



Foraging and diet of yellow-eyed penguins (*Megadyptes antipodes*) in the subantarctic

Chris Muller (PhD candidate), Massey University, Palmerston North

Yellow-eyed penguins are endemic to New Zealand, with their distribution restricted to the southeast of the South Island, and subantarctic islands. There is minimal migration between the mainland and subantarctic meaning these areas need to be considered as separate populations for conservation management. The subantarctic population represents over 60% of the total population so is considered an important stronghold, and has been described as an “insurance population” for the species.

However, despite their importance to the species there is little published data on subantarctic yellow-eyed penguin populations. The islands are isolated and the climate and terrain make fieldwork challenging, meaning research there is expensive and difficult. Before this study there was very little information available on yellow-eyed penguin foraging and diet in the subantarctic, and population data were nearly 30 years out of date.

Foraging is a key factor affecting breeding success and population viability, and can be an indicator of complex processes such as climate change, which can affect the location, distribution, availability, and quality of prey species. The importance of diet in seabird ecology and conservation means a comprehensive understanding of diet and foraging ecology is essential for predictions of possible decline. Diet quantity and quality have been implicated as possible factors contributing to the decline of yellow-eyed penguins on the mainland. Some mainland yellow-eyed penguin populations have recently undergone serious decline due to successive poor breeding seasons and ongoing higher than average adult mortality, making the need for accurate data for the subantarctic even more urgent.

This study represents the most comprehensive investigation of yellow-eyed penguin diet and foraging in the subantarctic. Stable isotope analysis provided valuable information on diet, and is less invasive than most other methods. Combined with information from dive and GPS loggers attached to breeding penguins, this provided insights on wider foraging behaviour, including distances and depths travelled during foraging trips.

Better knowledge of subantarctic foraging allows improved estimation of the effort required to obtain food and provision chicks, and whether food availability or quality might be a limiting factor for successful breeding for these populations. In addition, this research will help to highlight any differences in foraging and breeding success between the subantarctic and mainland New Zealand, and whether there are any unique concerns for yellow-eyed penguins in the isolated subantarctic areas.