A paucity of females – predicting a continued decline in yellow-eyed penguins

Hiltrun Ratz, Chris Lalas, Rosalie Goldsworthy

Abstract

Yellow-eyed penguins, *Megadyptes antipodes*, are listed in the IUCN Red List as endangered and their numbers have declined in the three key mainland breeding sites through the last four years: Moeraki, (North Otago), Boulder Beach (Otago Peninsula) and Long Point (Catlins). We compared the demography of resident yellow-eyed penguins at Moeraki in 2015/16 with that presented from 10 years of data by L. E. Richdale in *A population study of penguins* (1957). The key indications of a decline in a population is that the proportion of the population breeding increases as recruitment decreases, and the proportion of females decreases due to a sex-bias in survival. Breeders represented 71% of the resident population at Moeraki compared with 61% in Richdale's study. Females available for recruitment accounted for 5% of the population at Moeraki, less than half the 11% reported by Richdale. Without a more substantial reservoir of females available for recruitment there will be no fast recovery of the population. Application of average values for survival and recruitment predict a 2% annual increase in nest numbers from the demography generated by Richdale but a 9% annual decrease from the recent demography at Moeraki. We also predict a decrease in breeding success due to increasing interference by surplus males. These predictions are possible only because the Moeraki population is marked and closely monitored throughout the breeding season and subsequent moult.