The Effect of a Translocation on a Source Population Using North Island Robins as a Case Study.

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Errata Sheet

Corrections and amendments to pages 7, 30, 50, 53 and 75.

Page 7: "There are approximately 2-3 birds/ha with about 2 pairs/ha". The line should read only: *There are approximately 2-3 birds/ha.*

Page 30: "Based on 500 bootstrap data sets, the global model {ϕ(a*y + s*y + p), p(a*y + s*y + p)} appears to fit the data (P = 0.14)". *The value of P = 0.14 means that, under the assumptions of the model, the probability of a deviance as large or greater than the observed value (269.716, Table 2.2) is approximately 0.14. This is well above an α level of 5% (0.05), so it is reasonable to assume that the data set meets the assumptions of the model.*

Page 50: Paragraph 3. For adult survival the β value should read $\beta = 3.92$. For juvenile survival the formula should read $\beta = 4.07 - 0.87P$.

Page 53, Table 3.1: The row "Intercept (β value) for juvenile survival" should read as follows:

Parameter	**Worst value (Lower 95% confidence interval)**	**Predicted values**	**Best values (Upper 95% confidence interval)**
Intercept (β value) for juvenile survival	2.95	4.07	5.19

Page 75: Methods, first sentence. Reference to Appendix C should be *D*.

Abstract

This thesis aims to assess the effects of a translocation on a source population. In 1999, 21 North Island robins (*Petroica australis longipes*) were translocated from Tiritiri Matangi Island (Hauraki Gulf) to Wenderholm Regional Park (north of Auckland). Previous research on Tiritiri Matangi Island suggested that the population was limited to about 60 birds by the available habitat. There was high (about 75%) juvenile mortality each year, and the number of juveniles surviving closely matched the number of adults dying. It was therefore hypothesised that juvenile survivorship was density dependent, and that a portion of the population could thus be removed each year with little impact. The translocation was designed as an experimental reduction in density to test this hypothesis.

Survival was modelled using by mark-recapture analysis, and suggested that density dependence was present in the Tiritiri Matangi population. Survival of juvenile robins was correlated with the number of pairs present in the population during the breeding season they were produced. Population viability analysis (PVA) suggested that the Tiritiri Matangi robin population was not affected detrimentally by the removal of 21 birds for translocation, with a 0% probability of extinction within the next 20 years. The PVA indicated around 3 years was required for the population to recover to an equilibrium of around 65 birds. A sensitivity analysis suggested that even if all the parameters are overestimated, the probability of extinction of the Tiritiri Matangi population within 20 years was still low (1.3% for a worst-case scenario).

PVA indicated that the Wenderholm population had a high probability of extinction, but this may be an artefact of the translocation. This PVA was based on only one year of data, and therefore had a high degree of uncertainty. It nevertheless suggested that juvenile recruitment was a key factor limiting population survival; hence the viability of the population could be improved by identifying and managing threats to juvenile survival.

I investigated the viability of different harvesting regimes for the Tiritiri Matangi population. Annual, biennial and triennial harvesting indicated around 100, 90 and 80 birds

respectively, could be removed over 6 years resulting in a 5% probability of extinction within 20 years. The model indicated that harvesting the population to as few as 4 pairs was possible, and would result in an extinction probability of 0% within 100 years. This would take about 10 years to recover from.

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In writing this thesis I have been very lucky to have so many people give me advice, support and the benefit of their knowledge. Without these people I would never have got so far as I have. I just want to start by apologising if I miss you off this list. It's not intentional and I will probably be kicking myself the minute this gets to the binders and I realise all the people who have helped in their own little ways.

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Thanks to everyone who has made this research, not only possible, but an experience that I will never forget!

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