

# Motuhara seabird research: field trip report January 2021



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## Introduction

Motuhara (the Forty-Fours) is Maori Freehold Land with over 200 registered owners. I discussed this research, and access to the island with the senior owners of Motuhara, and I am grateful to the island owners for granting permission to land and camp on the island to undertake this research.

Northern Royal Albatross (*Diomedea sanfordi*), Northern Buller's Mollymawk (*Thalassarche bulleri plateri*) and Northern Giant Petrel (*Macronectes halli*) all have significant breeding populations on Motuhara (43°96'S, 175°83'W) (Checklist committee 2010).

Northern Royal Albatross have been counted on Motuhara using aerial photography from 2006-2009, with an average count of 2,209 breeding pairs (range 1,879-2,692 pairs), although a ground census in 2016 recorded only 1,400 breeding pairs (Bell *et al.* 2017). A larger number of birds are also found breeding on The Sisters, where the average count was 3,336 pairs over the same period (Scofield 2011), although again down to 2,250 breeding pairs in 2017 (Bell *et al.* 2018). A small population of 30-40 pairs also breeds at Taiaroa Head, Dunedin.

Northern Buller's Mollymawk have been counted on Motuhara in 2007, 2008 and 2009, with an average count of 14,699 nests (range 14,185-15,238 nests) (Fraser *et al.* 2010). A repeat census in 2016 recorded 17,682 nests with the increase in numbers considered to reflected improved methodology rather than a true increase (Bell *et al.* 2017). This represents the largest breeding colony of the species, with approximately 3,200 pairs also breeding on The Sisters (Bell *et al.* 2018) and a small population of 15 pairs on Rosemary Rock, in the Three Kings Islands (northern North Island).

The number of Northern Giant Petrels breeding on Motuhara has never been systematically counted, but the breeding population was estimated at 2,000 pairs in 1993 (Robertson and Sawyer 2004). Extrapolating from a census during mid chick rearing in 2016 the population of Motuhara was estimated at 1,935 breeding pairs (Bell *et al.* 2017); making Motuhara the largest colony of this species in New Zealand.

This report summarises the results of a field trip to Motuhara in January 2021 to undertake a research on Northern Buller's Mollymawk, Northern Royal Albatross and Northern Giant Petrel; including deploying tracking devices on birds.

## Results

### Field trip

A team of two, Mike Bell and Paul Bell camped on Motuhara from January 19<sup>th</sup> to 31<sup>st</sup> 2021. Due to a northwest roll, we landed at the south landing, resulting in a slightly longer carry of gear to the camp site. Despite this we landed and had finished setting up camp by 11am on the 19<sup>th</sup>. The weather throughout the trip was good, with mostly light winds and very little rain, which meant that very little field time was lost to weather. We departed the island from the north landing, in exceptional calm conditions.

During this field trip we found the island to be well vegetated although being later in the season areas of Button Daisy and Senecio were starting to die back. The vegetation did not appear to be too adversely affected by the extended dry periods the Chatham's has been experiencing over the past two years. There was less vegetation in the western end of the Island (the main area of breeding Northern Buller's Mollymawk) than recorded during the last visit in December 2016, although the Eastern end of the island (the main Northern Royal Albatross colony) was mostly well vegetated with what appeared to be normal late summer die off of Button Daisy and Senecio (Figure 1).

*Figure 1. Photo of main Royal Albatross breeding area on the eastern end of the island showing condition of island and vegetation.*



## Northern Royal Albatross

### Study plot establishment

Two study plots were established on Motuhara to create a marked population to begin a demographic research project aimed at investigating adult survival. Both study plots were within the main Royal Albatross breeding area on the eastern end of the island. The first, named Tuamata study plot, is located at the summit, and runs down to the north-eastern cliffs. The second, the Māwake study plot, is on the central plateau heading down towards the south-eastern cliffs.

Each plot contained at least 100 active nests, where an attempt was made to capture and band both partners from each nest. These breeding adults attending eggs or young chicks were banded with both a metal and engraved darvic band to assist re-sighting moving forward. A total of 366 adult breeding Royal Albatross were banded within these two study plots (Table 1)

*Table 1. Number of nests, and nests where one, or both partners were banded in each study plot on Motuhara Jan 2021.*

Study colony	Study nests	One partner banded	Two partners banded
Tuamata	101	14	87
Māwake	100	21	79
Total	201	35	166

### Recoveries of banded birds

Only 3 previously banded Royal Albatross were recorded during the trip, along with a closed metal band found on the surface – this band had no wear and was a band put on a chick in 1994 and it is likely that this chick died before fledging and the band has not been discovered until now. All three of these birds were banded as chicks on Motuhara on 23 May 1994, making them 25.5 years old (Table 2). These band returns have been submitted to the FALCON banding database.

*Table 2. Details of banded Royal Albatross recorded on Motuhara January 2021.*

Band Number	Recovery date	Banding date	Banding age	Minimum age
R32820	24/01/2021	23/05/1994	Chick	25.5 years
R34465	30/01/2021	23/05/1994	Chick	25.5 years
R34471	30/01/2021	23/05/1994	Chick	25.5 years
R34534	24/01/2021	23/05/1994	Chick	0 – presumed chick died prior to fledging.
Band only recovered				

### PTT tracking deployment

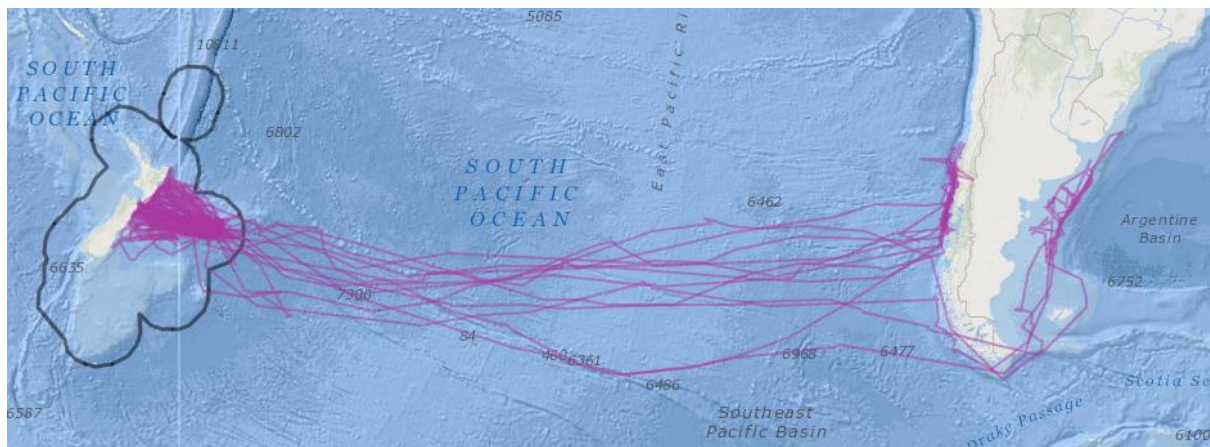
A total of 30 PTT trackers were deployed on breeding Royal Albatross from within the Taumata study plot. The aim was to track both partners from each pair, however as some birds didn't change over in time additional birds were chosen for deployment (attempting to keep an even sex ratio based on measurements). In total 13 nests had both partners tracked, with 4 nests having a single bird tracked. One of the 25 year old recaptured birds had a PTT attached.

Breeding birds were targeted for deployment, but two nests failed during hatching. At the time of departure all other nest were active, but from the tracking data at least 6 nests failed in the early chick period with birds departing to South America. Location data from tracked birds is available on the Department of Conservation’s shiny app <https://docnewzealand.shinyapps.io/NorthernRoyals/> (Table 3 and Figure 2).

Table 3. Details of nest with PTT devices attached, Motuhara January 2021.

Nest	Male	Female	Nest status on departure from Island
1	Yes	Yes	Chick
2	Yes	Yes	Egg
3	Yes	Yes	Chick
4	Yes	Yes	Chick
5	Yes	Yes	Egg
6	Yes	Yes	Chick
7	Yes	Yes	Chick
8	Yes	Yes	Chick
10	Yes		Egg
11		Yes	Failed
12	Yes	Yes	Egg
13	Yes	Yes	Chick
14	Yes		Failed
15	Yes	Yes	Chick
16	Yes	Yes	Egg
101	Yes	Yes	Chick
XR	Yes		Chick
Total	16	14	

Figure 2. Screen shot from Department of Conservation albatross tracker shiny app (accessed June 17<sup>th</sup> 2021) showing tracking data for Northern Royal Albatross from Motuhara.



Unfortunately, 12 of the PTT stopped transmitting earlier than expected, initially it was believed that the device may have fallen off the bird. However, on a pelagic birding trip into Cook Strait, Phil Battley photographed one of these birds, the image clearly shows that the aerial has been lost from the device which would prevent data transmission (Figure 3).

*Figure 3. Northern Royal Albatross photographed in Cook Strait with PTT device with aerial missing (Photo Phil Battley).*



### Static camera deployment

Five trail cameras were set up within the main Royal Albatross breeding area at the eastern end of the island to investigate aspects of breeding ecology of the species. Cameras were mounted on purpose-built mounts rock-bolted to areas of raised rock, which provided a vantage point over an area of nests (Figure 4). As the eastern end of Motuhara is relatively flat, and Royal Albatross prefer flat ground, site selection was some-what limited. Despite this, 5 suitable areas for camera deployment were found which cover a variety of aspects within the breeding area. Cameras were programmed to record a still image every hour and were left running to be checked in December 2021 during the next planned visit to the island.

## Aerial study grids

Five study grids were established within the main breeding area on the eastern end of the island to support future aerial survey work, and these were counted on January 30<sup>th</sup> (Table 4).

*Table 4. Nest counts from 5 newly established study grids in the main Royal Albatross breeding area on Motuhara Island, January 2021.*

Study grid	Egg	Chick	Failed	Total
Grid 1	10	21	2	33
Grid 2	5	21	3	29
Grid 3	8	17	3	28
Grid 4	8	27	3	38
Grid 5	7	22	2	31

## Northern Buller's Mollymawk

### Study plot establishment

Two study plots were established on Motuhara to establish a marked population to begin a demographic research project aimed at investigating annual adult survival. Both study plots were within the main Buller's Mollymawk breeding area on the western end of the island. The first, named Hopuni study plot, is located adjacent to the camp, and runs down the valley towards the northern landing. The second, the Roto study plot, is on the plateau on the edge of the "lake" running down to the south-western cliffs.

Each plot contained at least 100 nests, where an attempt was made to capture and band both partners from each active nest. Well-formed nests, which showed signs of being bred in this season, but had already failed, were included in the study plots, but birds from these nests were not banded as it could not be confirmed that they were the breeding birds from these nests or interlopers. The breeding adults attending eggs or young chicks were banded with both a metal and engraved darvic band to assist re-sighting moving forward. A total of 317 adult breeding Buller's Mollymawk were banded within these two study plots (Table 5)

*Table 5. Number of nests, and nests where one, or both partners were banded in each study plot on Motuhara Jan 2021.*

Study colony	Study nests	One partner banded	Two partners banded	Empty/ failed nests
Hopuni	100	26	52	22
Roto	104	12	79	13
Total	201	38	131	35

### Recaptures

Five banded Buller's Mollymawk were captured from around the Camp area, these birds were banded in 2007 and 2008 as breeding adults. With an estimate age of first breeding of 12 years (Francis and Sagar 2011) the minimum age of these birds is estimated at 27-28 years old (Table 6). As it was suspected that these would be birds which had previously been used for tracking studies,

these birds had GLS devices deployed on them. These band returns have been submitted to the FALCON banding database.

*Table 6. Details of recaptured Buller’s Mollymawk caught on Motuhara, January 2021.*

Band Number	Recovery date	Banding date	Banding age	Minimum age
M-81061	20/01/2021	16/11/2007	Adult	28 years
M-81084	21/01/2021	9/11/2008	Adult	27 years
M-81080	21/01/2021	9/11/2008	Adult	27 Years
M-81070	22/01/2021	17/11/2007	Adult	28 Years
M-81071	22/01/2021	17/11/2007	Adult	28 Years

### GLS deployment

A total of 55 GLS devices were deployed on breeding Buller’s Mollymawk from within, or near the Hopuni Study Plot. Again, our best attempt to deploy devices on both partners at nests was undertaken; with 23 pairs having GLS devices attached (Table 7). The five recaptured birds were all fitted with GLS, as these birds were just outside the study area, but were from the area that previous tracking work had been carried out from.

*Table 7. Details of Buller’s Mollymawk pairs (nest numbers given) with PTT devices attached on Motuhara, January 2021.*

Nest	Male	Female	Nest status on departure from Island
1	Yes	Yes	Chick
2	Yes	Yes	Chick
3	Yes		Chick
5	Yes	Yes	Chick
7	Yes	Yes	Chick
8	Yes	Yes	Chick
10	Yes	Yes	Chick
11	Yes	Yes	Chick
13	Yes	Yes	Chick
14	Yes	Yes	Chick
20	Yes	Yes	Chick
21	Yes	Yes	Chick
22		Yes	Chick
23	Yes	Yes	Chick
26	Yes	Yes	Chick
27		Yes	Chick
34	Yes		Chick
35	Yes	Yes	Chick
38	Yes	Yes	Chick
39	Yes	Yes	Chick
39	Yes		Chick
41	Yes	Yes	Chick
42	Yes	Yes	Chick
43	Yes	Yes	Chick
45	Yes	Yes	Chick



87	Yes	Yes	Chick
Tent 1	Yes	Yes	Chick
Tent 2	Yes	Yes	Chick
Blow hole	Yes		Failed
Blow hole		Yes	Failed
Blow hole	Yes		Chick

### Study grid counts

The 5 existing 10x10m study grids were counted (recording nest contents), and 5 further grids were established on the island and counted (Table 8). These grids are used during aerial surveys of the island.

*Table 8. Nest counts from the 5 existing and 5 newly established study grids on Motuhara Island, January 2021.*

	Study grid	Egg	Chick	Empty	Total
Existing	Grid 1	11	32	8	51
Existing	Grid 2	13	43	21	77
Existing	Grid 3	2	41	14	57
Existing	Grid 4	8	45	22	75
Existing	Grid 5	10	39	19	68
New	Grid 6	6	51	18	75
New	Grid 7	4	32	22	58
New	Grid 8	7	47	13	67
New	Grid 9	4	53	7	64
New	Grid 10	8	33	14	55

### Static camera deployment

Five trail cameras were set up within the main Buller's Mollymawk breeding area at the western end of the island to investigate aspects of breeding ecology of the species. Cameras were mounted on purpose-built mounts rock-bolted to the sides of low cliffs which provided a good vantage point over an area of nests (Figure 4). As the western end of Motuhara has many areas of low cliffs and dense breeding concentrations of Buller's Mollymawk there was multiple options for selecting areas for cameras. Again, cameras were programmed to record a still image every hour and were left running to be checked in December 2021 during the next planned visit to the island.

Figure 4. Static camera mounted to low cliff providing a vista of Buller's Mollymawk nests, Motuhara January 2021.



## Northern Giant Petrel

### Chick banding

The timing of this field trip overlapped with fledging of Giant Petrels, with chicks actively fledging whilst we were on the island. During the first half of the trip we banded a total of 450 chicks on the verge of fledging.

### PTT tracking deployment

A total of 10 PTT trackers were deployed on Giant Petrel; as the breeding season was almost over (chick fledging was well advanced), it was not possible to target birds from known nests, or birds that were known to still be tending chicks. All adult birds were in active moult, and we attempted to deploy devices on birds that were further progressed through their moult cycle (birds with a higher primary moult score) in the hope that devices may last for a longer time on these birds. However, there was no correlation between moult score and duration the device remained transmitting data (Table 9).

The PTT devices transmitted for between 19-82 days, and showed that all birds travelled towards New Zealand, with most birds using the Kaikoura to Cook Strait area at some time. Location data

from tracked birds is available on the Department of Conservation's shiny app <https://docnewzealand.shinyapps.io/albatrosstracker/> (Figure 5). One of the tracked birds was seen and photographed by Tracey McKeown (Albatross Encounter) off Kaikoura on March 10<sup>th</sup> 2021 (Figure 6)

*Table 9. Details of primary moult score, deployment date and duration on adult Giant Petrels tracked from Motuhara, January 2021.*

Darvic band number	Primary moult score	Date deployed	Last data received	Days on bird
001	27	23/01/2021	26/03/2021	63
002	27	23/01/2021	09/03/2021	45
003	17	23/01/2021	15/04/2021	82
004	15	23/01/2021	10/03/2021	46
005	39	23/01/2021	11/04/2021	78
006	35	23/01/2021	13/03/2021	49
007	41	23/01/2021	08/04/2021	75
008	39	23/01/2021	13/03/2021	49
009	41	27/01/2021	15/02/2021	19
010	43	27/01/2021	11/03/2021	43

*Figure 5. Screen shot from Department of Conservation albatross tracker shiny app (accessed June 17<sup>th</sup> 2021), showing tracking data for Giant Petrel from Motuhara.*



Figure 6. Giant Petrel with PTT device photographed off Kiakoura by Tracey McKeown (Albatross Encounter) on March 10<sup>th</sup> 2021.



### Static camera deployment

Two trail cameras were set up with an overview of areas of Giant Petrel nests to investigate aspects of breeding ecology of the species. As Giant Petrel nesting is relatively dispersed on the island, and most birds breed on the flatter eastern end of the island, it was only possible to deploy a camera where a small number of nests were within the cameras field of view (2-5 nests per camera). As with the other cameras, these were programmed to record a still image every hour and were left running to be checked in December 2021 during the next planned visit to the island.

### Acknowledgements

Motuhara is a privately owned Island and I am grateful for the island owners allowing me access to the island to undertake this research. Thanks to Chris Morrison for providing access to the island and my brother Paul for his company and hard work on Motuhara. This work was funded by the Department of Conservation Conservation Services Program and I thank Graeme Taylor for managing this.