Tiritiri Matangi Island Transect Bird Survey: 2018 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, March 2017 and again between the 8th February and the 15th March 2018. This report describes the 2018 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 from the 8th February to the 15th March 2018, about two weeks earlier than in previous years. The same 20 transects that were set up in 2015 and used in subsequent surveys were used again (see map below). As with the 2017 survey, this year's work was carried out over an extended period (36 days) which makes it easier to arrange accommodation for the surveyors.

Over the survey period each transect was walked 16 times (8 in each direction) by the participants. As in 2017, the total number of transect counts was 320

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.

Six people took part in the survey. Four of the six had taken part in previous years. The two new volunteers were very familiar with the Island and the transect routes and had good bird recognition skills.

In preparation for the survey:

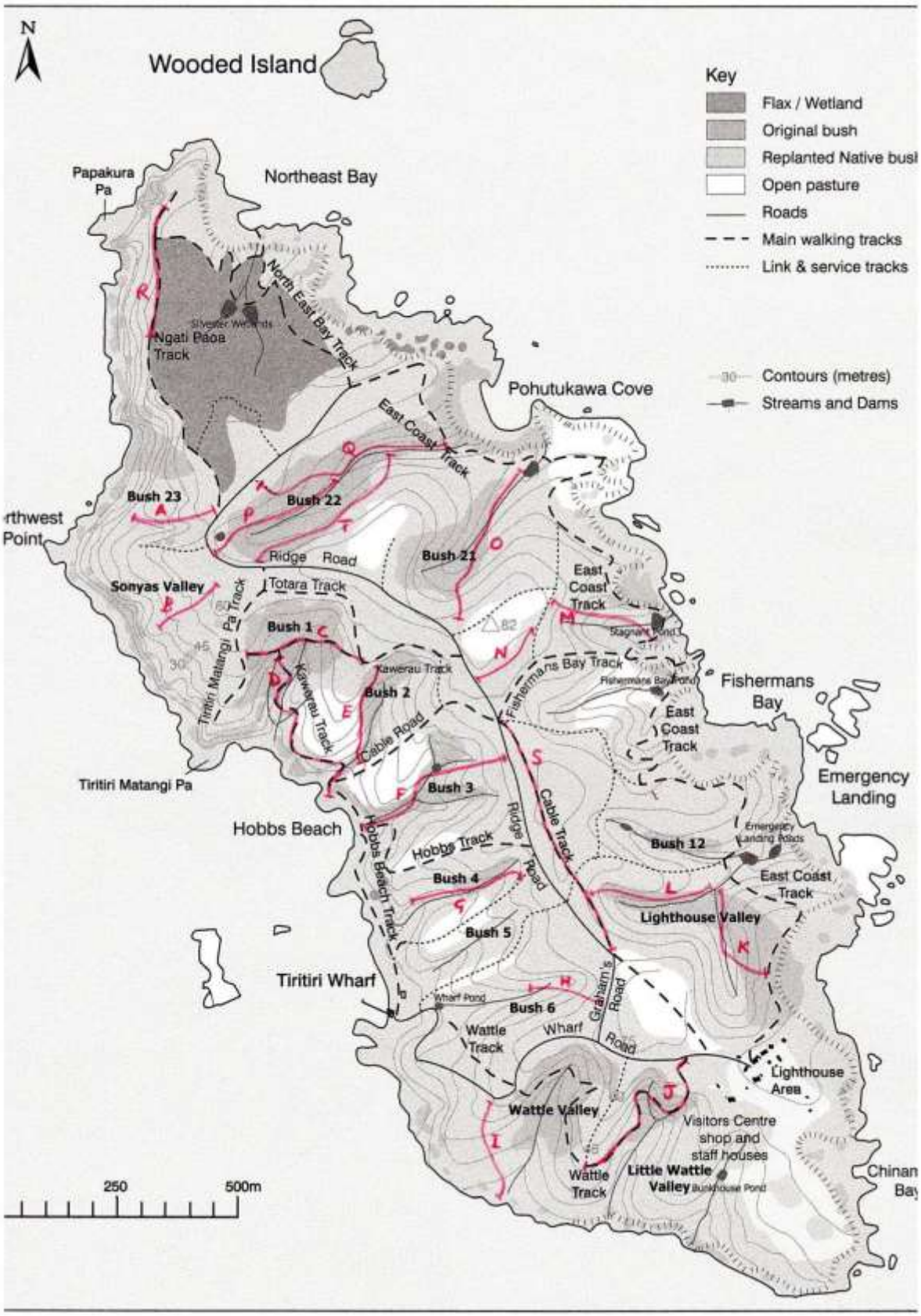
- each end of each transect route was marked with flagging tape (which was removed at the end of the survey),
- maps and instructions were prepared and provided to the participants,
- a health and safety plan was prepared and provided to participants,
- a schedule of routes and timings was generated 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.

The same methodology that had been used in 2017 was used again. Similar walk schedules to those developed for 2017 were used to ensure that each transect was counted an equal number of times earlier and later in the morning. This avoids a bias which would otherwise be present because birds tend to be more easily detected earlier than 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, 2017 and 2018 surveys.

		2018			2017			2016			2015	
	Lower CL	Mean	Upper CL	Lower CL	Mean	Upper CL	Lower CL	Mean	Upper CL	Lower CL	Mean	Upper CL
Pōpokotea/Whitehead	1541	1868	2195	1318	1794	2270	1593	2011	2429	2072	2644	3215
Tīeke/Saddleback	779	931	1083	939	1124	1309	956	1155	1355	1131	1337	1542
Toutouwai/Robin	338	427	517	298	366	435	350	495	640	285	360	436
Korimako/Bellbird	1162	1515	1867	1897	2332	2767	1430	1717	2004	681	1063	1444
Kōkako	47	81	115	70	116	162	77	115	152	26	48	70
Tūī	217	375	533	462	630	798	1034	1388	1741	708	987	1266
Kākāriki	277	427	578	251	365	479	227	335	443	318	447	576
Hihi	375	502	629	355	536	717	495	665	836	414	582	751
Kererū	59	110	162	38	78	118	132	189	246	97	150	203
Blackbird	55	87	119	86	124	162	70	118	167	152	228	312
Titipounamu/Rifleman	32	75	118	16	29	42	24	52	80	2	18	23
Mātātā/Fernbird	63	107	150	30	72	114	55	104	153	56	113	169
Pīwakawaka/Fantail	200	255	309	249	371	494	109	230	350	155	214	273
Pūkeko	20	46	72	17	39	61	5	21	37	17	41	65
Pūweto/Spotless crake	4	18	31	-5	11	28	1	14	28	12	26	40
Takahē	0	0	0	-1	3	8	0	7	14	0	10	20
Riroriro/Grey warbler	5	14	42	18	37	56	10	34	58	13	43	72
Kōtare/Kingfisher	11	27	42	-1	7	15	1	13	24	7	36	66
Ruru	9	31	52	1	10	18	3	18	33			

Discussion of results

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), those produced by the 2016 (115), 2017 (116) and 2018 (81) surveys are nearly double the known numbers at the time (60, 64 and 50 (approximate population at the end of the breeding season)). Twenty kokako were translocated to Paraninihi between the 2017 and 2018 surveys.

Although the confidence limits indicate there may not have been a change, the estimated mean population for pōpokotea/whitehead has risen slightly after having fallen in both 2016 and 2017. The possible drop in population could have been due to the high numbers removed in translocations. Around 1,000 pōpokotea were removed over the six years up to 2017. None were removed in the past year.

Korimako/bellbird estimates had risen considerably over the first three survey years becoming the most common forest-dwelling species. However the mean population estimate has fallen by around a third since last year.

Tūī and blackbird have continued their substantial declines while kererū and kōtare/kingfisher have recovered somewhat from earlier declines.

The population estimate for titipounamu/rifleman shows a considerable increase over previous years and this corresponds with results from nest finding, more nests having been found than in any previous year. The actual population is likely to be higher than reported here because the very high-pitched calls of this species may not have been detectable by all observers. Their calls may have been especially difficult to hear when cicada calls were loud.

Tīeke/saddleback estimates continue the steady decline shown over the surveys since 2015.

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. It is still possible to use the estimates as an index if we assume that the factors impacting on the accuracy have a similar effect each year.

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 fifth annual transect survey in 2019. Following this we shall review the results and consider whether to continue with yearly surveys or reduce the frequency to once every two or three years. The cumulative 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, Karin Gouldstone, Alison Forbes and Morag Fordham.

References

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