

Ecology, breeding biology and conservation status of the South Georgian Diving Petrels on Codfish Island (Whenua Hou), New Zealand

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During the 2015/2016 breeding season I conducted a study, funded by the BNZRF, on the ecology, breeding biology and conservation status of South Georgian Diving Petrels (*Pelecanoides georgicus*; SGDP) at the Sealers Bay dunes, Codfish Island (Whenua Hou), with the following aims:

- Identification of dune characteristics on Codfish Island (Whenua Hou) critical to SGDPs for nest site selection.
- Assessment of interspecific interactions and breeding biology of the SGDP using remote cameras.

I found 143 Diving Petrel (*Pelecanoides* spp.) burrows in the Sealers Bay dunes, for which I assessed occupancy using playback, captures (both by hand and burrow-traps) and toothpick fences. Through this, I determined that 74 burrows were actively used by SGDPs, six by Common Diving Petrels (*P. urinatrix*; CDP) and four showed mixed occupancy (one CDP burrow was taken over by SGDPs, two SGDP burrows were taken over by CDPs and one burrow was occupied by a SGDP x CDP pair. The latter three burrows failed to produce any fledglings). 25 active burrows remained unidentified. To assess nest site selection of *P. georgicus*, I then measured five physical and six biological parameters at the 74 active burrows of *P. georgicus* and 131 random sites within the Sealers Bay dunes. I used an Information Theoretic Approach (AIC_c) to analyse the influence of parameters on SGDP nest site selection. This analysis showed that the SGDP on Codfish Island is dependent on steep, seaward-facing foredunes with mobile soils, while invasive plant species, presence of conspecifics or other seabird species did not influence nest site selection.

To assess interspecific interactions at SGDP burrows and to study the breeding biology of this species, I deployed 20 remote cameras at active SGDP burrows, of which five were paired with Radio Frequency Identification (RFID) readers. These burrows were monitored for a cumulative total of 1121 nights. Videos revealed seven different bird species to occur at SGDP burrows, of which only one impacted the breeding success of the SGDP: the CDP. When comparing SGDP records from remote cameras with RFID readers, cameras had a mean detection rate of 10.86% (SE= 7.62%). Therefore, remote cameras, at least of the used models, appear to be an unfeasible to study the breeding biology of the SGDP.

Given the distinct preference for fragile foredunes of the SGDP, stochastic events and catastrophes, such as storms and storm surges, causing erosion of the preferred habitat are likely to be the most detrimental threat to this Nationally Critical species. In addition, competition for nest sites with the CDP may form a minor threat to the SGDP population on Codfish Island. In order to identify the appropriate conservation management strategy, continued monitoring of the SGDP, the CDP and the Sealers Bay dune system is advised. Long-term monitoring may allow for an assessment of population dynamics, which in turn would facilitate increased quantitative understanding of the magnitude of threats and population trends. Quantitative data would allow for construction of the appropriate decision-making framework to render the SGDP less vulnerable, and potentially reinstate population growth.

The results of this study will be written up formally and will be published in relevant scientific peer-reviewed journals (including Notornis).



(Photo taken by Jake Osborne)



(Photo taken by Igor Debski)