Survey of breeding success in kākāriki nest boxes, Tiritiri Matangi Island, 2017-18

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Introduction

This is the first year that volunteers from SoTM have undertaken the nest box monitoring study initiated several years ago by staff and researchers associated with Auckland Zoo. The Zoo project, which was completed in 2017, involved a detailed analysis of the health of birds using the boxes. SoTM's aim, in line with the recommendations for monitoring stated in *Tiritiri Matangi Island Biodiversity Plan 2013*, is to use the nest boxes to collect information on the birds' annual breeding success. Together with the results from transect surveys, this study will help to monitor the population and productivity of kākāriki on the Island.

This project was carried out under Authority (no. 39910-RES) granted to the Supporters of Tiritiri Matangi (Inc.) to undertake non-invasive monitoring of fauna and flora on Tiritiri Matangi Scientific Reserve.

Ideally, for each nest box used, we wished to record the number of eggs laid, the number that hatched and the number of chicks that fledged, together with the dates of these events. For various reasons (see below), some of these data were easier to collect than others.

Nesting cycle

Kākāriki are reported (Heather and Robertson, 2015) to begin nesting in the spring with most eggs laid between October and December, though re-laying may continue until March. The most common clutch size is 7 eggs with a range of 4 to 9. Incubation starts after the fourth egg is laid and the eggs hatch after 23 to 25 days. As incubation begins before all the eggs are laid there may be considerable differences in the hatching and fledging dates within a clutch. Fledging occurs at around 41 days (range 36 to 49).

Methods

A detailed methodology was prepared based on our protocols for other nest checking and on those previously used by Zoo staff. There were 53 boxes in total, distributed between the wharf and the buildings (see image below) and accessible either from the main tracks (Wharf Road, Shortcut, Wattle Track) or from research tracks. We divided the boxes into four groups, based on location, and allocated each group to a volunteer (or, in one case, two volunteers who worked together). A 54th box, which had been missing from the list supplied by the Zoo, was later discovered and checked by the project supervisors.

The methodology can be summarised as follows:

- boxes were checked at approximately seven-day intervals (this is the maximum interval which will still allow a good estimate of laying and hatching dates)
- a mirror and torch was used to check if an adult female was in the box (in which case the nest was not further disturbed)
- if an adult was not present, the box inspection door was carefully opened to allow counting of eggs and/or chicks

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- all observations (presence or absence of adults, eggs or chicks with numbers where possible) were entered on data sheets kept at the Visitor Centre.

Results 2017-18

Nine of the 54 boxes were occupied but in two cases (nos. 36 and 38) no eggs were laid.

Dates when an incubating female or egg were first found in a box ranged from 29th November to 27th December (two on 29/11, three on 3/12, one on 6/12, two on 8/12 and one on 27/12). Laying could have commenced at any time (approximately seven days) since the previous visit (when the box had been empty). We detected no attempts to re-lay after a nest had failed.

One pair laid at least one egg which was found broken in the base of the box at the end of the season (82).

One pair hatched a single chick which disappeared before it could have fledged (52).

Five pairs fledged at least one chick. The minimum numbers of chicks fledged at these nests were:
81 – 1, Cam1 – 3, 46 – 2, 57 – 2 and 33 – 3.

We were unfortunate with ferry cancellations this season, due to rough weather in January and February. This meant that some visits were missed around the time of fledging, making the assessments of numbers fledging less exact.

Previous seasons

As the females were mostly sitting tight on their nests at the time of checking we were unable to record the numbers of eggs laid in each nest. Zoo personnel (who had more time and different objectives) were accustomed to wait up to two hours at a nest site before the female came off the nest and allowed the eggs to be counted.

As shown in the table, this season had a low number of nests with a low number of chicks hatched. Interestingly, the fraction of chicks fledging from those which hatched was the highest so far recorded at 61%.

Season	Number of nests	Eggs laid	Chicks hatched	Chicks fledged
2013-14	12	98	42	24
2014-15	12	66	16	0
2015-16	15	82	46	16
2016-17	9	72	53	26
2017-18	9	?	18	11

Personnel

For this first season, the study was planned and managed by Kay Milton and John Stewart. Nest-box checking was carried out by Steve Branca, Pam Boyce, Bill and Raewyn Tutty, Thiagaraj Mahalingam, and Kay and John.

Reference

Heather B. and Robertson H. 2015. *The Field Guide to the Birds of New Zealand*. Penguin.

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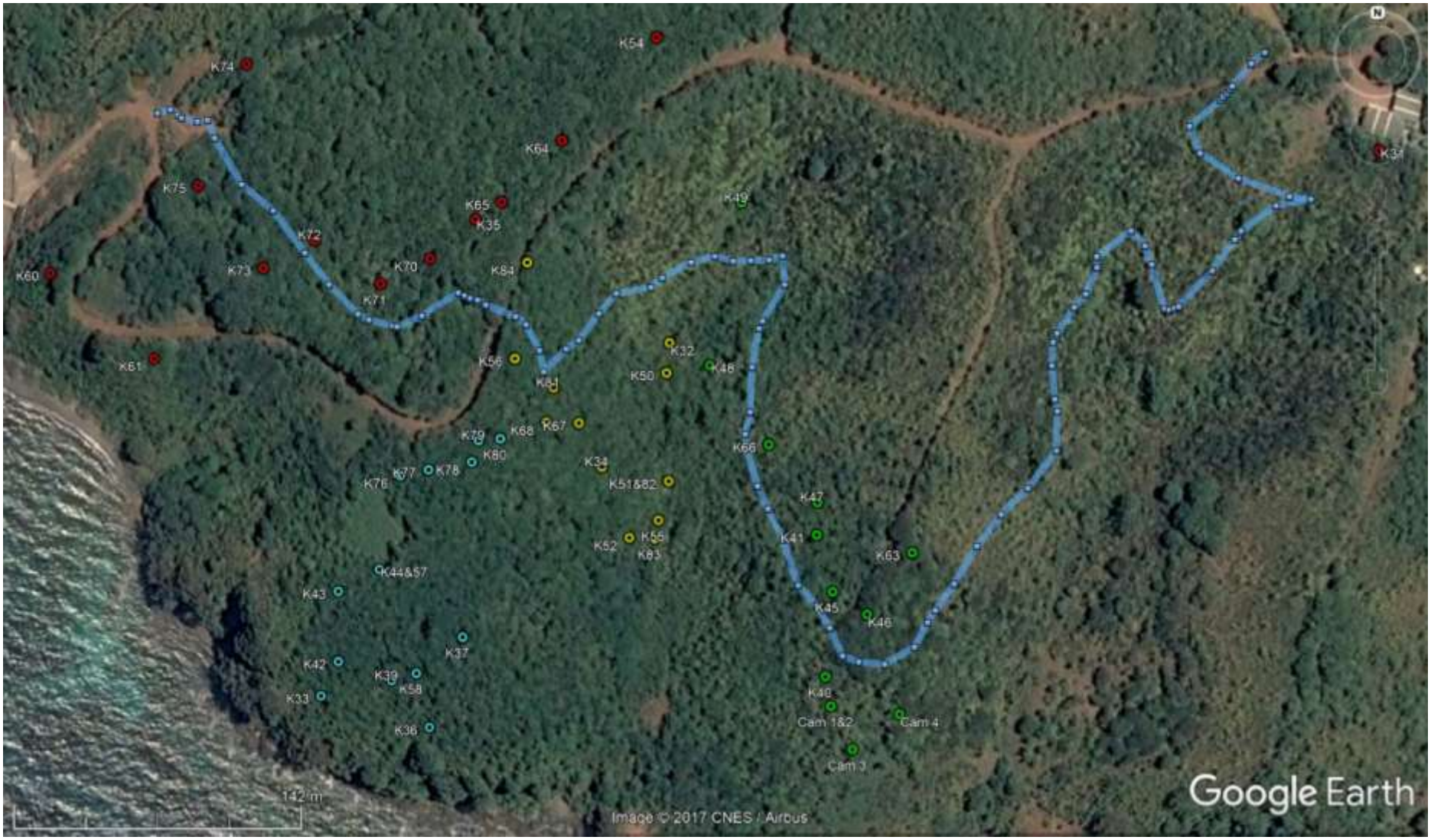

The locations of 53 kākāriki nest boxes, with the wharf on the left of the image and the buildings in the top right-hand corner. The blue line indicates the Wattle Track. The colours of the box markers indicate the four groups into which the boxes were divided for checking.