

## Integrated conservation of the Whenua Hou Diving Petrel

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My PhD project is aimed at preventing the recently-described and ‘Nationally Critical’ Whenua Hou Diving Petrel (*Pelecanoides whenuahouensis*; WHDP) from sliding further towards extinction.

Specifically, I aimed to investigate:

- 1) The WHDP population size and sex ratio.
- 2) The WHDP breeding biology.
- 3) The effect of WHDP presence on local herpetofauna.

Between September 2017 and January 2018, I caught 192 adult WHDPs. Of these, 103 were unbanded (Fig. 1), 41 were caught in 2016/17, 34 in 2015/16, 7 in 2008, 4 in 2004, 1 in 2003, and 2 in 2002. I used this dataset to analyse the WHDP population size with Cormack-Jolly-Seber models.

This resulted in a population estimate of 222 adult WHDPs (95% confidence intervals: 201-241). In addition, I collected feather samples of all birds captured this season. Feather samples were used to genetically determine the sex of the birds. Results show a slight male-skewed adult (46% ♀ : 54% ♂) and offspring sex ratio (45% ♀ : 55% ♂). Future repetitions of these efforts will provide better insights into sex ratios, while taking sex-specific recapture probabilities into account.

During the 2017/18 breeding season, I also created the first detailed breeding schedule for the WHDP. While I aimed to use 10 custom-made artificial nest boxes, these were rejected by 80% of the birds early in the season (thus not resulting in nest failure). This prevented me from collecting growth curve data. However, I used a burrowscope instead to assess WHDP breeding phenology in detail:  $\bar{x}$  arrival date = 13 September,  $\bar{x}$  lay date = 10 October,  $\bar{x}$  hatch date = 26 November,  $\bar{x}$  post-guard date = 5 December, and  $\bar{x}$  fledge date = 12 January.

Finally, to understand the effect of WHDP presence on other species groups, I counted skinks (Green Skink [*Oligosoma chloronoton*] and Southern Grass Skink [*O. polychroma*]) at sites with ( $n = 51$ ) and without WHDP burrows ( $n = 48$ ) for 26 consecutive days. I used this dataset in combination with occupancy models to assess the effects of WHDP burrows on skink occurrence, while accounting for imperfect detection rates of skinks. Results show that the occurrence of Southern Grass and Green Skinks at sites with WHDP burrows was 34% and 119% higher, respectively, than at sites without. In addition, I made the first records of communal basking for both skink species, a social behaviour that was only observed at WHDP burrows. Thus, WHDP burrows have a significant influence on skink habitat selection. However, vegetation cover and interspecific skink interactions also played a role.

Combined, this work has already contributed several new and useful insights into the population and the breeding biology of the WHDP as well as into overall community ecology. All results will be published in peer-reviewed scientific journals and presented at conferences, including OSNZ conferences. Furthermore, 62% of the assistants were OSNZ members. Thus, by funding logistics, equipment, and lab-related costs, the Birds NZ Research Fund has undoubtedly contributed significantly and generously to a better future for the Whenua Hou Diving Petrel.

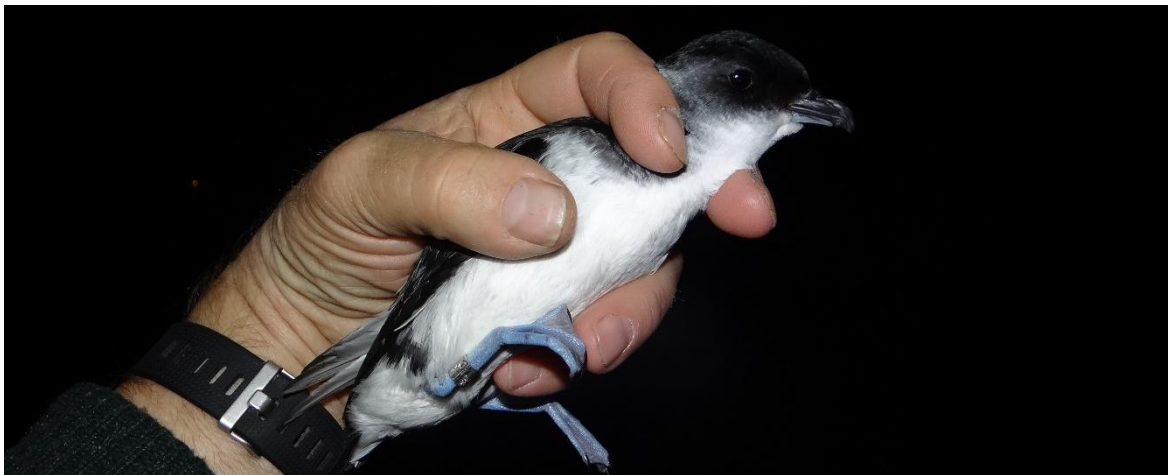


Fig 1. A newly banded Whenua Hou Diving Petrel. Credit: Graeme Taylor.