



## Post-fledging dispersal of mainland hōiho | BNZRF 2018 Project overview

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Juvenile survival is critical to the stability of seabird populations. Mortality is higher for juveniles than adults because they lack foraging and predator avoidance experience, which must be learned<sup>1</sup>, but size, body fat, and overlapping industrial activities can negatively influence survival. Very little is known about the parameters that shape hōiho (yellow-eyed penguins, *Megadyptes antipodes*) dispersal away from the natal area. Less than c. 19% of each cohort survive the juvenile year, and less than c. 12% survive to breed at least once<sup>2</sup>, compared to c. 26% recorded from 1936 to 1952<sup>3</sup>. Juvenile hōiho have been resighted as far north as Hawke's Bay, with most sightings occurring on the Canterbury Coast.

My aims for this study were to determine the initial dispersal and survival of juvenile hōiho after fledging, and their spatial distribution in relation to industrial activities at sea. In addition, I aimed to determine the performance of low-cost solar satellite tags in New Zealand waters, which could be fit for purpose for other seabird tracking studies. My research has focused on tracking juvenile mainland hōiho from their natal areas in 2017 and 2018, which has provided critical baseline data for conservation management of this species.

With a generous donation from the Birds New Zealand Research Fund 2018, I purchased six new generation satellite tags (Seatag-11, 25g, body length 75mm x 19mm depth, with 45° reinforced antennae mount; Desert Star Systems LLC, Monterey Bay USA) to deploy on fledgling hōiho. Using the Argos satellite system, I tracked the movements of these six juveniles from coastal nesting sites in Otago in 2019.

All six birds dispersed to the Canterbury Bight within 3-16 days of fledging. Transmissions were received for 40–106 days; one juvenile returned to Otago Peninsula within 45 days and I was able to retrieve its tag for future use. The data collected over three seasons is being used for marine spatial planning and risk assessments of the marine environment in hotspot foraging areas.

1. Riotte-Lambert L, Weimerskirch H. 2013 Do naive juvenile seabirds forage differently from adults? Proc R Soc B 280: 20131434. <http://dx.doi.org/10.1098/rspb.2013.1434>;
2. Stein et al. (2017), Evidence for high inter-generational individual quality in yellow-eyed penguins. PeerJ 5:e2935; DOI 10.7717/peerj.2935
3. Richdale, L.E. (1957) A population study of penguins, Clarendon Press.