Tiritiri Matangi Island Transect Bird Survey: 2020 Report

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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 has been repeated each year since then. This report describes the 2020 survey and presents some preliminary analysis.

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 7th February to the 16th March 2020. The same 20 transects that were set up in 2015 and used in subsequent surveys were used again (see map below). As with the previous three surveys, this year's work was carried out over an extended period (39 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 the past three years, 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.

Eight people took part in the survey. Seven of the eight had taken part in previous years. The new volunteer was familiar with the Island and the transect routes and had good bird recognition skills.

In preparation for the survey:

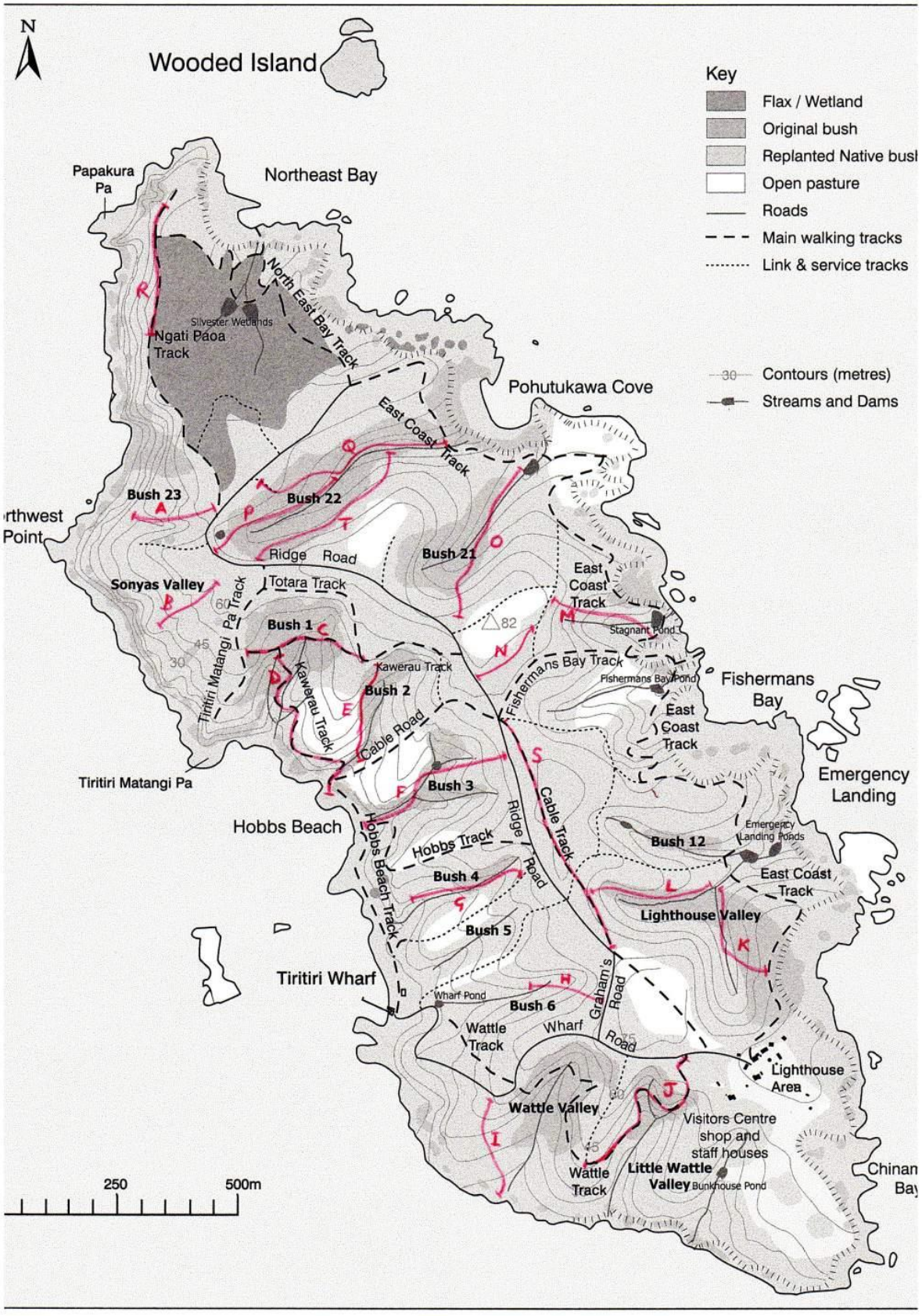
- each end of each transect route was marked with flagging tape (which was removed at the end of the survey),
- maps and instructions were prepared and provided to the participants,
- a health and safety plan was prepared and provided to participants,
- a schedule of routes and timings was generated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

The same methodology that had been used over the last three seasons 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. korimako/bellbird), 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 2017, 2018, 2019 and 2020 surveys.

	2020			2019			2018			2017		
	Lower CL	**Mean**	Upper CL	Lower CL	**Mean**	Upper CL	Lower CL	**Mean**	Upper CL	Lower CL	**Mean**	Upper CL
Pōpokotea/Whitehead	1256	**1663**	2070	1469	**1890**	2312	1541	**1868**	2195	1318	**1794**	2270
Tīeke/Saddleback	655	**807**	959	889	**1100**	1311	779	**931**	1083	939	**1124**	1309
Toutouwai/Robin	235	**313**	392	336	**418**	501	338	**427**	517	298	**366**	435
Korimako/Bellbird	1480	**1962**	2443	1956	**2297**	2638	1162	**1515**	1867	1897	**2332**	2767
Kōkako	40	**71**	102	37	**64**	90	47	**81**	115	70	**116**	162
Tūī	214	**319**	425	938	**1336**	1734	217	**375**	533	462	**630**	798
Kākāriki	326	**469**	612	538	**753**	968	277	**427**	578	251	**365**	479
Hihi	462	**655**	848	465	**685**	904	375	**502**	629	355	**536**	717
Kererū	61	**102**	143	170	**252**	383	59	**110**	162	38	**78**	118
Blackbird	111	**150**	188	183	**231**	278	55	**87**	119	86	**124**	162
Titipounamu/Rifleman	34	**65**	96	11	**35**	59	32	**75**	118	16	**29**	42
Mātātā/Fernbird	15	**54**	93	48	**91**	134	63	**107**	150	30	**72**	114
Pīwakawaka/Fantail	211	**266**	320	289	**363**	436	200	**255**	309	249	**371**	494
Pūkeko	27	**48**	69	27	**58**	89	20	**46**	72	17	**39**	61
Pūweto/Spotless crake	0	**6**	12	6	**19**	32	4	**18**	31	-5	**11**	28
Takahē	0	**13**	28	0	**0**	0	0	**0**	0	-1	**3**	8
Riroriro/Grey warbler	20	**34**	48	8	**19**	31	5	**14**	42	18	**37**	56
Kōtare/Kingfisher	5	**11**	16	6	**12**	18	11	**27**	42	-1	**7**	15
Ruru	10	**26**	42	10	**31**	51	9	**31**	52	1	**10**	18

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 was close to that total (estimate 48, known total 42), those produced by the 2016 (115), 2017 (116), 2018 (81) and 2019 (64) surveys are substantially larger than the known numbers at the time (60, 64, 50 and 42 (approximate population at the end of the breeding season)). Twenty kōkako were translocated to Paraninihi between the 2017 and 2018 surveys. The estimate for 2020 is 71 (confidence limits 40 and 102) while the known population was close to 45.

The total numbers of birds counted each year since 2016 are shown in the chart.

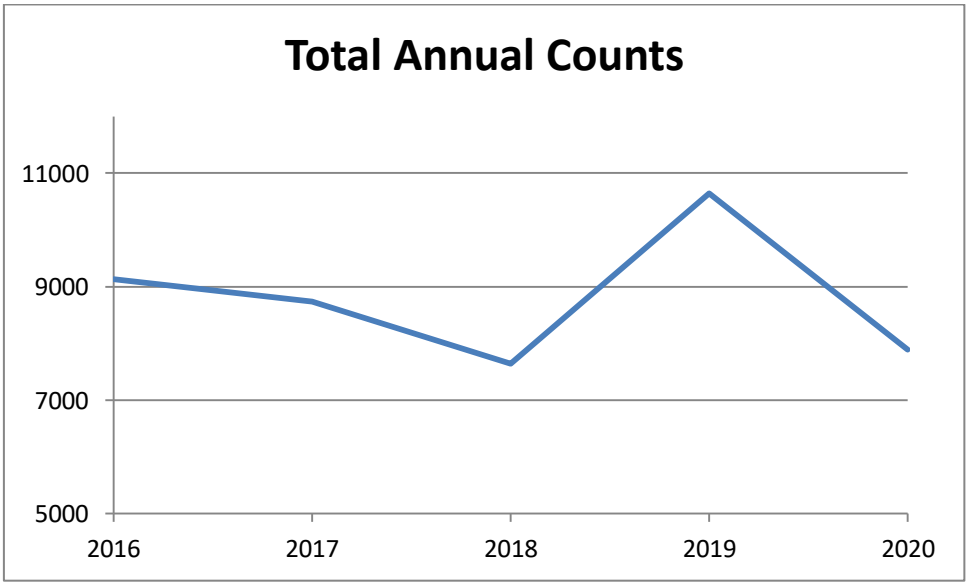


Figure 1 – Total annual number of birds counted on transects (2016 adjusted upwards as fewer transects were counted that year).

The highest number, 10,640 in 2019, is 39% higher than the lowest which was 7,645 in 2018. This year the count of 7,890 is near the previous low. The figures

illustrate how dramatically bird populations on the Island can vary from year to year. It may be that this year's low counts reflect the long dry spell since the start of the year with only 6 mm of rain over three months.

Comments on individual species estimates

Pōpokotea/Whitehead: at 1663, the estimate is 131 below the previous lowest figure (1794 in 2017) since surveys began in 2015.

Tīeke/Saddleback: the estimate of 807 is the lowest since the surveys began and 322 below the average for the previous five years.

Toutouwai/Robin: the survey over-estimates the population, but the numbers can be used as an index. This year's estimate is 24% below the average for the previous five years.

Korimako/Bellbird: at an estimate of 1962 bellbirds are the most populous of our forest dwelling birds. This year's count is down a little from last year but is about average.

Kōkako: the survey over-estimates kōkako populations but using the data as an index shows it is closely following the trends in the known levels (about 45 at the time of this year's survey). The over-estimate may be related to the transect routes 'favouring' the areas kōkako prefer.

Tūī: the estimate of 319 is our lowest to date and only one third of the average for the previous five years. Tūī are often observed flying to and from the mainland and it seems possible that in response to the dry conditions most of them have left in search of better habitats.

Kākāriki: the estimate has fallen back from last year's high to a level near the average.

Hihi: The estimates are probably around twice the actual population as hihi tend to move towards the surveyors as they walk through the bush. Used as an index, this year's estimate is only slightly lower than last year's and still above the previous five year average.

Kererū: The kererū estimate is less than half of last year's and back down near the five year average. This is another species that may leave the Island when conditions are poor.

Blackbird: also down from last year's high to near the long term average.

Titipounamu/Rifleman: inconsistent ability to hear rifleman renders the population estimates unreliable.

Pīwakawaka/Fantail: A near average estimate. The survey over-estimates fantail populations as birds tend to move towards the surveyor. Also, fantails use parts of the Island not covered by the survey so that part of the Island's population is not estimated.

Participants

The survey was organised by John Stewart and Kay Milton. Other participants were Karin Gouldstone, Noel Ward, Alison Forbes, Roger Bray, Luca Kornélia Kósa and Morag Fordham.

References

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