

SHORT NOTE

Sightings and capture of Kermadec storm petrels
(*Pelagodroma marina albiclunis*), off Haszard Island and the
Meyer Islets, Kermadec Islands, in 2004

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INTRODUCTION

Murphy & Irving (1951) described the Kermadec Is race of the white-faced storm petrel (*Pelagodroma marina albiclunis*) from 15 specimens collected 18-20 Nov 1925 at sea off Raoul and Meyer Is, Kermadec Is (29°15'S, 177°53'W) by the Whitney South Sea Expedition of the American Museum of Natural History. They separated this subspecies (hereafter referred to as the Kermadec storm petrel) from the 5 other subspecies by its white rump, generally smaller size, and a shorter and only slightly forked tail. Including these collections, there have been only 48 records of the *albiclunis* subspecies, all but 4 having been observed near or on the Kermadec Is (Table 1). The remaining 4 were reported 450 km off the eastern coast of Australia in Oct 1981 (Jenkins 1982).

On current knowledge, the Kermadec storm petrel is evidently restricted now to the Kermadec Is. However, Meredith (1985) reported fossil bones of *Pelagodroma marina* from Norfolk and Nepean Is, Norfolk group, 1366 km west of Raoul I and at the same latitude. These remains may represent the Kermadec storm petrel but there are no records of live or intact specimens from which to identify the subspecies that formerly bred at Norfolk Is and it is apparently extinct there. Fossil bones may not be identifiable to subspecies by morphology alone, but it may be possible to do so genetically.

Breeding grounds

No breeding colony of Kermadec storm petrel is known at present. The subspecies was reported first when Thomas Cheeseman visited the Kermadec Is

in 1887 and reported that the "Storm Petrel" was common in the vicinity of the islands. He also noted that Thomas Bell (a resident of Raoul, or Sunday, I) informed him that it bred on the Meyer Is and other islets (Oliver 1955; Sorensen 1964). However, Oliver did not find them on those islets during 10 months in residence on Raoul I in 1908 (Oliver 1955).

All other subspecies of the white-faced storm petrel are nocturnal on land and nest in burrows, but failure to find nests has not been for lack of searching on most of the Kermadec group. Ornithological Society of New Zealand expeditions to Raoul I and the Meyer and Herald Is in 1964 and 1966/67 failed to locate breeding birds (Merton 1970). Other biologists visited Macauley I, south of Raoul I, in 1966 and 1969 to eradicate feral goats and study birdlife (B.D. Bell, *pers. comm.*), and in 1988 (Tennyson *et al.* 1989) and 1990 (Veitch *et al.* 2004) to study birdlife and other aspects of natural history. The southern islands of the group, Curtis and Cheeseman (600 m from each other), are little-visited, but no breeding was observed during 2 recent visits by Lovegrove (1978) or a c.1 month visit to Curtis I by Tennyson & Taylor (1990).

The only records of live Kermadec storm petrels on land were the capture of 1 by spotlight at night on Macauley I on 4 Dec 1988 (Tennyson *et al.* 1989), and 4 others at the same place in Aug 1990 (Veitch *et al.* 2004). All were caught at a point opposite Haszard I (30° 14'S, 178° 25'W), which lies 220 m offshore, so it is possible that storm petrels breed on that small (c.6 ha, c.80 m high) island, which is, and probably always has been, free of introduced mammalian pests such as Pacific rats (*Rattus exulans*). This rat is abundant on Macauley I and elsewhere is incompatible with the survival of storm petrel breeding colonies (MJI, *pers. obs.*).

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Table 1 Records of Kermadec storm petrels (*Pelagodroma marina albiclunis*) at the Kermadec Is before 2004. b, beached corpse; c, collected at sea; s, sighting at sea; f, flew aboard ship; h, caught on land.

Dates	Locality	n	Record type	References
Sep 1908	Raoul I	2	b	Iredale (1910), Oliver (1955)
18-20 Nov 1925	Raoul/Herald Is	15	c	Murphy & Irving (1951)
22 Nov 1964	Herald Is.	2	s	Edgar <i>et al.</i> (1965)
Sep 1974	Raoul I.	6	s	Smuts-Kennedy (1975)
25 Nov 1974	Raoul I.	1	b	Smuts-Kennedy (1975)
31 Oct 1979	Raoul I.	1	s	Jenkins (1980)
15 Oct 1980	Curtis I.	1	f	Jenkins (1981)
22 May 1982	Macauley I.	1	s	T. Lovegrove, pers. comm.
4 Dec 1988	Macauley I.	1	h	Tennyson <i>et al.</i> (1989)
4-5 Nov 1989	Curtis I.	± 10	s	Tennyson & Taylor (1990)
Aug 1990	Macauley I.	4	h	Veitch <i>et al.</i> (2004)

Table 2 Measurements (mm, g) of 3 Kermadec storm petrels (*Pelagodroma marina albiclunis*) caught near Raoul I, Kermadec Is, on night of 7-8 Nov 2004. Imber (1984): mean, range, and sample size of previous specimens of Kermadec storm petrel. *, weight ignored because bird was on ship (hidden) for 1 day before measurement; NA, not available.

Bird	Bill	Wing	Tail	Tarsus	Toe+Claw	Mass
1	15.6	155	69	42.5	33.2	50
2	16.1	159	68	40.8	32.9	51
3	17.7	154 (worn)	65	41.6	34.5	*
Imber (1984)	16.6, 15.3-17.7, 16	156, 144-166, 16	71, 66-76, 16	41.2, 37.5-43.1, 16	37.0, 35.2-39.3, 16	NA

Haszard I, is the most likely breeding site, small burrows having been found there in late Jul 2002 (R.P. Scofield, *pers. comm.*).

During a diving expedition to the Kermadec Is from 1-14 Nov 2004, we visited those islands on MV salvage vessel *Southern Salvor* and observed birds at sea. We intended to camp on Haszard I for up to a week, using spotlights, mist nets, and taped calls to locate, and perhaps catch storm petrels, but persistent, strong easterly winds prevented our landing. BMS did, however, swim ashore on 11 Nov and spent 1 h examining burrows behind the beach. Most of the area suitable for burrowing petrels on Haszard I is at the summit, which is safely accessible only by helicopter because the surrounding cliffs consist of soft volcanic ash. We had hoped to find storm petrels breeding on the erosion slope behind the beach on the sheltered side facing Macauley I or attract and catch birds flying over the top at night.

As we were unable to land, we continued to Raoul I, 110 km to the north, passing to the east of Macauley and Haszard I on both outward and return voyages, and observing, counting, and photographing (BMS, using Canon D60 DSLR camera and Canon f4 300IS/L lens) storm petrels encountered. We examined closely those birds that came aboard at night, and measured, collected lice and blood samples (for DNA and sexing studies) and then banded and photographed birds before release.

At-sea sightings and shipboard captures

We saw at least 30 Kermadec storm petrels and 1 white-bellied storm petrel (*Fregetta grallaria*) while the vessel cruised slowly c.1-2 km off Haszard I from 0600 to 0800 h on 4 Nov 2004. The Kermadec storm petrels were characterised by: white face and eyestripe; crown not noticeably dark; pale (but rarely clear white) rump; dark, square tail; quite dark edges to underwings; limited dark markings on sides of breast; and yellow toe webs.

During the remainder of the passage to Raoul I we saw only 1 more Kermadec storm petrel. None was seen during the next 3 days when the vessel was anchored in Denham Bay on the western side of Raoul I. On 7 Nov, we shifted anchorage to the north side of Raoul I, just west of Meyer Is. During the cruise around Hutchison Bluff at the western end of Raoul Island we saw 10 Kermadec storm petrels in ones and twos. That night, while spotlighting at the stern, we saw a storm petrel and poured tuna oil on the sea to attract more. Although only 1 more was seen, within 2 h 2 had been caught on board, presumably attracted by the strong deck lights, and a 3rd was found the next evening, having probably come aboard that night and spent the intervening time sheltering in a chain locker.

The 1st bird had an entirely downy incubation patch, a white rump of unworn feathers slightly speckled grey (Fig. 1), and a nearly square tail. The incubation patch of the 2nd bird was mostly bare



Fig. 1 Dorsal view of presumed non-breeding Kermadec storm petrel (*Pelagodroma marina albiclunus*) caught off Meyer Is, Kermadec Is on 7 Nov 2004, showing extensive white rump patch.

but new down was emerging over the whole patch. Its rump feathers were much worn and feathers were probably missing, so only a narrow band of dull white was visible (Fig. 2). The tail was slightly forked. The incubation patch of the 3rd bird was covered in apparently fresh down. Its rump feathers were at least as worn as those of the 2nd bird; new white feathers were beginning to emerge from sheaths, though they were still not visible in the undisturbed plumage. Its tail was square. None of the 3 birds showed any moult of wing or tail quills.

Having seen and caught storm petrels during the only night at anchor off the Meyer Is, none was seen during 3 more nights at Denham Bay. The vessel then sailed for New Zealand early on 11 Nov, and was c.30 km north of Haszard I at dawn that day. The 1st Kermadec storm petrel was c.20 km to the north of the island and a total of 8 was seen between there and when sightings increased when the vessel was 2-3 km from Haszard I. We passed close by a flock of c.40 storm petrels c.1-2 km offshore. We saw 2 storm petrels from the inflatable on the way to Haszard I, and 8 on the way back. As on the passage northwards, highest numbers of storm petrels coincided with the presence of a pod of bottlenose dolphins (*Tursiops truncatus*). Storm



Fig. 2 Dorsal view of presumed breeding or failed breeding Kermadec storm petrel (*Pelagodroma marina albiclunus*) caught off Meyer Is, Kermadec Is on 7 Nov 2004, showing reduced white rump patch.

petrels were constantly in view during the next 1.5 h as the vessel cruised slowly off Haszard I, so that at least 80 had been seen before it was anchored southwest of Macauley I at 1000 h.

After departing from Macauley I at 1500 h, we saw a few Kermadec storm petrels c.2-10 km south of the island, then none until 3 were seen within 2 km of Curtis and Cheeseman Is, 35 km south of Macauley I. None came aboard there during the evening. Next day the vessel was >100 km to the south and no more Kermadec storm petrels were seen during the voyage south.

Breeding sites

Although Imber (1984) proposed that the Kermadec storm petrel could be merely wintering Australian white-faced storm petrels (*P. m. dulciae*), the captures at lights on Macauley I in 1988 and 1990 (Table 1) indicated that they bred there. The unexpected number of birds seen and captured during our visit far exceeded any reports since 1887 (Oliver 1955). An explanation may be that previous trips may have usually passed west of Macauley I, while our vessel passed to the east of Haszard. It is difficult to find an explanation for a population increase to account for the 150+ birds we observed, and we suggest the birds were present but missed by earlier observers.

The concentration of Kermadec storm petrels around Haszard I (90% of our sightings) reinforced our suspicion that this is the largest colony at present. Macauley I had a large population of feral goats (*Capra hircus*) until 1970 and Pacific rats are still abundant. The occurrence of these storm petrels off Meyer Is at night was surprising, as they had been reported in that area rarely since 1887 (Table 1; Sorensen 1964) but a breeding population may survive. We saw banks of small rocks partly covered by soil on South Meyer I, which might have concealed a few storm petrels nests.

Breeding season

Sightings of Kermadec storm petrels span the period from late May to Dec. None was seen during a targeted search off Haszard I and elsewhere during 14-16 Jan 2006, (C. Gaskin, *pers. comm.*). The 1st bird we caught had relatively fresh plumage and a downy incubation patch and was probably a pre-breeder (1-3 years). The other 2, by their worn plumage, may have bred or attempted to breed that season. Their brood patches being downy or in the process of regrowing down on 7-8 Nov suggests that incubation ended in Oct, which agrees with the pattern of sightings at sea.

If the peak hatching period in these storm petrels is in mid-Oct, and incubation lasts c.55 days (Richdale 1965) or 52 days (Underwood & Bunce 2004), chick-rearing 52-67 days (Richdale 1965) or 50-70 days (Underwood & Bunce 2004), and egg-laying extends over 5-6 weeks (Richdale 1965; Underwood & Bunce 2004), then Kermadec storm petrels may lay eggs between mid-Aug and mid-late-Sep, hatch late Sep-early Nov, and their fledglings may depart late Nov-early Jan. The population could then be absent from the breeding area, except for stragglers, from Jan to May.

At c.30°S, the Kermadec population's breeding season can be compared with that of the North Atlantic populations breeding on the Selvagens at 30°N (*P. m. hypoleuca*) and on the Cape Verde Is at 15°N (*P. m. eadesi*). Egg-laying occurs during the end of Jan – Mar at the Cape Verde Is, and Mar – Apr at Selvagen (Cramp & Simmons 1977). The equivalent egg-laying period deduced for Kermadec storm petrels would be Feb – Mar (Aug – Sep in the southern hemisphere), which is intermediate between that of the 2 North Atlantic populations, though closer to that at Cape Verde Is. The Kermadec Is lie within a warm ocean current, whereas the North Atlantic colonies lie in the cool Canaries current (Bartholomew *et al.* 1988). This could account for earlier breeding at the Kermadec Is in relation to latitude.

The white rump patch in the Kermadec storm petrel

Having examined the different states of the rump plumage in the birds we handled near the Meyer

Is, and another shown in fig. 7 in Veitch *et al.* (2004), of which only 1 showed a prominent and extensive white rump, we attempted to assess the frequency of white, "intermediate", or "worn" rump patches of the birds seen at sea on the return voyage. Omitting birds judged to be indeterminate because they were not seen well, we assessed the state of the rump in 54 birds: 8 (15%) had extensive white on the rump; 15 (28%) had "intermediate" rump patches that were clearly very pale but restricted and not "bright white"; and 31 (57%) had very restricted, worn, dingy white rump patches.

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[Note added in press: subsequent observations have confirmed the breeding of Kermadec storm petrels on Haszard Island (Baird, K; Imber, M. 2006. Discovery of nesting site of the Kermadec storm petrel. *Southern bird* 28: 8-9.). Whether breeding occurs on other islands in the Kermadec Island group remains to be determined. Attempts to rid Macauley Island of Pacific rats have also been initiated, and if successful, should provide increased breeding sites for the storm petrels and other seabirds of the region.]