

## Phylogeography and microevolution of kokako (*Callaeas* spp.)

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During the past two years, our team has been studying basic morphometric data, bill shape, and stable isotopes (carbon and nitrogen from feathers) of all members of the New Zealand endemic family Callaeidae, a.k.a. the wattlebirds. Using specimens from natural history collections worldwide, we compiled a dataset spanning circa 130 years for North Island kokako (*Callaeas wilsoni*) and 80 years for South Island kokako (*Callaeas cinerea*), covering all regions of each of NZ's main islands.

Our preliminary results provided insights about microevolution and feeding ecology of those birds, showing differences between NI and SI kokako that could be due to a lower degree of genetic variability in the latter. A previous study has hinted at reduced genetic variability in SI kokako (Murphy et al., 2006: *Emu* 106), but it was

based on a restricted dataset (only two SI individuals and only present-day NI birds). This would also have implications regarding the ancestral lineage of this pair of species.

As such, I will conduct a population genetics study (with a heavy phylogeography bent) of kokako using an ancient DNA protocol to acquire DNA from historic museum specimens. The focus will be on sequencing the barcoding region of the COI marker and the mitochondrial control region to conduct network analyses and phylogenetic tree building. Specimens will also be sexed via the genetic sex marker CHD-W/CDH-Z.

Natural history collections offer a glimpse at the species' past "natural" state and this study will provide data on the genetic variability of kokako, uncover geographically structured genetic signals, and elucidate their biogeographic history. Furthermore, the resulting genetic data will be added to our framework of geometric morphometrics and stable isotopes to produce a more comprehensive study on the ecology and microevolution of these species and their survival or extinction.



South Island kokako, watercolour by Paul Martinson (2003) from the series *Extinct Birds of New Zealand*. ©Te Papa CC BY-NC-ND 4.0 ([2006-0010-1/10](https://creativecommons.org/licenses/by-nc-nd/4.0/)).