

THE DISTRIBUTION OF BULLER'S SHEARWATER (*Puffinus bulleri*) IN NEW ZEALAND COASTAL WATERS AND IN THE TASMAN SEA

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ABSTRACT

Records gathered since 1960 in the coastal waters of New Zealand and in the Tasman Sea are plotted. They show the September return of Buller's Shearwaters from migration; their distribution through the austral summer; and their almost total withdrawal from the region by the end of May. Their present wider distribution is shown, apparently related to the increasing numbers of breeding birds at the Poor Knights Islands.

INTRODUCTION

Harper (1983) recorded the known history of Buller's Shearwater at the Poor Knights, their only known breeding islands. However, little has been written on their distribution at sea in the South-west Pacific, other than my records, largely in New Zealand coastal waters (Jenkins 1974). Since 1974 the total population has increased markedly (Harper 1983), and so it is useful to update the pattern of coastal distribution and show how the birds have spread into the Tasman Sea. More people have been keeping records in the region since 1974, giving much better coverage. This paper is based on all the observations I have been able to find, including my own records made before 1974.

The charts (Fig. 1-12) show the highest count of Buller's Shearwaters seen at one time in any area of one degree of latitude by one degree of longitude. The charts also show areas visited where none were seen (open circles) and areas not visited (blank).

DISTRIBUTION AT SEA

Buller's Shearwaters arrive back in New Zealand waters early in September. First sightings were 12 Sep 1961 (Edgar 1962), 19 Sep 1962, 11 Sep 1967, 2 Sep 1969, 3 Sep 1974, 13 Sep 1976, 13 Sep 1978, 10 Sep 1982, 14 Sep 1984, 15 Sep 1986, and 3 Sep 1987. Although these are the dates the birds were first seen at sea, not necessarily the dates of arrival, the spread of dates - 18 days - is small. On Aorangi, Poor Knights, in 1981, the first birds were seen ashore on 10 September, and birds were all over the island by 18 September (Harper 1983). In 1987, the first few single birds were seen at East Cape on 3 September, but many thousands were about the Poor Knights by 9 September. It appears that the birds are usually back in New Zealand waters by the middle of September and can be expected during the first week.

The first influx appears to be directed toward the breeding islands, although weather-affected migrants probably arrive anywhere from East Cape

to north of North Cape. Birds have been seen as far west as 163E by 15 September, possibly non-breeders without attachment to the Poor Knights.

An apparent arrival of migrating birds was seen on 11 September 1967 (Jenkins 1974) some 160 nautical miles north of the Poor Knights at 32S 175E. Here "... for over two hours we passed through a continuous stream of Buller's Shearwaters spread out in the typical shearwater migration pattern, in ones and twos and in small groups of about five birds. They were seen out to the limit of visibility on both sides of the vessel's track and were all heading south. At least several thousand birds must have passed during the afternoon".

Since then many passages have been made through this area at the same time of the year, enabling three further series of sightings. In 1974, I saw a few birds there and to the north. Actual observations were one bird at 23S 176W on 1 September, two at 28S 179W on 2 September, and ten at 32S 176E on 3 September. All birds were flying directly towards the Poor Knights at an estimated speed of about 25 knots. The second series of sightings was made on 13 September 1978 when, in areas 33S 177E and 33S 176E, I saw a few small parties of 4-12 birds. They were all on a course of about 225° (directly for the Poor Knights) and were making an estimated 20 knots. The third series was made a few days later, 16 September. The wind was strong to gale west to west-south-west throughout the day:

0730 34.9S 175.1E - 200 + spread out with no specific direction of flight.
0800 34.7S 175.2E - 300 + flying, without much purpose, to the north.
0900 34.5S 175.2E - 200 + making slowly to the north, with more and more birds coming in from the east. Small flocks of 3-30 birds were seen throughout the day, the last sighting being of four birds at 1630 in 32.4S 175.5E. These migrating birds were seemingly being forced to the north by the strong head winds they were encountering.

These sightings show that, during the migration, few birds were north of 32S. This probably indicates that the main migration path approaches New Zealand from the east.

In October, numbers increased about the North Island, though this increase is masked in Figure 2, which shows the highest numbers seen together rather than the total number of birds in the one degree area. Distribution appears less wide than in September owing, no doubt, to the attachment of breeding birds to the Poor Knights. Probably all the breeding birds are back in coastal waters during October because Harper (1983) said that in 1975 and 1981 copulation was prevalent in the colonies on the evening of 26 October. Birds have spread down the west coast of the North Island, but very few are on the east coast south of Hawke Bay. Birds were seen 25-28 October 1986 in west longitude out from East Cape (Fig. 2). They were largely rafted and were probably migrants held up by the adverse winds - the wind was between WSW and WNW and 30-40 knots. Outside coastal waters, no birds were seen south of 38S, again suggesting that the birds to the north were returning migrants. The small parties of up to seven birds seen north of New Zealand from 32S to 33S 175E on 2 October 1977 were all flying to the south, toward Poor Knights, and were thought to be returning migrants.

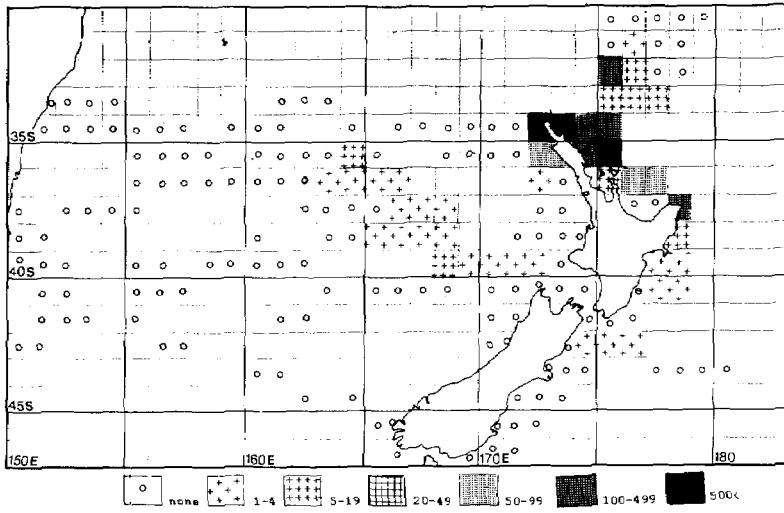


FIGURE 1 — September

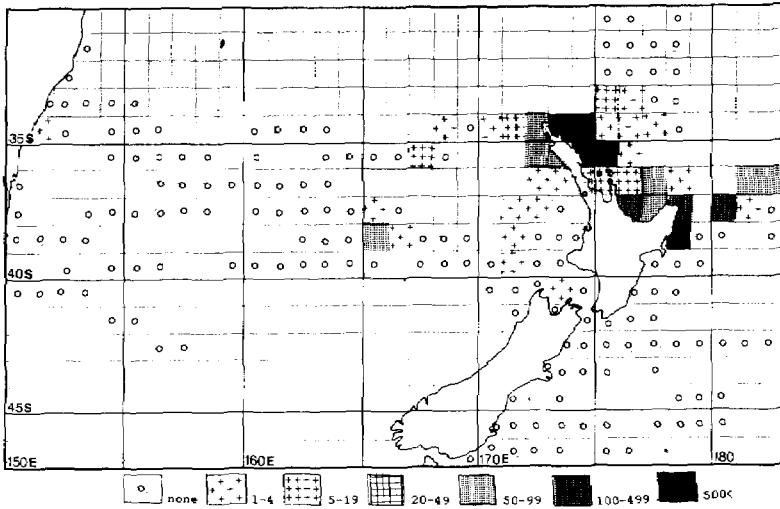


FIGURE 2 — October

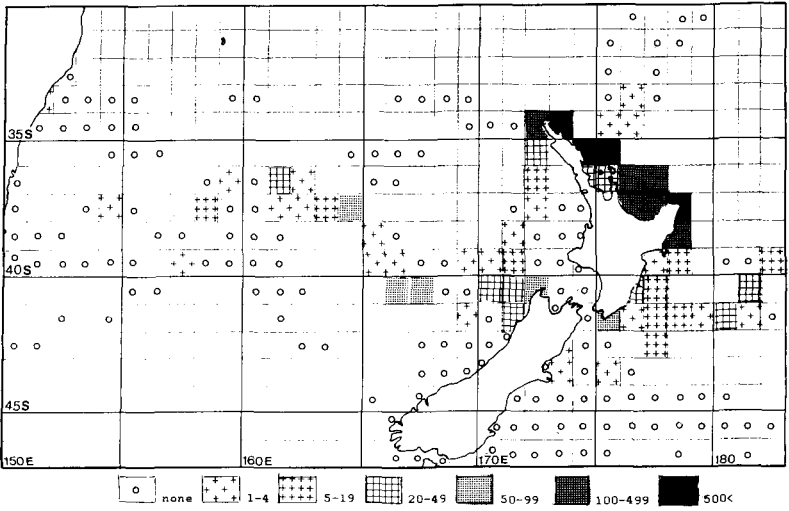


FIGURE 3 — November

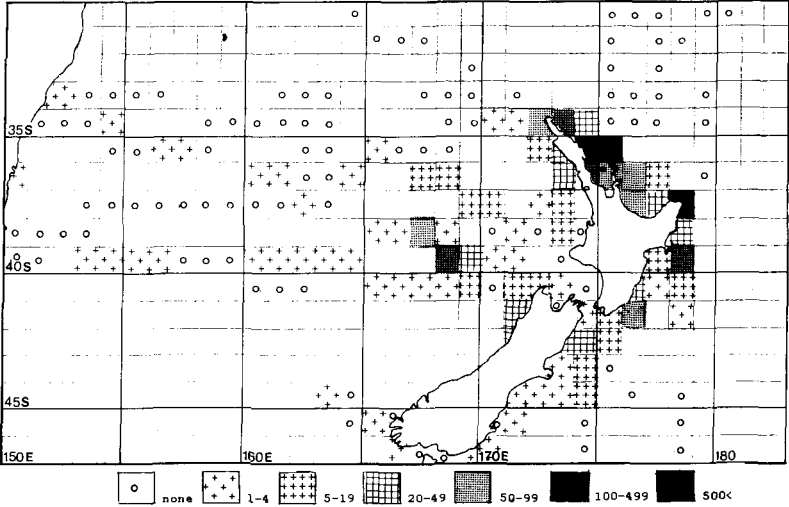


FIGURE 4 — December

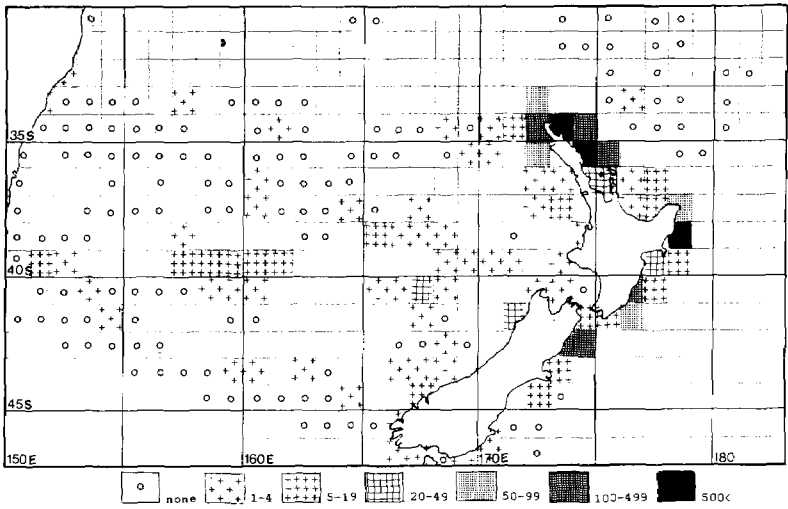


FIGURE 5 — January

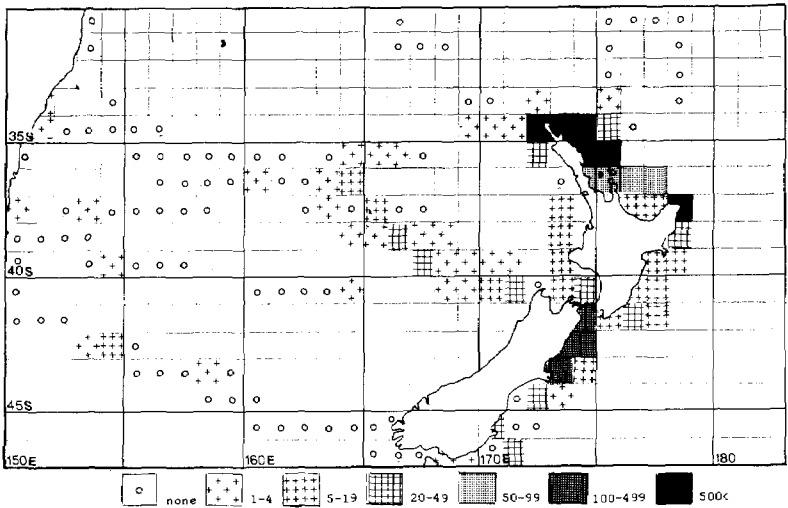


FIGURE 6 — February

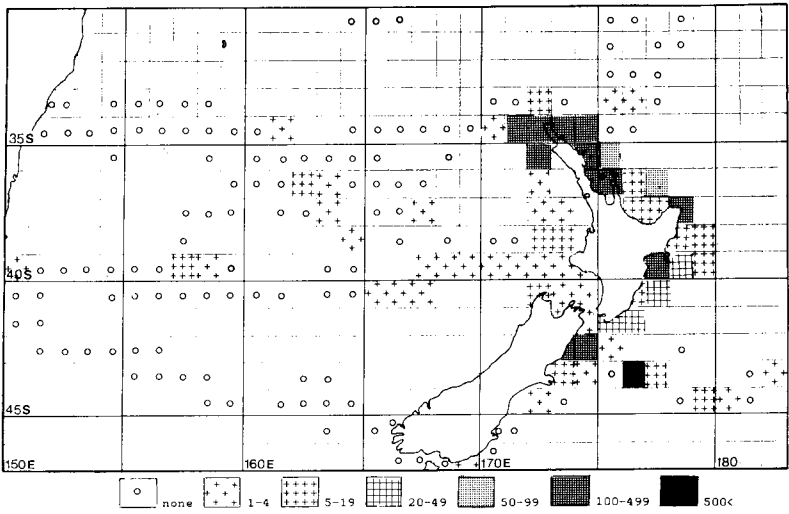


FIGURE 7 — March

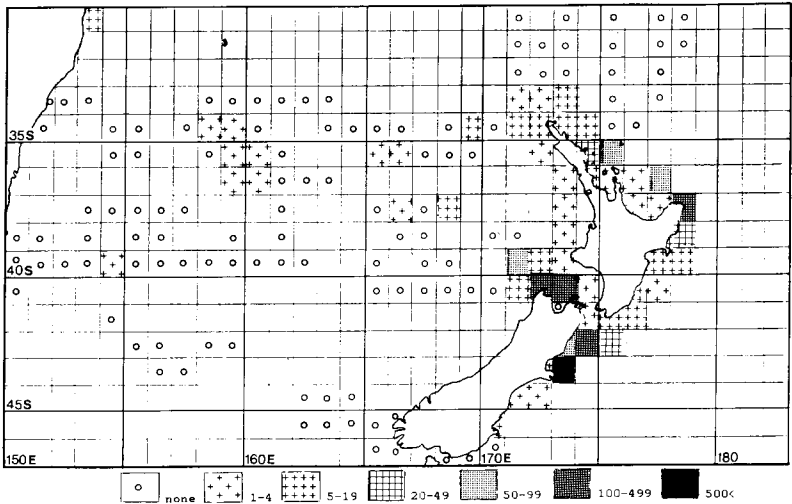


FIGURE 8 — April

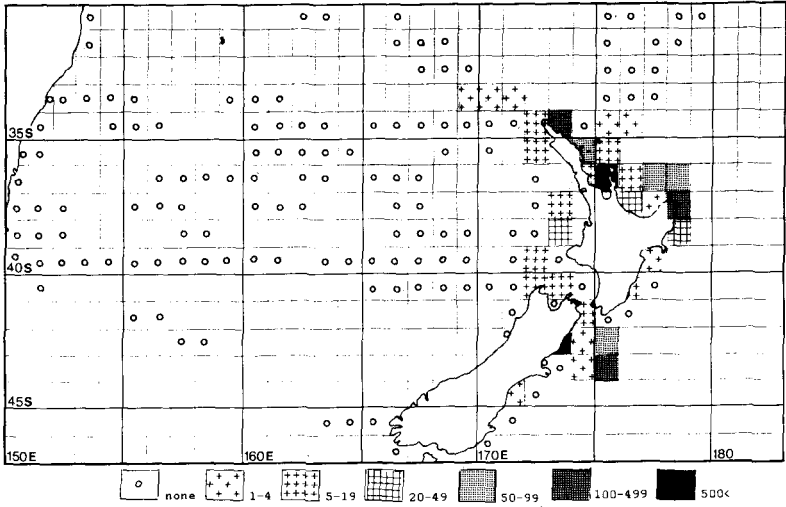


FIGURE 9 — May

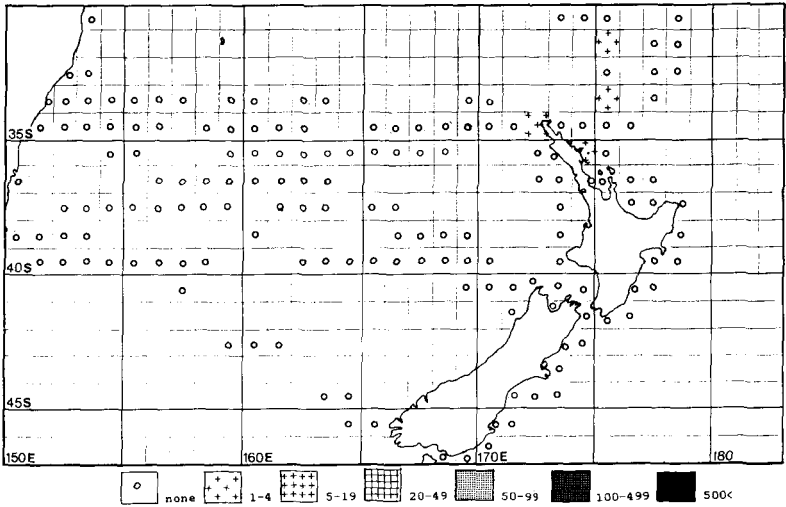


FIGURE 10 — June

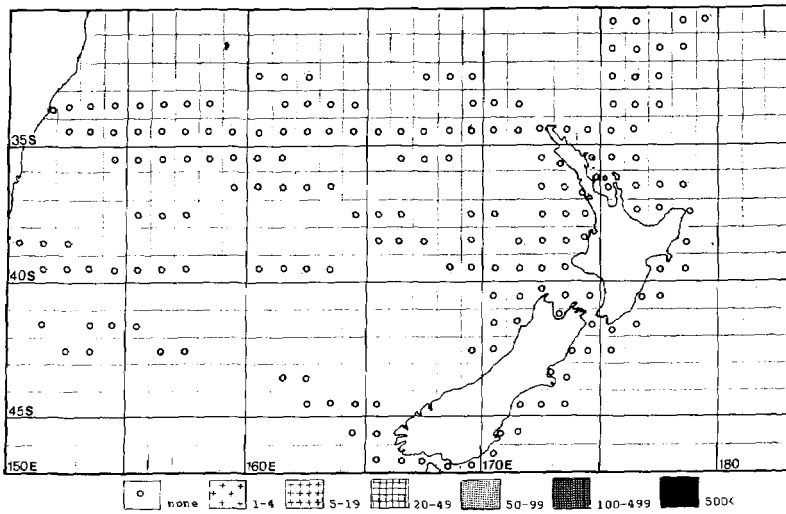


FIGURE 11 — July

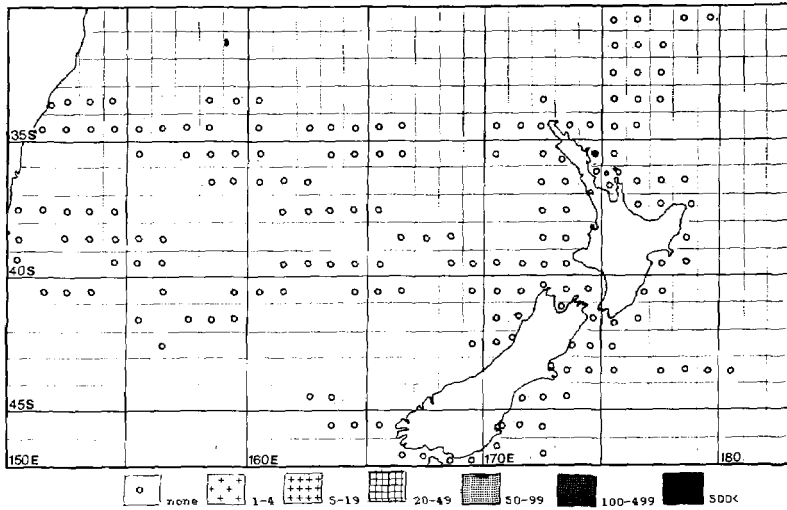


FIGURE 12 — August

According to Harper (1983), the prelaying exodus has ended a few days after 26 October. In November, therefore, large numbers are at sea. Most seem to remain between Three Kings and East Cape, favoured feeding grounds that offer the sheltered waters preferred (Jenkins 1974). Many thousands have regularly been recorded close to the Poor Knights in early November (Fig. 3). Returning non-breeders might account for the slightly wider distribution in the Tasman Sea and in coastal waters south of Cook Strait. By the end of November, and for the rest of the summer, only the odd straggler is seen beyond the continental shelf to the north of New Zealand.

In December, even though half the breeding population and many non-breeders are ashore by day, most eggs being laid 26-30 November (Harper 1983), there seems to be little reduction in the numbers seen at sea. The distribution expands greatly during this month (Table 1), across the Tasman Sea into Australian coastal waters, south to Foveaux Strait, and out to the Chatham Islands. This expanded distribution could indicate that non-breeding birds are still arriving in the region, but it is more likely to be related to the departure of unemployed birds, which start to leave the breeding islands in late December.

The January pattern (Fig. 5) is similar to that of December with little obvious difference in either numbers or distribution.

Table 1 shows that, in February, birds have been recorded in approximately the same percentage of sea areas visited as in December and January. However, it is obvious from Figure 6 that considerable changes occur in February. The numbers and distribution fall in the Tasman Sea and rise on the New Zealand coast, especially to the north of the country and about the eastern approaches to Cook Strait. Harper (1983) recorded 23 flocks of between 179 and 315 birds off Banks Peninsula on 19 February 1982. During frequent voyages between Wellington and Lyttleton and between Banks Peninsula and Cape Palliser, I made many such observations, seeing rafts of up to 600 birds. M. J. Imber (pers. comm.) has regularly seen Buller's Shearwaters in Pitt Strait, Chatham Islands, during February.

In March (Fig. 7) there is a noticeable decrease in the numbers recorded about the breeding islands and to the north of New Zealand. In the Tasman Sea both numbers and distribution are much reduced and the birds seem to have withdrawn from the southern Tasman.

The chart for April (Fig. 8) shows fewer birds in mid-Tasman and south of Banks Peninsula, and a further reduction in the numbers around the breeding islands and the north of the North Island. Sizable flocks are still on the east coast between Banks Peninsula and East Cape. On 9 April 1984, I saw rafts of Buller's Shearwaters from 1230 h at 43.3S 173.3E to 1345 h at 43.0S 173.6E. During this time I recorded 10 rafts of 50-400 birds. After 1345, although birds were seen, there were no more than three together. From the time that the ship had left Lyttleton until 1345, we passed more than 40 squid boats, all lying to sea anchors, rigged for and obviously awaiting darkness to resume fishing. It appears that the shearwaters and the squid

are attracted to the area by the same food source, just as the many albatross species and Westland Black Petrels (*Procellaria westlandica*) are attracted by the squid.

In May (Fig. 9), numbers seem to increase about the breeding islands. Certainly, larger flocks have been recorded between Auckland and North Cape in May than in April. On 17 May 1979, in a strong SSW wind, large rafts were sheltering in the lee of Little Barrier Island, the largest containing no fewer than 2000 birds. Harper (1983) suggested that the young leave their islands during May, which probably accounts for the larger numbers seen. Elsewhere in May, apart from a few birds to the west of Cape Reinga, there is an almost total withdrawal from the Tasman Sea. There are still birds about East Cape and some flocks in the eastern approaches to Cook Strait. There are no records of birds south of Banks Peninsula after the end of April and few to the north of New Zealand. However, Cheshire (1974) and Jenkins (1980) saw a few birds in Tongan and Fijian waters at this time and, in addition, there are May records of one bird between Tonga and the Kermadec Islands and two birds south of Samoa at 14S 172W on 8 May 1975. Many voyages between New Zealand and Samoa have produced only these few sightings of fewer than 10 birds in total.

TABLE 1 — The number of one degree areas visited each month and the percentage of areas in which Buller's Shearwaters were seen

Month	Number of areas visited	Areas in which Buller's Shearwaters were seen	
		Number	%
Jan	223	91	41
Feb	165	74	45
Mar	193	68	35
Apr	169	57	34
May	174	33	19
Jun	162	4	3
Jul	179	0	0
Aug	178	0	0
Sep	191	44	23
Oct	200	40	20
Nov	210	59	28
Dec	186	87	47

In the New Zealand region there are no further June sightings other than the four given in Jenkins (1974). These were made in 1959 (1 bird), 1962 (1 bird), 1963 (2 birds), and 1969 (4 birds). It seems odd that there have been no further sightings since 1969, even though the population is known to have been increasing continuously.

For the region under discussion there are no August records. However, an important sighting, obviously of returning migrants, was made on 31 August 1978, when 15 birds were seen at 32S 175W (Chapman 1981). These birds could easily have been at the Poor Knights by 1 or 2 September.

The small circles in Figures 10-12 show that there was no reduction in effort during June, July, and August, when the birds were away on migration.

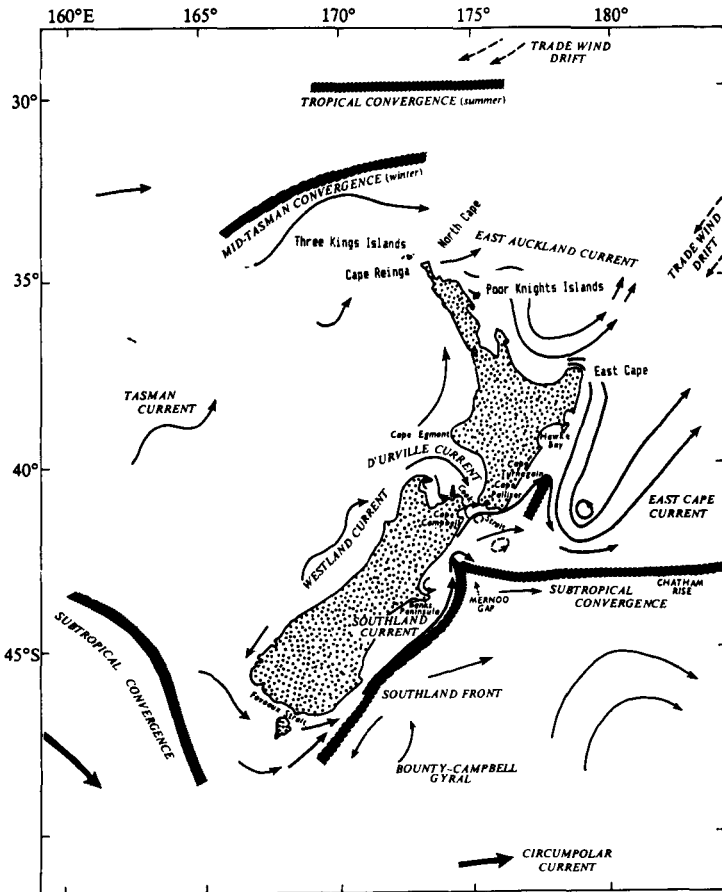


FIGURE 13 — Ocean currents around New Zealand, as shown by Heath (1975)

DISCUSSION

Comparing these observations with the ocean current chart of Heath (1975) (Fig. 13), we see that Buller's Shearwaters appear to spend the austral summer in subtropical waters. The few records south of the subtropical convergence are probably of birds feeding in the convergence zone. Although there are few records, probably some birds feed out towards the Chatham Islands, north of or in the convergence, from November until they leave on migration. By keeping close to the east coast of the South Island the birds are able to remain in the comparatively warmer water of the Southland Current down to and through Foveaux Strait. The birds range far more widely in the south Tasman Sea than they do in comparable latitudes to the east of New Zealand, where the convergence is further north. The birds spread throughout the Tasman Sea and eastward to the Chatham Islands are probably non-breeders. If so, the waters closer to the Poor Knights provide feeding grounds for the breeding birds. The morning flight of birds from the Poor Knights toward the North Cape/Cape Reinga area (Jenkins 1974) probably consists largely of breeding birds feeding close to the breeding islands.

In my 1974 paper I said that I had not seen a return flight, later in the day, from the north of New Zealand toward the Poor Knights. From this I suggested that ". . . there could be many birds that over-fly the North Island and return direct to the Poor Knights from the west coast." Since 1974 I have many records from the area of birds moving south in the late afternoon and early evening – obviously birds returning to the breeding colonies. I have no proof that any birds return to their islands by flying across the North Island, and any reference I have made to this happening should be discounted.

Once the southerly migration is completed, few Buller's Shearwaters are seen north of the continental shelf and almost none north of 33S. This northern limit of distribution may be related to a scarcity of acceptable food to the north of the shelf. The Wedge-tailed Shearwater (*Puffinus pacificus*), which is close taxonomically to Buller's Shearwater, feeds regularly in the austral summer down to about 100 n.miles north and north-east of New Zealand (Jenkins 1979). It seems that the same barrier which keeps the Wedge-tailed Shearwater to the north keeps the Buller's Shearwater to the south and so ensures their separation during the breeding season. However, in Australian coastal waters, Wedge-tailed and Buller's Shearwaters are recorded in the same sea areas throughout the austral summer. Hindwood (1955) reported that the first sighting of Buller's Shearwater for Australia was on 31 October 1954. Holmes (1975) showed that they had been seen offshore from October to April and recorded a beach-washed specimen in early June. Our records show that, 'in Australian coastal waters, we have seen small numbers from October to April (Fig. 2-8). It appears that Australian Wedge-tailed Shearwaters occupy the same waters as does Buller's Shearwater, whereas the Wedge-tailed Shearwaters from the Pacific Islands to the north of New Zealand do not. This may be a further difference between these two populations of Wedge-tails (Jenkins 1979) rather than having anything to do with the preference of Buller's Shearwaters for a particular sea area.

Bartle (1968) said that the burrows of Buller's Shearwater on Aorangi Island had increased from almost nil in 1925, when wild pigs were present, to about 100 000 in 1964, 28 years after the pigs had been exterminated. This trend has continued and Bartle (pers. comm.) has suggested that the burrows on Aorangi doubled between 1964 and 1980. This increase is reflected in the larger numbers seen in the Tasman Sea (Fig. 1-9) than the mere 20 birds seen over a long period of Tasman crossings before 1974 (Jenkins 1974).

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SHORT NOTE

The Hakawai

Colin Miskelly's paper on "The identity of the Hakawai" (*Notornis* 34(2): 95-116) makes most a convincing case for the Stewart Island Snipe. It is particularly satisfying to be able to rescue from mythology all those traditional stories of a fabulous bird that cries in the night but is never seen.

There must be many references to Hakawai or Hokioi in old writings, but one I came across may be of interest. The diary of Frederick Tuckett, surveyor for the New Zealand Company (published in T. M. Hocken's *Contribution to the Early History of New Zealand*, 1898), described his