Hōiho go solo with solar

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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[1], 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[2], compared to c. 26% recorded from 1936 to 1952[3]. Juvenile hōiho have been resighted as far north as Hawke's Bay, with most sightings occurring on the Canterbury Coast. Juvenile hōiho spend most of their first year at sea, with survivors returning to near their natal area by the austral Spring. 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.

Two hōiho fledglings from Alfred Beach, Otago Peninsula, and one from Long Point/Irahuka, Catlins, were deployed with Seatag-tt satellite tags (25g, Desert Star Systems LLC, Monterey Bay, USA) in February 2018. The devices were attached to the birds' central lower back using cloth tape and cable ties, and covered in quick-set epoxy resin. All three fledglings were in excellent body condition (5.6 – 5.8 kg) at c. 100 days of age, with the Long Point chick entering the water at 104 days, and the two Alfred Beach siblings fledging at 107 and 113 days.

All three chicks dispersed to the north from their natal areas, and travelled as far as the Canterbury Bight, with two chicks spending most of their time between Kātiki Point and the Waitaki River mouth on the Otago coast. Once the birds had fledged, transmissions were received between nine to 44 days, with the tags transmitting location data to Argos satellites almost every day, even in poor weather. Overall the Seatag-tt had a mean location accuracy of 52% (i.e. locations whose accuracy was between 250 to 1500m). I conclude that the Seatag-tt is a reasonably efficient satellite tag, and being cheaper, hydrodynamic, re-deployable, and lighter than all other commercial tags currently available for seabirds, would be suitable for future penguin foraging studies.

For more information, please contact Mel Young (youngmjf@gmail.com).

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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.