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Effects of translocation on Kokako (*Callaeas cinerea wilsoni*) song and its application to management.



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Sarah Michelle van Herpt

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Abstract

This thesis fills a research gap in our knowledge of kokako song by looking at how song evolves in multi-dialect areas. Kokako only exist in small remnant populations separated by large tracts of unsuitable land. Kokako are very poor flyers, only able to fly for approximately 100 metres at a time. In order to prevent inbreeding and a loss of genetic diversity in the remaining kokako populations, managers are carrying out translocations to establish new populations, maintain gene flow and prevent inbreeding. However, these translocations have the potential to be unsuccessful because kokako exhibit macrogeographic variation in their dialects, and tend not to breed with individuals who do not share the same dialect as them. If the purpose of the translocation is to enhance genetic diversity by having kokako from different areas breed then song is an important factor that must be dealt with. Song is extremely important to kokako for a number of reasons. Chiefly, it is hypothesised that song is their primary means of territory defence. A kokako gains all its resources from its territory, so it is imperative that they successfully defend it. Their duet song functions in territory defence, but also acts to form and maintain pair bonds.

In order to try and address the problem that song causes in translocations I studied if and how song evolves in a multiple dialect area. I conducted research at Pukaha Mount Bruce, where there is a population of kokako originating from two different source populations, and thus two different dialects, Northern Mapara and Mangatutu. I looked at the Northern Mapara dialect, and recorded kokako belonging to three groups; kokako currently living in the source population, kokako that were translocated to Pukaha and kokako that were born at Pukaha. In order to determine how the song may be changing I looked at element repertoires, the levels of sharing between groups, the number of unique elements in repertoires and the syntactical and temporal characteristics of phrases.

This study shows that translocation into multiple dialect areas can affect kokako song. Translocation did not affect the size of the kokako repertoire, but it seemed to affect the amount of sharing within and between different groups of kokako. Currently the level of

sharing within the groups at Pukaha is lower than the level of sharing within the source Mapara population, indicating that the song may be diverging. There also seem to be more unique elements found at Pukaha, which in part explains the lack of sharing. There appears to be microgeographic variation at Pukaha, with birds clustered around the second (Mangatutu) dialect sharing less with the source population than do those kokako whose territories are lower down in the reserve. The phrases which are used are also evolving, with only one phrase truly shared among all groups. There are other phrases which show additions or deletions of elements, and so are evolving. The main change found in the phrases is the timing between elements, with six out of seven phrases examined showing changes.

These results have repercussions for future kokako translocations, and the future of the Pukaha kokako. A low amount of phrase and element type sharing combined with changes of intra-phrase timing could lead to the Pukaha kokako's inability to successfully defend their territories. This research shows how kokako song can give conservation managers information on the status of their populations in regards to interbreeding and raises questions which can be answered by further research, both at Pukaha and in other mixed-dialect kokako populations.

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