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

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Science in Conservation Biology

at Massey University, Palmerston North, New Zealand

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2009

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.

Acknowledgements

This thesis would not have been possible without the help, support and encouragement from my supervisors. I would like to acknowledge Isabel Castro who was enthusiastic from the start, you made me excited too. Thank you for all your help and guidance and for reading my many drafts, and especially for being patient with me when I was stressing out! I would also like to recognise Laura Molles who leant me equipment and had her father-in-law build me a shock mount for my mic. Thank you for helping me with my stats and for listening to my recordings to make sure I was on track, and for also reading many drafts. Thank you both for everything you have done for me, I am so very grateful to you.

I would like to acknowledge my family who have all been incredibly supportive and helpful throughout the whole thesis process. Mum, you were a huge help when I was stressing out about getting everything done, the computer work you did for me is greatly appreciated, and thanks for getting me out of the house at the end! Dad, you were really patient when my computer had a meltdown and I stressed out, thank you so much for fixing it, and for being my personal alarm clock! Emma thank you for all the little presents you gave me and for helping to give me a break.

Thank you to the Department of Conservation, in particular everyone at Pukaha. Tony Silbery, who showed so much interest in my thesis right from the start, and Tom Studholme who helped me out finding kokako and lent me equipment. I have really appreciated the use of the staff quarters as my base, particularly when I was serenaded in the morning by Romeo. Thank you to all the captive staff who gave me jobs and kept me busy on the days when I couldn't record, and in the afternoons when I'd finished, I had a lot of fun.

I gratefully acknowledge the help of all my field workers; Rachel Wells, Natasha Petrove, Emily Platt and Katrina O'Connor. You came away with me to Mapara and Mangatutu and were so helpful, in more then just recording. We had flat tires, droughts, dead lambs and horrific thunderstorms! There was also the blackberry picking, finding more pairs of kokako then we could ever imagine and the chance to explore these amazing places. I had

such a good time with you all and I will remember it forever. Thank you also to everyone else who walked with me and encouraged me on my way: Chloe, Katie, Hamish, Eric, Michelle and all the volunteers at Pukaha.

At Mapara I would like to acknowledge Rachel and Joe Barton, who provided me with accommodation. Thanks to Pat and Arthur Cowan and the New Zealand Native Forests Restoration Trust for allowing me to stay at Rangitoto station in Mangatutu. Also at the Te Kuiti DoC office Lisa Daglish and Dave Smith for helping me find accommodation and providing me with maps of both Mapara and Mangatutu.

I also want to thank the Massey University Ecology Group. Barbara Just and Erica Dahya provided all the administrative and technical support. Thanks to the other graduate students for all your enthusiasm, support and encouragement. Thanks to the B.E.E.R.S. group for listening to my conference talks and trying to help me solve problems. And for the beers and entertainment!

This project was funded by a Lovell and Berys Clark Scholarship. Approval for this project was granted by the Massey University Animal Ethics Committee and a permit was granted by the Department of Conservation.

And a huge thanks to all the beautiful kokako I recorded!!

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