

Inbreeding Depression and Male Fertility in Hihi

My research involves assessing sperm quality (motility, morphology and DNA fragmentation) in New Zealand's native bird species. I will be using funding from Birds NZ to investigate sperm quality in hihi (*Notiomystis cincta*). Hihi are known to have experienced a population bottleneck in the late 1800s when the population was reduced to the individuals surviving on Hauturu (Little Barrier Island). The species has since experienced subsequent bottlenecks as a result of translocations from Hauturu to sites such as Tiritiri Matangi Island. Previous work on hihi has shown that inbreeding resulting from these bottlenecks can affect hatching success in hihi. Research in other bird species has shown that inbreeding can also affect male fertility by causing issues with sperm morphology and motility (swimming speed). To understand the full impact of inbreeding on hihi it is necessary to examine a variety of life history stages. Measuring hihi sperm health in relation to inbreeding will build on the previous work carried out in this species and provide new insight. Thanks to the pedigree for the hihi on Tiri maintained by the Zoological Society of London and the University of Auckland, this population represents a rare opportunity to investigate inbreeding depression in a wild population with known inbreeding coefficients for individuals.

The funding awarded by Birds NZ will allow me to spend two weeks on Tiritiri Matangi during the 2015/16 breeding season collecting semen samples from male hihi. My aim is to analyse sperm from as many males in the Tiritiri Matangi population as possible and then assess the impact (if any) of inbreeding on sperm quality. I will analyse sperm motility for each male in the field using a state of the art mobile laboratory designed especially for my research. I will then take the remaining sperm samples back to the lab at Otago to measure sperm morphology for each bird and assess DNA damage in the heads of sperm. This data will give the most complete yet of the effect of inbreeding on male fertility in any New Zealand bird and I am very grateful to Birds NZ for their assistance on this project.



Helen Taylor working in her in-field sperm motility laboratory.

Image credit: Robyn White.