

THE FIORDLAND CRESTED PENGUIN SURVEY, STAGE II: DUSKY AND BREAKSEA SOUNDS

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ABSTRACT

From 10 to 16 August 1991, we surveyed the complex of sounds making up Breaksea and Dusky Sounds, the Acheron Passage and Wet Jacket Arm, Fiordland, for Fiordland Crested Penguins. Two islands in Doubtful Sound were also checked. Minimum total estimates were 24 nests and 62 penguins in Doubtful Sound and 47 nests and 106 penguins in the Breaksea/Dusky complex. Penguins known to be on Breaksea I. and adjacent islands were not surveyed. Relatively more penguins were found nesting in caves or under rock overhangs and fewer were found in dugouts under trees than were found in the more northern sounds in 1990. No penguins were found on the many islands in Dusky Sound formed from steep-sided granite domes. The results support our suggestion made in 1990 that there are fewer than 1000 nests for the species annually.

INTRODUCTION

Fiordland Crested Penguins (*Eudyptes pachyrhynchus*) occur in small discrete breeding colonies of up to about 20 pairs from South Westland to the western coastline of Stewart Island (Bull *et al.* 1985). No detailed information about distribution and abundance is available for this rare penguin (McLean & Russ 1991), presumably because of its inaccessibility. Fiordland Crested Penguins nest under rock overhangs, in caves, in dugouts under tree roots, or on the ground under concealing vegetation, and even when a colony is located accurate counts of nests are difficult to make.

Since beginning this survey we have received several anecdotal reports about local populations of Fiordland Crested Penguins in decline or catastrophic mortality of chicks at local sites. Without historical information, we have no way of assessing the significance of these observations for the species as a whole because no information is available on such events in the recent past. The aims of this survey are: (1) to provide baseline counts for monitoring populations of Fiordland Crested Penguins in the future; (2) to provide much more detailed information on the distribution of the birds than has been previously available; (3) to develop replicable techniques for rapid censusing of breeding penguins; and (4) to develop an overview of the details of nesting habitat used by the birds in different parts of their range. Details of our methodology are provided elsewhere (McLean & Russ 1991) and will not be repeated here. In this report we present the results of the 1991 survey.

METHODS

The 1991 survey began on 10 August in Doubtful Sound (Figure 1). We landed on two islands in Doubtful Sound that had been checked in 1990, and then steamed to Breaksea Sound on 11 August. From 11 to 16 August

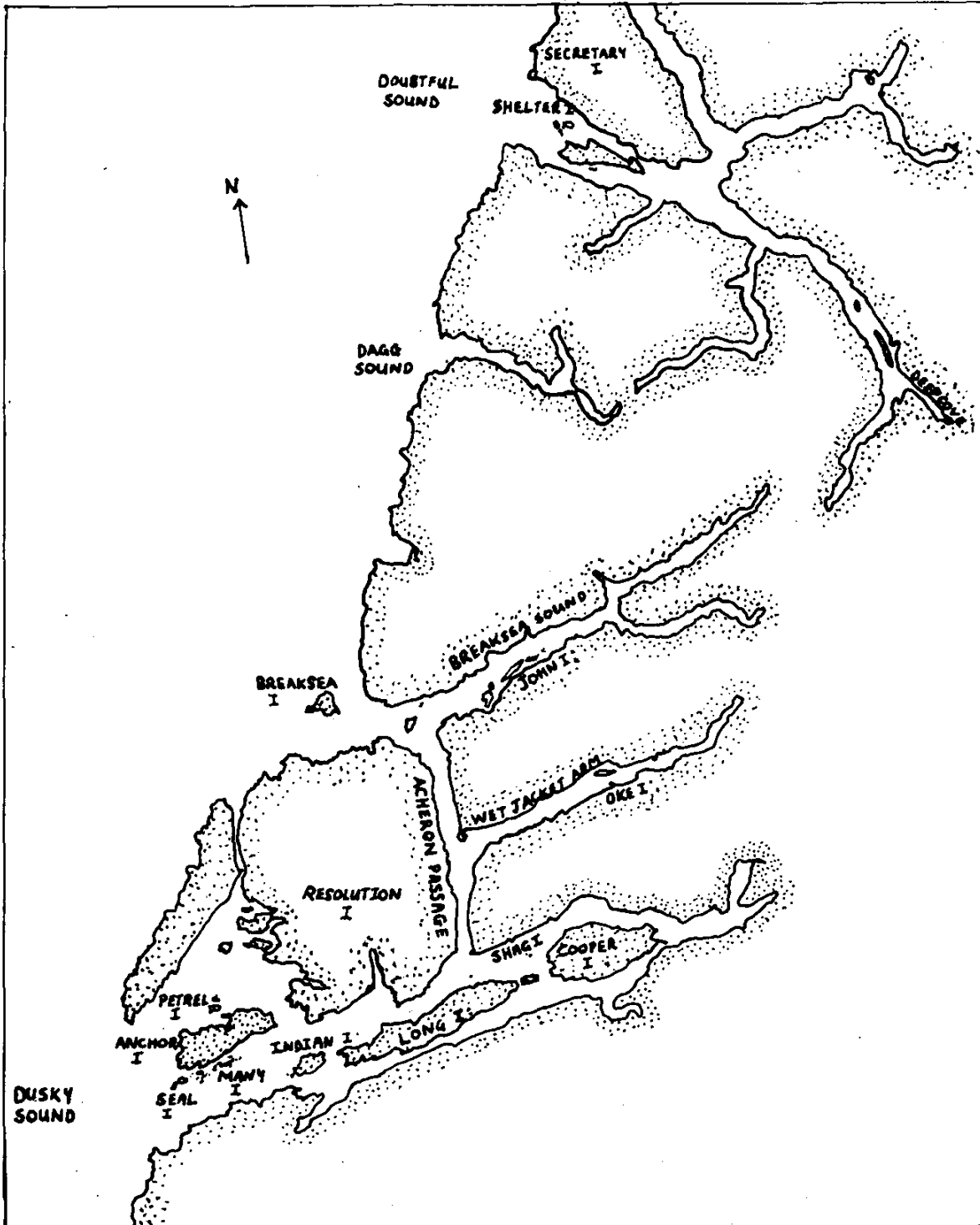


FIGURE 1 — Survey area for the 1991 survey of Fiordland Crested penguins

we remained in the complex of sounds made up of Breaksea, Wet Jacket Arm and Dusky, returning to Doubtful Sound on 16 August. Weather during the week of the survey was the opposite of the calm and clear weather that we experienced in 1990. Rain was virtually continuous throughout, and a severe storm on 15 August forced us to lay up in the most sheltered place available at the head of Wet Jacket Arm. Several islands at the entrance to Breaksea Sound are known to have penguins (R. Taylor, pers. comm.), but were not checked because of the weather.

We are confident that our checks in the more sheltered parts of the sounds would have located any penguin colonies, although we may have missed some isolated nests. Much of our checking of the coastline in 1991 involved surveying the shoreline either from a small boat or from the RV *Acheron*. Details about all islands surveyed are provided below. Much of the information about location in this report is about sites where penguins were not found. Breeding Fiordland Crested Penguins are sensitive to disturbance and we do not disturb them off nests when counting. Because of the potential for disturbance by visitors to the sounds, we have not given precise details about the location of some colonies.

RESULTS

A total of 46 nests and 106 penguins was counted in Dusky and Breaksea Sounds. This total includes 6 nests and 15 penguins in a small cave that we did not visit, but which were counted on 7 August 1990 by RBR. An additional 25 nests and 62 penguins were counted in Doubtful Sound.

In contrast to the more northern sounds (McLean & Russ 1991), most nests found were in caves or rocky crevices rather than in dugouts under tree roots. Penguins were found in only five locations, of which three were caves. All were on islands.

Doubtful Sound, 10-11 August

Rolla I.: A small island at the junction of Deep Cove and Hall Arm. Complete survey: 7 pairs and 1 single on a nest (8 nests, 17 birds); 1 clutch of 2 eggs, 1 nest with 1 freshly laid egg. Breeding just begun (5 nests and 15 birds recorded in 1990).

East Shelter I.: At the entrance to Doubtful Sound. This island was visited but not counted in 1990. Incomplete survey: 16 pairs and 1 single on a nest (17 nests, 42 birds); 2 nests with 2 eggs (one contained a fresh egg), 1 with 1 freshly laid egg. Breeding just begun as most pairs had no eggs. Birds were counted along ridges in the centre of the western and eastern blocks of the island, but no checks were made at the western tip or along the eastern margins. Birds were heard but not counted on the southeastern corner. Most nests were along the ridges of the island under bush rather than around the edges, which tend to be steep sided. It is likely that the 1990 estimate of 100 birds was a little high.

First Arm: Three penguins were seen in the water near the head of the sound. None were heard overnight at the head.

Breaksea Sound, 11-12 August

After checking East Shelter I., we steamed south to Breaksea Sound, where because of sea conditions we bypassed the islands at the entrance. Overnight was in Second Cove, opposite the Johns Is.

Johns Is: One moderate-sized and four small islands half-way up Breaksea Sound. The three small islands at the eastern end were all low domes with mixed broadleaf/podocarp forest. One of these had 5 pairs and 4 singles on nests plus 4 singles on empty nests and 2 singles (9 nests, 20 birds in total). Birds were early in breeding as most incubating birds still had their mates present. All nests were in dugouts under tree roots. Old tar drums and PVC parkas indicated human activity in the recent past. Much deer browse. Weka (*Gallirallus australis*) were present. Complete check of the four small islands and the eastern third of the larger island. One of the small islands had paths and dugouts but no birds or moult sign.

Dusky Sound, 12-14 August

We steamed from Breaksea up the Acheron Passage to Dusky Sound, spending the night in Luncheon Cove, Anchor I. The next day we checked islands at the entrance to Dusky Sound and then steamed to the western side of Resolution I., where we spent the night in Cormorant Cove. After checks on 14 August, we steamed to Wet Jacket Arm.

Shag Is: A group of small islands a short distance east of the conjunction of Dusky Sound and the Acheron Passage. All were low domes with mixed podocarp forest and a fringe of *Dracophyllum*, and there were good landings. No Fiordland Crested Penguins or sign were found despite a complete check of all islands. Little Blue Penguin (*Eudyptula minor*) sign was abundant and a dead Mottled Petrel (*Pterodroma inexpectata*) was found.

Front Is: Two small islands at the conjunction of the Acheron Passage and Dusky Sound. Similar to the Shag Is; complete check; no Fiordland Crested Penguins or sign and Little Blue Penguins appeared to be less common than on the Shag Is.

Many Is: A large number of islands at the entrance to Dusky Sound. All are granite domes with mature forest and a well-developed soil that appeared deep enough for penguin dugouts in many places. Although steep sided, most of the islands appeared to have at least one reasonable landing place for Fiordland Crested Penguins. We checked six islands near our overnight anchorage at Luncheon Cove. Little Blue Penguin burrows and trails were present and one bank of petrel burrows was found, but there was no sign of Fiordland Crested Penguins. Local fishers from the *June I* reported not having seen Fiordland Crested Penguins in the area.

Seal Is: A small group of exposed islands at the entrance to Dusky Sound. We could not land on the most seaward islands, but made nearly complete checks on three, finding no Fiordland Crested Penguins or sign.

Indian I.: A large island east of the Many Is on which penguins had been seen previously by RBR in a small harbour. The southern and eastern coasts were checked from the *Acheron* and we landed at the eastern tip, but no penguins were seen. In the harbour, two pairs on nests were found (1

clutch of 2 eggs), plus one single on an empty nest and four singles (2 nests, 9 birds in total). All nests were in deep dugouts under trees or in small caves close to sea level.

Petrel Is: Two small islands between Anchor and Resolution Is. These are also steep-sided granite domes, although reasonable landings for penguins were available. Several teams checked most of the southern island, but no penguins or sign were found. The smaller northern island was not checked.

Pigeon I.: This island consists of sedimentary rocks rather than granite. Richard Henry (1903) referred in his writings to the "South Cave" of Pigeon I. We checked much of the coast by boat for caves and landing sites. One major rockfall was noted on the south coast, and a small deep (40 m) cave was found about 200 m further along. Either could have been Henry's cave, although the cave we inspected would be extremely cramped if it housed the "50 pairs" reported by Henry. Landing at the cave was hazardous and the cave entrance was well hidden. Much of the cave involved crawling and squeezing, except for a kidney-shaped chamber in the centre in which 6 nests were found; 1 further nest was found at the end of the cave (7 nests, 15 birds in total). Two nests contained 2 eggs (1 fresh) and 1 nest contained 1 egg. Most birds were paired; the birds were early in breeding.

Wet Jacket Arm, 14-16 August

Oke I.: A moderate-sized island in the middle of Wet Jacket Arm. Complete check of the perimeter by small boat. No penguins or landings seen.

The head of Wet Jacket Arm was checked for penguins; none were found. No further landings were made because a severe storm prevented our leaving Wet Jacket Arm and forced a second night at the head. On 16 August, the storm had abated somewhat and we ran up the coast to Doubtful Sound in rough seas. A white Southern Giant Petrel (*Macronectes giganteus*) followed the boat for a short period during the coastal leg.

We located two further caves containing penguins. Near one, we counted 2 pairs and 2 singles on nests and 5 singles (4 nests, 11 birds) in dugouts and small caves on the exposed tip of the island. The cave contained 18 nests and 36 birds. A few eggs were seen and most nests had pairs (overall total 22 nests, 47 birds). These birds appeared to have only recently begun breeding. This cave represents the largest concentration of penguins at one location that we have found to date. We did not check the cave on the other island, but RBR recorded 6 nests and 15 birds there on 7 August 1990.

DISCUSSION

It is clear that Fiordland Crested Penguins are not abundant in the Breaksea/Dusky complex of sounds. Fishers working in the area did not regularly see the birds, and we saw no birds in the water during our time there. The absence of penguins from the large number of islands formed by a granite extrusion in lower Dusky Sound is unexplained. These islands tend to be steep-sided, but most provided landings for penguins and appropriate nesting habitat seemed to be available. Henry (1903) reported

a colony of Fiordland Crested Penguins in Luncheon Cove (which is granite) and several other colonies "within half a mile". Thus penguins have apparently disappeared from the granite islands relatively recently. Little Blue Penguins were usually present wherever we searched, and so were able to get ashore. Most of the islands that we checked in the 1991 survey appeared to us to provide appropriate breeding habitat for penguins.

All penguin colonies found in the 1991 survey appeared to be relatively early in breeding, and were therefore later by 1-2 weeks than is usual on Open Bay I., near Haast (pers. obs.).

It was unfortunate that we could not check the islands at the entrance to Breaksea Sound, as penguins are known to occur on Breaksea and several adjacent islands. Several islands near to Pigeon I. were also not checked, and Henry (1903) reported a small colony on the mainland at the southern entrance to Dusky Sound. We hope to check these locations in 1992.

The count from 1991 substantiates our report from the 1990 survey in which we suggested that Fiordland Crested Penguins are a rare species with fewer than 1000 nests each year (McLean & Russ 1991). Henry (1903 p. 34) noted that he had seen "thousands" of Fiordland Crested Penguins and that "the bush is just full of them near the shore". Thus it appears that this species was originally numerous in Dusky Sound and has declined dramatically this century.

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