AN UNUSUAL SEABIRD MORTALITY IN THE SOUTHERN NORTH ISLAND (NEW ZEALAND) APRIL, 1968

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ABSTRACT

An account of 588 birds found dead or alive on beaches and some inland areas of the southern North Island and Hawkes Bay. An unusually high mortality of albatross was recorded, with 110 Royal and 26 Wandering Albatross being found in the Wellington area. Other notable records were of Grey-faced and Black-winged Petrel, two sub-tropical species, not usually recorded in the Cook Strait area.

INTRODUCTION

A tropical cyclone of unusual force hit the North Island of New Zealand on 9 and 10 April 1968, causing storm force southerly winds in the Wellington area and along the south west coast of the North Island. Severe property damage occurred in Wellington, including the sinking of the Wellington-Lyttelton ferry steamer "Wahine" inside the Wellington Harbour entrance.

The first indication that pelagic birds were affected came from Epuni (Lower Hutt) 2½ miles inland, where M.J. Imber and many other Wellington commuters were stranded while going to work on Wednesday, 10 April. Michael reported to the Dominion Museum at 9.30 a.m. that numerous Grey-faced Petrels and prions were battling the storm, unable to make headway against the wind, in the vicinity of the Epuni railway station. This was followed by a call from J. A. (Sandy) Bartle at the Victoria University Marine Biological Station in Island Bay, reporting that petrels were being blown inland "backwards" in an unsuccessful attempt to fly against the wind. From late afternoon Wednesday, through Thursday and Friday, live birds were brought into the Dominion Museum, mainly by officers of the Wellington R.S.P.C.A., and the general public.

At one stage on Friday (12 April, 1968) the Museum was caring for over 25 live birds of 6 species, ranging in size from large albatross to prions. Few of these birds had been picked up on or in the vicinity of beaches. The majority were collected in city streets and back gardens from Wellington, Petone, Lower Hutt and as far north as Wainuiomata and Upper Hutt (12½ miles inland). During Saturday (13 April, 1968) telephone reports were received from the Wairarapa, about "numerous" albatross cast ashore in the Palliser Bay area. The first three Black-winged Petrels were picked up on western beaches between Hokio and Waitarere Beach by P. Roberts. Beach patrols were organised, and during the following week the entire stretch of approximately 150 miles from Wanganui in the north to Cape Terawhiti (Figure 2, Beach Sectors 9 to 14), and from Cape Terawhiti to Cape Palliser (Beach Sectors 1 to 7) was investigated. The following members of the O.S.N.Z. and other parties contributed to the outstanding success of these beach patrols: D. E. Crockett with a Wanganui party supported by I. Andrew and a

Palmerston North party covered the beaches from Wanganui to Te Horo (Beach Sectors 11 to 13); Dr. P. C. Bull and P. Roberts each conducted lone beach patrols between Otaki and Waitarere (Beach Sector 11); G. Foreman covered the area between Titahi Bay, Cape Terawhiti and Ohiro Bay (Beach Sectors 9 and 1); Brian and Mrs. Enting and Ian and Mrs. Gillespie investigated the Wainuiomata and Orongorongo River mouth areas (Beach Sector 3 east part); B. D. Bell organised several very successful Wildlife Service teams which covered the entire Palliser Bay area (Beach Sectors 5 to 7); L. Moran (Wildlife) in addition to participating on Palliser Bay searches, made a successful lone beach patrol north of Wanganui (Beach Sector 14). The author joined some of the Wildlife teams in the Palliser Bay area and with J. A. Bartle covered beach areas not enumerated above.

A total of 578 birds of 30 species was found on southern and western beaches of the Wellington area, including some birds blown inland and reported to the Dominion Museum. However, it can be assumed that many birds blown inland during the storm were either not found, or not reported. All birds found and positively identified are tabulated in Table 1, which contains only birds killed or stranded by the storm of 10 April. Birds found, which had evidently been beach cast before the storm, or had been killed by other causes (fish hooks, etc.) or birds reported to the museum but of doubtful identification were not included in the count.

PASSAGE OF STORM

The centre of the tropical storm, which approached New Zealand from the direction of New Caledonia, passed east of Auckland about midnight of 9 April, moved directly over Tauranga, continuing in a south-south-easterly direction over the North Island and crossed the east coast near Castlepoint about 9 a.m. on 10 April (See Figure 1). It continued in a general southerly direction. During the passage of the storm over the North Island, gale force east to north-east winds predominated in the Bay of Plenty and the Hawkes Bay areas. Storm-force south to south-west winds hit the Wellington area round about 6 a.m. on 10 April. The average wind speed being approximately 50 m.p.h. with gusts of at least 100 m.p.h. recorded frequently between 8 a.m. and midday, when the centre of the storm was about 100 miles distant. Shortly after midday, winds in the Wellington area diminished rapidly, and turned to light north-westerlies late in the afternoon, when the centre of the storm had shifted well to the south and east of the South Island.

NOTES ON SELECTED SPECIES

Spheniscidae (Penguins)

The only species of penguin which suffered unusually high mortality was the Yellow-eyed Penguin *(Megadyptes antipodes)*. Six specimens were found, i.e. five on Wellington south beaches, and one at Hokio. This comparatively high number of birds killed indicated that numbers of Yellow-eyed Penguins frequenting the eastern Cook Strait area must be even higher at this time of the year than was assumed from the rarity of beach cast specimens in the past

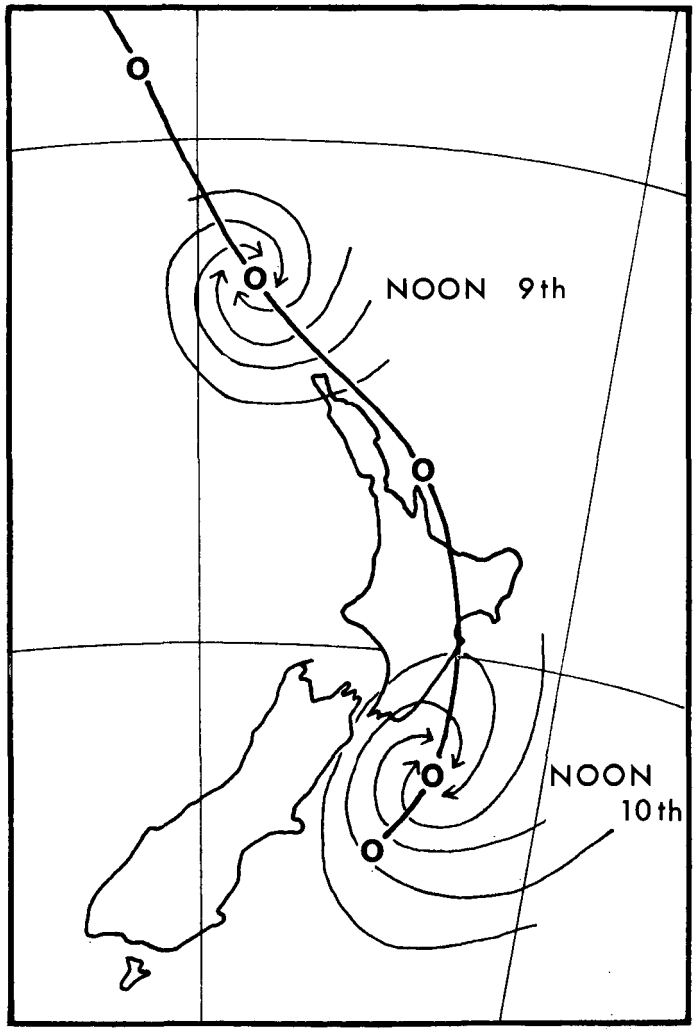


FIGURE 1 — PASSAGE OF STORM ACROSS THE NORTH ISLAND, SHOWING WIND DIRECTIONS

(From details supplied by New Zealand Meteorological Service)

(Bull and Boeson 1961 et. seq.). All five birds found on the Wellington south coast were juveniles (birds of the year), whereas the one bird found at Hokio was allegedly in adult plumage.

Northern Blue Penguin *(Eudyptula minor novaehollandiae)* were not as heavily affected by the storm. The number of birds found (only four on the Wellington south shores, and 15 along the west coast) compares favourably with the normal mortality of the species during this time of year. The four birds found dead within the Wellington Harbour were not actually killed by the storm, but polluted from the oil slick following the 'Wahine' distaster, and died on eastern beaches of the Miramar Peninsula. One of these, P-526, was a female banded as an adult breeding bird on Somes Island on 10 November, 1956. This bird was at least 15 years old at the time of its death.

Diomedeidae (Albatrosses)

A total of 187 albatrosses of 5 species was found, all of which, except for one White-capped Mollymawk *(Diomedea c. cauta)* were cast ashore on southern beaches, or blown inland from the south. All albatrosses on beaches were found on or beyond storm tide level, indicating that they were swept ashore at the height of the storm and either killed in the breakers, or cast ashore alive and died later. By contrast, many of the smaller petrels were probably killed by the storm further out to sea and cast ashore by later tides. The larger albatrosses were more affected by the storm than the smaller ones. 91 Northern Royal Albatross *(Diomedea epomophora sanfordi)*, 19 Southern Royal Albatross *(Diomedea e. epomophora)* and 26 Wandering Albatross *(Diomedea e. exulans)* were found. Of the smaller albatrosses the White-capped Mollymawk was most affected, and a total of 45 specimens was collected, whereas only 5 Black-browed Mollymawk *(Diomedea melanophris)* and a single Buller's Mollymawk *(Diomedea bulleri)* were recovered.

The ratio of immature to adult Royal Albatross on the beach sectors visited by the author was approximately 1:5, whereas 50%, i.e. 13 out of the 26 Wandering Albatross, were birds in brown juvenile plumage. Only one of 45 White-capped Mollymawk showed some immature signs in the colouring of its bill, whereas four of the five Black-browed Mollymawk found, were birds of the year. One of these was banded as a chick on Campbell Island, 13 March 1968 (0-12120). Some birds were blown up the Wairarapa Valley for considerable distances, and two White-capped Mollymawk were found alive as far north as Mauriceville and Woodville, i.e. 53 and 85 miles inland respectively. Others were reported ('Wairarapa Times-Age,' 17 April 1968) from Featherston, Mangamahoe, and Masterton. The only adult Black-browed Mollymawk found, was picked up 3 miles inland on the Orongorongo River bed.

All the above species of albatross occur in numbers in Cook Strait and outer Palliser Bay area, but comparative numbers killed by the storm are surprising. Bartle (in prep.) reports Wandering Albatross and both sub-species of Royal Albatross throughout the area. Wandering Albatross were never observed in large numbers, but Royal Albatross were more frequently seen. The ratio of Southern

to Northern Royal Albatross observed from a fishing vessel was estimated at 6:1. However the ratio of Southern to Northern Royal Albatross killed by the storm was 1:5.

The severe mortality of the two large albatross species during this storm is apparent when compared with published data on beach-cast specimens during recent years. In a 25-year period i.e. during 1939 - 1959 and 1960 - 1963 (Bull and Boeson, 1961a, 1961b, 1963, 1964, 1965) only 46 Wandering Albatross and 23 Royal Albatross were reported to the O.S.N.Z. Beach-patrol Scheme, or published in "Notornis" as individual findings of dead birds, as being found along all of the New Zealand coast. During the April 1968 storm, 26 Wandering Albatross and 110 Royal Albatross were found on Wellington south coast beaches alone.

In addition to the three species of mollymawk found during April, three others occur regularly in the affected area, i.e. Salvin's Mollymawk *(Diomedea cauta salvini)*, Chatham Island Mollymawk *(Diomedea cauta eremita)* and the Grey-headed Mollymawk *(Diomedea chrysostoma)*. The Grey-headed Mollymawk although normally the most common of the mollymawks reported beach-cast in the Wellington area (Bull and Boeson 1961 et seq.), was not found storm-wrecked during April. Chatham Island Mollymawk are extremely rare, but Salvin's Mollymawk are regularly present and scavenging offal from fishing vessels in only slightly lower numbers than White-capped Mollymawk (Bartle in prep.). Bartle estimates the ratio of these two closely related sub-species as being about 1:2 (Salvin's : White-capped). Bartle's estimate has been confirmed by J. Moreland (pers. comm.) and compared closely with observations made by the author in the area some years ago. It was surprising therefore, that although 45 White-capped Mollymawk either died or were blown inland, no specimens of Salvin's Mollymawk were found. Following a similar, but less severe storm in February 1947, close to 40 Salvin's Mollymawk were picked up on Wellington south beaches, but no White-capped Mollymawk were reported at the time (Cunningham, 1948). On first glance it seems difficult to explain why the position was reversed during the April storm of 1968. However, all White-capped Mollymawk found storm-killed during April were in heavy moult, with primary feathers missing, or not completely renewed, and body moult only half completed. Cunningham (1948) does not mention the plumage conditions of Salvin's Mollymawk found during February 1947 but three specimens picked up on Wellington beaches following that storm and held in the Dominion Museum collections (DM-1309, Petone 18/2/47; DM-1310, Petone, 17/2/47; DM-12301, Wanganui, 17/2/47) were in full moult. The same moult condition was found in two additional specimens both collected during February, but in different years and localities (DM-1212, Bounty Island, 27/2/26; DM-9893, Ohope, Bay of Plenty, February 1962). Therefore, the evident reason for the large mortality, is that the respective storms occurred during moult, when the birds were most vulnerable. Heavy losses of moulting White-capped Mollymawk were suffered during April 1968, whereas Salvin's Mollymawk, which had completed their annual moult at the time, seemed to have been unaffected. During the February storm in 1947 the situation was reversed.

The same applied to the two larger species of albatross *(D. exulans* and *D. epomophora)*. In February 1947 only eight of these albatross were cast ashore, whereas in April 1968 136 were killed. All the April birds were in heavy moult, showing that Albatross are particularly vulnerable to storm mortality during moult.

Procellariidae and *Pelecanoididae*

Only four Giant Petrel *(Macronectes giganteus)* were found on Wellington's southern beaches. This is a surprisingly small number, as several hundred at a time congregated at the Tory Channel whaling station during its operations a few years ago, and dozens can sometimes be observed within Wellington Harbour. However, this species does not seem numerous in eastern Cook Strait (Bartle, in prep.) and the number killed by the storm confirms this observation. The same appplies to Cape Pigeon *(Daption capensis)*, which only occur in moderate numbers during the late summer, increasing during the winter months (Bartle, in prep.) when they are more frequent casualties on Wellington beaches. No Cape Pigeon were found.

Numerically, the two most unexpected petrels killed in the Wellington area, were Grey-faced Petrel *Pterodroma macroptera gouldi)* and Black-winged Petrel *(Pterodroma hypoleuca nigripennis)*, both of which are classified as sub-tropical, warm water sub-species. Grey-faced Petrels are seldom found on Wellington beaches, the only published record being 11 specimens killed on the Palliser Bay coastline by the February 1947 storm. (Cunningham, 1948). Following the April 1968 storm, 42 Grey-faced Petrel were recorded, concentrated mainly in the Wellington Harbour, Hutt Valley, and on eastern Palliser Bay beaches. Birds found were as far inland as Upper Hutt, and also Mount Bruce in the Wairarapa, 60 miles inland. The "Wairarapa Times-Age" of 17 April 1968 reported several "mutton-birds" found alive in the Wairarapa, which are assumed to have been Grey-faced Petrel. Cunningham (1948) explains the occurrence of this species storm-killed on the Wairarapa coast, by the birds having first being blown south from the Bay of Plenty - East Cape, and then north against the mainland. This explanation is quite plausible. However, Fleming (1950: 184) reports this species as abundant about 100 miles off the North Island coast and as far as 35°S, and J. Moreland (pers. comm.) has observed Grey-faced Petrel between Banks Peninsula and the Chatham Islands. It can be assumed that this species, although not previously observed in eastern Cook Strait, regularly feeds in the warm East Cape current, which extends south to the Chatham Islands. The birds killed in April 1968 could have been blown in from the east or south-east, and killed by the southerly wind as the storm passed south.

All birds of this species were far advanced in moult with fresh flight feathers. However, in the majority, the 10th (outermost) primary had not reached its full length and all birds dissected were adults coming into breeding condition.

Black-winged Petrels are known to breed on Norfolk, the Kermadec and Three Kings Islands within the New Zealand region. Observations of these birds at sea south of North Cape are rare, but were reported in the Bay of Plenty and East Cape vicinity by P. C. Harper in 1965 (pers. comm.). Up to April 1968, only four

storm-cast specimens were found on the New Zealand mainland and all were found in the Wellington area (Imber, 1966; P. C. Bull, unpublished, 1964). Following the April storm, 41 were found, nine in Hawkes Bay (one nearly five miles inland at Pakowhai), two on the Wellington south coast, and 30 on beaches between Otaki and Wanganui on the west coast. The weather preceding the beach-cast of one specimen found on Foxton beach in 1963 was similar to, but not as severe as that in April 1968. Imber (1966) speculates that this bird was probably blown south along the east coast of the North Island and later blown through Cook Strait by strong southerlies, finally perishing in the Tasman Sea. The large number of Black-winged Petrels found during the April cyclone, and the distribution of the storm-wrecked birds around the southern parts of the North Island, support Imber's theory. The birds may have been swept south from the North Cape and Bay of Plenty by gale force northerlies, some being killed on Hawkes Bay beaches by predominantly east to north-east winds there; others, blown further south and wrecked on the Wellington south coast, or blown back north through Cook Strait into the Tasman Sea by the storm force southerly winds.

Ten birds of this species were found in good condition, and prepared as study skins at the Dominion Museum. Eight were adults (3 males and 5 females) and 2 immature (both males). All adults had finished their moult of flight feathers and rectrices and only two had not completed body moult. Both immature birds showed slight body moult. All ten birds were thin, their average weight being 115.5 gms. with a maximum of 150 gms. and a minimum of 100 gms.

The total of 102 Fairy Prion *(Pachyptila turtur)* found may seem high. However, if the vast numbers normally occurring in the affected area are kept in mind, and the number killed during the storm compared with those beach-cast in the Wellington area annually (Bull and Boeson 1961 and seq.), it is evident that the mortality caused by this storm is not particularly high.

Westland Black Petrels *(Procellaria westlandica)*, now known to occur regularly in eastern Cook Strait and along the South Island east coast, as far as Banks Peninsula (Bartle in prep.), were affected to some degree by the storm, six birds being found. Two were found at Petone Freezing Works, one near the Orongorongo River mouth and three on eastern Palliser Bay beaches. All had fresh plumage, and the four birds dissected were adults with enlarged gonads.

Flesh-footed Shearwaters *(Puffinus carneipes hullianus)* seem to have suffered little during the storm, as only eight were found (one in Wellington, five in eastern Palliser Bay, and two on the west coast). This species is very common in eastern Cook Strait and outer Palliser Bay, and Bartle (in prep.) considers them to be one of the most numerous species of pelagic birds during summer and up to the end of April, when they suddenly disappear on their northward migration. J. Moreland (pers. comm.) reported them as numerous in the area on 27 March 1968, two weeks before the storm.

TABLE 1 — LIST OF SPECIES RECOVERED FOLLOWING STORM OF 10 APRIL, 1968 SHOWING NUMBERS AND PLACE OF RECOVERY

Species	Sectors 1.	2.	3.	4.	5.	6.	7.	8	Total on Southern Beaches	9.	Sectors 10.	11.	12.	13.	14	Total on West Coast	Hawkes Bay	Species Totals
Megadyptes antipodes			1		1		3		5			1				1		6
Eudyptula minor novaehollandiae		4			3		1		8	3		1	1	2		7		15
Diomedia e. exulans			1		2	6	17		26									26
Diomedia e. epomophora			1		3	11	4		19									19
Diomedia epomophora sanfordi		9	17		19	19	27		91									91
Diomedia melanophris			2			2	1		5									5
Diomedia bulleri						1			1									1
Diomedia c. cauta		8	11		3	7	13	2	44					1		1		45
Macronectes giganteus		1			1		2		4									4
Pterodroma macroptera gouldi		17	1		1	14	8	1	42									42

TABLE 1 — *Continued*

Species	Sectors 1.	2.	3.	4.	5.	6.	7.	8.	Total on Southern Beaches	9.	10.	Sectors 11.	12.	13.	14.	Total on West Coast	Hawkes Bay	Species Totals
Pterodroma hypoleuca nigripennis			1				1		2			16	12	1	1	30	9	41
Pachyptila v. vittata						1			1			1				1		2
Pachyptila desolata						2	1		3			2		1		3		6
Pachyptila turtur		10	2		20	21	13	1	67	3		12	8	1	11	35		102
Procellaria westlandica		2	1			1	2		6									6
Puffinus carneipes hullianus		1				3	2		6					2		2		8
Puffinus bulleri		2	4		3	26	34		69			1	3	2		6		75
Puffinus griseus					1				1	1		1	2	1		5		6
Puffinus g. gavia		2	3			5	8		18			8	3	7		18		36
Puffinus huttoni													1			1		1

TABLE 1 — *Continued*

Species	Sectors (see map) 1.	2.	3.	4.	5.	6.	7.	8.	Total on Southern Beaches	9.	Sectors (see map) 10.	11.	12.	13.	14	Total on West Coast	Hawkes Bay	Species Totals
Puffinus assimilis ssp.													1			1		1
Pelecanoides urinatrix						1			1			1	1	1		3		4
Sula bassana serrator	8			9		3			20			1	4			5		25
Phalacrocorax carbo						1			1									1
Strictocarbo punctatus						1			1	1						1		2
Haematopus ostralegus finschi													1			1		1
Larus dominicanus			2				1		3	1						1		4
Larus novaehollandiae scopulinus							1		1									1
Larus bulleri																	1	1
Sterna striata						1	3		4		3	2	1			6		10
Carduelis carduelis					1				4		3	2	1			6		10
TOTALS:	64	47		67	126	142	4		450	9	3	47	38	19	12	128	10	588

Buller's Shearwaters *(Puffinus bulleri)*, however, suffered heavy losses and a total of 75 was found. Buller's Shearwaters are found on Wellington beaches fairly regularly, but have been considered one of the rarer species of the area. Recently, however, Bartle (in prep.) has found them occurring in large numbers in eastern Cook Strait during autumn and considers them to be the most abundant species of petrel at that time. The large number storm-killed during April agrees with his findings. The birds found were both juvenile and adult, the latter being in full moult.

Two further species of petrel need special mention, mainly because of the small number killed. Sooty Shearwater *(Puffinus griseus)* occur in eastern Cook Strait throughout the summer, with a large increase during the spring and autumn migrations. Bartle's observations during the first half of 1966 (in prep.), indicate that numbers of Sooty Shearwater in the area are fairly constant up to late April when they suddenly increase because of migrating birds moving north from the Stewart Island breeding grounds. His estimated ratio of Sooty Shearwater to Buller's Shearwater during late summer is in the vicinity of 1:5. However, only one Sooty Shearwater was found on eastern beaches, as compared with 69 Buller's Shearwater. This indicates that Sooty Shearwater were not as heavily affected.

Least affected of all petrels was the Diving Petrel *(Pelecanoides urinatrix)*, large numbers of which occur in Cook Strait throughout the year. This species is regularly beach-cast in the Wellington area. Only one specimen (freshly moulted) was found on the Wellington south coast, and three on Wellington west coast beaches.

Sulidae

Gannets *(Sula bassana serrator)* suffered a fairly high mortality during the storm, and of the 25 individuals found, 20 were picked up on the Wellington south coast. Eight of these were blown ashore at Petone, giving a fair indication of numbers present in Wellington Harbour at the time. Three of the 25 birds were juveniles. One adult was banded as a chick on 31/1/60 at Cape Kidnappers Plateau (M-14290), and one juvenile banded as a chick on 26/1/68 at Cape Kidnappers Plateau (M-17361).

Laridae and *Sternidae*

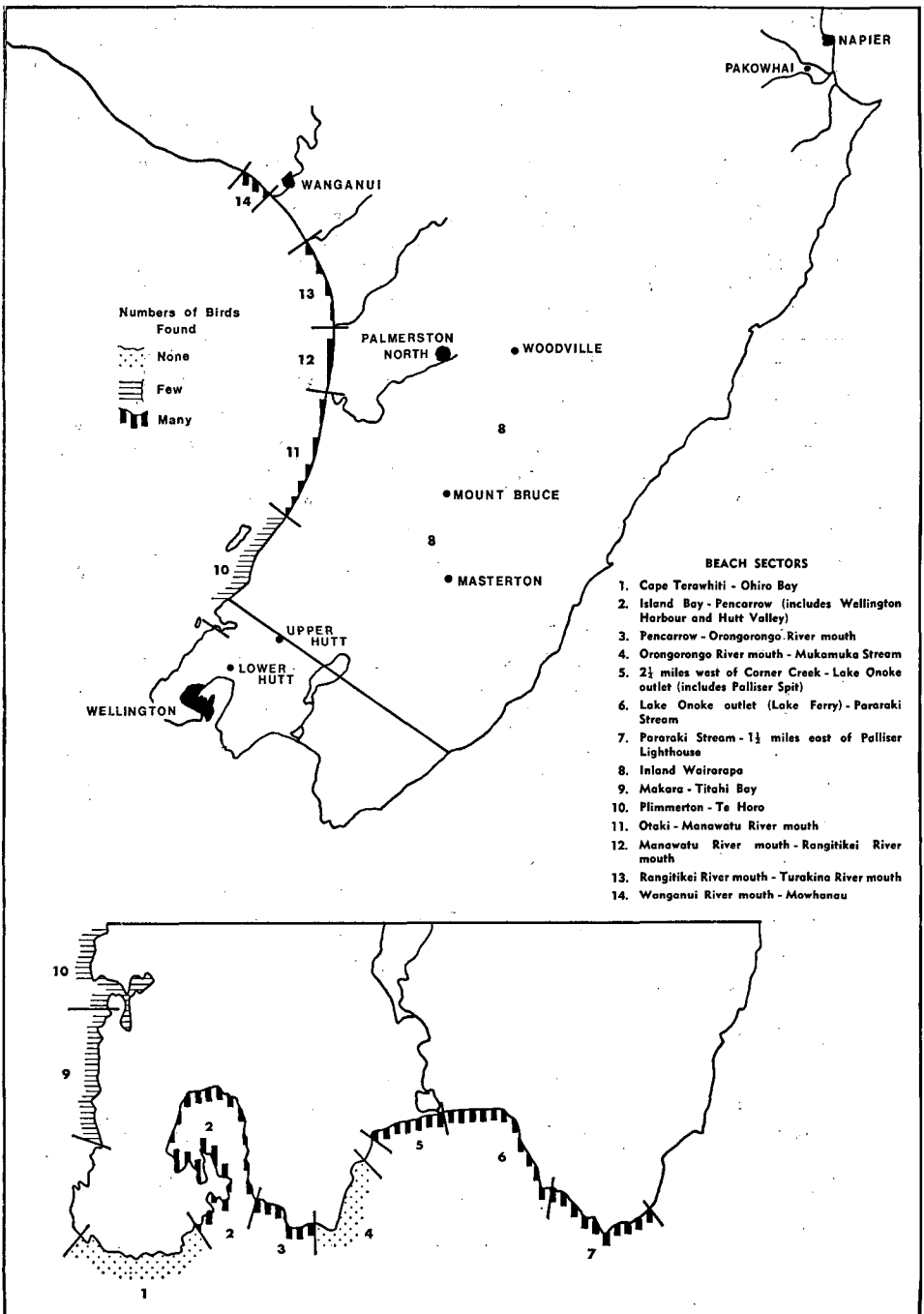
These two families hardly suffered any loss, except for White-fronted Tern *(Sterna striata)*, 10 of which were found. All of these were juveniles, fledged during the previous breeding season (1967-68), and in very poor physical condition.

One Black-billed Gull *(Larus bulleri)*, banded as a chick on 20/11/66 at Waipara River, North Canterbury (E-46468), was found storm-killed in Hawkes Bay.

DISCUSSION

It is evident from Table 1 that the main mortality of pelagic birds occurred along the Wellington south coast. The largest numbers were found in the Wellington Harbour area, near the Wainuiomata and Orongorongo River mouths and in the central and eastern parts of Palliser Bay. No birds were found along two lengthy stretches of beach between Cape Terawhiti and Cape Palliser. The long stretches from Cape Terawhiti to Ohiro Bay and the beach between

FIGURE 2 — COASTLINE INVESTIGATED FOLLOWING STORM OF 10 APRIL, 1968, SHOWING AREAS SEARCHED AND DENSITY OF WRECKED BIRDS



the Orongorongo River mouth and Corner Creek were bare (see Figure 2 and Table 1). A possible explanation for this is the orientation of the beaches to wind direction. Petrels blown against the coast during a storm tend to fly along the coast in the line of least resistance, until exhausted. A coast aligned north-west, such as that between Sinclair Heads and Cape Terawhiti, will naturally tend to "funnel" birds north through the Cook Strait narrows, into the Tasman Sea. The western beaches of Palliser Bay, however, lay more or less parallel to the wind at the height of the storm. On the Wellington west coast, with winds during the storm blowing from the south to south-west, the beaches become more exposed in the north (Sectors 11-14), where the majority of beach-cast birds were found. The exceptionally high mortality in the Palliser Bay and Wellington Harbour areas can be accounted for by birds being swept south along the east coast of the North Island and west out of the Pacific Ocean, into the comparatively restricted area of eastern Cook Strait, where they were caught by the storm-force southerly winds and swept north against the North Island, with only a very narrow escape route through Cook Strait. Those birds which managed to escape were able to disperse in the Tasman Sea, if not overcome by exhaustion and washed ashore on western beaches.

ACKNOWLEDGEMENTS

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