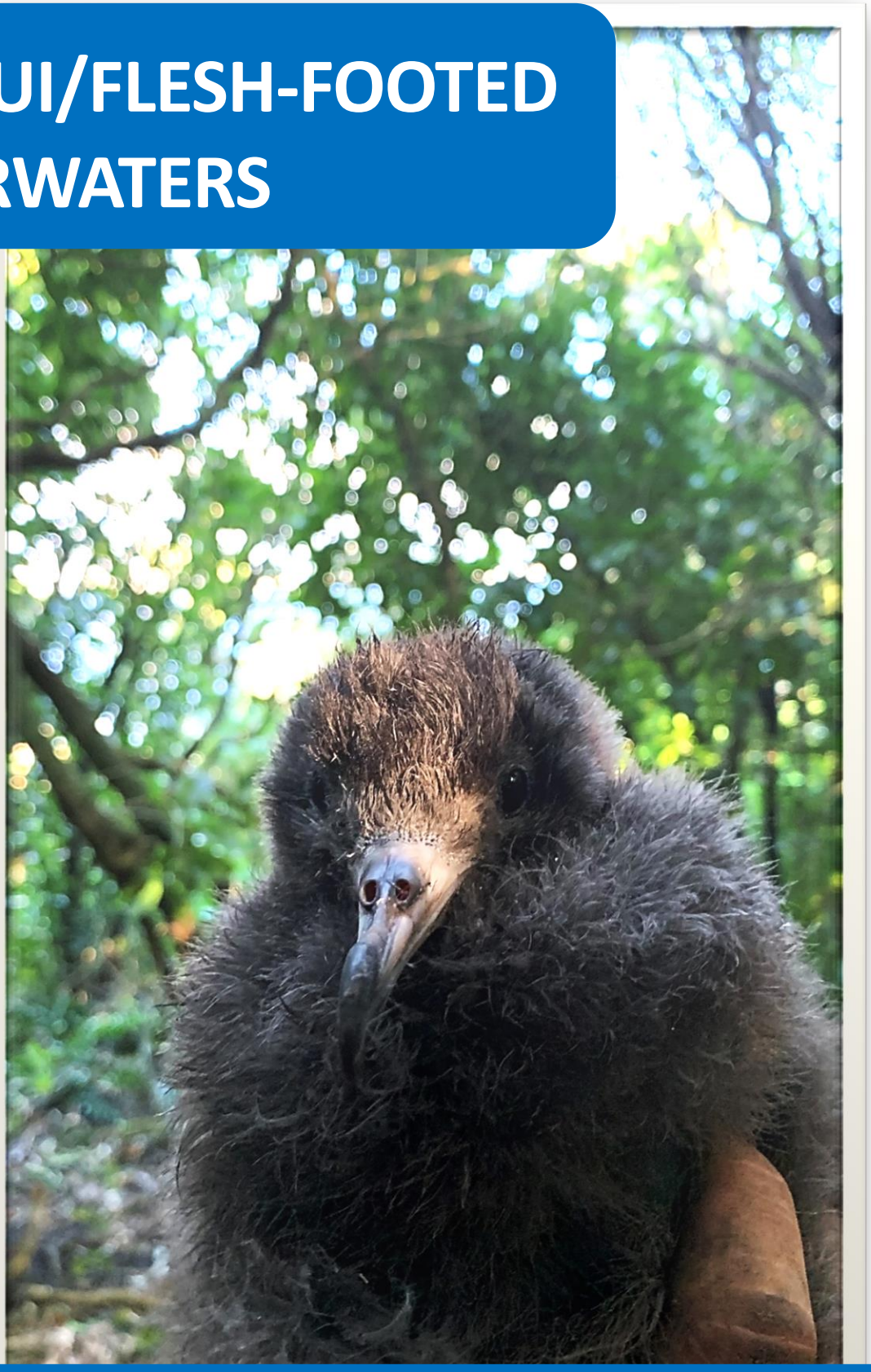
TOANUI/FLESH-FOOTED SHEARWATERS



Preliminary Chick Banding Report for Ohinau Island: 2022/23 season

WMIL Wildlife Management International

TOITŪ CARBON ZERO ISO 14064-1 ORGANISATION

Preliminary Chick Banding Report for Ohinau Island: 2022/23 season

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This preliminary report was prepared by Wildlife Management International Limited for the Department of Conservation as partial fulfilment of the contract (DOC- 7172757 - POP2021-04 Flesh-footed Shearwater Research) dated 17 October 2022.

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Cover image: Flesh-footed shearwater chick in hand, May 2022 © Dan Burgin.

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KEY OBJECTIVES & OUTPUTS

This research was carried out as part of the Conservation Services Programme (CSP), flesh-footed shearwater research project (POP2021-04). The key objectives WMIL were funded by Department of Conservation to complete were:

1. **To collect key demographic parameters of flesh-footed shearwater at Ohinau Island, especially adult survival, juvenile survival and recruitment rates.**
2. **Estimate the current breeding population of flesh-footed shearwaters at Ohinau Island, to compare with past surveys.**
3. **Attach satellite tracking tags to ten fledgling flesh-footed shearwaters in May 2023.**

Objectives 1 and 2 are ongoing and will be reported on in a future end of season report. Objective 3 was completed in May. Here we report on the preliminary results from the chick trip to Ohinau Island undertaken in May 2023.

Preliminary Chick Banding Report for Ohinau Island: 2022/23 season

1. DATES AND PERSONNEL

Trip dates: 2 May – 8 May 2023

Personnel: Samantha Ray and Simon Lamb

2. PURPOSE

The purpose of this trip was to check all study burrows to determine breeding success and band all chicks in burrows. Additionally, the team were to attach 10 satellite tracking tags to chicks to track them as they fledge.

3. STUDY SITE

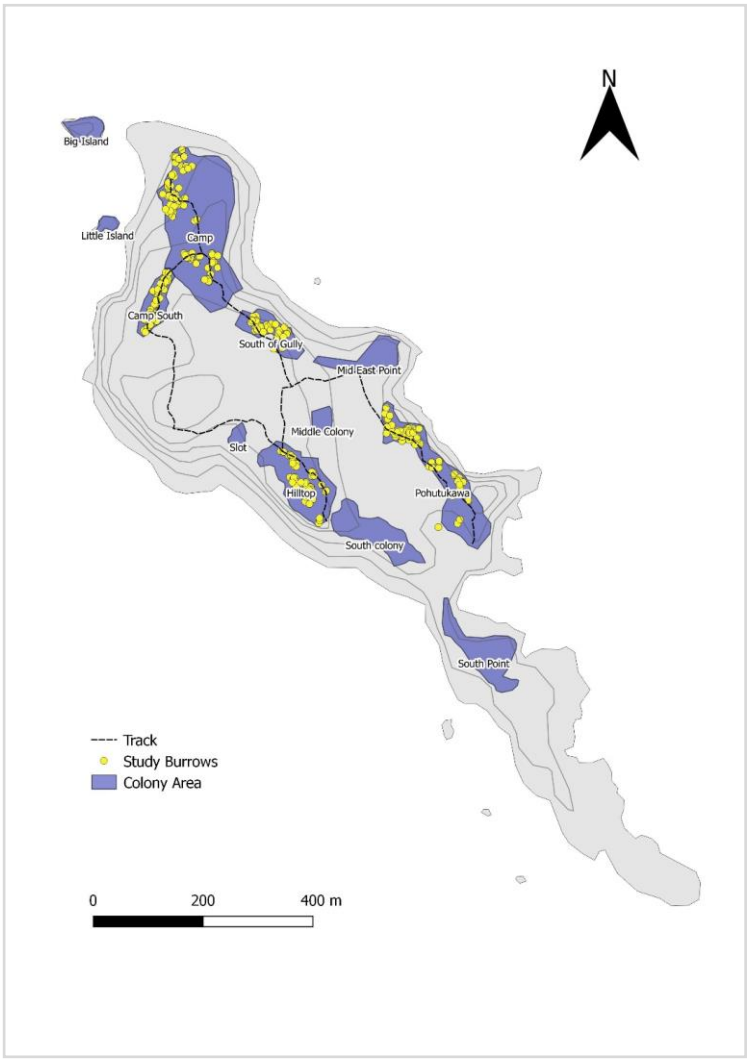

Figure 1. Map of Ohinau Island showing the location of all flesh-footed shearwater colonies and all marked study burrows.

WMIL: Ray, S. 2023

4. PRELIMINARY RESULTS

4.1 Banding

During the May 2023 trip a total of 28 chicks were banded during the trip, all from within study and burrowscope burrows. 35 flesh-footed shearwater chicks were detected within all burrows checked, with 71.4% (*n=25*) found within the study burrows, and the remaining 28.6% (*n=10*) found within the burrowscope burrows.

80% (n=28) of those chicks detected within burrows were banded, consisting of 25 (89%) in the study colonies and 3 (11%) in the burrowscope burrows. Only chicks within reach in burrowscope burrows were banded.

4.2 Egg Numbers

Table 1 shows the total number of eggs in each study colony on Ohinau in January 2023 to provide context for the number of chicks found in study burrows in May 2023 presented in Section 4.3.

Table 1. Total number of eggs in each study colony on Ohinau Jan 2023.

Colony	Number of eggs in burrows
Camp	33
Camp South	35
Hilltop	36
Pōhutukawa	32
South Gully	32
Total	**168**

4.3 Chick Numbers

4.3.1 Study Burrows

Total numbers of chicks, both alive and dead, are presented in Table 2 for each study colony on Ohinau for the May 2023 trip.

Table 2. Total number of chicks, both alive and dead, in each study colony on Ohinau May 2023.

Colony	Number of chicks (alive) in burrows	Number of chicks (dead) in burrows
Camp Colony	7	2
Camp South	0	0
Hilltop	8	0
Pōhutukawa	0	0
South Gully	10	2
Total	**25**	**4**

Preliminary analysis calculates 14.9% of study colony burrows had chicks in May 2023. 8 of the chicks found within study burrows were in poor condition and are not expected to fledge. Therefore, the preliminary analysis for breeding success for Ohinau Island study colony burrows is calculated as 10.1% for the 2022/23 season. There is a large degree of uncertainty, as the cause of burrow failure could not be determined in most cases, however it is assumed failures were mostly due to storm events and Cyclone Gabrielle impacting the Island. This will be reported on in full in the final end of season report after further analysis.

4.3.2 Burrowscope Burrows

Total numbers of chicks, both alive and dead, in burrowscope burrows are presented in Table 3 for the burrowscope study colony on Ohinau for the May 2023 trip.

Table 3. Total number of chicks, both alive and dead, in the burrowscope burrows on Ohinau May 2023

Colony	Number of chicks (alive) in burrows	Number of chicks (dead) in burrows
Burrowscope	10	0

From the 31 breeding burrowscope burrows, 10 produced a chick with all of these being alive when checked in May 2023. Preliminary analysis calculates breeding success in Ohinau Island burrowscope burrows as 32.3% compared to 14.9% in study burrows. We will report on whether this difference was significant or not, and consequently whether there is an impact of handler disturbance, in the final report after further analysis.

4.4 Breeding Success

On Ohinau Island, the preliminary analysis shows breeding success for study burrows this season was 10.1%. This is a sharp decrease from the 59% measured in the 2021/22 season and particularly the 68% measured in the 2017/18 season. This is well below the range that would be expected for this species in a predator-free environment. On Woody Island, Western Australia, breeding success for flesh-footed shearwaters was measured as 40% and 53% for two consecutive seasons (Powell et al. 2007). Priddel et al. (2006) observed a 50% breeding success rate during the 2002/03 breeding season on Lord Howe Island in the Tasman Sea. Reid et al. (2013) incorporated data from the literature with their own field studies on Lord Howe Island, and estimated breeding success for the 2008/09 season to be 60%. Both Lord Howe and Woody Islands had ship rats (Rattus rattus) present, which are known to predate the eggs and young of several species of burrowing Procellariiformes (Moors & Atkinson 1984). Further analysis will be reported on in the final report.

Storm events and ex-tropical cyclone Hale are thought to be the cause of some egg failures, with the team observing damp and flooded burrows during the January trip. Most breeding burrow failures are thought to have occurred when Cyclone Gabrielle hit the Island in February.

Additionally, grey-faced petrels are thought to cause at least some breeding failures on Ohinau Island. None of our study burrows with grey-faced petrels present in May contained a flesh-footed shearwater chick. Some grey-faced petrels were observed on the surface at night-time on the island, and in previous years there has been evidence of chicks having been killed by them. Grey-faced petrels are known to evict the unguarded chicks of flesh-footed shearwaters when they arrive to clean out burrows in April (Barbraud *et al*. 2014, Waugh *et al*. 2014).

There was only one burrow that had a chick present in May that had no egg detected in January. All birds had finished laying before the January trip, therefore there was an egg in this burrow which was missed during burrow checks. It was discovered that a new nest chamber had been dug which was missed in January.

4.5 Chick Tracking

In total nine Lotek Sunbird Argos PTT tags (satellite tags) were attached to flesh-footed shearwater chicks in May 2023. Four satellite tags were attached using a tail mount and five attached using a back mount. All chicks were weighed, and wing length measured to select chicks in burrows in good condition and those closest to fledging for tracking. As of May 30, all chicks had fledged and travelled

north of Ohinau. The chicks were either in or just north of the Pacific Islands. The deployment details for each chick are presented in Table 4.

Prior to deploying satellite tags all ten devices were tested to determine if they were functioning correctly. One satellite tag (242232) was not being detected by satellites, and therefore this device was not deployed in May.

Table 4. Deployments details for the nine satellite tracked chicks from Ohinau Island May 2023. Weight and wing length were recorded for the date of deployment.

Burrow	Tag #	Date Tag Attached	Weight (g)	Wing Length (mm)	Fledging Date	Mount Method
CC104	242225	5/05/23	620	317	12/05/23	Tail
SG41	242227	7/05/23	720	294	20/05/23	Back
SG36	242230	7/05/23	750	300	20/05/23	Back
SG47	242228	7/05/23	730	309	12/05/23	Tail
SG26	242233	7/05/23	680	321	12/05/23	Tail
HT52	242229	7/05/23	680	321	15/05/23	Tail
BS44	242226	7/05/23	630	302	11/05/23	Back
CC69	242234	8/05/23	625	303	18/05/23	Back
SG44	242231	8/05/23	620	295	12/05/23	Back

5. DISCUSSION

The preliminary findings on breeding success on Ohinau this season are concerning due to the sudden sharp decrease in breeding success. Further discussion will be provided in the final end of season report, alongside conclusions and recommendations.

6. REFERENCES

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