Tiritiri Matangi Island Transect Bird Survey: 2016 Report

John Stewart and Kay Milton

Introduction

The *Tiritiri Matangi Island Biodiversity Plan 2013* recommends population monitoring as a management requirement for most of the bird species on the Island (SoTM 2013: 51-53). In February 2015 SoTM carried out a transect survey of birds in the forested areas of the Island. Some results from this survey were reported to DOC in June 2015 (SoTM 2015). In March 2016 a repeat survey was carried out. This report describes the 2016 survey and presents some preliminary results.

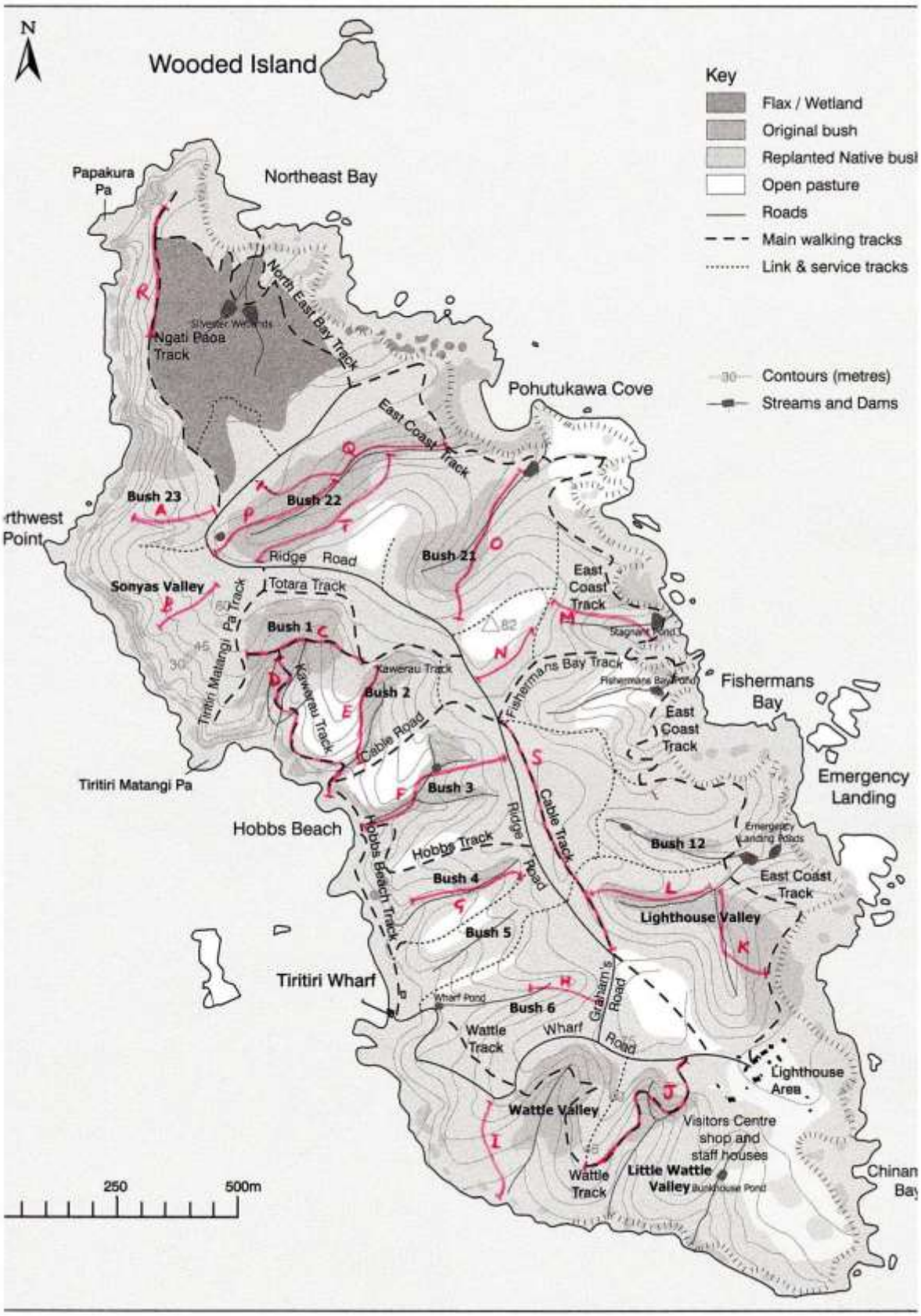
This survey was authorised under a general permit (39910-Res) for non-invasive research and monitoring issued by the Department of Conservation (DOC) in December 2014.

Methodology

The survey was carried out over four days from the 7th to the 10th March 2016. The same 20 transects that were used in 2015 were used again (see map below). On each of the four days, seven volunteer counters took part. Over the four days, each transect was walked twice (once in each direction) by every participant, which meant that each transect was walked 14 times (280 counts in total).

The transects were walked at a slow pace and all birds seen or heard within 10 metres either side of the route were counted. Birds flying overhead were also counted.

Eight people took part in the survey. One of the original seven had a competing commitment on the fourth day and so an eighth person stood in. Five of the participants were experienced bird surveyors and four of these also took part in the 2015 survey. The remaining participants were already familiar with the Island, with the bird species they would be identifying, and with some of the transect routes.



Map of Tiritiri Matangi Island showing the routes of the 20 transects used in the bird survey.

In preparation for the survey:

- each transect route was marked with flagging tape (which was removed at the end of the survey),
- maps and instructions were prepared and provided to the participants,
- a health and safety plan was prepared and provided to participants,
- a schedule of routes and timings was generated for each participant and sent to them in advance,
- the survey organisers walked some of the transects with the new participants to familiarise them with the routes.

For the most part, the same methodology that had been used in 2015 was used again. The only difference was that, in 2015, no schedule of routes and timings had been provided, which meant that there was less control over how long it took to walk each transect and at what time of day it was walked. Providing such a schedule in 2016 meant that the effort was spread more evenly over the transects and time of day, and ensured that no two surveyors were walking the same transect at the same time.

Data analysis

The total number of each species recorded (seen or heard) on each transect was averaged to produce a mean count per transect. This figure was then divided by the area counted (length x width (20m)) to give a mean density (birds per hectare) per transect. For each species the 20 transect densities were then averaged, to give an estimate of the density across the forested areas of the Island. This figure was then multiplied by the total area of forest on the Island, to produce a population estimate. It is important to recognise that this method does not produce a population estimate for the whole Island, but only for the forested areas. Thus, for species that spend all or most of their time in the forest (e.g. titipounamu/rifleman), the final figures will be closer to an overall island population estimate than for species that spend a lot of time in open areas (e.g. pūkeko)

Standard errors and 95% confidence limits were also calculated.

Summary of results

The table shows population estimates and upper and lower 95% confidence limits (CL) for the 2015 and 2016 surveys.

		2016				2015	
	Lower CL	**Mean**	**Upper CL**		**Lower CL**	**Mean**	**Upper CL**
Pōpokotea/Whitehead	1593	2011	2429		2072	2644	3215
Tīeke/Saddleback	956	1155	1355		1131	1337	1542
Toutouwai/Robin	350	495	640		285	360	436
Korimako/Bellbird	1430	1717	2004		681	1063	1444
Kōkako	77	115	152		26	48	70
Tūī	1034	1388	1741		708	987	1266
Kākāriki	227	335	443		318	447	576
Hihi	495	665	836		414	582	751
Kereru	132	189	246		97	150	203
Blackbird	70	118	167		152	228	312
Titipounamu/Rifleman	24	52	80		2	18	23
Mātātā/Fernbird	55	104	153		56	113	169
Pīwakawaka/Fantail	109	230	350		155	214	273
Pūkeko	5	21	37		17	41	65
Pūweto/Spotless crake	1	14	28		12	26	40
Takahē	0	7	14		0	10	20
Riroriro/Grey warbler	10	34	58		13	43	72
Kōtare/Kingfisher	1	13	24		7	36	66
Ruru/Morepork	3	18	33		0	15	30

Discussion of results

Interpretation of the results is at a very preliminary stage, and it will be impossible to detect clear trends until more annual surveys have been carried out. With just two surveys completed it is also impossible to tell whether differences in the results for 2015 and 2016 indicate changes in population or are due to other factors, such as difference in methodology (see above).

The accuracy of population estimates derived from slow-walk transect surveys relies on meeting a number of conditions including that the birds be detectable if present and that the presence of the counter does not influence the count. Some of the population estimates fall within the expected range while others, we know, are

inaccurate. For instance, the figures for hihi and toutouwai/robins are known to be considerably exaggerated, because these species are closely monitored throughout the breeding season. Similarly, the total number of kōkako on the Island is known through close monitoring, and while the mean estimate produced by the 2015 transect survey is close to that total (estimate 48, known total 42), that produced by the 2016 survey (115) is nearly double the known number at the time (60).

In the case of pīwakawaka/fantail, hihi and toutouwai/robin, we can assume that the condition that the counter's presence does not influence the result was not met, and probably never will be. Observation of these species outside the context of the survey teaches us that they will often come towards someone walking through the bush, so estimates of their population are likely to be artificially high.

In the case of the more secretive species, such as ruru/morepork and pūweto/spotless crake, we can expect only a fraction – perhaps a small fraction – of the birds present to be detectable, so the figures produced by the survey are likely to be underestimates.

Nevertheless, for many species, slow-walk transects are likely to be the most practical technique available for estimating population numbers and trends, and are widely used in wildlife research. It is SoTM's intention to carry out a transect survey at least annually for five years. The results, together with the results of other monitoring work carried out on Tiritiri Matangi, should enable us to get a clearer picture of population levels and trends, and form a basis for decisions on longer-term monitoring and management.

Participants

The survey was organised by John Stewart and Kay Milton. Other participants were Morag Fordham, Simon Fordham, Mhairi McCready, John Sibley, Margie Luby and Kathy Chandler.

References

SoTM 2013: *Tiritiri Matangi Island Biodiversity Plan 2013*.

SoTM 2015: *Non-invasive research and monitoring of fauna and flora on Tiritiri Matangi Island: 2015 Report on activities undertaken under Authorisation no. 39910-RES*.