

Survey of breeding success in kākāriki nest boxes, Tiritiri Matangi Island, 2019-20



John Stewart

Introduction

This is the third 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.

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 54 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 two cases, two volunteers who shared the work).

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)
- an inspection camera on a flexible cable (similar to a burrowscope) or mirror and torch were 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

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

Results 2019-20

Sixteen of the 54 boxes were occupied.

Dates when an incubating female or an egg were first found in a box ranged from 5th December to 9th January (a narrower range than last year). 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.

In comparison to last year's very successful breeding season, this one was back to a more typical outcome. While there was one more box occupied than the previous best number, the number of eggs laid was the second lowest. The hatching rate of 67% was a better than the average of 58%. Only 30% of the chicks fledged, well short of the average of 60%.

This season was noticeable for its hot and dry weather which may have impacted on the availability and quality of food. Certainly, there was much less flax flowering and seed production than last year. Also, heavy mite infestations were recorded for five of the nests and three of these subsequently failed, probably due to the mites.

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
2018-19	15	96	83	77 or 78
2019-20	16	69	46	14

Eight of the boxes had one or more wetapunga during the season and five of them had either complete or partly-built rifleman nests.

Personnel

For this season, the study was planned and managed by John Stewart. Nest-box checking was carried out by Julie Scott, Bill and Raewyn Tutty, John Sibley, Pam Boyce, Jacqui Darvill and John.

Reference

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



The locations of 54 kākārīki 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.

March 2020