

Motuhara seabird research: December 2016



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EXECUTIVE SUMMARY

Motuhara is Maori Land and we are very grateful for the permission of the island owners to camp on the island to undertake this research.

A field team of three (Dave Bell, Dave Boyle and Hamish Tuanui-Chisholm) camped on the island from Dec 5th until Dec 9th 2016.

A full census of Northern Buller's Mollymawks on the island counted 17,682 nests sites. This total is higher than previous counts (2007-09 average 14,699 nests) and is likely to be a result of improved methodology rather than an increase in numbers.

A full census of Northern Royal Albatross on the island counted 1,400 birds incubating eggs. This is significantly lower than that recorded using aerial photography in 2006-2009: average of 2,209 breeding pairs (range 1,879-2,692 pairs). As Northern Royal Albatross are a biennial breeder, without knowing the productivity from last season, it is difficult to determine if this represents a true decline and further research is needed.

A full census of the island counted 1,235 Northern Giant Petrel chicks. Applying a correction factor using breeding success data from the island (which is similar to that recorded from Macquarie Island) the breeding population on Motuhara is estimated to be 1,977 breeding pairs (range 1,769-2,217 breeding pairs). There is no previous full island census to determine population trends.

1. INTRODUCTION

Motuhara is Maori Freehold Land with 187 registered owners (at December 2016). In 1993 four owners were appointed agents, primarily to deal with requests for access. In Oct 2016 the last of these agents passed away. At present no new agents have been appointed. We discussed this research, and access permission with the senior owners of Motuhara. Permission is required to land and camp on the island and we are very grateful to the island owners for granting permission 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 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). This represents the largest breeding colony of the species, with approximately 2,000 pairs also breeding on The Sisters and a small population of 15 pairs on Rosemary Rock, in the Three Kings Islands (northern North Island).

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). A larger number of birds are also found breeding on The Sisters, where the average count was 3,336 pairs over the same time period (Scofield 2011). A small population of 30-40 pairs also breeds at Taiaroa Head, Dunedin.

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).

This report summarises the results of a field trip to Motuhara in December 2016 to undertake a population census of Northern Buller's Mollymawk, Northern Royal Albatross and Northern Giant Petrel.

2. METHODS

2.1 Census

A full census of Northern Buller's Mollymawk, Northern Royal Albatross, and Northern Giant Petrel on Motuhara was carried out using the same format.

For each species the island was separated into count sections and within each of these sections every nest site was marked with a small dot of spray paint to ensure all nests were counted and no nests double counted. At each nest the contents were recorded as either-

- Egg – a nest with an adult bird incubating an egg
- Chick – a nest with an adult bird guarding a chick, or a live chick alone in a nest
- Failed nest – a nest with a broken or abandoned egg, or dead chick. Representing a nest where a breeding attempt was undertaken this season, but had already failed
- Empty – a nest without an egg or chick, which may have an adult bird present, but shows no evidence of attempted breeding this season

For Northern Buller's Mollymawk the island has been divided into 18 count sections (Figure 1). To define each section, the boundaries were marked with spray paint. Parts of the island where Northern Buller's Mollymawk breed that are not accessible on foot were counted using binoculars from vantage points. Nest contents were inferred by the bird's behaviour (i.e. birds standing on an empty nest, birds repositioning an egg etc.).

For Northern Royal Albatross the Island was divided into 4 count sections, each a discrete colony area (Figure 2).

For Northern Giant Petrel the island was divided into 4 count sections, each on the edge of the Northern Royal Albatross breeding colonies (Figure 2).

Figure 1. Count sections of Northern Buller's Mollymawk on Motuhara

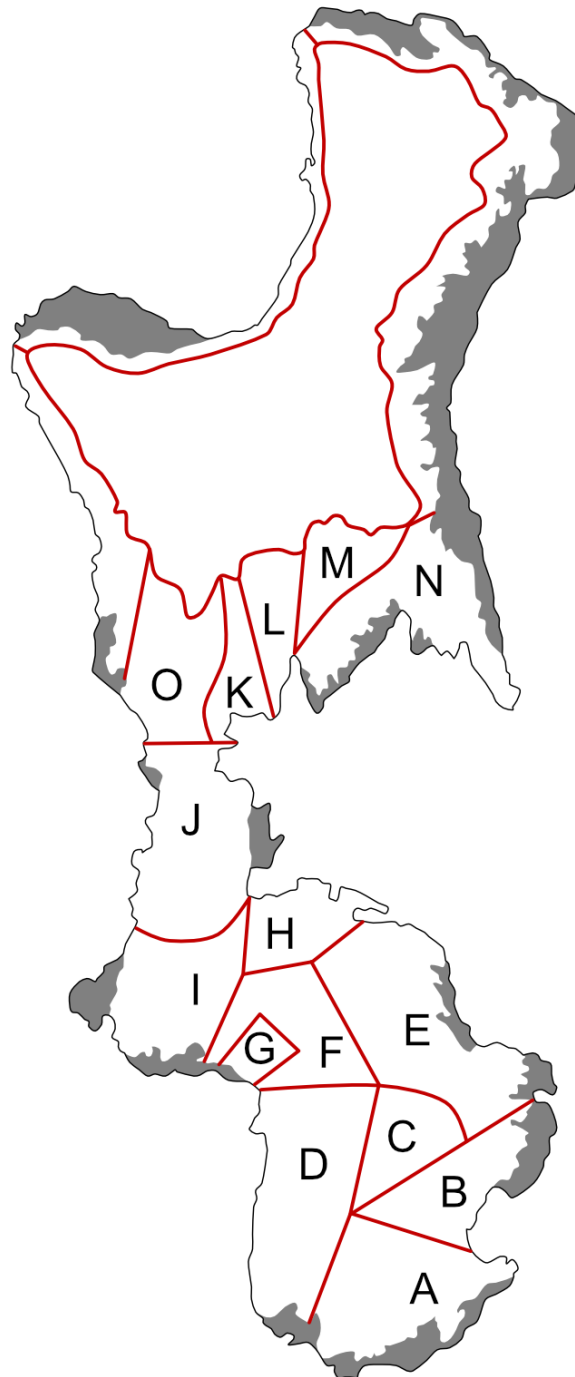
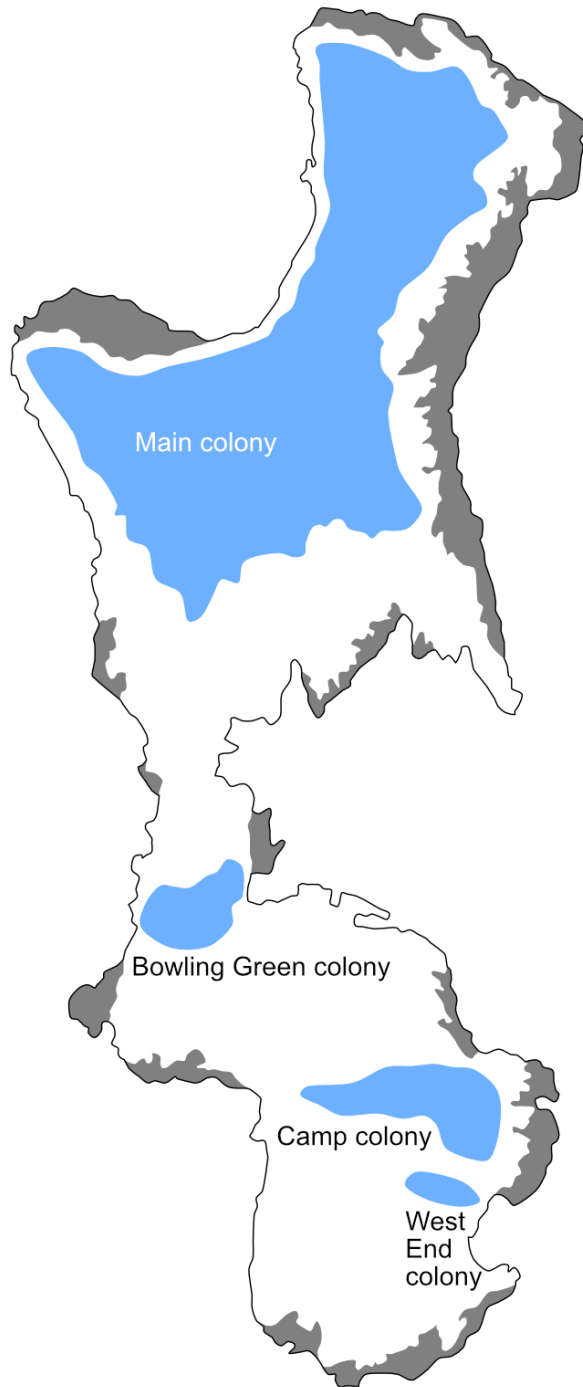


Figure 2. Count sections of Northern Royal Albatross and Northern Giant Petrel on Motuhara



3. RESULTS

A field team of three (Dave Bell, Dave Boyle and Hamish Tuanui-Chisholm) arrived on Dec 5th, and camped on the island until they departed on Dec 9th. A brief overview of the field trip is provided below -

Dec 5th - Depart Owenga 0730 and arrive Motuhara 0900. Landing using Naiad, team and gear ashore by 0930. Gear up to Camp and Camp established by 1330. Familiarisation of field team with the island. Mark Buller's Mollymawk count sections and start Buller's census (Sections D and C).

Dec 6th – Continue with census Buller's Mollymawk and count 5 Buller's Mollymawk study grids.

Dec 7th – Completed census of Buller's Mollymawk. Undertook ground truth transects of Buller's Mollymawk for Barry Baker for use in aerial census work. GPS Royal Albatross colony boundaries, and GPS nest locations of two sample areas of Royal Albatross nests for Barry Baker for Satellite counts. Census of Giant Petrel Sample Area 2 and small Royal Albatross and Giant Petrel colonies.

Dec 8th - Census of Royal Albatross and Giant Petrel main colony. Undertook ground truth transects of Royal Albatross for Barry Baker for use in aerial census work. Counted offshore stacks from vantage points.

Dec 9th – Picked up from island at 1100. Circled Island and counted offshore rock stacks. Departed Motuhara at 1215, arrived Owenga 1400.

3.1 Island condition

During this field trip we found the island to be extremely well vegetated. Many areas of the western end of the Island, including the areas of breeding Northern Buller's Mollymawk, had good growth of Button Daisy and *Senecio*. The Eastern end of the island in the main Northern Royal Albatross colony was especially well vegetated; with relatively deep soil, and thick Button Daisy and *Senecio* (Figure 4). Clearly the island has not suffered from any significant storm events in the recent past, and at present is in excellent condition.

Figure 4. Photos of main Northern Royal Albatross breeding sub colony showing vegetation growth, Dec 2016.



3.2 Census results

A full census of Northern Buller's Mollymawk, Northern Royal Albatross and Northern Giant Petrel on Motuhara was carried out between Dec 5th and 9th 2016.

3.2.1. Northern Buller's Mollymawk

A total of 17,682 Northern Buller's Mollymawk nests were recorded on Motuhara. This included 272 nests counted on the offshore rock stacks (Table 1).

Results of this count are higher than previously recorded in 2007-2009. The results of each count section are broadly similar to that recorded from 2007-2009 (Table 2) but, as available maps of the count sections used from the 2007-2009 surveys had differing boundaries for several sections, direct comparison between sections is not possible.

Counts of the five study quadrats were also carried, and results reported here to assist with the aerial survey component of the research which is being carried out this season (Table 3).

Table 1. Results of census of Northern Buller's Mollymawk per count section on Motuhara, Dec 2016.

Section	Egg	Failed	Empty	Total
A	770	238	60	1,068
B	519	181	10	710
C	774	121	68	963
D	712	168	31	911
E	2,009	376	136	2,521
F	1,026	299	105	1,430
G	276	52	26	354
H	446	123	48	617
I	306	74	4	384
J	1,051	304	49	1,404
K	581	96	75	752
L	579	161	59	799
M	678	184	112	974
N	926	283	24	1,233
O	801	182	54	1,037
N Cliffs	302	109	11	422
NE Cliffs	592	218	26	836
S Cliffs	699	276	20	995
Stack One				27*
Stack Two				169*
Stack Three				42*
Stack Four				34*
Total	13,047	3,445	918	17,682

*Nest contents not checked

Table 2. Number of Northern Buller's Mollymawk nests recorded on Motuhara 2007-2016 (excluding stacks not counted in 2007-2009), date of census and proportion of nests occupied each season.

	2007	2008	2009	2016
Total	15,238	14,674	14,185	17,410

Date	13-19 Nov	9-18 Nov	1-8 Dec	5-9 Dec
Egg	61%	61%	76%	75%
Empty	35%	32%	21%	20%
Failed	NR	6%	3%	5%

Table 3. Nest counts of the five Northern Buller's Mollymawk Study Plots on Motuhara Dec 2016.

	Egg	Failed	Empty	Total
Grid 1	51	2	6	59
Grid 2	52	9	8	69
Grid 3	41	10	12	63
Grid 4	55	5	7	67
Grid 5	56	11	7	74

3.2.2. Northern Royal Albatross

A total of 1,400 Northern Royal Albatrosses incubating eggs were counted on Motuhara in four breeding sub colonies (Table 4, Figure 2).

Table 4. Results of census of Northern Royal Albatross on Motuhara, Dec 2016.

Section	Nest contents			Total
	Egg	Failed	Empty	
Main Colony	1,282	118	119	1,519
Bowling Green Colony	45	1	0	46
Camp Colony	45	1	9	55
West End Colony	28	1	1	30
Total	1,400	121	129	1,650

This is a significant decrease from counts in 2006-2009, which recorded an average of 2,209 breeding pairs (range 1,879-2,692 pairs).

Table 5. Number of breeding pairs of Northern Royal Albatross recorded on Motuhara 2006-2009 from aerial photography, 2016 from ground count.

	2006	2007	2008	2009	2016
Breeding pairs	1879	2212	2055	2692	1,521

3.2.3 Northern Giant Petrel

At the time of the visit Northern Giant Petrels had chicks which were approximately half grown. A complete count of the island recorded 1,235 Giant Petrel chicks. These were found breeding along the edge of the Northern Royal Albatross sub colonies (Table 5, Figure 3).

In addition we surveyed the two Sample Areas which have been used for population estimates since 1993, recording 398 chicks, 26 failed nests and 238 empty nests (Table 6). This gives a breeding success rate of 60.1% half way through chick rearing, which will be very close to the fledging rate as most chicks will survive from this point

As chick survival once they are half grown is likely to be high, we have used 60.1% as the fledging success which extrapolates out to a breeding population of 1977 breeding pairs. This is very similar to the 63.8% breeding success rate found on Macquarie Island and used by Parker *et. al.* (2016) in extrapolating from data from Macquarie Island where breeding success was recorded at 63.8% (range 55.7-69.8%).

Table 5. Number of Giant Petrel chicks recorded in each Northern Royal Albatross sub colony on Motuhara Dec 2016.

Section	Number of chicks
Main Colony	1177
Mid Colony	17
Camp Colony	11
West End Colony	30
Total	1235

Table 6. Nest contents of Sample Areas One and Two of Giant Petrel, Motuhara Dec 2016.

	Chick	Failed (dead chick)	Empty
Sample Area One	181	16	118
Sample Area Two	217	10	120
Total	398	26	238

3.3 Band recoveries

A small number of banded birds and one dead banded bird were found, details are provided below (Table 7). The number of re-sightings are insufficient to undertake any survival analysis, and are provided here to record collected data. This included one Royal albatross banded as a chick on Middle Sister Island in 1975, making it 41 years old.

Table 7. Band recoveries from Motuhara, Dec 2016.

Band	Date Recovered	Species	Breeding Status	Location recovered	Date banded	Age banded	Sex	Location banded	Bander
M-81059	6-Dec	Buller's Mollymawk	Incubating egg	Section C	17/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
M-81063	6-Dec	Buller's Mollymawk	Failed nest	Section C	17/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
M-81069	6-Dec	Buller's Mollymawk	Incubating egg	Section C	18/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
M-81057	7-Dec	Buller's Mollymawk	Incubating egg	Section C	17/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
M-81070	8-Dec	Buller's Mollymawk	Failed nest	Section C	18/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
R-32397	5-Dec	Northern Royal Albatross	Incubating egg	Camp Colony	3/09/1975	Pullus	U	Middle Sister Island, Chatham Islands	CJR Robertson
R-32820	6-Dec	Northern Royal Albatross	Incubating egg	Main Colony	23/05/1994	Pullus	U	Forty Fours, Chatham Islands	CJR Robertson
R-63558	12-Dec	Northern Royal Albatross	Band attached to leg bone	Camp Colony	17/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
R-63559	7-Dec	Northern Royal Albatross	Incubating egg	Camp Colony	17/11/2007	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
R-32602	8-Dec	Northern Royal Albatross	Incubating egg	Main Colony	23/05/1994	Pullus	U	Forty Fours, Chatham Islands	CJR Robertson
R-32605	8-Dec	Northern Royal Albatross	Incubating egg	Main Colony	23/05/1994	Pullus	U	Forty Fours, Chatham Islands	CJR Robertson

R-32645	8-Dec	Northern Royal Albatross	Incubating egg	Main Colony	23/05/1994	Pullus	U	Forty Fours, Chatham Islands	CJR Robertson
O-33793	5-Dec	Salvin's Mollymawk	??	East end of Section J	10/11/2008	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield
O-33792	6-Dec	White-capped Mollymawk	Incubating egg	Section E, Nest marked WC-2	10/11/2008	1st yr or older	U	Forty Fours, Chatham Islands	Paul Scofield

3.4 Fulmar Prions

The population of Chatham Island Fulmar Prion *Pachyptila crassirostris pyramidalis* in the Chatham Island's is estimated at 1,000-5,000 pairs, with birds breeding on Te Tara Koi Koia and Motuhara, although there is no specific population estimate for each island.

We found Fulmar Prion to be common on the island although the habitat for them is more restricted than on Te Tara Koi Koia. A systematic survey was not carried out and we estimate the population to be 500-1,000 pairs. Most birds were incubating eggs, with hatching just starting at the end of the trip.

4. DISCUSSION

The census of Northern Buller's Mollymawks was higher than the previous counts (2007-2009) and is likely a reflection of improved methodology rather than an increase in numbers. During this census the boundaries of all sections were marked and every nest was also marked, in previous surveys, boundaries were not marked, and each nest was not marked when counted. Clearly defining the boundaries of count sections and marking every nest will have ensured no areas were either double-counted or missed and this method is recommended for future surveys.

Northern Royal Albatross numbers on Motuhara were lower than previously recorded, with the results of this census significantly lower than counts in 2006-2009. Even allowing for failed and empty nests, the population results are down from previous research. However as Northern Royal Albatross is a biennial breeder, without knowing the breeding success of the previous breeding season results are difficult to interpret. Further census of the population over a number of years is recommended to determine the present population numbers, and determine the population trend.

Aerial photography of Motuhara in November 2016 estimated the breeding population to be 1,830 breeding pairs (Baker *et al* 2017), 27% higher than the ground count. This is the first time that the entire Northern Royal Albatross population on Motuhara has been counted on the ground, and highlights that the entire population can be counted accurately and quickly by a ground based team.

For the first time the entire population of Northern Giant petrel was counted, albeit towards the end of the breeding season. A total of 1,235 chicks were counted and, using the success rate from the established sample areas, an estimated breeding population or 1,977 breeding pairs was extrapolated. This is by far the most significant breeding population of Northern Giant Petrel in New Zealand, and one of the largest populations away from a major seal or penguin breeding colony.

There has been no previous island wide census of Northern Giant Petrels, but in 1993 Robertson and Sawyer (1994) estimated the population at 2,000 pairs. In the two Sample Areas they recorded 103 live chicks, 170 dead chicks and 346 empty nests, giving a total of 619 nests, and noted that it was an exceptionally poor breeding season for Northern Giant Petrels. The number of nest sites recorded in the two sample areas in 1993 and 2016 are similar (619 compared to 662), suggesting the Northern Giant Petrel population is possibly increasing, probably at least stable, and definitely not declining significantly.

4.1 Assessment of undertaking a demographic study on Northern Buller's Mollymawk

The largest breeding population of Northern Buller's Mollymawk is found on Motuhara, and as such it is likely to be the best place to undertake a demographic study. Such a demographic study could investigate: annual number of breeding pairs, annual productivity, age at first reproduction; annual adult survival; and the proportion of adults that breed each year.

Biologically there is unlikely to be any issues in regards to undertaking a demographic study on this species. Northern Buller's Mollymawk on Motuhara were found to be like other species of mollymawk

which we have worked with; birds seemed tolerant of handling and the banded birds found on the island were readily caught to enable band numbers to be read. In addition we recorded some of the banded GLS birds in the same study areas they were banded, suggesting long-term site fidelity.

Motuhara is Maori Land, and as such needs the permission of the owners to land on the island. At present there are no Agents appointed to deal with access permission and other issues regarding the island. In discussions with the senior owners, they have indicated that they would support further research on the island.

In other discussions with some of the younger owners, there is a growing awareness that the birds breeding on Motuhara and Rangitahi face numerous threats, and that many of these occur outside of Chatham Island, or New Zealand waters. As such there is more understanding that there is a need to undertake research on the islands, and that this needs to involve long term projects.

If a project was to be initiated on Northern Buller's Mollymawk, at the same time a project on Northern Royal Albatross should also be carried out as these population appears to be in serious decline.

5. ACKNOWLEDGMENTS

Motuhara is Maori Land and we are very grateful for the permission of the Island owners to camp on the island to undertake this research. Thanks to Joss Thomas for helping to arrange access with the owners. Special Thanks to Ruka Lanauze and Bubbles Gregory-Hunt for making their boat available to take us to the island, and to their Skipper Justin Greenbank for transporting us to and from the island. Eugene Page & Joe Goomes assisted with the landings. Nathan (Ministry of Primary Industries) provided copies of past field trip reports to compare with this seasons results. This project was carried out with funding from the Department of Conservation Marine Threats Team, and we thank Kris Ramm for efficiently managing this.

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