

Motuhara seabird research: field trip report January 2024

March 2024

Mike Bell; Toroa Consulting Limited, mike@toroaconsulting.co.nz

Introduction

Motuhara (the Forty-Fours) is Māori 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 their continued support of this research and granting permission to land and camp on the motu.

Northern Royal Albatross (*Diomedea sanfordi*), Northern Buller's Mollymawk (*Thalassarche bulleri platei*) and Northern Giant Petrel (*Macronectes halli*) all have significant breeding populations on Motuhara (43°96'S, 175°83'W). Although research has been undertaken periodically since the 1970's on these islands, more recently I have initiated a long-term research project on Motuhara since January 2021. Some aspects of this work have been funded by the Department of Conservation's various programmes, including the Conservation Services Programme and the Budget22 International Seabird Conservation Initiative.

In January 2024, a 10-day field trip to Motuhara was carried out to undertake seabird research. Aims of the trip were varied and included:

1. Deploying PTT satellite transmitters on Northern Royal Albatross and Northern Buller's Mollymawk, including the trialling of a novel leg-loop harness attachment method (DOC AEC 453),
2. Deploying and recovering i-got-u GPS loggers on Northern Buller's Mollymawk,
3. Retrieving previously deployed GLS loggers on Northern Buller's Mollymawk, Cape Petrels (*Daption capense*), and Pyramid Prions (*Pachyptila pyramidalis*),
4. Census breeding Northern Royal Albatross and Northern Buller's Mollymawk
5. Resighting banded Northern Royal Albatross and Northern Buller's Mollymawk at various study colonies,
6. Retrieving trail cameras set up to recording breeding activity at Northern Royal Albatross, Northern Buller's Mollymawk, and Northern Giant Petrel breeding areas,
7. Banding another cohort of Northern Giant Petrel chicks.

This report provides a summary of the trip and the associated raw data. Similarly to previous trip reports, no species analyses of data are included, as all these species are long-lived, and demographic data hasn't been collected for enough years to warrant analyses. This report aims to provide data of the trip's findings in a similar format to previous trip reports (e.g., [Bell 2023](#)).

Unlike previous trips, however, this trip included an additional international component in the form of a secondee from Perú to New Zealand: Carlos Zavalaga (Director de la Unidad de Investigación de Ecosistemas Marinos, Grupo Aves Marinas, Universidad Científica del Sur, Lima, Perú) joined the trip assist with the field research and further strengthen the connection and collaboration between Perú and New Zealand on the conservation of seabirds that are shared between the two countries, including Northern Buller's Albatross.

Results

Field trip

A team of three, Mike Bell and Dave Bell (Toroa Consulting) and Carlos Zavalaga (Universidad Científica del Sur) camped on Motuhara from January 17th to 27th 2024. We landed on the northern landing in the early morning, and immediately ferried our gear up to the usual campsite. We had our campsite setup and all gear safely stowed by earlier afternoon. The weather throughout the trip was highly variable – but dominated by northerly winds. Initially it was warm with light winds, but a significant northerly storm system passed over the island from the evening on January 22nd until late evening Jan 24th, 2024. This included 40-50 knot winds and over 60 mm rain (recorded on Main Chatham) in a 24-hour period.

Northern Royal Albatross

PTT device deployment

As the leg-loop harnesses did not attach devices securely to Northern Buller's Mollymawk (see below for more details), the 10 Telonics PTT devices originally ear-marked for deployment on Northern Royals were switched to Northern Buller's. Hence, no PTT devices were deployed on Northern Royal Albatross.

Study plot re-sighting and banding

Within the two study plots established in 2021 we re-sighted 246 banded birds. This was a higher number than in previous field trips and will reflect the biennial breeding nature of this species. A further 54 new birds were banded with both metal and engraved colour bands – all birds partnered to previously banded birds. Bringing the total number of adult Northern Royal Albatross colour banded on Motuhara to 681 individuals. As a much longer data series will be needed to attempt any survival analyses, no analyses have been attempted here.

Aerial study grids

In January 2021, five study grids were established within the main breeding area on the eastern end of the island to support future aerial survey and these were counted on January 20th, 2024 (Table 2). There continues to be some difference between years in the five plots, but as Northern Royal albatrosses are biennial breeders, a longer time series is needed to determine any population trends.

Table 1. Nest counts from established study grids in the main Northern Royal Albatross breeding area on Motuhara, January 2024.

Study grid	Egg	Chick	Failed	Total
Grid 1	34	1	1	36
Grid 2	38	2	1	41
Grid 3	34	0	1	35
Grid 4	30	1	2	33
Grid 5	33	2	3	38
Total	169	6	8	183

Island wide census

A complete census of the Royal Albatross nesting population was undertaken on 20 January 2024, with a total of 1,553 active nests counted (Table 2).

Table 2. Nest counts of Northern Royal Albatross breeding population on Motuhara, January 2024.

Area	Egg	Chick	Failed	Total
Camp colony	81	0	1	82
Bowling Green Colony	27	0	0	27
Main Colony	1,314	50	80	1,444
Total	1422	50	81	1,553

Dead banded chicks recovered

In August 2023, a total of 703 pre-fledgling Northern Royal Albatross chicks were banded. During this January 2024 trip, we found 15 of these banded chicks dead, indicating that a proportion (2.1%) of this chick cohort perished during the later stages of chick development. The cause of death is unknown, and no significant adverse weather event occurred which may explain these losses.

Camera retrieval

Two cameras within the Northern Royal Albatross area were removed, and SD cards downloaded. Analyses of the collected images is outside the scope of works for this report.

Northern Buller's Mollymawk

PTT device deployment

The initial plan was to deploy 10 TechnoSmart PTT devices to breeding Northern Buller's Mollymawk using leg-loop harnesses to enable long term tracking of birds to South American waters (AEC DOC 453). However, on testing the leg-loop harnesses it was found that due to the birds' anatomy, and potentially due to the shape of the TechnoSmart devices, the devices did not remain on the birds satisfactorily.

As such, the 10 Telonics PTT devices originally planned to be deployed on Northern Royal Albatross were deployed on Northern Buller's Mollymawk. All devices were attached by Tesa tape to the three central-most tail feathers (Fig. 1A). The devices were attached to 10 failed breeders from within one of the study plots on Motuhara, five females and five males (sex was identified through morphometrics). Failed breeders were chosen, as these were likely to provide the most data on movements in South American waters, as this work is conducted in collaboration with Universidad Científica del Sur with the aim to evaluate overlap and risk of various Peruvian fisheries to this species.

Further deployments of devices are planned for next season. To work towards future deployments, and long-term deployments on albatrosses in general, a PTT device was attached to a bird using the backpack method (Fig. 1B), with the device left on the bird for two hours (with bird under constant observation to ensure it did not attempt to go to sea). The bird remained on its nest (brooding a small chick) and preened the device for approximately ten minutes, before returning to typical brooding behaviour. This attachment method may be a promising method for Mollymawk species.



Fig 1. A tail mounted Telonics PTT device (A) and a body-harness mounted TechnoSmart PTT device (B) fitted to a Northern Buller's Albatross. The latter was fitted as a test for a couple of hours only.

GPS tracking using i-got-u devices

A total of 12 i-got-u GPS devices were deployed and subsequently recovered on Northern Buller's Mollymawk, six on breeding birds guarding/feeding young chicks, and six on failed breeders. These devices produced nine short-term tracks (Fig 2); the remaining devices for unknown reasons could not be data downloaded.

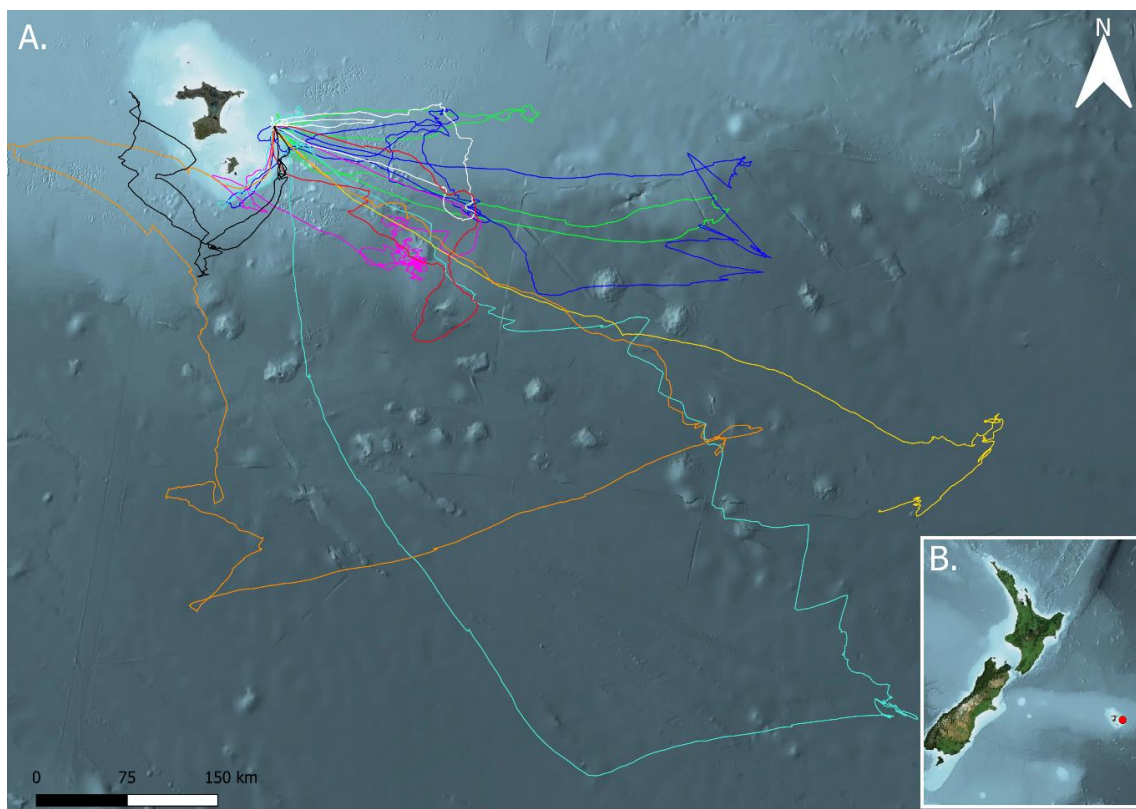


Fig 2. Short-term GPS tracks of nine Northern Buller's Albatross.

Study plot re-sighting and banding

Within the two study plots established in 2021, all nests were checked multiple times, and banded birds recorded. A total of 155 banded birds were resighted, and 41 additional new birds were banded (we only banded new birds on numbered study nests). The number of re-sighted birds was lower than previous trips, but this may be due to the high nest failure rate already occurring by the time we arrived on the Island (see study grid counts below).

GLS recovery

A further 10 GLS devices that were deployed on breeding Northern Buller's Mollymawk in January 2021, but not recovered in the last December 2022 trip, were removed from birds. Analysis of the data was not part of this project and the devices have been supplied to the Department of Conservation who will process the data and map the movements of these birds, similar to [Fischer et al. 2023](#).

Study grid counts

The 5 original 10x10m study grids and the 5 newly established grids (January 2021) were counted on January 18th, 2024 (Table 3). Interestingly, with hatching just underway, there was already a high failure rate, with 47% of nests already having failed.

Table 3. Nest counts from the 5 existing and 5 newly established study grids on Motuhara Island, January 2024.

	Study grid	Egg	Chick	Failed	Total
Existing	Grid 1	22	9	23	54
Existing	Grid 2	32	6	22	60
Existing	Grid 3	16	6	28	50
Existing	Grid 4	30	14	29	73
Existing	Grid 5	28	6	43	77
New	Grid 6	22	10	39	71
New	Grid 7	15	9	33	57
New	Grid 8	24	10	28	62
New	Grid 9	22	9	25	56
New	Grid 10	22	10	19	51
Total		233	89	289	611

Impact of severe weather event

A recount of the Northern Buller's Mollymawk study plots was carried out the day after a severe weather event (January 25th) to investigate the impacts of the storm on breeding. Among the ten plots, 28 nests failed - 4.6% of all breeding attempts, or 8.7% of all nests still active at the time. The amount of water on the island, caused nests to be washed away, or partly collapsed, which resulting in eggs and chicks being washed out from nests.

Island wide census

Due to the high nest failure rate recorded on the island when we arrived, it was decided that a complete census of the Northern Buller's Mollymawk would not give a meaningful result, so the count was not undertaken.

Trail camera retrieval

Four trail cameras within Northern Buller's Mollymawk colonies were removed, and cards downloaded. Analysis of images was outside the scope of work of this project.

Northern Giant Petrel

Chick banding

A total of 500 Northern Giant Petrel chicks were banded, to continue to build on previous chick banding carried out on the motu and develop a known age marked population.

Trail camera retrieval

Two cameras within Northern Giant Petrel areas were removed, and cards downloaded, again image review was not part of this project.

Cape Petrel

GLS recovery

A total of 3 of the 15 GLS were deployed on incubating Cape Petrels in December 2022 were recovered. Unfortunately, of the 7 nests where GLS were deployed, only 3 had chicks present. At one nest both birds were captured and still had their GLS on and these were recovered. At the second nest one partner still had a GLS and this was recovered, but the other partner was new and unbanded. At the third nest with a chick, neither adult was captured or seen during our trip (the chick continued to grow, and it was just that at our visits to the nest we never encountered an adult at the nest).

The GLS devices were removed and returned to DOC for data removal and analysis. Two out of three devices did not provide any data and will be returned to Migrate Technology for data extraction. The third device provided the first insights into the year-round movements of this species from the Pacific (following data processing in ProbGLS; [Merkel et al. 2016](#)) (Fig. 3). Specifically, this individual largely spent its time in waters around the Chatham Rise and the waters east and south of New Zealand. However, between early February and mid-April 2023, this individual foraged in Antarctic waters. Further analyses, once more data has been obtained, will be conducted later, and published elsewhere.

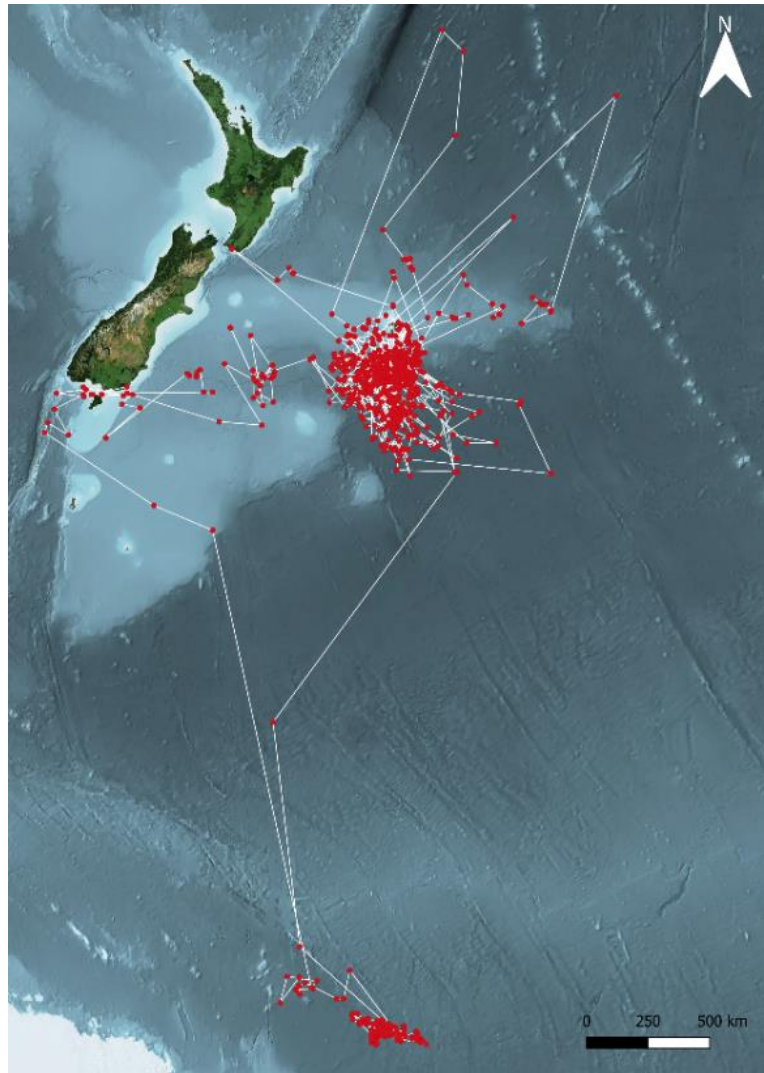


Fig 3. Movements of an individual adult Cape Petrel as recorded by a GLS device and processed in ProbGLS during December 2022 and January 2024.

Fulmar Prion

GLS Recovery

A total of 15 GLS were deployed on Fulmar Prion in August 2023 (presumed pairs in burrows/crevices' courting, but yet to lay). All sites were checked, of the seven burrows/crevice's used, three had large near fledged chicks present, with the other four all empty (three appeared to look as if they had failed during incubation, and one was possible unused). No banded birds, or birds with GLS devices were found – but overall prion activity on the island was low. Further efforts in future trips will be invested to recover GLS devices from these species.

Discussion and recommendations

This trip builds on previous research trips to Motuhara and continues to build the pool of data on several species breeding on this island. The number of colour banded Northern Buller's Mollymawk and Northern Royal Albatross continue to increase, as does the re-sighting data for this population. As both are long lived species it is recommended to continue re-sighting efforts for 3-5 years to improve this data set prior to attempting a survival analysis.

Known age cohorts of both species are still lacking, and banding of pre-fledging Northern Royal Albatross chicks should continue for 3-5 years to build up a known age population to investigate

juvenile survival and recruitment. Consideration should be given to undertaking trips in May, to band Northern Buller's chicks to develop a known age cohort.

Efforts should be made to recorded returning banded Northern Giant Petrels as these birds start to get old enough to return to Motuhara for breeding. Given the flighty nature of this species, however, this may be difficult to achieve.

The failure of leg loop harnesses on Northern Buller's Mollymawk suggests that future long-term deployments on albatross and mollymawks should test backpack harnesses.

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 boat transport to the island and Dave and Carlos for their company and hard work on Motuhara. Aspects of this work was funded by the Department of Conservation's Budget22 International Seabird Conservation Initiative, and I thank Johannes Fischer for managing this. I also thank Olivia Rowley and Arawhetu Waipoua for generating the maps in Figs. 2 & 3.

References

- Bell, M. 2023. Motuhara seabird research: field trip report December 2022. Client Report to Department of Conservation.
- Fischer JH, et al. 2023. Year-round GLS tracking of Northern Buller's Albatross and comparison with Southern Buller's Albatross. Department of Conservation, Conservation Services Report.
- Merkel B, et al. 2016. A probabilistic algorithm to process geolocation data. *Movement Ecology* 4: 26.