



Department of
Conservation
Te Papa Atawhai



Understanding egg trait variation and viability in kākāpō

Kākāpō (*Strigops habroptilus*) were once common throughout New Zealand, but like many native birds their population plummeted after humans and introduced predators arrived in Aotearoa. Today only around 200 exist, and these remaining birds are managed on several predator-free islands by the Department of Conservation's Kākāpō Recovery Programme. Kākāpō eggs often fail to hatch, and their breeding seasons are irregular, being driven by the abundance of fruit from masting species such as rimu (*Dacrydium cupressinum*). Together, these problems limit the speed with which the kākāpō population can recover.

Until recently hatching failure in kākāpō was attributed to infertility, but we now know that most unhatched kākāpō eggs contain fertilized embryos that died very early in development. It remains unclear why these developmental problems occur, and whether infertility and embryo death have different underlying causes. To answer these questions, and understand how we can boost kākāpō hatching success, we need to assess the fertility status of more unhatched eggs, measure more egg traits, and combine these data with information about the parents and their environment.

This project will take advantage of the upcoming 2022 kākāpō breeding season to measure the size and shape of many more kākāpō eggs, and dissect unhatched eggs to determine yolk/albumen weight, shell weight, and shell thickness. We will then preserve the yolks of unhatched eggs without visible embryos, and use microscopy to determine whether these are unfertilized or contain embryos that died early in development. Together with egg data collected during the 2019 breeding season, and long-term monitoring data collected by the recovery programme, these results will help us identify the environmental and individual causes of poor fertilization and/or developmental problems in kākāpō.

