

# Mangaia Kingfisher *Tanga'eo* (*Todiramphus ruficollaris*):

## Species Status Report 2020



***Tanga'eo* (Mangaia Kingfisher)**

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## **Species Status Report – *Tanga’eo*, Mangaia Kingfisher (*Todiramphus ruficollaris*)**

### **Summary**

The Mangaia Kingfisher, known locally as *Tanga’eo*, is one of the eight threatened land bird species identified within the Cook Islands Key Biodiversity Areas and Important Bird Area assessment made in 2012 (Evans. 2012). Consequently, it was included in the project design of the Ridge to Reef project (R2R) as one of four terrestrial priority species for conservation activities (UNDP Project document, undated).

*Tanga’eo* baseline population data identified at the start of the R2R project (2015) was estimated around 1000 individuals. Since 2015, R2R funding has contributed to projects that have supported the activities of a recently formed Site Support Group (included in the Mangaian Forest Ecosystem Restoration Plan) to assess threats towards the species (including nest damage from Myna birds (*Acridotheres tristis*), habitat degradation from the spread of invasive plants species, and habitat destruction from the spread of agriculture) as well as developing a strategic plan to address those threats. R2R target goals for the *Tanga’eo* consisted of ‘no net decline in population’ numbers by the end of the project period, initially planned for 2019 but later extended to 2021.

Remarkably, most recent population surveys completed in 2019 found *Tanga’eo* population numbers were recorded at 4,106, a 400% increase over previous estimates over a four-year period (Thacker 2019). This indicates that there has been no net decline in species population by the end of the project period (2020), therefore fulfilling the project targets.

### **The Mangaia Kingfisher Background**

The Mangaia Kingfisher (*Todiramphus ruficollaris*) locally known as the *Tanga’eo* is endemic to the island of Mangaia in the Cook Islands. The maori name for the bird, *Tanga’eo*, emulates the sound of its call. It is considered a symbolic bird to the people of Mangaia. It is listed on the IUCN Red List of Species as vulnerable, based on the fact small population and is confined to just one island, where, although it is subject to a variety of threats, its population appears to be stable (Birdlife International, 2016).

The *Tanga’eo* is closely related to the chattering kingfisher (*Todiramphus tutusa*) locally named *Ngotare*, of Atiu and Mauke. The *Ngotare* differs in colour by having a white neck and throat, compared to the *Tanga’eo* which distinguishes itself with an orange neck (McCormack et al 2008).

Adult *Tanga'eo* occupy territories which span 50-100m in length. Nests comprise of holes approximately 45mm in diameter that are dug into decaying Coconut, Barringtonia, Albizia and Hernandia trees, usually at 2-15m in elevation. Breeding typically starts in November, with parents sharing the responsibility of incubation for three weeks. This is followed by the feeding of chicks for around five weeks (McCormack et al 2008).

### **Population history and distribution**

The earliest known population records for the *Tanga'eo* dates back to 1973 where Holyoak estimated numbers varied from 100 to 1000 (Holyoak 1980). Just over 10 years later, Steadman (1985) recorded between 100 to 300 birds in March/April 1984, and less than 200 six years later (Steadman & Kirch 1990).

Surveys conducted by Rowe & Empson in 1992, estimated the *Tanga'eo* population was between 250 and 450, with at least 60 % of the population being in either pairs or trios (Rowe & Empson, 1996). Having identified that more than half the population was potentially existing as breeding pairs, it was suggested that the population at this point in time had the potential to maintain itself (Rowe & Empson 1996). This statement was verified by Baker et al (1996) who confirmed an increase in population numbers four years later, with around 390-760 individuals being recorded. Between 1996 and 2015, very few research surveys on *Tanga'eo* numbers had been conducted. For R2R project document purposes, *Tanga'eo* numbers were recorded at 1000 in 2015 (UNDP, undated).

The low number of *Tanga'eo* identified in the latter half of the 20<sup>th</sup> century by Steadman (1985) and Steadman & Kirch (1990) was attributed by local Mंगाians to the Common Myna bird (*Acridotheres tristis*) that was introduced in the 1950s to help control the coconut stick insect outbreak. These birds were found to be harassing *Tanga'eo* nests and causing nest failure (McCormack et al 2008). Additional causes of the perceived decline were also believed to be related to forest fragmentation and habitat loss caused by the browsing of goats and clearing of land for agriculture and new infrastructure (Rowe & Empson 1996).

Population densities as early as 1992 indicated higher densities were observed in small Barringtonia (*Utu*) forests, and the extensive 'Indigenous Mixed Forest' on the Makatea (Rowe & Empson 1996). Low densities were identified in the extensive 'Secondary Forest' lower inland areas (Rowe & Empson 1996). The patchy *Utu* forest was further found to provide an important refuge for the *Tanga'eo* as these dark forests were not favoured by Mynas (McCormack et al 2008). The lower inland areas where *Tanga'eo* numbers were at their lowest were found to be correlated with increased competition with the Mynas, which also occupied this particular area (McCormack et al 2008). Recently there are anecdotal reports of the species now being seen in residential areas (pers. comms Tuara 2020).

## Current population

The most recent population survey undertaken by Otago University Masters student Tom Thacker between December 2018 and February 2019 suggests there has been an increase in *Tanga'eo* numbers across Mangaia since the 1996 survey by Baker. Distance sampling was undertaken using line transect surveys across six different habitat types on Mangaia (Barringtonia Forest, Coastal Scrubland, Plantation Forest, Primary Forest, Secondary Forest and the Village area).

Thacker's 2019 survey estimated a total of 4,106 individuals compared to an estimated 576 individuals (393-764) from Baker's 1996 surveys. Though Thacker's study sought to replicate Baker methodology, it did vary in a number of ways which may have led to the higher population estimates (Thacker 2019). For example, distribution surveys carried out by Thacker included transects undertaken in habitats not previously surveyed. These included the central volcanic hills and along the coastal scrublands.

Thacker found that the Primary and Secondary forest habitats had the highest densities of *Tanga'eo* (0.72 and 1.65 ha<sup>-1</sup> respectively), for all the habitats sampled with total *Tanga'eo* abundance estimates of 941 and 2102 respectively. Contrary to Rowe and Empson findings in 1996, it was the secondary forest which had the greatest density of *Tanga'eo* (Thacker 2019). The secondary forest was comprised of Albizia trees (*Falcataria moluccana*), an introduced species that is now frequently used by nesting *Tanga'eo*. Baker et al (1996) also initially identified the Primary and Secondary forest as being favoured habitats for the *Tanga'eo* in 1996, but at much lower densities (335 and 218 individuals respectively) than Thacker. Relatively high densities were also recorded in the Barringtonia forests, but because these habitats are less common, only 209 individuals were estimated (Thacker 2019). This compares to Baker's 1996 results of 23 individuals in the Barringtonia forest. The plantation forest, which covered the majority of the centre of the island, contributed 821 individuals (Thacker 2019). These large numbers recorded were related to the size of the habitat surveyed (roughly 1,231 ha). Thacker's 2019 survey recorded lower estimates in the Villages (33) and no records of the *Tanga'eo* in the Coastal Scrubland of the southeast side of the island. Baker 1996 surveys found no *Tanga'eo* in the Village area, suggesting that no *Tanga'eo* occupied this habitat 23 years ago.

Table 1: Density and Abundance estimates for the *Tanga'eo* across six habitat types. (CV) represents the Coefficient of Variation for each habitat (Thacker 2019).

Habitat Type	Area (ha)	Density (ha <sup>-1</sup> )	Range (95% CI)	CV	Abundance	Range (95% CI)
Barringtonia Forest	300.6	0.7	0.31 - 1.58	0.399	209	92 - 474
Coastal Scrubland	371.7	-	-	-	0	0
Plantation Forest	1230.8	0.67	0.42 - 1.06	0.229	821	514 - 1309
Primary Forest	1309.2	0.72	0.35 - 1.48	0.359	941	458 - 1934
Secondary Forest	1270	1.65	1.19 - 2.30	0.161	2102	1513 - 2918
Village	281.5	0.12	0.06 - 0.23	0.331	33	17 - 66
<b>Total (Pooled estimates)</b>	<b>4763.8</b>	<b>-</b>	<b>-</b>	<b>0.127</b>	<b>4106</b>	<b>3191 - 5283</b>

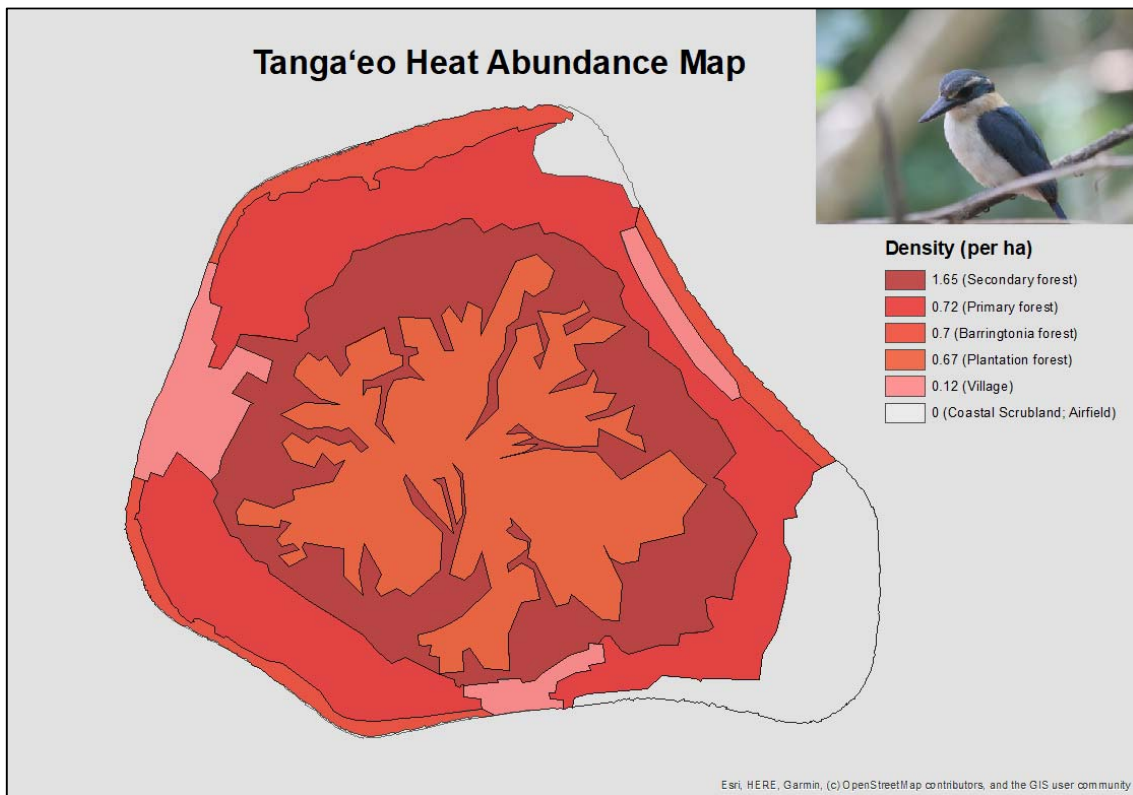


Figure 1: Density distribution of the *Tanga'eo* across Mangaia (Thacker 2019).

While it was previously thought that low density *Tanga'eo* numbers could be attributed to competition by the introduced Common Myna, Thacker (2019) found from the most recent breeding season that the Myna posed no threat to the viability of the *Tanga'eo* population. Thacker (2019) summarised that the previous low-density numbers were associated with the loss of habitat cause during the pineapple industry in the early 1960s.

## Conservation status and management

A management plan to help preserve the *Tanga'eo* population was agreed by the island council and the aronga mana in 2014. As a result, the entire island was designated as a sanctuary for the *Tanga'eo* in 2014 through traditional management (Thacker 2019). No regulations or written agreements however were adopted, as it was agreed *Tanga'eo* numbers were stable and did not require any particular form of official management protocols, apart from being vigilant in regard to any future threats (T. Nooroa pers. comm. 2016).

A management plan in the form of an online documentary was developed in 2016 by Te Ipukarea Society with funding by the JENSEN Charity Foundation. Key recommendations from the Management plan include:

- 1) Ensuring household rubbish is kept out of the forest
- 2) Preventing deforestation, particularly those trees favoured for nesting by the *Tanga'eo*: *Albizia (Falcataria moluccana)*, *Barringtonia (Barringtonia asiatica)* and South Seas *Schleinitzia (Schleinitzia insularum)*

## Conclusion

For many years it was believed that the introduction of the Common Myna as a form of biocontrol contributed to the decline in *Tanga'eo* numbers, based on the surveys between 1984 and 1990 that cited as few as 100 and 300 individuals. Recent research however has dismissed this theory and instead suggested the agricultural boom in the pineapple industry on Mangaia in the early 1960s was in fact the key factor that contributed towards population declines, as large areas of forest habitat for the *Tanga'eo* was cleared for the growing cash crop industry. Once the industry ended in the mid-1980s, the pineapple fields reverted into a regenerating forest which included *Albizia* trees suited to *Tanga'eo* nesting. This increase in available habitat for the *Tanga'eo* was suggested as the key contributing factor to increased population levels.

R2R baseline population figures for the *Tanga'eo* were recorded at 1000 individuals in 2015. Since then, a management plan in the form of an online documentary has been produced in 2016, as well as a thorough population survey conducted in 2019. The population of the *Tanga'eo* appears to be on the rise. Over the course of five years, the estimate of *Tanga'eo* numbers has increased from 1000 to 4106 individuals. This is possibly because the pineapple industry is no longer in operation, there has been a reduction in human population. The regenerating forest now comprises of *Albizia* trees, supporting a habitat better suited for the *Tanga'eo*.

This report therefore concludes that there has been no net decline in *Tanga'eo* numbers from the baseline figures established under the R2R project in 2015, but rather a 4 fold increase in individual numbers based on the most recent population survey conducted by Thacker (2019). How much of this increase is attributed to an actual increase in numbers, and how much can be attributed to a more comprehensive survey methodology, is unclear, but nevertheless indicates a significant increase in population size, which confirms the project target for this species has been met.

SRF #	Description of Indicator	End-of-project target level	End-of-project indicator	Target status
14b.2	Conservation of priority species at selected sites: Mangaia Kingfisher (Mangaia 1000)	No net decline in population	Total Mangaia population: 4106	Achieved

## References

- Baker, C., Bottomley, C., Kelly, L., Payne, L. and Whittle, M., 1996. Mangaia '96: Final Report of the Oxford University Expedition to the Cook Islands to study the Mangaia Kingfisher (*Tanga'eo*). 21 June - 21 August 1996. Oxford University, Oxford. pp. 60.
- BirdLife International. 2016. *Todiramphus ruficollaris*. The IUCN Red List of Threatened Species 2016: e.T22683465A92987289. Downloaded on 12 September 2020.
- Evans, J. 2012. Priority sites for conservation in the Cook Islands: Key Biodiversity Areas and important bird areas. Te Ipukarea Society, Rarotonga, Cook Islands. 39p.

- Holyoak, D. T. (1980). Guide to Cook Islands birds. Cook Islands Library and Museum Society.
- McCormack, G., Karika, I. and Marsters, J., 2008. 'Unpublished data: Tanga'eo reproductive monitoring survey', Cook Islands Natural Heritage Trust.
- Nooroa, Taoi, Mangaian Community Development Officer, personal communication 2016
- Rowe, S. and Empson, R., 1996. Distribution and abundance of the *Tanga'eo* or Mangaia Kingfisher (*Halcyon tuta ruficollaris*). *Notornis*, 43, pp.35-42.
- Steadman, D. W., & Kirch, P. V. (1990). Prehistoric extinction of birds on Mangaia, Cook Islands, Polynesia. *Proceedings of the National Academy of Sciences*, 87(24), 9605-9609.
- Steadman, D.W., 1985. Fossil birds from Mangaia, southern Cook Islands. *Bulletin of British Ornithological Club*, 105, pp.58-66.
- Thacker, T. 2019. The Mangaia Kingfisher: A study of population size and reproductive success. Wildlife Management Research Placement. University of Otago
- Tuara, Allan. Mangaian environmentalist. Personal communication in 2016.
- UNDP Project document. Undated. Conserving biodiversity and enhancing ecosystem functions through a "Ridge to Reef" approach in the Cook Islands.