



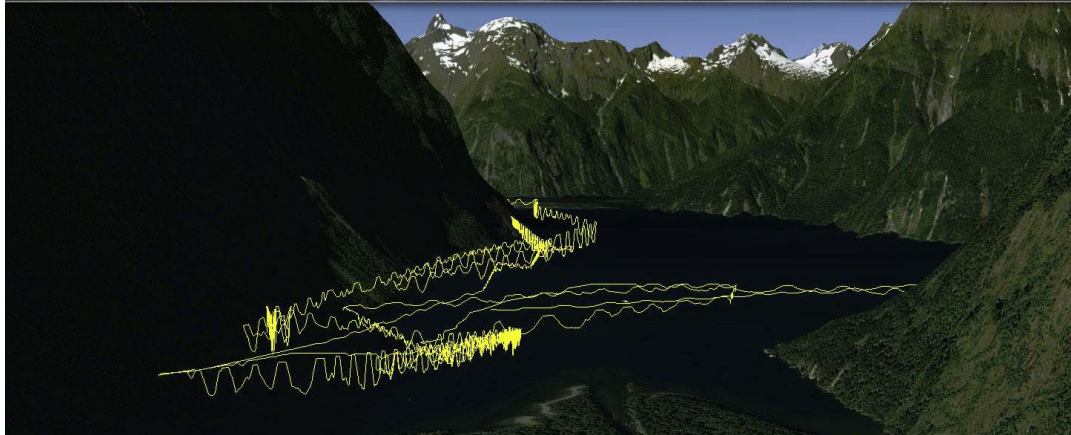
Tawaki Project – Year 2, field season 2015/16

The Tawaki Project is a 5-year project to study the marine ecology of the Fiordland penguin/tawaki across the species entire breeding range. We study the penguins' foraging movements and diving behaviour using miniaturized GPS dive loggers during the chick rearing period in late winter/early spring. After a successful pilot study in the 2014/15 season, we expanded our study focus to include a second study site in Harrison Cove, Milford Sound. Between 14 September and 13 October the project operated with two teams that deployed GPS dive loggers simultaneously at both sites. Field work coincided with the occurrence of one of the strongest El Niños on record. And the effects of the climate phenomenon appeared to have significant effects on the penguins at both study sites.

At Jackson Head we recorded high chick mortality in throughout the entire duration of our stay. Of the 34 tawaki nests we monitored between mid-September and mid-October, 25 nests failed. Since tawaki generally only raise one chick to fledging, only nine chicks remained by the time field work concluded. Main cause for the chick deaths was starvation and/or inadequate food supply. Dissection of four chick carcasses showed that the birds stomach contained mud, stones and bits of vegetation in their stomachs, or was clogged up with squid beaks which cannot be digested. Nest attendance patterns and foraging ranges of adult penguins were significantly longer that what we recorded during the pilot study in the year before. During the first weeks after hatching, only the female penguin goes out to search food for the chicks. While in the previous season females returned every night to feed their chicks, this year they stayed at sea for up to three days. Some birds spent less than 30 minutes at their nest sites before departing on another foraging trip. During these trips, the penguins travelled up to 100 km away from their colonies (foraging ranges in 2014/15: 10-20 km). Clearly the feeding conditions off Jackson Head were very poor.

This proved to be diametrically different in Milford Sound. At Harrison Cove we found 16 active nests, all with healthy chicks, four even with two chicks. That both chicks survive is highly unusual as one of the chicks is generally outcompeted by its sibling during feeding and dies a few days after hatching. However, the food situation in Milford Sound seemed to be exceptionally good. The female penguins hardly left Harrison Cove and only few birds ventured towards the fiord entrance – which is only 9 km from the colony. The average foraging range of 11 tracked penguins was <2 km.

Continuing the research over the next three years will allow us to examine how foraging behaviour varies under different conditions and to assess the species resilience to environmental change. For further information, please visit our website www.tawaki-project.org where we publish annual field reports.



Top: Fiordland penguin/tawaki fitted with GPS dive logger in Milford Sound. Bottom: three-dimensional representation of a tawaki foraging trip performed in Harrison Cove.



Monitoring of a tawaki nest using a time-lapse camera.