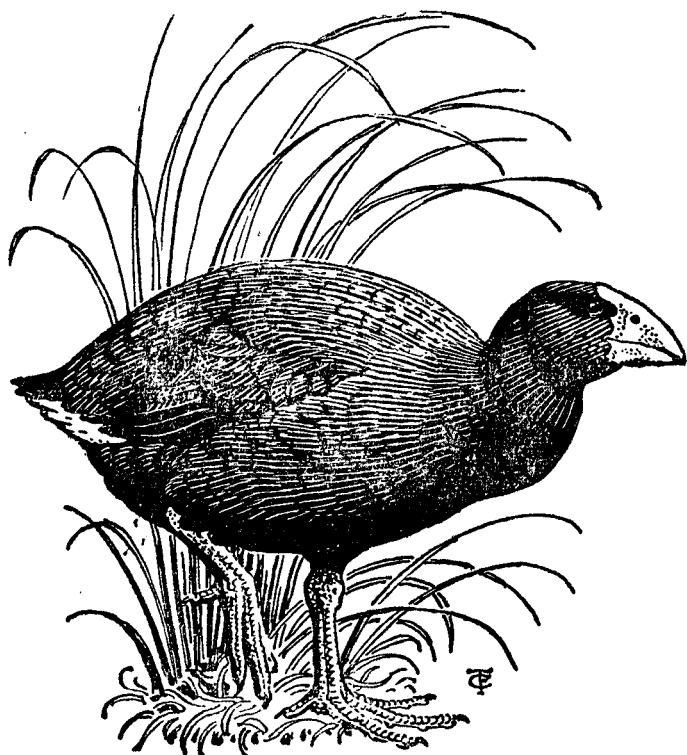


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SOME OBSERVATIONS OF HUTTON'S SHEARWATER

By G. HARROW

ABSTRACT

The breeding cycle and breeding range of *Puffinus huttoni* in the Seaward Kaikoura mountains are described. Measurements and characteristics of adult birds, their chicks and eggs at the breeding colonies are recorded. The effects of weather, moon phase, and snow on breeding and navigation are noted. Information about mortality and predation is given. Observations of *P. huttoni* near the New Zealand sea coast are outlined, and some historical background is presented.

INTRODUCTION

The discovery of breeding grounds of Hutton's Shearwater, *P. huttoni* Mathews, 1912, has been described (Harrow 1965). The present paper reports the results of visits to the breeding areas in the Kaikoura mountains and adjacent feeding grounds at sea, from 1965 to 1974.

Description of P. huttoni from Kaikoura breeding area:

Falla (1965) and Serventy (1939) described the plumage characters of this species. All the Kaikoura birds handled had the underwing coverts mostly light brown or smudgy, and the long axillaries brown, although a few individuals have shown a faint white tip on the axillaries. Five birds on the colony at the head of the Wharekiri Stream were noted as having conspicuous white flecking on the brown head and nape with feet pinkish and inner legs light pink to dark pink and mauve, and on the outer side of legs dark grey.

Sexes are alike, with juveniles like adults. The nestling is clad firstly in a mid grey protoptile down, succeeded by a light grey mesoptile plumage.

Measurement of live adult *P. huttoni* at Wharekiri colony
23 September 1967:

Body weight mean of 17	364.1 g	
Wing length " "	58 223.3 mm	± 6.5
Bill length " "	58 36.0 mm	± 1.7
Tarsal length " "	58 44.1 mm	± 1.9

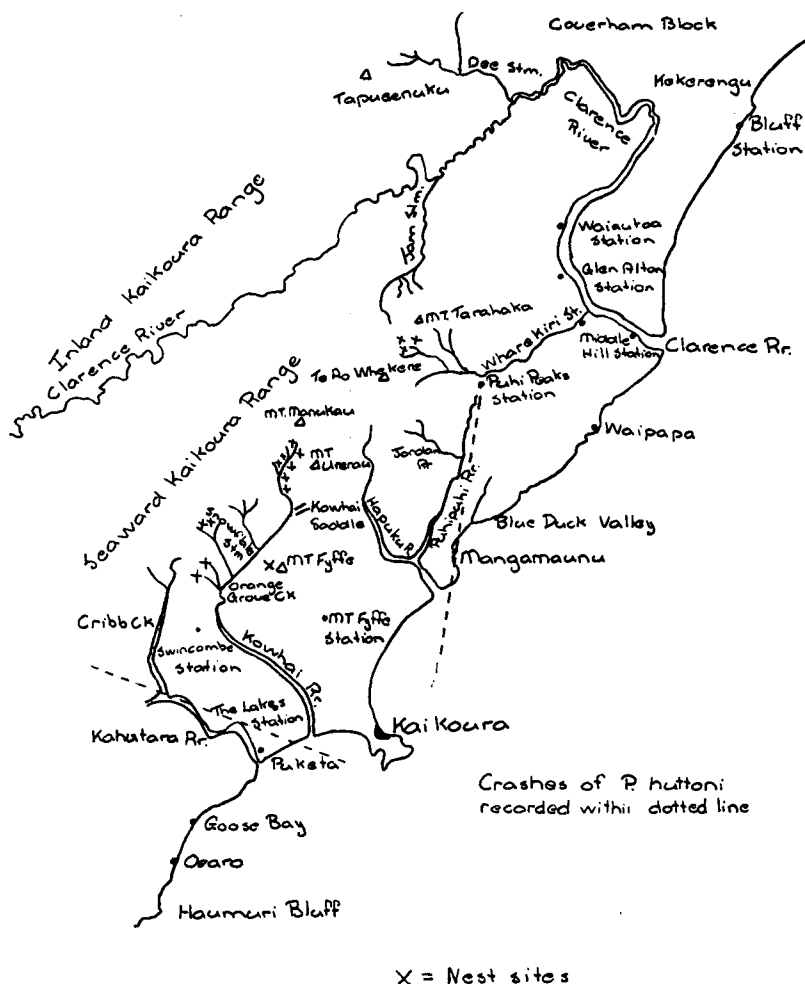


FIGURE 1 — Breeding ground of Hutton's Shearwater.

del.: Belinda Harrow

Logistics and methods including banding:

Most of the data were obtained during weekend visits with usually six visits per season. The timing was varied each year where possible, so that observations were made at both breeding colonies and at sea to include all months of the year. The 1965 and 1966 seasons were used to prove the extent of the breeding range of *P. huttoni*. Many more nesting sites were found in widely separated parts of the Seaward Kaikoura Range (Fig. 1). None of these sites are easily reached, and all are above 1,200m above sea level. An area of high density burrows about an acre (0.4 hectare) was selected in the upper gorge of the Kowhai River for random banding of birds found at night on the surface, and for banding older chicks taken from burrows during the day.

In the head of the Wharekiri Stream random banding along similar lines to the Kowhai colony was carried out from 1967 to 1970 and in addition burrows were marked with their occupants' band numbers. Aluminium foil tags were wired alongside burrow entrances, and although the tags are easily numbered and indestructible, they are difficult to relocate in tall snow tussock (cf. Fig. 5). Manuka sticks were used in deep snow to mark the site of pairs of birds defending territory. Banding of crashed birds has been done at Puhī Peaks sheep station, and at Kaikoura township from 1967-1975. At the time of writing there have not been any recoveries of banded birds other than on the breeding sites and these have all been recoveries of adult birds of unknown age. Banded Hutton's Shearwaters have been observed among flocks close to the Kaikoura shore, but as the numbers could not be read, it is not known where they were banded.

Only about 5% of *P. huttoni* nest chambers can be reached from the burrow mouth, without damage to the site and some brooding birds deserted after handling so that later observations were limited to the surface.

BREEDING COLONIES

In the first account of a breeding colony, Harrow (1965) discussed an area directly below Mount Urerau, at the headwaters of the Kowhai River. Further exploration of this river has revealed extensive burrowing up stream in the high tussock areas, and also further downstream, high on the true left bank above the middle gorge in the Kowhai River. The number of burrows at the headwaters of the Kowhai River would be counted in tens of thousands. A discrete colony was found at the headwaters of the Snowflake Stream and this, like that found on the SE flank of Mount Fyffe, appears to be a remnant of larger breeding sites occupied years ago. Today these hillsides are badly eroded with few burrows left in the remaining islands of tussock.

Some of the more likely accessible areas of the Hapuka River have been searched for breeding sites without success, but Creswell (pers. comm.) reports dead shearwaters at 2,300m a.s.l. in this catchment, and two farmers hearing "mutton birds" calling at night,

suggest that there may be nesting in this valley. There have been several records during the 1950 to 1970 era of large numbers of "mutton birds" landing about farm houses in the middle Puhī Puhī Valley and these birds may have been heading into breeding places in the Jordan Stream. Mr S. Pilbrow, of Puhī Peaks sheep station, usually has several flocks of Hutton's Shearwaters crash around his homestead lights on foggy nights each year from September to March. Immediately west of Mr Pilbrow's homestead, on steep snow grass bluffs below Mount Tarahaka, extensive colonies of Hutton's Shearwater were found in the Wharekiri Valley.

Muttonbirding by local deershooters has been alleged to have occurred in the Jam Stream in recent years but shearwater breeding has not been confirmed here. Mr E. M. Wilson (pers. comm.) states that, during the spring of 1935, while on goat destruction in the Coverham block of the Bluff Sheep Station, at dawn one morning he observed a flock of black and white sea birds fly out towards sea from burrows under snow tussocks at about 1500m a.s.l. on the flanks of Mount Tapuaenuku.

Breeding areas of *P. huttoni* are known to exist over a distance of some 32 km on the coastal watersheds of the Seaward Kaikoura Range and are suspected to breed on the Inland Kaikoura Range (Fig. 1). No breeding areas have been located below 1,200m a.s.l. and the greatest concentrations are between 1,200 and 1,500m. A few burrows are found as high as 1,828m in favourable aspects where snow tussock reaches this level. Hutton's Shearwater breeding colonies vary from 9 to 24 km inland.

Siting of Burrows:

Burrows can be on gentle slopes of 15° or greater and have been found on almost vertical bluffs, provided there is soil and tussock sufficient to allow burrowing (Fig. 2). Rocky or shingly soils are avoided. Bare eroded soils are sometimes utilized in all breeding areas and many collapsed burrows are found in these parts of the colonies. Burrows have been found facing every aspect, except north-west. The burrow mouth commonly has the base of a snow tussock (*Chionochloa* or *Poa*) as a veranda, although sometimes an *Aciphylla* or *Dracophyllum* serves as an alternative. Usually one burrow opening leads from a veranda, but sometimes this is shared in common with one or rarely two other entrances to neighbouring burrows. Nests collapsed by deer, chamois or ornithologists were measured. No part of any burrow was found deeper than 500mm below the surface. From a sample of thirteen burrows that had a finished nest chamber, the shortest was 0.6m long and the longest was 2.5m and the average length was 1.2m. One damaged burrow was extended a further 0.6m the following year. The nest chamber at the end of the burrow is a little bigger than the approach tunnel, and lined with dry snow tussock and white shearwater feathers. Examination of material at lower levels of the nest chamber produced egg fragments, and skeletons, indicating occupation of the burrow for some years.



FIGURE 2 — Hutton's Shearwater at burrow entrance, Kowhai colony, Seaward Kaikoura range. Photo: G. Harrow

THE ANNUAL CYCLE

Winter Prior to Re-occupation Period:

Weekend visits were made to nest sites of *P. huttoni* over a period of seven years, and records have been taken to cover at least one night each fortnight of the year.

The observations were not made consecutively in one season. Thorough search at night on the upper Kowhai gorge colony on 26 April 1969, 16 May 1970, 29 May 1971, 12 June 1965, 26 June 1965 and 12 August 1967 failed to find any shearwaters. Observations at night at the Wharekiri colony on 13 July 1968 and 1 August 1970 resulted in no signs of shearwaters. The winter visits were made in varying phases of the moon.

The earliest record of *P. huttoni* on the breeding grounds was on 27 August 1966 at the Wharekiri site, when several snow free burrows were occupied by Hutton's Shearwaters by day and small numbers were scratching out burrows at night or noisily calling on the mixed snow and tussock covered slopes. By mid-September in seasons of moderate snowfall, half of the Wharekiri colony is snow free and vast numbers of shearwaters visit the area at night. Single birds and pairs were located in most burrows by day where the nest chamber could be reached. There was also much vocalisation within the burrows during daylight. During September 1965, 1966 and 1968 there were large areas of the breeding sites under deep snow. Many shearwaters were sitting quietly, often in pairs that were sometimes seen to preen each other mutually (Fig. 3). Other pairs of shearwaters were fighting a third intruder and, even though they were located on a deep snow drift, this behaviour suggested territory defence (cf. Figs. 4 & 5). Three such pairs were banded and the site marked with a pole and numbered tag. One pair was relocated at a burrow mouth within 0.6m of the pole marked with their band numbers during the next visit, and a single bird was removed from a second burrow by the second pole the following season, with a corresponding band number. This would suggest that *P. huttoni* are able to fix the approximate location of the burrow when it is covered by snow.

Where the snow has almost melted clear of a burrow mouth, the shearwaters tunnel through the last few centimetres of snow, and scratch earth from their burrow onto the surrounding snow slope. Where snow is lying deep over the colony, birds breeding in these parts make no attempt to burrow in the snow. These birds enter their burrows up to a month later in a heavy snow season than do birds whose burrows are clear of snow early in the spring. Heavy snow delays entrance to the burrows, although snow-free winters and springs do not encourage *P. huttoni* on to the breeding grounds any earlier as was noted in the snow-free August of 1967. No evidence is available to prove that egg laying is delayed in parts of the colony



FIGURE 3 — Mutual preening by Hutton's Shearwaters at the Wharekiri colony. They appeared to defend territory on this deep snow drift. Photo: P. J. Woolman

under late snow other than chicks and fledglings at a much later stage of development by comparison with chicks and fledglings from the early snow free parts of the colony. Furthermore, there were no birds found fledging later than 24 February 1968 in that autumn when there had been a snow free winter in 1967. Brian Bell (pers. comm.) reported that between 9 and 13 March 1968 no juveniles were seen to fledge on the Kowhai Colony nor were any chicks found, although in other seasons after late spring snow he had banded many juveniles and chicks in mid March.

The nightly influx of what appears to be the greater part of the breeding population continues to come onto the breeding grounds throughout September and into the first half of October when the number of birds arriving over the colony each evening dwindles to a mere trickle by comparison with previous weeks. This may be the "honeymoon period" noted in other species of shearwaters, *P. tenuirostris* (see Marshall & Serventy 1956), *P. puffinus* (see Harris 1966). Numbers of *P. huttoni* on the breeding colonies increased again late October and early November, but counts are lower than September records.

Arrival and Departure Times on Colony:

In the first week of September, with sunset at 6.15 p.m., the first birds arrive over the breeding colony at 7.20 p.m. and within a quarter of an hour the air is alive with shearwaters calling on the wing as they circle before landing. The exodus of departing birds to the sea reaches a climax at 5 a.m. and is over by 5.30 a.m. with sunrise three-quarters of an hour later at 6.15 a.m. A month later, in the first week in October, the first bird heard calling over the colony as it arrived from the sea was recorded at 8.05 p.m. and the exodus peaked at 4.40 a.m. and was all over by 5.10 a.m. As the season progresses this pattern of later arrival in the evening and earlier departure in the morning increases; thus on 14 December 1968 the first bird arrived at 11.10 p.m. with the main influx coming between 11.20 to 11.45 p.m. In mid summer the exodus is drawn out, but there is a small build up in departing numbers between 2.30 a.m. and 3.00 a.m. Normally *P. huttoni* is only found on the surface of the colony after dark, but on 16 December 1967 on a hot summer day, two shearwaters were observed outside burrows. Once the birds noticed our party, they quickly entered a nearby burrow.

Effect of Moon Phase on Breeding Population at Colony:

The phase of the moon can have an important bearing on the numbers of incoming birds to the colony. In September and early October at full moon, there is a great influx of *P. huttoni* onto the breeding grounds which would likely account for a large proportion of the total population. There does not appear to be much difference in numbers on the colony at night during September-early October, irrespective of the moon phase. The numbers of birds ashore on the



FIGURE 4 — Courtship display by Hutton's Shearwaters at the Wharekiri colony. Photo: P. J. Woolman



FIGURE 5 — Hutton's Shearwaters attempting copulation. The tag and wire are not attached to the wing but are driven into the snow drift above the birds. Photo: P. J. Woolman

surface dwindle spectacularly from mid October until late December, and during this time at full moon the outward appearance of the colony is particularly quiet with very few birds about, but once the moon has waned, there is small noticeable build up in numbers of birds. These could be unoccupied younger birds, looking for breeding territory or establishing pair bonds, because there is often much vocalisation from pairs sitting on the tussocks, and less frequently burrow scratching out. During late December through to early February one finds an increase in population ashore, well up in numbers compared with the November counts, but well below those of September. Moonless nights invariably bring more birds onto the colony in the summer and early autumn. Several times with a bright moon which has set during the middle of the night, only breeding birds have flown in quietly in the moonlight and quickly entered their burrows, but once the moon had set and it was really dark, many birds came in noisily calling on the wing and on the ground where they remained until just before dawn when they joined the departing occupied birds leaving the burrows. The late arrivals on these nights would presumably be non breeding younger birds.

Effect of Weather on Breeding Population at Colony:

On foggy nights there is a regular pattern of *P. huttoni* crashes into the lights of farm houses and townships on the Kaikoura coast (cf. Fig 1). These have been recorded each month from September to early April, at Kaikoura township, Puhi Peaks Station in the Wharekiri Valley, several farms in the middle Puhi Puhi Valley, farms in the lower Hapuka, Mount Fyffe Station, the Lakes Station, and Swincombe Station. Spot lighting for deer feeding on spring growth lucerne paddocks at Mount Fyffe Station is a common practice, and when the beam is turned up into the fog as mutton birds are heard passing, some can be attracted to the spot light.

Inquiries made at Oaro, Goose Bay, and from Mr Ivan Hislop at Puketa, all south of Kaikoura Peninsula, failed to confirm any crashes or night sounds of shearwaters. Mr Hislop knows the breeding grounds of *P. huttoni* well and is very interested in this species, although H. C. Cowie (pers. comm.) has found *P. huttoni* at Puketa. Contacts made in the Blue Duck Valley, Mangamaunu, Waipapa, Clarence Bridge, Middle Hill Station, Glen Alton Station, Waiiau Toa station, and Kekepengu did not reveal any knowledge of mutton birds crashing into house lights on foggy nights. The latter localities are all north along the coast from Kaikoura township and the sheep stations are inland up the Clarence Valley quite close to breeding colonies of Hutton's Shearwater. This suggests that the shearwaters may fly into the breeding colonies along defined routes, which would explain the regular occurrence of crash sites radiating out in a "V" pattern with the apex at Kaikoura township, and also the lack of reports along the coast south of Kaikoura Peninsula and north along the coast and up the Clarence Valley. No difficulty in navigation appears to be encountered by incoming birds, on clear moonlight nights,

on dark clear starlight nights, or on heavy overcast nights, so long as the cloud base is at least 1,800m, because no crashes have been recorded in these conditions. It would seem therefore that the birds are not relying on the moon or stars for navigation. Observations have also been made on breeding colonies when there have been heavy sea fogs up to 1,200m a.s.l. on the flanks of the Seaward Kaikoura Range, and large numbers of shearwaters have flown up through the cloud to their burrows. Subsequent inquiries elicited no reports of crashed birds. In these conditions, the birds presumably gain sufficient altitude over the sea to break above the cloud, and then fly inland to their breeding site.

The crashes of adult shearwaters have been recorded in south east storm conditions with heavy fog or rain clouds from sea level to the tops of the Kaikoura Range. In these circumstances the birds are attracted to bright lights about houses, but are able to take off again at dawn or on improvement of night visibility. These observations would suggest that the shearwaters are navigating by land marks, and that heavy clouds prevent them from recognising these landmarks (cf. Warham 1960). Hutton's Shearwaters have been seen already stranded at night in stormy weather on the Puhī Puhī Valley road, not near any lights.

Egg Laying and Incubation:

P. huttoni lays eggs during the last week of October and in the first and second week in November, but late fledging in some parts of the colony indicates later laying when snow delays entrance to burrows.

The earliest egg found in a nest chamber was on 27 October 1968 at Wharekiri, but as only about 5% of nests can be reached, data on egg laying are meagre.

A traverse of an acre (0.4 hectare) of the colony in daylight on 27 October 1968 produced 17 whole or partly broken shearwater eggs on the open ground, and six surface eggs were found over the same area on 2 November 1968. Keas (*Nestor notabilis*), which are common at the shearwater breeding colony, have been seen to eat surface eggs. On 2 November 1968 many birds handled from surface capture had palpable eggs in their oviducts. Jackson (pers. comm.) also reports brooding shearwaters in burrows at the Kowhai Colony in the second week in November. Incubation continued to 30 November 1968 but as there were some eggs deserted because of earlier handling of brooding birds, nest inspection was stopped at this period.

Egg Measurements:

	Range	Average
Seventeen whole		
surface eggs	52.3 - 64.5 x 36.2 - 42.7	61.1 x 38.4 mm
Ten nest chamber eggs	54.0 - 65.2 x 37.5 - 46.9	59.8 x 40.9 mm

In other shearwater species it has been observed that surface eggs tend to be longer and are narrower than eggs measured from the nest chamber and the small sample from *P. huttoni* corresponds with this tendency. It has been suggested that surface eggs are laid by young birds not in possession of a burrow, and being possibly their first egg, it could be compressed in the primiparous oviduct to longer and narrower dimensions. The average egg weight was 70 g.

The Chick:

On 15 December 1968 a nest chamber collapsed under foot, during a traverse of the Kowhai colony, on to a brooding bird breaking the egg which had a well grown chick with a yolk sac of 15 mm diameter. The earliest chick was found on 29 December 1965 (Kowhai) still being brooded. It weighed 68 g and, as the average weight of unhatched eggs is about 70 g, this chick was most likely less than a week old. Six chicks weighed at the Kowhai colony on 10 January 1966 were 115, 135, 140, 145, 150 and 170 g and they averaged 142.5 g. At night many chicks can be heard making a pleasant piping whistle and adult birds, apparently in the same burrow, respond with a crooning or soft chuckle.

Eleven chicks from the Kowhai weighed on 5 February 1966 were 400, 400, 440, 450, 470, 470, 475, 500, 510, 550 and 605 g and they averaged 479.1 g. Adult birds found in five of these burrows weighed 305, 340, 355, 355 and 370 g with the average 345 g. Small chicks were found in areas where the snow lies late, characterized by the presence of small tussocks of species of *Notodanthonia* and *Poa*, while large chicks came from areas of the colony that cleared early of snow and are grassed by the big snow tussock *Chionachloa flavescens*. The breeding seasons of 1965, 1966 and 1968 had snow drifts that did not thaw in some parts of the colony until early November. Fledging was therefore much later with the peak in the second and third weeks of March with the latest record on 3 April 1965.

The complete absence of snow on the Seaward Kaikoura ranges from June to October 1967 was followed with a peak in fledging during the third week in February 1968, and no juveniles were found at all the following month. Chicks of 400 g still fully covered in down were recorded on 5 February 1966 after the late snows of 1965, whereas in the first week of February 1968, after the snow free previous spring, juvenile chicks with adult plumage were noted.

Juvenile Hutton's Shearwaters have not been observed exercising wings at burrow entrances like other petrels, but just sit quietly on the surface before beginning their first flight to the sea. The latest juvenile seen to fledge was on 3 April 1966, and three other birds with remnants of down around the neck and flanks were noted by burrows that same night. J. A. Bartle (pers. comm.) advised that while on the trawler "Maimai" fishing on the Cone Grounds 8 km off the mouth of the Ure River from 21 to 24 March 1966, during foggy weather at night, newly fledged *P. huttoni*, some

still covered with earth from their natal burrow, landed on the vessel. These mud covered juveniles must have flown from their burrows on their fledging flight, and crashed into the floodlit trawler before landing on the sea.

Fledging Juvenile Crashes:

On 21 March 1966, with B. D. Bell and party, I had been banding fledging *huttoni* on the Kowhai colony. The following evening at the time of a thick autumn fog, a number of fledging Hutton's Shearwaters, estimated by Dr A. L. Johnston to be about one hundred, crashed into houses in Kaikoura township. Crashes of fledging juvenile Huttons' shearwaters have been recorded more frequently at Kaikoura township and surrounding farm houses from mid March through to the first week in April, than from mid-February to mid-March even though many young shearwaters leave the breeding places in the second half of February and early March. The reason is thought to be linked to the greater incidence of heavy coastal fog in late autumn compared with early autumn and late summer. F. C. Kinsky (pers. comm.) inquired if there had been a breeding disaster on the colonies during the spring of 1967 as no Hutton's Shearwater fledglings had been received during March-April 1968 from ships or around Wellington suburbs in the usual pattern. Far from being a disaster, the breeding during that season appeared to be successful with advanced chicks noted in late January and most burrows deserted by 17 February 1968. Early fledging in 1968 allowed the departing young birds a fog free flight to the ocean. Six young birds picked up under lights in Beach Road, Kaikoura, in late March 1966, had remnants of down on the nape and flanks, and one had a complete collar of down around the neck. These birds may have been deserted and left their nest in a poorly nourished condition.

Mortality:

Neither feral cats nor rats have been found on the colonies. Stoats (*Mustela ermina*) have been observed working the shearwater burrows in both winter and summer. A stoat, in ermine fur except for the black tipped tail, was seen entering several burrows on the Kowhai colony on 13 August 1967 when no shearwaters were heard or observed the previous evening. Normally at this date the breeding area is under snow in the Kowhai Valley, and an ermine stoat would be impossible to pick out against a white background. Mice are common on all colonies and may provide a food source for stoats when the shearwaters are absent from land during mid April to late August. Most of the Hutton's Shearwaters found recently dead on the breeding grounds had the neck wounds which suggested stoat predation. A stoat lair was found under a large boulder by the Kowhai River with many remains of shearwaters cached.

A New Zealand Falcon's feeding station was found in the middle Kowhai gorge, littered with dismembered parts of *P. huttoni*. On a late setting full moon that merged with dawn, in the half light,

a falcon pursued a departing shearwater. A shoulder of a spur in the gorge below prevented further observation of the fast diving pair, but some shearwaters are undoubtedly killed by falcons in these encounters. Eight freshly dead, un mutilated Hutton's Shearwaters have been found in mountain gorges and river beds of the Kowhai, and Wharekiri, and perhaps these had been concussed by a falcon in mid flight and lost in the half light.

Some shearwaters die when they crash into night lights and farm cats take some storm grounded birds. Mount Fyffe Station staff report seeing dead and live shearwaters being swept down flooding creeks during some storms experienced on this property, but the reasons for this mortality are not apparent. Harrier Hawks regularly patrol shearwater breeding areas and have been seen eating *P. huttoni* carcasses, thought to have been killed by stoats. There is a large Kea population about the colonies, but the only interference noted has been the eating of surface shearwater eggs. An Arctic Skua has been seen to attack White-fronted Terns and Red-billed Gulls that were feeding in company with Hutton's Shearwater on the Kaikoura Coast, but the shearwaters were unmolested.

ECTOPARASITES AND GECKO

Many burrows have nest chamber material heavily infested with fleas of the genus *Notiopsylla*, and a few fleas of the genus *Parapsyllus* have been found (J. R. Jackson, pers. comm.). An unrecorded species of tick has also been recovered from Hutton's Shearwater (*vide* Jackson). An undescribed mountain gecko, probably of the genus *Hoplodactylus* (A. H. Whitaker pers. comm.), found on the Wharekiri colony, may feed on shearwater fleas.

DEER, CHAMOIS AND GOATS

These introduced browsing animals were formerly common on the *P. huttoni* colonies, and their trampling frequently collapsed burrows. However, these noxious animals have been greatly reduced since 1970 and there has been spectacular regeneration of the vegetative cover over the burrows. In some breeding areas the big snow tussock appears to be more luxuriant than in non breeding parts.

ACTIVITY AT SEA

Imber & Crockett (1970) suggested that *Puffinus huttoni* is migratory, and that "the entire population of *huttoni* leaves N.Z. seas during autumn and they return in spring." Hutton's Shearwater is a sedentary species which can be seen off shore from the Kaikoura coast between the mouth of the Ure River and Haumuri Bluff on most days, if a careful search is made with an adequate telescope. I have sight records of *P. huttoni* close enough in shore for positive identification for each month of the year. Flocks of *huttoni* have been watched in mill pond seas, feeding a few metres from the beach edge, sometimes even flying low over the beach to dive back into

shoaling small fish. They are just as likely to be found on rocky parts of the Kaikoura Coast, swimming amongst kelp, frequently diving from a surface position, wings often half outstretched after small minnow-like fish. In stormy weather these shearwaters are to be found just a little further off shore, diving into or skimming the waves. Doubtless they are further out to avoid the danger of being dashed on rocks. *P. huttoni* often feeds in company of Red-billed Gulls, White-fronted Terns, and occasionally Southern Black-backed Gulls. When whitebait (*Galaxias*) are running in Kekerengu, Kowhai, or Kahutara River mouths, during late October or November, large flocks of *P. huttoni* have been seen sharing the harvest with the whitebaiters. The largest flock the author has noted at sea was about 10,000 birds feeding close inshore on 31 January 1967 about 5 km south of the Ure River mouth. A much bigger flock was photographed by several people from Kaikoura on 20 and 21 September 1967 when numerous Hutton's Shearwaters occupied the bay in front of Kaikoura township, between the Marine Biological Station and the Kaikoura Railway Station. The birds were feeding on shoals of unidentified silver fish about 35-40 mm long, which were so numerous that many were seen to become stranded on the beach. From the photographs taken on this occasion, there would appear to be possibly 20,000 *P. huttoni* in the Kaikoura Bay for those two days. The almost complete lack of vocalisation from these feeding flocks of shearwaters is surprising when one recalls how noisy they are at night on their breeding ground.

While most of my observations of *huttoni* at sea have been made from the Kaikoura Coast, I have sighted flocks within Long Bay just east of Akaroa, on Banks Peninsula, near Gore Bay, Marfell's Beach, and at the entrance to Tory Channel in Cook Strait. Falla (1965) stated that *huttoni* has been observed during September and also December in the tide rip off Karori Rock in Cook Strait, and during February in the channel between Kapiti Island and Waikanae. Sibson (1952) reported a raft of about 300 Fluttering Shearwaters at the northern end of Goose Bay, but in a recent discussion, he agreed with me that these birds were most likely to be *huttoni* rather than *gavia*. R. H. Beck, of the Whitney South Sea Expedition, collected specimens of *huttoni* just off Banks Peninsula on 28 and 29 January 1926, listed by Murphy (1930: 12) as *P. gavia* (see Murphy 1952). P. Sagar (pers. comm.) advised that a number of dead *huttoni* were picked up on a South Canterbury beach adjacent to Waimate. Serventy (1939) reported *huttoni* at sea in South Australian waters in Bass Strait, near Kangaroo Island, and an isolated specimen near Albany, in Western Australia (Fig. 6). These Australian records might possibly be juveniles from the Kaikoura population, but as yet there is no proof for this supposition. Mathews (1912) described a specimen of *huttoni* as being collected near Snares Island, but doubt about the authenticity of this location has been questioned both by Murphy and Falla. Warham (1967) did not find either *P. gavia* or *P. huttoni* on the Snares Island in recent years. All the recent New



FIGURE 6 — Extralimital records of Hutton's Shearwater in the Australian Region.
del.: Belinda Harrow

Zealand records of *huttoni* at sea are within easy flying distance of the Kaikoura breeding grounds, when it is considered that *Puffinus puffinus*, a closely related species, range up to 200 miles from its nesting island collecting food (Harris 1966).

Rafting:

Rafting of *P. huttoni* has been regularly recorded during the breeding season. Late in the day feeding ceases, and the birds gather in large idle groups riding the ocean swell. Favoured parts of the Kaikoura Coast for rafting are a kilometre or so off shore from the Kekerengu Store, also off Waipapa, and adjacent to the Goose Bay Store. These rafts could well correlate with their breeding colony directly inland on the mountain ranges.

Beach Patrols:

Beach patrols have been conducted on several Kaikoura and North Canterbury shorelines at irregular intervals. Eleven dead *P. huttoni* were recovered, but no *gavia* were found over a period of four years. In the ten days following the disastrous cyclonic storm that hit the Cook Strait region during April 10 and 11 1968, 25 km of beach were patrolled at Birdlings Flat, North and South Brighton, Leithfield, Goose Bay, and South Bay, Kaikoura (Fig. 6). Spotted Shag was the commonest species picked up, followed by the White-flipped Penguin, but no specimens of Hutton's Shearwater were found. Kinsky (1968), discussing seabird mortality around the southern North Island during the same cyclonic storm, reported finding only one *huttoni* corpse out of a total 578 dead birds identified. March and early April is a period when young *huttoni* are sometimes found on the Kaikoura, Marlborough, and Wellington coastlines, and at first it seemed odd that virtually none was recovered during the cyclonic storm. However, the explanation is possibly due to abnormally early fledging of *huttoni* in late January and February 1968. The winter and spring of 1967 brought no snow over the Kaikoura Hutton's Shearwater breeding grounds, which resulted in no delay in chick rearing. The early fledging of 1968 allowed the chicks almost two months at sea, and the parents a similar period to complete their moult and regain vitality after the stresses of breeding before the cyclone hit the area. Several investigators have pointed out the advantages of early fledging of Procellariidae and disadvantage of late fledging; Harris (1966) for the Manx Shearwater; Serventy (1966) for Short-tailed Shearwater; Stonehouse (1964) and Richdale (1963) for the Sooty Shearwater.

HISTORICAL NOTES

The vessel "Acheron" under the command of Captain J. L. Stokes, with Mr. J. W. Hamilton as surveyor, in 1849 did survey work on the east coast of the South Island between Wellington and Lyttelton. In Hamilton's diary on Tuesday, 13 November 1849, he gave an account of the first ascent of Mount Tapuenuku by his

party, and also refers to Maoris taking mutton birds in the following quotation — “I was afterwards informed at Kaikoura Peninsula by the Natives that the Titi (muttonbird) breeds in large numbers on the Mountain (Tapuaenuku), and that many persons have been killed hunting for them” (Hamilton 1849). These muttonbirds could have been *Pterodroma inexpectata*, but are more likely to have been *Puffinus huttoni*.

Mr. H. Melville, an octogenarian, told me recently that when he was a young man in his twenties, he recalled an aged Maori describing annual mutton birding expeditions that the Waipapa tribe made up the Clarence River into the head of the Dee Stream, under Mount Tapuaenuku. These parties took a supply of Paua shellfish to keep them in food for the two to three days it took them to reach the mutton bird breeding grounds high in the mountains. Paua shell middens found at the bush line on the southern flank of Tapuaenuku were suggested as evidence of a Maori retreat of probably pre-European age (McLintock 1966: 200), but this is much more likely to have been the result of Maori mutton birding. Maoris traditionally avoided high mountainous country, and only entered when there was a powerful need such as to obtain greenstone over the other side of the alpine passes of the Southern Alps. Mutton birds were highly prized and traded between tribes like the greenstone, and would have provided sufficient incentive for Maoris to make these hazardous expeditions.

The Jacobs family of Oaro near Kaikoura have recounted descriptions of their ancestors mutton birding in the Kowhai Valley of Seaward Kaikoura Range. The tradition of mutton birding was most likely lost with Te Rauparaha's massacre of the Kaikoura Pa in 1828, and his later attacks at Kekerengu. I can find no evidence of serious Maori mutton birding in recent times.

EPILOGUE

Hutton's Shearwater colonies are widespread throughout the Seaward Kaikoura Ranges in great numbers with possible breeding on the Inland Kaikoura Range. This species appears to be surviving successfully. A detailed long term study would be necessary to work out the complete breeding biology; requiring much time and certainly a safer, permanent habitation than a tent fly used by the author.

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SHORT NOTE

STINKER: THE STORY BEHIND THE NAME

The OED, that never-failing source of curious information, tells us that a "Stinker" is "A sailor's name for the Giant Fulmar (*Ossifraga gigantea*) and other ill-smelling petrels," a term first noted in 1837. If, having been a victim of a Giant Petrel's surprisingly accurate and fullsome vomit, you are still intrigued by the phenomenon, the following recently-published studies will be of interest:

- WARHAM, J.; WATTS, R.; DAINTY, R. J. 1976. The composition, energy content and function of the stomach oils of petrels (order Procellariiformes). *J. exp. mar. Biol. Ecol.* 23 (1): 1-13;
- CLARKE, A.; PRINCE, P. A. 1976. The origin of stomach oil in marine birds: analyses of the stomach oil from six species of subantarctic procellariiform birds. *J. exp. mar. Biol. Ecol.* 23 (1): 15-30.

A BUSHMAN'S SEVENTEEN YEARS OF NOTING BIRDS

PART D—SHINING CUCKOO AND LONG-TAILED CUCKOO

By R. St. PAUL

(Edited by H. R. McKenzie)

SHINING CUCKOO (*Chalcites lucidus lucidus*)

STATUS AND HABITS

Habitat

This migratory bird occurs in considerable numbers throughout the country and is at home in this area in heavy and light bush, scrub and exotic trees and shrubs.

Flight

The flight is direct, with shallow undulations, which show the beautiful iridescent green of the back. Although it crosses the ocean it does not seem to fly high here, preferring to keep well within reach of cover.

Breeding

I have known the Shining Cuckoo to victimise only the Grey Warbler (*Gerygone igata igata*) but it is reputed to use the nest of the House Sparrow (*Passer domesticus*) and some other small birds. There are many conflicting and unsubstantiated reports and theories as to how it places its egg in the nest of the warbler and whether it feeds its own young at times but I have not observed any of this. I do know that one will feed another, probably when courting and that a cuckoo, apparently an adult, will set up the juvenile call when it sees a Grey Warbler passing by and that the warbler will respond (J. W. St. Paul pers comm.). I do not think that anyone can say that they fully understand this bird or can definitely refute the strange observations that have been made.

Food

Feeding is mostly in fairly close growth. It takes insects, grubs and caterpillars, including the hairy caterpillar of the Magpie Moth, common on the ragwort, which is plentiful here. I think that few if any other birds will eat this caterpillar. Rarely is bare ground visited for food. I have not known this cuckoo to take any vegetable food.

Song

When the Shining Cuckoo first arrives from overseas it sometimes gives only the first half of the whistled song or else the downward

notes only. Soon the full song is given, perhaps when it has recovered from fatigue. It appears to ventriloquize but this may be due only to head movements during song.

From mid-December to mid-January groups of six to ten or more will hold a noisy meeting in one tree, chirping excitedly and fussing about for some time, then leaving two at a time.

It is not unusual to hear one give a very prolonged song at any hour of the night. At 2300, 24 October 1947, an earthquake disturbed the birds and from my hut at the mill I heard 12 Shining Cuckoos calling from different points. Heard also were some Long-tailed Cuckoos (*Eudynamis taitensis*) in the distance and some Pheasants (*Phasianus colchicus*). Mrs Hetty McKenzie (pers. comm.) has reported a Shining Cuckoo singing on the wing.

Relation to other birds

I have not known other birds to mob it. They apparently regard it as not so harmful as the Long-tailed Cuckoo, so do not fear and resent it.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to 20 heard and not seen.

The following summaries for Tihoi, Minginui and the Waiau are not made according to calendar years but to the seasons of the Shining Cuckoo in New Zealand, i.e., from September to February from 1944 to 1961.

Although I was away for about the last two weeks of December and about the first week in January those two months, though having less count days, still had high counts. This may be because this bird is more active and vocal at this time of year. This applies also to the Long-tailed Cuckoo.

TIHOI

The total of birds seen for the two cuckoo seasons, i.e., September 1944 to February 1946 was 42 (860).

Count days per month for the 12 months of the two seasons averaged 24.80; days seen 2.20; days not seen 22.60.

Daily counts of birds seen ranged from 0 to 3.

Count days totalled 297 and the total birds seen 48, giving an average of 0.16 (3.20) per count day.

Notes on Analysis

The earliest dates for Shining Cuckoo heard at Tihoi were 2 October 1944 and 6 October 1945. The latest were calls in February 1945, undated, and 1 heard on 22 February 1946.

In the earlier years of my note-taking I was recording mostly birds seen and occasionally birds heard until HRMcK asked me to record especially the earliest and latest calls of the cuckoos. Fortunately, except for February 1945 notes had been taken of the calls of the first heard to arrive at Tihoi and the last heard to depart.

These figures could indicate that Tihoi (plus Arataki) would have had fewer birds than did Minginui in later seasons. Tihoi had 23 for 1944-45 and 19 for 1945-46, while Minginui had 13 for 1946-47. However, Minginui then went on from that season to 100, 200 and 300 odd up to 1959-60 and Tihoi could well have gone up similarly for those seasons also.

There were not sufficient records for making a table for Tihoi to show the average of birds seen per count day for each of the 12 months of the two seasons, 1944-45 and 1945-46.

MINGINUI

The total of birds seen for the 15 seasons, i.e., September to February, 1946-47 to 1960-61 was 3050 (64,050).

Count days per month for the 90 months of the 15 seasons averaged 22.40; days seen 10.10; days not seen 12.30.

Daily counts of birds seen ranged from 0 to 17.

Count days totalled 2012 and the total birds seen 3050, giving an average of 1.50 (31.50) per count day.

Notes on Analysis

TABLE 1 — Monthly averages of birds seen per count day during the 15 seasons, September 1946 to February 1961.

Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
0.90	1.65	2.85	2.77 (3.69)	1.15 (1.38)	0.17

The figures for December and January need to be modified as shown in brackets. They had incomplete records owing to my being away for the Christmas holidays for an average of 10 days in December and 6 in January, so that the December average should be at least one third more, i.e., 0.92, making the total 3.69 and January one fifth more, i.e., 0.23, making the total 1.38.

TABLE 2 — Averages of birds seen per count day at Minginui for the seasons shown.

1946-47	0.10	1954-55	2.64
1947-48	0.74	1955-56	1.67
1948-49	1.44	1956-57	1.18
1949-50	2.27	1957-58	2.26
1950-51	1.59	1958-59	2.59
1951-52	1.68	1959-60	2.06
1952-53	1.18	1960-61	0.30
1953-54	1.27		

The 1946-47 season at Minginui was very poor but a steady recovery was made up to 1949-50. It is to be noted that numbers for the early nineteen fifties were quite well maintained, not dropping so badly as in the case of some of the small birds already dealt with for that period (e.g., Whitehead, Rifleman and Pied Tit).

The 1960-61 season shows a disastrous drop:

Sept. 1960, none seen in 29 count days.

Oct. 1960, 25 seen up to 19th, then none in the rest of the 30 count days (5 being spent in the coastal Bay of Plenty).

Nov. 1950, 4 seen in 28 count days.

Dec. 1960, 7 seen in 6 of 18 count days.

Jan. 1961, 0 seen in 26 days.

Feb. 1961, 0 seen in 26 days.

It is to be noted that November, December and January usually provide the highest counts so it seems that, since there was the usual number up to 19 October, the decline for 1960-61 took place in New Zealand, not during migration, or at the winter quarters in the Pacific islands. The cause of the drop is not apparent. The Grey Warbler and other insectivorous birds showed no decline so food was not a factor. Since the drop occurred so soon after arrival here it is possible that a disease was brought from the Pacific islands.

WAI AU

The total birds seen for Wai au for 11 months of the period 1946 to 1961 was 181 (3801).

Count days per month for the 26 months in which trips to Wai au were made averaged 3.00; days seen 1.30; days not seen 1.70. Daily counts of birds ranged from 0 to 12. Count days totalled 79 and the total birds seen 181, giving an average of 2.30 per count day.

Notes on Analysis

The Shining Cuckoo has not shown a tendency to linger longer in February in the Wai au area than at Minginui as the Long-tailed Cuckoo has done to some extent.

SEASONAL RECORDING

Although September has rather sparse records it has been included because occurrences are fairly regular, but I was away in September 1948 and 1949 and in 1958, 1959 and 1960 there were none.

The Shining Cuckoo arrives in this higher country a week or more later than it does at the coast.

March has not been included in the analysis because it can well be termed "out of season." In 1950 it had 3 seen, the last on 20 March, 1953 had 1 on the 26th, 1956 2 on the 28th and 1959 2 on the 21st. All of these were at Minginui and were silent. It could be expected that these would either winter here or die rather than that they would still migrate.

There has been no noticeable outward migration movement noted here so they may filter through to the coast. H. R. and H. M. McKenzie (pers. comm.) were at Muriwai Beach, North Auckland, from 12 to 25 February 1945, where a very large flock was feeding on caterpillar on lupin and was still there at the latter date. During the whole period song was heard only twice, though there seemed to be some hundreds of birds. This must have meant that a particularly late departure would be made. On 10 February 1946, none were found there so migration that year must have been earlier or they may have been congregating elsewhere.

DATES OF FIRST AND LAST SEEN OR HEARD

Many people listen for the first Shining Cuckoo and welcome it as a harbinger of spring. Few note any evidence of its dates of departure.

Table 3 gives such dates as I have been able to obtain for this area. The "out of season" ones are included as I do not know whether or not they would stay or migrate.

TABLE 3 — Dates of first and last Shining Cuckoos

<i>First Seen or Heard</i>	<i>Last Seen or Heard</i>	<i>Date Before Last</i>
1946 Sept. 17 1	1947 Feb. 22 1	Jan. 14
1947 Oct. 7 1	1948 Feb. ? 1	
1948 I was away	1949 Feb. 14 2	
1949 Oct. 4 2	1950 Mar. 20 1	Mar. 1
1950 Sept. 20 1	1951 Feb. 27 1	Feb. 7, 11, 16
1951 Sept. 23 1	1952 Feb. 11 1	
1952 Sept. 20 1	1953 Mar. 26 1	Feb. 3
1953 Oct. 3 1	1954 Feb. 7 2	
1954 Sept. 29 2	1955 Feb. 20 1	Feb. 16, 18
1955 Sept. 26 1	1956 Mar. 28 2	Feb. 15
1956 Sept. 26 1	1957 Feb. 8 1	
1957 Sept. 29 1	1958 Feb. 28 1	Feb. 4
1958 Oct. 1 2	1959 Mar. 21 2	Feb. 4
1959 Oct. 5 2	1960 Feb. 4 2	
1960 Oct. 4 1	1960 Dec. 16 1	

Where the gap is considerable dates of those heard prior to the last are given in the third column. For instance, the gap in 1947 would be 22 days, so that the bird may be presumed to be one which will not migrate.

Although the song fades considerably in January and ends almost entirely in early or mid-February, the birds are still present and nearing migration. The late February and the March dates shown in Table 3 indicate birds which may be expected to fail to migrate. If these late birds do in fact remain for the winter they may possibly survive by moving to coastal areas which would be warmer than Minginui.

LONG-TAILED CUCKOO (*Eudynamis taitensis*)

STATUS AND HABITS

Habitat

This cuckoo was almost wholly a bird of the native forest but in recent years it has adapted itself to exotic forests also. Its range in the North Island is practically determined by the presence of the Whitehead (*Mohoua albicilla*) which is the main victim of its parasitic breeding habit. The Long-tailed Cuckoo is very secretive and difficult to observe because of its habit of hiding in thick growth, often in high trees.

Flight

Normally, it uses a flapping flight but it will glide a little distance. Its wings are held out at right angles to the body and this, with its long tail, gives it the appearance of a flying cross. These features help to distinguish it from the New Zealand Falcon (*Falco novaeseelandiae*), which in some respects it otherwise resembles. Its flight is not fast enough to prevent it being fiercely mobbed by Tuis. Wilkinson (1952) recorded two Tuis forcing one down into the sea. After they desisted the cuckoo got up and flew back into the bush. I have heard of another case of one being forced down into a river and getting up again and flying off. Perhaps the lightness of the bird allows it to take off from the water provided it does so before it becomes waterlogged. Here it is not uncommon for it to be forced down to the ground to take refuge in fern or other low growth.

Breeding

The victims of the breeding habit here in the north are mainly the Whitehead and to a lesser extent the Grey Warbler (*Gerygone igata igata*). I have not known of any other. In the "School Journal" of my young days I remember a picture of a Grey Warbler standing on a young cuckoo while feeding it in the nest. I actually saw this happen by the Wanganui River, the two Grey Warblers bringing food as fast as they could and the big young cuckoo screeching all the time for more.

Food

The general food is insects and their larvae, which it seeks in thickly branched trees and shrubs, but I believe that it will eat the eggs out of any kind of nest it finds. Others claim that it takes nestlings (Buller 1888; Turbott 1967) and even adult birds (Wilkinson 1952). Wilkinson noted it on Kapiti Island stalking and catching lizards on stony ground. There would be little opportunity for it to do this here.

Song

The main call is a long harsh screech, uttered by day and by night. This and all other calls are aptly described by A. T. Edgar (Falla, Sibson & Turbott 1966, 1970). At my old home in Moumoukai in the Hunua Ranges the only call heard was the harsh screech made

during migration. The calls from thick cover seem to come from one side and the other, so that it may ventriloquize to some extent, or perhaps merely turn its head as it calls. It sits parallel with a branch and looks part of it.

Besides some heard at Minginui at 2300 hours at the time of an earthquake on 4 October 1947, I also heard several calling for some time at night in bush near Wanganui after an earthquake. Buller (1888) mentioned an account by Captain Mair of seeing some hundreds, during three days of travel, in parties of 20 to 30, making a great noise while flying about in an area of dead trees and apparently feeding on cicada. HRMcK (pers. comm.) was told by a resident of Franz Josef village of many Long-tailed Cuckoo gathering in a large heavily foliated native tree and chattering loudly. The observer was standing in the middle of the road and more were flying past on either side of him to the tree. Close questioning appeared to prove that they were really Long-tailed and not Shining Cuckoo. The nearest to these accounts that I have experienced has been 3 or 4 in different hawthorn trees screeching at the same time, a much lesser performance than that of the Shining Cuckoo.

Use of makutu

The makutu (a Maori term for spell of death) is certainly used by the Long-tailed Cuckoo. Guthrie-Smith (1914) told of one landing at a Tit's nest, appearing to touch but not harming the chicks physically and the watching parents skulking and not returning to the nest but leaving the chicks to die. HRMcK (pers. comm.) noted on Little Barrier Island (where the species is plentiful) several deserted passerine nests with one of the full clutch of eggs having a small dent in it. Perhaps the Cuckoo preferred to thus put the makutu on them, not feeling like eating them. These were not the nests of species in which it usually deposits its egg.

As the Long-tailed Cuckoo comes approximately a month later than the Shining, the September month is not included in the following analysis.

ANALYSIS OF MONTHLY CHARTS

(Brackets = total birds seen plus estimate of birds heard only).

Proportion seen to heard: 1 seen to 18 heard and not seen.

TIHOI

The total of Long-tailed Cuckoo seen for its two seasons, i.e., October 1944 to February 1946 was 64 (1216).

Count days per month for the 10 months of the two seasons averaged 24 days; days seen 4.20; days not seen 19.80.

Daily counts of birds seen ranged from 0 to 3.

Count days totalled 240 and the total birds seen 64, giving an average of 0.27 (5.13) per count day.

Notes on Analysis

The earliest dates for Long-tailed Cuckoo heard at Tihoi were 12 October 1944 and 16 October 1945.

No note was made of the last heard in February 1945.

In 1946 the last seen and heard was on 22 February.

Not included in this analysis is an "out of season" record of two seen and heard on 9 March 1946. Since these very late birds were vocal they may have been adults.

MINGINUI

The total of birds seen at Minginui for its 15 seasons, i.e., from the late spring of 1946 to the late summer of 1961, was 594 (11,286).

Count days per month for the 75 months of the 15 seasons averaged 23.53; days seen 4.96; days not seen 18.57.

Daily counts of birds seen ranged from 0 to 5, but usually 0 to 2 or 3.

Count days totalled 1765 and the total birds seen 594, giving an average of 0.34 (6.46) per count day.

Notes on Analysis

TABLE 4 — Monthly average of birds seen per count day during the 15 seasons, October 1946 to February 1961.

Oct.	Nov.	Dec.	Jan.	Feb.
0.02	0.44	0.75 (1.00)	0.27 (0.32)	0.03

The December and January counts need to be modified, as shown in brackets. As in the case of Tihoi, they had incomplete records owing to my being away for the Christmas holidays for an average of 10 days in December and 6 in January, so that the December counts should be at least one-third more, i.e., 0.25, making the total 1.00, and January one-fifth more, i.e., 0.05, making the total 0.32.

September was not included in Table 4. It had only 1 "out of season" record, 1 heard on 18 September 1953. The nearest early record to this for Minginui was of one heard flying south at night on 7 October 1956. Minginui had no "out of season" record.

TABLE 5 — Seasonal averages of birds seen per count day at Minginui

1946-47	0.11	1954-55	0.26
1947-48	0.16	1955-56	0.46
1948-49	0.26	1956-57	0.43
1949-50	0.22	1957-58	0.35
1950-51	0.44	1958-59	0.57
1951-52	0.33	1959-60	0.36
1952-53	0.05	1960-61	0.14
1953-54	0.06		

As with the Shining Cuckoo the 1946-47 season was very poor, then climbed gradually to a peak in 1950-51. The numbers of the Long-tailed Cuckoo were normal throughout the 1951 season but showed a marked drop in 1952-54, few returning to this country. However, there was a build-up in 1954-55 and 1955-56 showed a full recovery. Some other insectivorous birds already treated in this series followed much the same course, dropping in the whole of 1952 and on to part 1954, an exception being the Shining Cuckoo, which dropped much less in comparison in its 1952-53 and 1953-54 seasons. No explanation is evident.

The 1960-61 season shows a drop similar to that of the Shining Cuckoo:

Oct. 0 in 24 count days
 Nov. 2 in 28 count days
 Dec. 13 in 18 count days
 Jan. 2 in 26 count days
 Feb. 0 in 26 count days.

Since the New Zealand resident insectivores showed no decline in the 1960-61 season, yet both cuckoos did so, this could perhaps suggest that they imported some personal avian disease which carried them off early in their stay here.

WAIAU

The total of birds seen for Waiau for parts of the 9 months in the period 1946 to 1961 was 182 (3508).

Count days per month for the 9 months in which trips to Waiau were made averaged 5.70; days seen 4.60; days not seen 1.10.

Daily counts of birds seen ranged from 0 to 10.

Count days totalled 51 and the total birds seen 182, giving an average of 3.57 (67.83) per count day.

Notes on Analysis

The analysis of monthly charts for the Long-tailed Cuckoo shows Tihoi 0.27, Minginui 0.34 and Waiau 3.57 per count day. The much higher count for Waiau could be due to (a) my being on the move so much more while hunting; (b) there being more Whiteheads whose nests are used for breeding; (c) preference for beech forest for some reason which is not evident. (a) and (b) I do not think could account for the whole of the differences in the populations of the three areas.

SEASONAL RECORDING

September and March, the "out of season" months, were not included in the analysis. The only September arrival record was of one flying at night on the 18th in 1953. The next heard was on 18 November. March had two records, 2 birds at Tihoi on 9 March 1946 and one at Waiau of 3 birds on 3 March 1956.

Strangely enough, the Long-tailed Cuckoo was later in leaving Waiau than Minginui in the several years in which I happened to visit the back country at or near the end of the season. For instance, the last seen at Minginui in 1957 was on 30 January, but on a hunting trip to Waiau the same year I got 5 to 8 for 10-19 February and these were unlikely to have been the last. Again in 1958 Minginui had as its last date 18 January, while on another trip to Waiau the same year I got daily counts of from 2 to 8 from 10-19 February, and these again were unlikely to have been the last. I am at a loss to account for the difference in the leaving dates for the two areas which are so close together.

TABLE 6 — Arrival and departure dates of the Long-tailed Cuckoo.

<i>First seen or heard</i>	<i>Last seen or heard</i>
1944 Oct. 12 1	1945 Feb. Heard, no date
1945 Oct. 10 1	1946 Mar. 9 3
1946 Nov. 2 1	1947 Feb. 22 1
1947 Oct. 24 1	1948 Feb. 4 1
1948 Nov. 28 1	1949 Feb. 6 4
1949 Oct. 23 1	1950 Jan. 27 2
1950 Oct. 26 1	1951 Feb. 25 1
1951 Oct. 20 1	1952 Jan. 26 1
1952 Nov. 10 1	1953 Jan. 16 2
1953 Sept. 18 1	1954 Feb. 10 1
1954 Nov. 1 1	1955 Jan. 14 1
1955 Oct. 23 1	1956 Mar. 3 2
1956 Oct. 7 1	1957 Feb. 19 5
1957 Nov. 2 1	1958 Feb. 19 2
1958 Nov. 11 1	1959 Jan. 25 1
1959 Oct. 31 2	1960 Feb. 20 1
1960 Nov. 20 1	1961 Jan. 30 2

As with the Shining Cuckoo the uncharted "out of season" early and late records are included in this table, which covers Tihoi, Minginui and Waiau together.

Unlike the Shining Cuckoo the Long-tailed did not show significant gaps before the last seen or heard each year.

I have noted that in some years the Long-tailed Cuckoo was first heard flying high to the beech forest but in other years it would come first to the flats and valleys and then spread to the higher country.

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NOTES ON THE BIRDS OF NORFOLK ISLAND

By JOHN L. McKEAN, OWEN EVANS and J. H. LEWIS

INTRODUCTION

Recent appraisals of the status of birds on Norfolk Islands can be found in Turner, Smithers & Hoogland (1968), Wakelin (1968), Smithers & Disney (1969), Disney & Smithers (1972) and De Raven (1975). Hull (1909) account provided an historical background against which modern accounts of status can be measured. Two of us, McKean and Lewis, visited the Island during November 1975. During our stay there we had the collaboration of Mr Owen Evans, an island resident, who, although mainly a specialist in the local flora, was able to provide data additional to that obtained by us. Notes were made on some 54 species but we propose to limit our remarks to those species for which we have new information.

Puffinus carneipes, Fleshly-footed Shearwater

Many Fleshly-footed Shearwaters were seen at sea between Phillip Island and Norfolk Island during November 1975. Although no previously published record is known to us the species is regarded as a regular visitor by some of the local residents with fishing interests. Norfolk Island could be expected to be within the normal foraging range of breeding birds from Lcdr Howe Island (McKean & Hindwood 1965) or New Zealand.

Sula bassana serrator, Australian Gannet

A pair of Australian Gannets was noted nesting on Nepean Island in November 1961 by Mrs L. M. Marsh (*In litt.* to W. B. Hitchcock 21 July 1962). A colour slide of the incubating Gannet was sent to CSIRO by Mrs Marsh on 3 April 1963. It was examined by Hitchcock and McKean who agreed with her identification. Presumably the species has continued to nest in the Norfolk Island area since then, certainly two pairs bred on Phillip Island during the 1974/75 summer and we located three pairs with eggs during November 1975 on Phillip Island. A search of Nepean Island and Bird Rock failed to reveal any other nesting Gannets. This is apparently the first time the Australian Gannet has been recorded in breeding contact with another sulid species, in this case the Masked Booby (*S. dactylatra*). There appear to be no previously published records of the Australian Gannet from Norfolk Island.

Threskiornis molucca, White Ibis

A White Ibis was seen during November 1975 in the vicinity of Kingston. This would appear to be the first published record for Norfolk Island of this Australian breeding species but it has been

recorded as a straggler in New Zealand (OSNZ 1970) and also to Lord Howe Island (Fullagar *et al.* 1974).

Anas platyrhynchos, Mallard

Up to four Mallards were present during November 1975 at a swampy patch near Kingston. Although there are no previous published records for Norfolk Island the species is common in New Zealand and during November 1975 Dr P. J. Fullagar (pers. comm.) recorded about 20 Mallard on Lord Howe Island. G. Southwell (*in litt.* 2 January 1976) stated that he has seen the species on Norfolk on several occasions.

Rallus philippensis, Banded Rail

Apparently there have been no published reports of this species on Norfolk Island since the time of Hull (1909). On 19 November 1975 at dusk a Banded Rail was seen at the edge of the swamp below the Melanesian Mission (St. Barnabas Chapel). We spot-lighted the same spot on 26 November 1975 and glimpsed three Banded Rails as they scurried into thicker cover. It is relevant to mention that Banded Rails reappeared on Lord Howe Island during the latter half of 1975 (P. J. Fullagar, pers. comm.). They had not been noted there since about 1944 (Hindwood & Cunningham 1950).

Calidris acuminata, Sharp-tailed Sandpiper

A bird was present at a freshwater pool near Kingston during most of November 1975. It was examined carefully in case it might have been a Pectoral Sandpiper (*C. melanotos*) but its breast markings and bill colour excluded that possibility. Apparently there are no previously published records for Norfolk Island, however G. Southwell (*in litt.* 2 January 1976) reported that he has noted them annually in small numbers.

Sterna sp., Fairy or Little Tern

The remains of a small Tern, either *S. albifrons* or *S. nereis*, were picked up at Emily Bay, Norfolk Island, on 15 November 1975. This material, comprising two wings and a tail, has been lodged in the collections of the Division of Wildlife Research, CSIRO (Reg. No. 18241). New Zealand Little Terns could pass through the area on migration whereas any of the races of Fairy Terns could occur as occasional visitors or vagrants. The mummified remains of a *S. albifrons* were found on Gower Islet, Lord Howe Island, by J. Pickard on 15 December 1975 (CSIRO Div. Wildl. Res. Colln. Reg. No. 18253).

Turdus poliocephalus, Grey-headed Blackbird

We found two old nests of this species (identification based on bulkiness of nest, lack of mud in lining and egg fragments present) yet failed to find any birds despite many hours observation and mist-netting throughout the forest. The Blackbird (*Turdus merula*) and the Song Thrush (*T. philomelos*) were abundant. It is our opinion that

the Grey-headed Blackbird on Norfolk Island is on the verge of extinction and that the population has shrunk to the point of no return. The Norfolk Island population is the nominate race. The most recent sighting that we are aware of is of a single bird seen below the summit of Mt Pitt by Mrs Beryl Evans during September 1975.

Zosterops albogularis, White-throated Silvereve

Our only sighting was a pair probing the branchlets and leaves of a tree in rainforest just below the summit of Mt Pitt on 16 November 1975. Our sighting, although not changing its status from that given by Mees (1969) or Smithers & Disney (1969), at least indicates that the species is still extant.

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COMFORT MOVEMENTS OF THE KEA, *Nestor notabilis* (Psittaciformes: Nestoridae)

By K. J. POTTS

ABSTRACT

Comfort movements of the parrot *Nestor notabilis* in captivity are described and their occurrences in sequence statistically analysed. Some movements were found to be significantly associated.

INTRODUCTION

Systematic study of the non-reproductive ethology of the Kea (a species endemic to New Zealand) has not previously been undertaken; such information as exists is fragmentary, consisting of loosely descriptive or anecdotal references within the framework of more general studies.

Apart from their significance in comparative studies, descriptions of non-reproductive behaviour provide a basis for the study of reproductive behaviour since, in birds, elements of the latter have frequently been shown to derive from the former (e.g. van Iersel & Bol 1958) . Furthermore, non-reproductive behaviour may be organised and, as such, challenges an explanation (Delius 1969) . An analysis of uninterrupted sequences (or " bouts " as defined later in this paper) of various kinds of comfort movements of Keas shows that some movements are significantly associated.

The applicability of studies made of captive birds to behaviour in the wild is widely accepted for, although differences in behaviour frequency and intensity do occur, the range of basic movements associated with body maintenance, reproductive and agonistic display tends to be highly stereotyped.

METHODS

Observations were made on caged birds at Wellington Zoological Gardens from mid-March to early July 1969 and in March 1976. The number of birds confined at any one time varied from 6 to 28. No nestlings were available for study.

The 1969 cage measured approximately 10 x 16 x 5 metres; in 1976 6 birds were confined in a larger cage. Details of behaviour were recorded by direct observation from outside the cages, except in 1969 when an internal hide was sometimes used.

COMFORT MOVEMENTS

I have closely followed McKinney (1965) in classifying under

the general heading of comfort movements the activities of shaking, stretching, cleaning, bathing and autopreening*.

These movements serve to remove sources of irritation and extraneous material, care for the body surface and plumage and counteract the effects of muscular inactivity.

Shaking movements:

(i) Head-shake

The head is shaken in a side to side motion several times, usually within the space of 1-3 seconds; its intensity may vary. The bill may be partially open. Head-shaking often occurs after sneezing, drinking and feeding to remove mucus, water, dirt or food particles from the bill surface.

(ii) Body-shake

This consists of a fluffing of the entire plumage, followed by a sharp side to side twisting shake of the body. It is probably performed in response to disarranged feathers or to the presence of water or foreign matter on the plumage.

(iii) Tail-wag

The tail, which may be fanned slightly, is shaken from side to side a number of times, usually within the space of 3-5 seconds. It often occurs after body-shaking for the apparent purpose of arranging misplaced tail feathers.

Stretching movements:

(i) Wing-and-leg-stretch

One wing and the leg on the same side are extended downwards and backwards from the body while the tail is fanned to the same side. The wing and leg are not always returned to rest simultaneously; the leg is sometimes returned to the substrate while the wing remains stretched for a few seconds longer.

Wing-and-leg stretching is often performed after long periods of inactivity and usually lasts about 5 seconds. It tends to follow rest and probably serves to stimulate the flow of blood in the

* McKinney considers what he terms 'social preening' to be a comfort movement. I do not for the following reasons: (1) Harrison (1965) has pointed out that 'social preening' is an ambiguous term, synonymous in the literature with such diverse terms as 'mutual preening,' 'heteropreening' and 'feather nibbling' and as such is not definitive enough. To avoid ambiguity I will follow Cullen (1953) in using 'autopreening' for the occasions when a bird preens its own plumage — as opposed to 'allopreening' when it preens the plumage of another bird. (2) Evidence by Harrison suggests that allopreening (McKinney's 'social preening') does not, in fact, serve the function of caring for the plumage but rather is related to agonistic behaviour. If this is so, and my own observations of the Kea lead me to agree with Harrison, then allopreening should not be designated a comfort movement. The agonistic behaviour of the Kea is described elsewhere (Potts in prep.).

limbs, thus preparing the bird for action. Andrew (1956) noted that general stretching occurred most frequently in *Emberiza spp.* when birds had been cramped, as in brooding.

(ii) Both-wings-stretch

Both wings, slightly bent at the carpal joints, are raised over the back so the bows and tips come close together, are held for a few seconds, then folded to rest. Its function is probably the same as for both-legs-stretching, except perhaps when it precedes or accompanies defaecation, in which case it may serve to increase muscle tension necessary for faecal ejection.

(iii) Jaw-stretch

The mandibles are held wide open for a few seconds then shut, giving the impression of yawn. It may be performed in response to extended muscle inactivity, internal irritation, or to tense throat and head muscles for vigorous scratching.

Cleaning movements:

(i) Head-scratch

This movement is achieved by first bringing one leg behind, then over, a lowered wing so that the nail of the longest claw can be used to scratch the throat and the crown, back or side of the head i.e. by the 'indirect' method in the terminology of Simmons (1957). The head is suitably inclined and the foot is moved rapidly back and forth over the area being scratched. The bird sometimes shifts its body weight towards the lowered wing side to help maintain balance.

On a few occasions I have observed birds scratching directly i.e. under the wing, but this was performed in a clumsy, less intensive manner.

Simmons (1957) suggested that head-scratching may function as a supplementary means of autopreening and may serve to remove a source of irritation, possibly ectoparasites.

(ii) Bill-wipe

The bill is rubbed against a solid surface, first on one side and then the other. It nearly always follows feeding, and sometimes drinking, to remove food, water and other material from the bill surface.

(iii) Foot-and-leg-nibble

A bird may stand on one leg and bring the other up to the bill so that the foot or leg can be nibbled; it may instead lower the bill to the foot or leg. Commonly, however, it compromises by raising the leg and lowering the bill so that they meet each other halfway.

The function of nibbling is probably to remove foreign matter or dead skin.

Water bathing:

(i) Head-dipping

This is normally the first action in a bathing session. The bird stands in, or at the edge of, the water trough and dips its bill and part of its head. On withdrawal the head is flicked sharply sideways. This serves to direct water adhering to the cheeks and bill onto the back.

(ii) Wing-thrashing

Wing-thrashing is often performed in bathing. Both wings are employed more or less simultaneously to beat the water. This is often very forceful and rapid and the bird tends to spring up as it does so. Body-shaking also serves to splash water onto the unsubmerged parts of the body. Crouching in the water occurs frequently.

Birds did not normally remain in the water for the entire bathing session. They usually bathed for a minute or so, got out of the trough to head-shake, body-shake and tail-wag then re-entered to bathe again. This was often repeated two or three times. The session was usually terminated by another brief spell of shaking and tail-wagging at the side of the trough after which the bird clumsily flew up to a branch to aut preen. A bathing session lasted from about 1-5 minutes.

Water bathing appeared to occur most frequently on sunny days from mid-morning to early afternoon i.e. at the time of maximum light penetration into the cage.

Autopreening:

Autopreening may occur as an isolated event, as when a bird preens its breast feathers during a break in feeding, or it may occur for extended periods, usually following feeding or bathing. It is sometimes preceded by a slight ruffling of the plumage to facilitate the grasping and preening of individual feathers. The longer feathers of the wings and tail are pulled upward by the bill and are then drawn through it while being simultaneously nibbled.

Autopreening serves to remove loose skin and other extraneous material from the plumage. It probably also hastens the drying process after wetting by separating adhering feathers and so exposing a greater surface area for evaporation.

SEQUENTIAL ORGANISATION OF COMFORT MOVEMENTS

Records were kept of sequences of comfort movements performed in "bouts" (see below) by individual birds. These records were combined to obtain sufficient data for statistical treatment; the data were arranged in a matrix to indicate how often particular patterns were either followed or preceded by others and these were analysed to determine significant sequence correlations (by the method of Davies 1963 adapted by Andrew 1956).

A "bout" is defined as a sequence of two or more comfort movements in which the time lapse between any two consecutive components did not exceed one minute nor were interrupted by any other kind of behaviour. Bathing activity was arbitrarily unrecorded. Defaecation, though not a comfort movement in terms of the definition used, was recorded since it commonly occurred during comfort bouts.

I have followed Andrew (1956) in regarding an autopreening component as ended when a bird paused after preening a specific area of its plumage e.g. behind its wing, or its breast. Jaw-stretching often started just after head-scratching began in which case it was recorded as following head-scratching. Likewise defaecation was deemed to follow a both-wings-stretch when it occurred between the onset and full extension of a both-wings-stretch.

The legend underlying Table I describes how significant sequence correlations were obtained.

DISCUSSION

Comfort movements of the Kea tend to occur more in "bouts" during resting periods than as isolated events. Andrew (1956), noting the same tendency in passerines (*Emberiza spp.*)* suggested this probably arises, in part, from the absence of any other strong motivation; he found that toilet behaviour was easily suppressed by other tendencies. My own observations support Andrew's explanation. For example, it is rare for bouts of comfort activity to interrupt intense feeding and birds, when attacked, will invariably cease comfort behaviour to flee or retaliate.

Andrew also suggested that stimuli for most toilet behaviour are likely to occur fairly continuously, although at times weakly, and such stimuli will intensify if the movements are not performed for some time. He added: "Sleep is probably another activity that tends to appear when other motivations are low, and this would explain why toilet behaviour often occurs in the same period of time as a resting attitude."

Little can be said about proximate causes of behavioural linkages in birds because of the technical difficulties involved in having to record simultaneously, not only behaviour, but also the external and internal stimuli likely to affect it (for a discussion on this topic see Delius 1969). However, some general explanations of causation have been suggested for certain behavioural associations in birds and these are briefly discussed as they apply to significant associations exhibited by Keas as shown in Table I.

Autopreen + autopreen: Positive correlations between autopreening performances in bouts have also been recorded for Skylarks (*Alauda arvensis*) by Delius (1969) and for *Emberiza spp.* by Andrew

* He was referring specifically to 'toilet behaviour' but this includes comfort behaviour as defined earlier in this paper.

TABLE I

ORGANISATION OF COMFORT MOVEMENTS IN BOUTS WITH INTEREVENT INTERVALS OF ONE MINUTE OR LESS. BASED ON OBSERVATIONS OF SEVERAL MALES AND FEMALES.

		SECOND ACTION										
		Head-shake	Body-shake	Head-scratch	Auto-preen	Both-wing-stretch	Wing-leg-stretch	Bill-wipe	Tail-wag	Jaw-stretch	Foot-leg-nibble	Defaecation
FIRST ACTION	Head-shake	0.6	6*	0.6	3	1.6	-	2	1	-	-	-
	Body-shake	1.4	1	1.6	10	4.2	9.8	2.3	15*	3	-	-
	Head-scratch	1.6*	3	5	7	2	1	2	-	8*	1	2
	Auto-preen	8.2	7	9.2	112*	5 ⁽⁻⁾	13 ⁽⁻⁾	16	11.1	1	-	-
	Both-wing-stretch	3.4	1	2	4 ⁽⁻⁾	3	58*	5.6	2	-	-	18*
	Wing-leg-stretch	4.2	1	3	10 ⁽⁻⁾	39*	34	1	-	1	1	2
	Bill-wipe	0.3	-	-	1	0.9	-	3*	0.4	0.3	0.1	0.5
	Tail-wag	0.8	2	0.9	12	-	2	-	-	2	-	-
	Jaw-stretch	0.3	-	0.3	-	0.7	1.7	0.4	0.3	2*	0.1	0.4
	Foot-leg-nibble	0.3	-	-	2	-	1	1	-	-	2*	1
	Defaecation	0.6	1	0.7	3	-	4	1	3	-	1	1
			0.8	0.7	5.7	1.7	4.1	1.0	0.8	0.6	0.2	0.9

In each cell the upper of the two figures represents the number of times the actions shown down the side of the table were followed by those shown along the top. For example, tail-wagging followed body-shaking 15 times. The lower figure in each cell is the expected value i.e. the number of times the actions at the top of the table would be expected to follow the actions shown down the side if the sequences were due to chance. A difference between the observed and expected values was considered significant if it was more than three times the square root of the expected value. If the observed value was greater than the expected correlation was positive i.e. the sequence occurred more often than would be expected if it was by chance. If the expected value was greater than the observed the correlation was negative and the reverse was true. Positive correlations are indicated by an asterisk and negative correlations by a minus sign in brackets (after the method of Davies, 1963 adapted from Andrew, 1956).

(1956). Delius suggested the behaviour may have a self-activating effect up to a certain number of performances. Bouts of uninterrupted autopreening ranged from two to about 12 movements in the Kea. Jaw-stretching, bill-wiping and foot-leg-nibbling also showed a significant tendency to be followed by themselves, but the results are based on too few figures to be conclusive.

Head-shake + body-shake: This sequence was particularly common after water bathing and in this context may be interpreted as a response to water on the plumage. That head-shaking tended to precede body-shaking may have been a consequence of a co-ordination mechanism in the nervous system.

Body-shake + tail-wag: This sequence, when performed by a dry bird, is probably an example of one activity engendering a stimulus (in this case disarranged tail feathers incurred in body-shaking) which causes another (Delius 1969). After bathing the head-shake + body-shake + tail-wag sequence was common, in which case all movements were likely to have been direct responses to adhering water; thus the primary cause of tail-wagging after bathing was probably the tactile stimulation of water and not disarrangement of feathers caused by body-shaking. Shaking was the first priority after bathing. Quick removal of the bulk of the water would hasten the drying process and so restore full mobility and balance. This may be important since birds when wet appeared to be more vulnerable to attack than when dry.

Head-scratch + head-shake: This positive sequence may be another example of one activity engendering a stimulus which causes another. Head-shaking may be a psychological response or it may serve to remove adhering particles dislodged by scratching.

Head-scratch + jaw-stretch: Jaw-stretching often occurred just as the actual scratching phase of the head-scratching movement began. It may serve to tense head and throat muscles for vigorous scratching.

Wing-leg-stretch + both-wings-stretch (and conversely): These positive correlations have also been recorded for Skylarks by Delius (1969). They may be consequences of simultaneous proprio-stimulation from inactive muscles, i.e. the different forms of stretching may be required to prepare sets of muscles for action. The wing-leg-stretch (on one side) + both-wings-stretch + wing-leg stretch (opposite side) was a common sequence. The negative correlations shown between autopreening and wing stretches indicate these behaviours tend to be performed separate from each other.

Defaecation from perches was significantly preceded by both-wings-stretching which may contribute toward the muscles tension necessary for faecal ejection. On the ground defaecation was usually performed while walking stiffly backward; both-wings-stretching did not normally accompany it.

It should be stressed that the statistical analysis undertaken indicates only relatively broad trends of comfort movement organisation in bouts. Different methods of data collection and higher order analysis would need to be applied for more refined information (see e.g. Delius 1969 and Morgan *et al.* 1976). It is not known whether the same basic organisation persists when comfort patterns do not occur in bouts i.e. when intervals between patterns are longer than one minute and are interspersed with non-comfort behaviour patterns.

Delius (1969) pointed out that if one were to repeat an analysis of behaviour sequences obtained from a different sample of the same species the two results may not be equivalent in their statistical properties because (1) they stem from different individuals, sexes, ages, aggregations, etc., which may not exhibit the same behaviour frequency and pattern and (2) behaviour frequency and pattern may alter over time due to environmental factors and endogenous changes in individuals.

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STATUS OF GREAT BARRIER ISLAND BIRDS

By BEN D. BELL

ABSTRACT

The status of 18 species of birds on Great Barrier Island is examined following a field survey in March 1975 and a review of published and unpublished records. Little Black Shag (*Phalacrocorax sulcirostris*), Paradise Duck (*Tadorna variegata*) and Welcome Swallow (*Hirundo tahitica*) appear new to the island, whereas White-faced Heron (*Ardea novaehollandiae*), Pukeko (*Porphyrio porphyrio*) and Indian Myna (*Acridotheres tristis*) have increased over the last 10-15 years. The Brown Teal (*Anas aucklandica*) apparently remains widely distributed in suitable habitats, but the distribution and status of Kokako (*Callaeas cinerea*) is uncertain. The island supports other rare fauna and more thorough biological surveys are required.

INTRODUCTION

The status of some Great Barrier birds has changed since Bell & Brathwaite's (1964) report and even since that of Reed (1972). This became evident following observations in March 1975 and examination of files from the Bird Distribution Mapping Scheme and the Wildlife Service. The present paper examines some of these changes, where possible in relation to the wider Auckland region.

As Bell & Brathwaite (1964) provided an annotated checklist of Great Barrier birds, most records are merely summarised in Table 1.

The 1975 survey from 5-14 March covered most of the island except the forest north of Whangapoua Beach and Katherine Bay; no offshore islands were visited. Fifty-four species were identified, plus parakeets that were only heard; 18 species are considered in more detail below.

SELECTED SPECIES

Cook's Petrel, *Pterodroma cooki*

Bartle (1967) confirmed this petrel's presence on Mount Hobson during November-December 1966; S. Reed and party recorded 100+ there in January 1972. On 6 March 1975 remains of *Pterodroma* species were found at about 100 m a.s.l. on the South Fork track of Mount Hobson, and at about 200 m (2 birds) and 440 m a.s.l. on the Kauri Dams track. The identification of 2 birds from the latter sites was later confirmed as *P. cooki* by J. A. Bartle. The 4 birds had possibly been killed by cats, as reported by Bartle (1967): two groups of cat droppings, collected at about 200 m on the South Fork track and examined by B. J. Karl, contained remains of rat (*Rattus* sp.) and

cicadas, but no avian material. *Pterodroma* remains were also found on the saddle between Whangapouapoua and Claris in January 1976 (A. H. Whitaker, pers. comm.).

TABLE 1. Summary of bird surveys on Great Barrier Island including seabirds seen from the coast. Vernacular names follow Kinsky (1970).

	HUTTON (1868)*	BELL & BRATHWAITE (1964)*	WILDLIFE SERVICE UNPUBL.	REED (1972)	BIRD MAPPING SCHEME UNPUBL.	MARCH 1975
Northern Blue Penguin	x	x	x5		x	
Wandering Albatross	x	x4				
Black-browed Mollymawk	x					
Yellow-nosed Mollymawk	?7					
Giant Petrel	x	x4			x4	
Cape Pigeon	x	x4				
Grey-faced Petrel	x3,6	x				
White-headed Petrel	x4					
Mottled Petrel		x2				
Cook's Petrel	x	?	x	x	x	x
Fairy Prion	x	x1				
Black Petrel	x	x	x	x	x	x
Flesh-footed Shearwater		x1			x	
Buller's Shearwater		x1	x5		x	
Sooty Shearwater		x5	x5			
Fluttering Shearwater		x	x5		x	
Little Shearwater	?					
Grey-backed Storm Petrel	x4					
White-faced Storm Petrel			x5		x4	
Black-bellied Storm Petrel	x					
Northern Diving Petrel	x	x	x5			
Australasian Gannet	x	x		x	x	x
Black Shag		x	x	x	x	x
Pied Shag	x	x	x	x	x	x
Little Black Shag						x
Little Shag		x	x	x	x	x
White-faced Heron		x1	x	x	x	x
White Heron		x1				
Reef Heron	x	x		x	x	x
Australasian Bittern	x1	x	x	x		x
Black Swan		x1	x1	x		
Paradise Duck			x			x
Mallard		x	x1	x		x
Grey Duck	x	x	x	x	x	x
Brown Teal		x	x	x	x	x
Australasian Harrier	x	x	x	x	x	x
N.Z. Falcon	x		x			x
N.Z. Quail	x1					
Brown Quail		x	x			
Californian Quail		x1		x		
Pheasant		x	x	x	x	x
Banded Rail		x	x	x	x	x
North Island Weka		x6	x1,6			
Pukeko		x	x	x	x	x
South Island Pied Oystercatcher		x				
Variable Oystercatcher	x	x	x	x	x	x
Pacific Golden Plover		x			x	x
N.Z. Dotterel	x	x	x	x	x	x
Banded Dotterel		x	x	x	x	x
N.Z. Shore Plover	x					
Wrybill		x		x		
Whimbrel		x2				x
Bar-tailed Godwit	x	x		x	x	x
Pied Stilt		x	x	x	x	x
Arctic Skua		x	x		x	

	HUTTON (1868) ⁺	BELL & BRATHWAITE (1964)*	WILDLIFE SERVICE UNPUBL.	REED (1972)	BIRD MAPPING SCHEME UNPUBL.	MARCH 1975
Southern Black-backed Gull	x	x	x	x	x	x
Red-billed Gull	x	x	x	x	x	x
Caspian Tern	x	x		x	x	x
White-fronted Tern	x	x	x	x	x	x
N.Z. Pigeon	x	x	x	x	x	x
North Island Kaka	x	x	x	x	x	x
Red-crowned Parakeet	x	x1)?sp.)?sp.	x)?sp.
Yellow-crowned Parakeet	x	?)))
Shining Cuckoo	x	x	x	x	x	x
Long-tailed Cuckoo	x	x1				
Morepork	x	x	x	x	x	x
N.Z. Kingfisher	x	x	x	x	x	x
Broad-billed Roller		x1				
North Island Rifleman	x			x1		
Skylark		x	x	x	x	x
Welcome Swallow					x	x
N.Z. Pipit	x	x	x	x	x	x
Hedge Sparrow		x	x		x	x
North Island Fernbird	x	x	x	x1	x	x
Brown Creeper		:1,6				
Whitehead	x	x6				
Grey Warbler	x	x	x	x	x	x
North Island Fantail	x	x	x	x	x	x
Pied Tit	x	x2			x	
North Island Robin	x					
Song Thrush		x	x	x	x	x
Blackbird		x	x	x	x	x
Silvereye	x1	x	x	x	x	x
Stitchbird	x					
Bellbird	x	x6				
Tui	x	x	x	x	x	x
Yellow Hammer		x	x	x	x	x
Chaffinch		x	x	x	x	x
Greenfinch		x	x	x	x	x
Goldfinch		x	x	x	x	x
Redpoll		x				x
House sparrow		x	x	x	x	x
Starling		x	x	x	x	x
Indian Myna		x	x	x	x	x
North Island Saddleback	x					
North Island Kokako	x	x1	x	x1	x	x1
White-backed Magpie		x1,8	x1,8	x		

Key to symbols:

x	specifically identified	1	previously reported/not seen by author
?	uncertain identity	2	previous unconfirmed record
!	unlikely identity	3	identified by later authors
+	also records of Hutton & Kirk (1868) for Arid Island	4	seen at sea, Great Barrier region
*	excluding Hutton's (1868) records which are listed separately here	5	washed up dead on shore
		6	on Arid Island only
		7	probably Grey-headed Mollymawk - see Oliver (1955) p.168.
		8	reported simply as Magpie

Bartle (1967) found 6 dead birds at and below about 240 m a.s.l., and suggested they probably breed on the lower slopes as on Little Barrier (Turbott 1961), with Black Petrels (*Procellaria parkinsoni*) confined to the summit (621 m). Reed (1972) also surmised that any burrows of *P. cooki* would be on lower slopes. However, in April 1974 7 Cook's Petrels were found on the summit and were juveniles believed to have emerged from burrows close by (P. C. Harper, pers. comm.).

Little Black Shag, *Phalacrocorax sulcirostris*

Not recorded by Bell & Brathwaite (1964), nor by Reed (1972), but one seen near Sugarloaf Creek on 13 March 1975.

White-faced Heron, *Ardea novaehollandiae*

A few reported to Bell & Brathwaite by S. Hailes in 1960 and D. V. Merton in 1963 but since then the species appears to have increased. A local resident reported a marked increase to G. Findlay and C. R. Veitch in March 1972, and although they only saw a few at Tryphena and Whangapoua, up to 18 had been reported the previous January by S. Reed *et al.*, including 12 in one map square (2974). In March 1975 at least 12 were seen scattered in groups of 1-6 in various parts of the island.

Carroll (1970) stated that a population explosion started in the Auckland area in 1961, peaked about 1966 and then subsided somewhat; the species became established at Waiheke (Kawau, Ponui and Great Mercury Islands with reports of birds on Little Barrier, Mokohinau and the Rangitoto Islands, as well as Great Barrier; at least 3 on Raoul Island in 1973 (C. Smuts-Kennedy, Classified Summarised Notes 1973).

Paradise Duck, *Tadorna variegata*

Not recorded by Bell & Brathwaite, nor by Bird Mapping Scheme observers including Reed (1972), but G. Findlay and C. R. Veitch reported a family of 5 on the lower Kaitoke Creek in March 1972; on 11 March 1975 3 seen near Okiwi airfield, and on 13 March at least 7, possibly 12, near Claris. Subsequent enquiries revealed that a pair was brought to the island from Taranaki in 1970 and a second pair from the Whitford district two years later. The original pair apparently failed to breed in their first season, but did so in later years. The population in June 1975 was reported to be 18 (G. Mason, *in litt.*). Williams (1971) did not report it from Great Barrier but noted that its northward extension in the North Island since 1950 had been aided by liberations.

Brown Teal, *Anas aucklandica chlorotis*

Its status is probably unchanged since the survey by Bell & Brathwaite. Over 350 recorded by G. Findlay and C. R. Veitch in March 1972 including over 100 in the Whangapoua Stream and over 150 in a creek at the end of Mitchener Road. In March 1975 recorded in wetlands from Whangapoua south to Medlands Beach, and local people indicated a high population was still present.

New Zealand Falcon, *Falco novaeseelandiae*

Bell & Brathwaite noted that none of their informants had seen this species and its disappearance since Hutton's day seemed likely. However, in 1960 one flew into a house at Whangaparapara (A. T. Edgar, Classified Summarised Notes 1963-70) and one heard in March 1972 by G. Findlay and C. R. Veitch in regenerating forest west of Mount Hobson; not recorded by Reed (1972), nor other Bird Mapping Scheme observers, but I saw one bird briefly near the Kaiarara hut on 8 March 1975, where staff at Port Fitzroy Forestry Headquarters reported one a few weeks earlier.

Brown Quail, *Synoicus ypsilophorus*

Recorded by Bell & Brathwaite in 1957 and 1960, and by D. V. Merton in 1963, but not since.

Californian Quail, *Lophortyx californica brunnescens*

Recorded only by D. V. Merton in October 1963 (Mabey's Road, Okiwi and Kaitoke) and Reed (1972).

Pukeko, *Porphyrio porphyrio melanotus*

Pukeko were recorded by Weetman (1889) but not by Hutton (1868). Bell & Brathwaite recorded a few in 1957, but evidently many more by 1960. In October 1963 D. V. Merton was told they were still increasing, and later observers including the author found them common, especially on the eastern side from Whangapoua to Oruawhero Bay. Carroll (1969) described local increases in parts of the Auckland area in 1962-63, and reported it was rapidly increasing on the Great Barrier, Mercury and Ponui Islands.

Parakeet *Cyanoramphus* sp.

An unidentified parakeet was heard near the summit of Mount Hobson on 6 March 1975. Parakeets appear scarce judging from a variety of reports between 1957 and 1975. Apparently only Red-crowned Parakeets (*C. novaeseelandiae*) have been definitely identified in recent years: 5 by P. C. Harper in the Mount Hobson area in December 1975 and January 1976, and others reported to A. H. Whitaker in the area behind Rosalie Bay. A local informant said birds were occasionally seen on pastoral areas, as well as in bush.

Rifleman, *Acanthisitta chloris granti*

Hutton (1868) listed the species as present at Harataongo. D. V. Merton searched for it in 1963 in both northern and central forests without success. Evidently 6 birds seen by J. & J. Hewat in a small patch of bush on the Karaka Bay road (S. Reed, pers. comm. 1972); not recorded in March 1975.

Welcome Swallow, *Hirundo tahitica neoxena*

This species not recorded by Bell & Brathwaite (1964) nor by Reed (1972). In March 1975, however, small numbers of swallows seen at Whangapoua, Okiwi (up to 12), Kaitoke (up to 5, breeding

suspected), Claris (over 10), Oruawhero, Port Fitzroy and Kaiarara Bay. Local enquiries revealed species had been present for only 2-3 years, and this confirmed by the records: none seen by S. Reed's party in January 1972, nor by G. Findlay and C. R. Veitch in March 1972; on Bird Mapping Scheme cards A. —J. Goodwin reported 3 in the Whangapoua area in January 1973* but none in 5 other grid squares; M. N. Foggo saw several in Whangaparapara Harbour in December 1973.

Edgar (1966) examined the colonisation of New Zealand by Welcome Swallows over 1958-1965 and relatively few had been reported in the Auckland/Firth of Thames area; more records appeared in Classified Summarised Notes up to 1973, including reports of a further increase in range and numbers in Northland; in 1974, just after the first records on Great Barrier, a 'spectacular and phenomenal' increase was reported from the Auckland area (R. B. Sibson, Classified Summarised Notes 1974).

Hedge Sparrow, *Prunella modularis occidentalis*

Bell and Brathwaite found this species as common as on the mainland in 1960; C. R. Veitch reported few in March 1972. However, Reed noted it was a 'rather surprising omission' for her party in January 1972, and other Mapping Scheme recorders failed to record it in 1973. In March 1975 it nowhere appeared plentiful, but birds were recorded in such scattered localities as Port Fitzroy, Okiwi, Claris, Kaitoke and along the Fitzroy-Whangaparapara road.

N.I. Fernbird, *Bowdleria punctata vealeae*

Though Bell & Brathwaite found the Fernbird locally abundant, it was not recorded by Reed (1972) though she refers to a report for the previous week. Reported from manuka scrub between Mount Young and Whangaparapara Harbour in 1968 (M. Douglas, Classified Summarised Notes 1963-70) and A. J. Goodwin recorded 5 near Whangaparapara in January 1973. In March 1975 it was quite numerous in Kaitoke Swamp, and was also heard near the Fitzroy-Whangaparapara road and at Whangapoua.

Pied Tit, *Petroica macrocephala*

Though reported by Hutton (1868), this species was not observed on either Great Barrier or Arid Island by Bell & Brathwaite, although one informant thought he had seen it recently on the former. It was not recorded in March 1975 nor by other observers from 1963 to 1973, except for a Bird Mapping Scheme record of one in the Whangaparapara Harbour area in December 1973.

Silvereye, *Zosterops lateralis*

A common species in March 1975. A resident of the Fitzroy-

* A report by A. J. Godwin (Classified Summarised Notes 1973) of 4 at Whangapoua estuary and 1 at Mabey's Road on 9 January 1972 presumably refers to the above records of January 1973.

Okiwi area reported thousands of Silvereyes flying down from bushes and trees to feed on open paddocks during the 1974 winter — a phenomenon he had not seen before.

Indian Myna, *Acridotheres tristis*

Bell & Brathwaite did not record any mynas in 1957 but in 1960 saw two flying over the Whangapoua Spit and later saw two (possibly the same birds) at S. Hailes' home nearby; according to Hailes a small group had been present for about a year. However, D. V. Merton saw none in October 1963 and believed the species might have failed to establish. By May 1970 R. W. H. Simpson and G. P. Adams found mynas moderately plentiful and by January 1972 S. Reed and party recorded a cumulative total of at least 70 on 7 of the 8 Bird Mapping Scheme squares they covered. It was still widespread in March 1975, with flocks of up to 16 seen in most settled areas, especially on the east coast from Whangapoua south to Oruawhero; none recorded in forest.

Mynas have spread considerably in the northern and central North Island in recent years — compare the maps of Cunningham (1948) and Bull & Gaze (1972). The occupation of the Coromandel Peninsula appeared complete by 1960 (R. B. Sibson Classified Summarised Notes 1960), and since then the species has been recorded on several offshore islands in the Hauraki Gulf. Skegg (1963) reported the first pair on Great Mercury in 1961, with 5 by late 1962 and greatly increased numbers by February 1963; Blackburn (1967) found 3 birds breeding on Cuvier Island in January 1964, but none in June 1966; Gaze (1973) reported 16 on the Poor Knights for the first time in January 1973, but by July 1975 numbers had declined to 5 (J. A. Bartle, pers. comm.) and none were seen in October; at least 24 were present on Little Barrier in January 1974 (T. R. Harty, Classified Summarised Notes 1973/74).

North Island Kokako, *Callaeas cinerea wilsoni*

Kokako were recorded by Hutton (1868). More recent but unconfirmed reports by island residents came from the Mount Hobson region (Hayson 1954, Bell & Brathwaite 1964, P. C. Harper and A. H. Whitaker, pers. comm.). However, most recent reports are from the northern forest area, for which Bell & Brathwaite (1964) mentioned records since about 1930, and D. V. Merton reported a strong colony in the Ahuriri River Catchment in 1963. Reed (1972) was told it was extremely rare in the northernmost area, and only singles were reported in the Rangiwakaea Bay watershed by Findlay and Veitch in March 1972 and by Goodwin in January 1973. It was not recorded in March 1975 but the northern forest block was not visited.

Reed (1972) reports damage to bush in this northern area and it is to be hoped that remaining Kokako habitat has not been so reduced or modified as to threaten survival of the species there (see

review discussion of Fleming (1975) concerning size of forest areas in relation to extinction rates).

St. Paul & McKenzie (1974) believed reduction of its numbers in the Hunua Ranges was due almost entirely to predators, especially ship rats *Rattus rattus* and mynas, which 'could well cause the extinction of the species [there] and elsewhere.' This is a bleak forecast. While both these species now occur on Great Barrier, it is clearly not possible to assess their impact on Kokako until more information is available; mynas do not yet occur in substantial numbers in the forests but rats do (Daniel 1972; pers. obs.); cats are also present.

DISCUSSION

The avifauna of Great Barrier is reasonably well documented, but there are still species such as Kokako whose status remains obscure, and the presence of Brown Quail, Yellow-crowned Parakeet, Rifleman and Pied Tit requires confirmation. Though occasional records of Hutton (1868), such as Brown Creeper, are questionable, coming from an early phase in the country's ornithological investigations, many species have seemingly disappeared, as Bell & Brathwaite (1964) pointed out. These include N.Z. Shore Plover, N.Z. Quail, Robin, Stitchbird, and Saddleback; and, from the main island, Whitehead, Bellbird and probably several seabirds now confined to offshore islands. On the other hand, Hutton made no mention of many introduced or self-introduced species now familiar, such as Mallard, Pheasant, Hedge Sparrow, Song Thrush, Blackbird, Yellowhammer, Chaffinch, Greenfinch, Goldfinch, Redpoll, House Sparrow and Starling. According to Thomson (1922), the Auckland Acclimatisation Society was most active in liberating many of these species in the 1865-1875 period, and though many established themselves rapidly, Hutton's observations in 1868 presumably predated their spread to Great Barrier. Silvereyes had apparently arrived four years previously, while White-faced Heron, Welcome Swallow and Indian Myna established only in recent years. Although the Wildlife Service has introduced wekas to Arid Island, the flightless species (except Blue Penguin) are otherwise absent, and were so in Hutton's day.

As a result of surveys by the Wildlife Service the general distribution and numbers of Brown Teal are fairly well known, and Great Barrier is clearly its major stronghold today. Wetland habitats of such species as Australian Bittern, Banded Rail, Spotless Crake, Brown Teal and Fernbird need to be preserved, and the Kaitoke Swamp and Whangapoua Creek area appear especially important.

Great Barrier is the only island on which the North Island Kokako occurs. The immediate conservation priority is to determine its distribution more accurately and to ensure preservation of existing habitats, then closer study would determine how best these habitats might be managed for Kokako over the long term. Large areas of

regenerating forest in the central part of the island might, in time, become suitable for recolonisation by these birds.

Apart from such interesting birds Great Barrier supports other rare fauna. For instance it is apparently the only locality from which the large skink (*Leiopisma homalonotum*) has been collected in recent years and *Hoplodactylus duvauceli*, New Zealand's largest gecko, also occurs on the island (B. J. Gill, G. S. Hardy, A. H. Whitaker, pers. comm.). Mr M. J. Mabey of Okiwi saw 15-20 bats in a swamp area some 25 years ago (M. J. Daniel, pers. comm.) while C. R. Veitch reported seeing native bats in the northern forest area in March 1972; the bat species has still to be identified. More detailed surveys of these and other faunal groups could reveal further records of interest. Before any changes of existing land use are implemented (see Great Barrier I. Cttee. of Inquiry 1975) further biological surveys should be carried out, so that such rare and interesting biota can be protected.

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SHORT NOTE

WINTER NESTING OF N.Z. PIGEON

On 24 July 1976, the Canterbury section of the OSNZ conducted a census of the N.Z. Pigeons (*Hemiphaga novaeseelandiae*) present in Christchurch city. Of the six birds found in the area, one was sitting on a nest with one egg. The nest was a flimsy structure, 2.5m above the ground, in relatively dense shrubs in the native section of the botanical gardens.

The nest was kept under observation and the young hatched between 3-6 August. By 26 August, the chick's plumage had come to resemble that of the adults. As the chick grew older, the nest began to tilt with its weight, and the chick left the nest on 9 September.

The *Field Guide to the Birds of N.Z.* (Falla *et al.* 1970) gives the period of incubation as 30 days; hence the egg was probably laid between 4-7 July. The date of laying is unusual in that Oliver (*New Zealand Birds*, 1955) recorded eggs up to May and deduced that laying had occurred in July from the sighting of a fledgling in September. Falla *et al.* (1970) record eggs as late as June-July. All records from the nest record scheme are of eggs laid between September and April.

The interesting issue is whether the bird was a late or early nester. The weather pattern at the time would indicate the latter, as on 21-22 June, Christchurch had its heaviest snowfall since 1945. From 25 June until 6 July, the weather was fine and sunny with quite warm temperatures during the day, but frosts at night, sometimes severe.

Accordingly, it is possible that this period of weather deluded the pigeon into breeding earlier than normal.

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NOTES ON THE GADFLY PETRELS *Pterodroma externa* & *P. e. cervicalis*

By R. A. FALLA

Mrs Sylvia Reed's note in this issue confirming a New Zealand record of *Pterodroma externa externa* and correcting an earlier identification (Reed 1972) of the bird as *P. e. cervicalis* prompts some comment on the status and distribution of these forms generally known as the Juan Fernandez Petrel and the White-necked Petrel in the Pacific. All breeding records to date of *P. e. externa* are from Juan Fernandez only. Distribution at sea throughout the year is not so precisely defined though data from specimens collected (Loomis 1918: 95) confirm substantial movement to the northern hemisphere. Sight records are handicapped by the difficulty of distinguishing this form from *P. e. cervicalis*, the White-necked Petrel breeding at the Kermadec Islands, except under very favourable viewing conditions. King (1967: 13) recorded Juan Fernandez Petrels east to the Marquesas Islands and both forms abundant in the Central Pacific at least north to Hawaii between May and November. Elaborating on this pattern King (1970: 10) gave data based on positive sightings of White-necked Petrels which indicate that they formed a small percentage, from 2 to 16% of total sightings, and were not represented at that time in specimens actually collected. Information is lacking on any further range north of either sub-species except for the bird recorded by Kuroda (1962) from Honshiu and identified by him as *P. e. cervicalis*. While this could well be a correct identification, there is no mention in his paper of *P. externa externa*, nor any reason given for eliminating it. Kuroda's figures, especially of the under wing, do not all conform to the average characters of the Kermadec population of *P. e. cervicalis*. On the other hand his figure of the tail appears to do so.

Some features by which the two can be distinguished have been recorded by a number of authors, but each mentioned only one or two characters and not always the same ones. Salvin (1875, 1891, 1896), who originally described both forms and had at the time only one adult specimen of each, distinguished *cervicalis* thus — "the under wing-coverts are less white, those of the edges of the wing being mingled black and white, the primaries have less white at the base of the inner web, the white portion being almost covered by the longest white coverts." This is confirmed by the larger series now available in collections. Other characters used by Salvin prove to be more variable, dependent on age and state of moult. Godman (1910), still with only one adult *externa* but several more *cervicalis*, pointed out that the tail of the latter is distinctive, "the two outer rectrices being for the most part white."

Loomis (1918: 96) was the first to tabulate differential characters, here quoted in slightly condensed form:

<i>P. externa</i>	<i>P. cervicalis</i>
Cap dark brownish grey.	Cap brownish black.
No definite cervical collar.	Definite cervical collar, white
First (= outer) primary extensively white on inner web.	flocked with grey.
Only indications of dark band on edge of underwing.	First primary with little or no white on inner web.
Dark colour of upper surface of tail brown, greyish bloom in fresh plumage.	Dark band, varied with white, on edge of wing.
Shafts terminally black or dark brown in all tail feathers.	Dark colour of tail grey, fading to dull brown.
	Shafts not terminally black or dark brown in all tail feathers.

Though Loomis omitted to mention the difference in the pattern of outer tail feathers, he did refer to the effects of wear and of moult, pointing out that in several specimens of *externa* a temporary white collar has been developed where loose feathers have fallen out, exposing the basal white of others. His material was all from areas away from the breeding grounds and north of the equator.

In more recent literature, dealing mainly with distribution, and observations at sea, authors have been more concerned with characters to assist sight identification. Hence, King (1967: 13), confirmed that because the nape may become whitish with feather wear, "it is safe to distinguish between these forms on the basis of nape colour only when it approaches one extreme or the other." As an exception to the all-white underwing he mentioned a small black patch at the wrist joint in the Juan Fernandez Petrel, whereas the White-necked has a thin but noticeable dark margin between the wrist and the leading primary. As his accompanying figure shows the black patch at the wrist occurs in both forms. Harper & Kinsky (1974: 40) referred to it as extending from the carpal joint diagonally for a short distance over the white inner underwing coverts. It is correctly illustrated in both the papers cited, though Harper & Kinsky figure the underwing of *P. e. cervicalis* only.

It seems that sight identification must remain doubtful, except under very good conditions or near known breeding grounds. Apart from the variable effects of plumage wear is the fact that birds of both forms are much the same size. Of Salvin's original two specimens his *cervicalis* was larger than *externa*. However, of specimens in the National Museum of New Zealand, the ranges and averages (in mm) are:

	<i>P. externa externa</i> (5 spec.)	<i>P. e. cervicalis</i> (14 spec.)
Wing	315 - 324 (319.5)	301 - 322.5 (312)
Tail	144 - 148 (146)	132 - 142 (136)
Tarsus	42.5 - 47.4 (44)	40 - 46 (42)
Toe	53.5 - 56.3 (55)	50.4 - 55.2 (52)
Bill	37.7 - 41.1 (36.4)	34.5 - 38.5 (36.4)

These figures indicate that on average *P. e. cervicalis* is a slightly smaller bird in most dimensions. It does, however, have a relatively more robust bill, the latericorn showing slightly swollen convexity when viewed from above.

Although available specimens of *cervicalis* from Kermadec Islands have dimensions which fall within the range given above, there are six Whitney Expedition specimens in the American Museum of Natural History, collected at sea about 48 km east of Banks Island, New Hebrides, on 29 January 1927, which are uniformly smaller. Their registration numbers are 24555-6, 24571, and 24575-7. Number 24571, a male, which is typical of the series has dimensions — wing 275 mm; tail 125; tarsus 36; toe 45; bill 33 x 14 x 14. They all have the plumage characters of *cervicalis* but do not fall within the range of any of the material collected over many years at the Kermadec Islands.

Kuroda's specimen from Honshiu can be confirmed as *cervicalis*, and of the larger form, on the basis of his figure of the tail, which seems diagnostic, though the other characters figured are not positively so, particularly the underwing which shows an abnormal amount of white webbing on the primaries exposed beyond the coverts. The one stray record from New Zealand (Kinsky 1971: 216) is also of the larger form, so that evidence of its extreme range north and south is still tenuous. Apart from the useful Smithsonian mid-Pacific records of both *externa* and *cervicalis* given by King, their extension into more temperate northern hemisphere is so far better documented for the former than the latter.

Assistance in the preparation of this note is acknowledged to the several museums in which specimens were examined, and perhaps should be also to Dr W. R. P. Bourne who has for years been urging me to record and comment on the anomalous series of White-necked Petrels in the American Museum of Natural History.

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CLASSIFIED SUMMARISED NOTES

Compiled by A. T. EDGAR

Selected extracts from notes supplied to the Recording Scheme during 1975-76. Records of Reef Herons and 1975 records of White Herons, egrets, Ibis, Spoonbill and Kestrel are not included as these are subjects of Special Enquiries and will be published elsewhere.

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E. & O. E.

BROWN KIWI (*Apteryx australis*)

Kerikeri, January 1976, a local resident reports finding a stray kiwi egg in a small pinewood on his farm; another stray egg was found in the same locality last season (ATE).

Apteryx sp.

Arthur's Pass area, Mt Avalanche, 1725 m. a.s.l., 9/11/75, kiwi footprints going right up the main ridge and down the other side in snow, which was unusually widespread for the time of year (PD).

BLUE PENGUIN (*Eudyptula minor*)

Stephenson Island, off Whangaroa, 23-25/7/76, penguins came ashore at night all round the island and judging by the noise must

have been in good numbers. Some form of pre-mating courtship was going on. Once out of the water the birds became almost oblivious to humans and could be closely observed. Two, presumably a pair, would call each other and move together over the rocks, emitting "rattling" or "burring" noises; circle each other and while in an erect stance peck each other and make preening motions. After some minutes this display ceased and the birds separated but remained within a few yards of each other and joined in the loud chorus of screeches, cat-calls and bleating noises. One bird came into my tent and when I pushed it just outside, it remained almost all night, quietly crouching (MPK). Ashburton beach, 21/10/75, near the top of a cliff 20-25 metres high, departure of a rock pigeon from its nest (one egg) revealed a sitting Blue Penguin at the back of the same small cave (ML).

WHITE-FLIPPERED PENGUIN (*E. albosignata*)

A bird banded at Motunau Island was recovered at Hawke's Bay. This is unusual in that most of the movement of the species from its breeding area in Canterbury seems to be southward (RG). 1970 Checklist records straggling south to Otago Peninsula and north to Marlborough.

ERECT-CRESTED PENGUIN (*Eudyptes pachyrhynchus sclateri*)

Ashburton beach, 22/3/74, one in moult; 22/5/74, one, not in moult, seen at a point one km. from the first sighting (ML).

SOUTHERN CRESTED GREBE (*Podiceps cristatus*)

Lake Matheson, October 1975, the first seen here for many years, may have come from nearby Lake Gault; April 1976, three at Lake Ianthe, two at Lake Mapourika (M. Hall). January 1976, a pair at Lake Lyndon, six in a small bay at Lake Heron (RG). Lake Hauroko, 21/3/75, one near Mary Island (JST).

N.Z. DABCHICK (*P. rufopectus*)

Muriwai Lakes, Feb 76, 52 (SMR). Kaiua, McKerras farm dam, late Spring 1973, six young, one-third grown, no adults seen; 1-2 adults seen at times in 1974 winter; 21/2/75, pair with 2 young on dam; 1974-1976, sometimes seen on Guy C. Goss Pools (JW). Lake Waikare, 11/10/75, seven (BB). Taupo, Hatepe stream, 4 on upper dam, 7/1/76 (WAW); Hardcastle lagoon near Broadlands, 13/9/75, one (RWJ). Lake Rotorua, 1975, 26 in June, 11 in December (AP); 1975 records from Blue and Green Lakes and Lake Okataina, 1-3 birds; at least 5 on Lake Rotoma, 3/4/76 (RWJ). Hawke's Bay, Hurimoana, 10/8/75, six; Westshore, 24/4/76, five (KVT). Lake Horowhenua, 1976, January-May, one to five; 15th June, 25 (EBJ, MLF). Waikanae sewage ponds, May 76, 15 (BDB). Sewage ponds at Waingawa, near Masterton, 1976, 12 in April, 3 in May, none on 9th July; Carterton sewage ponds, 9/7/76, 9 (BDH).

AUSTRALIAN LITTLE GREBE (*P. novaehollandiae*)

Lake Elterwater, two on 24/10/75, present till Aug 76 (MLF, TJT). Doctor's Dam, Aorere valley, March 76, two (BDB).

WANDERING ALBATROSS (*Diomedea exulans*)

Orongorongo estuary, 27/9/75, 20; 29/5/76, 10 plus (JLMM). Hinds River mouth, 4/7/71, a young bird flapping along the beach trying to take off eventually climbed a sheep track to the top of a

cliff 10 m. high, preened for a while and then successfully launched itself off the cliff (ML).

ROYAL ALBATROSS (*D. epomophora*)

Wandering Albatross are frequently recorded, but a Royal picked up on Somes Island by Mr Benfell may be the first record of this species within Wellington harbour (MLF, Dec 75).

BLACK-BROWED MOLLYMAWK (*D. melanophris*)

Orongorongo estuary, 50 on 13th and 19th July 1975, one on 17th August (JLMM).

SHY MOLLYMAWK (*D. cauta cauta*)

Orongorongo estuary, 20 on 13/7/75 (JLMM).

LIGHT-MANTLED SOOTY ALBATROSS (*Phoebastria palpebrata*)

One blown inland to Rongotea on 21/5/75, released in fairly strong condition the following day (HAR).

NELLY (*Macronectes giganteus*)

Three reports of white phase birds — one off Cape Runaway, first seen 5/7/75, remained in the area for about three weeks, reported by a crayfisherman; one, liberally dark spotted, near Tiritiri island 7/10/75 and 2-3 near North Cape 13/7/76, reported by E. D. Willis, Fisheries Research Vessel (SMR). Dark phase birds, Orongorongo estuary, 1975, 20 on 13th July, 30 on 17th Aug; Wellington, Ngauranga outfall, 15 on 14/11/75 and on 9/2/76 (JLMM).

ANTARCTIC FULMAR (*Fulmarus glacialisoides*)

Flying 100 metres offshore, Waikato Heads, 25/9/75 (IWJ).

CAPE PIGEON (*Daption capensis*)

Mainly a winter visitor to Wellington harbour and not commonly seen close inshore but three on 16/9/75 and two on 17/9/75 off Petone (JLMM, HLS). 1975 winter, fewer birds seen at Nelson sewer outlet, no large rafts as noted in 1974 (CFJO'D).

GREY-FACED PETREL (*Pterodroma macroptera*)

Occupied burrows at Laingholm and Karekare, Auckland West Coast, September 1976 (SMR, JFS). 10/11/74, during a cruise from Orere Point to Manaia Heads, three, with other petrels at a school of fish; our first daytime record for Hauraki Gulf (GKMCK). Taranaki, Pukearuhe colony, burrows occupied 18/10/75 (DGM, RWW, CDP).

BROAD-BILLED PRION (*Pachyptila vittata*)

Ashburton, 16 km from sea, one under a street gutter bridge on 29/12/75, after a day of southerly wind; released on coast (ML).

FAIRY PRION (*P. turtur*)

Lake Horowhenua, 31/1/76, one, straight and level flight, flaps and glide; twice alighted on the water; at least four picked up in Levin after westerly gales (EBJ). Palmerston North, one found injured in a street 1/2/76 (IGA).

WESTLAND BLACK PETREL (*Procellaria parkinsoni*)

One dead at Waikato Heads, 13/9/75 (IWJ). One in flight offshore from Petone 20/4/76 (HLS). Black Petrel sp. off Orongorongo estuary, 20 on 13th and 30 plus on 19th July 75 (JLMM).

FLESH-FOOTED SHEARWATER (*Puffinus carneipes*)

Hauraki Gulf, 15/2/74, c. 400 on eastern side, many of them on a school of fish, others scattered widely, mostly singly, all over the gulf (HRMcK). Clevedon to Great Barrier, 17/3/76, 200 + (BB).

BULLER'S SHEARWATER (*P. bulleri*)

Cape Brett, January 1-5, 1976, very large numbers seen flying north each morning; movement of birds first seen about 0620 hours, i.e., about 20 minutes after dawn. Greatest numbers at 0700 hours, dwindling to very few at 0745 hours. Birds fly close to the surface of the water and extend about 2 km out to sea; at Cape Brett the stream of birds is partially funneled between the Cape and Piercy Island. At the peak of the northward movement it is estimated that thousands of birds pass a single point at the same time. Little or no feeding is observed during this movement, but small numbers remain in the vicinity of Piercy Island during the day to feed. It was noted that *P. bulleri* was the main species attracted to the lights of the light-house station at night and a few crash-land on ground near the buildings; the main direction of night flight is southward (MPK). Ashburton beach, 3/5/75, one mobbed by a flock of Red-billed Gulls which had been resting on the water 50 m. offshore, was chased for about 150 metres (ML).

SOOTY SHEARWATER (*P. griseus*)

Mercury Bay, 26/10/75, 200 (ABJ). Foxton, 1/1/76, several thousands per hour passing south; 18/1/76, 100 + (JLMM). Kapiti, June 1976, burrows evident in black soil just below the crest of the main ridge on the eastern side; no sign of recent use (MLF). Birdling's Flat, 8/11/75, c. 3000 flying close inshore during a southerly gale (RG). Coast near Lake Vincent, Fortrose, 26/1/76, 8-10,000 feeding on shoals of fish close inshore, watched for two hours. They dived underwater to feed, circled round to the back of the queue and dived again, following the shoals about the bay. White-fronted Terns were also feeding and four Southern Skuas chasing the terns (MLB). Stewart Island, 2/3/76, 300 feeding to within 10 metres of Acker's Point, following a fish shoal; individual birds seem to sit on the water and make brief shallow dives (PMS).

FLUTTERING SHEARWATER (*P. gavia*)

Mangonui harbour, large rafts close inshore, April 1976 (ECMC). Whangarei Heads, Kauri Mountain beach, 25/4/76, c. 7000 less than one km. offshore (PJM). Mercury Bay, thousands, often close inshore, 17-30/7/75, similar to the invasion reported for 16-25/7/74 (ABJ). Bay of Plenty, Kaituna-Maketu, hundreds offshore in bad weather — 650 in June 1974, 1000+ in Oct 1975 (AP). Foxton, 1/1/76, 3000 per hour, passing south; over 100 off Eastbourne 20/7/75, off Orongorongo estuary 17/8/75 (JLMM).

GREY-BACKED STORM PETREL (*Garrodia nereis*)

July 1976, one on Petone beach (S. Cotter).

AUSTRALIAN GANNET (*Sula bassana*)

A new gannetry at Pillar Rock, off Muriwai, six chicks in January 1976 (SMR). Motutakapu gannetry off Colville, 15/2/76, 20-25% of the population were juveniles (BB). Juveniles noted at

Kawaroa, 13/4/76 (DJB); fresh corpses on 20/7/75 (two) and 3/8/75, Foxton beach (HAR); one immature with 50 adults at sea off Great Mercury 8/9/75 (ABJ).

BROWN BOOBY (*S. leucogaster*)

Petone beach, 2/3/76. Body chocolate-brown with a clean line junction across breast and creamy-white underparts spotted brown (JLMM).

BLACK SHAG (*Phalacrocorax carbo*)

Waimamaku, 13/3/76, one dived and came up with a flounder, large enough to take ten minutes to swallow after much rearranging and recovery after escape; swallowing followed by neck stretching and the shag had trouble getting airborne, which it did after much splashing, on the second attempt (PGS). Whangarei, 15-30 present in Hatea river, April 1976 (ATP). Manukau harbour, only 8 counted Dec 75, 148 in June 76; Firth of Thames, Nov 75, 37; July 76, 76 (BB); 94 on 29/6/75 (WFC). Whitianga, 5/5/75, 23; Buffalo Beach, 19/7/75, 30 (ABJ). Little Waihi, 13/12/75, 26; Lake Rotorua, Dec 75, 83; only 8 counted in June 75 (AP). Rangitaiki river at Katangaroa 5/10/75, marked drop in numbers, only one nest occupied; there had been aerial spraying of gorse in the area (RWJ). Manawatu estuary, March 76, 27 (HAR). Nelson, summer 1976, several large flocks of c. 100 birds flying over Nelson tidal flats or along Boulder Beach, probably towards feeding grounds in the harbour (CFJO'D). March 1976, 50 at Takaka and 38 at Aorere, in estuaries (RBS). Washdyke lagoon, 27 at creek mouth, 14/3/76 (PMS). Arthur's Pass, Oct 75, one in a stream, choked to death on a rainbow trout (PD). Southland, new nesting colony at Lora Falls, Kokonui hills, 16/10/75, 12 nests, 24 young and 15 eggs (RRS).

PIED SHAG (*P. varius*)

Whitianga, colony opposite wharf, 31/12/75, 43 birds, 29 nests (BB). Ponui passage, 15/2/75, c. 40 at nesting colony (HRMcK). Kaituna-Maketu, regular, maximum 24, Dec 75; Little Waihi, maximum 20, 30/11/75 (AP). East Cape, Lottin Point, skin divers observed at 14 metres depth a shag swimming fast along a rock crack, mandibles rapidly opening and closing as it caught some unknown prey; probably this species; plumage was coated with bubbles and colour difficult to make out at this depth (RWJ). Ngauranga, 1/4/76, one immature (HLS). Stewart Island, Little Kaipipi Bay, 4/3/76, 8 nests, six occupied by sitting birds (PMS).

LITTLE BLACK SHAG (*P. sulcirostris*)

Rangiputa Bank, 13/6/76, 20 (BDB). Lake Ngatu, a single bird, 24/11/76 (ATE). Mangonui, May-June 1976, 20-40 use a pontoon in the harbour as a high tide roost; June maximum, 58 birds, lined up on the edge of a runnel, waiting for the tide to flow; when fishing close inshore they are sometimes attended by White-fronted Terns (ECMC). Kaeo, 29/6/76, 8 on a beach in bend of the river (PJM). Kerikeri Inlet, regular in winter, fishing or resting on rocks or stumps on a farm dam, parties of 18-20 birds (ATE); 3 birds in Stone Store basin 23/6/76 (PJM). Muriwai Lakes, 28/2/76, 15 (SMR). Clark's Beach, 8/6/74, 230 (HRMcK). Orakei basin, peak numbers May, present May-July; when fish are shoaling *varius*, *melanoleucos* and *sulcirostris*

feed together (MB, MJT). Ryburn's lagoon, Pokeno Valley, Oct 75, mixed flock, mostly *sulcirostris* but some *carbo* and *melanoleucos*; nests in weeping willows, breeding well advanced, most young ready to fly (DAL). Miranda coast, one at Tarata Point 12/11/75, the first recorded here; Port Waikato, 4/1/75, 3 (HRMcK). Kawhia, 4/7/76, 10 (JHS). Buffalo Beach, Coromandel, 10/7/75, 25 in close formation near beach (ABJ). Tauranga harbour, near Matapihi bridge, 17/7/76, 205 on power pylon at high water (JHS). Little Waihi, 28/6/75, 33 (RWJ), Dec 75, 2 and Jan 76, 4. Regular at Kaituna-Maketu, 17 on 22/11/75. Lake Rotorua, 1975, 190 in June, 560 in December (AP). Hawke's Bay, East Clive, 8/6/75, 60; Ngaruroro estuary, 20/12/75, 30; Westshore, 8/5/76, 80, in a long group following shoal fish down the channel; a great turmoil in water as they dived and emerged; finally all sat on a shingle bank (KVT); Ahuriri, 18/5/76, 32+ (BDH). Taranaki, 10/4/76 one and 2/5/76, nine at Perth Road plus one at Barrett Lagoon (DGM); 3/5/76, Kawarua, first seen here since 9/9/75 (DJB). One dead on bank of Manawatu river near Palmerston North, winter 1976 (LJD). Lake Horowhenua, 1976, 16 on 3rd January, up to 12 on three occasions April-July (EBJ). Wellington harbour, Petone 1975, 7 in July, 10 in August; Eastbourne, 5 in Sept (JLMM).

LITTLE SHAG (*P. melanoleucos*)

Waimamaku, 13/3/76, neck stretching after eating small flounders (PGS). Lake Whangape, one khaki-coloured bird, 9/1/75 (HRMcK). Opoutere, Jan 76, pair courting; swimming, diving and neck weaving in unison (BB). Lake Elterwater, numbers seem to have increased in 1975 (TIT). Nelson, one wrestled for over 5 minutes with a large perch, often dropping it and moving its position in its bill before finally swallowing it (CFJO'D). Timaru, Washdyke lagoon, 3 white-throated and 4 black young, 14/3/76; Stewart Island, March 1976, all observed birds were white-throated phase (PMS).

CHATHAM ISLAND SHAG (*Leucocarbo carunculatus onslowi*)

August 1975, 100+ building at Matarakau Point and 100 at Kaiangaroa (LMcP).

SPOTTED SHAG (*Stictocarbo punctatus punctatus*)

A count in Hauraki Gulf-Firth of Thames on 15/2/76 gave an estimated population for the area of 3197 birds (BB). A previous estimate was 4750. Evidence that there is much individual movement is sightings of a near-albino bird which in the space of a year or so has been seen at Tarakihi, Ponui, Coromandel coast and lately Tarata Point, north Kaiawa (HRMcK). One, resting on rocks at Karioitahi Gap, Waiuku, 6/7/75 (IWJ). Lion Rock, Port Taranaki, a juvenile and an adult on 26/9/75 (REL, CDP) and further sightings of single birds in April and May 1976 (DJB). Wellington harbour, regular breeding for 3-4 seasons at Shag Rock, at the south end of Somes island; 22 chicks banded in 1975 by R. Benfell. Sightings reported 1975-1976 at Eastbourne and Ngauranga; one bird with a cockle stuck on its bill (MLF, JLMM). Nelson, Fifeshire Rock, 11/7/76, 200, plus 60 feeding in the sea (CFJO'D). Punakaiki, June 76, several nests on wave-formed shelves on cliff (JD). 9/11/75, most eggs had hatched at Whitewash Head, Sumner, but most birds at Tumbledown Bay still sitting on eggs (RG).

PITT ISLAND SHAG (*S. p. featherstoni*)

Chatham Islands, 10/8/75, 100+ building at Matarakau Point; c.500 at Kaiangaroa (LMcP).

WHITE-FACED HERON (*Ardea novaehollandiae*)

Tamaterau, Whangarei harbour, a pair nested in 1973 on a branch of a dead pine tree. The nest is about 15 metres above ground level and can be seen from the house, but its contents cannot be checked as the tree is not climbable. Two young were raised in 1973; in 1974 the same nest was used, three chicks hatched and two were raised to maturity. A pair of adults inspected the nest, which was in poor condition, on 29/6/75; repair work started on 3/7/75, copulation was observed on 11 and 13 July and incubation apparently started on or about 4 August; additional twigs were brought and added to the nest structure at intervals up to 28 August. Chicks were seen on 15 September, but had been fed by parents for about two weeks before that date; a partly fledged young bird was picked up dead below the nest on 22 September; the other fledgling moved out of the nest on to the branch on 2nd October and appeared to be fully fledged by 12 October. It stayed in the tree for some time before venturing further afield. The parents remained in the area, and again showed interest in the nest in mid-January 1976; were continually around it by 21 January and adding twigs to the nest on January 24-27. Incubation apparently started on 28 January and part of an egg, still damp, was picked up on 23 February. Three chicks hatched; one, smaller than the other two, was picked up dead on 6 March but the remaining two grew to maturity and eventually left the vicinity of the nest about the third week of April (CWD). Rawene, one perched on the centre of a single power line, causing considerable sag (PGS). One at Little Barrier, 22/1/76 (BB). Manukau, Dec 75, 378; June 76, 241; Firth of Thames, Nov 75, 130; July 76, 116; Opoutere, Jan 75, 100+; Dec 75, 113+ (BB). Bay of Plenty, very common in Tauranga harbour (RVMcL); Nov 75, 56 at Little Waihi, 42 at Kaituna-Maketu; Oct 75, 158 at Ohiwa (AP). Tairua harbour, 6/12/75, 200+ (ABJ). Nelson, single birds feeding on worms on the edge of the main road out of town, were apparently undisturbed by passing cars only two feet away; in summer, five roosted on Boulder Bank — an unusual location (CFJO'D). Southland coastal counts, 14/2/76, 148+; 27/6/76, 105 (RRS).

WHITE HERON (*Egretta alba*)

Rangaunu Bay, 4 on Rangiputa Spit 13/6/76; J. Perry, a local fisherman, reported a total of 14 present in the bay (BDB). Rawene, 15/2/76, one (PGS). Pokapu, 11/5/76, one reported by I. E. Courtney. Kaipara, Aug-Sept 76, 3 on Puketotara peninsula, with a probable Little Egret (MEW). Parakai, 24/8/76, one (SMR). Port Waikato 20/3/76, one (RCB). Miranda, Jan 76, one, appeared to be in breeding plumage (HRMcK), AP). East Clive 28/2/76, one (KVT); Ahuriri 18/5/76, 6 (BDH). Lake Horowhenua, one seen at intervals June-Sept 76 (EBJ). Nelson 1976, May, Westhaven Inlet (BDB); June, seen at Hapua and Riwaka wharves, Mariri and Waimea Inlets, on pasture on Waimea plain and three in a paddock at Appleby (CFJO'D). McCormack's Bay, July 76 (RG). Lake Wainono, 1976, two present Jan-Mar and May, 4 in April, 3 in June (RJP). Orowaiti

lagoon Mar 76 (JD); Hokitika 13/5/76 (GPSA); Fox Glacier township Dec 75 (M. Hall); Okarito lagoon, six on 3-6/5/76, one occasionally roosted on a rooftop in Okarito township (PMS).

LITTLE EGRET (*Egretta garzetta*)

Whangateau harbour, recorded on sixteen occasions between 13/3/76 and 9/10/76; two birds March-May, three in early July and three still present in October. One at Pakiri on 19/6/76 (LH, GE, RBS). Parau, one present in winter 1975 till mid September, by which time it had developed breeding plumes; 1976, one still had plumes when first sighted on 19 June and was observed at weekly intervals till August, usually with White-faced Herons, frequenting mangroves and occasionally perching in gum trees (CS). Two present in Manukau harbour mid-February 1976 (BB); single birds at Kirk's in March, Yates Dam-Seagrove in March-April, Weymouth in June (BB, RBS). Tarawera river mouth, one 12/6/76 (RMW). Hawkes Bay, Westshore, six on 21/2/76, seven on 24/4/76 (KVT). Manawatu estuary, one Nov 75 - 1/1/76, one on two dates in April, 1/5/76 and 6/6/76 (HAR, JLMM); Lake Horowhenua, one on 30/6/76 and 15/7/76 (EBJ). Pauatahanui Inlet, one on 15/4/76 (JLMM). Taupata Creek, Golden Bay, 10/5/76, one (BDB). Canterbury, McCormack's Bay, July 76; Ashley lagoon, Aug 76 (RG). West Coast, Orowaiti Inlet, 5/4/76 (JD); Okarito lagoon, May 76, one, mostly associating with a White Heron (PMS). Riverton, 27/6/76, one (IAM).

CATTLE EGRET (*Bubulcus ibis*)

Dargaville, 14/5/76, a single bird on a farm at Turiwiri, where two birds were seen in May-June 1975; a few days earlier there was a report of a white egret, possibly the same bird, further north at Omamari, among cattle (CDC). Two, south of Wellsford, 3/5/76 (KR). Meremere, 28/5/76, 2 (RBS); 13/6/76, seven, feeding actively in very wet pasture, with cattle, about midday; not there at 1545 hours (JPW). August, one near Kawhia (RD). Rangariri, 18 present from early June (BB), 24 in September (RD). Lake Ngaroto, two on 22/8/76 (ARL). Little Waihi, one on 6/1/76 (AP). Taranaki, May 1976, two at Hawera 11th-16th, one at Opunake 12th; two birds, probably this species, at Lepperton 3rd-19th (RWW). Lake Horowhenua, 12/6/76, one; others reported present by Mrs Duffy, but not seen by me (EBJ). Marlborough, 1976, two in July at Bay Paddock road, two in August. Fernleigh area (JAC). Golden Bay, one near Taupata Creek 10/5/76; a probable sighting on 8/5/76 at Puponga Inlet (BDB). Westport, May 76, two seen on three occasions, once with and twice in the absence of cattle (JD); Hokitika, 3/5/76, two (GPSA); Fox Glacier township, 1976, 3 in April, two in May (M. Hall). Southland, 2/2/76, Kaka Point, one, with Angus cross steers (JST); 2/6/76, Gorge Road, seven (SLL); 15/8/76, Otama, near Gore, two (CB).

AUSTRALIAN BITTERN (*Botaurus stellaris*)

Frequents reedbeds on the Awanui river bank; 27/10/75, feeding young in rushes on lake edge, one seen with a frog in its bill (M. Hows). Waipapakauri, 27/2/76, one temporarily caught in bracken, lying with wings outstretched (PGS). Muriwai Lakes 8/2/76, 10 (SMR). Waikato river bank near Otatau, 7/6/75, two (IWJ). Bay of Plenty, Kaituna lagoon, 27/4/75, 4; Little Waihi, 13/12/75, 2; Matata, Nov 75, 8 (AP).

Heard near Okataina lodge, 11/10/75 (RWJ). Hurimoana swamp, H.B., 10/8/75 (KVT). McKay's crossing, Paekakariki, 16/7/76 (JLMM). Canterbury, August 1975, Ashworth lagoon; at least three at Saltwater Creek, in swamp; July 1976, Styx river, Brooklands (RG). Southland, 31/8/75, one in the middle of the main highway 5 km south of Balfour (JST).

GLOSSY IBIS (*Plegadis falcinellus*)

Lake Wahi, one present 5-7 Jan 76, seen by Mr Metcalfe (RBS). Lake Ngaroto, one on 22/8/76 (ARL). Bay of Plenty, one on Mata-pihi mudflats on 2/2/76 was possibly one of the two birds, one larger than the other, which had been observed along the coast between Little Waihi and Thornton in Oct-Dec 1975 (RMW, RWJ, AP). Manawatu estuary, 1/5/76, one landed and fed near a party of godwits; when a shot was fired from a nearby maimai it took off and was chased by a dozen godwits up river until it was out of sight (HAR); seen again 6/6/76 and 26/6/76 (LJD, MLF). Nelson, Waimea estuary, two, 24/1/76 (FHB); Farewell Spit, March 1976, one, later four, on flooded paddock (BDB). Lake Wainono, April 1976, one (RJP).

WHITE IBIS (*Threskiornis molucca*)

Far North, one near Awanui on 3/4/76 (M. Hows), one at Rangiputa Bank 13/6/76 (BDB) and one at Unahi 23/8/76 (A. Billing). Lake Wahi, one on 8/1/76 (RBS). Maketu, 18/7/76, one, probably a first year bird, present since about mid-June (JHS).

ROYAL SPOONBILL (*Platalea leucorodia*)

Far North, April 1976, one at Awanui and one at Swan Lake, Waiharara (M. Hows); June, 4 at Rangiputa Bank (BDB); August, 2 at Unahi (A. Billing). Bay of Plenty, Maketu, one on 18/7/76 (JHS). Hawkes Bay, three at Westshore 24/4/76 (KVT), three at Ahuriri 18/5/76 (BDH). Manawatu estuary, maximum recorded 1976, 52, in March (M. Butcher); April-July, 26, 28, 25, 21 (HAR, LJD); in June one appeared to be moulting; plumage yellowish, stood and flew apart from the rest of the flock (HAR); five present 6 and 19 September (EBJ). Nelson, Waimea estuary, 15 on tidal flats 24/1/76 (FHB), regularly present through winter (CFJO'D); Motueka, 20/9/76, 12 (FHB); Farewell Spit, 16 in March, 21 at pools 16/5/76 (BDB). Canterbury, Lake Wainono, 9 in January 1976, one in March, two in April (RJP); McCormack's Bay, July 1976 (RG).

BLACK SWAN (*Cygnus atratus*)

Kawhia harbour, 4/7/76, 286 (JHS). Lake Horowhenua, a big influx in February-March 1976, numbers up to 4-500 (EBJ). Lake Elterwater, Feb-April 1976, up to c. 250 (TJT). Lagoons south of Punakaiki, 13/6/76, 32 including 2 juveniles (JD); Lake Paringa, 7/7/75, 5; Lake Pratt, 24/10/76, 8 (GPSA); Okarito lagoon, 3/5/76, loose flocks up to 137 birds, two cygnets in down, several non-flying juveniles. Washdyke lagoon 14/3/76, 378, six on nests; 20/6/76, 65 adults, 20 cygnets in down (PMS). Southland, 22 on a new oxidation pond at Gore, 4/9/75; notable increase on Mataura river upstream to Gore (RRS). Stewart Island, Freshwater river mouth, c. 200 on flats, January 1976 (DAL); March, 105 feeding on grass area (PMS).

CANADA GOOSE (*Branta canadensis*)

Long Bay, Auckland, 28/1/76 (DFB). Lake Waikare, 1975, July, 8; November, pair with 4 young (BB). Lake Pukepuke, one for four months, 1976 (LJD). Porirua harbour, north arm, 1975, two June-August, one Sept-December (COF). Lake Elterwater, 1976, February, 9; August, 17 (TJT). Mesopotamia flats, Havelock River, Feb 76, 16 (JD). Waiiau valley above Lake Guyon, 19/9/75, 1352 m., evidence of feeding on carpet grass (*Chionochloa australis*) considered to be an unpalatable species to most browsing animals (RG). Washdyke lagoon, 1976, 152 in March, 427 in June (PMS).

PARADISE DUCK (*Tadorna variegata*)

Northland, widespread and in some places in large numbers (PJM). Clevedon north, 1975 winter, parties up to 12 birds (HRMcK); Miranda, pools, 4 on 21/12/75 (RBS). Greymouth 15/4/76, 100 feeding on barley crop at Totara Flat (GPSA). Dawson Dam, Te Anau, 3/1/76, 750; 13/9/75, Waimatuku mouth, 19 (MLB).

GREY TEAL (*Anas gibberifrons*)

Miranda, 8/3/76, 20+ (HRMcK). Hawkes Bay, Hurimoana swamp 10/8/75, 60+; Westshore, 15/5/76, 80 (KVT). Bay of Plenty, 1975, 22 at Kaituna-Maketu, March; Little Waihi, Oct-Nov, 3 (AP).

BLUE DUCK (*Hymenolaimus malacorhynchos*)

Paradise Valley, Rotorua, 1/5/76, one in a mountain stream in tawa bush (RWJ). Whirinaki river, 6 km north of Minginui, 2/12/75, two (AP). Karamea, July 1976, one pair in Lower Kakapo and two pairs in Lower Cuckoo (JD). 1976, January, a pair with two mature young near valley head, Forgotten river, 790 m.; May, a drake at Forge Flat, Lower Routeburn (PC).

N.Z. SCAUP (*Aythya novaeseelandiae*)

Whau Valley Dam, Whangarei, three on 16/5/76, not present on 23/5/76 (PJM). Muriwai Lakes 8/2/76, 12 (SMR). Hurimoana swamp, H.B., 10/8/75, 56 (KVT). Lake Rotorua, 1975 best count, 1130, May (AP). Wairarapa, 23/3/75, several on a lake; recently liberated in the area (RHDS).

AUSTRALASIAN HARRIER (*Circus approximans*)

Helensville river, January 1976, a harrier which had flown low over the flats dropped both feet into the calm water but immediately took off when startled; there were no floating objects so it must have been attempting to pick up a fish (BSC). 25/1/76, one cruising over the forest canopy, Summit track, Little Barrier (BB). Particularly plentiful at Lake Whangape, 9/1/75 (HRMcK). Whakarewarewa Forest Park, a pair of Grey Warblers attacking two harriers, 9/8/75 (RWJ). Hochstetter Forest, near Lake Ahaura, 11/12/75, two flying over cut-over bush (MDW).

N.Z. FALCON (*Falco novaeseelandiae*)

Kaingaroa, 15/9/75, one chasing a skylark (RWJ). Taranaki, 1975, two at Tangarakau gorge, January; one at Te Popo, near Stratford, May; one at Waitara headwaters, December (RWW). One at Upper Hutt, Nov 75 (HLS): sightings in Lower Hutt, March and June 1975 (WAW, JLMM). Nelson, Upper Travers Valley, Nov 75, one vigorously attacked a party of three people, knocking off the hat of one member

(SCS). Arthur's Pass, June 76, one on a lamp post, watched for five minutes at a range of 6 metres till it flew to bush (JD). 1976, April, one on a telephone pole at Cook river flats, one at Knight's Point (RJP), one at Karangarua; regular at Fox Glacier township; settling in scrub on the sheer face of Cone rock (M. Hall). Mt Cook National Park, 1975, relatively common; recorded Hopkins valley, Ball Hut, Hooker river; from 29/10/75 to 4/11/75 one flew down from above the Hermitage each morning at 0830 hours (GG, RG). Haast River, Mossy Creek, two beautifully marked immatures flew from the forest to a large driftwood stump, 15/2/76 (PC). April 1976, one in Rees valley; Routeburn valley, track below Falls hut, one which glided down into an area of beech forest was immediately chased away by two kakas, which then returned and protested vigorously; a third kaka, apparently juvenile, was present in the area (WMJ).

CHUKOR (*Alectoris chukar*)

Kaikoura, Mt Patutu, 30/4/76, 4 seen by L. Bowring (JAC). Matakaitiki valley, heavy snow pushed birds down to 517 metres a.s.l. (CFJO'D). Mt Cook National Park, Oct-Nov 75, several near Ball Hut, a pair on White Horse hill (GG).

BROWN QUAIL (*Synoicus ypsiliphorus*)

Hokianga 1976, seen on most outings; March 75, covey of 10 including very small young (PGS). Waipu, 17/8/75, persistently scratching out young cabbages and cauliflowers; November, sunbaking and dust bathing on edge of garden (TGL). Bay of Plenty, formerly common, now rare at Kaituna-Maketu; Little Waihi, probably regular, not often seen; Ohiwa Spit, 8 + 5 chicks, 20/12/75 (AP). Clevedon north road, present again in small numbers (AJG). Sightings at Matingarahi and Karaka (BB, HRMcK). Tairua forest headquarters, 4 in nursery 8/7/75 (RWJ).

CALIFORNIAN QUAIL (*Lophortyx californica*)

Recorded from Kaituna, Maketu, Little Waihi (AP), Tairua forest and various localities around Rotorua (RWJ); Golden Bay, Jan 76, nest under gorse bush, 5 chicks, at Tata Beach (JST). Grey-mouth, Red Jack's village, 20/2/76, among dredge tailings and broom regrowth (GPSA). Queenstown, party of 15, 24/5/76 (JST).

BANDED RAIL (*Rallus philippensis*)

Spirits Bay, Jan 76, in swamp by camping ground (GE). Waiotira, May 76, on edge of swampy area, rushes and willow weed (TGL). Hokianga, Omanai and Mangungu, Mar 76 (PGS). South Kaipara, mangroves at Tangitike Bay and downstream from Helensville, Jan 76 (BSC); near bridge at Parakai-North road junction, Dec 75 (DFB). Kaituna-Maketu, Feb 75 (AP). Coroglen, two chicks 26/3/76, three chicks 5/4/76 (ABJ). Lake Taupo, Moturapa, Feb 76, in reed bed near old boat marina (HAR).

WESTERN WEKA (*Gallirallus australis australis*)

Tasman Bay, June 76, calling at night at Mapua; one wandering round street in Kaiteriteri (CFJO'D). Tata Beach, Golden Bay, less numerous than a decade ago (JST). Karamere, plentiful on flats, Cuckoo and Kakapo rivers; a pair can dig up quite a considerable area of flat, loosening ground cover to a depth of 2-3 inches, with bill

(JD). Common in Reefton and Ahaura district; 12 seen, mostly crossing road or disappearing into bush, Hochstetter Forest, Granville Forest (in exotic plantations), Inangahua West Forest (MDW). One near Lake Kaitiaki, 14/10/75; Thompson river, Arthur's Pass National Park, many calling at night, 18/5/76 (RG).

STEWART ISLAND WEKA (*G. a. scotti*)

Ulva Island, 6/3/76, 3 at Landing Cove, 2 at Boulder Beach, 5 at Sydney Cove; all foraged food off visitors (PMS).

MARSH CRAKE (*Porzana pusilla*)

Karamea, Granite Creek, Sept 75, a sick bird which later died (JS). Upper Lake Heron Station, 24/6/75, a young bird found dead on top of 50 cm of snow, which had fallen the previous night; footprints of the bird led to an opening under the snow grass. 10/3/74, in a swamp 10 km S.E. of Ashburton; cat-killed birds at Ashburton, 21/10/74 and 6/5/75 (ML). Dawson Dam, Te Anau, 3/1/76; Oreti beach ponds, 6/12/75 (RRS).

SPOTLESS CRAKE (*P. tabuensis*)

Kerikeri, Kennedy property, Jan 76 (BDH). Bethell's swamp, near Auckland, 21/8/76, 4 (JFS). Port Waikato, 12/10/75, two seen and others heard in a swamp close to houses at Sunset beach (BB). Tauranga harbour, Te Puna Inlet, 18/9/75 (RVMcL); present in small numbers in most raupo swamps, Bay of Plenty and Rotorua lakes (AP). Plimmerton swamp, one probable, 23/11/75 (MLF).

PUKEKO (*Porphyrio porphyrio*)

Awanui, two pairs reared 2 and 3 chicks, from nests on river bank, early 1976 (M. Hows). Muriwai lakes, 8/2/76, 34 (SMR). Regular, Kaituna mouth and Little Waihi (AP). Westshore, H.B., 15/5/76, 32 (KVT). Manawatu estuary 13/6/76, 107, far more than normally seen here (HAR). Silverstream, Hutt Valley, up to six still present till July 76 (HLS). Common in wet farmland, Inangahua and Grey Valleys (MDW).

AUSTRALIAN COOT (*Fulica atra*)

Poutu, Lake Kahuparere, 24/1/76, one swimming in an area of water clear of raupo; may have been a recent arrival; seemed rather agitated, and grey ducks noticeably curious; at about 5-minute intervals the coot dived and came up with bill full of vegetation which it carried round for a while (CDC). Lake Tarawera, 14/12/75, four (AP). Lake Heron, 18/1/76, two pairs, one pair with two chicks (RG). Lake Hayes, 4/4/76, 3 (JST).

S.I. PIED OYSTERCATCHER (*Haematopus ostralegus finschi*)

Paua, 1976, maximum 60, April-May; 22 still present on 27/9/76 (ATE). Whangarei harbour, 7/3/76, 490, plus 130 at Waipu (D. E. Crockett). Manukau harbour, 7/12/75, 2478; 13/6/76, 17,359 (BB); c. 300 at Huia 19/4/76 (RBS). Firth of Thames, 9/11/75, 1001; 4/7/76, 3356 (BB). Apparently a scarce bird Whangapoua-Whitianga, along the Bay of Plenty and at Hawkes Bay (AP, ABJ, et al.). Hatepe, Lake Taupo, 10-17/1/76, a single bird feeding along the shore and on nearby lawns and road verge (WAW). Kawhia harbour 4/7/76, 1454 (JHS). New Plymouth, 12/1/76, c.75 in four flocks flew north over a 15 minute period; other flocks reported flying north during the

same day (DGM). Manawatu estuary, 100+ 28/3/76, 48-63 April-June (JLMM, HAR). Awatere river mouth, Oct 75, one small chick of a pair on a paddock was restricted by wool twisted round its legs (TJT). Nelson, March 1976, only about 2000 at Farewell Spit, but 400 at Westhaven Inlet, 200 at Golden Bay and 2000 at Motueka (BDB, MLF). Mid-Arawhata riverbed 30/12/75, several pairs and one chick between Waipara and Grassy Huts, about 60 m. a.s.l.; 8/1/76, Waitoto river headwaters, a pair at Moraine Lake, 700 metres (PC). Southland counts, 14/2/76, 3137; 27/6/76, 3412 (RRS); but c. 4000 at Invercargill estuary 28/3/76 (MLB). Stewart Island, Jan 76, seen only at Halfmoon Bay and the head of Paterson Inlet (DAL); 4/3/76, 75 at Freshwater river mouth (PMS).

VARIABLE OYSTERCATCHER (*H. unicolor*)

Post-breeding flocks, 1976, Paua 128, June (ATE); north head, Rangaunu Bay, 30, June (BDB); Ruakaka, February, 60; Waipu, May, 50 (TGL). Waipu, 30/11/75, 12 nests; one clutch of 3 chicks had hatched, one nest 2 eggs one chick, 10 nests still with eggs (AHG). Waikato North Head 2/9/75, 25, seven pure blacks (IWJ). Coromandel Peninsula, Colville, Jan 75, 18 (BDH); Whangapoua harbour, 18/11/75, 12; Kuaotunu, 18/1/76, 21; Cooks Beach 4/12/75, 13 (ABJ); Oputere, 18/4/76, 24 (BB). Little Waihi, 9/1/76, 15 (AP). Ohau river mouth, Levin, 24/1/73, 19 (BDH). Post breeding flock, Wellington harbour, about 30 (MLF). Westland, Okarito lagoon, 4 on shingle beach 3/5/76 (PMS); Okuru, 27/12/75, two in cattle pasture 2 km from coast, with one *finshi* (PC). Stewart Island, Jan 76, 6 around Oban, 10 at Doughboy Bay, 20 plus two broods of young along Mason Bay (DAL).

CHATHAM ISLAND OYSTERCATCHER (*H. chathamensis*)

Two on Pateriki beach, 19/5/76 (HAR).

SPUR-WINGED PLOVER (*Lobibyx novaehollandiae*)

Hatuma, Hawkes Bay, 2/5/76, two being attacked by two magpies, but fighting back and holding their own (LWW). Manawatu, several sightings near Whirikino and Waitāere forest in winter 1976; well established, breeding round Pukepuke lagoon and appears to be spreading throughout the Manawatu sand country (LJD); Manawatu estuary, 21/3/76, 14 (HAR). Wellington, sightings in late 1975 at Shandon golf course, Horokiwi quarry area on a shingle bank, and at Karori (MLF); two birds at the head of Pauatahanui Inlet, 3/7/76 (MMN) and three in September, following an August report of sighting on farmland in Horokiwi valley (MLF). Wairarapa, July 76, reported near Lake Pounui on the western side of Lake Wairarapa (PER); nest with 4 eggs in August on a shingle island in Maunganui river near Pounui Lake (DS); Te Ore Ore, near Masterton, pair with young on 16/9/76 (RHDS). Marlborough, Ure river, one on flats, Nov 75; 1976, Jan-June, between Lake Grassmere and Lake Elterwater, up to 14 in groups, in paddocks close to the lakes (TJT); thinly spread over Kaikoura plain (JAC). Nelson, Jan-Feb 75, 25 near Lake Rototoi and 26 in Upper Wairau at turnoff to Rainbow Station (PJ); two at Farewell Spit farm April-May 75, one in September (BR). 1976, large numbers, groups up to 8, over farmland near Westport; 7 at Hokitika, February (JD); reported at Inchbonnie, Arnold River, Bell Hill, Mussel Point (GPSA); 4 at Okarito lagoon, May (PMS). Lake

Wainono, March 76, 46 (RJP). Ewing's Bay, West Wanaka, 538+ in winter 1976, cf. 426 in 1974 (PC). Southland, now very common in Waikaia valley; August 75, 42 counted near Glenary Station (JST). Invercargill, a pair nested 23/9/75-22/10/75 on a marshy triangle of land bordered by three busy streets; hatched three chicks two days before a bulldozer moved in; 26/10/75, two chicks still surviving on bulldozed area (MLB).

GREY PLOVER (*Pluvialis squatarola*)

Taramaire, Firth of Thames, probable sighting 22/2/76 (BB) confirmed 20/3/76, black axillaries well seen (AH).

GOLDEN PLOVER (*P. dominica*)

Paua, 1976, 67 in January, 20 in March, 10 in April (ATE). Waipu, Nov 75, a single bird present for a few days on an area recently planted with maize (TGL). Taporā, 3, 24/4/76 (ATP). Manukau, 16 at Karaka 22/11/75; Manukau summer count 7/12/75, 34 and about the same number present till early Feb 76; 20 in March (HRMcK, BB). Bay of Plenty, Little Waihi, Oct 75, 24 (JFS); 27/12/75, 11; Ohiwa harbour 30/11/75, 15 (AP). Hawkes Bay, Ahuriri, 11 on 1/11/75, 39 on 7/12/75; Westshore, 3/4/76, 15 most of them in breeding plumage and 8/5/76, one, in breeding plumage (KVT). Manawatu estuary, 21/10/75, one in almost full plumage (EBJ); regularly recorded 25/10/75-28/3/76, maximum seven on 19/1/76 (JLMM); 21/3/76, nine (HAR). One at Waikanae river mouth 14/2/76 (S. Cook). Farewell Spit, March 76, five (possibly ten) birds (BDB). Fox Glacier township, one sighted Oct 1974, one in Nov 75 (M. Hall). Southland, 9 at Fortrose, 30/12/75; summer count 14/2/76, 31 (MLB, RRS).

NEW ZEALAND DOTTEREL (*Charadrius obscurus*)

Spirits Bay, Jan 76, an oystercatcher which had been pecking at something in the sand was attacked and chased by a dotterel pair which had a nest with 3 eggs (GE). The species is holding its own in the Far North; post-breeding flock at Paua, April 76, 87 (ATE); on a January 1976 survey of beaches on Aupouri Peninsula 120+ were recorded, and of these only 9 were on 90 mile beach, which of recent years has had a population of nearly 100 birds; in January many of these would be off the beach except on a falling tide (D. E. Crockett). Numerous records from other parts of Northland, North Auckland and Firth of Thames. Waikato, North Head, 2/9/75, 18 (IWJ); Kawhia harbour, 4/7/76, 10 (JHS). Coromandel Peninsula, a total of 40 birds recorded on 18/1/76 at Whangapoua, Matarangi and Kuaotunu (ABJ). May be decreasing in Bay of Plenty; Little Waihi, 6/9/75, 7; Kaituna-Maketu, February 75, 12 (AP). Southland count, 27/6/76, 28 (RRS). Stewart Island, March 76, 20 in a loose flock on shell-covered flats at Freshwater river mouth were very flighty; 30 on one mile of beach at Mason Bay (PMS).

RED-CAPPED DOTTEREL (*C. alexandrinus*)

Karaka, 7/12/75, one, alone on the mud as the tide fell; lacked the red cap; broad white forehead, pale grey-brown above and white below, tail dark-centred with light edges (BB).

BANDED DOTTEREL (*C. bicinctus*)

Paua, ref, 1975 Classified Notes, the statement "none found

after March" was in error; in fact, several hundred were present until June 75. 1976, numbers built up from 100 in early January to 500 in April; an influx in May brought the total up to c. 1000, but numbers were down to c. 500 in June-July; only 10 birds on 15/8/76 (ATE). Whangarei, 113 on 7/3/76 (D. E. Crockett); Ocean beach, 4/4/76, c. 40, very restless, obviously on the move; not seen here before (ATP). Miranda, 2/1/75, a flying chick, the first known to be reared here for many years (HRMcK). Kawhia harbour 4/7/76, 104 (JHS). Manawatu estuary, maximum 85 on 16/4/76 (JLMM). Breeding on Motueka sandbar 1975-76 (CFJO'D). Lower Cook River flats, Fox Glacier, May 76, six (M. Hall). Okarito township, 20 on paddock 3-5 May 1976 (PMS). Lake Ellesmere, 18/2/76, 500+ at Kaitorete Spit; June 1976, 180 at Lake Wainono (RJP). Southland counts, 14/2/76, 769; 27/6/76, 165 (RRS).

MONGOLIAN DOTTEREL (*C. mongolus*)

Paua, 3/2/76, one, broken red band on upper breast (ATE). Karaka, one 11-19/2/75 (HRMcK), one 7/12/75 (BB). Miranda, one on 8/3/76 and 6/4/76 on which date the band was right across (HRMcK). Lake Ellesmere 9/11/75, one on mudflat at Kaitorete Spit, often chased by Banded Dotterels (RJP).

LARGE SAND DOTTEREL (*C. leschenaulti*)

Hokio, one on 20/3/74 and on 1/4/75 — identification checked with HRMcK (EBJ). Firth of Thames, 1975/76, one (BB).

BLACK-FRONTED DOTTEREL (*C. melanops*)

Manawatu, a good feeding spot discovered by M. Dennison and myself, behind Longburn freezing works, where there is a slight fanning slope of sludge with waste water running over it when the works are in operation; maximum count was 39 on 10/6/76; the birds seem to come off the rivers at 1500-1600 hours to the feeding and night roosting spot (HAR). Awatere river bed, Marlborough, railway bridge to mouth, 23/10/75, 5 (TJT). Rakaia south branch, Oct 75, one (RG).

WRYBILL (*Anarhynchus frontalis*)

An Aupouri peninsula count on 26/1/76 gave Paua, 90; Great Exhibition Bay, 4; Henderson Bay, 22; East Beach, 1; total 117 birds (D. E. Crockett). 90 still present at Paua in April (ATE). Whangarei harbour count 7/3/76, 81, plus one at Waipu (D. E. Crockett). Kaipara, 110 at Jordan's 3/3/76 (RBS), 118 at Tabora 10/7/76 (LH). Whangateau, 17/7/76, 4 (LH). Manukau 7/12/75, 17; 13/5/76, 551; Firth of Thames, 9/11/75, 39; 4/7/76, 2017 (BB). Waikato north head, 7/6/75, 5 (IWJ). Kawhia harbour, 4/7/76, 8 (JHS). Bay of Plenty, Kaituna-Maketu, 1975, one in January, two in February (AP); Tauranga, Sulphur Point, 18/9/76, 6 (RVMcL). Hawkes Bay, Ngaruroro estuary, 28/2/76, 3 (KVT). Manawatu estuary, 22 on 16/4/76 and on 5/6/76 (JLMM). Ruamahanga river near Greytown, 31/12/74, one, no chest band, feeding and washing in shingle runnels; gone 1/1/75 (BDH). Lake Ellesmere 9/11/75, 29; 18/2/76, 2. Cass delta, 20+ 1975-76 summer, two on 1/3/76 (RJP). Matukituki river mouth, 8/2/76, one immature, a very late migrant, feeding along water edge of river and breakwater, with immature banded dotterel nearby (PC). Southland, Waimatuku mouth, 27/10/75, one in breeding plumage; Awarua Bay 14/2/76, 2 (MLB).

LONG-BILLED CURLEW (*Numenius madagascariensis*)

Paua, 3 on 26/8/75, and in September; 2 in October-November; 1976, 7 in January, 6 in February-March; one on 15/8/76, 4 on 27/9/76 (ATE). Jordan's, Kaipara, 4/2/76, one (RBS). Manukau, 7/12/75, 4 (BB). Firth of Thames, 9/11/75, 15 (BB); 5/3/76, 17 (TC); 5-8 in May, 6 on 4/7/76 (BB, HRMcK). Bay of Plenty, Spring 1975, one at Kaituna, 3 at Tauranga (AP, KF). Manawatu, one 9/8/75 till 8/5/76, two in the last week of March (JLMM, EBJ, HAR). Farewell Spit, March 76, 7 (BDB); Takaka, April-May 76, one (KLO). Southland, one at Fortrose 9/1/76; at Awarua 14/2/76 (MLB, RRS).

ASIATIC WHIMBREL (*N. phaeopus variegatus*)

Paua, present in Oct 75, 3 in March 1976 (ATE). Rangiputa, 13/6/76, 7 (BDB). Whangarei, 6/12/75, 10 (D. E. Crockett). Taporā, 24/4/76 (ATP). Karaka, 6/2/76, 3 (BB). Farewell Spit, March 1976, 7 (BDB).

LITTLE WHIMBREL (*N. minutus*)

Paua, 22/1/76, one, in paddock, delicately picking an insect off a blade of grass (ATE). Karaka, 7/12/75, one, resting with golden plover (BB). Kaituna Lagoon, one, 6/1/76 (AP).

BLACK-TAILED GODWIT (*Limosa* sp.)

Jordan's road, Kaipara, one seen on 29/8/76 by R. D. Hooper, not specifically identified (SMR).

BAR-TAILED GODWIT (*L. lapponica*)

Aupouri peninsula count, Jan 76, Paua, 460; Rangiputa, 3500; Great Exhibition Bay, Henderson Bay, East Beach 621 (D. E. Crockett). Paua, maximum noted in 1975-76 season only about 1000; c. 300 wintered at Paua and 340 at Rangiputa (ATE, BB). Whangarei counts, 6/12/75, 2278; 7/3/76, 1518 (D. E. Crockett). Manukau, 7/12/75, 15,054; 13/6/76, 1155; Firth of Thames, 9/11/75, 5672; 4/7/76, 601; Port Waikato 12/10/75, 120 (BB). Kawhia, 4/7/76, 215 (JHS). Whangapoua, Nov 75-Jan 76, c. 2000 (HRMcK, ABJ). Opoutere, Jan 76, 350 (BB). Bay of Plenty, June 1975 counts at Ohiwa, Little Waihi and Kaituna, respectively 185, 5, 18; December counts for the same localities 3500, 372, 380 (AP). Manawatu estuary 1975-76, maximum 350; wintering birds 30-50 (JLMM, HAR, MLF). Christchurch estuary, birds normally arrive in the first ten days of October and leave in the third week of March (GG). Inland Otago, 19/10/75, two males and four females at Matukituki river mouth, on a sand bar among Black-backed Gulls (PC). Southland counts, 14/2/76, 2324; 27/6/76, 384 (RRS). Stewart Island, Jan 76, several hundred at Freshwater Inlet (DAL).

GREENSHANK (*Tringa nebularia*)

Puponga Inlet, Golden Bay, March 1976, one (ATE). Lake Wainono, one, Oct 75 (RJP).

SIBERIAN TATTLER (*T. brevipes*)

Paua, 3/3/76, one (ATE). Mataitai, 20/4/76, one (AJG). Miranda, 21/2/75, one ?sp (BB). Hawkes Bay, Ngaruroro estuary, 20/12/75, one (KVT). Kaikoura, one on 27/10/75, two on 29/1/76 (call heard on both occasions) and two on 22/2/76 (MLF, BDB, RG, JAC). Farewell Spit, March 1976, one (BDB). Awarua Bay, 14/2/76, one ?sp (RRS).

TEREK SANDPIPER (*Xenus cinereus*)

Great Exhibition Bay, 24/1/76, one (D. E. Crockett). Firth of Thames, Taramaire, 2-9/1/76, one (AP, HRMcK). Hawkes Bay, Ahuriri harbour board marsh, 7/12/75, one; Westshore, two on 3/4/76, one on 15/5/76 (KVT). Manawatu estuary, 14/3/76, two with godwits, knots and wrybills (HAR). Motueka, outside Moutere Inlet, one on 14/6/76 on mudflats, feeding with oystercatchers, godwits and dotterel; seen again on 16/6/76 on a sandspit, with dotterel and oystercatchers (KLO). Awarua Bay, 14/2/76, one (RRS).

TURNSTONE (*Arenaria interpres*)

Aupouri peninsula count, Jan 76, Paua, 380; Great Exhibition Bay, 12; Rangiputa, 160 (D. E. Crockett). None seen at Paua in the early part of the season; from January numbers built up to 700 in March, fell to 5-400 in April, 60 in May, 40 in June-September 76 (ATE). 4 birds at Aurere, Doubtless Bay, 3/7/76 (PGS). Whangarei harbour, none found on 6/12/75, 60 on 7/3/76; Ruakaka, some dates, 6 and 2; Waipu, 1975, 4 in June, 14 in August, 6 in November, 21 in December; Feb 76, 11 (D. E. Crockett, TGL). Taporā, 1976, April, 20-30; July, 28 (ATP). Manukau counts, 7/12/75, 119; 13/6/76, 85; but 150 at Karaka in Nov 75 and on 4/4/76 (BB). Firth of Thames counts, 9/11/75, 117; 4/7/76, 32; but at Taramaire 200 on 21/12/75, 260 on 4/1/76, 160 in February and 140 in March (BB, AP, RBS). Coromandel, one at Whangapoua Jan 75 (BDH), one at Buffalo Beach Nov 75, chasing a New Zealand Dotterel in the air (ABJ). Bay of Plenty, Kaituna-Maketu, 22/11/75, one; 7/1/76, 4; Little Waihi, Nov-Dec 75, 2; Tarawera mouth, 4 in Nov and 3 in Dec 75 (RWJ, AP); Ohope Spit, 29/12/74, 2 (RMW). Hawkes Bay, Ahuriri 1/11/75, 4; Ngaruroro estuary 20/12/75, 14 (KVT); Porangahau 22/10/73, 3 (BDH). Manawatu estuary, one 6/12/75-21/1/76, 2 on January 1-4, 1976 (JLMM). Kaikoura, 9/2/76, 42 (GW). Nelson, Farewell Spit 900, Motueka 100, March 76 (BDB, MLF); two on Tahunanui beach 12/6/76 (CFJO'D). Lake Ellesmere, one at Kaitorete Spit, 9/11/75; Lake Wainono, Dec 75, 7; 1976 March, 3; April and June, one (RJP). Southland, 32 at Waimatuku mouth, 13/9/75 (MLB); general counts, 14/2/76, 675, 27/6/76, 34 (RRS). Chatham Island, May 1976, 11 at Cape Pattison, 29 along north coast, Tuapeka Point to Matarakau, Pateriki (LH, HAR).

KNOT (*Calidris canutus*)

Paua, first seen this season in Jan 76, 20; April, 120; June-July, 150. Rangiputa, 26/11/75, 200; 24/1/76, 125. Whangarei, 6/12/75, 790; 7/3/76, 600. Ruakaka, same dates, 19 and 62. Waipu, 26/11/75, 181; 6/12/75, 80; 7/2/76, 127 (D. E. Crockett, ATE, TGL). A bird banded at Swan River, W. Australia, on 30/10/73 was recovered on 21/3/76 in Kaipara harbour, 5 km north of Poutu Point (BSC). Manukau, 7/12/75, 8770; 13/6/76, 668. Firth of Thames, 9/11/75, 7277; 4/7/76, 195 (BB). Bay of Plenty, Little Waihi, 30/11/75, 18 (AP). Ahuriri, H.B., 29/11/75, 5; 7/12/75, 2 (KVT). One at Waitara mouth, Taranaki, 18/10/75 (DGM). Manawatu estuary, recorded 14/9/75 to 16/4/76, maximum 75 on 4/1/76; c. 50 in March-April (JLMM, HAR). Waikanae estuary 26/10/75, one (WLG); only previous record, one on 11/11/72 (MLF). Farewell Spit, March 1976, c. 10,000 (BDB). Lake Ellesmere, Kaitorete Spit, 9/11/75, 4; Lake Wainono, Oct 75, 6; Cass river delta, 5/11/75-29/12/75, one feeding

in muddy pools, taking chironomid larvae and worms (RJP). Southland count, 14/2/76, 437 (RRS).

SHARP-TAILED SANDPIPER (*C. acuminata*)

Paua, 1976, Jan-March, maximum 6 (ATE). Jordan's, Kaipara, 1976, 4 in January, 5 Feb-March (RBS). Manukau, one at Huia 11/10/75 (JFS); 1976, Feb-March, 16; April, 8 (BB). Firth of Thames, 1976, January, 17 (AP); March, 6 (BB). Bay of Plenty, Little Waihi, Oct 75, two (JFS); Kaituna 27/12/75 - 6/1/76, 6 (AP). Ahuriri 1975, 3 in Nov, 4 in Dec (KVT). Manawatu, 5 on 13/12/75 and 21/3/76 (JLMM, HAR). Farewell Spit, March 76, 5 (BDB). Lake Wainono, Dec 75, 4; March 76, 10 (RJP). Southland count 14/2/76, 16 (RRS).

PECTORAL SANDPIPER (*C. melanotos*)

Firth of Thames, 9/11/75, one (BB). Ahuriri, H.B., one in Nov-Dec 75 (KVT). Manawatu estuary, one on 26/10/75 and 15/11/75, in company with *acuminata* (JLMM). Lake Wainono, one in December 1975, 3 in Jan-Feb 1976, 4 in March, one in April. Cass river delta, 1/3/76, 3 photographed (RJP).

BAIRD'S SANDPIPER (*C. bairdi*)

Karaka, 21/4/76, one (HRMcK).

CURLEW SANDPIPER (*C. ferruginea*)

Paua, 3 in January, March and April 1976 (ATE). Firth of Thames, 9/11/75, 2; 21/12/75, 9; 4/1/76, 10; 20/3/76, 9; 19/5/76, 3 full red, one half red (BB, RBS, AP, HRMcK). Tauranga, Sulphur Point, 18/9/76, one (RVMcL). Hawkes Bay, Ahuriri, one 29/11/75, 7/12/75; Westshore, one on 3/4/76 (KVT). Manawatu estuary, 25/12/75 - 4/1/76, one (JLMM). Lake Ellesmere, one on 18/2/76 — very scarce this season (RJP). Southland, 4 on 14/2/76 (RRS).

WESTERN SANDPIPER (*C. mauri*)

Paua, 3/4/76, one, on paddock with stints and wrybill (ATE).

RED-NECKED STINT (*C. ruficollis*)

Paua, 1976, present Jan-April, maximum 6; one very red bird on 3/6/76 (ATE). Manukau, 2/11/75, 9; 3/1/76, 11; 21/4/76, 14 (BB, AP). Firth of Thames, 9/11/75, 5; 21/12/75, 9; 20/3/76, 9 at Taramaire, some well coloured, 9 at Limeworks, one well coloured; 6/4/76, 4 (BB, HRMcK). Tarawera river mouth, 300 m. upstream, two on 22/11/75 (RWJ). Ahuriri, H.B., 29/11/75, one (KVT). Farewell Spit, March 1976, 6 (BDB). Lake Ellesmere, Kaitorete Spit, 9/11/75, 15; 18/2/76, 25; Lake Wainono, 1975, Oct, 2; Dec. one; one in June 1976 (RJP). Southland, one at Waimatuku 2/11/75; 14/2/76 general count, 23; Invercargill estuary, 28/3/76, 9 (RRS, MLB).

SANDERLING (*C. alba*)

Manawatu estuary 21/10/75, one in intermediate plumage, with 10 wrybills (EBJ). Farewell Spit, March 1976, one (BDB). Awarua Bay, 14/2/76, 2 (RRS).

PIED STILT (*Himantopus himantopus*)

Paua, maximum 1976 winter population only c. 400 birds (ATE). Whangarei, 7/3/76, 712 (D. E. Crockett). Manukau winter counts,

July 75, 2972; June 76, 3505. Firth of Thames winter counts, June 75, 3091; July 76, 2383 (BB). Central Otago, 1975-76 breeding season, noticeable lack of stilts; several areas which typically support good populations had few or no birds (PC).

SOUTHERN SKUA (*Stercorarius skua*)

Porangahau, H.B., 4-12/4/75, four in bay, which was full of fish, attended by 2000 Fluttering Shearwaters and 700 White-fronted Terns (LWW). 1976, sightings of five birds in January (DAL) and one in February (HAR), during crossing to and around Stewart Island.

POMARINE SKUA (*S. pomarinus*)

Off Leigh, 2/2/76, one, twisted tail feathers well seen (BB). Ponui-Waiheke, 9/2/76, one juvenile, white rump (TC). Westland, Gillespie's Beach, 19/4/76, a dark phase bird, larger and more leisurely than Arctic Skua, chasing White-fronted Terns and small gulls (RJP).

ARCTIC SKUA (*S. parasiticus*)

Hauraki Gulf, several records by various observers, 2/11/75 - 6/4/76. One preening on the water off Orewa, 22/2/76 (DFB); birds close inshore at Waiti Bay and Taramaire in March and at Miranda in April 76 (HRMcK, BB, MEMcK). One off Orakei wharf 7/3/76 (TGL). Porangahau, H.B., three in the bay 4-12 April 75 (LWW). Foxton, 28/12/75, 2 (JLMM). Taranaki, Jan-April 76, offshore records from north of Awakino river to New Plymouth (DJB, DGM, REL). Wellington harbour, 2 in January, 4 in March (JLMM), 2 in April 76 (MLF). Washdyke lagoon, Timaru, two dark and one light phase, March 76 (PMS).

BLACK-BACKED GULL (*Larus dominicanus*)

Aupouri peninsula, 23/11/75, chicks already hatched at Te Kao colony but in the small colony 14 km north of Forest headquarters 11 nests had three eggs, 11 had two eggs and three nests still empty (M. Hows). Tarawera mouth, 12/6/76, gulls picking up poisoned dead eels; Little Shags catching live fish in the same area (RMW).

RED-BILLED GULL (*L. novaehollandiae*)

Ngawhi, Palliser Bay, 16/11/75, breeding on a rock surrounded by water, near beach alongside settlement, c. 150; birds incubating (RHDS). Wellington harbour, 6000+ in June 1976 (MLF).

BLACK-BILLED GULL (*L. bulleri*)

One adult at Clark's beach, Manukau, 6/6/74 (HRMcK). Clevedon, 12 at Mataitai, 15 at Peach Point, April and May 76 (AJG). Kaiaua, 19/5/76, c. 450 (HRMcK). Kairito, Spring 1975, 14 pairs hatched chicks on a shellbank hidden amongst mangroves (RBS). Ohiwa harbour, 1975, 14 pairs on eggs at a White-fronted Tern colony; first breeding record here. One bird at Little Waihi 30/11/75 (AP). Hawkes Bay winter records, 8/6/75, East Clive, 194; 16/5/76, Ngaururo, 300 (KVT). Manawatu, reported breeding near Pahiatua, 1975 (HAR); May 1976, 50 at Manawatu estuary and 65, many immature, at Waikanā; Wellington harbour, small numbers, Feb-August (MLF). Masterton sewage ponds, March 73, 8 (BDH). Stewart Island, January 76, one, one and four at Butterfield beach, Lee Bay and Horseshoe Bay, with Red-billed Gulls (RHDS).

BLACK-FRONTED TERN (*Chlidonias hybrida*)

Bay of Plenty, Rangitaiki mouth, best winter count 1975, 38; one still present spring and early summer (AP); Tarawera mouth 12/6/76, two (RMW). Ngaruroro estuary, 80+ in May 75 and in July 76; one on 20/12/75 and two on 28/6/76 (KVT). Orongorongo estuary 29/5/76, one (JLMM). Southland counts 14/2/76, 6; 27/6/76, 45 (RRS).

WHITE-WINGED BLACK TERN (*C. leucoptera*)

Cass delta 27/12/75, one, full breeding plumage; Wainono, June 76, one, breeding plumage (RJP).

GULL-BILLED TERN (*Gelichelidon nilotica*)

Karaka, Manukau, December 75, one, much reduced black cap; 21/2/76, eight, seven with full black caps; 19/3/76, 7; April, 5; 8/5/76, 2 (BB). Ruamahanga river near Greytown, one on 22/11/75 (BDH). Waimatuku mouth, one on 2/11/75, not found on later visits (MLB). Two Karaka birds watched diving headlong on to just-wet mud to catch large worms; the worm was grasped as the bird faced forward and dragged from its hole with an over-the-shoulder motion (BB).

CASPIAN TERN (*Hydroprogne caspia*)

Awanui, 24/7/75, six hunting over river near cowshed (M. Hows). Hunua ranges, 19/7/75, one flying over Cossey's dam (TGL). Kawhia harbour, 4/7/76, 30, many more than previously seen here (JHS). Tarawera river mouth, one caught a 15 cm. herring, dropped it and caught another (RWJ). Whangapoua harbour 18/11/75, 100; Buffalo Beach 6/9/75, one diving into deep water, wings swept back like a gannet (ABJ). Lake Rotorua, only one pair bred 1975 (AP). Haast river 14/2/76, two flying downstream near Big Bluff, 11 km. from coast (PC). Cass delta, a pair nested unsuccessfully 1975-76 summer (RJP).

ANTARCTIC TERN (*Sterna vittata*)

SW arm, Paterson Inlet, Stewart Island, one seen January 1976 (DAL).

FAIRY TERN (*S. nereis*)

6/12/75, 5 at Portland, 4 at Waipu (D. E. Crockett). Waipu, one feeding a mile up river on 4/12/75 and one fishing up Pohuenui river on 21/12/75 (TGL). 30/11/75, two feeding on mudflats, another two very active and challenging; after an hour's search of about half an acre of bare sand a nest was found, containing two eggs; as we left, the bird settled and brooded. An hour later we returned and watched with binoculars from about 180 m. Change-over of parents was observed; the bird which had been relieved preened, shaking out all its feathers and combing them with its bill (AHG). Mangawhai Spit, 3 birds on two occasions, Dec 75, no sign of nesting. Kaipara, South Head, 27/12/75, two showing agitation over an area which held an N.Z. Dotterel nest (SMR); Taporā, Sand Island, 1/2/76, a nest, one egg one chick (LH). Sulphur Point, Tauranga, probable nesting recorded in November 1972 (RVMcL); 29/12/75, nest with 3 eggs; two had hatched by 0930 hours on 30/12/75; heavy rain prevented detailed observation on 31/12/75, when the chicks had

left the nest but one was on the sand a few feet away and I was mobbed by the parents; chicks not seen again, but adults were vigorously mobbing observers on January 1-7, near an adjacent colony of White-fronted Terns, from which a number of chicks were on the territory of the Fairy Terns by 1/2/76, a Fairy Tern adult among them (KF).

LITTLE TERN (*S. albigrons*)

Rangiputa Bank, 26/11/75, 69; 7/12/75, 65+ (ATE); 24/1/76, 88. Whangarei, 6/12/75, 9; 7/3/76, 11, both records from Portland (D. E. Crockett). Kaipara, one at Jordans, 2/1/76 (RBS). Manukau, 8 in Nov 75; 1976, January, 9; Feb, 8; March, 7; April, 3; May, one (BB, AP, RBS). Firth of Thames 1975, 13 in November, 21 in December; 1976, 19+ in January, 22 in February, 16 in March (BB, AP, RBS). 3 at Ohiwa, 7/12/75 (AP). Manawatu, numerous sightings from 6/12/75 to 16/4/76, each of one bird, on Lake Horowhenua and on the estuary, where it was frequently seen in company with knots (JLMM, HAR, EBJ). Motueka, 7 in January 1976 (MLF).

WHITE-FRONTED TERN (*S. striata*)

Numerous locality records received. Some years ago, in Spring, a small flock of terns was crouched low on a stony shore, facing into a fairly strong wind, the birds occasionally moving forwards in short flights. Copulation took place several times and on one occasion a presumed male mounted just as the presumed female moved forward leaving him squatting on the ground, where he attempted to copulate with a stone (FHB).

N.Z. PIGEON (*Hemiphaga novaeseelandiae*)

Waiotira, 20/5/76, party of 8 in taraire trees. Auckland, Parnell Rose Gardens, July 1975, one often seen flying round with a group of domestic pigeons (TGL). Huia, October, one sat on an empty tui nest in a tall kanuka; was driven off by tuis, which eventually raised two chicks (JFS). Ponui, 19/9/74, stripping buds and leaf shoots of plum trees, reported by P. Chamberlin (HRMcK). Miranda, March 76, one chased a godwit for several minutes, twice in a wide circle and then on out of sight (BB). Southern Alps, above bushline, Hunter river, 7/2/74, 4 at 1320 m.; 16/3/76, Hope river, 3 at 1300 m. On both occasions birds moving into sub-alpine scrub where they were feeding on berries of snow totara (*Podocarpus nivalis*) which were in abundance at that time of year (RG). E. Matukituki, Mt Aosta, 24/3/76, one flew out of snow tussock at 1200 m., probably feeding on berries of stunted coprosma (PC). Hollyford valley, 1976, numerous in beech forest, 27 in air at one time (MPD). Numbers in bush in and around Delamore Park, Gore, 1976 (JST). Stewart Island, Jan 76, common around Oban (DAL), the commonest bush bird in Bragg Bay-Lee Bay area (RHDS); March 76, feeding on wineberry (makomako) round Oban, flocks of up to 27 seen; individuals at Fred's camp-Mason Bay, Freshwater Landing, North Arm (PMS).

ROCK PIGEON (*Columba livia*)

Little Barrier, Dec 75, one (DAL). Manutuke, near Gisborne, 27/8/73, one non-flying young found beneath a nest in a kahikatea tree (JFC). Ashburton and Hinds beaches, nesting in shingle cliffs; scrape out holes in sandy patches which occur in these cliffs; frequently there are stones in the burrows, and where these occur nests are built behind them, using fine driftwood sticks, dry grass or seaweed (ML).

BARBARY DOVE (*Streptopelia risoria*)

Masterton 21/7/75, three in garden eating karamu berries (RHDS).

WHITE COCKATOO (*Cacatua galerita*)

Huia, one on a kauri, 20/3/76 (JFS). One flying south at Port Waikato, 12/10/75 (BB). 16 km north-west of Onewhero, 4/1/76, 40+ in a bush valley (AP). McCallum's beach, Whakatiri, Clevedon, 3/9/73, two (HRMcK). Kaiaua, 20/8/75, in trees behind beach (DAL); 21/10/75, a few in the district, in ti-tree and on maize on a neighbour's form (JW).

N.I. KAKA (*Nestor meridionalis septentrionalis*)

A stray bird around Kerikeri, August 1976 (ATE). Whangarei Heads, April 1976, one found dead on beach at Smugglers Cove had been in the water for some days; one seen at Peach Cove (CWD, PJM). 1976, Kakas observed at various localities in Waitakere Ranges; 1/8/76, one bird settled on a branch about 2 metres above the observer, watched for a while and then flew, quietly; birds observed at two localities in Titirangi, June-August (JFS). One over Herne Bay on 25/4/76 (TGL); May-August, numerous reports of up to 3 birds in Auckland — Cornwall Park, St Cuthbert's school, Mater Hospital and a private garden in Epsom; may have been the same birds moving around, attracted by flowering gums and prunus (SMR). Hurua ranges, two in Nov 75, one in March 76 (TGL); two flew NW high over Clevedon, 16/1/67 (AJG). 1976 winter reports of birds at Alfriston-Brookby and Pukekohe east; Little Barrier, 30/1/76, one feeding a young bird, which was puffed up like a feather duster and later flew, clumsily (BB). Taranaki, Waitara headwaters Nov-Dec 75, two (RWW), numerus in Tongaporutu headwaters, Jan 76 (DJB).

S.I. KAKA (*N. m. meridionalis*)

Nelson Lakes, Nov 75, upstream from forks, Sabine west branch (5), at Travers Falls and Lake head hut, all in bush dominated by red beech; Hopeless Valley, two in silver/mountain beech (SCS). Jan 76, Mt Crusader, Tasman Range, one flying down bushline on ridge, 1352 m. (JST). Reefton, Tawhai State Forest, beech/podocarp, one 10/12/75 at Brown's Creek (MDW). Gillespie's beach, occasional in summer (M. Hall). Hope River, one calling loudly, mobbing a harrier (RG). Stewart Island, 1976, January, up to 12 at Oban, 6 at North Arm (DAL), February, several at Port William (HAR); Ulva Island, March, 4 landed in rimu (PMS).

KEA (*N. notabilis*)

1975, March, 3 at Lewis Pass (RMW); Cobb saddle, Takaka R., Oct (JHS); Oct-Nov, one each in W and E branch of Sabine (SCS); fine sunny day in November, Canaan, 762 m., hopping on rocks and dead trees (CFJO'D). November 75 - March 76, two (possibly three) birds visited Farewell Spit (BR). 1976, January, St Arnaud, Mt Robert car park, three around cars; Homer Tunnel, May, several in vicinity; one offered a banana, which became the subject of a squabble between two others (JST). Karamea, July, one at Cuckoo river, one at Kakapo river; the first was slow in movement, unafraid and destructive round camp; the second was interested, but kept its distance (JD).

EASTERN ROSELLA (*Platycercus eximius*)

Wharekawa, north of Kaiaua, up to 9 reported 1976 (HRMcK). Coromandel peninsula, Coroglen and Te Mata Creek, Oct 75; Hikuai, April 76 (ABJ); Te Rerenga, a pair on 21/6/76 (PJ).

RED-CROWNED PARAKEET (*Cyanoramphus novaezelandiae*)

Coromandel peninsula, Road 309, 17/10/75; near Tapu, 25/3/76 (ABJ). Stewart Island, March 76, Leask's Bay, Fern Gully, Ulva Island (PMS); Moturau Moana, 1/2/76, close view of one feeding in mountain beech (specimen planted tree); other parakeets seen in flight (RHDS).

Parakeet sp. recorded Waitira, 5/1/76 (TGL); Whangarei Heads, McLeod's Bay, Peach Cove — Bream Head, 1976 (PJM); Coromandel peninsula near Coroglen, 1975-76 (ABJ); Hatepe, Lake Taupo, in cut-over bush, Dec 75 (WAW); Tawhai forest, Station Creek, Maruia, Dec 75 (MDW).

YELLOW-CROWNED PARAKEET (*C. auriceps*)

Coromandel Peninsula, Tapu Hill, 17/10/75 (ABJ). Hope and Hurunui valleys, quite common, apparently increasing. A number seen in and above sub-alpine scrub, 1380 m., Hope River, 25/11/75 (RG). Ulva Island, 6/3/76, one feeding with seven red-crowned parakeets, in canopy of rimu (PMS).

SHINING CUCKOO (*Chalcites lucidus*)

Northland, September 1975, Parua Bay, 13th, by M. Sanson; Pukenui, 17th (press report); Opuia, 19th (D. E. Calvert); Awanui, 27th (M. Hows). Ponui, 19/9/74, by P. Chamberlin; North Road, Clevedon, 21/9/74, 22/9/75; 12/10/75, singing at 2200 hours, in spite of near gale and rain (AJG). Whangapoua, Nov 75, six at once, on lupins (HRMcK). Taranaki, first for season 5/10/75; Jan 76, Waiapu river, East Mt Egmont, several between 400 and 600 metres a.s.l. (DGM); numerous in headwaters of Tongaporutu river (DJB, CDP). Foxton beach, 15/11/75 was our first record in this locality in six years (JLMM). Christchurch, 6/3/76, eating small caterpillars from leaves of greengage tree (RG). Lake Mapourika, first for season, 1/10/75 (DM).

LONG-TAILED CUCKOO (*Eudynamis taitensis*)

Houhora, March 76, one flew into a window (ATE). Waipu, 2200 hours, 7/2/76, one calling, flying north (TGL). Little Barrier, very numerous 1975-76 season; 20/1/76 - 1/2/76, prolonged bouts of the "rrrp-pe-pe" call heard till 1030-1100 hours, well up Summit track; one would start and others at increasing distances join in, producing a chorus (BB). Hunua ranges, 1/3/75, two together, feeding (G. Doherty per HRMcK). Taranaki, December 1975, seen in headwaters of Waitara river and heard day and night (RWW); plentiful in Matemateonga ranges (GM), and in Tongaporutu headwaters early Jan 76 (CDP, DJB). Massey University 26/9/75, in gum trees (HAR). Head of Hopeless Creek, Nelson, 3/11/75 (SCS). Arthur's Pass, arrived by 10/11/75; one chased by a Blackbird for about 5 minutes; a thrush panicked at the cuckoo call and took off to her nest (PD). Lake Mapourika, first for season 29/10/75 (DM). Stewart Island, Deep Bay and Ulva Island, calling 6/3/76, the Deep Bay bird loudly and persistently (PMS).

MOREPORK (*Ninox novaeseelandiae*)

Dome Valley State Forest, north of Warkworth, 1630 hours on 6/4/75, one roosting 5 m. above ground level was approached first by one and later by two other tuis; the first tui swooped to within one metre of the owl then perched about 3 m. from it and gave a prolonged series of scolding calls. After about 5 minutes, with all three tuis in attendance, the owl flew a short distance to a more sheltered situation. As it took flight the three tuis, which immediately before had been silent, joined in a loud chorus of mewing calls; they did not attempt to pursue the owl further (MJT). Rotorua, 18/7/75, one perched in an akeake, mobbed by thrushes, was apparently unconcerned at the presence of four observers; raised its head and peered at a cat; flew off after two minutes (RWJ). Nelson, Lake Rototoi settlement, two at dusk (PJ); Hole Hut, three calling on bush-line at 1350 m. (CFJO'D). Millerton, one seen in daylight on a haystack; Karamea, July 76, one flushed from roosting place in tall open bush at about 610 metres a.s.l., flew from tree to tree at not much more than a metre above ground (JD). Stewart Island, March 1976, Leask's Bay, Fred's camp, Fern Gully (PMS).

LITTLE OWL (*Athene noctua*)

Nelson, road-killed bird found on Maitai valley road; one perched on telephone line in early morning, Riwaka (CFJO'D).

SPINE-TAILED SWIFT (*Chaetura caudacuta*)

Just north of Haast river, late Nov 75, about 10, seen by R. Russ (BDB).

FORK-TAILED SWIFT (*Apus pacificus*)

Waipapakauri (90 mile beach) 11/10/75, a swift seen by R. Jeffrey may have been this species; reported to have had a forked tail (ATE). Lyttleton, 17/1/76, one seen for a few seconds only; forked tail and white throat observed (SCS).

KINGFISHER (*Halcyon sancta*)

Parengarenga block, 16/5/76, 25 on power lines on 9 km of road from main road junction to jetty was an unusually large count for the area (ATE). Opoutere, 9/7/75, 26 on power lines at high tide, regularly dropping on prey below (RWJ). Kaituna-Maketu, regular in winter, up to 15 (AP). Foxton beach 1/5/76, 15 in vicinity of motor camp (HAR). Porirua harbour, 12 and 11, June and July 1976; 5 in August, scarce or absent Sept-Dec (COF). Station Creek, Maruia, one deep in beech forest, 12/12/75 (MDW). Glendhu Bluff, West Wanaka, 290 m., one on a power line, 22/6/75 (PC). Stewart Island, Jan 76, round North Arm, also in bush behind coastal areas round Paterson Inlet (DAL); March, at mouths of Mill Creek (one) and three at Ryan's Creek (PMS).

RIFLEMAN (*Acanthisitta chloris*)

Little Barrier, May 1975, relatively few seen searching trunks in the typical manner; most of those seen were searching branches and twigs in the understorey 2-10 m. above ground and ground feeding was also recorded. Of all sightings, 58% were on twigs and branches among foliage, 30% on trunks, 12% on ground (JFS); 1/2/76, ground feeding recorded on two occasions (BB). 28/8/71 Whiritoa, south of Whangamata, one caught by cat: only odd bits of bush along creek,

scrub and wattle across the road (HRMcK). West Mt Egmont, January 76, common at 600-800 m. near Waiaua river (DGM); a few in headwaters of Waitara and Tongaporutu rivers (CDP, DJB). Urewera National Park, Dec 75, numerous family groups with young being fed; one parent, thought to be male, was particularly responsive to cork-and-bottle squeaker; in an almost vertical dive from 6 m. above it narrowly missed one of our heads, then perched a metre from our faces with wings quivering and chirring alarm call; dived at us once more before moving away with the family (BRK). North Rimutaka range, Tunnel valley, 10/11/75, one seen and one heard after 5 visits and 30 hours searching; present at the same spot on 11/2/76 (HLS). 1976, seems evenly distributed through Abel Tasman National Park (JST); Nelson Lakes, abundant in beech forest up to the grass line, main Sabine, east and west branch Sabine, Travers Valley, Hopeless Creek (SCS).

ROCK WREN (*Xenicus gilviventris*)

February 1976, Onlooker Spur, Mt D'Archaic, 1350 m.; Forbes River (tributary of Havelock river) 1676 m., two (JD).

TREE MARTIN (*Hylochelidon nigricans*)

Lake Wainono, one in June 1976 (RJP).

WELCOME SWALLOW (*Hirundo neoxena*)

Orewa, 18/2/76, five, chasing a kingfisher away from bridge where swallows nest (DFB). Winter counts, Manukau, 13/6/76, 267; Firth of Thames, 4/7/76, 107; Papakura, present all season, nesting suspected; 11-14 daily, Jan-Feb 76 (BB). Otua 12/6/75, 150 on power lines (IWJ). Tairua nursery, Opoutere, 3/11/75, 2 (RWJ). Little Waihi 27/12/75, 26+ (AP). Hawkes Bay, Ahuriri, 17/7/75, 25; 12 sitting on gravel on causeway, warm in sun after a frosty night; Ngaruroro estuary, 5 in May; East Clive, 20 in June; Hurimoana swamp, 3 in August 1975 (KVT); Tukituki river bed 24/7/76, c. 100 perching amongst shingle took to flight when a Caspian Tern passed over them (JLL). Taranaki, numerous north of Awakino, 11/1/76; Mokau 27/10/75; Bell Block oxidation ponds 3/7/76, 100-200; lakes south of Opunake 22/5/75, c. 30 (REL, RWW). Pahiatua, a pair nested in a culvert near the ponds, 1975 (MLF); 29/1/76, 100+ on a line (RN and Shane Cotter). Awatere valley, Sept 75, a pair on Richmond brook, 20 km upstream from Seddon (TJT). Arahura, Feb 76 (JD); Charleston, 9/12/75, two on wire (MDW); Okarito lagoon 3/5/76, c. 50 (PMS). Lake Wainono, Dec 75, 2; 30-40 birds May-June 76 (RJP). Southland, 2 at Waimatuku 27/10/75, no nest found (MLB); many reports in and around Gore, Feb-May 75 (JST); first autumn sightings, 7/3/76, 60+ in Lower Matura; 8/3/76, 20+ in Lower Oreti; numerous sightings of increasingly large flocks over a wide area of the district throughout winter; number greatly diminished by late August; no summer sightings (RRS). Chatham I., Kaiangaroa, 9/8/75 (LMcP).

PIPIT (*Anthus novaeseelandiae*)

Far North, still quite numerous in the rough country in Cape Reinga-Tapotupotu area, but a scarce bird at Parengarenga on pasture land, where skylarks are numerous (ATE). A rare bird in Firth of Thames (RBS) and around Kaituna-Maketu, where only one or two

are usually recorded (AP). Buffalo beach, Whitianga, 14/4/76 (ABJ). Lake Waikare outlet, Nov 75 and June 76 (BB). Rotongata, 11/10/75, two; Whaka forest, in cutty grass and swamp area, 9/8/75; April 76, Te Matea, in cut-over forest; at Rotorua airport (RWJ). Fossil Point, Farewell Spit, six on beach, one with a very large lesion on leg (BDB). Numerous in Aorere valley, March 76 (ATE); up to 1800 m. in snow, Matakaitaki region, 1975 (CFJO'D). Lake Wainono, 1976, one or two, April-June (RJP). Mt Hutt car park, 4 on 13/9/75, in snow (ML). Stewart Island, March 76, two in tussock country, Mason Bay, and two in sand dunes (PMS). Chatham Island, May 1976, abundant; obviously not showing the decline apparent in some areas of the New Zealand mainland (HAR).

HEDGE SPARROW (*Prunella modularis*)

Singing in Tairua forest 30/3/75 and at Matea, in understorey of 18-year-old *Pinus radiata*, on 29/4/76; 11/10/75, 12 seen on a bush walk above Rotongata and Rotatuha (RWJ). Hastings, 28/2/76, two locked in battle on a driveway, would have been run over by a car if the driver had not stopped, got out and made them move, which they did, only to resume the battle further on (KVT). Stewart Island, occasional near Oban, March 76 (PMS).

FERNBIRD (*Bowdleria punctata*)

Mangonui county, in stunted scrub and fern along a 5 km track from Stony Creek Lands and Survey block westward towards Taemaro Bay, 18 pairs counted on 29/7/76. Parahaki, Whangarei, estimated population in 2.5 hectares, 3 pairs; birds carrying nesting material on 31/8/76 (RSC). Awarua (south of Kaikohe), Gammon's road, 6/11/76 (AJG). Karaka, 1976, seen in two places after apparent absence (BB). Waiuku, two seen and others heard at Lake Pukeroa, 22/6/75 (IWJ). Present on a farm at Kaiaua, 1975 (RBS). Takaka, Pupu Springs, in low manuka scrub, 19/1/76 (JST). Aorere valley, plentiful in scrub, March 1976 (BDB). Seddonville, near Mokihinui mine, 9/12/75, two seen, others heard in a coprosma thicket (MDW). Stewart Island, Jan 76, seen and heard in thick low scrub above bushline near Doughboy Hill, also in low scrub along Mason Bay coast (DAL).

BROWN CREEPER (*Finschia novaeseelandia*)

Nelson, Whangamoia saddle, mixed flock of Brown Creepers, Silvereyes and one Yellowhead (RG); Canaan, Abel Tasman National Park, Oct 75 (JHS); Nelson Lakes, Blue, Lake, Sabine west branch, 31/10/75, two in high level pure mountain beech (SCS). Lake Matheson, occasionally seen (M. Hall). Ada riverbed 21/9/75, very common in matagouri scrub (RG). Seven in pine plantation near summit of Queenstown Hill, 4/4/76 (JST). Stewart Island, Jan 76, common in manuka bush, Freshwater flats (DAL); March 76, a flock of about ten birds feeding in upper and outer areas of manuka trees between Freshwater Landing and Mason Bay; occasionally a bird would stop feeding and give a small snatch of song (PMS).

WHITEHEAD (*Mohoua albicilla*)

Little Barrier, Feb 76, feeding on mahoe berries; one bird used its foot to hold a berry or berries, apparently to stop the fruit rolling away off a branch after it had been plucked (SMR). Near mouth of Hatepe stream, Lake Taupo, Jan 75 (WAW). Otaniwainuku Mt,

south of Te Puke, 16/8/75 and 24/4/76 (RWJ). Kaingaroa, 16/6/75, five in 6-year *Pinus radiata*, unthinned but pruned (MDW); in *Pinus nigra* 9/8/75 (RWJ). Taranaki, numerous in headwaters of Waitara and Tongaporutu rivers, 1975 and 1976 (CDP, DJB, RWW); West Mt Egmont, 6/1/76, one near Brames Falls (DGM). Tiritea, July 1976 (LJD).

YELLOWHEAD (*M. ochrocephala*)

Whangamoia saddle, Nelson, one with a mixed flock of Brown Creepers and Silvereyes (RG). Mt Aspiring National Park, 1974-76, present in very small numbers in the Upper Haast catchment, west of the main divide, e.g., Brewster ridge, Blue Duck Flat, mid-Howe (Burke), Roaring Swine Creek; none recorded in several areas (PC). Routeburn Valley, 21/8/75, 11 seen foraging on ground, others in high canopy (JST); 18/4/76, a flock of ten feeding on a fallen log and on young *hoheria* trees beside the track. One female was seen to pick out a large grub, pull it in half and feed a piece to each of two juveniles; this was our first sighting of Yellowheads feeding at ground level (WMJ).

GREY WARBLER (*Gerygone igata*)

Kapiti, only rarely found in scrub transect at north end of island, where other bush birds are present in good numbers (MLF). Millerton, 6/8/76, one caught by cat, managed to escape and took refuge on a wall hanging inside house; removed and taken outside, it perched on my finger, fluffed itself up, swayed drunkenly as in a fainting fit for over three minutes. It then opened its eyes, gradually perked up till reasonably steady on its legs, taking increasing notice of surroundings but still reluctant to fly. Carried into a breeze which appeared to steady it more, then another 20 yards down a track, when it flew into a bush, giving a half-song as it landed; apparently unharmed except for fright and ruffled tail feathers (JD). Stewart Island, March 76, regular along tracks near Oban, Fred's camp, Mason Bay, Freshwater landing, West Arm (PMS).

FANTAIL (*Rhipidura fuliginosa*)

One black fantail seen in bush near New Plymouth 24/1/75. Nelson, Kaiteriteri, a fantail stood on my head while feeding around me (CFJO'D); Cobb, 10/1/75, 15-20 blacks chasing and snapping at flies over the river (JST); Roding river 13/4/75, one black, with white ears (SC). Karamea bush country, one black, otherwise all seen were pied (JD). South of Christchurch estuary 17/7/75, two black, three pied (GG). A number of blacks seen at Taipoiti river and around Waimate-White river confluence, not many in other places in Arthur's Pass National Park (PD). Southland, Leitham reserve, 24/2/76, one black, 12 pied (JST). Stewart Island, Feb 76, one black between Murray beach and Christmas village, otherwise all noted were pied (HAR); March 76, regular along tracks, only pied phase seen (PMS).

PIED TIT (*Petroica macrocephala toitoi*)

Kaitaia, 5 km up Kiwanis track, Jan 76 (M. Hows). Whangarei, Parahaki Memorial drive, a pair carrying food, 20/8/76 (RSC). Waitakere ranges, tits favour large rimus; sit, sing and hunt high in trees, frequenting the understorey much less than in some localities;

attracted to squeak bottle or taped call but soon fly back to high branches (JFS). Hunua ranges, Kohukohunui ridge, four counts 12/11/75 - 4/4/76 each produced 18-20 birds (TGL). Taranaki, numerous in Waitara headwaters, Dec 75 (RWW).

YELLOW-BREASTED TIT (*P. m. macrocephala*)

Karamea back country, one typical yellow-breasted and one which appeared pied, in the same locality, July 76 (JD). Mt Hutt, 21/8/75, one sheltering in a derelict hut during very cold southerly conditions (RG). Hokonui hills, seven seen on a track through bush, 11/2/76 (JST). Stewart Island, regular along tracks, March 76 (PMS).

N.I. ROBIN (*P. australis longipes*)

Little Barrier, Summit track, 15/11/75, one took crumbs and when well fed placed surplus in a "larder" — a broken ponga 1.2 m. high; part song 21/1/76 (BB). Mamaku State Forest, scrub and hardwoods, 31/5/75, 2; Paradise Valley, Rotorua, mountain stream and remnant of tawa bush, one; Te Matea, 29/4/76, in 18-year-old *Pinus radiata* with understorey of ferns, bracken and pomaderris, three, constantly chasing each other; when an apple core was thrown down one flew to it; a second landed and the first bird flew to the second and pecked its face (RWW). Taranaki, Dec 75 - Jan 76, numerous in Waitara headwaters; present in Tongaporutu headwaters and Mateamateonga range; few at Mt Damper where bush has been eaten out by goats (RWW, CDP, DJB, GM). Kapiti, June 1976, common and unafraid; one half a metre from observer, sorting through leaves that had been turned over; one perched on observer's boot (MLF).

S.I. ROBIN (*P. a. australis*)

Nelson Lakes, widespread and quite common, all habitats except pure mountain beech and snow grass, Oct-Nov 75 (SCS); frequent in bush near Lake Rotoiti settlement; one undid shoelace and pulled at sock (PJ). Dec 75, Maruia, red beech forest, six seen, including a family group of 4; not seen in other Buller and Westland forests visited (DMW). Routeburn, 21/8/75, seven flying back and forth, accepting titbits of bread (JST). Lower Hollyford, 19/4/76, Marion junction to below Gunn's camp, very few birds; said to have been back for 2-3 years after an absence of several years — possibly wiped out by stoats and now re-colonising from the Eglinton (PC).

STEWART ISLAND ROBIN (*P. a. rakiura*)

1976, January, Lower Rakeahua valley and at Freshwater Inlet (DAL); March, five in manuka country, Freshwater landing - Mason Bay (PMS).

SONG THRUSH (*Turdus philomelos*)

One still singing at Waipu, 7/2/76; first songs Waipu 19/4/76, Auckland 2/5/76 (TGL). Nelson, 17/9/76, a bird which had been preening on the bare branch of an elm then flew to the flat top of the stump of a shortened branch of a tree lucerne; the stump was about 100 mm wide and flat. From there, with legs extended downwards and beak pointing downwards, it did a sort of aerial dance, flitting up and down above the stump, giving every indication of extreme excitement; it then flew about a metre to another shortened branch which was at an angle of something less than 45 degrees to the horizontal, landed and attempted to copulate with the stump, which was about

100 mm long and in diameter about the size of a thrush; this happened three times before the bird returned to the elm tree, paused briefly and then swooped downwards and out of sight (FHB).

BLACKBIRD (*T. merula*)

Clevedon, 28/9/74, one singing with its bill full of worms (HRMcK). South Westland, Waipara valley, 27/12/75, a nest in sub-alpine scrub above moraine lake, 975 metres a.s.l. (PC). On a back road 6 km north-west of Methven, 6/12/75, several pairs of Blackbirds were nesting at intervals along a pine hedge; one male was pied, two had more white than black and other males showed white feathers; none of the females showed any white (ML).

SILVEREYE (*Zosterops lateralis*)

Rotorua, feeding on aphids off pussy willow (RWJ). Only occasionally seen on Kapiti (MLF). Stewart Island, March 76, flock of 12 in a rimu, Horseshoe Bay (PMS).

BELLBIRD (*Anthornis melanura*)

Clevedon, Otau Hill road, 21/9/71, one on peach blossom, reported by D. Betts; Hunua ranges, Wairoa dam, 5 km east of Cossey's dam, one on 10/9/75, reported by B. McClure (HRMcK). Mercury Bay Golf Course, early on a misty morning 19/4/75, c. 50; a roseate gum tree was alive with them, all singing together, sounding like tinkling bells. After ten minutes the singing suddenly stopped and they flew away (ABJ). Female eating coprosma berries, Blue Lake, 3/8/75 (RWJ). Hopkins river, May and Dec 75, relatively uncommon; not recorded Rangitata forests Feb 76 (RG). Feed in my Christchurch garden Apr-Oct, mainly on flowering gums (GG). Stewart Island, March 76, regular (PMS).

TUI (*Prothemadera novaeseelandiae*)

Waipu, 1/9/75, scores of birds feeding and singing on flowering wattle behind dunes, Uretiti beach (TGL). Kawakawa Bay 12/9/74, 50+, c. 100 in distance (HRMcK). Okataina 11/10/75, some Tui calls mimic note of Kokako (RWJ). Nelson Lakes, Oct-Nov 75, present and vocal in all areas of mixed beech forest but not noted in pure mountain beech, also vocal in mixed beech forest at 1060-1200 m., Sabine side of Travers saddle (SCS). Rarely seen in my Christchurch garden, a pair on 4/6/76 (GG). Stewart Island, March 76, regular (PMS).

CHAFFINCH (*Fringilla coelebs*)

Kaingaroa 4/3/76, 50+ feeding on seeds of scorched radiata cones, in a burnt-off area (RWJ). Buffalo Beach, Whitianga, 9/7/75, one feeding along low tide mark among debris and shells (ABJ). Gore, winter flocks of 50+ were regular in 1974, not seen in 1975 (JST).

GREENFINCH (*Carduelis chloris*)

Whitianga, 5/11/75, 6 (ABJ). Bay of Plenty, uncommon at Kaituna-Maketu and Little Waihi (AP). Rotorua, 18/8/75, 12 on lawn (RWJ). Nelson, feeding on yew tree seeds, 1975 (CFJO'D). Invercargill, Bluff road, Oct 75, grain spilt from a truck on 2/10/75 attracted sparrows and greenfinches; from Oct 2-8, two counts of live

birds gave 202 sparrows, 60 greenfinches; three counts of road killed birds, 6 sparrows, 18 greenfinches; it seems that greenfinches are slower off the road than sparrows (MLB).

GOLDFINCH (*C. carduelis*)

Whitianga, pulling petals out of marigolds and eating seeds (ABJ). Masterton, post-breeding flock of 300 on playing field (RHDS). Stewart Island March 76, occasional near Oban (PMS).

REDPOLL (*Acanthis flammea*)

Large flocks in May 75 near State Forest, Waiuku (IWJ). Kaituna-Maketu, regular; large flocks; breeding (AP). April-March 75, near Rotorua airport, c. 100; Matea, c. 1000 in an area of old stump with bare patches, fog grass and tussock (RWJ). Stewart Island, Mar 76, usually in small flocks; one of these on snow tussock country near Mason Bay (PMS).

HOUSE SPARROW (*Passer domesticus*)

Clevedon, one took a dry grass stalk, flew up and soaked it in the garage spouting and then flew on with it to a nest under house roof (HRMcK). 1976, March, April, feeding on seeds of Bermuda grass; taking aphids from a birch tree (*Betula*) from underside of leaves and by hanging from branch tips. May, feeding on seeds of marigolds (RWJ). Manawatu, Lake Horowhenua, a very light coloured male with a normal female, 4/11/75 (EBJ); Foxton beach 6/6/76, an almost complete albino feeding with birds of normal plumage (JLMM). Stewart Island, March 76, only around Oban (PMS).

STARLING (*Sturnus vulgaris*)

Awanui, March 76, about 400 roost in macrocarpas near river (M. Hows). Westshore, H.B., a flock of 3-400 mobbed a harrier; they wheeled in perfect formation, chasing it from high in the air to below a belt of ngaio trees, when the starlings dispersed; the harrier presumably landed (KVT). Nov 75, Somes Island, very large numbers roost, a small number nesting in old buildings; Ward Island, several hundred roost, no sign of breeding (MLF). Rotorua 25/4/76, feeding on birch tree, crept out along branches and fed from a standing position (RWJ).

INDIAN MYNA (*Acridotheres tristis*)

Two records of partial albinos; Patumahoe, 6/9/75, body cream colour, wings very light brown (DAL); north of Kerikeri, June 76, general colour buffy white, but pure white markings on wings could be seen when it flew (D. E. Calvert). Kaingaroa forest, 26/2/76, in a compartment which had been clear felled last winter and the debris of radiata branches, cones and logs burnt, a flock of 60 mynas, more than I have ever seen before in this area; presumably they had been attracted by insects. At Whakarewarewa a sparrow, hit by a car, was injured but still alive when two mynas started to peck at it; 6 sparrows tried to drive off the mynas (RW). Little Waihi, common, up to 50 (AP). Trentham, seen in Spring 1973, still present April and May 1976 (HLS).

KOKAKO (*Callaeas cinerea*)

Kohukohunui track, Hunuas, 4/4/76, one (TGL); heard from

time to time at Cossey's dam (HRMcK). Lake Rotoma, Oct 75, 11 seen on 6 km stretch of road (AP). Taranaki, Rerekapa Hut, headwaters of Waitara river, Nov 75, 6 observed; none heard or seen on 14/2/76 (DJB).

BLACK-BACKED MAGPIE (*Gymnorhina tibicen tibicen*)

Wharehuia, near Stratford, one on 3/4/76 (JM). Foxton two, Waikanae one, 6/9/75 (JLMM). In Feb-Mar 76 a large influx of *tibicen* and *hypoleuca* into Tararua foothills at Aokautere; not uncommonly flocks of 60 include 5-10 identifiable as *tibicen*; possibly this is an overflow from Hawkes Bay (HAR).

WHITE-BACKED MAGPIE (*G. t. hypoleuca*)

Whitianga 10/10/75, 8; Ohui 6/12/75, 7 (ABJ). Tairua, 9/7/75, one in a burnt-over area (RWJ). Ohauti, increased over recent years (RVMcL). Kaituna, scarce; 3 on 15/2/75 (AP). Sightings at Rotorua 26/8/75, seven near Kaingaroa forest 15/9/75, one at Matea 29/4/76 (RWJ). Inland road from Kaikoura, 27/10/75, one, buff coloured on parts normally black (MLF). Grey and Inangahua valleys, Dec 75, 12 seen (MDW). Southland, numerous sightings of ones and twos over the whole Southland area in 1975-76; unusual; taken to be evidence of a quite sudden spread of the species (RRS).

ROOK (*Corvus frugilegus*)

Firth of Thames, 1975, January, 44; March, 30; December, 19 (RBS, JW). Waikato, Te Kohanga, one before Xmas 75, not seen since (A. Prickett); near Hinuera, 31/3/75, flock of 15 feeding in paddock (DAL). Manawatu, Forest Hill Road, Aokautere, 14/9/76, new colony, 50 birds, 7 nests; 3-4 pairs reported nesting at Cloverlea and feeding towards Opihi; a flock of c. 1000 reported near Ashhurst, Feb 76 (HAR). Marlborough, Grassmere district, numbers built up from 14 in Dec 75 to 40 in Apr 76; group reduced and dispersed by poisoning (TJT). One visited Farewell Spit in December 1975 (BR). Canterbury, records from Geraldine and Motunau, August 76 (RG).



SHORT NOTES

STOAT PREDATION AT A RED-BILLED GULL COLONY, KAIKOURA

On 5 December 1975, while watching part of the Red-billed Gull colony at Sugarloaf on the Kaikoura Peninsula, I observed a stoat taking eggs from the south-west end of the colony. I arrived at the colony at 1130 hrs (NZST). Nothing unusual was seen until just after 1700 hrs (NZST), when an adult stoat was seen about 12m away in the colony with a gull egg.

There were approximately 30 nests in the colony. Seven of these contained eggs and the remainder were empty. Only two large chicks were present in this area. A family of stoats was living in the area, and the high incidence of empty nests had been attributed in part to stoat predation, rather than reproductive failure.

The egg was too big for the stoat to hold entirely in its mouth. The animal carried the egg by sinking its teeth into the shell at the pointed end, and moving forwards with the egg tucked between the forelimbs. It was difficult to determine whether the forelimbs were used to assist in carrying the egg. Most egg shells examined subsequently at stoat dens had four neat puncture marks at the pointed end of the shell where the canine teeth had penetrated.

The animal made its way down from the colony, and at the base of the rock on which the colony was sited, in an area of open shade, the stoat set about eating the contents of the egg. Having eaten the egg, it returned to the colony, pausing to lick up yolk which it had spilt on the rocks when the egg was carried down. The stoat darted into the colony and reappeared a few seconds later with another egg, which was eaten under a small boulder 2-3m outside the colony. After finishing the egg, the stoat reached up the rock and licked up some yolk before it finally disappeared from view, presumably into the nearest cover, an African boxthorn thicket about 10m from the colony. The animal was at the colony approximately four minutes.

The stoat's presence in the colony caused only localised disturbance, about ten gulls immediately adjacent to the stoat appeared to react to its presence. Some called raucously from the ground, while others hovered less than 0.7m overhead. On one occasion the stoat leapt at a gull hovering directly above.

At no time did the stoat appear to notice me standing in full view. However, while eating the eggs it was continually alert to all that was going on around it and I think only failed to notice me because strong gusts of wind which shook distant vegetation, constantly distracted the animal's attention.

R. B. MORRIS, *Wildlife Service, Department of Internal Affairs, Private Bag, Wellington.*

CORRECTION TO SHORT NOTE ON
BLACK-CAPPED PETREL IN THE WAIKATO

On 15 March 1973, the skin referred to in my earlier note (Reed 1972, *Notornis* 19 (1): 91) was examined by Sir Robert Falla who drew attention to the fact that it is not *Pterodroma externa cervicalis*, but *P. e. externa*. In the latter, the dark underwing border on the leading edge is much narrower, and while the inner webs of the primaries have large white wedges, those of *P. e. cervicalis* are dusky throughout, at least in most of the distal surface exposed beyond the coverts. The outer tail feathers are more heavily pigmented in *externa* with variable but solid dark patches on the outer webs, which in *cervicalis* are faintly "peppered." Both forms have occasional dark terminal patches on the inner webs, but more extensively so in *externa externa*.

P. e. externa breeds on the Juan Fernandez Islands. This is the first record of *P. e. externa* for New Zealand.

The skin has now been re-numbered AV. 1072.1.

SYLVIA M. REED, *Auckland Museum*.



KING PENGUINS AT CHATHAM ISLANDS

On 19 February 1952, Mr J. R. Eyles collected the proximal of a left tibio-tarsus of a King Penguin (*Aptenodytes patagonica*) at Owenga, Chatham Island. It is probably derived from a midden.

Among bones submitted to me for identification by Mr Ian Smith, collected from a Moriori midden on Chatham Island, during last summer's excavations by the Otago University's Archaeological party, were more bones of King Penguin. One square produced the proximal ends of a left humerus and left ulna, and another square the imperfect first phalanx of the outer toe on the right foot, of a penguin which is almost certainly also a King Penguin.

Mr Smith states that the seal bones present at the site are largely Fur Seal, but contain some of Leopard and Elephant Seals, and he thinks it possible that the King Penguin may have arrived as the remains of a meal of one of these.

However, the bones look like typical midden bones. King Penguins occasionally reach the South Island of New Zealand and one was recorded from the Auckland Harbour. An Emperor Penguin also reached Oreti Beach, Southland. Therefore, with the proviso that Mr Smith's suggestion that the King Penguins at Chatham Island *may* have arrived in a seal's gut, I am publishing the records, as there is no reason why the birds could not have reached the Chathams by power of their own flippers.

R. J. SCARLETT, *Canterbury Museum, Rolleston Ave, Christchurch*

SOUTHERN BLACK-BACKED GULL AT CAPE BIRD,
ANTARCTICA

A Southern Black-backed Gull (*Larus dominicanus*) was observed at Cape Bird (77°13'S, 166°27'E) on 27 November 1975 by Dr D. S. Horning and me. When first sighted, the bird was over the sea flying from the west towards the beach. It circled us three times, flying within 20 m of us and the orange spot on the gull's lower mandible was clearly visible through 8 x 30 binoculars. Also, the bird's flight feathers were conspicuously tattered. The bird then flew north along the beach, followed by three Antarctic Skuas (*Stercorarius skua maccormicki*), until out of sight. During this time two other skuas chased the gull as it flew over their territory.

Three days later, on 30 November, a Southern Black-backed Gull was sighted again. This may have been the same gull that was seen earlier as its flight feathers were also tattered. The bird flew north along the beach and, as it flew over an Adelie Penguin (*Pygoscelis adeliae*) colony, a skua rose to chase the gull. No encounter between the gull and skua took place.

One record of a Southern Black-backed Gull sighted further south than Cape Bird has been published. A lone gull was recorded at Cape Royds (77°33'S) in 1965 by Spellerberg (1971, *Emu* 71: 161-171). It was chased, attacked and eventually driven away by Antarctic Skuas. Watson (1975, *Birds of the Antarctic and Sub-Antarctic*, Washington, D.C., American Geophysical Union: 218) recorded several recent sightings of *L. dominicanus* on mainland Antarctica and thought these may indicate a future expansion of its breeding range. However, increased sightings are probably a result of increased human activity in Antarctica and awareness of birds rather than an increase in the breeding range of Southern Black-backed Gulls. Interactions between Antarctic Skuas and Southern Black-backed Gulls are of interest as these may indicate whether the breeding ranges of these two species could overlap.

We made these observations while stationed at Cape Bird as members of the Antarctic Research Unit, Department of Zoology, University of Canterbury.

P. M. SAGAR, *Department of Zoology, University of Canterbury, Christchurch.*



NEW ZEALAND FALCONS AT ROUND BUSH, FOXTON

The coastal Manawatu (100 km north of Wellington) is intensively farmed and the New Zealand Falcon (*Falco novaeseelandiae*) is a rare visitor (Falla 1957, *Proc. N.Z. Ecol. Soc* 5: 24-5). However, between Foxton and Himatangi on 15 and 18 August 1975, I saw a solitary falcon from a car. At each instance the bird was flying low over farmland, the first time about 4 km north of Round Bush Scenic Reserve, but subsequently within 400 m of it.

On 27 September 1975, to check for the presence of falcons, I went to Round Bush (NZMS1 N148/800248) and saw at least two birds as well as several Australasian Harriers (*Circus approximans*), flying and calling above the forest. Round Bush (Esler & Greenwood 1968, *Bull. Wellington Bot. Soc.* 35: 3-7) is a remnant of semi-swamp vegetation with tall forest dominated by kahikatea (*Dacrycarpus dacrydioides*) and pukatea (*Laurelia novaezelandiae*). It covers 50 ha and is the largest of only a few remnants in the area, the nearest major tract of forest being on the Tararua Ranges about 22 km to the east.

It appears likely that the bush was serving as a roost for the falcons in an area not otherwise providing suitable retreats. The sand-country is noted for its abundance of finches (Falla 1957) so that ample food would have been available. The *Field Guide* (Falla, Sibson & Turbott 1970) mentions that young birds wander over farmland in autumn, but these observations were in spring. That the species may sometime breed at Round Bush remains an exciting possibility.

Apart from the falcons on the one occasion, and despite many visits to the area at all times of year, I have seen no native birds at Round Bush or in its vicinity other than those common throughout the coastal Manawatu; namely Fantail (*Rhipidura fuliginosa*), Grey Warbler (*Gerygone igata*), Silvereye (*Zosterops lateralis*), Kingfisher (*Halcyon sancta*), Shining Cuckoo (*Chrysococcyx lucidus*), Welcome Swallow (*Hirundo tahitica neoxena*), Pukeko (*Porphyrio melanotus*), White-faced Heron (*Ardea novaehollandiae*) and Harrier. This paucity of native species doubtlessly reflects the transformation of indigenous habitats into farmland, and provides circumstantial evidence for the inability of many native species to persist in a small and isolated remnant.

BRIAN J. GILL, *Department of Zoology, University of Canterbury, Christchurch*



WASHING OF FOOD BY SPOTLESS CRAKE

While observing Spotless Crake (*Porzana tabuensis plumbea*) in a swamp in Waiuku State Forest on 24 May 1975, I noticed a feeding technique which I had not seen this species use before.

A bird, attracted by my taped calls, dropped into shallow water from among the leaves of raupo (*Typha angustifolia*) with a caterpillar in its bill. It was about 2.5 m away from me.

The head was then lowered, until part of the bill and the caterpillar were submerged, and moved vigorously from side to side, causing a splash. The bird repeated this washing action twice, swallowed the caterpillar, then quickly disappeared in the raupo, giving two very soft "mook" calls (Hadden, *Notornis* 17 (3): 200-213) as it did so. This observation was made on a cold, dull, showery day and lasted about a minute. The crakes had been generally active.

I. W. JOHNSON, *Maioro, R.D. 2, Waiuku*

LETTERS

The Editor,
Sir,

CHATHAM ISLAND PARAKEETS

May I comment on the several points raised by Taylor (1976, *Notornis* 23 (2): 198-200) on the subject of comparative size as an isolating mechanism for the parakeets of the Chatham Islands, he having replied to an earlier letter by myself (*Notornis* 22 (4): 351-2; 1975) ?

The main argument being that Taylor believes that the Yellow- and the Red-crowned Parakeets of the Chatham Islands are "roughly the same size." His view is not supported by his material. To make this clearer I have turned his first figure into an histogram (Figure 1). (I take it as accepted that wing-length, in similar birds, reflects their mass). Figure 1 shows that, although there is overlap, the Red-crowned tends to be the bigger bird. Indeed, this is fully confirmed in Figure 2 where '5' is the Red-crowned and '8' the Yellow-crowned Parakeet of the Chathams.

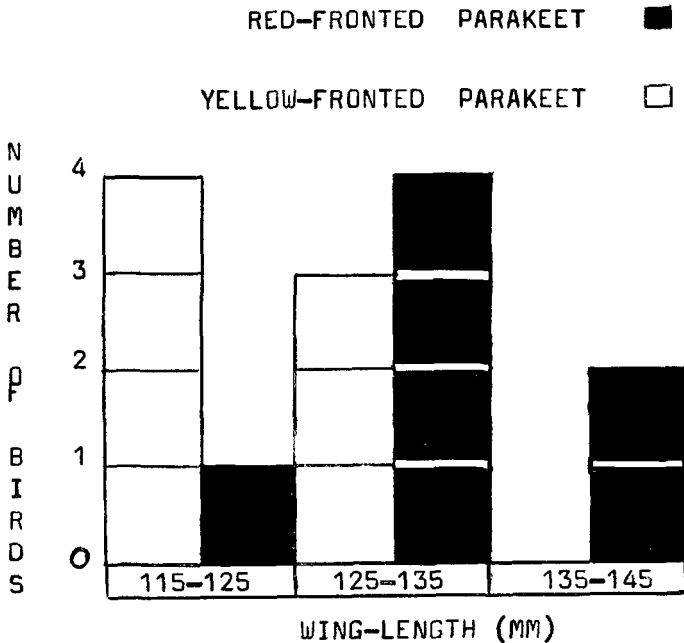


FIGURE 1 — Histogram of figure by Taylor (1976); wing length of Red-crowned and Yellow-crowned Parakeets.

The mean of the measurements given by Taylor, for the Red-crowned, are shown in Figure 2 as the black circle '5' and those of Forshaw as the square. The difference in position of the two on the graph resulting, probably, from the different material available to each author; but they do have a very close similarity.

The strong correlation between the length of the bill and the size of the parakeet is shown in Figure 2 where the mean length of the bill is plotted against the mean wing length for the *Cyanoramphus* parakeets in Forshaw's (1973) *Parrots of the World*:— 1 is *C. unicolor*; 2 *C. novaezelandiae cooki*; 3 *C. n. hochstetteri*; 4 *C. n. cyanurus*; 5 *C. n. chathamensis*; 6 *C. n. novaezelandiae*; 7 *C. n. saisseti*; 8 *C. auriceps forbesi*; 9 *C. a. auriceps* and 10 *C. malherbi*.

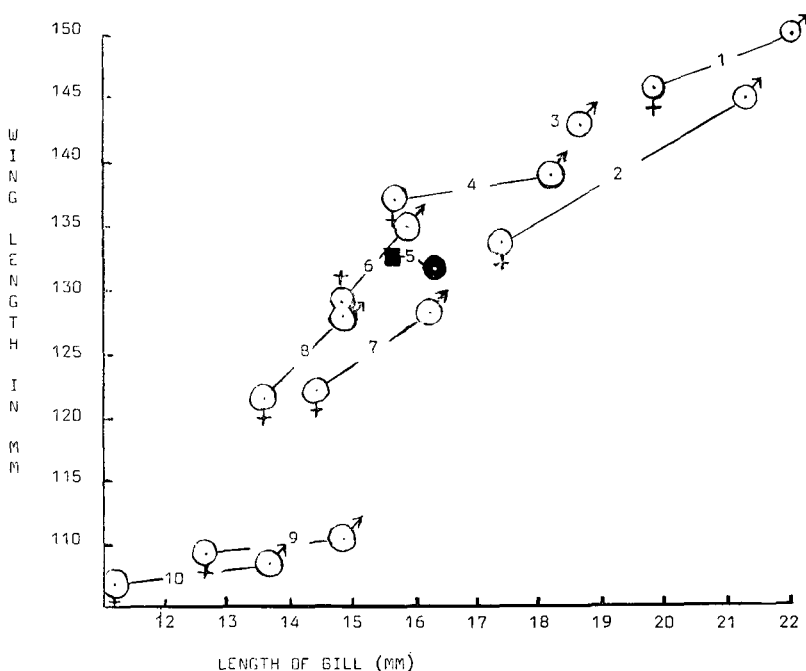


FIGURE 2 — Scatter diagram of wing length and bill length for *Cyanoramphus* parakeets. See text for key to symbols.

Forshaw had ten unsexed skins (and one male) of *C. n. chathamensis* — the Red-crowned Parakeet of this discussion — therefore it had to be shown as a single point. Consequently Taylor's results are also pooled.

Where two species of *Cyanoramphus* parakeets are sympatric the two differ in size. On the graph '1' and '3' are found on Antipodes Island; '5' and '8' on the Chatham Islands and '6' and '9' on the two main islands of New Zealand. ('10' *C. malherbi* is

very likely a 'non-species' from its measurements). The effect of small islands on many birds is to increase their overall size, compared with allopatrics on the mainland. Because of this I take it that the Yellow-crowned Parakeet antedated the Red-crowned Parakeet on the Chatham: '8' is so much larger than '9,' whereas '5' is only marginally different from '6.' Therefore, because of their lesser disparity in size, than is shown for other sympatric species, the parakeets on Chatham might hybridize the more readily. With time, I take it, the Red-crowned Parakeet of these islands will grow larger and/or the Yellow-crowned smaller.

On Antipodes Island and Mangere Island two species of *Cyanoramphus* co-exist and the circumscribed habitats must put them into strong competition for food. Taylor (1975, *Notornis* 22 (2): 110-121) had shown that for these islands each of the four items of food that contribute to more than 5% of the parakeets' total diet is disproportionately divided between the two endemic parakeets. On each island one species eat more leaves and far less flowers, seeds and invertebrates than does the other species. And this 'sharing-out' of the available food had allowed the species to co-exist: before the islands became affected by man.

But on Antipodes Island the Red-crowned Parakeet eats exactly the opposite diet to that which it takes on Mangere. It might be argued that as the islands differ considerably in the nature of their vegetable cover this might explain why the Red-crowned Parakeet has reversed its feeding patterns. My opinion, however, is that on both islands, because of competition for food, it is the bigger parakeet that eats the 'coarser' foods — because their larger bills are more appropriate for this fare — and the smaller parakeets attend to the 'softer' or smaller-sized foods with their relatively weaker bills. This is why I hold that "the difference in feeding pattern between (any) two (sympatric) species is but a further extension of the, very probable, similar feeding distinctions between the different sexes."

GEO. A. SMITH

158 Broadway,
Peterborough PE1 4DG,
England
5 October 1976



The Editor,
Sir,

TRANSLATION PROBLEMS OF SHOREBIRD LITERATURE

Last winter a fellow graduate student (Winifred Cairns) and I contacted about 40 English-speaking shorebird biologists, plus various libraries and government agencies, and inquired about English translations of foreign literature on shorebirds. The response was uniformly enthusiastic, yet only a *modest number* of translations was located. Two points emerged quite clearly from this little survey. Whereas English-speaking shorebird biologists are keen on studying the extensive

foreign literature, few have the talents or time to devote to personal translations, and fewer yet have access to funds for translation or to translation services as part of their job. Second, the translations in existence enjoy virtually no portability; certain works have, therefore, been translated several times, and some that were translated even more than a decade ago are not available to the great majority of workers (primarily because most workers do not know of their existence). This situation is progressively worsening as the ornithological literature proliferates and as foreign research on shorebirds continues. In addition, graduate language requirements at most North American universities are being loosened; many students can obtain a Ph.D. with FORTRAN fulfilling their foreign language requirement!

I have some suggestions which could ameliorate this situation:

(1) Major English journals of ornithology could act as information centres, where people who translate papers or who have or know of translations could sink their information. This information could be disseminated by publishing titles and their availability, with translated works periodically indexed. A copy of each translation should be filed in the library of each co-operating ornithological society. I suppose the easiest way to handle this would be to have one volunteer worker (W) cope with paperwork for particular taxa, a responsibility which could be rotated.

(2) Recommendations about signal works in need of translation (e.g. vol. 6 of *Handbuch der Vogel Mitteleuropas*!) should be made to W.

(3) People and agencies willing to do translation for free or for a fee should be known to W, and exchanges channelled through him.

(4) People willing to do translations should have this expedited by being able to, for example, dictate translations into a tape recorder and hence to be freed of typing and writing duties. Master cassettes (which should be freely supplied at least to altruistic translators) should be handled by W, who has the responsibility of having typed copy prepared, or of delegating this duty to workers making use of the network. Details of diplomacy are left to W.

The position of W should perhaps be split among different taxa. Inasmuch as I have now sequestered a number of titles on shorebirds, I would be happy to act in that capacity at least for the present. But clearly this sort of thing should not be restricted just to shorebirds. Given the enthusiastic response of shorebird people contacted over the last eight months, I think that interest in such a network would be widespread, and that no trouble would be experienced in finding workers to handle other taxa.

This is a very pressing business, I think. Ornithology can only suffer from the increasingly impenetrable language barrier within its own literature.

I would be happy to receive any comments on this matter.

EDWARD H. MILLER

*Department of Biology,
Dalhousie University,
Halifax, Nova Scotia,
Canada*

5 September 1976

REVIEWS

History and Natural History of the Boulder Bank, Nelson Haven, Nelson, New Zealand. Edited by Dr Elsie Collyer. Published by the Cawthron Institute, Nelson, 1976. 39 pp, frontis., 5 figs. \$1.00 (from the Cawthron Institute or \$1.50 through booksellers).

Every visitor to Nelson, and especially those who fly in and out from the fine airport set so delightfully close to natural habitats of great interest, knows the Boulder Bank. Dr Collyer's introduction to this worthy little book reminds us of the importance of the bank even for the primary establishment of a harbour and the early development of the colonial period of Nelson's history. The idea of providing a compilation of what is known of the Boulder Bank came largely from Dr Graeme Ramsay, a long-standing member of the OSNZ and a stalwart of the Nelson Branch of the Royal NZ Forest and Bird Protection Society, but now moved, with his colleagues of the Entomology Division of DSIR, to Auckland. Dr Collyer has developed the work and has edited a series of contribution which not only do much to provide the base line study so greatly needed in to-day's world of ecologically vulnerable landscapes, but yields a useful handbook for visitors to the pleasant haven of Nelson.

It is, like other booklets which I enjoy noting, another one of those rather ephemeral publications which comes one's way only by chance — in this case Dr Collyer, herself, drew my attention to it: The table of contents reads:— "Te Tahuna a Tame: pre-European history" by Jack Walls, Nelson district site-recording file-keeper for the NZ Archaeological Association; "European history" by B. E. Dickinson, Secretary of the Nelson Historical Society; "The geology of the Boulder Bank and Nelson Haven" by M. R. Johnston, NZ Geological Survey, Nelson office; "Vegetation" by Mrs M. J. A. Simpson, Botany Division, DSIR; "Birds" by Frank Boyce, OSNZ Regional Representative and former Council Member; "Land invertebrates" by A. K. Walker, Entomology Division, DSIR; "Intertidal invertebrates and fishes" by Arthur W. Parrott, Curator of the Cawthron Museum and former Zoologist of the Canterbury Museum — the records provided by the Cawthron Museum Club show that the good work developed by Mr Parrott in the children's club of the Canterbury Museum over 30 years ago is still bearing abundant fruit; "Lizards" and "Mammals" by B. W. Thomas, Ecology Division, DSIR, Nelson. It concludes with a note on the "Impact of Man" especially drawing attention to the apparent consequences of large-scale removal of stones by the Nelson Harbour Board and the City Council before the storm of August 1972. The Bank is still threatened in very many ways. It is certainly this reviewer's pious hope that the information in this booklet will convince the local authorities that the Boulder Bank is a natural feature in need of urgent protection and will lead to a deeper appreciation of its significance as a site of great scientific importance.

E. W. D.

Hong Kong Birds by G. A. C. Herklots, 2nd edition, 1974. South China Morning Post Ltd., Hong Kong. Pp. XXVI-333, 18 pls.

The Colony of Hong Kong, situated in south-east China, comprises the island of Hong Kong, the New Territories peninsula and several smaller islands approximately 1000 sq. kms. in total area. The geographical location of the Colony in latitude 22°15'N places it just within the tropics and appears admirably located on the path of many Palearctic migrants on their Spring and Autumn passages.

The author spent twenty years in the Colony from 1928-48 at a time when little was known of the birds of southern China and this revised edition of an earlier work is a compilation of his notes and avian articles from the *Hong Kong Naturalist*. In recent years the author has revisited the Colony and also spent time in the Bird Room at the British Museum (Natural History), London, studying museum specimens from southern China to aid in the updated descriptions.

This volume is designed as a companion volume to the author's *The Birds of Hong Kong, Field Identification and Field Note Book* (1952).

An introduction is given outlining the history of bird study in southern China and the author's trials and tribulations in the Colony during the war years. A list of the few available references to Asian avifauna is provided, along with a comprehensive glossary of terms encountered in the text. Three hundred and sixty-eight birds are described, the text being arranged in systematic order with some variation according to *A New Dictionary of Birds* edited by Sir A. Landsborough Thomson.

For each species, the scientific name, vernacular name and race are given, also range, the status within the Colony and a full description of the bird with emphasis on features most helpful in identification.

Following the description, the author has given his observations and details from other published material on sightings, habitat, breeding behaviour and other relevant information; some more culinary than ornithological e.g. ". . . eagles eggs are valuable to the Chinese for their remarkable medicinal properties and the adults are also eaten."

Nine of the plates and forty-two line drawings are by A. M. Hughes which are useful when used with the text, although some of the paintings appear somewhat stylized and no scale is used. The rest of the plates are photographs of localities in the Colony showing various habitats available to birds.

Too often the work and knowledge of an experienced bird watcher fails to become known outside his immediate area of operations. However, in this case, Herklot's notes and observations have been produced in a most readable and informative volume providing an important contribution to our knowledge of the birds of Asia which may be especially welcomed by some of the many New Zealanders who visit Hong Kong.

J. F. C.

Archaeopteryx and the origin of birds, by John H. Ostrom. 1976. *Biological Journal of the Linnean Society* 8: 91-182, 36 figs.

Only five specimens of *Archaeopteryx lithographica* (excepting a solitary feather imprint) exist. One of these, collected in 1855, was unrecognised as *Archaeopteryx* until 1970 by the author.

These specimens are the oldest (Late Jurassic) known fossil bird-remains, showing detailed impressions of feathers and a mixture of reptilian and avian features, and they provide a striking example of mosaic evolution where an organism is transitional between the ancestral and descendent stocks.

This paper is a comparative analysis of the known *Archaeopteryx* material and the skeletal anatomy of several reptilian groups that have been proposed as possible ancestors of birds. The anatomy of modern birds is not considered due to their high specialisation and their remoteness from Class origins.

The evidence of bird ancestry is preserved in the specimens of *Archaeopteryx*, evidence which has been generally ignored for the past fifty years.

It has been widely accepted that the origin of birds is to be found among the pseudosuchian thecodonts; archaic reptiles of Triassic age that are also thought to have given rise to the dinosaur orders:—Saurischia (Reptile-like), Ornithischia (Bird-like), Pterosauria (Flying reptiles) and Crocodilia (Crocodiles and Alligators).

The author is proposing a more immediate (as opposed to remote Triassic) ancestor of *Archaeopteryx*, one that is post-Triassic and post-pseudosuchian; and he selects ornithopods, theropods and pseudosuchians as those groups likely to be ancestral to, and having the closest phyletic relationship with, *Archaeopteryx*. A fourth group recently suggested as the originators of birds based on a specimen of *Sphenosuchus* is also considered.

Following the introduction is an enlightening section on the discovery of *Archaeopteryx* and the discussion this caused in the scientific world at a time when the significance of Darwin's *Origin of Species* (1859) was taking effect.

The major part of the paper consists of the sections comparing each considered reptilian group with the *Archaeopteryx* specimens; each section is followed by a summary giving the author's reasons for or against the probability of the group being directly ancestral to *Archaeopteryx*.

Ornithopods are discounted in the light of recent investigation of *Archaeopteryx*. This group was originally considered, due to a superficial similarity between the ornithischian pubis and pes, and those of recent birds.

However, the subsequent discovery that the *Archaeopteryx* pubis is oriented differently to either of these groups, and the ornithischian foot is unlike that of birds, and also the absence of any *Archaeopteryx* or bird-like features in any known specimen of Ornithischia, discounts any probability of a close phyletic relationship between ornithischians and birds.

Beyond the generally accepted fact that pseudosuchians are 'primitive' enough to have given rise to birds and that pseudosuchians and *Archaeopteryx* have certain primitive characters in common, this indicates only a probable common ancestry and there is no evidence of shared derived characters to suggest a close evolutionary relationship between them. *Sphenosuchus* is also rejected on similar grounds.

It is the theropods which provide the author with a group that, based on anatomical comparison, contain considerable evidence for a close phyletic relationship with *Archaeopteryx*. Avian derived characters in *Archaeopteryx* are the furcula and the feathers; in contrast *Archaeopteryx* contains many derived characters of coelurosaurian theropods which point to a close phylogenetic relationship. The author believes the skeletal similarities between coelurosaurs and *Archaeopteryx* are derived from a common ancestor, itself a coelurosaur.

Although not discounting the possible remote ancestry of *Archaeopteryx* in the pseudosuchians, Dr Ostrom proposes the updated theory that the phylogeny of avian ancestry was Pseudosuchia-Coelurosauria-*Archaeopteryx*-Higher Birds.

Though primarily palaeontological in content and not directly concerned with the New Zealand avifauna, this paper should stimulate interest and argument among all ornithologists; it also includes a comprehensive bibliography for further reading.

J. F. C.



Review of a review: Ralph Bulmer on some South Pacific bird books and their implications.

Readers have, on occasions, complained of the irrelevance of some books reviewed in the pages of *Notornis* to the ordinary member of the OSNZ who is interested first and foremost in *birds*. Aside from any justification that the editor might have felt for broadening the minds of his readers in believing that birds are only a part of any naturalist's world, it is cheering to note a 4-page review in a recent number of that distinguished ethnographical journal, the *Journal of the Polynesian Society*, in which Professor Ralph Bulmer of the Department of Anthropology at the University of Auckland treats in detail Philip L. Bruner's *Birds of French Polynesia* (Pacific Science Information Center, Honolulu, 1972) and Jared M. Diamond's *Avifauna of the Eastern Highlands of New Guinea* (Nuttall Ornithological Club, 1972).

Professor Bulmer may not be an ornithologist but he knows his bird literature and can clearly demonstrate the relevance of such ornithological studies to anthropologists and to "students of human activity on Oceania." He gives footnotes of references for further reading which are most useful in themselves.

The reviewer commends Bruner's book in its aim of helping "the newcomer to identify some of the commoner birds that he sees" noting that "it's not every bird-book, however useful to the specialist, that achieves this." Then, in Dr Bulmer's own field, the book "also

contains several snippets of information of interest to anthropologists . . ." and he mentions some of them. However, he points out that, in some instances, there is confusion in reporting the work of others, noting deficiencies especially in the naming of certain rails.

Dr Bulmer has some fine praise for the "solid technical monograph" by Professor Diamond. He shows how it is "of considerable interest both to naturalists and to at least some anthropologists" but especially draws attention to the conclusions which Diamond reaches about the historical, ecological and evolutionary processes affecting the bird fauna in the island-like mountains of New Guinea (a setting not unlike some of the late Quaternary archipelagic phenomena demonstrable in New Zealand) which complements his other studies on island faunas.

Bulmer's concluding remarks are worth noting: ". . . one thing is clear: that students of human history and of man's ecological adjustment in the Pacific Islands, whether or not they have any particular interest in birds, are going to hear a great deal more from him about problems of common interest. They may count themselves fortunate to have a biologist with such energy and such stimulating and provocative ideas to share who is also a specialist in their region of study. Some of those who are intrigued or even infuriated by his suggestions, for example the parallel he has drawn between Polynesians and the bird species he characterises as 'supertramps' — good colonizers but not good competitors and thus found mainly on small and remote islands — and Melanesians and avian 'overexploiters' — good competitors but poor colonizers and thus found only on large islands close to land masses — may also be interested to read this technical ornithological monograph, or at least its first 90 pages. In it they may gain some impression for themselves of how well he analyses the very impressive quantities of data he has assembled.

However the most immediate and widest relevance of Professor Diamond's research is to the issue also raised by Mr Bruner's book, namely conservation. As many Pacific Islanders realize better than most Australians or New Zealanders appear to do, a failure to develop effective conservation policies will result in the most lamentable consequences for the quality of their future life. On the basis of his analyses of composition and turnover rates of 'island' populations, whether these are separated by sea or by other barriers such as man-made grasslands and agricultural zones, Professor Diamond has gone on to make important suggestions about the scale and location of reserve areas. Any social scientist concerned with social and economic development in the tropical Pacific should be encouraged to familiarise himself with this and other recent contributions by biologists to this debate." Bulmer 1976, *J. Polynes. Soc.* 85 (1): 121-122.

Diamond's later essay — The island dilemma: lessons of modern biogeographical studies for the design of natural reserves. *Biological Conservation* 7: 129-146, 1975 — is also valuable reading for New Zealand ornithologists with island reserve and avifaunal transference problems of their own. Perhaps the moral is clear: we cannot afford to be isolated ourselves in our attempts to understand and care for the natural world whether we be primarily ornithologists, anthropologists or even spider-watchers.

T. N. T.

ABOUT OUR AUTHORS



GEOFF. HAROW says of himself: "As long as I can remember I seem to have been climbing and taking an interest in bush and birds. I joined the Forest & Bird Protection Society as a primary school boy and did many cycling trips around Banks Peninsula and Canterbury foothills bush reserves. A wish to touch the snow and ice of the Southern Alps had to wait until secondary school days.

Mr George Southgate and Dr R. A. Falla ran a Canterbury Museum biology club for a few secondary school boys during the early war years, and I was lucky enough to join these activities including field trips to estuaries around Christchurch.

I joined the Canterbury Mountaineering Club in 1945 and the N.Z. Alpine Club in 1954 and became an active mountaineer and skier. I was a member of the Alpine Club's 1954 Himalayan Expedition led by Sir Edmund Hillary to Mt Makalu with plenty of time for bird watching on the approach marches. Dr Salim Ali of the Bombay Natural History Museum supplied Dr Charles Evans of our expedition with a shot gun requesting us to secure specimens of the Blue Grandalha, there being very few study skins in museums at that time. We saw many flocks of these high altitude Himalayan starlings but never shot any.

Interest in birds and experience in mountain country enabled me to follow up clues that led to the finding of the breeding colonies of Hutton's Shearwaters, high on the Seaward Kaikoura Ranges in 1965 and to make bird surveys of these mountains during the following seven years.

Later in 1965 an invitation was accepted to join Professor William Sladen's Johns Hopkins University ornithological research team at Cape Crozier, Antarctica, as a field assistant, and I had three months working with Emperor and Adelle penguins and was able to see several other Antarctic bird species.

During 1967-8 I was Canterbury Regional Rep for OSNZ. For the past three years I have been the Federated Mountain Club's and New Zealand Ski Council's nominee on the Mount Cook National Park Board, when a bird survey of the Park by Ranger Staff has been encouraged with assistance from Canterbury members of OSNZ.

My work is regional sales manager, South Island and Fiji, for a pharmaceutical company, and business trips throughout these areas give many opportunities to visit varied bird habitats."

K. J. POTTS graduated B.Sc. (Hons) in Zoology from the Victoria University of Wellington in 1970, and M.Phil. from Waikato University in 1973. During 1974 he worked as a research assistant with the Department of Forestry, Environment Canada, in Victoria, British Columbia. He joined the N.Z. Wildlife Service in February 1975 and is currently working on a study of the feeding ecology of Grey, Mallard and Shoveller ducks.

BEN D. BELL came to New Zealand to join the Ecology Division DSIR in 1969. He received his B.Sc. and Ph.D. degrees in Zoology from the University of Nottingham, going on to lecture in ecology at the University of Leicester. While in Britain he studied the ecology of marshland passerine populations, looking especially at habitat selection and territorial behaviour. He was also closely involved in amateur ornithological activities such as banding and migration studies at coastal and inland observatories, and with studying mapping census techniques. In New Zealand he ran a population study of the opossum in the Orongorongo Valley before taking up a new post as lecturer in Zoology at Victoria University of Wellington in July 1976. He has a wide interest in conservation and environmental matters and his other work in New Zealand has included forest bird counts, opossums and wekas on Kapiti, collating records of the recent influx of Australian birds and studying introduced and native frogs.

SIR ROBERT FALLA, recently retired as Chairman of the Nature Conservation Council, was knighted in 1973. A biographical account appeared in the March 1973 *Notornis*.

JOHN L. MCKEAN is employed by the Division of Wildlife Research, CSIRO, at Lyneham, Canberra. His major interests lie in the taxonomy and ecology of birds and bats. He is often accompanied on his field work by his co-author John Lewis. At the present time they are at Birdsville studying wrens and owls.

OWEN EVANS lives on Norfolk Island and is of Pitcairn Island descent, his paternal grandmother having come from Pitcairn as a 3-year-old girl on the *Morayshire* in 1856. An amateur naturalist with a deep interest in botany, he is a carpenter for the local administration and a foundation member of the Flora and Fauna Society of Norfolk Island. He and his wife Beryl have illustrated a booklet recently published by the Norfolk Island Hospital Auxiliary as "a project which would bring in a regular income to provide amenities for the Hospital patients and staff and at the same time give pleasure to those who love the beauties of Norfolk Island."

Entitled "*Dars-et (This is it). Birds & Flowers of Norfolk Island*," this introductory booklet will be welcomed by the increasing number of natural history-minded New Zealanders who visit the island.

JOHN H. LEWIS works for the Department of Capital Territory in Canberra as a Housing Inspector. He began banding birds for CSIRO about seven years ago and has since worked on seabirds on Lord Howe Island and Cabbage Tree Island and regularly bands on Tollgates Island. He is interested in breeding of mutations and hybridizing of finches and parrots of which he has a fine collection, developed from the few pairs of budgies given to him by his father at an early age.