# SEA BIRDS FOUND DEAD IN NEW ZEALAND IN 1968

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**ABSTRACT**

During 1968, 65 members of the O.S.N.Z. patrolled a total of 1,188 miles of coast and found 4,716 dead seabirds of 49 species. A unique factor was the tropical cyclone in April, the effects of which around southern coasts of the North Island have been described elsewhere. There was an unusually protracted period of strong westerly winds from mid-September to end of November which was accompanied by an extensive wreck of Short-tailed Shearwaters **Puffinus tenuirostris** and several other species. Excluding April specimens, unusual birds were three Storm-petrels (Wilson's, **Oceanites oceanicus**; Grey-backed, **Garrodia nereis**; Black-bellied, **Fregetta tropica**), a Sooty Tern **Sterna fuscata** and two Spine-tailed Swifts **Chaetura caudacuta.**

The style of this report follows that of the 1964 report (Imber and Boeson 1969). See figure 1 in that paper for demarcation of the 15 coastal zones.

## RESULTS

In Table 1 the overall results of 1968 patrols are presented, and in Tables 2, 3 and 4 data on the birds found are analysed. The normal pattern of mortality (in terms of birds/mile) through the year was upset by a tropical cyclone which, from April 9 to 11 while maintaining its intensity, progressed much further south than such systems usually do in the New Zealand region. This cyclone caused considerable seabird mortality around southern coasts of the North Island (Kinsky 1968). Unfortunately other eastern coasts of New Zealand were apparently not searched after this storm. It seems likely that, at least on some parts of South Island's east coast, numbers of seabirds were wrecked. L. C. Edlin (pers. comm.) found numbers of old corpses on a Canterbury South beach about a month afterwards. The cyclone passed down the Auckland East coast and over the Bay of Plenty coast but no subsequent patrols were reported from those zones. In addition to those reported by Kinsky (1968), specimens of the Black-winged Petrel *Pterodroma hypoleuca nigripennis* were found inland at Rotorua (probably via Bay of Plenty) and at Wairoa (East Coast North Island) afterwards. Results of the patrols reported by Kinsky, to which the reader is referred, are excluded from this report except for their inclusion in Table 1 (578 specimens from WW and WS zones).

The second important feature of 1968 patrols was the big wreck in spring of Short-tailed Shearwaters *Puffinus tenuirostris,* Prions (*Pachyptila* species) and, to a lesser extent, several other species. This prolonged wreck, concentrated in the second half of October but extending from mid-September to the end of November, accompanied an almost continuous period of westerlies. Though westerlies are common over New Zealand in spring and summer, this period was notable for its persistence and severity. The numbers of Short-tailed and Hutton's Shearwater *Puffinus huttoni* were by far the highest recorded yet in one year. In contrast Sooty *P. griseus* and, on a lesser scale, Buller's Shearwaters *P. bulleri* are often found in higher numbers in spring.

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TABLE 1 : Numbers of dead seabirds recorded and miles patrolled on each coast in 1968*

| COAST | CODE | | MONTH JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTALS | | BIRDS/MI/MO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Auckland West | AW | Miles | 30 | 4 | - | - | 4 | 4 | 45 | 50 | 16 | 12 | 19 | 10 | 194 | | |
| | | Birds | 18 | 5 | | | 10 | 5 | 58 | 24 | 8 | 109 | 35 | 23 | | 295 | 1.5 |
| Taranaki | T | Miles | 6 | 10 | 5 | 3 | 7 | 3 | 10 | 5 | 3 | 1 | 3 | 8 | 64 | | |
| | | Birds | 4 | 19 | 6 | 5 | 9 | 9 | 16 | 5 | 3 | 2 | 7 | 32 | | 117 | 1.8 |
| Wellington West | WW | Miles | 2 | 20 | - | 70 | - | 40 | - | 41 | 44 | 66 | 63 | 45 | 391 | | |
| | | Birds | 5 | 59 | | 128 | | 15 | | 81 | 436 | 1944 | 942 | 105 | | 3715 | 9.5 |
| Westland | WD | Miles | - | - | - | - | - | - | - | - | 12 | 27 | - | - | 39 | | |
| | | Birds | | | | | | | | | 0 | 17 | | | | 17 | 0.4 |
| Auckland East | AE | Miles | - | 7 | 1 | - | 2 | - | 14 | 2 | - | - | - | - | 26 | | |
| | | Birds | | 7 | 1 | | 1 | | 29 | 1 | | | | | | 39 | 1.5 |
| Canterbury South | CS | Miles | - | - | - | - | - | - | - | - | - | 3 | 3 | - | 6 | | |
| | | Birds | | | | | | | | | | 12 | 2 | | | 14 | 2.3 |
| Otago | O | Miles | - | 10 | - | 3 | 1 | - | - | - | - | - | - | - | 14 | | |
| | | Birds | | 6 | | 3 | 0 | | | | | | | | | 9 | 0.6 |
| Southland | S | Miles | - | - | - | - | - | - | - | - | - | 2 | 2 | - | 4 | | |
| | | Birds | | | | | | | | | | 43 | 5 | | | 48 | 12.0 |
| Wellington South | WS | Miles | 1 | - | - | 65 | 1 | - | 4 | - | - | - | 1 | - | 72 | | |
| | | Birds | 2 | | | 450 | 1 | | 7 | | | | 2 | | | 462 | 6.4 |
| Total Miles Travelled | | | 39 | 51 | 9 | 143 | 18 | 54 | 79 | 118 | 154 | 234 | 216 | 73 | (1188) | | |
| Total Miles Covered | | | 39 | 51 | 6 | 141 | 15 | 47 | 73 | 98 | 75 | 111 | 91 | 63 | 810 | | |
| Total Birds Recorded | | | 29 | 96 | 7 | 586 | 21 | 29 | 110 | 111 | 447 | 2127 | 993 | 160 | | 4716 | |
| Birds/Mile Covered/Month | | | 0.7 | 1.9 | 1.2 | 4.2 | 1.4 | 0.6 | 1.5 | 1.1 | 6.0 | 19.2 | 10.9 | 2.5 | | | 5.8 |

* No patrols were reported from Fiordland, Bay of Plenty, East Coast North Island, Wairarapa, Canterbury North, or North Coast South Island.

Specimens of several unusual species were found. From sub-antarctic or antarctic seas there were 10 Blue Petrels *Halobaena caerulea*, a Kerguelen Petrel *Pterodroma brevirostris*, and 3 Storm-petrels: Wilson's *Oceanites oceanicus*, Grey-backed *Garrodia nereis* and Black-bellied *Fregetta tropica*. From subtropical or tropical seas a Sooty Tern *Sterna fuscata*. From arctic regions and a regular trans-equatorial migrant, one Arctic Skua *Stercorarius parasiticus* which, however, is more often seen than found dead. But perhaps most interesting were two Spine-tailed Swifts *Chaetura caudacuta* which breed in Asia and migrate to Australia for the southern summer. They were found on 23 November 1968 (Waitarere beach, WW) and 1 December 1968 (Timaru Road beach, T). Another unusual and migratory land bird found was a Long-tailed Cuckoo *Eudynamis taitensis* on Himatangi beach (WW) in October.

Miscellaneous birds not considered seabirds totalled 37. These were the three above plus 11 White-backed Magpies, 6 Rock Pigeons, 5 Blackbirds, 2 Song Thrushes, 2 Kingfishers, and one New Zealand Pigeon, White-faced Heron, Pukeko, Black Swan, Pheasant, Myna, Chaffinch and House Sparrow.

## DISCUSSION

### Fairy Prion:

Between 10 and 16 September 1968, 4991 Fairy Prions were banded on Stephens Island (N.Z. National Banding Scheme, pers. comm.). This island lies off the South Island's north coast and is just 60 miles west of Wellington West coast. During the following three months 637 Fairy Prions were picked up on that coast yet not one of them was found to be banded. This gives us an indication of the vast numbers of this species.

### Short-tailed Shearwater:

The 755 found this year can be compared with 8 in 1960, 22 in 1961, 16 in 1962, 6 in 1963, and 4 in 1964 (see Imber and Boeson 1969; Boeson 1965; and previous reports by Bull and Boeson). On the other hand Sooty Shearwaters were *more* abundant in all of those years, numbering 300 to 600 except in 1960, despite lesser mileages being searched. The large numbers of *tenuirostris* found suggested a shortage of food in the course of their 1968 circum-Pacific migration. But *griseus* apparently takes the same course and probably has a very similar, if not identical, diet. There may have been differences in the food supply for the two species during that migration.

But, to us, a more likely explanation is the spring weather conditions. At the end of the migration both *tenuirostris* and *griseus* apparently move south-westwards from the eastern North Pacific ocean to south-eastern Australia and New Zealand respectively. In the final stages strong westerly winds, such as persisted in the Tasman Sea and around New Zealand in the spring of 1968, would impede their progress. Usually a few *tenuirostris* are wrecked on our coasts in spring, especially on west coasts, but this year the adverse winds apparently exhausted many more than usual, while they tried to cross the Tasman Sea, and many were wrecked on our west and south coasts. In the final stages of their migration, probably the vast majority of *griseus* were kept east of New Zealand by the winds. If so, most of such mortality as occurred then would pass unnoticed (because offshore winds prevent corpses being washed ashore).

TABLE 2 : Seabirds of which 1 to 5 specimens were found dead in 1968, excluding April specimens from WW and WS zones. Coast and month of discovery given.

| SPECIES OR SUBSPECIES | NUMBER FOUND | COAST(S) | MONTH(S) |
|---|---|---|---|
| Eudyptes p. pachyrhynchus | 1 | WD | 10 |
| Diomedea sp.* | 3 | AW;WW | 11; 9,11 |
| epomophora | 1 | WW | 11 |
| melanophris | 5 | AW;WW | 1,7,7,10;8 |
| bulleri | 1 | WS | 7 |
| Puffinus carneipes | 4 | AW;AE | 1,11,11;2 |
| Pterodroma macroptera | 3 | AW;AE | 7;7,7 |
| inexpectata | 3 | AW;WW | 12;11,11 |
| brevirostris | 1 | WW | 9 |
| cooki | 2 | WW;AE | 11; 3 |
| Oceanites oceanicus | 1 | WW | 1 |
| Garrodia nereis | 1 | WW | 10 |
| Pelagodroma marina | 2 | WW | 10 |
| Fregetta tropica | 1 | WS | 5 |
| Phalacrocorax carbo | 4 | WW; T | 9; 2,7,7 |
| varius | 1 | AE | 2 |
| sulcirostris | 1 | AW | 9 |
| melanoleucos | 3 | AW;AE | 5,5; 2 |
| Stercorarius parasiticus | 1 | WW | 11 |
| Larus bulleri | 1 | CS | 11 |
| Hydroprogne caspia | 2 | AW | 2,8 |
| Sterna striata | 5 | T;WW;O | 1,4,7;2;4 |
| fuscata | 1 | T | 2 |
| TOTAL | 48 | | |

* Species not identified.

TABLE 3 : Coastal distribution of the more common seabirds found dead in 1968, excluding April specimens from WW and WS zones.

| SPECIES OR SUBSPECIES | COAST | | | | | | | | | TOTAL BIRDS |
|---|---|---|---|---|---|---|---|---|---|---|
| | AW | T | WW | WD | AE | CS | O | S | WS | |
| Eudyptula minor | 24 | 12 | 44 | - | 1 | - | 2 | - | - | 83 |
| Diomedea exulans | 8 | - | - | - | - | - | - | - | - | 8 |
| chrysostoma | 13 | - | 12 | - | - | - | - | - | - | 25 |
| cauta cauta | 8 | 4 | 5 | - | - | - | - | - | - | 17 |
| cauta subsp.* | - | - | 1 | - | - | - | - | - | - | 1 |
| Phoebetria palpebrata | 6 | - | - | - | - | - | - | - | - | 6 |
| Macronectes giganteus | 9 | - | 4 | - | 1 | - | - | - | - | 14 |
| Daption capensis | 2 | 1 | 16 | 1 | - | 1 | - | - | 1 | 22 |
| Halobaena caerulea | - | 1 | 9 | - | - | - | - | - | - | 10 |
| Pachyptila spp.* | - | - | 1500 | - | - | - | - | 1 | - | 1501 |
| vittata | 17 | 2 | 148 | - | 2 | - | - | 13 | - | 182 |
| salvini | 16 | - | 17 | - | - | - | - | - | - | 33 |
| desolata | 3 | - | 56 | 1 | - | 1 | - | - | - | 61 |
| belcheri | - | - | 24 | - | - | - | - | - | - | 24 |
| turtur | 24 | 3 | 688 | 1 | 5 | - | - | - | 1 | 722 |
| Puffinus spp.* | - | - | 1 | - | - | - | 1 | - | - | 2 |
| bulleri | 1 | - | 3 | - | 1 | - | - | - | 2 | 7 |
| griseus | 16 | 18 | 70 | 5 | - | - | - | - | 3 | 112 |
| tenuirostris | 77 | 2 | 640 | 8 | - | 6 | - | 21 | 1 | 755 |
| gavia gavia | 3 | 1 | 12 | - | 3 | - | - | - | - | 19 |
| gavia huttoni | 2 | - | 90 | - | - | - | - | - | - | 92 |
| gavia subsp.* | 10 | 5 | 41 | - | 1 | - | - | - | - | 57 |
| assimilis | 1 | - | 8 | - | - | - | - | - | - | 9 |
| Pterodroma lessoni | 8 | 1 | 17 | - | - | - | - | - | - | 26 |
| Pelecanoides urinatrix | 3 | 7 | 128 | - | 3 | - | - | 12 | - | 153 |
| Sula bassana serrator | 21 | 8 | 9 | - | 12 | - | - | - | 1 | 51 |
| Phalacrocorax punctatus | - | - | - | - | - | 5 | 1 | 1 | - | 7 |
| Larus dominicanus | 6 | 15 | 24 | - | 1 | - | 1 | - | 1 | 48 |
| novaehollandiae | 2 | 30 | 5 | - | 3 | - | 3 | - | - | 43 |
| TOTALS | 280 | 110 | 3572 | 16 | 33 | 13 | 8 | 48 | 10 | 4090 |

* Species or subspecies not identified.

TABLE 4 : Monthly distribution of the more common seabirds found dead in 1968, excluding April specimens from WW and WS zones.

| SPECIES OR SUBSPECIES | MONTH 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | TOTAL BIRDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eudyptula minor | 3 | 10 | 1 | 1 | 3 | 1 | 2 | 6 | 2 | 14 | 25 | 15 | 83 |
| Diomedea exulans | 1 | - | - | - | - | - | 2 | 2 | - | 2 | 1 | - | 8 |
| chrysostoma | - | - | - | - | - | 1 | 9 | 5 | 6 | 3 | 1 | - | 25 |
| cauta cauta | 2 | 2 | - | 1 | - | 2 | 6 | - | - | 1 | 2 | 1 | 17 |
| cauta subsp.* | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| Phoebetria palpebrata | - | - | - | - | - | - | 5 | 1 | - | - | - | - | 6 |
| Macronectes giganteus | 1 | - | - | - | - | 1 | 4 | 3 | 3 | 2 | - | - | 14 |
| Daption capensis | - | - | - | - | - | 1 | 2 | 3 | - | 12 | 3 | 1 | 22 |
| Halobaena caerulea | - | - | - | - | - | - | 1 | - | 1 | 7 | 1 | - | 10 |
| Pachyptila spp.* | 3 | 18 | - | - | - | 1 | - | 18 | 262 | 848 | 329 | 22 | 1501 |
| vittata | - | - | - | - | - | - | 3 | 2 | 4 | 153 | 18 | 2 | 182 |
| salvini | - | - | - | - | - | 5 | 3 | 1 | 3 | 15 | 5 | 1 | 33 |
| desolata | - | - | - | - | - | 1 | 2 | 3 | 2 | 34 | 18 | 1 | 61 |
| belcheri | - | 1 | - | - | - | 1 | - | 8 | 5 | 7 | 2 | - | 24 |
| turtur | - | 15 | - | - | - | - | 12 | 21 | 53 | 360 | 234 | 27 | 722 |
| Puffinus spp.* | - | 1 | - | - | - | - | - | - | - | - | 1 | - | 2 |
| bulleri | - | 3 | - | - | - | - | 3 | - | - | - | - | 1 | 7 |
| griseus | 5 | 8 | - | 1 | 1 | 1 | 1 | - | 1 | 31 | 44 | 19 | 112 |
| tenuirostris | 4 | 2 | - | - | - | - | - | - | 3 | 495 | 212 | 39 | 755 |
| gavia gavia | 1 | 5 | - | - | - | - | 4 | 1 | 1 | 4 | - | 3 | 19 |
| gavia huttoni | 1 | 4 | - | - | - | - | 1 | - | 2 | 44 | 34 | 6 | 92 |
| gavia subsp.* | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 24 | 15 | 11 | 1 | 57 |
| assimilis | - | - | - | - | - | - | - | 1 | - | - | 7 | 1 | 9 |
| Pterodroma lessoni | - | - | - | 1 | - | 2 | 4 | - | 3 | 13 | 2 | 1 | 26 |
| Pelecanoides urinatrix | 1 | 4 | - | 1 | 1 | 2 | 4 | 13 | 59 | 49 | 16 | 3 | 153 |
| Sula bassana serrator | 2 | 4 | 1 | - | 7 | 1 | 19 | 10 | - | 3 | 3 | 1 | 51 |
| Phalacrocorax punctatus | - | - | - | 1 | - | - | - | - | - | 5 | 1 | - | 7 |
| Larus dominicanus | - | 5 | 2 | - | 1 | 3 | 5 | 8 | 6 | 3 | 10 | 5 | 48 |
| novaehollandiae | - | 6 | 2 | - | 4 | 5 | 8 | 2 | 3 | 1 | 3 | 9 | 43 |
| TOTALS | 25 | 89 | 6 | 6 | 18 | 29 | 101 | 109 | 443 | 2122 | 983 | 159 | 4090 |

* Species or subspecies not identified.

Two other shearwaters, *P. carneipes* and *P. bulleri,* both trans-equatorial migrants and summer breeders mainly on islands off the north-east coast, were more scarce on western beaches this spring than they have been in previous years (previous and unpublished reports).

In the period from 1953 to June 1968, there have been 48,795 Short-tailed Shearwaters banded in Australia (Purchase 1969). Two of these were recovered here this spring, one on a Westland beach (N.Z.N.B.S., pers. comm.) and the other on a Wellington West beach (E. K. Saul, pers. comm.). Both had been banded on an island in Bass Strait.

Hutton's Shearwater:

The number of this subspecies found this year is the highest yet recorded. In fact well over 100 were found, but a high proportion of those picked up in September and early October on Wellington West coast had been scavenged, only wings and sternum remaining. At first some observers were not sufficiently confident to separate the subspecies with such limited evidence.

But in most cases the wing measurement and coloration of the underwing coverts make the subspecies obvious. In the following table are set out comparative wing measurements of Hutton's and Fluttering Shearwaters. The data were extracted from the scheme's specimen record cards.

| Subspecies | Locality | Number | Wing (mm) Range | Mean | % overlap with other race |
|---|---|---|---|---|---|
| P.g. huttoni | all N.Z. | 42 | 215-238 | 224 | 42.8 |
| P.g. gavia | Cook Strait | 49 | 187-222 | 208 | 14.3 |

It can be seen that there is some overlap but, together with the evidence of underwing coloration (see Falla 1965), it should be possible to identify the subspecies of at least 3 out of 4 *Puffinus gavia* specimens by the wings alone.

Assuming that the proportion of Hutton's Shearwater among unidentified specimens was similar to that among those sub-specifically identified, then about 126 were found this year on Wellington West coast alone.

There is a markedly seasonal pattern of discovery of *huttoni* specimens, much more so than of *gavia* (Table 4; and previous reports). While *gavia* may be found throughout the year, there are no records in the scheme of fresh specimens of *huttoni* in July and August. In fact a well-developed migratory habit is shown by the latter. Earliest spring records are 5 September from Auckland West coast and 19 September from Cook Strait, both just dead. The latest records for fresh specimens are around 20 June, but they are rather scarce after March, in which month the last of the young leave the breeding ground (Harrow 1965). It seems certain, therefore, that the entire population of *huttoni* leaves New Zealand seas during autumn and they return in spring. The wintering area is almost certainly in the Great Australian Bight. Years before this race became recognised in New Zealand it was found in considerable numbers, and two specimens were collected in February 1939, near Kangaroo Island off the South Australian coast (Serventy 1939). The months when it was reported in that area were February to July, but it may well have been present for longer. A specimen had previously been reported, as a new species, from as far west as Bunbury in south-western Australia (Serventy 1939) and at least one other specimen has been found there since then (Serventy 1956). There is also a specimen from the New South Wales coast (Serventy 1939). Though some ornithologists suspected that the South Australian *huttoni* were breeding in that area, only the New Zealand South Island breeding ground has been found.

Fluttering Shearwater:

While *huttoni* is migratory, *gavia* is apparently partially migratory or sedentary. Beach patrolling has confirmed the presence of *gavia* around the North Island throughout the year; "fluttering-type" shearwaters may be seen right through the year in Cook Strait, Bay of Plenty and elsewhere. But part of this population apparently migrates to the eastern coast of Australia in the non-breeding season, and some (immatures probably) may be present there the whole year round. Though ornithologists have visited most islands on that coast no breeding ground has been found locally for these shearwaters, which occur in considerable numbers along the New South Wales and Queensland coasts as far north as the southern limit of the Great Barrier Reef (Hindwood 1948; Norris 1967). They have been recorded throughout the year but "the period of greatest abundance appears to be from July to November" (Hindwood 1948: 77). Hindwood thought these were migrants from New Zealand.

Though these birds have been treated as the subspecies *byroni*, the name originating with G. M. Mathews (Serventy 1939: 104, 1941: 404), it appears that the small differences between them and specimens collected in New Zealand can be accounted for by immaturity. Most Australian specimens may be young and non-breeding migrants from New Zealand; older birds may be more sedentary. The differences attributed to these Australian birds were smaller size and darker upperparts. These are characteristics of recently-fledged shearwaters in particular. However, Murphy (1952: 16) decided that "there is no difference in size between 55 examples of *gavia* collected in and around New Zealand and 26 taken in Australian waters." In the following table culmen and wing measurements of *P.g. gavia* from Australia, northern New Zealand and Cook Strait are compared.

| Region | Culmen | | Wing | | Source of data |
|---|---|---|---|---|---|
| | N | Mean (mm) | N | Mean (mm) | |
| Australia | 13 | 32.5 | 13 | 198 | Serventy 1939 |
| " | 26 | 32.9 | 26 | 206 | Murphy 1952 |
| Northern N.Z. | 28 | 33.3 | 25 | 206 | Serventy 1939 and B.P. Scheme |
| All N.Z. | 55 | 33.5 | 55 | 209 | Murphy 1952 |
| Cook Strait | 66 | 32.7 | 49 | 208 | B.P. Scheme |

The main difference between the Australian and New Zealand specimens is the wing length. With the Sooty Shearwater, Richdale (1963: 33-35) found that fledglings immediately prior to departure had shorter wings (by about 8 mm.) than adults measured at the breeding colony. A similar relationship no doubt exists with Fluttering Shearwaters.

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**REFERENCES**

BOESON, B. W., 1965: Seabirds found dead in New Zealand in 1963. Notornis 12, 3, 169-175.
FALLA, R. A., 1965: Distribution of Hutton's Shearwater in New Zealand. Notornis 12, 2, 66-70.
HARROW, G., 1965: Preliminary report on discovery of nesting sites of Hutton's Shearwater. Notornis 12, 2, 59-65.
HINDWOOD, K. A., 1948: Notes on the sea-birds breeding on the coastal islands of New South Wales. The Emu 48, 1, 73-81.
IMBER, M. J., and BOESON, B. W., 1969: Seabirds found dead in New Zealand in 1964. Notornis 16, 1, 50-56.
KINSKY, F. C., 1968: An unusual seabird mortality in the southern North Island (New Zealand), April 1968. Notornis 15, 3, 143-155.
MURPHY, R. C., 1952: The Manx Shearwater **Puffinus puffinus**, as a species of world-wide distribution. Amer. Mus. Novitates 1586, 1-21.
NORRIS, A. Y., 1967: Seabird observations from the south-west Pacific in the southern winter. The Emu 67, 1, 33-55.
PURCHASE, D., 1969: Fourteenth annual report of the Australian bird-banding scheme, July 1967 to June 1968. C.S.I.R.O. Div. of Wildlife Research, Tech. Paper 19.
RICHDALE, L. E., 1963: Biology of the Sooty Shearwater **Puffinus griseus**. Proc. Zool. Soc. Lond. 141, 1, 1-117.
SERVENTY, D. L., 1939: The White-breasted Petrel of South Australia. The Emu 39, 2, 95-107.
———— 1941: The identity of **Procellaria gavia** Forster. The Emu 40, 403-408. (April 1941).
———— 1956: Western Australian ornithology — a review of the **Western Australian Naturalist** 5, 6. September 1956. The Emu 56, 5, 438.


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# SHORT NOTE

## THE WHITE-FACED HERON

The recent article on the White-faced Heron *Ardea novaehollandiae* in New Zealand (Carroll 1970, *Notornis* 17, 1: 3-24) provides a summary which must be of considerable value to future workers, and the author is to be commended on an exhaustive treatment of records. However, the frequent use of the term 'colony' in regard to this species, is likely to be misleading.

I know of no case where the White-faced Heron's behaviour has included the gregarious breeding which typifies a colony (Thomson, 1964). In the Shag Valley, Otago, it nested first near Bushy Park Estate, from 1931 according to the late Mr. Alex. Twaddle, manager of the estate for many years. I believe only one pair nested there until the late 'thirties; about 1938 a second pair nested some five miles away near Inch Valley, then a third pair took up a site two or three years later at the old Waihemo Estate property some three miles away, where some records were obtained (Ellis, 1944). In each case a site was occupied in consecutive seasons by only one pair (Ellis, 1954).

Although some areas now carry quite heavy populations, with consequent demands on available nesting sites, in New Zealand this heron continues the pattern of its behaviour in Australia, most recently described by Frith (1968): "Normally single nests are found, and they do not form nesting colonies, although occasionally several nests are found in adjacent trees."


**REFERENCES**

CARROLL, A. L. K., 1970: The White-faced Heron in New Zealand. Notornis 17, 1: 3-24.
ELLIS, B. A., 1944: The White-faced Heron. Notornis 1, 6: 109-110.
ELLIS, B. A., 1954: New Zealand Nesting of the White-faced Heron. Notornis 6, 1: 22-24.
FALLA, R. A., SIBSON, R. B., and TURBOTT, E. G., 1966: *A Field Guide to the Birds of New Zealand* (Collins).
FRITH, H. J., (Ed.), 1968: Birds in the Australian High Country (A. H. & A. W. Reed), p. 71.
THOMSON, A. LANDSBOROUGH (Ed.), 1964: A New Distionary of Birds (Nelson), p. 139.


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