

# Eastern Coromandel cryptic avifauna species inventory for wetlands of the Waikato Region

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CONTRACT REPORT: SAS2016/2017-1758

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Cover photo: Wainaro Wetland

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Survey planned and completed by Patrick (Paddy) Stewart.

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28 February 2017



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## Summary

An autonomous acoustic survey of 24 unprotected wetlands (sites) on the Eastern Seaboard of the Coromandel Peninsula was completed in the late spring/summer of 2016. The work was completed by Red Admiral Ecology for the Waikato Regional Council (WRC) to contribute to their Biodiversity Inventory Project.

Threatened avifauna species were detected at eleven new sites comprising of Australasian bittern (4), marsh crake (1) and NI fernbird (13). This information is presented here and provided for the WRC Biodiversity Inventory.

Data from the 42 acoustic recorders showed that NI fernbird were present at most sites. This is to be expected as the species is widely distributed across a range of wetland/scrubland habitats. The data indicated that birds were at lower densities when compared to areas receiving predator control in the Northern Coromandel.

Marsh crake was detected on one occasion and spotless crake were not detected. Spotless crake may be present at low densities. Detection probability issues with a low resolution landscape scale effort likely contributed to more crake not being detected. Expert opinion is that numbers have declined at other sites in the Waikato since the 1990's.

Australasian bittern were consistently detected in or about the larger wetlands, with a total of eight individuals confirmed. A more intensive survey effort would be required to identify a higher prevalence of bittern but this was outside the scope of this work. Based on these results it is unlikely there are more than two dozen active males on the Coromandel Peninsula.

# 1. Introduction

## 1.1 Objective

The objective of this work was to collect cryptic wetland avifauna species data to assist the Waikato Regional Council's on-going Biodiversity Inventory Project.

## 1.2 Brief background

Presently cryptic avifauna distribution data across the Waikato region is restricted to observations from professionals and the public that has been gathered informally over ad hoc timeframes. It is unclear whether this data under or over represents actual distribution on the ground. Often rural landowners have knowledge of some species which is not represented in present GIS data sets. Casual observations of mobile species such as Australasian bittern (*Botaurus poiciloptilus*) may overestimate the resident population. Long term population status and dynamics of these species is poorly understood.

### **Habitat**

Wetlands supporting target avifauna species within the Colville and Tairua ecological districts are generally classified into two types:

1. Small fragmented ponds/bogs/fens/marshes scattered across the landscape, often in the near vicinity to developed areas or within farmland. Vegetation is typically modified and marsh water tables susceptible to high levels of seasonal variation.
2. Larger palustrine wetlands which are typically situated about the lower reaches of valley floors, sometimes connecting to saltmarsh communities about upper reaches of harbours. They are often situated in areas unsuitable for development or within production pine forests. Typically manuka dominated associations grade to mosaics of fern/rushland. Further downstream raupo often dominates about areas of shallow standing water (IMAGE 1). The presence of raupo indicates year round water, providing reliable foraging and refuge opportunities for avifauna species.



IMAGE 1: TYPICAL VEGETATION SEQUENCE, ONUKUHOU WETLAND OPOUTERE.

## 2. Methods

### 2.1 Desktop review

The Waikato Regional Council Bioveg 2012 GIS layer was used to identify all potential freshwater wetlands. Freshwater wetlands were not sampled if they had protected status therefore Department of Conservation/TCDC Reserve, QE II and TCDC covenant layers were utilised to identify formally protected wetlands and these were filtered out of the potential list of survey sites.

### 2.2 Target species

The method used was based on a Proof of Concept completed at two Waikato wetlands in 2016 (Stewart and Lauder, 2016). A total of four avifauna species that utilise freshwater wetlands were targeted (TABLE 1).

TABLE 1: WETLAND ACOUSTIC SURVEY TARGET SPECIES.

Common name	Scientific name	Threat status <sup>1</sup>
North Island NI fernbird *	<i>Bowdleria punctata</i>	At Risk/Declining
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Threatened/Critically Endangered
Spotless crane	<i>Porzana tabuensis</i>	At Risk/Relict
Marsh crane	<i>Porzana pusilla</i>	At Risk/Relict

\*denotes endemic species

Multispecies acoustic surveys are inherently difficult due to factors such as different habitat preferences, territory size and variation of bird vocalisations between species. Australasian bittern are the most threatened of the four target species, therefore the AR deployment was targeted towards this species and field deployment based on best practice protocols (O'Donnell and Williams, 2015).

Although not detecting all birds, autonomous acoustics is a cost effective, consistent data collection method across landscapes. It also enables the review of target species to positively identify calls (e.g. difference between spotless and marsh crane calls).

### 2.3 Field deployment

Thirty five Department of Conservation manufactured omni-directional autonomous acoustic recorders (ARs) were deployed by Paddy Stewart between 28 November and 4 December 2016. These ARs were distributed in the Eastern Coromandel between Kennedy Bay in the North and Whangamata in the south (FIGURE 1). A further seven ARs were deployed at the Wainaro Wetland at Whangapoua on 15 December 2016 once

<sup>1</sup> From Roberson et al 2013

access had been granted. One recorder was deployed at most small wetlands however multiple ARs were used if wetlands were greater than 500m long. All ARs were set to run from 18:00 – 21:00 during evenings and 04:00 – 07:00 in mornings.

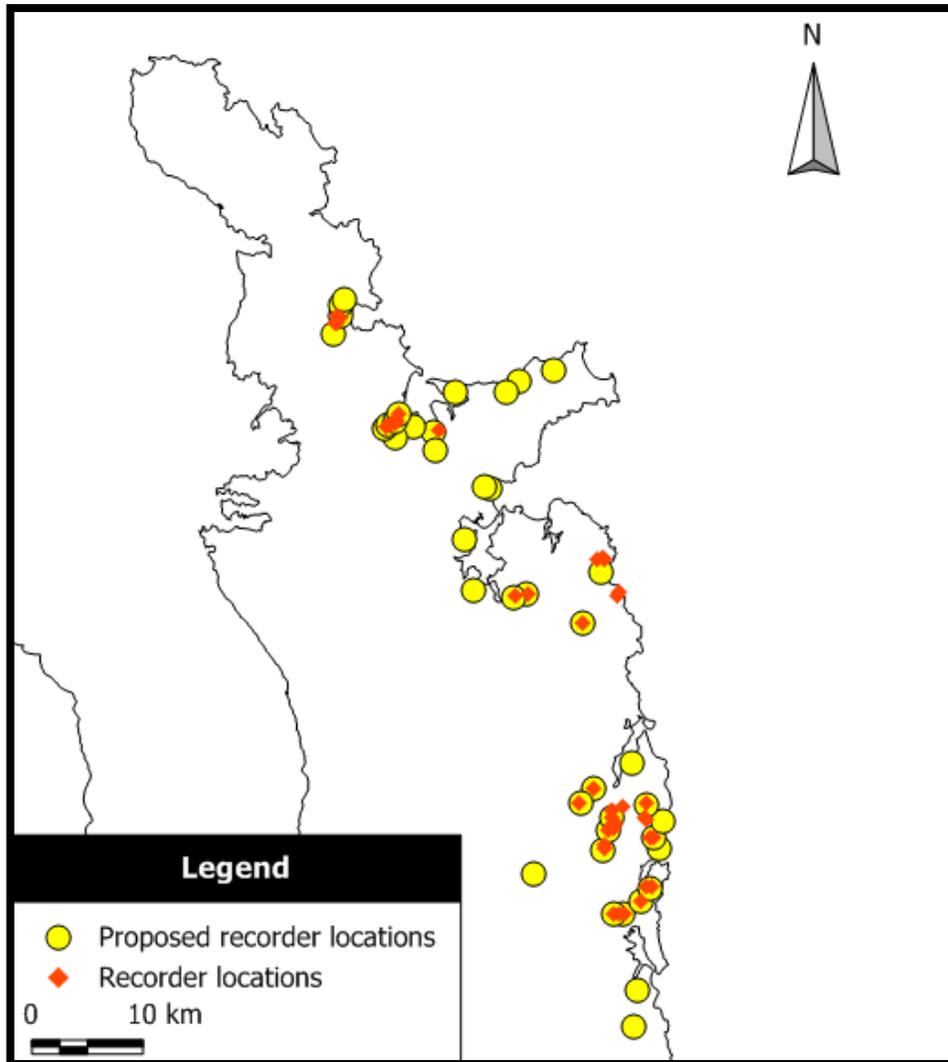


FIGURE 1: LOCATION OF AUTOMATED ACOUSTIC STATIONS, EASTERN COROMANDEL, 2016.

## 2.4 Data attributes

Data attributes collected from each AR were entered into Excel spreadsheet **EWDOCS\_SAS2016\_20171758\_cryptic\_fauna\_inventory.xlsx**. This data included: SNA site ID, AR site ID, actual deployment site name, Ecological District, NZTM Coordinates, Area (ha), existing SNA data, 2016 acoustic data, dominant veg type and any pertinent notes such as plant pest infestations.

Acoustic recorders deployed at previously unidentified wetlands were identified as 'supplementary' in the spreadsheet Notes column.

## 2.5 Habitat assessment

Avifauna habitat was classified as two general types:

1. Woody vegetation – often including manuka-tangle fern associations (IMAGE 2).
2. Raupo associations – typically supporting small scattered areas of standing water (IMAGE 3).



IMAGE 2: MANUKA-TANGLE FERN ASSOCIATIONS, UPPER DUCK CREEK CATCHMENT.



IMAGE 3: RAUPO ASSOCIATIONS IN ARM OF DUCK CREEK WETLAND.

## 2.6 Data analysis

The 15 minute sound files were manually inspected in RAVEN PRO 1.5<sup>®</sup> (Charif et al. 2010) at default settings, except that a 512-sample Hann window was selected to improve spectral resolution. Five days of data was inspected from each AR station to maximise the chance of detecting crake.

### 3. Results

#### 3.1 Desktop analysis

Half of the desktop sites were not sampled due to a combination of wetlands being unsuitable (grazed and drained), located within areas of public activity (Whangamata Golf Club and Opoutere Motor Camp), access was declined or difficulty contacting landowners (TABLE 2).

TABLE 2: RESULTS OF ACOUSIC RECORDER SITE DESKTOP PLANNING

Sampled	Unsuitable	Declined	No contact
20	7	6	8
49%	17%	14%	20%

Recorders from the rejected sites were redeployed to six wetlands not identified on the Bioveg layer and the balance deployed in the larger wetlands which:

- Increased the chance of detecting birds with small territories such as crane.
- Enabled sampling of different habitat types at each site.

The green dots in FIGURE 2 show the gaps in coverage, mostly about the Whitianga/Kuaotunu areas.

#### 3.2 Distribution of threatened species

All 42 Acoustic recorders functioned as programmed with a total of 1260 hours data utilised for analysis. Data in TABLE 3 shows the minimum number of birds detected in each habitat type.

General patterns observed were:

- The endemic NI fernbird was detected at 60% of all stations sampled. Wetland type or size were not predictive factors for site occupancy.
- Spotless crane were not detected at any of the 42 AR stations.
- Marsh crane was detected on southern reaches of Whangapoua Harbour.
- Booming bittern were restricted to the larger wetlands close to the Whangapoua, Whitianga and Tairua Harbours.

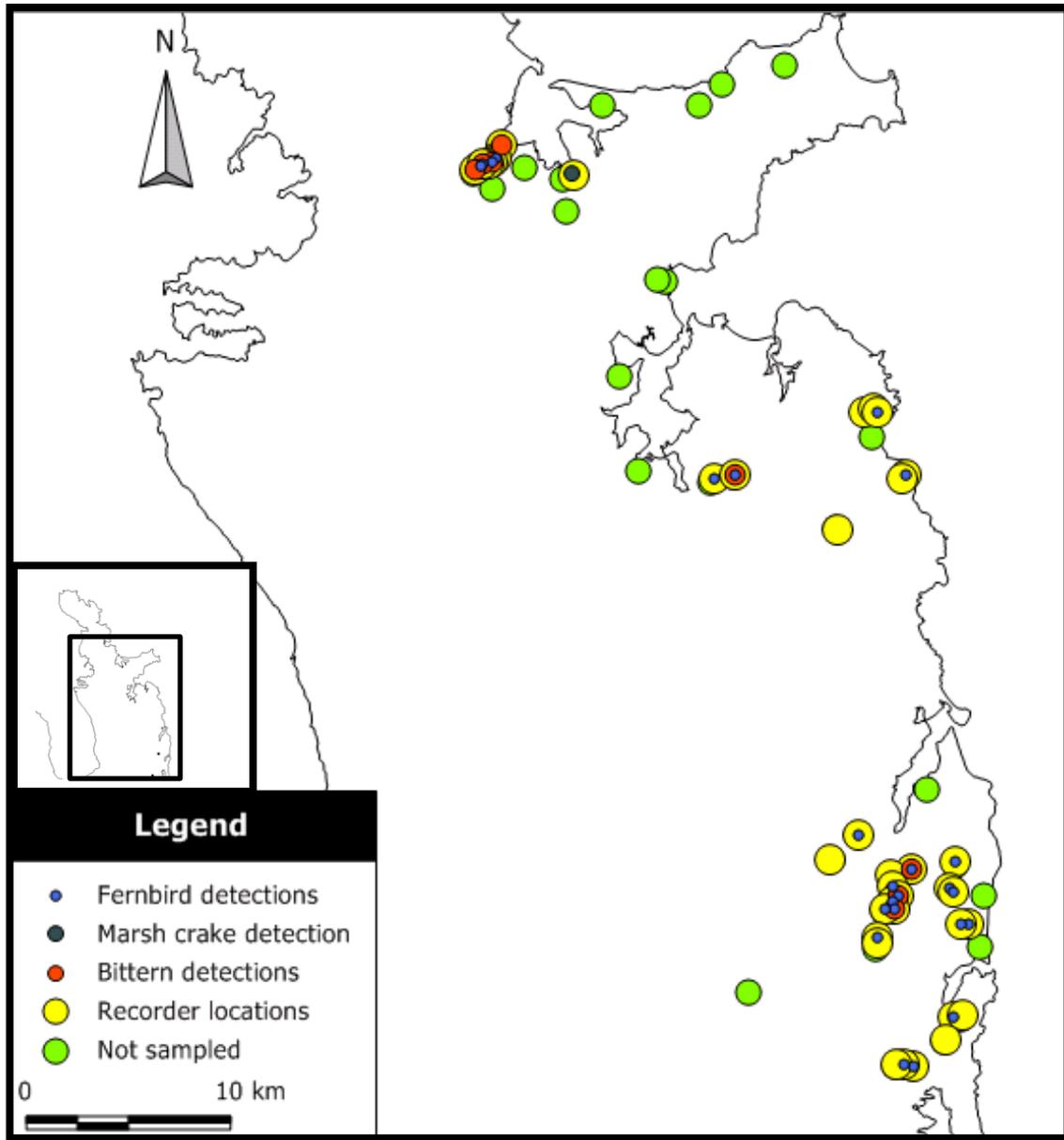


FIGURE 2: DISTRIBUTION OF THREATENED WETLAND AVIFAUNA

TABLE 3: NUMBERS OF TARGET SPECIES RELATIVE TO HABITAT

Common name	Woody vegetation associations	Raupo/rush associations
Spotless crake	0	0
North Island (NI) fernbird	18	7
Marsh crake	1	0
Australasian bittern	6	2

### 3.3 Comparison of autonomous acoustics and existing wetland avifauna Significant Natural Area (SNA) data

Australasian bittern were detected by acoustics at five new sites. NI fernbird were detected at four existing sites and a there were a further ten new observations, all of which can be added to the SNA layer (see attached Excel spreadsheet). Marsh crake was detected at one site in 2016 and this species was not previously recorded on the SNA database.

TABLE 4: COMPARISON OF EXISTING SNA AND 2016 ACOUSTIC DATA.

<b>SNA site #</b>	<b>Deployment site name</b>	<b>Area (ha)</b>	<b>Existing SNA data</b>	<b>2016 acoustic data</b>
TC180 (outlier)	Waingaro harbour side manuka wetland	Data deficient	Data deficient	Australasian bittern
TC180	Waingaro Stream Bog, and harbour side manuka wetland	37.894	NI fernbird	Australasian bittern, NI fernbird
Not a SNA	Owera Stream riparian wetland	Data deficient	Data deficient	Marsh crake
TC358	Whenuakite River riparian forest	115.968	Data deficient	NI fernbird
TC358	Whenuakite River riparian forest	115.968	Data deficient	Australasian bittern, NI fernbird
TC331	Orua Stream wetland	34.039	Australasian Bittern	NI fernbird
Not a SNA	Radar Road dammed wetland	Data deficient	Data deficient	NI fernbird
TC449	Tairua Road wetland	5.28	Data deficient	NI fernbird
TC455	Duck Creek tributary wetland	6.368	Data deficient	Australasian bittern, NI fernbird
TC478	Boom Stream wetland	10.146	Data deficient	NI fernbird
Not a SNA	McGregor Road wetland	Data deficient	Data deficient	NI fernbird
Not a SNA	Ohui Road wetland	Data deficient	Data deficient	NI fernbird
TC482	Onukuhou wetland	12.069	Data deficient	NI fernbird
TC508	Normans Access Road wetland fragment	2.676	Data deficient	NI fernbird
TC524	Rangipo wetland fragment	21.857	Data deficient	NI fernbird

## 4. Discussion

### *Planning*

Three issues could have adversely affected the detection of threatened species during the survey. Two of these were at the planning phase.

- The WRC Bioveg layer was utilised to select sampling sites. After the fieldwork was completed some differences were noticed between the Bioveg and SNA GIS layers (the same sites were not in both layers). It would have been better if both layers were utilised at the planning stage.
- Saltmarshes were not included in the survey. It is possible that avifauna are utilizing these areas due to the lack of habitat in the freshwater zone. For example, bittern typically favour freshwater raupo wetlands for breeding, yet they are reported booming about the margins of Whitianga Harbour. They can also be observed in large numbers in highly modified wetlands such as the Kopuatai Flax Block where very little raupo is present (pers obs). It may be beneficial to include all wetland habitat in any future surveys.

### *Field result*

The fieldwork went very smoothly with all ARs successfully collecting data. There were no safety issues, although a couple of landowners were quite robust as they declined access.

### *NI fernbird*

NI fernbird were detected at most of the sites although not all of the AR stations. This species is especially adaptable on the Coromandel, taking advantage of a range of habitats from saltmarsh through to montane scrub. It is not surprising that they were frequently detected. Their call is easily identified during analysis and so it is possible that the detection gaps in large wetlands are due to predation issues. Integrated predator control in the Northern Coromandel has demonstrated a sharp increase in densities (W. Todd, pers comm).

### *Crake*

The single marsh crake detection is not unexpected as activity levels are quite variable for this species. The non-detection of spotless crake is not convincing and the result should not be interrelated as extirpation on the Eastern Seaboard. Peak call periods for this species are October through to December (J. Sumich, pers comm), so the survey dates may have been too late to detect these birds. They have reliably been detected during three other similar surveys at Te Henga and Toreparu (pers obs) and so the most obvious conclusion is they are present at low densities. This is likely due to predation with cats

observed to have significant impacts on local wetland bird populations (O'Donnell et al, 2015).

Numbers of spotless crane have declined at Whangamarino wetland over the last 25 years, and this was attributed to predation (C. O'Donnell, pers comm). These birds may also be sensitive to water table changes and may move about to take advantage of optimal habitat. Targeted surveys for this species may need more intensive sampling of 200 m intervals between AR stations.

### *NZ Bittern*

Recent surveys have shown bittern to prefer raupo habitat for breeding (E. Williams, pers comm). Data showed more bittern to be detected from woody association wetlands (TABLE 3), but the calls may have originated from patches of raupo within the larger wetlands that were not visible in the field. For this reason the vegetation description results are somewhat questionable.

It is clear that the bittern in this survey were consistently detected in the larger wetlands. There were quite possibly more birds present but sampling effort would require intensifying and was outside the scope of this work. Informal observations of the birds foraging in daytime were obtained from members of the public and two reports of mortalities were recorded over the last ten years. The first was a power line strike at Greys Beach (Kuaotunu), the second a roadkill (two birds) on Link Road (Hot Water beach). Based on results of automated acoustic surveys from the last two seasons it is unlikely there are more than two dozen active males on the entire Coromandel Peninsula.

## Recommendations

- Include the avifauna data onto the SNA data base.
- Continue to include informal data to the SNA data base as it comes to hand.

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## 5. References

- Charif, R., Strickmann, L. & Waack, A. 2010. Raven Pro 1.4 User's Manual. *The Cornell Lab of Ornithology*, Ithaca, New York, USA.
- O'Donnell, C.F., Clapperton, B.K. and Monks, J.M., 2015. Impacts of introduced mammalian predators on indigenous birds of freshwater wetlands in New Zealand. *New Zealand Journal of Ecology*, 39(1), p.19.
- O'Donnell, C.F.J. & Williams, E.M. 2015: Protocols for the inventory and monitoring of populations of the endangered Australasian bittern (*Botaurus poiciloptilus*) in New Zealand. *Department of Conservation Technical Series 38*. Department of Conservation, Wellington. 40 p.
- Robertson, H.A., Dowding, J.E., Elliott, G.P., Hitchmough, R.A., Miskelly, C.M., O'Donnell, C.F.J., Powlesland, R.G., Sagar, P.M., Scofield, R.P. & Taylor, G.A. 2013: Conservation status of New Zealand birds, 2012. *New Zealand Threat Classification Series 4*. Department of Conservation, Wellington. 22 p.
- Stewart, P & Lauder B. 2016. *Protocol for cryptic avifauna species inventory for wetlands of the Waikato Region*. Contract report SAS2015/2016-1428 for Waikato Regional Council, Private Bag Hamilton.

