



Understanding banded rail habitat use in New Zealand's mangroves

Jacques de Satgé – Massey University



The plight of New Zealand's elusive banded rails *Gallirallus philippensis assimilis* may be closely tied to mangrove forests. However, we know remarkably little about this native bird species undergoing decline – for more than forty years the avifauna of New Zealand's mangroves forests have received little scientific attention, and our mangrove management strategies today rarely account for the birds who call mangroves home. Admittedly, studying banded rails is a tricky undertaking; they are cryptic birds who shy away from human contact, while the dense and muddy mangroves they inhabit repel all but the most stubborn of fieldworkers. However, my motivation to dive into mangroves regardless is simple; stopping the decline of banded rails is intrinsically linked to uncovering their ecology. As a result, I have spent the last year monitoring and tracking the moho pererū who silently tread our northern coastlines.

Banded rails nest among dense coastal rushes and tend to forage under cover of vegetation. This begs the question; how do you study a bird you cannot see? Banded rails are ground foragers and their use of muddy mangrove environments lends a helping hand – they leave distinguishable footprints as they go about their daily business. These footprints represent valuable data points, marking the location and direction a bird has walked. To an ornithologist, this is gold dust and explains why I spent 2019 gathering data on footprints from 360 quadrats, trekking through 365,000 square-meters of mangrove habitat in the process. Initial insights from this dataset are revealing; banded rail footprints were found with far higher frequency within mangrove forests (67% of quadrats) than along their seaward edge (27%) or in adjacent mudflat habitats (1%). I am now pondering the finer details of this footprint data, exploring whether banded rails might find certain patches of mangrove appealing given their vegetation density, structure and size, or the presence of tasty prey items (e.g. mud crabs *Helice crassa*).

While footprint surveys are highly practical, what happens if birds wander beyond those habitats with soft substrates? Thankfully, advances in technology mean I can track individual birds wherever they roam. In early 2020, I teamed up with DOC to capture, GPS-tag, and track two banded rail individuals. This was a global first for the species, requiring custom-built trapping infrastructure and a made-to-fit GPS backpack system weighing less than six grams. While Covid-19 did its best to interrupt proceedings, I managed to collect valuable location data before a premature end to fieldwork. A first look at the movement data is intriguing; our two banded rails roamed widely in mangrove habitat when foraging, while one individual chose to roost in mangrove stands overnight. My next steps involve quantifying these behaviours statistically (give me the mangroves any day!), defining how and when birds use different habitat elements within their home ranges. Our success to date has been buoying and the research team will undertake further tracking fieldwork in early 2021. Fingers crossed that we can shed further light on a species and a habitat so long neglected by scientific study, despite being right on our coastal doorstep.

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