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Source: Bulletin of the British Ornithologists' Club, 142(3) : 380-382

Published By: British Ornithologists' Club

URL: <https://doi.org/10.25226/bboc.v142i3.2022.a11>

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More New Zealand Storm Petrels *Fregatta maoriana* off Gau Island, Fiji, in May 2022

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Received 19 June 2022; revised 10 August 2022; published 6 September 2022

<http://zoobank.org/urn:lsid:zoobank.org:pub:D6B581B6-6D14-406C-B3E2-0A560E53F235>

We document the sighting of four New Zealand Storm Petrels *Fregatta maoriana* off Gau Island, Fiji, by summarising the circumstances and the identification and ageing of the birds. Like the first record off Gau in May 2017 (Flood & Wilson 2017), these sightings are significant for three reasons. They are only the second confirmed records of New Zealand Storm Petrel away from New Zealand / Australasia. They provide further evidence of long-distance dispersal / migration (Fiji is c.2,000 km north of New Zealand). New Zealand Storm Petrel remains listed as Critically Endangered (IUCN 2022).

We undertook an eight-day pelagic expedition (25 May–1 June 2022) to observe tubenoses off Gau (Ngau), Fiji. The vessel used was the 18-m sailing yacht *Sauvage*. Wind direction varied between north-east and south-east, and its speed between still and 35 knots, and sea state from flat to 2.5 m: 25–26 May north-east 15–25 knots, 27–29 May east-northeast 10–15 knots (35 knots evening 28 May), 30 May east-southeast 0–5 knots (several hours of heavy rain mid-afternoon), 31 May–1 June east-southeast 10–15 knots. The broader picture saw the dominant trade winds and associated high-pressure system pushed away from Fiji by small low-pressure cells arriving from the south-west.

At given locations, we set up an oil slick using Menhaden fish oil *Brevoortia* and other fish products. Three locations south of Gau were used: 'position 1' c.50 km south (c.25 nm), 'position 2' c.30 km south (c.15 nm) and 'position 3' c.10 km south (c.5 nm). Most time was spent around position 2. These locations were originally chosen by Shirihai *et al.* (2009) for their successful at-sea search for Fiji Petrel *Pseudobulweria macgillivrayi* and were used by Flood & Wilson (2017), yielding the first record of New Zealand Storm Petrel off Gau. Morning and afternoon / evening chumming sessions lasted 3–5 hours. A fish-oil drip at the stern of the yacht was running at all other times in daylight hours.

We recorded four New Zealand Storm Petrels within c.5 km of position 2 (individual birds separated by pattern of streaks on underparts; Fig. 1). On 29 May 2022, three different New Zealand Storm Petrels were observed: bird 1 at 11.19–12.20 h, bird 2 at 15.05–15.24 h, and bird 3 at 16.13 h. On 30 May 2022, one was seen at 16.13–16.22 h.

Identification was based on recently established criteria to separate New Zealand Storm Petrel from New Caledonian Storm Petrel *F. lineata* (details in Bretagnolle *et al.* 2022; summarised in Table 1), along with our past at-sea experience of the two. Briefly, New Zealand Storm Petrel is smaller (the size of Wilson's Storm Petrel *Oceanites oceanicus*), shorter winged, shorter legged, smaller billed, with a different underwing pattern and underparts streaking. All four were seen alongside Wilson's Storm Petrels and were about the same size.

New Zealand Storm Petrel breeds in February–June (egg laying end of February; Rayner *et al.* 2013; C. Gaskin *in litt.* 2022). Typically, storm petrels that have bred successfully commence primary moult post-breeding, presumably from July in New Zealand Storm Petrel (depending on post-breeding movements, which are largely unknown). Typically, juveniles from the previous season, non- and failed breeders, commence primary moult



Figure 1. New Zealand Storm Petrels *Fregatta maoriana*, c.30 km south of Gau, Fiji, 29 and 30 May 2022, presented in chronological order, top left to bottom right. Note the compact build and relatively small bill. The white underwing panel is broad and clean-looking, with the diagnostic clear-cut border to the longest lesser secondary-coverts and the greater secondary-coverts are unmarked. All four birds show broad dark feathering from the dark lateral undertail-coverts to / beyond the thighs, forming a broad elongated dark band either side of the rear underparts, and streaking is largely confined to the flanks and upper breast. Note the bird top left lacks a toe projection beyond the tail tip because its legs are retracted. Top left and bottom right (Mike Danzenbaker), top right and bottom left (Hiroyuki Tanoi)

TABLE 1

Key differences in structure and plumage that enable field separation of New Zealand Storm Petrel *Fregatta maoriana* from New Caledonian Storm Petrel *F. lineata* (based on Bretagnolle *et al.* 2022). WSP = Wilson’s Storm Petrel *Oceanites oceanicus*.

Feature	New Zealand Storm Petrel	New Caledonian Storm Petrel
Size	Approx. same as WSP	Noticeably larger than WSP
Build	Compact	Long neck, body, wings, tail, legs and feet
Bill	Relatively tiny	Fairly long
Border of dark breast	Fairly straight	Rounded, curving from sides of lower breast to central upper breast
Underparts streaking	Variable, typically largely confined to flanks and upper breast, belly often clean white, streaks straight and do not coalesce	Variable, typically covers entire underparts, streaks dense and bold, some uniquely patterned in dense and continuous rows
Thighs	Typically has broad dark feathering from lateral undertail-coverts to / beyond thighs, forming broad elongated band either side of rear underparts	Region is streaked
Underwing panel	Broad and clean white looking, numerous underwing-coverts lack dark centres	Narrow with dirty appearance, numerous underwing-coverts have broad dark centres
Underwing pattern	Diagnostic: clear-cut border to dark leading edge and all-white greater secondary-coverts	Diagnostic: partially dark row of longest lesser secondary-coverts creates ragged border to dark leading edge, with dark centres to greater secondary-coverts



a month or so earlier than breeding adults, presumably sometime in May / June for New Zealand Storm Petrel. None of the four was in primary moult, but their primaries were noticeably worn and primary moult might be expected to commence within a month or so. This is consistent with juveniles from the previous year's breeding season, and non- and failed breeders in the current year. It is unlikely that the birds in May off Gau, c.2,000 km north of the breeding grounds, were successful breeders from the 2022 breeding season.

We considered whether the five birds recorded off Gau (in 2017 and 2022) could represent a previously unrecognised taxon of streaked storm petrel most like New Zealand Storm Petrel, or a northern population of the latter. The possibilities arise because these are the only records of the species away from New Zealand, bar a few off eastern Australia that are pending acceptance by the BirdLife Australia Rarities Committee (T. Palliser *in litt.* 2022), and thus are geographically isolated from all other records by >2,000 km. However, an unrecognised taxon or northern population of New Zealand Storm Petrel appear improbable based on current knowledge. All historical specimens of streaked storm petrel have been assigned to either New Zealand Storm Petrel or New Caledonian Storm Petrel. Other taxa of *Fregatta* are known to disperse or migrate long distances. The eastern border of the Australian tectonic plate runs directly north from New Zealand to the region around Fiji and Tonga, forming a significant ridge likely to generate upwelling and food productivity.

Acknowledgements

We thank Didier & Sophie Watrelet for safe passage on their yacht *Sauvage* and the excellent service that they provided throughout the expedition. Many thanks to Paul Walbridge and Kirk Zufelt for comments on the manuscript. PMH is funded by a Fellowship and grants from the National Health and Medical Research Council of Australia (1175134) and by the University of Technology Sydney.

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