# BIRDS OF THE SOLANDER ISLANDS

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ABSTRACT

Birds observed on the Solander Islands 25-27 July 1985 are discussed in relation to previous records from the islands. Black Shag, Banded Rail, Song Thrush and Greenfinch have not been reported previously.

Solander Island had a major colony of Buller's Mollymawk, with an estimated 4000-5000 pairs. A further 300 pairs bred on Little Solander Island, which also had a large colony of Common Diving Petrels. On Little Solander, New Zealand's southernmost gannet colony, were 20-30 Australasian Gannets. Red-crowned Parakeets seem to have displaced Yellow-crowned Parakeets on the Solander Islands since 1948.

The faunal relationships of the Solander Islands are discussed, as is the apparent effect of predation by introduced weka on Solander Island.

## INTRODUCTION

The Solander Islands lie in the western entrance to Foveaux Strait 40 km south of the South Island and 60 km west-north-west of Stewart Island, at 46° 35' S, 166° 52' E (Fig. 1). The islands (Fig. 2) are the eroded remains of an andesitic volcano (Harrington & Wood 1958). The larger, Solander Island (100 ha, Fig. 3) is roughly triangular, about 1.5 km across and 340 m high, with very steep slopes and a small summit plateau. The shoreline consists of boulder beaches and rock platforms contained within steep headlands. Little Solander Island (Fig. 4), 2 km to the west, is about 8 ha and rises to 180 m. It has cliffs to the south and west but slopes to the north and east are less steep.

The islands were discovered by Captain James Cook in March 1770 and named after Dr Daniel Solander, a botanist aboard his vessel. During the first decades of the 19th century sealers visited the islands, with one gang marooned on Solander Island from 1808 to 1813 (McNab 1907)). Despite their activities and more recent open seasons up to 1946, Solander Island still holds New Zealand's largest colony of fur seals (*Arctocephalus forsteri*); 5000 were estimated in January-February 1973 (Wilson 1981).

Blanket peat covers both islands, except on steep slopes, where slips have formed fans of peat, pebbles and grit. On Solander Island the debris fans and slopes above are covered in extensive areas of *Poa foliosa* but the steeper exposed slopes are clothed in *P. astonii* and *Anisotome lyallii*. Many of the steepest cliffs and headlands are bare. *Olearia lyallii* dominates the plateau, with *Senecio stewartiae* around the periphery. Under the 6 m canopy are tall ferns of *Blechnum durum*, *Asplenium obtusatum* and *Polystichum vestitum* and extensive waist-high clumps of the large-leaved punui (*Stilbocarpa lyallii*).

The flora of Little Solander Island is less diverse. Dense *P. foliosa* grassland covers the eastern side, except where *Hebe elliptica* shrubs occur in gullies. A 2-3 m scrub of *S. stewartiae* and *H. elliptica* predominates on the northern slopes. Moister gullies and breaks in the canopy are filled with a lush growth of *P. foliosa*, *Stilbocarpa robusta* (elsewhere known only from The Snares) and some *Asplenium obtusatum*. *Poa astonii* predominates on drier soils on the summit ridge, rock outcrops, and along cliff margins. Much of the south side of the island is vertical and bare, but the very steep upper slope has a perched cover of *P. astonii* and shrubs of *Hebe* and *Senecio*.

There are no introduced mammals on either island.

The Solander Islands were included in Fiordland National Park in 1959 and were gazetted as a specially protected area in September 1973. Entry to the islands is by permit only.

Scientific visits have been few and usually brief.

Captain and Mrs J. Bollons landed on Solander Island in 1908 and collected plants (Cockayne 1909) and some rocks (Speight 1909). E. F. Stead spend an hour ashore in 1933 (Falla 1948). Sir Robert Falla made four landings on the islands: in December 1947, July 1948 (during which an ascent was made of Little Solander Island), May 1950, and May 1956. After a visit in February 1957, Harrington & Wood (1958) described the geology. G. T. S. Baylis visited Solander Island on 27 October 1958 (Johnson 1975). In January-February 1973, G. J. Wilson camped on Solander Island for several days and subsequently reported on the birdlife (Wilson 1973). A party organised by Fiordland National Park staff visited Solander Island for 16 days in November 1973 (Johnson 1975; Nilsson, R. J., 1974. Solander Island expedition 10-25 Nov 1973. Unpubl. report. NZ Wildlife Service). Johnson, Nilsson and A. Cragg visited Little Solander Island for a night in November 1976 (Johnson 1982; Cragg, A., 1976. Unpubl. report on Preservation Inlet/Solander Islands. Fiordland Nat. Park). Two of the authors visited Solander Island for two days in February 1984 (Cooper & Morrison 1984).

We visited both islands between 25 July and 27 July 1985. WJC and CMM were landed on a small terrace about mid-way up the eastern slopes of Little Solander Island, and KM, RJP and K. Gillies were landed at Eastern Bay on Solander Island (Fig. 1).

The party on Solander Island surveyed the coast and much of the lower slopes, from the south end of Eastern Bay to the north-western headland. They also climbed the cliffs behind the northern bay and traversed the summit plateau and part of the razorback ridge before descending into Eastern Bay. On Little Solander Island the eastern and northern slopes, south-east cliff top and summit ridge were all traversed.

## SYSTEMATIC ACCOUNT

### SOUTHERN BLUE PENGUIN *Eudyptula minor minor*

Wilson found skeletal remains at Eastern Bay on Solander Island. This remains the only record.

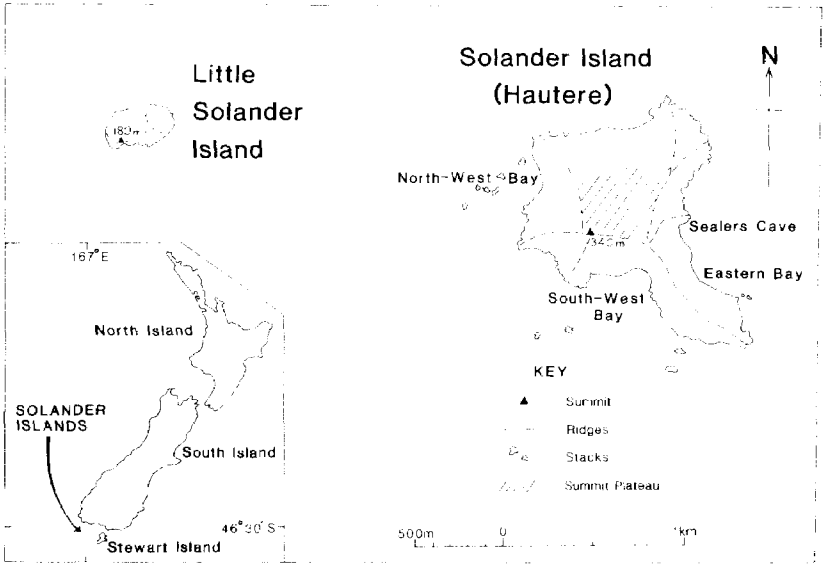


FIGURE 1 — The Solander Islands

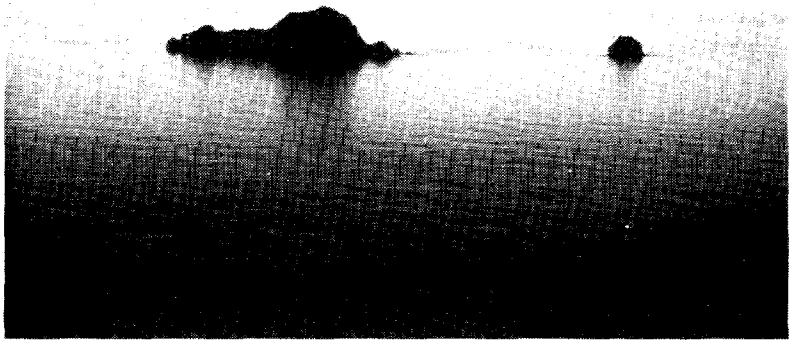

FIGURE 2 — The Solander Islands from the north-east
Photo: T. A. Paterson

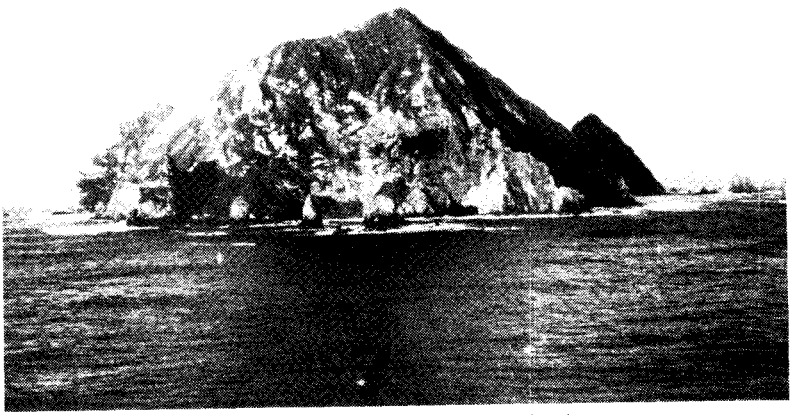

FIGURE 3 — Solander Island from Little Solander Island

Photo: W. J. Cooper, ARPS

FIGURE 4 — Little Solander Island from the south-east

Photo: C. M. Miskelly

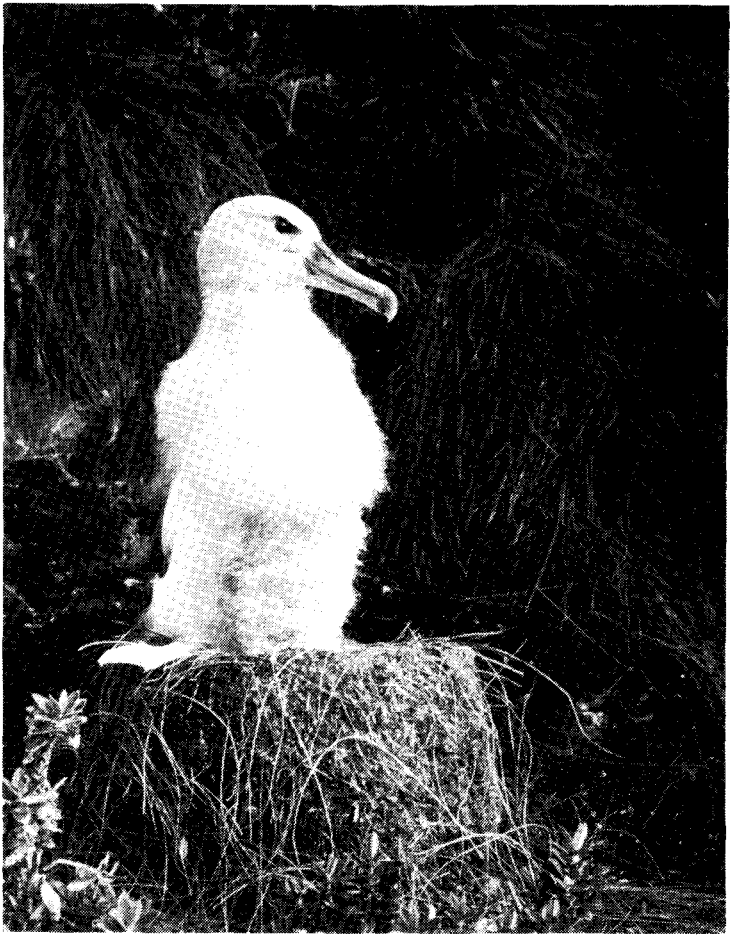

FIGURE 5 — Buller's Mollymawk chick, Little Solander Island, 25/26 July 1985
Photo: W. J. Cooper, ARPS

FIORDLAND CRESTED PENGUIN *Eudyptes pachyrhynchus*

Ten pairs and a female were seen at nests under boulders at the south end of Eastern Bay; at least 15 adults were on nests under boulders and *Hebe* north of Sealers Cave. The nests were constructed of fresh *Poa foliosa* leaves and were without eggs. Four adults and two immatures were ashore in the northern bay.

A few Fiordland Crested Penguins have been recorded by all recent expeditions, but Falla considered them to be plentiful. Little Solander Island has no suitable landings for penguins.

SNARES CRESTED PENGUIN *E. robustus*

Single birds were reported on Solander Island by Falla, Wilson, and Nilsson. One seen by Cooper & Morrison in February 1984 was overlooked in their published account. None was seen during this visit.

BULLER'S MOLLYMAWK *Diomedea bulleri*

Buller's Mollymawks were nesting over both islands and on stacks to the south-west of Solander Island. An aerial survey of Solander Island revealed an estimated 4000-5000 pairs well distributed around the island's lower slopes. The highest densities were on the western side. Occupied nests were found up to 212 m a.s.l.

We banded 137 chicks on Little Solander Island, saw six more out of reach, and found six dead chicks. Judging by the number of empty nest sites, up to 300 pairs may attempt to breed there.

Chicks on both islands ranged in development from completely downy to near fledging (Fig. 5). Food items regurgitated by chicks included squid flesh and beaks, fish bones, aquatic and terrestrial vegetation and a sweet wrapper. Ticks (*Ixodes uriae*) were seen attached near the base of the bills of five chicks. Large terrestrial leeches (*Ornithobdella* sp.), previously known only from The Snares, were seen in the nest bowls of two of the four chicks inspected at night on Little Solander.

Falla reported mollymawks as just returning to Solander Island on 9 December 1947 and found well-grown young the following July. Wilson and Cooper & Morrison found the species nesting over most of both islands, most being on eggs in February. Nilsson saw only one bird over Solander Island in November 1973, but Cragg observed them nesting at the northern end of the island on 2 November 1976. During a brief visit to Solander Island on 28 April 1983, KM saw some Buller's Mollymawks with very young chicks.

Robertson (1984) has suggested that two subspecies of *D. bulleri* be recognisd, the Southern Buller's Mollymawk (*D. b. bulleri*) breeding on The Snares and Solander Islands. The laying period for these birds is January-February, as against October-November for *D. b. platei* on the Chatham Islands. An estimated 5550 pairs of *D. b. bulleri* breed on The Snares (Warham & Bennington 1983, Miskelly unpubl. data).

NORTHERN GIANT PETREL *Macronectes halli*

Although previously recorded at South-west Bay, Solander Island, by Wilson, Nilsson, and Cooper & Morrison, none was seen during our visit.

CAPE PIGEON *Daption capense*

Cape Pigeons were seen off Little Solander Island on each day of our visit, including tight flocks of over 50 birds. One group of 10 flew past the southern cliff at about 130 m above sea level on 26 July.

Falla observed 20-30 Cape Pigeons cruising around the cliffs of Little Solander Island in December 1947 and suggested that they may breed there.

MOTTLED PETREL *Pterodroma inexpectata*

We found skeletal remains of three Mottled Petrels on the summit ridge of Little Solander Island. None appeared to have been preyed on by skuas.

Wilson recorded hearing *Pterodroma* petrels, probably this species, over Solander Island at night. Nilsson found a corpse at the southern end of Eastern Bay and identified several birds by torchlight as they flew in at dusk at South-west Bay. Cragg recorded small numbers on Little Solander Island.

BROAD-BILLED PRION *Pachyptila vittata*

Single prions were observed flying along the northern cliff of Little Solander each day, and up to six at a time were flying around the south-eastern corner in the late afternoon of 26 July. All but one of the birds identified were *P. vittata*.

Falla recorded Broad-billed Prions flying around Solander Island at dawn in July, and Nilsson believed small numbers of prions flying over South-west Bay at night to be this species. He found two corpses, and he also found burrows that may have belonged to Broad-billed Prions.

FAIRY PRION *P. turtur*

One Fairy Prion was seen in flight over the eastern slopes of Little Solander Island on 26 July. Falla found remains of this species in "skua and (or) hawk castings" on Little Solander, and Cragg reported small numbers there. Wilson found bones at Eastern Bay on Solander Island, and Nilsson found a small colony at the northern end of South-west Bay.

SOOTY SHEARWATER *Puffinus griseus*

Previous expeditions have found Sooty Shearwaters breeding in low numbers on Solander Island. None was seen during our winter visit, but a few burrows probably belonging to this species were found under *Senecio/Hebe* scrub on the northern slopes of Little Solander Island. Cragg recorded small numbers on Little Solander in November.

LITTLE SHEARWATER *P. assimilis*

We heard a Little Shearwater calling in flight over Little Solander Island at night on 26 July. Falla suggested that a small seabird seen flying out to sea from Solander Island by R. C. Murphy in December 1947 may have been this species, and he picked up the feathered wings of a Little Shearwater in July 1948. Skeletal material collected at Eastern Bay by Wilson in 1973 was apparently identified as *P. a. elegans*. The nearest known breeding grounds of *P. a. elegans* to the Solander Islands are at the Chathams and Antipodes Islands.

COMMON DIVING PETREL *Pelecanoides urinatrix*

Diving Petrels were the only burrowing petrel coming ashore on Little Solander in July. Their burrows occupied all available soil. Large numbers came ashore each evening. They were first seen at 1756 on 25 July and 1753 on 26 July and continued arriving for about two hours after dark. Birds started departing before dawn, and all had apparently gone by 0820. No burrows were inspected, but the birds appeared to be courting and cleaning burrows.

Diving petrels were the only birds recorded in the middens of Southern Great Skua (*Stercorarius skua lonnbergi*), and one was seen taken in flight by a skua.

Cragg and Johnson (Unpubl. report, 1976, Botany Division, DSIR) estimated the population on Little Solander at 250 000 to 300 000 pairs, based on two 2 m x 2 m plots in *Poa astonii* and *P. foliosa* grassland with 26 and

23 burrows respectively (Johnson 1982). Skeletal material was found on Solander Island by Wilson, Nilsson, and Cooper & Morrison. Nilsson also found an adult with an egg in a burrow about 90 m above Western Bay.

AUSTRALASIAN GANNET *Sula bassana serrator*

Two groups of gannets were on Little Solander during our stay. The larger, of up to 20 birds on 17 nests, was on a rock face on the northern ridge about 80-90 m a.s.l. (Fig. 6), and two birds were seen on two nests on a steep face below and west of the main colony, 20-30 m a.s.l. Only three pairs plus 14 singles were in the upper colony at night on 26 July, and so we presume that many females had yet to return.

Courting behaviour was observed among the larger group of gannets, with birds bringing nest material, mainly *Poa astonii* and seaweed. One pair was seen copulating on 26 July, after which the male flew away and returned three minutes later with nest material. Some birds in flight were closely followed by Southern Great Skuas and one gannet was forced to settle on the sea.

The presence of breeding gannets on Little Solander Island was confirmed by Falla; it is the southernmost known colony in New Zealand. During his visit on 20 July, Falla found 20 nests (11 in a gully, three on a spur, and six at the foot of the slope), and about 14 birds. Wilson saw two groups on 30 January; one of 19 or 20 birds on 18 nests on a steeply sloping rock face about 10 m above sea level, and the other of 20-30 birds on an exposed ridge about 70 m a.s.l. Only one colony (25 birds) was seen by Nilsson during a brief aerial reconnaissance in November 1973. Cragg

FIGURE 6 — Part of the upper gannet colony on Little Solander Island, 26 July 1985

Photo: C. M. Miskelly

recorded two groups on 2-3 November, one of 21 birds on 17 nests and the other of 28 on about six nests, other nests being under construction. Aerial photographs taken on 14 November 1980 showed three groups with a total of 62 pairs (Wodzicki *et al.* 1984), but Cooper & Morrison saw only two groups (of 28 and six) from the air on 8 February 1984.

It is difficult to see any pattern in the counts of gannets made on Little Solander Island since 1948. Most observers have found 20-30 nests, the exceptions being the counts of Wilson and Wodzicki *et al.* Falla counted 20 nests in 1948; 37 years later we counted 19 nests. This does not support the 3.4% mean annual increase (1946/47-1980/81) suggested by Wodzicki *et al.* (1984).

BLACK SHAG *Phalacrocorax carbo*

One adult flew along Eastern Bay, Solander Island, on 27 July. This species has not been recorded before from the Solander Islands.

BLUE SHAG *Stictocarbo punctatus steadi*

Two Blue Shags seen by Wilson on the north-eastern point of Solander Island remain the only record.

REEF HERON *Egretta sacra*

There are no recent records of Reef Heron. Falla observed a pair in December 1947, and Beattie (1954) reported them as breeding early this century.

AUSTRALASIAN HARRIER *Circus approximans*

This species was seen over Solander Island by Falla but has not been recorded by any subsequent party.

BANDED RAIL *Rallus philippensis*

A rail-like call was heard from among *Stilbocarpa* and *Poa foliosa* at three localities along the northern slope of Little Solander Island. Although the birds responsible were not seen, and attempts to flush one into a net were unsuccessful, we are sure that the call was that of Banded Rail. This was probably the source of the "snipe-like" call heard by Falla and the unidentified species Cragg heard calling under *Stilbocarpa*. There are probably only three or four pairs of Banded Rail on Little Solander Island, where their habitat is restricted.

Banded Rail still occur on some of the southern muttonbird islands that lack weka and rats but have not previously been reported from the Solander Islands.

STEWART ISLAND WEKA *Gallirallus australis scotti*

We recorded weka from sea level to about 200 m on the eastern and northern slopes of Solander Island. They were common under coastal scrub, and on boulder beaches where they fed in tidewrack.

Weka were introduced to Solander Island by sealers, and are probably responsible for the scarcity of burrowing petrels and larger invertebrates there in comparison with Little Solander, and for the absence of Banded Rail.

VARIABLE OYSTERCATCHER *Haematopus unicolor*

Three black-phase birds were seen at Eastern Bay and a pair was on the north-eastern point of Solander Island. Variable Oystercatchers have been recorded by Wilson, Nilsson, and Cooper & Morrison.

SOUTHERN GREAT SKUA *Stercorarius skua lonnbergi*

Up to three skuas at a time were seen on and over Little Solander during our visit. Middens found along the summit ridge and at the foot of peat slips contained remains of diving petrels and fish.

Two skuas were seen near the stacks south-west of Solander Island on 25 July, and two circled the summit plateau at 300 m on 26 July. At Eastern Bay, one skua was observed repeatedly wheeling and hovering over a Buller's Mollymawk nest with chick.

Falla saw one or two nesting pairs in December and the occasional bird in July. Nilsson reported at least two pairs on Solander Island. Cooper & Morrison saw a skua midden on Little Solander, and an immature bird was seen there by WJC, CMM and G. J. Eller during an unsuccessful landing attempt on 16 March 1985.

SOUTHERN BLACK-BACKED GULL *Larus dominicanus*

One adult and one immature Black-backed Gull were seen frequently flying around Little Solander Island during our stay. On Solander Island, nine adults were present in Eastern Bay and five adults were seen in the northern bay.

Falla (1948) reported finding a few nests above the high-water mark at Eastern Bay. Wilson recorded the species as common and found two chicks at South-west Bay. Nilsson saw small numbers on all beaches in November 1973, and he found six nests, most of which contained three fresh eggs. Cooper & Morrison saw moderate numbers around all beaches visited and found two large chicks at South-west Bay and another along the south-eastern peninsula.

RED-BILLED GULL *L. novaehollandiae scopulinus*

We saw up to six Red-billed Gulls on the rock platform on the northern coast of Little Solander Island throughout our stay. On Solander Island, groups of up to 16 were seen.

Falla recorded Red-billed Gulls as not abundant but saw at least one breeding colony on Solander Island. Wilson found three small colonies at South-west Bay, and Nilsson found another at Eastern Bay.

WHITE-FRONTED TERN *Sterna striata*

Three White-fronted Terns were seen off Solander Island. Both Falla and Wilson saw terns offshore and on coastal rocks and suggested that the species bred on Solander Island. Nilsson saw 40 White-fronted Terns on an islet near the southern end of South-west Bay, five of which appeared to be on nests.

NEW ZEALAND PIGEON *Hemiphaga novaeseelandiae*

Although not seen during our visit, Nilsson saw two pigeons on the summit plateau of Solander Island, and Cooper & Morrison saw eight in the same area.

PARAKEET spp. *Cyanoramphus* spp.

About 15 parakeets were on Little Solander, and all of the 30-40 confirmed sightings were of Red-crowned Parakeets (*C. novaezelandiae*). Fourteen parakeets were seen on Solander Island, of which three were identified as *C. novaezelandiae*.

The first published account of birds on the Solanders (Falla 1948) listed only Yellow-crowned Parakeets (*C. auriceps*), which were present on both islands. Wilson stated that the parakeets observed on Solander Island "appeared to be *auriceps* as reported by Falla", but this seems doubtful in view of Nilsson's record of only *C. novaezelandiae* (8 sightings) later in the same year. Cooper & Morrison also identified only Red-crowned Parakeets (5 sightings).

Red-crowned Parakeets seem to have displaced Yellow-crowned Parakeets on the Solander Islands between 1948 and 1973.

HEDGESPARROW *Prunella modularis*

About 15 were on Little Solander Island, and birds were seen regularly in coastal scrub on Solander Island. Two were seen foraging on boulders 30 m from the scrub edge in Eastern Bay.

Falla recorded them on both islands. Nilsson found them to be common on Solander Island, but Wilson and Cooper & Morrison made few sightings.

GREY WARBLER *Gerygone igata*

Grey Warblers were found throughout the *Hebe/Senecio* scrub on Little Solander Island, the total being about 12 birds. On Solander Island they were seen on the northern and eastern slopes. All previous observers have found Grey Warblers to be widespread and common on Solander Island.

SOUTH ISLAND FANTAIL *Rhipidura fuliginosa fuliginosa*

Thirteen fantails were seen on Solander Island as singles or pairs from sea level to the summit plateau. Although Falla recorded fantails on Solander Island, Wilson did not, and Nilsson saw only one bird. Cooper & Morrison saw seven adults and one juvenile.

Fantails have not been recorded on Little Solander Island.

YELLOW-BREASTED TIT *Petroica macrocephala macrocephala*

Tits were the most commonly recorded passerines on Little Solander Island, at least 20 being present. Moderate numbers were seen throughout scrub slopes on Solander Island. Falla found Yellow-breasted Tits plentiful on both islands, and subsequent parties have found them to be widespread on Solander Island.

SONG THRUSH *Turdus philomelos*

Single Song thrushes seen on both islands during our stay are new records for the Solander Islands.

BLACKBIRD *T. merula*

One male and one female Blackbird were seen on Little Solander Island, and a male was seen on Solander Island. Falla recorded this species from both islands, although Wilson and Nilsson considered it to be uncommon on Solander Island. WJC & CMM saw a Blackbird from the air on the southern face of Little Solander Island on 16 March 1985.

SILVEREYE *Zosterops lateralis*

A few Silvereyes were on Little Solander Island during our visit, 12 being the largest group. Pairs and small parties were seen occasionally in coastal scrub and on higher slopes on Solander Island. They have been recorded previously in low numbers on both islands.

BELLBIRD *Anthornis melanura*

Bellbirds are widespread and common on Solander Island but had not previously been reported from Little Solander Island, where we saw one on 27 July.

GREENFINCH *Carduelis chloris*

A Greenfinch heard among *Hebe* at Eastern Bay, Solander Island, on 26 July 1985 is the only record from the Solanders.

REDPOLL *C. flammea*

One Redpoll was seen over Little Solander Island on 25 July 1985. Redpolls have been recorded before only on Solander Island, where Nilsson saw several small groups on the summit plateau.

STARLING *Sturnus vulgaris*

We saw a flock of 12 on Little Solander Island and 18 around the northern cliffs of Solander Island. Nilsson saw about six on Solander Island in November 1973.

## DISCUSSION

The Solander Islands have close faunal and floral relationships with the Muttonbird (Titi) Islands off southern Stewart Island, The Snares, and the Chatham Islands. Of the 19 native bird species breeding on the Solanders (excluding the weka), 17 (89%) are shared with Big South Cape and neighbouring islands, 14 (74%) are shared with the Chatham Islands, and 11 (58%) are shared with The Snares. The similarities between avifaunas of these cool temperate island groups is particularly noticeable among the seabirds; indeed the breeding distributions of Buller's Mollymawk and Broad-billed Prion are almost confined to these groups.

The presence of Australasian Gannet, normally a warm temperate zone species, is an anomaly, although gannets are starting to colonise the Murumurus at the southern end of Pitt Island in the Chatham Islands (Miskelly, pers. obs.).

Counts of gannets on Little Solander Island have been made in different months and so few are comparable. No observers have recorded eggs or chicks. Efforts should be made to assess reproductive success at this isolated colony, as well as to count the adults and nests. Our observations of skua-gannet interactions suggest that the skuas may be a factor acting against an increase of gannets.

Fernbirds (*Bowdleria*) and snipe (*Coenocorypha*) are conspicuously absent from the Solander Islands, as they occur (or formerly occurred) on The Snares, Chatham Islands, and islands off Stewart Island. Weka could have exterminated these species on Solander Island, as they did fernbirds on Kundy and Jacky Lee Islands and snipe on Jacky Lee, Herekopare, Solomons and Green Islands (Miskelly, unpubl.). However, as unmodified Little Solander has enough habitat for about 50 pairs of fernbird, but no birds, it is doubtful that fernbirds ever occurred on the Solander Islands. There is some evidence that snipe were formerly on Little Solander Island (Blackburn 1965), where there is sufficient habitat for 10-20 pairs.

The introduction of weka to Solander Island more than 150 years ago has apparently had a severe effect on the avifauna. Prions, Common Diving Petrel and Mottled Petrel are scarce on Solander Island, and even Sooty Shearwater chicks may suffer predation (Cooper & Morrison 1984). Banded Rail were probably present on Solander Island, as they are known to have been displaced by weka on muttonbird islands off Stewart Island (Miskelly, unpubl.).

There is evidence that Solander Island formerly held a colony of Little Shearwater (Falla 1948, Wilson 1973). Being a winter or spring breeder it would have been particularly vulnerable to weka predation because of the lack of alternative prey. Even the decline in the numbers of Fiordland Crested Penguins since 1948 may be because of weka, which take eggs of *E. pachyrhynchus* (Miskelly, pers. obs.).

Solander Island is an important breeding ground for New Zealand fur seal and Southern Buller's Mollymawk. Nearly half the population of *D. b. bulleri* breeds on the Solanders. Little Solander Island is one of the few unmodified islands in the New Zealand region. In addition to the small gannet colony, Little Solander has a significant colony of Common Diving Petrels.

## ACKNOWLEDGEMENTS

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