

# Report on penguin nest box survey, 2019-20

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## Introduction

The *Tiritiri Matangi Island Biodiversity Plan 2013* proposes population monitoring of virtually all bird species on the Island. For many longer-established species it is believed that populations are at or near the maximum level which can be supported on the Island. However, it is obvious that there are annual fluctuations in numbers around these levels. These fluctuations may be driven by availability of resources (territories, food), disease, weather and predation.

Earlier studies (up to approximately 2010) carried out by university researchers on Tiritiri Matangi and elsewhere in the Gulf suggests that little penguins have widely varying breeding success from year to year which is suspected to be related to food availability.

We consider it will be informative to have long-term data on breeding success from the less well-studied New Zealand sub-species of little penguin/kororā (*Eudyptula minor*) which breeds on Tiritiri Matangi. The information collected will be useful in the assessment of changing conditions in the Hauraki Gulf. A similar and complementary project is underway on nearby Motuora Island.

This report covers our first season monitoring breeding success on Tiritiri Matangi.

Twenty-nine new penguin nest boxes have been placed on the inland side of the Hobbs Beach Track.

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.

Most of the nest box checking was carried out by Yue Chin Chew.

## Methodology

A detailed methodology was prepared based on our protocols for other nest checking.

In summary:

- 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)
- Box lids were gently raised a small distance to allow inspection of the contents. Occupying birds were not handled and disturbance time was kept to a minimum
- Numbers of adult birds, eggs and chicks were noted

## Results

The project proceeded much as planned. The boxes were checked on 21 occasions between 30<sup>th</sup> June 2019 and 21<sup>st</sup> February 2020. There was a final check on 22<sup>nd</sup> March 2020.

No penguins were recorded in any of the 29 new nest boxes. Rifleman built nests in two boxes but did not lay eggs. Tuatara and little spotted kiwi were also recorded in boxes. The boxes were installed just before the start of the breeding season and were possibly not in place at the time the penguin pairs were selecting their nest sites. Due to restrictions on digging around the site, which is

rich in archaeological features, the boxes were not dug into the ground and this may have made them less attractive to the kororā.

We were able to monitor nesting in four penguin display boxes and in one natural site under a flax bush.

Each of the five monitored nests had two successive nesting attempts.

The date of first laying varied from a few days before 30<sup>th</sup> June to around the 31<sup>st</sup> July. Each nest had two eggs. All of the eggs hatched and all ten chicks fledged. Fledging dates ranged from mid-September to mid-November.

All five nests had a second clutch of eggs laid between early October and mid-November. Three of these nests had two eggs, but there was no confirmed count of eggs in the other two. Two of these nests failed at egg stage, one failed at chick stage, and the other two both fledged two chicks.

## **Discussion**

Success rate for the first nesting attempt was 2.0 chicks per pair. This is the maximum possible for kororā which typically lay one to two eggs (source: NZ Birds Online). Success rate for the second clutch was 0.8 chicks per pair.

The description in NZ Birds Online suggests that only a few populations have more than one clutch per season. Two clutches were also noted on nearby Motuora Island and at Tawharanui (James Ross, personal comment), so this may have happened across the Hauraki Gulf this year and suggests some environmental trigger rather than being associated with particular populations.

As the birds are not marked we cannot be certain that the second clutches involved the same parents as the first ones. However it is likely that this was the case and it would be more remarkable if it were not.

## **Future work**

Discussions are under way with representatives of the NZ Penguin Initiative who are hoping to enlist a number of long-term monitoring studies of penguins around New Zealand. They are encouraging standardised recording and the use of PIT tags on little penguins so that it becomes possible to track the fortunes and breeding success of individual birds. It is uncertain if this project will get underway for the coming season due to the impacts of COVID-19 which may limit transport and access.

It is our intention to continue long-term monitoring at least equivalent to the work reported here.

Some of the boxes will be relocated for next season and will be buried or covered with sandbags which will reduce their exposure and the associated risk of overheating and reduce visibility to visitors and possible disturbance.

If resources are available the monitoring season will be extended to include the moult period.