

## **Foraging plasticity in Fiordland Crested Penguins / Tawaki (*Eudyptes pachyrhynchus*): A stable isotopic approach**

Jeff White – Marshall University, West Virginia, USA

The Fiordland Crested Penguin (*Eudyptes pachyrhynchus*), or Tawaki, is a medium sized crested penguin that breeds along the southwestern coast of the South Island. This distributes them across some of the most diverse marine habitats of any penguin species. This apparent habitat plasticity suggests that they may be better equipped to tailor their foraging strategy to a variety of local environmental conditions. As global climate change and human disturbance alters prey abundance and diversity, assessing the foraging strategy plasticity of Tawaki is vital for understanding their foraging ecology and dietary preferences.

This project, in collaboration with the ongoing Tawaki Project, aims to determine the trophic position of Tawaki across their entire breeding range during both the breeding season and the pre-moult dispersal. Previous dietary studies required the extraction of stomach contents to determine prey composition, but we are using a minimally invasive technique not previously employed on this species: stable isotopic analysis. For this, blood and feather samples are collected from penguins at three locations across their range (Jackson Head, Milford Sound / Piopiotahi, and Codfish Island / Whenua Hou) during the breeding season. From this, we gain vital information for two critical periods of the Tawaki's annual cycle. Stable isotope ratios in blood reflect the penguins' diet intake in the weeks before sampling (i.e. early chick rearing), while feathers provide information about prey consumed during the pre-moult period that fuels feather growth. The unique signatures of nitrogen ( $\delta^{15}\text{N}$ ) and carbon ( $\delta^{13}\text{C}$ ) isotopes will be analysed to determine the trophic position of prey consumed and the latitude of important foraging areas. The information gathered during the study, along with tracking data from the Tawaki Project, will provide much needed insight into the dietary preferences of this species as well as confirm just how adaptable this enigmatic species truly is.



Tawaki at Harrison Cove, Milford Sound



Tawaki adults and chicks at Jackson Head