

Summary article: Evolutionary history of Australasian stilts

Kakī (black stilts; *Himantopus novaezelandiae*) are a critically endangered wading species endemic to New Zealand. Their numbers declined to a low of approximately 23 birds in 1981 following human impacts. Through intensive management by the Department of Conservation's Kakī Recovery Team, the wild population has increased to 132 adults today.

When kakī numbers have been very low, they have interbred with poaka (the New Zealand population of pied stilts; *H. himantopus leucocephalus*). Poaka self-introduced from Australia and are now widespread across New Zealand. Hybridisation results in fertile hybrids with intermediate plumage, but hybrid offspring exhibit lower fitness than pure individuals.

With the support of the Birds New Zealand research fund, Natalie Forsdick is reconstructing the evolutionary history of kakī. To do this, she has produced the first whole mitochondrial genomes (mitogenomes) for a number for kakī, Australian and New Zealand pied stilts, and hybrids. Mitogenomes are relatively short sequences of DNA that are maternally inherited, and provide strong evidence to determine phylogeny. Combined with published mitogenomes for other Charadriiformes species, these data will add to the story of the evolutionary history of the stilt complex, and improve our knowledge of the origins of New Zealand's avifauna.

Phylogenetic analyses confirm the split between pied stilts and kakī. Preliminary dating of the divergence time between poaka and kakī based on genetic distance unsurprisingly shows a recent common ancestor that may have lived as little as 500,000 years ago. Hybrid individuals group most closely with pied stilts, which suggests that hybridization is mostly driven by male kakī mating with female poaka, with hybrids inheriting the maternal mitogenome. While results still have to be confirmed by more specific molecular clock analyses, the close relationship shown by the preliminary analyses is consistent with the ability of the two species to produce fertile hybrid offspring. Natalie is currently expanding the study by incorporating 28 historic stilt samples collected from Canterbury, Auckland, and Te Papa Museums to narrow down the divergence time estimates.



Photo credit: Liz Brown