

Monitoring kororā/little blue penguin (*Eudyptula minor*) populations on the Banks Peninsula using a portable MinION sequencing device

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Introduction

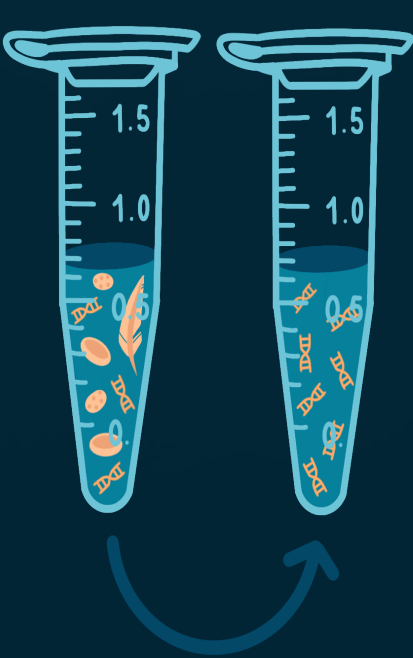
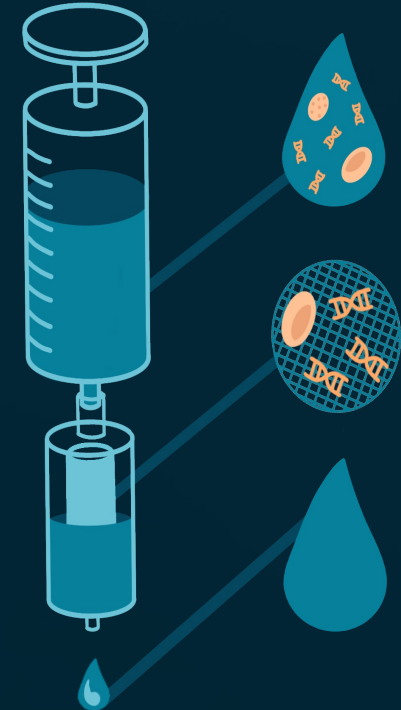
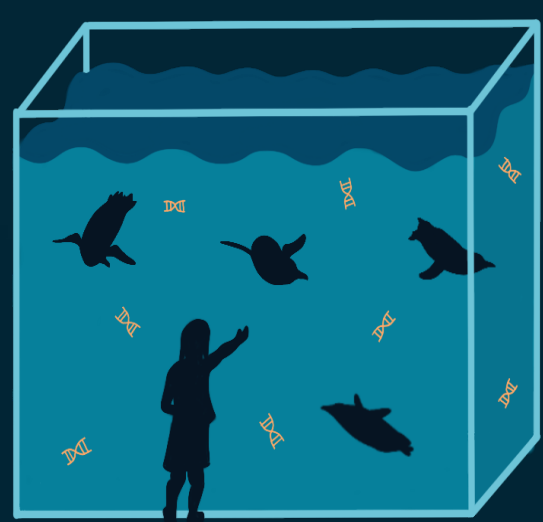
"He kororā, he tohu orange"
"the kororā is the sign of life."

- In Aotearoa Kororā are a **conservation dependent taonga** species.
- Canterbury is home to the unique white flippered morphotype; previously *Eudyptula minor albosignata*.
- Monitoring kororā populations can be time and labour intensive, and genetic methods are invasive.
- Using **Environmental DNA**; DNA extracted from environmental samples e.g. water, is a **non-invasive method** for genetic monitoring that should be considered for assessing kororā population decline

Can we use non-invasive genetic methods to monitor kororā populations in-situ?

Methods

eDNA sample collection Sample filtration DNA extraction PCR DNA Amplification



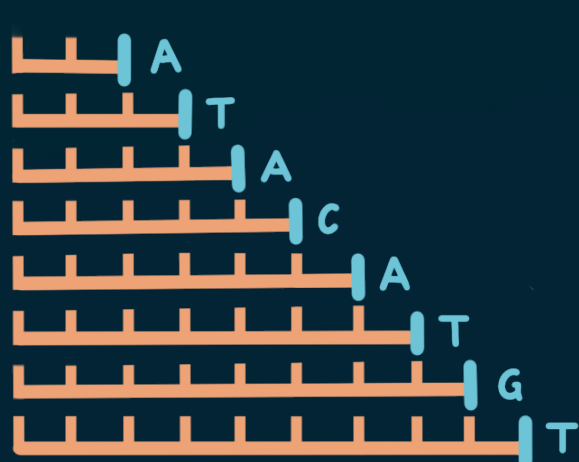
Nanopore sequencing



Long read sequencing method

Sanger sequencing

Chain termination method



Results

Initial successful single species detection of kororā using eDNA and portable sequencing technology.



Target Species



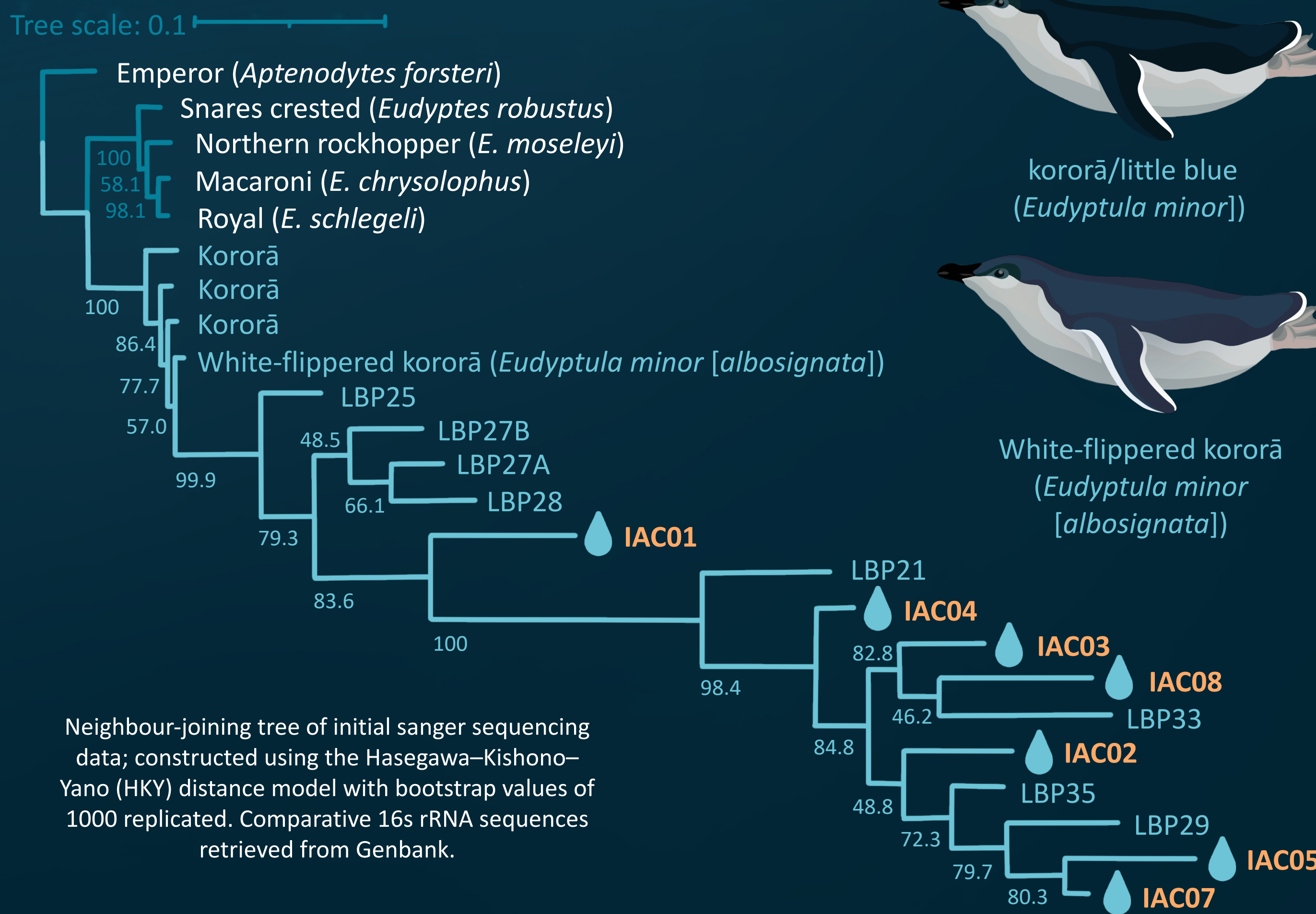
Prey Species



Contamination



- Generated ~2 295 000 raw MinION reads
- Preliminary investigation= **primarily kororā sequences**, some **prey** (*Sprattus sprattus*)
- Low levels of **contamination** a potential issue



- Limited information in such a small region of DNA
- Sanger sequences identified as kororā displayed a large degree of divergence between sequences.
- Potential issues with degraded sequences

Future directions



Map of the Akaroa and Pohatu marine reserves (blue) and the nest boxes at Pohatu Penguins (orange).



White flipped kororā and chicks in a nest box at Pohatu Penguins, Pohatu/Flea Bay, banks peninsula; feather and faecal samples will be collected from nest boxes. Image: L. Howell

Captive kororā were detected in tank water; further work is needed to investigate individual differences

- Looking beyond single species detection; considering nanopore sequencing for **population genetics**, detecting individual variation.
- Utilise these molecular tools to investigating **factors influencing the decline in the kororā** colony at Pohatu/Flea bay using **non-invasive genetic samples** such as faeces, feathers and water.
- Developing methods for **community collaboration**, engaging with Mana Whenua, local tourist industry and the general public.

