

Tiritiri Matangi Island Transect Bird Survey: 2017 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. The survey was repeated in March 2016 and again in March 2017. This report describes the 2017 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 the 1st to the 23rd March 2017. The same 20 transects that were used in 2015 and 2016 were used again (see map below). This year, because of clashes with other commitments, the survey was carried out over 23 days rather than just four as in the past.

Over the survey period each transect was walked 16 times (8 in each direction) by the participants. The total number of transect counts was 320 (up from 280 last year).

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. Four of the eight had taken part in previous years. Of the four new volunteers two were very familiar with the Island and the transect routes and had good recognition skills while the other two had good

recognition skills but limited knowledge of the Island. These two accompanied an experienced surveyor on their survey routes before counting on their own.

In preparation for the survey:

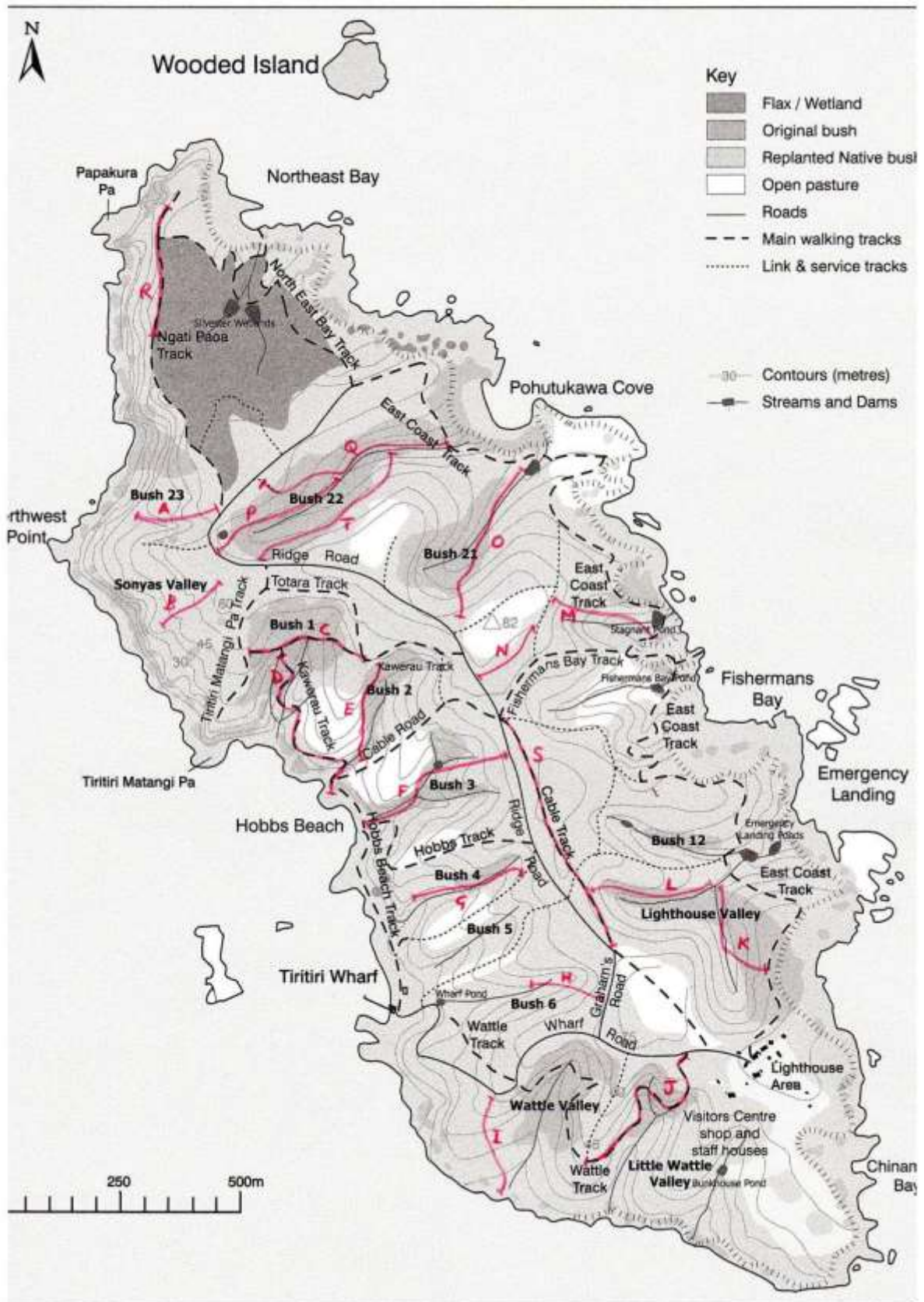
- each transect route was marked with flagging tape (which was removed at the end of the survey),
- maps and instructions were prepared and provided to the participants,
- a health and safety plan was prepared and provided to participants,
- a schedule of routes and timings was generated for each participant 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 2016 was used again. The major difference was that the survey was carried out over a longer period. Similar walk schedules to those developed for 2016 were used to ensure that there were never two counters on the same transect at once and that each transect was counted an equal number of times earlier and later in the morning to avoid introducing a bias related to lower detection rates later in the morning.

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.



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

Summary of results

The table shows population estimates and upper and lower 95% confidence limits (CL) for the 2015, 2016 and 2017 surveys.

	2017			2016			2015		
	Lower CL	Mean	Upper CL	Lower CL	Mean	Upper CL	Lower CL	Mean	Upper CL
Pōpokotea/ Whitehead	1318	1794	2270	1593	2011	2429	2072	2644	3215
Tīeke/ Saddleback	939	1124	1309	956	1155	1355	1131	1337	1542
Toutouwai/ Robin	298	366	435	350	495	640	285	360	436
Korimako/ Bellbird	1897	2332	2767	1430	1717	2004	681	1063	1444
Kōkako	70	116	162	77	115	152	26	48	70
Tūi	462	630	798	1034	1388	1741	708	987	1266
Kākāriki	251	365	479	227	335	443	318	447	576
Hihi	355	536	717	495	665	836	414	582	751
Kereru	38	78	118	132	189	246	97	150	203
Blackbird	86	124	162	70	118	167	152	228	312
Titipounamu/ Rifleman	16	29	42	24	52	80	2	18	23
Mātātā/ Fernbird	30	72	114	55	104	153	56	113	169
Pīwakawaka/ Fantail	249	371	494	109	230	350	155	214	273
Pūkeko	17	39	61	5	21	37	17	41	65
Pūweto/ Spotless crane	-5	11	28	1	14	28	12	26	40
Takahē	-1	3	8	0	7	14	0	10	20
Riroriro/Grey warbler	18	37	56	10	34	58	13	43	72
Kōtare/ Kingfisher	-1	7	15	1	13	24	7	36	66

Discussion of results

Interpretation of the results is still at a preliminary stage but the mean of these three surveys will provide a baseline against which to compare future annual variations in population estimates.

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 (115) and 2017 (116) surveys are nearly double the known numbers at the time (60 and 64).

Although the confidence limits indicate there may not have been a change, the estimated mean population for pōpokotea/whitehead has fallen in both 2016 and 2017 and this could well be due to the high numbers removed in translocations. Around 1,000 pōpokotea have been removed over the past six years.

Korimako/bellbird estimates have risen considerably over the three years and they are now the most common forest-dwelling species.

Tūi, kōtare/kingfisher, kereru and blackbird may have declined substantially.

The population estimate for titipounamu/rifleman is lower than the known population probably reflecting the difficulty in detecting this cryptic species where the high-pitched calls may not be detected by some observers. Their calls may also have been difficult to hear when cicada calls were loud.

Despite the concern raised by the very low numbers of tūeke/saddleback breeding in nest boxes this year the population estimate is holding up well.

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 crane, 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 Mhairi McCready, Vix Franks, Margie Luby, Roger Bray, Sophie Journé and Sophie Kynman-Cole .

References

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