1	.	.	.	.	1	.	.	.	.	.	1	3
carneipes	6	10	4	1	.	1	.	.	.	.	.	1	23
bulleri	3	2	1	.	.	.	.	.	.	1	13	1	21
griseus	42	14	14	4	3	2	.	.	1	10	239	6	335
gavia gavia	6	4	.	.	1	.	3	2	10	3	5	1	35
gavia huttoni	2	1	3	.	.	.	.	.	.	.	3	.	9
assimilis	1	.	.	.	.	.	2	.	.	.	4	1	8
Pterodroma macroptera	5	1	.	.	.	.	1	.	.	.	.	.	7
lessoni	1	.	.	.	.	.	.	2	1	2	1	.	7
Pelecanoides urinatrix	6	.	.	.	.	.	4	12	8	2	2	5	39
Sula bassana serrator	3	1	1	1	1	.	.	2	1	5	4	.	19
Phalacrocorax punctatus	.	2	5	.	2	.	1	.	3	1	.	.	14
Larus dominicanus	12	8	13	12	5	3	3	2	7	7	7	.	79
novaehollandiae	5	8	5	1	.	.	1	1	1	1	1	2	26
bulleri	3	1	1	.	.	.	.	.	1	.	.	.	6
Sterna striata	2	2	.	3	1	.	2	1	.	.	1	.	12
TOTALS	177	93	57	24	18	9	50	105	109	42	474	26	1184

*Species not identified
() Not confirmed.

TABLE 5: Numbers of seabirds found dead in beaches regularly patrolled during 1964.

Coast	Miles Covered	Total Seabirds Found	Birds Per Mile Per Month
Wellington West	6	267	3.7
Bay of Plenty	3	59	1.6
Canterbury North	3	41	1.1
Otago	2	7	0.3
Southland	3	68	1.9

DISCUSSION

Results of this year's patrols, which were well distributed round the coasts, show that seabird mortality was low in 1964 and there were no unusual wrecks. The number of birds per mile travelled was 1.2 (from Table 1) which compares with 1.8 in 1960, 3.7 in 1961, 1.9 in 1962 and 1.8 in 1963 (see relevant reports). Mortality was highest on the Wellington West coast and it was higher on most coasts exposed to westerly winds (AW, T, WW, S) than on eastward-facing ones. Moderate numbers reported from northeast coasts (AE, BP) were very largely species breeding on adjacent islands. On eastern coasts from East Cape southwards few birds were found throughout the year.

A typical pattern of monthly mortality is evident in Tables 1 and 4. This patern was partly influenced by higher mortality, associated with persistent strong winds, on some western coasts in January and November. The following extracts are from meteorological returns in the New Zealand Gazette of 1964: " — January 1964 will be remembered for the exceptionally strong and persistent winds from a westerly quarter during this period, — " (*1*, 8: 230); " The period from the 14th to the 20th (November) was one of typical westerly weather " and " The period from the 24th to the 29th (November) was another one of westerly weather " (*3*, 79: 2357). Nearly all birds found in January and February on west-facing coasts (T, WW, S) had died during the five weeks of westerlies which began in the last week of December 1963. The high return from Auckland East in January was caused by birds which had died the previous year. The most productive patrols in November on western coasts were made following the periods of onshore winds. Sooty Shearwater mortality was high then but this is typical. However, unusually high numbers of Fairy Prions were found in November on Wellington West coast.

ACKNOWLEDGEMENTS

Beach patrolling is a time-consuming and sometimes expensive recreation. Great credit is due to the following who contributed cards during the year: N. M. Adams, J. H. Allan, Mrs. M. L. Barlow, J. A. Bartle, B. D. Bell, B. W. Boeson, Dr. P. C. Bull, C. N. Challies,

Mrs. R. Crockett, D. E. Crockett, J. C. Davenport, Miss M. M. Davis, A. M. C. Davis, D. G. Dawson, Shirley Douglas, Dr. R. A. Falla, R. A. Fordham, P. C. Harper, J. E. Hilton, M. Hodgkins, M. J. Hogg, M. J. Imber, J. R. Jackson, J. Jenkins, E. B. Jones, S. R. Kennington, Mrs. M. McGrath, H. R. McKenzie, Mrs. R. V. McLintock, D. V. Merton, R. J. Nilsson, J. O'Brien, W. J. Pengelly, Miss E. M. Perano, W. T. Poppelwell, C. J. R. Robertson, P. Ryder, E. K. Saul, H. L. Secker, M. J. Sexton, C. R. Veitch, Richard Wallace, David Walter, P. A. Williams and A. Wright.

We wish to thank the following: M. J. Williams who gave considerable time to tabulating data; Dr. P. C. Bull and E. K. Saul who read the manuscript and made very helpful comments; and C. L. Morgan who drew the map.

REFERENCE

BOESON, B. W., 1965: Seabirds found dead in New Zealand in 1963. Notornis 12, 3, 169-175.

★

SHORT NOTES

ARCTIC TERN IN MANUKAU HARBOUR

On a visit to a beach at Ihumatao on 29/6/68 I picked up a rather battered dead tern. There were two holes in the body and one leg was missing, but the remaining leg was brightly red, and the tarsus seemed very short. Later examination with Mr. H. R. McKenzie proved it to be a female Arctic Tern *(Sterna paradisea)*. Terry Jenkins was able to convert the wreckage into a very presentable study skin which is now in the Auckland War Memorial Museum (A.V. 1399.8). Its measurements are:— Wing 240 mm., tail 140, tarsus 15, bill 32.

The plumage is at an intermediate stage, showing a little feather wear on the upper wing coverts but none otherwise. The bill is black with scarlet at the base; but on the inside it is scarlet to the tip and the gape is scarlet. Face and forecrown are white: the top and back of the head black with white speckling. The back is pearl grey, the primaries slate grey. The tail is mainly white but the outer webs of the outer feathers are slate grey; and the next pair light grey.

The general colouring, the state of plumage and the date suggests that it was a sub-adult, on its way from the Antarctic to the Arctic, perhaps to breed for the first time.

— H. FREW

★

A HUGE REDPOLL FLOCK

On 5/4/68, I was hunting about five miles north-west of Barryville, King Country, near the source of the Waipa River. A long wide stretch of old bush working, wider at its upper end, had failed to regenerate and was in blackberry, a poor growth of fern, some wineberry and much grass and weed. It was alive with Redpolls *(C. flammea)* and when a hawk flew over they rose like a swarm of bees. The flight was about a quarter of a mile long, fifty feet deep and a hundred yards wide. I estimated it to contain over a hundred thousand birds.

— F. P. HUDSON