THE BIRDLIFE OF CODFISH ISLAND

By A. BLACKBURN

SUMMARY

The birdlife in December, 1966, is recorded in detail. Predation by the Weka, particularly on nesting sea-birds, is noted and discussed; and the mammalian life, both native and introduced, is described. A brief outline of the early history of the island, and a general description of the topography and vegetation are included. A possible reason for the total absence of some species of birds is suggested. The value of the island as a future sanctuary for rare species is discussed.

INTRODUCTION

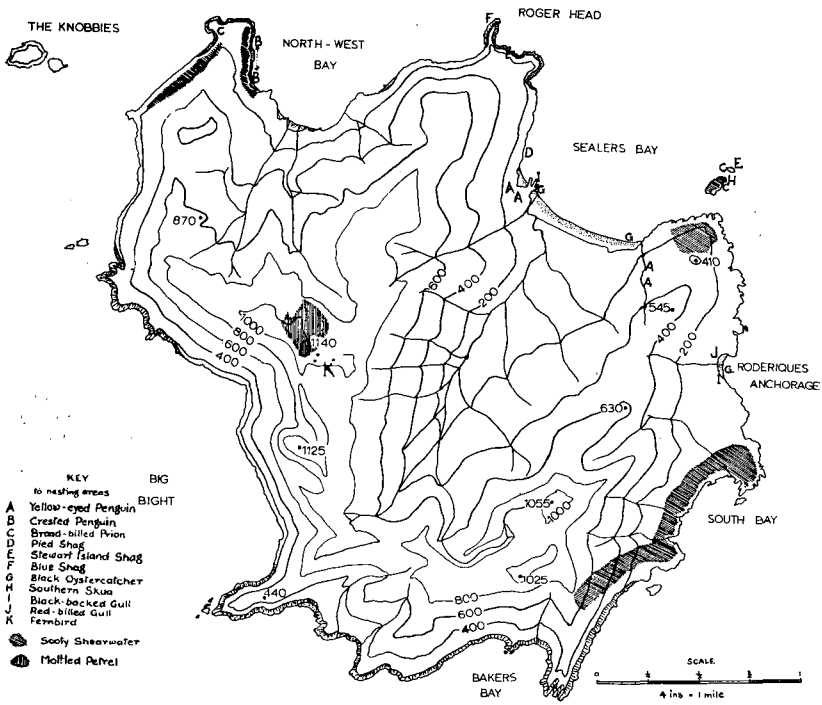
Codfish is a large island separated by about two miles from the north-west coast of Stewart Island, adjacent to where the towering Ruggedy Range falls sheer into the sea. Visits by naturalists have been few and far between, and much work remains to be done. The present survey is far from complete, but at least it reveals some of the wide gaps in our knowledge of the island's fauna.

The expedition was organised by Wildlife Service, the party being led by B. D. Bell, and comprising E. Sharpe and M. Crombie, both of Wildlife Service, A. H. Whitaker of Animal Ecology Division, D.S.I.R., J. I. Townsend of Entomology Division, D.S.I.R., I. M. Ritchie of Botany Dept., Lincoln College, and the writer. We departed from Bluff at 8 a.m. on 6/12/66 on board the " Buccaneer," a 60ft. crayfish boat owned by Mr. J. Waitiri, after having been held up for five days by a continuous gale and rain storms, and arrived off Codfish Island at 3 p.m. Despite the disturbed state of the sea, few birds had been observed en route, other than large numbers of Sooty Shearwaters. An Arctic Skua *(Stercorarius parasiticus)*, 7 White-faced Storm Petrels *(Pelagodroma marina maoriana)*, 2 Prion sp. *(Pachyptila)* and 6 Diving Petrels *(Pelecanoides urinatrix)* completed the tally. Later one or two White-capped Mollymawks *(Diomedia c. cauta)* were seen off the coast of Codfish.

We remained on the island until 17/12/66, and throughout our stay were much frustrated by recurring gales from the south-west and north-west. We had taken ashore a dinghy and outboard motor, but attempts to round the headlands at the N.W. and S.E. corners of the island were unsuccessful, so that the western and southern coasts were untouched. Journeys overland to these parts would have been arduous in the extreme, so we were obliged to confine our observations to the northern and eastern coastlines, to the summit area, where a night was spent in a gale of unusual severity, and generally to the bush and scrub within a radius of about a mile from our camp at Sealer's Bay.

TOPOGRAPHY AND VEGETATION

Codfish Island covers 3660 acres, and rises to a height of 1140 feet, the summit consisting of a large knoll of bare rock, surrounded by thick vegetation. It will be seen from the map that much of the coastline consists of precipitous rocky cliffs, and elsewhere



it consists either of a sloping rock shelf 20 to 30 feet high, or of boulder beaches. Sealers' Bay provides a fine sweep of sandy beach, and at low tide only there are small stretches of sand at Roderique's Anchorage and in North-West Bay. Well-defined ridges are shown by the map contours, which also indicate the big valley with its considerable stream of peat-stained water which flows down to Sealers' Bay. Streams exist in many of the smaller valleys.

Most of the island is covered with forest or scrub, the forest varying in height from 20 to 60 feet, and the scrub from a low Dracophyllum heathland type to a mixed community up to 20 feet high. Considerable areas of vegetation have been modified by burning at some stage, for a search in several areas revealed traces of charcoal. This would have been done either during the settlement of Codfish by sealers between 1825 and 1850, in an attempt to provide grazing for live stock, or during the years from 1892 to 1913, when the island was taken up as a pastoral run. There are thus sudden changes in the vegetation, but generally it consists of (a) the sand dune community behind Sealers' Bay; (b) the Olearia-Senecio scrub on exposed headlands and western slopes; (c) the manuka-kamahi belt, mainly on the western end of Sealers' Bay; (d) the podocarp forest; and (e) the Dracophyllum heathland on the upper ridges. Rata is prominent throughout.

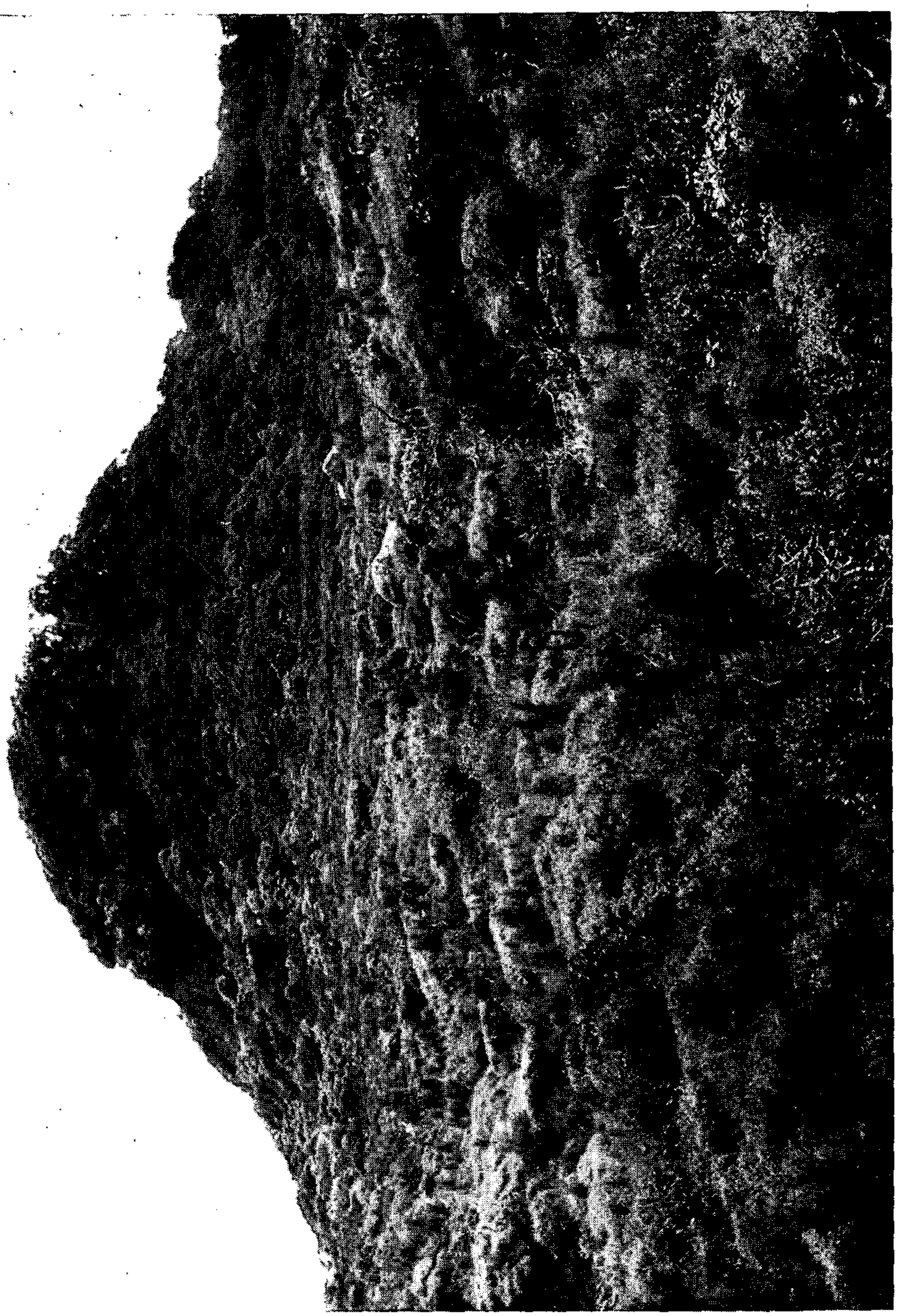


Plate IX — North-eastern aspect of Summit Rock, showing the dense vegetation round the base, and pakihi scrub, habitat of the Codfish Island Fernbird. [B. D. Bell

HISTORICAL

Early maps, according to Howard 1940 (1) showed various names for Codfish: Whenuahou, Fenouacho, Pukehou, Pegasus I., and Passage I. This author believes that from 1818 on, sealing gangs were in occupation for long periods. Certainly in 1823 sealers' huts occupied the site of the settlement believed to have been founded in 1825/6, when sealers, probably from the ship *Glory*, took Maori wives and settled there. Bishop Selwyn visited Codfish in February, 1844, and found a total population of 33, including 5 whites, although the Bishop considered that a few years earlier there must have been over 60. By 1850 Codfish was completely deserted.

Probably only very few cattle were grazed from 1892 to 1913, when the project was abandoned, and the grazing lease was surrendered in 1915. Poppelwell 1912 (2) recorded "a few cattle" present in 1911.

Visits by naturalists have been few and far between. In April, 1911, D. L. Poppelwell spent two days collecting botanical specimens; in December, 1934, and January, 1935, E. F. Stead, R. A. Wilson and P. Elworthy were on the island for 17 days studying its birdlife; in November, 1948, R. I. Kean, R. K. Dell and four others made a 7 day visit to ascertain the island's suitability for the introduction of rare indigenous birds, and resulting from this visit Dr. Dell made a valuable record of the birdlife; on 16/7/48 Dr. R. A. Falla spent a day ashore; in August, 1964, B. D. Bell and party visited the island, and listed the birdlife. Then in March, 1965, another party led by Bell, of which the writer was a member, spent three days ashore during their return from islands to the south.

MAMMALS

Deer, cats, goats and stoats have all been stated by local people to be present, but there is no evidence whatever that any of them do occur. Falla (pers. comm.) states that in July, 1948, he saw what appeared to be a few deer tracks; but a probable explanation lies in the well-worn possum tracks which occur throughout the forest.

BAT (*Mystacina* or *Chalimolovous* sp.). Bats of unidentified species were observed in March, 1965, flying about the Summit Rock (Blackburn 1965 (3)), but conditions during a night spent on the summit in December, 1966, were so bad that further observation or mist-netting was out of the question.

POSSUM *(Trichosurus vulpecula)*. It is not known when this pest was introduced to the island; but the Lands Department records at Invercargill show that an authority to trap was considered in 1928, and systematic trapping appears to have begun prior to 1934, and to have been carried on until a few years ago. An old blazed trail to the summit proved of use to us, and there are the decayed remains of a substantial trappers' camp on a small headland west of Sealers' Bay. The animal is distributed fairly evenly throughout the forest and along the coastline, and has caused widespread damage to certain types of vegetation of value to birdlife, in particular to konini *(Fuchsia exorticata)* which

is now scarce, wineberry *(Aristotelia serrata)* which seems to have gone, and orihau *(Pseudopanax colensoi)*. The ground cover has also suffered extensive damage, and the punui *(Stilbocarpa lyalii)* stated by Poppelwell as forming luxuriant stands in 1911, is now confined to the larger of the two islets at the eastern end of Sealers' Bay. A.H.W. trapped consistently for specimens, and 168 'trap nights' produced 16 possums, while 16+ were killed by the dog, and 2 were shot.

RAT *(Rattus exulans)*. The presence of rats is mentioned by Stead 1935 (4), and by Dell 1950 (5), so that we were most anxious to define the species. The first rat was trapped on the second night ashore, this being a female, and positively identifiable as kiore by the number of mammae. All rats subsequently trapped by A.H.W. were kiore. The population is low, but is apparently subject to fluctuations; for while none were taken in the forest areas, old caches of miro seed husks were numerous there, and in places the ground has been extensively burrowed, probably for insect larvae. The identification of the rat species has a considerable bearing on the future use of Codfish, and its importance is discussed towards the end of this paper.

FUR SEAL *(Arctocephalus forsteri)*. The main concentration was along the shore of the western side of North-West Bay, where c.100 were observed. A few had made their difficult way to rock ledges about 100 feet a.s.l. Numbers have increased substantially since 54 were recorded in 1948 (Kean 1948 (6)).

BIRDLIFE

The impression of an abundant and varied birdlife gained during three days spent on the island in March, 1965, was fully confirmed during the present longer visit. At the campsite on the first morning, Bellbirds were building overhead at 28 feet in a kamahi, Yellow-crowned Parakeets were feeding on kamahi flower, Red-crowned Parakeets on blooms of *Olearia arborescens,* Yellow-breasted Tits were feeding flying young, and Brown Creeper were continually moving through in numbers.

On most mornings, wind inhibited any worthwhile dawn chorus; but the early morning of 13/12/66 was calm, and an extract from my field notes on that occasion may be of interest: "First light appears in the east at 3.15 a.m., and the only sounds to be heard at that hour until 4 a.m., when the light strengthens, are the short cadences of song from innumerable Tuis, the musical trilling of Oystercatchers along the beach, the repetitive call of a Morepork nearby, and the whistle of an occasional Kaka. At 4 a.m. precisely the Bellbirds began, and on this windless morning they are particularly good. The volume of sound appears to stimulate the Yellow-eyed Penguin into 'song,' and several are heard braying in the vicinity of the camp. A few minutes after 4 a.m. the Yellow-breasted Tit begins a vigorous song, to be continued for half an hour. By that time there is the chatter of Parakeets, the whistling of innumerable Kaka, and the varied song of the Brown Creeper to replace the now silent Tuis and Bellbirds. At 5.30 a.m. a Fernbird begins to call, and sustains it for quite 20 minutes."

Along the sand dunes of Sealers' Bay, birdlife is abundant in the low mixed vegetation, Tuis and Bellbirds in particular. Many pairs of Brown Creeper inhabit this area, a few Codfish Island Fernbirds, and several pairs of Grey Warbler and Yellow-breasted Tit, plus an occasional Fantail.

YELLOW-EYED PENGUIN *(Megadyptes antipodes)*. A favoured nesting area was situated in a deep dry creek-bed with high overhanging banks about 200 yards north-west of the campsite, for here we found several nest sites already vacated by the young birds, except one still containing two half-grown nestlings. Another pair nearer the campsite, in an open, decayed tree stump, also had two young still in heavy grey down, as did two other pairs along the creek-bed at the eastern end of Sealers' Bay. All sites were under the bush canopy. Relief at the nest usually took place from about 3.30 p.m. on, and again at the same hour in the morning, and was normally accompanied by much calling, for upwards of half an hour. The first part of the call is an indrawn whistle, akin to a pleasant note of the Kaka, followed by a loud braying note. A half hour of this "song" hard by the campsite at 3.30 a.m. provided an excellent opportunity of studying the bird's call, for sleep was out of the question. Dell 1950 (5) described the species as common, with fairly heavy concentrations in the vicinity of beaches and streams, so the numbers breeding on Codfish may have fallen off.

SOUTHERN BLUE PENGUIN *(Eudyptula m. minor)*. This species is extremely common, and seen in large numbers, feeding at sea, and ashore after dark. In daylight hours odd birds were still found ashore, up to 500/600 feet a.s.l. Along the sand of Sealers' Bay the tracks of 72 birds leading seawards were counted one morning.

CRESTED PENGUIN *(Eudyptes p. pachyrhynchus)*. In November, 1948, Dell recorded a small colony on the northern coast. This is located at the western arm of North-West Bay, and extends for some 400 yards under the huge boulders which here line the coast. The actual numbers and state of nesting could not be determined, but obviously the young had already vacated many of the sites, and only a few adult birds were seen. It appeared to us that the colony is now considerably more extensive than indicated by Dell.

BROAD-BILLED PRION *(Pachyptila v. vittata)*. Recorded by Stead in 1935 as breeding on off-shore islets. We found them breeding in unknown numbers on the outer islet at the eastern end of Sealers' Bay, a young bird removed from a burrow being in the final downy stage, and just beginning to lose the down on its head. Numerous small burrows on the inner islet were doubtless also of this species. Here in the midden of a nesting pair of Southern Skuas were many fresh and skeletal remains of Broad-billed Prion. A breeding colony of unknown extent was also discovered on the high headland at the extreme north-western tip of Codfish.

SOOTY SHEARWATER *(Puffinus griseus)*. Only the northern and eastern coasts were examined, as high seas from the south-west prevented us from rounding the headlands at the north-west and south-east points of the island. So the remainder of the coastline remains *terra incognita* in respect of this and other species of seabirds. The accompanying map shows the distribution so far as our observations went, and indicates a vast breeding population. In North-West Bay there was a heavy concentration on the steep slopes behind the great boulders containing the Crested Penguin colony. On the headland east of Sealers' Bay, and on the nearby island, the numerous larger burrows probably all belonged to this species. All along the south-eastern coastline the vegetation has been burnt off at some stage, so that the skeletons of *Olearia spp.* stand out above the dense low growth. Here all suitable areas are riddled with Sooty Shearwater burrows, beginning above a steep bare fringe of rock 15 to 20 feet high. No mutton-birding has taken place on Codfish for many years, so far as is known, so the reason for burning the coastal vegetation is obscure.

SHORT-TAILED SHEARWATER *(P. tenuirostris)*. This species is included on account of a beach-washed specimen picked up at Sealers' Bay. When shown to Mr. J. Waitiri of Bluff, who conveyed us to Codfish, he immediately recognised the corpse as that of a " little muttonbird," and stated that the muttonbirders of Big South Cape Island usually pick up a few " little muttonbirds " each season when torching. These would be immatures of the Tasmanian species, which could well be breeding in small numbers on the more southerly islands, and even on Codfish.

MOTTLED PETREL *(Pterodroma inexpectata)*. Dell did not record this bird in November, 1948, other than a single corpse in the bush, but Wilson 1959 (6) states that in 1935 it was a common breeding bird, and with the Sooty Shearwater, monopolised most or the bare spurs near the sea. We did not find it so, and fear that there may have been a very serious decline in the numbers of this rare petrel breeding on Codfish. Late each evening, that is, from about 10 p.m. onwards, 10 to 12 birds would be heard from the campsite flying inland singly at intervals. From the high-pitched call of " ti ti ti " a majority of these were clearly Mottled Petrel, and the remainder with a rather lower pitched and slightly varied call we considered might have been Cook's Petrel. We spent the night of 11/12 December at the summit, and in the Mottled Petrel breeding area marked on the map, which we defined in March, 1965, very few birds came in. A gale of unusual severity contributed largely to this, but burrows in use were extremely sparse throughout the area. We were dismayed at the large number of freshly killed corpses, all stripped clean by Wekas, and quite obviously killed by them. It would seem that this predator constitutes a very serious threat to the continued existence of the Mottled Petrel, for the same sad state of affairs possibly exists all over the island. In examining burrow areas along the south-east coast, we found no definite sign of breeding Mottled Petrel.

COOK'S PETREL *(P. cooki)*. Our only record of this species was a fresh beach-washed specimen, with a damaged wing, possibly caused by a Southern Skua. At the end of 1935, Stead 1936 (8) found it nesting in great numbers on Codfish. He dug out a number of nests, and the eggs indicated that laying had begun about 12th December, some weeks later than on Little Barrier Island. He says "The birds were plentiful . . . their burrows being everywhere from 15 feet above sea level up to the tops of the bush." Entrance to the burrow was almost always in rather steep ground, usually among the roots of trees. He estimated that there were over 20,000 burrows. Dell found none of this species in November, 1948, and considered their visit was a little early in the season. We found none in early March, 1965, and thought we might have been too late. In December, 1966, we could not have missed seeing the birds in the forested areas had they been there, for in addition to search by night, there were extensive trap lines for possums and kiore to be visited. So it may be that the only known southern breeding colony of this rare species has been virtually destroyed, again presumably by the Weka, except for perhaps a rapidly dwindling handful of birds; and there remains, so far as is known, only the precarious breeding colony on Little Barrier, with small numbers on Great Barrier.

SOUTHERN DIVING PETREL *(Pelecanoides urinatrix chathamensis)*. Very old skeletal remains at a Skua's midden was the only evidence of the occurrence of this species. In 1948, Dell found their burrows in the consolidated sand dunes of Sealers' Bay, a few feet about high water mark, and less commonly higher up in the dunes; but these dunes are nightly patrolled by numerous Wekas, and there is no sign of these burrows today. It is possible that breeding colonies still exist on Codfish, but we neither heard the birds at night, nor observed any in the seas off the coast.

PIED SHAG *(Phalocrocorax varius)*. Six adult birds at a roost at the western end of Sealers' Bay, probably near the spot where 6 were noted in a breeding colony by Dell in 1948.

WHITE-THROATED SHAG *(P. melanoleucos)*. An occasional bird was seen off the coast, but there was no evidence of breeding.

STEWART ISLAND SHAG *(P. carunculatus chalconotus)*. A brief visit was made on 7/12/66 to the outer of the two islets at the east end of Sealers' Bay, but weather conditions made it inadvisable to prolong our stay. However, it was noted that the breeding colony of this species on the outer face was fairly extensive, and that there were many small burrows of what later proved to be Broad-billed Prion. A second visit was made on 13/12/66 under more moderate conditions, and a check on the state of the shag colony was attempted. It was estimated that there were at least 150 adult and sub-adult birds, the bronze and pied forms being in about equal numbers. Nests counted were 64, but of these the contents of 36 were not checked for fear of disturbing the birds. Disturbance of such colonies can cause irreparable damage, and furthermore in this case Southern Skuas from a nest on the inner islet regularly patrolled the colony every 15 minutes or so, on the lookout for unguarded nestlings. Of the 28 nests checked, the following details were recorded:

Plate X — A mixed phase pair of Stewart Island Shags at the nest. [B. D. Bell

Bronze Phase in attendance at nest:

3	nests	containing	2	chicks
5	„	„	1	„
1	„	„	2	„ + 1 egg
1	„	„	1	„ + 1 egg
1	„	„	3	eggs
1	„	„	2	„
2	„	empty		

Pied Phase in attendance:

3	nests	containing	2	chicks
1	„	„	1	„ + 1 egg
4	„	„	1	„
2	„	„	1	egg
1	„	empty		

Mixed pairs at nest:

1	nest	containing	1	chick
1	„	„	3	eggs

No parent in attendance:

1	nest	containing	2	chicks

Mixed pairs unoccupied — 2

Dell recorded this colony in 1948 but did not visit it. It is interesting to note that Stead estimated 60 nests in 1935. We were frustrated in an attempt to reach the Nobbies, only a mile from the north-west point of Codfish, where we have reason to believe there is a large colony of this species.

BLUE SHAG *(P. punctatus steadi)*. This subspecies nests in small numbers, about 8 pairs, high up on the beetling western rock face of Roger Head. Nesting was over at the time of our visit, but about 10 birds were counted in North West Bay, and 2 had been previously observed along the rocky coastline S.E. of Roger Head. Earlier observers did not record the bird as breeding on Codfish.

HARRIER *(Circus approximans)*. Two birds were seen occasionally.

BUSH HAWK *(Falco novaeseelandiae)*. Two nesting pairs were recorded by Stead in 1935, and one sighting was made by Dell's party in 1948. We did not record it.

STEWART ISLAND WEKA *(Gallirallus australis scotti)*. Immediately on establishing camp, a pair took over the site, and subsequently spent much of their time chasing intruders. The Weka was observed at all levels up to the summit, 1140 feet, and in all situations, feeding along the intertidal rocks, on the beach of Sealers' Bay, in the low coastal vegetation, and throughout the forested areas. All birds were small and 'scraggy' in appearance, due possibly to the population pressure. Dell reported young birds in November, 1948, but we encountered none on the main island, which may be significant; but we were surprised to find a pair with two well grown young in the almost impenetrable thickets of *Hebe elliptica* on the inshore islet at the eastern end of Sealers' Bay, and others called as we were leaving. Obviously these birds had reached new territory, and new prey, by swimming.

The dire effects of predation on even large petrel species has already been indicated, and will be discussed towards the end of this paper.

BLACK OYSTERCATCHER *(Haematopus unicolor)*. A pair at either end of the beach at Sealers' Bay were the only records. Those at the eastern end had two young, 6 to 8 days old when first observed on 6/12/66. On the inert young being picked up, they called continuously in two notes of the same timbre as the call of the parents, but audible for a few yards only. The smaller chick disappeared about a week later, doubtless a prey to the beach-haunting Wekas. For the first few days of observation, both parents kept with the young continuously, the food supply consisting mainly of sand-hoppers, judging from the marks in the sand. On approach, one parent would fly towards the intruder, and the other run into the dunes, while the chicks stretched out inert on the sand. After a few days, one parent only remained with the young, while the other fed along the rocks some distance away. Becoming accustomed to intrusion, the bird with the chicks would then fly a few yards only towards the observer, and then run into the dunes. On the approach of 5 Southern Skuas, the bird took to high flight and kept above the Skuas despite their efforts to gain the advantage of height. On their departure, the Oystercatcher made one sheer drop to the beach at astonishing speed.

SOUTHERN SKUA *(Stercorcarius skua lonnbergi)*. On a high northern headland of the larger islet at the eastern end of Sealers' Bay, a pair had two nestlings, about 9 and 7 days old. The parent birds were not unduly aggressive. They were joined on one occasion by an immature bird, and on another by three birds. No other nests were seen.

BLACK-BACKED GULL *(Larus dominicanus)*. Not common along the coastline, but odd pairs were found to be nesting, as shown on the accompanying map. Two clutches of 2 eggs each gave the following measurements: 69.5 x 48.4, 70.0 x 46.4, 72.6 x 47.5, 73.0 x 48.9. Average 71.3 x 47.5.

RED-BILLED GULL *(L. scopulinus)*. Two or three scattered pairs had nested at Roderique's Anchorage, where we found a chick about three weeks old. A small number frequented the tide-line of Sealers' Bay, but we found no other evidence of nesting.

WHITE-FRONTED TERN *(Sterna striata)*. 5 or 6 birds normally fed in the late afternoon and up to 7.30 p.m. off the rocky point north of the campsite, and odd birds seen elsewhere. There was no evidence of breeding.

PIGEON *(Hemiphaga novaeseelandiae)*. Although the population is not high, the bird was met with in all parts of the forest. One member of our party reported quite a concentration along the western slopes of a heavily bushed ridge towards the east coast.

SOUTH ISLAND KAKA *(Nestor meridionalis)*. A very numerous bird, common in all parts. On one damp, mild morning a walk of about 600 yards up an easy ridge S.W. from the campsite gave a count of 35 birds seen or heard, and this would be a fair

sample of most of the forested area. On the few calm nights we experienced, their musical whistling was an enjoyable feature.

RED-CROWNED PARAKEET *(Cyanoramphus novaeseelandiae)*

YELLOW-CROWNED PARAKEET *(C. auriceps)*
Both species were found in good numbers throughout, and we could not define any altitudinal variation in the numbers of either.

ORIENTAL CUCKOO *(Cukulus saturatus horsfieldi)*. An interesting record was made by Falla (pers. comm.) when he spent a day ashore on 16/7/48.

LONG-TAILED CUCKOO *(Eudynamis taitensis)*. This species is surprisingly numerous, perhaps the result of the very high population of Brown Creeper, which it probably parasitises. There were many sight records, mostly of birds being hotly pursued by Tuis.

MOREPORK *(Ninox novaeseelandiae)*. Infrequently seen, but two, and sometimes three, heard from the campsite on calm nights.

RIFLEMAN *(Acanthisitta chloris)*. Frequently met in the forest from about 200 feet a.s.l. A call would usually attract two or more birds.

SOUTH ISLAND FANTAIL *(Rhipidura f. fuliginosa)*. Not a common bird, and more frequently seen in the coastal fringe than in the forest.

YELLOW-BREASTED TIT *(Petroica m. macrocephalus)*. Common in all situations, particularly in the coastal fringe. At least 3 pairs inhabited the sand dunes, and at the campsite, in the dunes, and in a small rocky bay, pairs were seen feeding flying young. An unusual nest was found at 4 feet in a hollow stump, containing three freshly laid eggs. The nest did not fill the hollow, and was constructed as a perfect globe, with a 1½ inch cup.

CODFISH ISLAND FERNBIRD *(Bowdleria punctata wilsoni)*. Dell states that in 1948 it was comparatively abundant in the sand dunes, but refers to its restricted habitat there. The finding of several nests and its more extensive 'pakihi' habitat is described by Blackburn 1967 (9). The population is possibly large and flourishing.

BROWN CREEPER *(Finschia novaeseelandiae)*. Without doubt the most abundant species, in both the forest and the coastal fringe. The small flocks referred to by Dell were probably family parties for we found them moving and feeding in loosely knit family groups, the juveniles in some cases still being fed. We considered that many pairs must have been nesting for the second time, in view of the activity of the numerous Long-tailed Cuckoos; but we searched for nests without success.

GREY WARBLER *(Gerygone igata)*. Although not common, it is today more abundant than indicated by Dell, who saw only two birds in 1948. Three pairs, one with flying young, inhabited the sand dunes, and others were often seen, and song heard frequently.

SONG THRUSH *(Turdus philomelos)*. One bird only, briefly seen in the sand dunes.

BLACKBIRD *(Turdus merula)*. Seen occasionally throughout the forest, but more often only its alarm note heard, as it is most wary.

[I. M. Ritchie

Plate XI — Punui **(Stilbocarpa lyalii)** survives only on an islet at the east end of Sealer's Bay.

PIPIT *(Anthus novaeseelandiae)*. One record only.

BELLBIRD *(Anthornis melanura)*. Very common in all situations, especially along the coastal fringe. The sand dune area held innumerable birds.

TUI *(Prosthemadera novaeseelandiae)*. Also abundant, although its numbers are not comparable with those of the Bellbird. The upper fringe of the sand dunes was always alive with them.

SILVEREYE *(Zosterops lateralis)*. Stead recorded 2 or 3 pairs in 1935, and Dell did not find it in 1948. We recorded at least three small flocks of 10 to 15 birds, two in the coastal fringe, and one near the summit.

STARLING *(Sturnus vulgaris)*. The only record was two groups of 2 birds observed from the sea above the eastern coastline.

Various introduced birds have been recorded by other observers, viz. Redpolls by Stead, Chaffinch, House Sparrow, Yellowhammer, and Hedge Sparrow by Dell, Hedge Sparrow, Redpoll, Chaffinch and Yellowhammer by Bell; but these species were not recorded by us.

DISCUSSION

The various races of Weka are desirable enough birds on the mainland, but on the many off-shore islands where the Maoris have introduced them for food, they can be shown to be highly inimical to a number of other species. On most of the southern islands, the Banded Rail *(Rallus philippensis)* is a very common bird where no Wekas are present, but it has been exterminated on those where the Weka has been introduced. There is tragic evidence of the predation by Wekas on several of the smaller petrels on the islands lying east of Stewart Island; and now we have clear evidence of their preying heavily upon the larger Mottled Petrel, and by implication, of the possible destruction of the breeding colony of Cook's Petrel. Possums have exterminated, or substantially reduced, many plant species of value to birdlife. The kiore or Polynesian rat undoubtedly has cycles in its population, and when at a peak, apparently preys upon the eggs and young of certain species. Such predation seems to account for the disappearance of the Pied Tit from Cuvier Island in the north, and of the Yellow-breasted Tit from Inner Chetwode Island in Cook Strait, kiore being common on both islands. On Codfish, peak populations are no doubt kept partly in check by the Weka, for the Tit is a common bird there.

Despite these disadvantages, the absence of more serious predators such as wild cats, stoats, weasels, black and Norwegian rats, renders Codfish an extremely valuable island as a future sanctuary for certain of our rare species. Measures to control the possum and the Weka are urgently required, and such measures need not be injurious to any other of the island's fauna, except the kiore. In considering the transfer to Codfish of a species such as the Saddleback *(Philesturnus carunculatus)*, which feeds much on the ground, serious thought must be given to possible predation by the Weka. While the Weka is abundant on Big South Cape, which was the final stronghold of the southern Saddleback, the ground cover is much more open than on Codfish. Here the denser cover might give

considerable advantage to the Weka in preying upon the Saddleback, as seems to be the case on Inner Chetwode Island.

One can only speculate on the reasons for the total absence from Codfish of the Saddleback, Robin *(Petroica australis)*, Wren *(Xenicus longipes)*, and Snipe *(Coenocorypha aucklandica iredalei)*, all of which were abundant on Big South Cape prior to the invasion of black rats in 1963. It is possible that separation from Stewart Island occurred much earlier in the case of Codfish than of Big South Cape, so that Codfish may have been populated by colonisation from Stewart Island. The sheer stark mountains of the Ruggedy Range across the two mile wide channel from Codfish could well have proved a barrier to species either incapable of sustained flight, or unwilling to undertake sustained flight above the bush canopy. The strong subspeciation of the Codfish Island Fernbird seems to support this theory of early separation.

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SHORT NOTE

BLACK SHAGS FLYING WITH BILLS AGAPE

At Kapiti on 6/4/68 two Black Shags *(Phalacrocorax carbo)* flew north at a height of a couple of hundred feet near the coastline. Both birds had their bills wide open and a few minutes later a single bird was seen to fly south, also with its bill open. Perhaps the birds had swallowed large fish and were uncomfortable: but high purposeful flight is unusual at such times. The air, however, was still and very hot and one wonders if the action was perhaps a cooling mechanism, in the way a dog pants with its tongue out. In warm weather nesting birds may sometimes be seen with their bills open, and "resting birds exposed to hot sun" sometimes even pant. (*A New Dict. of Birds*, ed. A. L. Thomson, 1964, p. 697).

I have however not previously seen a bird flying with its bill open, nor am I able to find any explanation for it, or even that such a habit has been recorded, in New Zealand or overesas literature. I would be interested to know of any published reference to it.

— J. M. Cunningham