

Appendix 1: Records of the Fiji Petrel on land.

The type specimen

The Fiji Petrel *Pseudobulweria macgillivrayi* was first described in 1859 (Gray 1859) from a single bird collected four years earlier on the island of Gau (then known as Angau) by F. M. Rayner, the medical officer aboard the vessel *HMS Herald*. The holotype is currently housed in the Natural History Museum, Tring, England (registration no. 1856.8.30.8). The history of this specimen has been investigated and documented in Bourne (1965, 1981) and Watling and Lewanavanua (1985).

Remarkably, this specimen provides the only strong clue as to the time of the year that the Fiji Petrel breeds. The current label describes it as a “young male”, its age confirmed by the observation that the flight feathers were not yet fully developed (Bourne 1981). Imber (1985) inspected the skin and he too concluded, based on skull morphology (non-fused pre-frontals), that it is an immature bird.

Lieutenant-Commander A.C.F. David reported that the specimen was listed as a young *Puffinus* among the specimens collected on the island, but no other details appear to have been recorded (Bourne 1981). According to the ship’s log (Napier unpublished), the *Herald* visited Gau between 27 September and 29 October 1855. On 28 September the ship anchored on the western side of the island, and two boats were sent out; one explored the reef to the south, the destination of the other was not recorded. Boats were launched from the *Herald* on 2, 3, 4, 5, 8, 17, 18, 23 and 24 October. The first six occasions were for survey and investigation of the island, the seventh to tow the *Herald*, and the last two to collect freshwater. It is most likely, therefore, that the Fiji Petrel was collected sometime between 2 and 17 October 1855. The boats were away from the *Herald* only during daylight hours so it is unlikely that the mariners ascended far into the mountainous, densely forested interior of

the island. We deduce, therefore, that the Fiji Petrel was probably not collected in the extreme interior of the island.

Subsequent records on land

In 1965, a Fiji Petrel landed in Nukuloa village. This report was investigated and evaluated by Bruce Palmer and Kolinio Moce, then of the Fiji Museum.

On 30 April 1984, an adult Fiji Petrel was deliberately attracted to the ground with the aid of a spotlight (Watling and Lewanavanua 1985). The location was southwest of Mount Delaco above a cliff with distant views overlooking Gau Secondary School and Nawaikama. This site (17°59'33" S, 179°16'12" E; 600 m above sea level) is hereafter referred to as the Secondary School Overlook. The bird was captured, measured, photographed and released. Unlike the Collared Petrels *Pterodroma brevipes* caught that night, the Fiji Petrel was placid and calm. When released, it did not attempt to escape or flee. Indeed, it needed to be flung high into the air before it would take flight (D. Watling, *personal observation*).

In April or May 1985, a bird landed in Nukuloa village. Moce investigated but no other details are known.

On 3 July 1985, a bird flew into lights at Nukuloa village. The bird was weak and possibly injured. Several attempts by Moce to liberate it failed. A week later the bird died. It was subsequently deposited in the Fiji Museum by Dick Watling, where it was fixed in formalin and then preserved in ethanol in an unlabelled bucket. In August 2007, the specimen was examined by Walter Boles of the Australian Museum. The bird was determined to be a young adult female that had not yet bred. The oviduct was thin and straight, and the ovary (5 x 3 mm) was smooth. The primaries were fresh but fully grown.

On 30 July 1987, a bird landed on a roof at Gau Secondary School, northeast of Nawaikama. It flew off three days later. The incident was investigated by Moce and Filimone Kau.

On 11 October 1987, a bird landed on a roof at the Public Works Depot near Nawaikama village. It flew off nine days later. The incident was investigated by Moce.

On 18 December 1989, a bird landed on a sheet-metal roof of a temporary building in Nukuloa village. Moce was at the village at the time and released the bird.

In 1990, a bird landed in Nawaikama village. The incident, investigated by Moce, featured on the Radio Fiji News.

The local community of Lele recalled that a dog came into this settlement holding a Fiji Petrel in its mouth (Ratu 2004). No date was given and no other details are known.

In December 2000, a landing was reported from Nukuloa village but no other details are known. Milika Ratu investigated the report, but its veracity remains in doubt.

In 2001, a landing was reported from Nawaikama village but no other details are known. Ratu investigated the report, but its veracity remains in doubt.

On 29 December 2002, a bird landed on a roof at Nukuloa village (Ratu 2004). This bird was photographed by Ratu and confirmed by the authors to be a Fiji Petrel. The bird was reported to be placid and did not flee when unrestrained. Unfortunately, although the bird later died, it was not retained.

Also in December 2002, a bird was reported to have landed (between 1930 and 2000 h) at Lamiti-Malawai School, in the village of Lamiti on the eastern side of the island. This incident was reported to Ratu while she was conducting an island-wide education and awareness campaign (Ratu 2004). She was told that the bird died but that it was not retained. Without confirmatory evidence, we view this report with scepticism.

In June 2003, Ratu received additional reports of single birds landing at Lovu and Nacavanadi. Apart from the time that the bird fell to ground in Lovu, no other details or supporting evidence were provided. These two reports came just days after David Priddel and Nicholas Carlile departed from Gau, and both were from villages that previously had not reported groundings. Again, without confirmatory evidence we view these two reports with scepticism.

At 2000 h on 4 May 2005 two birds were seen under power lines in Sawaieke village. One flew off, but the other was captured by local children. There was no moon, complete cloud cover and low cloud over the interior of the island. Drizzling rain was falling and a light breeze was blowing from the south-east. The next day Amania Taukei investigated the report, identified the bird as a Fiji Petrel, and released it at 2000 h that evening. Several

photographs were taken. From the worn appearance of the plumage (described by Taukei as “brown and black”) we believe that the bird was probably an adult.

About 2200 h on 12 April 2007, a bird landed in Levuka village and was captured by Epeli Bose. There was no moon, three-fourths cloud cover and low cloud over the interior of the island. Light rain was falling and the wind was from the south-east. The bird was kept in captivity, but died on the night of 19 April. It weighed 120 g just prior to death. The next day the body was forwarded to Watling in Suva on board the vessel *M.V. Dau Soko*. It was kept in the ships cooler during the voyage, and immediately placed in a freezer on arrival in Suva. Taukei recorded the grounding, collected weather data and organised for the body to be transported. In August 2007 the specimen was prepared as a museum skin by Walter Boles, Australian Museum. The bird was an adult female that had not yet bred. Measurements and notes taken at the time of preparation are contained in [Supplementary Material 2](#). The skin, along with all skeletal material and soft body tissues, were deposited in the Fiji Museum.

Erroneous reports

On the evening of 13 June 2003, while on Gau, Priddel and Carlile received a report of a Fiji Petrel having been discovered by children in the village of Nawaikama. The bird had died and been buried. Next day, when the remains were exhumed and examined, the bird was found to be a Collared Petrel fledgling with primary feathers not yet fully formed (Priddel and Carlile 2003).

In November 2004, an unusual seabird washed up on a beach near the village of Lovu. The specimen, reported to be a Fiji Petrel, was later identified by Watling as a Wedge-tailed Shearwater *Puffinus pacificus*.

In April 2007, Manueli (surname not known) reported finding a bird on an egg in a burrow while clearing land in a Yaqona *Piper methysticum* plantation near the village of Qarani. The bird escaped the following day while attempts were being made to photograph it. Subsequent investigation by Taukei located a total of 15 burrows in the vicinity, but the single photograph that was taken showed the bird to be a Collared Petrel. Collared Petrels incubating eggs on Gau in April accords with previous observations of young in the nest between May and August (see Watling 1986).

References

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Appendix 2: Measurements and description of the Fiji Petrel *Pseudobulweria macgillivrayi* specimen obtained in April 2007

Data collected by Walter Boles, Australian Museum. Specimen, skeletal material and soft body tissues were deposited in the Fiji Museum, Suva.

Morphometrics

Weight: 120 g.

Total length: 271 mm.

Wingspan: 752 mm.

Wing length: 220 mm.

Tail length: 91 mm.

Culmen length: (from skull) 33.2 mm; (exposed) 26.2 mm.

Tarsus length: 35.3 mm.

Total head length: 65.3 mm.

Toe 2 (from edge of web): with claw 33.1 mm; without claw 28.9 mm.

Toe 3 (from edge of web): with claw 39.3 mm; without claw 36.3 mm.

Toe 4 (from edge of web): with claw 40.6 mm; without claw 35.3 mm.

Body parts

Iris: dark.

Bill: external black, internal dark pink.

Gape: black.

Tarsus: light blue.

Foot: (right foot) webs with rose tinge (laterally), dark rose tinge (medially). Underside same pattern as dorsal surface.

Toes: black and light blue; webs buff. T4 has lateral side with 1st joint black, medial side light blue.

Claws: black.

Plumage

Moult: wing none, varying from little to significant wear; tail no moult; body no moult.

Primaries: (assessed on right wing) slightly worn to worn with distinct brown cast. Lengths (10 to 4, right wing): 153 mm; 151 mm; 142 mm; 138 mm; 124 mm; 119 mm; 98 mm.

Wing formula: 10 > 9 > 8 > 7 > 6 > 5 > 4.

Secondaries: not fresh, but little wear; dark grey cast.

Tertials: old but not worn.

Coverts: secondary coverts more worn than primary coverts; latter not fresh. Median coverts less worn than secondary coverts, but very worn near tertials. Lesser coverts and alula less worn than median coverts. Underwing coverts with a strong brown cast, larger feathers appear recently to have been grey.

Internal

Ovary: 10 x 5 mm; most follicles < 1 mm, a few ~1.5 mm.

Oviduct: straight and thin.

Fat: nil.

External

No Mallophaga or other ectoparasites were found.

A few feathers were removed from the axillary region of the left wing.

Appendix 3: Records of the Fiji Petrel at sea.

Captain J. B. Mitchell of the merchant vessel *Lagenbank* frequently plied between Panama and Australia by way of Tonga, Fiji and Samoa. On four occasions (8 November and 31 December 1964, and 1 January and 23 May 1965) whilst in Fijian waters, he reported seeing small dark petrels which could have been, among other things, the Fiji Petrel *Pseudobulweria macgillivrayi* (Bourne 1967).

On 12 June 1986, Dick Watling saw a single bird at sea near the barrier reef off Herald Bay, approximately 5 km off the northwest coast of Gau, and was fairly confident that this was a Fiji Petrel.

In August 1986, Alipate Tabaiwalu (a resident of Gau) witnessed a single black petrel land at night on a ferry between Viti Levu and Gau. Unaware of the importance of this observation, it went unreported until 2003 (Priddel and Carlile 2003). The observer was confident as to the date of this sighting as it coincided with a particularly memorable sporting event.

In early October 1999, a birdwatcher aboard a freight ship reported to Watling that he had sighted a Fiji Petrel in the waters of both Fiji and Tonga. The veracity of this report is unknown.

On 14 August 2003, Hadoram Shirihai reported seeing a Fiji Petrel (in the company of Heinroth's Shearwaters *Puffinus heinrothi*) off Kimbe Bay, West New Britain, Papua New Guinea. The bird was small, dark chocolate-brown with a slightly darker head. It was shaped like a Bulwer's Petrel, but with a more robust body, a larger head and heavier bill. Also, the wings were more rounded and lacked the upper wing-bar, or had only part of it (H. Shirihai *in litt.*). No mention was made of the length of the tail, which is much shorter in the Fiji Petrel (M. Imber, *personal communication*).

On 12 April 2007 members of the Western Pacific Odyssey Cruise sighted a bird that appeared to them to be a Fiji Petrel (Howell 2007). At the time the ship was at sea ~400 km north of Bougainville. No other details are known.

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Appendix 4: Surveys to locate the breeding grounds of the Fiji Petrel.

During 17–21 February 1925, an ornithological survey of Gau was undertaken as part of the Whitney South Sea Expedition conducted by the American Museum of Natural History (Jenkins 1986). Rollo Beck and another two collectors spent four days on the island. They specifically searched for the Fiji Petrel *Pseudobulweria macgillivrayi*, but failed to find it (King 1981). The only seabird among the 14 bird species encountered (13 collected and one sighted) was the Black-naped Tern *Sterna sumatrana* (Watling 1985).

The next search for the Fiji Petrel was conducted by J. B. Smart in October 1971 (King 1981). Details of the survey effort are not known. Smart discovered that the indigenous population knew nothing of the bird. He concluded, therefore, that the high interior of the island was the most likely place where the petrel nested.

In July–August 1982, members of the Forest and Bird Society and Ornithological Society of New Zealand, on a five-month survey of the South West Pacific, unsuccessfully searched the “hinterland on the north-west region of the island” (Lovegrove 1984), “specifically the saddle between Shoulder Peak [Delainavuga Hill], a forested 510 m high promontory overlooking Sawaieke village, and Delaco” (Jenkins 1986). They were looking for either surface-nesting or burrow-nesting petrels, but found none. They concluded that the most likely place to find burrows was on the high peaks of Delaco and Vatuvula. The locals were questioned about their knowledge of the Fiji Petrel, but again they could provide no useful information.

Between May 1983 and August 1984, Dick Watling undertook a series of expeditions to Gau to search for the Fiji Petrel. Visits were conducted every two months and were of 1–3 weeks duration. In all, seven surveys, totalling 61 days, were completed (see Watling and Lewanavanua 1985, Watling 1986).

In 1985, Mike Imber and Andrew Brown accompanied Watling on a visit to Gau. They were on the island from 17–26 June, spending 7 days in the field (Imber 1986). Setting out from Sawaieke they concentrated their efforts around Delaco, extending about 1 km along the highest ridge, and around a base camp 200 m below the summit. They searched for signs of petrel activity or burrows, but found none. Using spotlights at night, a small number of Collared Petrels *Pterodroma brevipes* were seen and heard, and one landed, but no Fiji Petrels

were seen. Cat scats which they found and examined contained *Rattus* fur and bone, and feathers of a Collared Petrel (Imber 1986).

From 15 September to 9 October 1987, Adrian Plant, Kolinio Qalo, Kinijioji Vererusa and Watling visited Gau. The following account is taken from field notes provided by Plant. They searched the ridge immediately south of Waiboteigau Creek (along an old track that once led from the east coast to Nukuloa), where they located burrows that they presumed belonged to Collared Petrels. A cat scat containing feathers was found. Also, setting off from Malawi, they ascended Koroninokonoko, searching the route and the ridge to the east of the upper reaches of Waiboteigau Creek. Later, they departed from Sawaieke and searched the ridge up to, and around, Delaco. They also visited Yaciwa Island, off the southern end of Gau, but spotlighting revealed no petrels. In total, the team spent 114 hours operating floodlights and spotlights at night from four sites: Delaco; the inland side of Vatulasawa peninsula; about 1 km inland along the ridge above Waiboteigau Creek; and at the Secondary School Overlook. They observed several Collared Petrels, and caught and banded one, but found no Fiji Petrels. They did discover the remains of a Tahiti Petrel *Pseudobulweria rostrata* at 620 m elevation “on a track following the steep-sided NW ridge of Qilai [Delainavuga] (a subsidiary peak of the island’s main summit, Delaco)” (Plant *et al.* 1989). They were of the opinion that the bird had been killed by a cat. Intensive searches of the vicinity failed to locate any evidence of breeding (Plant *et al.* 1989). We estimate the location of this find to be 17°59'36" S, 179°16'29" E, about midway between the Secondary School Overlook and Delaco.

In March 1989, Watling again searched the ridgeline around Delaco, without success. The repeated lack of success in locating the nesting grounds, together with concern that cutting tracks along many of the ridges could facilitate the ingress of cats into critical areas, led Watling to abandon his search. Attempts were made to obtain funding support for a major research effort, but to no avail. More than a decade passed before any further work was undertaken.

In June 2003, David Priddel and Nicholas Carlile went with Watling to Delaco to reassess the situation (Priddel and Carlile 2003). Setting out from Navukailagi, we entered the hinterland by following a newly opened track that leads to a communications tower just to the north of Delaco. Over a period of seven days we searched for burrows and inspected natural cavities

that could potentially be used for nesting. At night we searched for birds on the ground, and used spotlights in an attempt to attract birds (Priddel and Carlile 2003). Collared Petrels were sighted frequently, and one individual captured, but no Fiji Petrels were seen.

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Appendix 5: A traditional lullaby featuring the Fiji
Petrel *Pseudobulweria macgillivrayi*

Words and English translation provided by Milika Ratu.

Vuka ra Kacau, vuka ra Kacau,

Laki tau i delai Gau,

Laki kana kuita ki cakau,

Sili ka tau, ka tau, ka no.

Fly petrel, fly petrel,

Land in the upland of Gau,

Eat squids far out to sea,

Shower and land, and land, and still.