

Chatham petrel foraging ecology and climate change vulnerability

The Chatham petrel *Pterodroma axillaris* is one of the rarest seabird species in the world (c. 1100 adults). This Chatham Islands endemic was once abundant on several islands of the archipelago. However, the destruction of its breeding habitat and introduction of invasive predators dramatically reduced its population. While major threats on land have been identified and are being managed, the species vulnerability to climate change is largely unknown. Around Aotearoa New Zealand, ocean temperature, acidity, and the frequency of marine heatwaves are increasing and the predicted impact on primary productivity includes an important decrease of macronutrients in the eastern Chatham Rise, near the Chatham Islands. These climate change induced alterations of the marine environment may affect Chatham petrel's forage availability. Improving our understanding of the species foraging ecology would allow us to better assess and predict how climate change might affect this species. Year-round tracking with light-level geolocators provided a first insight into the species' at-sea movements and distribution, however, the resolution of the data and inherent drawbacks of geolocation limit behavioural and habitat analyses particularly during chick-rearing. Yet, the species may be particularly vulnerable to climate change during this period as central-place foraging constraints could limit the species' ability to cope with variation in forage availability.

To improve our understanding of Chatham petrel foraging ecology, I will deploy 10 solar-powered GPS loggers on adult Chatham petrels breeding on South East Island, the species' main colony. The birds will be tracked from late incubation and throughout the full chick-rearing period. Tracking breeding Chatham petrels with GPS will provide us with invaluable information on the species' foraging ecology, which will be used to provide insights into the species' vulnerability to climate change. It will allow us to characterize individual movements, at-sea behaviour, and general distribution, and identify marine areas of importance for the species, marine habitat preferences and the drivers of the birds' at-sea movements. Achieving these objectives will provide the necessary information for subsequent modelling of the species marine habitats availability under different climate change scenario, an important step to inform future conservation management.

