



The impacts of disturbance on yellow-eyed penguins (*Megadyptes antipodes*) in the sub-Antarctic

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There are estimated to be fewer than 2000 pairs of the endemic yellow-eyed penguin/hoiho, which is classed as endangered in the IUCN red list. The penguin has a restricted range, found only in the south-east of the South Island, Stewart island/Rakiura and the New Zealand sub-Antarctic. Enderby Island in the Auckland Island archipelago is considered a stronghold for yellow-eyed penguins, where there are estimated to be almost 300 breeding pairs. Impacts from disturbance have been implicated in declines on the mainland, but there has been little study of the impacts of disturbance in the sub-Antarctic and how this may be managed into the future.



Rebecca French with two yellow-eyed penguin fledglings to be weighed.



Chris Muller with an adult yellow-eyed penguin

With the generous support of the Birds NZ research fund and the Department of Conservation we investigated the impacts of disturbance on yellow-eyed penguins on Enderby Island in the sub-Antarctic. The funding from Birds NZ was used to purchase innovative technology including VHF technology for tracking from a drone. This allowed for more efficient nest finding, which enabled population estimates and monitoring of yellow-eyed penguin transits, foraging behaviour and nesting success throughout the breeding season.

Currently on Enderby Island tourists are allowed to approach yellow-eyed penguins to a minimum distance of 5 m. We used experimental behavioural data to provide a model to the Department of Conservation, which predicts the probability of a penguin being disturbed at different human approach distances. This can be used to update the minimum approach guideline for tourists to a distance than minimises the probability of disturbance. We also monitored yellow-eyed penguin nests throughout the breeding season to study mortality rates at different phases of the breeding cycle (incubation, guard-phase and post-guard phase), and weighed fledglings at the end of the breeding season. This is the first time chicks have been weighed on Enderby Island, providing a measure of condition and a predication of juvenile survival in the subsequent year. These data (currently being analysed) provides crucial information about the health of the population on Enderby, on which we know little about. Additional analysis (including diet studies by Chris Muller) will further increase our knowledge of this population.

This research will help to ensure the persistence of this unique species into the future, and could not have been conducted without the help of Birds New Zealand.