

SHORT NOTE

The broad-billed prion (*Pachyptila vittata*) nesting colonies recorded during Cook's visit to Dusky Sound in 1773

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James Cook was at Dusky Sound in southern New Zealand for 6 weeks from Mar-May 1773 in the course of his 2nd voyage (1772-1775). On board HMS *Resolution* with him were Reinhold Forster, the official naturalist on the voyage, and Forster's son, George, as an assistant naturalist and natural history draughtsman (Beaglehole 1961; Hoare 1982). The Forsters and Cook found large nesting colonies of broad-billed prions (*Pachyptila vittata*), which they called "blue" petrels, on Anchor I and the Seal Is. Broad-billed prions are not known to nest on those islands now. The discovery of those colonies, and the factors that may have contributed to their demise, are discussed in this note.

Discovery of the "blue" petrels of Dusky Sound
During the afternoon of 12 Apr, Reinhold Forster accompanied Cook on a visit to the Seal Is at the entrance to Dusky Sound. In the evening, Forster saw "thousands of the blue Petril" about the island on which they had been able to land. He later recorded that the summits of the Seal Is "are shrubby & in the Soil under the roots of the Shrubs of the myrtle leaved Speedwell (*Veronica elliptica*) & the *Phytolacca antarctica* (*Coriaria ruscifolia*), the blue Petrels (*Procellaria vittata*) have burrowed their retreats, wherein they bring up their young ones" (Forster in Hoare 1982: 254, 275-276).

On 13 Apr, Reinhold Forster again accompanied Cook when he went surveying. High surf at the Seal Is prevented a landing there, so Cook decided to survey round Anchor I. When working along the north side of the island, they came across a drifting boat that belonged to a party from the ship who had gone shooting in Goose Cove on Resolution I. They recovered the boat and moored it in a small cove where they lunched and "heard a noise of young birds in several holes under huge stones & between the rocks, but could get none of them". Later that afternoon they attempted to rescue the sportsmen, but were not successful in doing so until early the following morning after which they returned to the cove where they had left the drifting boat: "Here we heard at about 5 o'clock a croaking & sometimes a shrill noise, caused by innumerable young & old birds, which we found to be the blue or black banded Petrels, which live in the above mentioned holes, & are fed there by their parents, who go every day in the morning out to Sea, & return in the evening, & disgorge the collected food in the mouths of their young ones. We saw in the dawn vast flights of them go out to Sea." (Forster in Hoare 1982: 255-256).

Cook's original account of the relevant part of this event, an edited version of which appears in Cook (1777: 1: 79), is as follows: "When we came to the Creek which was on the nw side of Anchor Isle we found their an immense number of Blue

Peterls, some on the Wing, others in the Woods, in holes in the ground, under the roots of trees and in the crevices of rocks where there was no getting at them and where we supposed their young ones were; as not one was to be seen in the day time they must be then out at sea seeking for food which they bring to their young in the evening, the noise they made was like the croaking of Frogs. They are I believe of the broad bill'd kind which sort are not so commonly seen at sea as the others, here however they are in great numbers and fly much about in the night, some of our gentlemen at first took them for bats" (Cook in Beaglehole 1961: 120-121).

George Forster later gave an account of the "blue" petrels seen in Dusky Sound which was based on his father's observations of 12-14 Apr 1773: "Here they found an immense number of petrels of the bluish species, common over the whole southern ocean, some being on the wing, and others in the woods, in holes under ground formed between the roots of trees and in the crevices of rocks, in places not easily accessible, where they probably had their nests and young. In day time, not one of them was to be seen there, the old ones then being probably out at sea in quest of food. They now saw them going out for that purpose, and two days ago they had been observed at the Seal Islands, returning in the evening in order to feed their young with the food which they had collected. They now heard a great variety of confused sounds coming from the sides of the hill, some very acute, others like the croaking of frogs, which were made by these petrels. At other times we have found innumerable holes on the top of one of the Seal Islands, and heard the young petrels making a noise in them; but as the holes communicated with each other it was impossible to come at one of them. We had already frequently observed the old petrels flying about us in the evening, when we returned late from our excursions, but till now they had always been taken for bats. They have a broad bill, and a blackish stripe across their bluish wings and body, and are not so large as the common shear-water or Mank's petrel of our seas. The instinct is very wonderful which actuates these birds to burrow holes under ground for their young, to roam all over the ocean in quest of food for their support, and to find their way to the shore when they are several hundred leagues distant from it" (Forster 1777: 1: 153-154).

Identity of the "blue" petrels of Dusky Sound

Reinhold Forster identified the "blue" petrels he saw in Dusky Sound with the "blue" petrels he had collected in the southern Indian Ocean in Dec 1772 that he and his son described and illustrated as *Procellaria vittata* (Medway 2002). A manuscript catalogue of George Forster's zoological drawings contains the following entry relating to his folio 87

of *Procellaria vittata*: "Breed in Dusky Bay, under ground in holes which communicate: Make a noise like Toads or Chickens" (Medway 2002). Reinhold Forster included a brief account of the Dusky Sound petrels with his description of *Procellaria vittata*. His original Latin text (Forster 1772-1775: 1: 35) has been published by Lichtenstein (1844: 21) and Medway (2002). A translation reads: "They have their nests in burrows under rocks and the roots of trees on the cliffs of New Zealand. The adults leave the nestlings in the morning and spend the whole day at sea collecting food for themselves and their young from fishes and worms; by night or in the evening they return in flocks to their young (I have seen many thousands returning at the same time) and then they disgorge the food into the mouths of their young; before dawn they make such a clamour when they are passing the time in the burrows that you do not know whence the noise arises and you can scarcely hear a man talking near you; then at dawn itself they head for the sea again in flocks and they are to be seen scattered over the whole ocean incessantly flitting this way and that".

The "blue" petrels seen in Dusky Sound were unquestionably prions (Medway 2002). George Forster said they had a broad bill, and Cook believed them to be of the broad-billed kind. It seems that Reinhold Forster was not able to obtain a specimen at Dusky Sound, but he must have seen some of those birds closely enough to identify them with the "broad-billed" prions he had collected in the southern Indian Ocean a few months previously (Medway 2002). The only "broad-billed" prion that nests in the southern New Zealand region is the broad-billed prion (*Pachyptila vittata*) (Taylor 2000: 295). The "blue" petrels of Dusky Sound have always been identified as that species (Mathews & Hallstrom 1943: 24; Oliver 1955: 123; Medway in Hoare 1982: 2: 252n; Fleming 1982: 94; Medway 1990: 125; Turbott 1990: 46; Marchant & Higgins 1990: 515; Taylor 2000: 295; Checklist Committee (OSNZ) 2010: 99).

Reinhold Forster and Cook thought the broad-billed prions were nesting when they saw them at their colonies in Dusky Sound. Richdale (1944, 1965) found that the breeding season of the broad-billed prion on Whero I, near Stewart I, extended from about the beginning of Aug, with most eggs being laid at the end of that month, until the 1st week of Jan, with most chicks leaving between 10 and 20 Dec in the 1942-1943 season. His observations indicated that broad-billed prions were absent from their breeding ground on Whero I only for a short continuous period of c. 5 weeks after breeding was completed by the latest birds, and that thereafter they appeared spasmodically on their breeding areas until the pre-laying period about the beginning of Aug. Richdale (1965: 136)

considered that weather conditions played a part in the presence or absence of birds on the island. His observations showed that: "The birds were ashore only at irregular intervals. There would be an influx ... and the birds would stay in the burrows for a varying number of days. In this period other birds would be in the air at night, presumably having just arrived. There was usually much calling from the burrows during the day. Then would follow a silent period with no calls day or night and with none in the air at night. The island was temporarily deserted." Richdale's observations indicate that the petrels observed at and about Anchor I and the Seal Is on 12-14 Apr 1773 were broad-billed prions on a post-breeding visit to their nesting grounds.

Demise of the broad-billed prions of Dusky Sound

Vancouver's expedition visited Dusky Sound in 1791, just 18 years after Cook. Archibald Menzies, the botanist on Vancouver's ship, recorded that they were met by vast flights of "blue" petrels as the ships approached Dusky Sound on 2 Nov 1791, but "blue" petrels are not mentioned while the expedition was in Dusky Sound itself. This may be primarily because neither Menzies nor, apparently, anybody else from Vancouver's ships visited the Seal Is or the small cove at the nw end of Anchor I where "immense" numbers of those birds had been seen in 1773 (McNab 1908-1914: 2: 483-501; Lamb 1984: 1: 359-366). Broad-billed prions would have been nesting at the time Vancouver was in Dusky Sound.

It seems that nobody went looking for the broad-billed prion colony on Anchor I until Richard Henry, the caretaker of Resolution I from 1894-1908 (Hill & Hill 1987), did so more than 100 years after Reinhold Forster and Cook had observed them there. In Apr 1900 Henry went to the island, which he had visited several times before, specifically for the purpose of finding "blue" petrels if he could, but he found no evidence of them. As he reported in Jul 1900: "Captain Cook mentions great numbers of blue petrels on Anchor Island in April, but I never saw one there, and thought it might be for want of going at the right time. So last April I had a good cruise round there at the same place and date, but there was no sign of them" (Henry 1901: 133; *contra* Begg & Begg 1975: 154 and Taylor 2000: 295).

The Petrel Is near Anchor I Harbour were named by Cook in 1773, but he does not mention why he gave them that name. Charles Fleming and I did not find any evidence of petrels on the northern portion of the large Petrel I when we searched for signs of them there on 15 Apr 1973, exactly 200 years after Cook had been in Dusky Sound. Morrison (1984) found sooty shearwaters (*Puffinus griseus*) breeding on the Petrel Is or the Seal Is, or both, in Feb 1984.

Luncheon Cove on Anchor I was the base for the 1st New Zealand sealing gang in 1792-1793, and it seems to have been the most frequently-used haven for sealing gangs in New Zealand throughout the entire course of the industry until its decline in the 1820s (Smith 2002). The nearby Seal Is were the principal sealing grounds from the base at Luncheon Cove. Captain Raven left a sealing gang at Luncheon Cove in Nov 1792, having completed a substantial dwelling house for them and landed provisions and stores for 12 months. Raven returned for the gang in Sep 1793. He subsequently reported that they had procured ducks, wood-hens, and various fowls in "great plenty", and that the animals he left had fed themselves upon what they found in the woods and were exceedingly fat and "prolific" (McNab 1908-1914: 1: 177-179). Cats (*Felis catus*) were included among the animals which Raven left with the sealing gang. When they departed from Anchor I in Oct 1793, Murray, a mate on Raven's ship, recorded: "It happened that the last Boat when was at Luncheon had forgot a Cat which was out of the House. A boat was now sent to fetch that Cat" (McNab 1908-1914: 2: 517).

The identity of animals other than the cats which Raven left with the sealers at Luncheon Cove in 1792 is not known (Thomson 1922: 16; *contra* Begg & Begg 1975: 171). The above-quoted statement suggests that at least some of them had become free-ranging and plentiful by the time he returned to the island just 10 months later. Broad-billed prions may have been among what those animals fed upon in the woods, and those birds may have been among the various fowls that the sealers themselves procured in "great plenty". Some of the "prolific" animals mentioned by Raven may have remained on Anchor I after the first sealers left. No doubt more animals were taken there by subsequent sealers who used the island as their base, but there seem to be no surviving records in that regard.

Vancouver's ship would almost certainly have carried rats, as did Cook's ships shortly before him. Norway rats (*Rattus norvegicus*) or ship rats (*R. rattus*), or both, may have reached Anchor I from aboard Vancouver's ship which was anchored in Anchor I Harbour for 15 days in Nov 1791. On arrival, the ship was anchored close to shore and "steadied by hawsers, from the bows to the points of the cove, and from the quarters to the trees on each side". Many movements between ship and shore would have taken place while Vancouver was there (Lamb 1984: 1: 359-366). Surely, even if Norway rats or ship rats, or both, did not reach Anchor I with Vancouver in 1791, they would have reached the island with the sealers over subsequent years, and they may have made it from there to the Seal Is as stowaways on their boats.

Although there is no direct evidence in that regard, it is probable that predatory mammals, introduced accidentally or intentionally by Europeans, were primarily responsible for the demise of the large colonies of broad-billed prions that Reinhold Forster and Cook observed at Anchor I and the Seal Is in 1773. Taylor (2000: 295) thought that these colonies were eliminated by stoats (*Mustela erminea*), but they may have ceased to exist before mustelids made their first known appearance in Dusky Sound in early 1900 (Hill & Hill 1987).

Another factor that may have contributed to the demise of these colonies should not be discounted. Probably as many as several 100,000 broad-billed prions died in the catastrophic "wreck" of that species which occurred on the west coast of New Zealand in Jul 2011 (Taylor *et al.* 2011). Most or all of those birds may have been attached to breeding colonies in southern New Zealand and the Chatham Is. An unrecorded event of this nature occurring after Cook's visit to Dusky Sound in 1773 could have significantly reduced the population of broad-billed prions which nested there at that time.

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