

## Magical island's natural secrets revealed



Photos by: Steffi Ismar (top & lower right), Megan Friesen (lower)

### Buller's shearwater survey, Tawhiti Rahi, Poor Knights Islands, 5-17 December 2016

Between 5-17 December 2016 two teams of enthusiastic researchers and volunteers camped on Tawhiti Rahi, the largest island in the Poor Knight group, to begin the first stages of determining a population estimate on Buller's shearwaters. This is the first comprehensive survey for seabirds on this globally important seabird island. The aim of this trip (first of several to the islands for the 2016-2017 season) was primarily to: collect data on burrow occupancy and density throughout the island; record audio of nocturnally active seabird species to provide insight into the density and distribution of Buller's shearwaters and other species; and to investigate the incubation periods, provisioning shifts, and fledgling success of Buller's shearwater chicks. During this trip, we focused on running transects throughout the island to determine the ratio of burrow occupancy in association with environmental factors (10 transects, 100 m in length were completed). Acoustic recorders were deployed at intervals along each of the transects). We also completed

57 (6m diameter = 28.3m<sup>2</sup>) random plots distributed throughout the island (using pre-chosen coordinates). At each random plot the burrow density of all burrowing seabird species was counted. We also set up three 25m x 25m (625m<sup>2</sup>) permanent plots for long-term monitoring of the breeding biology and parental care of Buller's shearwaters. More specifically, these plots will provide information on the density of birds in a larger area, calculating an index for determining acoustic density in other areas of the island, and insight into the provisioning shifts of adults feeding chicks (via automated cameras).

Data and observations have already provided unique insight into Buller's shearwaters and Tawhiti Rahi in general. At night, Buller's shearwaters were seen in large groups on the ground interacting with each other (e.g. preening and mating). Birds were seen climbing trees to depart the colony (a potentially difficult task due to the large plateau on the island). The west coast of the island was found to be very densely occupied by Buller's shearwaters, with larger areas of burrows than were found elsewhere on the island. In fact, a significant number of the random plots showed zero Buller's shearwater burrows

The island's vegetation and other fauna also proved interesting. An expansive field of flax was discovered on the east coast of the island. Kauri trees and a puriri tree were something of a surprise amongst the pohutukawa-dominated forest, however a recent paper highlighted vegetation changes over 2000-years from a podocarp-dominant forest (with a palm) to what we see today. In addition to Buller's shearwaters, we found fairy prions (and chicks), Pycroft's petrels, little shearwaters, grey-faced petrels (and chicks) and diving petrels (chicks). Black-winged petrels, fluttering shearwaters and Cook's petrels were all heard from the island (and at least black-winged petrels presumed to be breeding – possibly on the southern headland). Five-minute bird counts were conducted along transects and at random plots highlighting a high density of bellbirds throughout the island. Other birds seen or heard included: kakariki, blackbirds, starlings, harriers (chick found), kereru, shining cuckoo (H), fantails, kingfishers, spotless crane and mynah.

Megan Friesen (Field Team Leader)

## Field team

Megan Friesen, Sandra Anderson, Karen Baird, Stefanie Ismar, Glenn McKinlay, Tim Neill, Craig Simpkins, Alan Tennyson, Jingjing Zhang



Photos by: Steffi Ismar (left), Karen Baird (right)



## Gallery



Photos by: Glenn McKinlay, Steffi Ismar (SI)



## Buller's shearwater (background notes)

Buller's shearwater (*Ardenna bulleri*) is an endemic Procellariiform to New Zealand. It is also known as the 'New Zealand Shearwater' (Ballance 2003, Taylor 2013) and nests only on the Poor Knights Islands group, north-eastern North Island (Forest & Bird 2015). Buller's shearwater is classified as **Vulnerable** (IUCN Red List) and At Risk, **Naturally Uncommon** (NZ Threat Classification System). Harper (1983) wrote about Buller's shearwater breeding biology during visits to study fairy prions (*Pachyptila turtur*) on Aorangi Island (110ha) from 1963 to 1981. J. Bartle, during visits to Aorangi to study Pycroft's petrels (*Pterodroma pycrofti*) in 1963 and 1964, accumulated information about Buller's shearwater, mainly anecdotal observations and habitat data based on study plots and transects (J. Bartle pers. comm.). G. Taylor, during visits to Aorangi in 2011-2013, looked at distribution of burrows, breeding success and undertook tracking studies using geolocators (two seasons) and GPS loggers (during pre-lay and incubation periods). However, despite of Buller's shearwaters being a commonly seen species in the Hauraki Gulf during the breeding season (Jenkins 1988, Gaskin & Rayner 2013, Gaskin & Miller 2014), the overall ecology of this species remains little studied (Harper 1983, Taylor 2013). No comprehensive survey for Buller's shearwaters (or any other seabirds) had been conducted on Tawhiti Rahi (163ha), the largest island in the Poor Knights group. The only previous accounts of birds on Tawhiti Rahi are by G. Buddle (1943), F. Kinsky and R. Sibson (1959) and J. McCallum (1981) during visits to the island in January 1943, 6-8 August 1958, and 6-12 September 1980 respectively.

The total population of Buller's shearwaters was believed to be 2.5 million birds (c. 800,000 pairs) in 1981 with c.200,000 breeding pairs nesting on Aorangi Island (Harper 1983, Taylor 2000a). However, following their visit in 2012, G. Taylor and A. Tennyson suggested that the figure of 300,000-400,000 pairs could be more likely, based on what they found on Aorangi Island.

The objective of this current study is to investigate Buller's shearwater populations and breeding biology at the Poor Knights Islands. This will be achieved by using controlled site burrow checks, acoustic surveys and population models. The results of this survey will feed into a larger project (to be funded separately) that investigates the foraging behaviour of Buller's shearwaters throughout their range including their migration to the North Pacific Ocean.



Photos by: Neil Fitzgerald (left), Karen Baird (right)

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