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THE NEW CALEDONIAN PETREL

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ABSTRACT

When *Pterodroma leucoptera* was first recorded from New Zealand in 1942, the 10 beach-cast specimens were recognised as being distinct from Gould's Petrel *(P. l. leucoptera)*, mainly because of their larger average dimensions. Their origin was unknown. Since then 10 more have been reported. Between 1971 and 1979, during studies of petrels in New Caledonia, R. de Naurois discovered populations of a form of Gould's Petrel breeding in the mountains and gave them the name *P. l. caledonica*, with a brief description. A New Caledonian specimen is identical with extant New Zealand specimens. Distinguishing features of the two subspecies are discussed: definite separation probably can be made in the hand only. Recent sightings of this species in the Tasman Sea are reported. Previous reports attributable to New Caledonian Petrels are assembled: these show it to be an east-west migrant like several other petrels of this region. Gould's Petrel should be replaced by New Caledonian Petrel in the New Zealand checklist.

INTRODUCTION

Gould's Petrel *(Pterodroma leucoptera leucoptera)* is known to breed only on Cabbage Tree Island, off New South Wales, Australia, where the population has been estimated as less than 2000 birds (Fullagar 1976). This is a very small population for a petrel and, considering the low mortality rate of petrels generally, not likely to yield more than occasional corpses on distant shores.

This may have been in P. C. Bull's mind when he examined and measured the remains of 10 petrels collected from Muriwai Beach, Auckland west coast, on 12 April 1942; the first of this species reported

from New Zealand, over 2000 km from Cabbage Tree Island (Bull 1943). Bull found that these Muriwai Beach specimens had larger average dimensions than those of Cabbage Tree Island, that the leading edge of the underwing was less dark, that they had less of a tendency towards having a breast band, and that foot colour differed slightly from that reported for Australian birds. He did not give a name to the new subspecies because he considered this would be best done when its breeding grounds were discovered. Furthermore, he noted, taxonomy of the small *Pterodroma* petrels was at that time unstable, Murphy (1929), Fleming (1941) and Falla (1942) having recently published conflicting interpretations. From a study of weather conditions before this minor wreck, Bull deduced that the breeding grounds of the new subspecies probably lay north, rather than west, of New Zealand.

NEW ZEALAND SPECIMENS

Since the 10 were found in 1942, a further 10 specimens of *P. leucoptera* have been reported from New Zealand (Table 1). All but one have been beach cast, all but one are from the west coast, and their occurrence has been seasonal. The evidence shows that this petrel frequents the Tasman Sea, but apparently not seas immediately east of New Zealand, from November to June. (The only east coast specimen came from the Far North in spring and was probably migrating westwards.) It is, therefore, probably migratory.

TABLE 1 — Data concerning the 20 **Pterodroma leucoptera** recorded from New Zealand. BPS = Beach Patrol Scheme records. • Bones only. + Only 4 study skins extant.

Date	Locality	No.	Depository	Reference	Subspecies
12.4.42	Muriwai Beach	10	Auckland Museum+	Bull 1943	caledonica
27.1.46	" "	1	not kept	Bull 1946	?
25.6.61	Otaki Beach	1	National Museum	Falla 1962	caledonica
3.3.65	43° 28'S 163° 55'E	1	" "	Harper coll.	"
11.1.70	Muriwai Beach	1	not kept?	BPS	?
24.1.71	" "	1	Auckland Museum*	"	?
27.11.71	Waipu Beach	1	National Museum*	"	?
4.5.73	Titahi Bay	1	" "	Veitch 1975	caledonica
20.5.73	Muriwai Beach	1	Auckland Museum	" "	"
8.6.75	" "	1	not kept	Veitch 1977	?
11.5.80	Port Waikato	1	?	Sibson 1981	caledonica

TABLE 2 — Measurements (mm) of New Caledonian Petrels from various sources compared with those of Gould's Petrels from Cabbage Tree Island. * Includes one **P. l. leucoptera** from Cabbage Tree Island. † Possibly includes some **P. l. caledonica**. ‡ 3 in the National Museum plus 1 from Port Waikato. + claws worn down.

Source & Locality	Loomis 1918 Tropical E. Pacific	Murphy 1929* S-W Pacific	Bull 1943 Muriwai, NZ	This study: New Zealand‡	This study: N. Caledonia Tonga Pitcairn I.	This study: Overall P.l.caledonica	This study: (Serventy et al. 1971) P.l.leucoptera†
CULMEN No.	8	3	8	4	3	26	23-48
Mean	25.5	25.7	25.2	25.4	25.7-23.5-26.9	25.4	24.6
Range	24.3-27.0	25.0-27.0	24.0-27.5	24.8-25.9		23.5-27.5	23.0-26.5
WING No.	7	3	9	4	3	26	23-48
Mean	230	225	229	231	232-222-219	229	225
Range	225-234	224-226	225-235	229-232		219-235	213-238
TAIL No.	8	3	6	3	3	23	23-48
Mean	95	91	95.5	93	95-98 39	95	93
Range	93-97	89-93	93-97	91-96		89-98	82-105
TARSUS No.	(see	3	9	4	3	19	23-48
Mean	text)	29.7	29.9	30.7	30.6-28.0-31.0	30.1	29.0
Range		29-30	28.5-30.5	30.4-31.3		28.0-31.3	25-33
MID-TOE & CLAW No.	8	3	5	4	3	23	23-48
Mean	37.9	37.3	38.7	38.3	37.5+-36.0-35.2	37.9	37.0
Range	35.2-39.1	37-38	38-41	37.2-39.4		35.2-41.0	-

Measurements of New Zealand specimens are compared in Table 2 with those of Cabbage Tree Island birds from Serventy *et al.* (1971). The tendency towards larger size in New Zealand birds noted by Bull (1943), is confirmed in this larger series of measurements.

Additional plumage features have now been observed in these specimens. The back and upper tail-coverts are grey, thus contrasting with the rest of the upperparts, which are dark grey to sooty. State of plumage wear affects the back colour, as fresh feathers have a pale grey tip. In Gould's Petrel the upperparts are darker, the back in particular, and so there is much less contrast between the back and the rest of the upperparts than in New Caledonian Petrel.

However, the most reliable distinguishing feature seems to be found in the rectrices of the tail, and we are greatly indebted to F. C. Kinsky for pointing this out. In Gould's Petrel (two specimens in the National Museum were examined), the outermost tail feather has its inner web grey to brownish grey, except for the basal half, which is off-white. All eight New Zealand specimens that are available for examination (S. M. Reed and MJI checked those in the Auckland Museum; J. A. Bartle and MJI checked those in the National Museum) have the inner web of the outer tail feather white, or mainly white, but with a variable amount of grey freckling near the tip. At most this freckling extends from about the mid-point near the rachis gradually over the whole width near the tip. Falla's (1962) illustration of the Otaki specimen shows the inner web of its outer tail feather as entirely white.

Possibly the foot colour of live birds differs also since that of Gould's Petrel is described as " greyish blue " (Serventy *et al.* 1971) or " flesh-coloured " (Fullagar 1976), whereas that of New Zealand specimens was " pale Russian blue " (Bull 1943).

NEW CALEDONIAN SPECIMENS

Hitherto, study of the Procellariiformes of New Caledonia has been rather neglected. However, research carried out by R. de Naurois between 1971 and 1980 (Naurois 1978 and pers. comm.) has added greatly to our knowledge. In addition to locating many colonies of *Puffinus pacificus* and *Pterodroma rostrata,* he discovered two small *Pterodroma* nesting: first records for the region of Black-winged Petrels *(P. nigripennis)* nesting on islets in the lagoon, and *P. leucoptera* nesting in the mountains of the mainland.

At first, Naurois (pers. comm.) thought that these *leucoptera* would be a new subspecies but, when he came to publish his findings, he had only a few old specimens from Cabbage Tree Island for comparison and so was unsure of distinctions between the two populations. He recorded that New Caledonian birds were larger and had longer tarsi than Collared Petrels *P. (leucoptera) brevipes,* and, in comparison with Gould's Petrels, had larger bills and paler plumage on the back,

wings and sides of the chest. He had intended withdrawing what he had written regarding a new subspecies (pers. comm.) but, owing to an oversight, the name "*P. leucoptera caledonica* nov. ssp." was published in the abstract of his paper (Naurois 1978). Thus we have a name, a locality, and a brief description without measurements. Additional diagnostic information comes from an American Museum of Natural History specimen collected at one of the colonies, which we have examined. It has white inner webs to the outer pair of tail feathers and its measurements are shown in Table 2. Thus, New Zealand and New Caledonian specimens are identical.

The New Caledonian Petrel breeds in heavily forested slopes of the mountains forming the backbone of New Caledonia. Naurois pers. comm.) found them in burrows on Mt Dzumac in the Humboldt Massif at an altitude of 450-500 m. They had fresh eggs on 30 December 1979. He collated reports of at least five other localities along the southern two-thirds of New Caledonia where petrel colonies, possibly of this species, were known locally.

The AMNH specimen was found dead near a burrow above a waterfall on the Kalouehola River at about 550 m below Mt Dzumac on 19 February 1978. Possibly this was the colony that Naurois studied.

MIGRATIONS

Apparently the earliest report attributable to New Caledonian petrels comes from R. H. Beck (Loomis 1918), who collected eight specimens identified as *P. leucoptera* at 4° 20'S, 93° 30'W (about 5 km south-west of the nearest island of the Galapagos) on 11 June 1906. He reported seeing "flocks" of the same birds in the vicinity at the time. The measurements of these birds, shown in Table 2, fit in well with those of *caledonica* obtained elsewhere, except for the shorter tarsus measurements. As we thought Loomis' method of measuring tarsi might have produced lower readings than those of other observers, we compared his data and Murphy's (1929) for Cook's Petrel *(Pterodroma cookii)* collected in the eastern Pacific Ocean. Wing measurements were too few for comparison but tail, culmen and middle toe and claw of Loomis' *P. cookii* were within 3% of Murphy's data. However, Loomis' tarsal measurements were 7.7% shorter than Murphy's. When Loomis' eight tarsal measurements of *P. leucoptera* are increased by 7.7% their mean is 29.9 mm (range 29.2-31.0), which is almost the overall mean for *caledonica* in Table 2.

It was probably the relatively short tarsus measurements given by Loomis that led Murphy (1936) to consider these birds to have been *P. brevipes.* However, all dimensions of Loomis' birds are greater than those recorded for *P. brevipes* by Murphy (1929).

Thus there is good evidence for a post-breeding migration to the eastern tropical Pacific. Using the available data on the breeding season of New Caledonian Petrel and extrapolating from this, using

FIGURE 1 — Dorsal view of New Caledonian Petrel captured near Tonga on 27 April 1979. Note colour pattern of outer tail feathers. Photo: J. Jenkins.

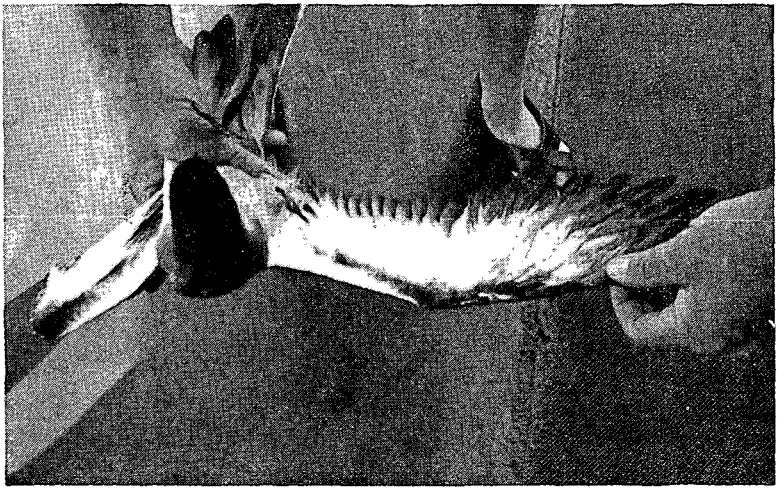

FIGURE 2 — Underwing pattern of same bird. Note similarity to that of Black-winged Petrel (see Notornis 27: 173). Photo: J. Jenkins.

much better knowledge of the breeding of Cook's Petrel as a guide (Imber, unpub. data), the following movements of New Caledonian Petrel may be expected. Breeders would return to the south-west Pacific in October-November and non-breeders from November probably to January. Return migration eastwards probably takes place from late March through April (non-breeders), May to June (breeders), and June to early July (fledglings).

Thus, migrating petrels might be observed in the subtropical/tropical South Pacific between New Caledonia and Galapagos Islands from October-January and March-July. We mention this because of the records of petrels of this species in the vicinity of the Tonga Archipelago (Jenkins 1980 a, b). There seems little doubt now that most of these sightings were of migrating New Caledonian Petrels. We also suggest now that those considered to have been possibly *P. longirostris,* sighted in June-July, were fledglings of *P. l. caledonica,* showing pale backs because of their fresh plumage with prominent broad grey tips to the back feathers.

One of these *P. leucoptera* was caught aboard ship near northern Tonga on 27 April 1979 (Jenkins 1980a and Fig. 1 and 2). This bird we subsequently identified by photographs and notes taken at the time as *P. l. caledonica.* It had white inner webs to its outer tail feathers, although its dimensions (Table 2) are among the lowest recorded for this subspecies. Another record of a migrating New Caledonian Petrel was drawn to our attention by J. A. Bartle. This is now a skin in the Auckland Museum and was captured aboard MV *Africa Star* " before Pitcairn Island " on a voyage to New Zealand via Panama on 25 May 1955. It is a male with white inner webs to the outer tail feathers and dimensions shown in Table 2.

We interpret these records to indicate that the migration route follows a broad front in an east-west direction between the western and central South Pacific Ocean, turning almost north-south in the east. Thus the petrels remain over surface waters of similar temperature throughout migration, following a route that approximately parallels the Subtropical Convergence.

SIGHTINGS OF *Pterodroma leucoptera* IN THE TASMAN SEA

Regular logs by JAFJ of seabird sightings in the Tasman Sea on voyages between Australia and New Zealand, and around New Zealand, have been kept since 1970. Sight records of petrels identified as *Pterodroma leucoptera* made during the period 1970-1980 are shown by month in Figures 3 to 5. No sightings were made east of New Zealand. The area shown is that between 33°S and 47°S, and between 151°E (Sydney in the top left corner) and 175°E or the New Zealand coast. This area comprises 293 x 1° squares of ocean. It is approximately bounded by the Subtropical Convergence in the south. The Figures show only those months in which sightings were made; there were no sightings from May to November inclusive. The number of

squares visited has ranged between 52 (April) and 109 (January) per month; the average number visited monthly during the positive period (December to April) was 77.6, which was only 4.3 per month more than that during the negative period. Thus no bias can be attached to relative effort in each period.

These sightings correspond well with the specimen records from the west coast of New Zealand. The latter undoubtedly arise from the frequent strong west to south-west winds over the southern Tasman Sea. The New Zealand specimens, and particularly the one collected independently at sea (Fig. 4) in an area of many sightings, indicate that most of these sightings have been of New Caledonian Petrels. Probably Gould's Petrels were encountered only in the western Tasman Sea. By being seasonal, these sightings provide further evidence that this species is migratory.

The extent of southward ranging of these petrels in the Tasman Sea is surprising. They range very near to Codfish Island, where another small *Pterodroma,* Cook's Petrel *(P. cookii),* breeds. However, during the voyages of the Antipodes Islands expedition in 1978, we observed Cook's Petrels far east of Codfish Island. Perhaps this is how these two petrels partition their food supply.

DISCUSSION

Gould's Petrel and New Caledonian Petrel are closely related, and clearly the latter must be considered a subspecies of *Pterodroma leucoptera.* The Collared Petrel seems more distinct, particularly since it breeds in the New Hebrides, within 1000 km of *caledonica.* Furthermore, this population of *brevipes* is polymorphic in plumage (Murphy 1929). Accordingly, the Collared Petrel is best treated as a full species. Distinguishing characteristics of New Caledonian Petrels compared with Gould's Petrels are their larger average dimensions, paler back, paler sides to the chest with less tendency towards a collar, mainly or entirely white rather than grey inner webs to the outer tail feathers, and less prominent underwing bar. Although Naurois (1978) did not formally describe the new subspecies, he provided an available name, a breeding locality and some valid characters. Since there can be little doubt about the petrel to which Naurois refers, we propose that his name be accepted. We understand that type specimens have been deposited in the Museum National d'Histoire Naturelle in Paris (J. A. Bartle, pers. comm.). Needed now are a good series of measurements from New Caledonia and further information on its breeding biology, its breeding distribution, and whether the colonies are endangered in any way.

Since all New Zealand skins of *P. leucoptera* still available (9 of the 20) show the characteristics of *P. l. caledonica,* and since none of the others has been confirmed as *P. l. leucoptera* nor seems to be that subspecies on available evidence, New Caledonian Petrel should replace Gould's Petrel in the *Checklist of New Zealand birds.*

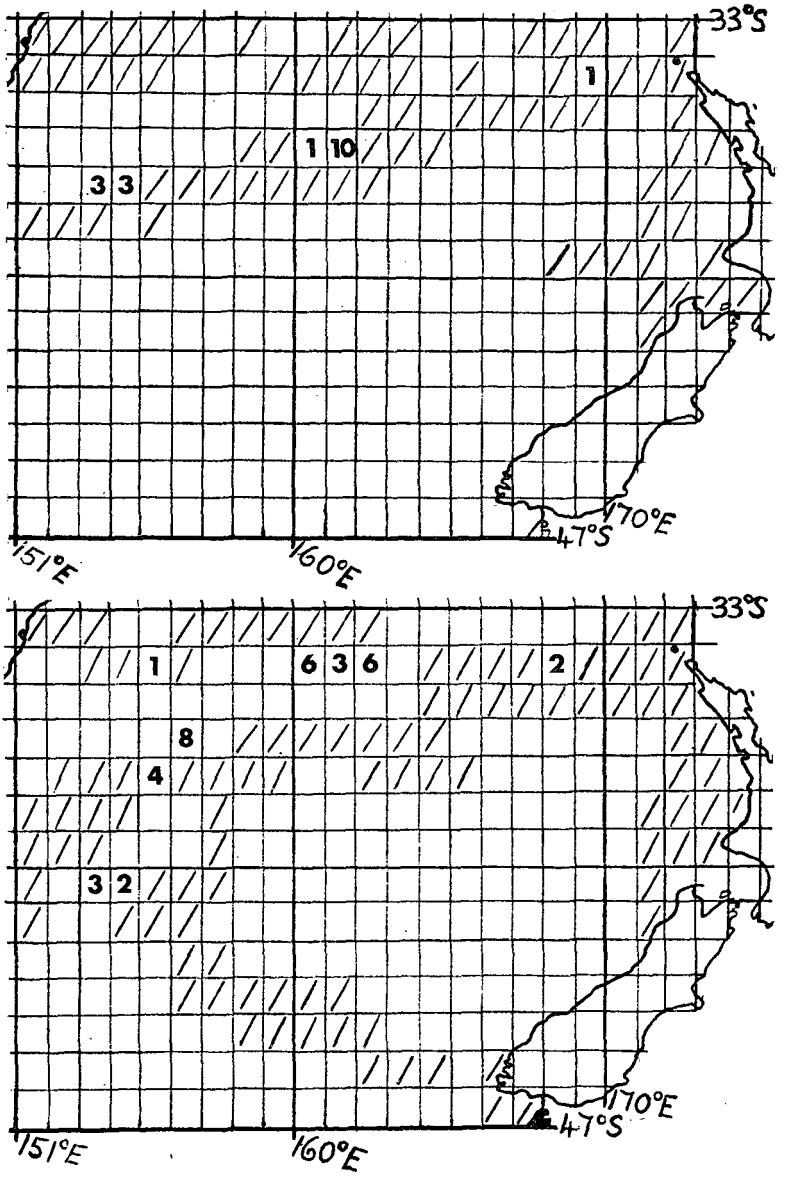

FIGURE 3 — Sightings of **P. leucoptera** in the Tasman Sea: above, in December; below, in January. **Key:** Blank squares = no observations made. Squares with diagonal line = observations made but no **P. leucoptera** seen. Squares with numbers = total sightings of **P. leucoptera** in that area of the grid.

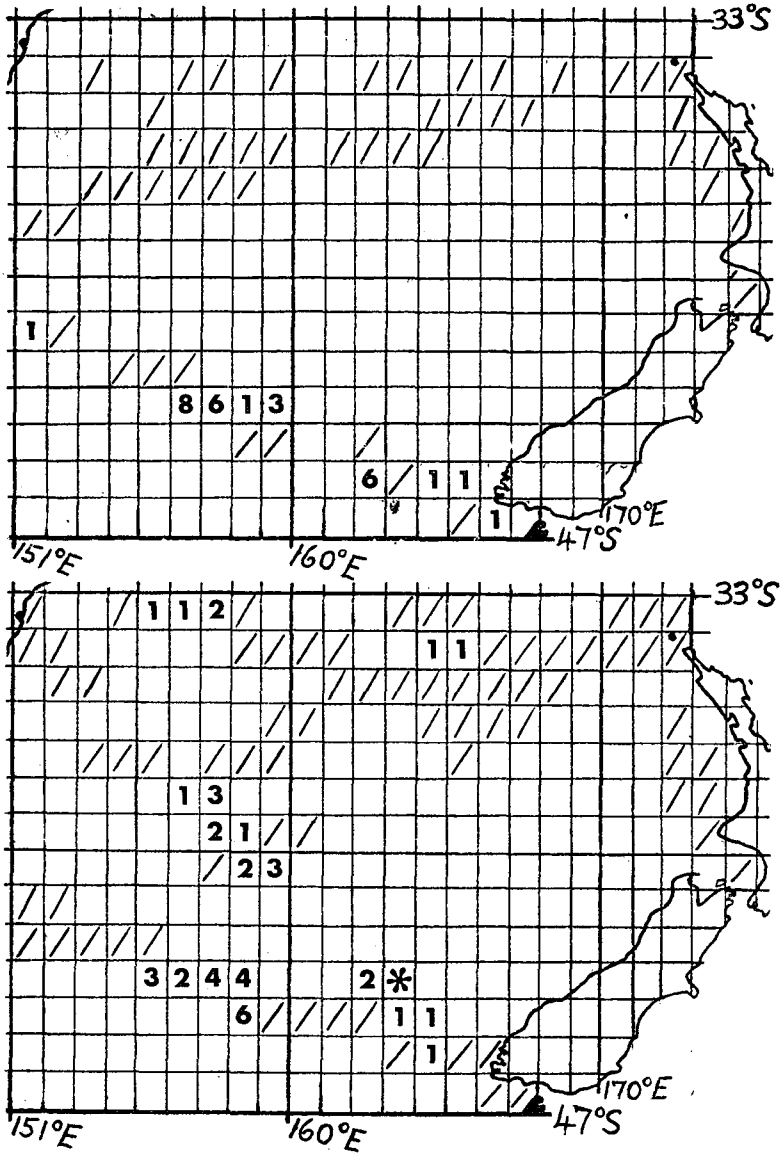

FIGURE 4 — **Above**: Sightings of **P. leucoptera** in the Tasman Sea in February. Details as in Fig. 3.
Below: Sightings of **P. leucoptera** in the Tasman Sea in March.
* Specimen of **P. l. caledonica** collected 3 March 1965 (see Table 1).

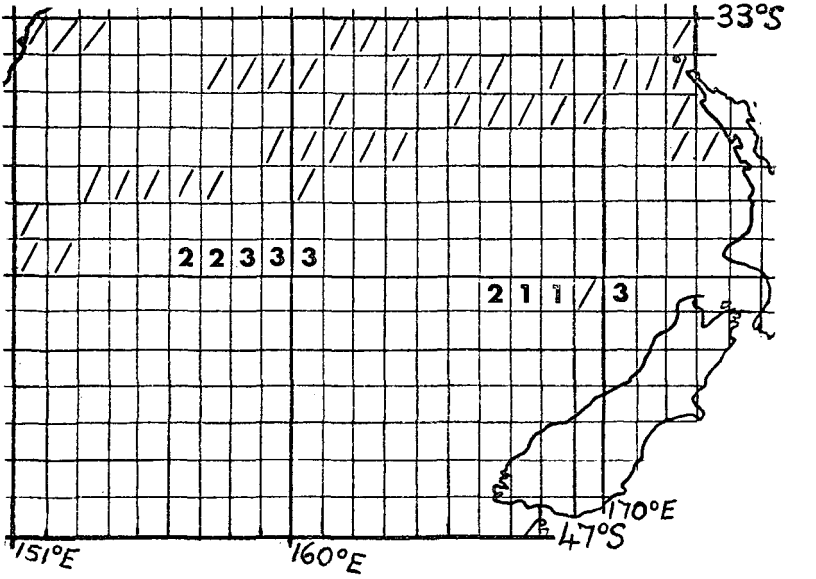

FIGURE 5 — Sightings of **P. leucoptera** in the Tasman Sea in April. Details as in Fig. 3.

Whether or not New Caledonian Petrels can be reliably distinguished from Gould's Petrels at sea has yet to be settled but, if they can, this will probably be by means of the contrast between generally very dark upperparts and the grey back in New Caledonian Petrels, and lack of this contrast in Gould's. Collections at sea indicate that New Caledonian Petrels are much more numerous than Gould's. Whether Gould's Petrels also migrate eastwards is not known as none seems to have been collected far from the breeding place.

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COMMON SANDPIPER IN SOUTH ISLAND

While carrying out *Spartina* control work on the Whanganui Inlet (North-west Nelson) on 12 March 1981, a Wildlife Service party of six returning down the Wairoa River flushed a small wader from the water's edge. It had an undulating jerky flight but was too distant for us to get any other details. The stream was a narrow channel with mudflat on each side but not more than 50 metres from bush edge to bush edge. We followed the bird downstream and saw it better. It was definitely a sandpiper with tilting pose but noticeably smaller than a tattler. It was smooth greyish brown above and white below. It flew off again but the only distinctive markings seen were two prominent white patches either side of the rump. The following day the bird was seen again and this time it circled against the bush background and exposed its prominent white wing bands confirming our initial identification of Common Sandpiper *(Tringa hypoleucos)*.

The bird's use of a confined habitat rather than the open mudflats is characteristic of the species. It went behind rocks on the bush edge and even walked under and through the branches of a stranded tree. This species has been recorded several times from the North Island but this seems to be the first record for the South Island.

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