

Waitakere City Wetland Bird Survey 2004: Te Henga and Harbourview - Orangihina

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Contents

1. Introduction	1
2. Methods	2
3. Results	2
4. Discussion	3
5. Recommendations	5
6. Acknowledgments	5
7. References	5
8. Appendix	6

Introduction

Human-induced changes to New Zealand's environment have been extensive. The loss of habitats and the introduction of mammalian predators and browsers have led to declines and extinctions of many indigenous species (Wilson, 2004). Fifty native vertebrate species have become extinct in New Zealand over the past millennium and many others now only survive in low numbers on small predator-free islands. New Zealand's wetland birds were particularly vulnerable to extinction, with native waterfowl and rails most affected (Wilson, 2004).

Since European settlement of New Zealand, many wetlands have drained to make way for agricultural development and for residential and industrial use. It is estimated that only 10% of the New Zealand's wetlands remain and many of those remaining are degraded (MFE, 1997). Wetlands are important ecosystems. In addition to the roles they play in water quality, flood control, and the regulation of global carbon levels, they have considerable ecological, cultural and recreational value (Clarkson *et al.*, 2003).

Of Waitakere City's remaining wetlands, two are of national and international significance due to their outstanding natural values: Te Henga Wetland (also known as Bethells Swamp) and Harbourview - Orangihina. The significance of these wetlands as habitat for rare species has been well documented (e.g., Kingett Mitchell Ltd. 2002, Bioreserches 1996, Denyer *et al.* 1993). Te Henga wetland is the largest wetland in the Auckland Ecological Region. It supports a range of vegetation classes and structural types. Such diversity is also reflected by the high number of wildlife species in the wetland. The wetland at Harbourview is considered to be the most significant wetland in the Waitakere City portion of Tamaki Ecological District as it provides a transition from saline to brackish to freshwater wetland. In Waitakere City, wetland degradation and the impacts of predators have led to declines and extinctions of a number of native wetland bird species. However, the region still supports a number of threatened wetland bird species (WCC, 2001)

New Zealand is obliged to monitor the health and condition of wetlands as a signatory to two international conventions (Convention on Biological Diversity and the RAMSAR Convention on Wetlands). The responsibility for meeting the obligations of these conventions is shared between several central government agencies, in particular the Department of Conservation and the Ministry for the Environment. Local authorities also have a responsibility under the Resource Management Act (1991) to monitor the state of the environment '*to the extent that is appropriate to enable the local authority to effectively carry out its functions under this Act*' s35 2 (a). As one of these functions is to preserve the natural character of wetlands under s6 (a), there is effectively a statutory obligation for local authorities to monitor the state of wetlands.

The Waitakere City Council contracted Envirologic Limited to undertake surveys of wetland birds at Te Henga Wetland and Harbourview - Orangihina during April 2004. The aims of the study are: 1) to undertake a trial to determine the effectiveness of digital recorders as a tool for monitoring wetland birds, 2) to review the literature relating to the ecology and management of wetland birds in New Zealand, and 3) to make recommendations about the monitoring and management of wetland birds in Waitakere City.

Methods

Study sites

This study was undertaken at two sites: 1) Te Henga Wetland (36° 52.2'S, 174° 27.8'E; 140 ha), and 2) Harbourview - Orangihina (36° 50.6'S, 174° 39.5'E; 80 ha).

Recording wetland bird calls

Digital recorders (Olympus model DS330) were used to record the calls of birds present at the two monitoring sites. The 'voice operated recording' (V.O.R.) function was activated to ensure that batteries and recording time were not used while there was no sound to record. The recorders were housed in waterproof containers with mesh at one end to keep moisture away from the recorders while still allowing sounds to be recorded. The recorders were set on two occasions, 1 April and 20 April 2004. On each occasion a pair of recorders set 50-100 m apart was left in place at each site for three days. The recorders were then collected and the recordings transferred to computer for analysis (performed by SC). The recorded bird calls were identified and counted.

Literature review

A literature review was undertaken to collate existing information relating to wetland birds in Waitakere City. Emphasis was given to summarising: a) information specific to the two monitoring sites; and b) information relating to the management of wetlands to enhance their value as habitat for native wetland birds.

Results

Two wetland bird species were recorded during the surveys: North Island fernbird (*Bowdleria punctata vealeae*) and pukeko (*Porphyrio porphyrio melanotus*). Pukekos were recorded at all sites. Fernbirds were recorded at the northern Harbourview site and at both Te Henga sites (Table 1).

Table 1: Numbers of fernbird and pukeko recorded using digital recorders at Harbourview and Te Henga during April 2004.

Location	Survey 1 (1/4/04)		Survey 2 (20/4/04)	
	Fernbird	Pukeko	Fernbird	Pukeko
Harbourview - North	*	*	1	4
Harbourview - South	*	*	0	0
Te Henga - East	1	0	2	0
Te Henga - West	0	0	1	0

* Equipment failure meant that no recordings were obtained.

Literature review (also see Discussion and Appendix)

The literature review highlighted the conservation significance of Waitakere City's wetland birds, with most species rare or extinct (Table 2).

Table 2: National and local conservation status of Waitakere City's wetland birds.

Species	DoC Threat Classification	Population status	
		Te Henga Wetland	Harbourview - Orangihina
Australasian Bittern	Nationally endangered	Rare	Extinct
Banded Rail	Sparse	Rare	Rare
Brown Teal	Nationally critical	Extinct	Extinct
Marsh Crake	Sparse	Rare	Extinct
New Zealand Dabchick	Sparse	Extinct	Extinct
New Zealand Scaup	Not threatened	Extinct	Extinct
North Island Fernbird	Sparse	Rare	Rare
Spotless Crake	Sparse	Rare	Extinct

Table 3: Conservation status scales used by DoC and in the Waitakere PNA report.

DoC Classification	Waitakere PNA Classification	Extinction Risk
Nationally Critical	Endangered	Greater risk of extinction
Nationally Endangered	Endangered	
Nationally Vulnerable	Vulnerable	Less risk of extinction
Serious Decline	Rare	
Gradual Decline	Rare	
Sparse	Rare	
Range Restricted	Uncommon in Waitakere City	
Not Threatened	Common	

Discussion

This study has highlighted the continued presence of fernbirds at Harbourview and Te Henga Wetland. Pukekos were also detected but are of lower significance as they are very common in New Zealand. Other wetland birds known to inhabit Waitakere City's wetlands were not detected but it is not clear whether this is because they were not present, or whether the digital recorders cannot detect their calls. Clarifying this issue requires manual surveys (primarily call and response surveys and territory mapping) to be run alongside digital recorder based surveys. A potential advantage of using digital recorders is that they can considerably reduce the resources required to undertake surveys. However, the results of this study suggest that the use of digital recorders in wetland bird monitoring may be limited to confirming the ongoing presence of fernbirds at sites when their presence is known or suspected.

The abundance of wetland birds cannot be determined by simply listening to recordings of their calls because it is almost certainly impossible to determine whether one bird called often, or whether two or more birds each called less often. However, based on known territory sizes it may be possible to use digital recorders to systematically survey an area for fernbirds and determine which territories are

occupied. This would require a clearer understanding of the distance up to which the digital recorders are able to detect fernbird calls. Gaining this understanding is complicated by variation in bird call characteristics (e.g., call volume and intensity), and the influence of factors such as background noise (e.g., insects) and wind. Future fernbird monitoring using digital recorders should aim to control for wind conditions (i.e., by ignoring results obtained during windy conditions).

The literature relating to the wetland birds of Waitakere City revealed that little is known about the status and population trends of wetland birds at Harbourview and Te Henga Wetland. The only exception is the research undertaken on the fernbird population at Harbourview by Bioreserches (1996) and Kingett-Mitchell (2002). Both studies involved variable-length transects, call-response surveys, and searching for signs (e.g., tracks) of other secretive wetland bird species (crakes and banded rails). While crakes and banded rails were not found using any of the methods implemented at Harbourview, accurate assessments of fernbird population density were able to be made. Annual or biannual surveys using the same methods as used previously will enable trends in fernbird abundance and population density to be assessed. Also, if crakes and / or banded rails are present, regular surveys are likely to confirm their presence or absence within a few years.

Habitat loss accounts for the massive declines in wetland bird populations of the past but the impacts of introduced predators is probably the greatest threat to wetland bird populations at present. Predation accounted for 73% of fernbird nesting failures at Omaha (Parker, 2002). Evidence from Parker's (2002) Omaha study suggests that mustelids and mice are the most significant egg predators in wetlands. Parker also highlighted that a potential difficulty with detecting changes in fernbird populations is that individuals may increase their territory size as numbers fall potentially masking the decline. Careful mapping of territories on an annual basis may be required to detect population declines. The difficulties associated with determining population trends and causes of decline for fernbirds are similar or greater for Australasian bitterns, banded rails, marsh crakes and spotless crakes as these species are very secretive in their habits.

Undertaking mustelid and rodent control within wetlands is difficult therefore the programme should initially focus on establishing a perimeter of tracking tunnels and traps along the edge(s) of Harbourview and Te Henga wetlands. At Harbourview, a single trap line running north-south along the relatively easily accessible western edge of the known fernbird territories is most appropriate. At Te Henga, a line of tracking tunnels and traps should be established along the southern margin of the wetland between Brissenden Stream and Tasman View Road (a transect length of up to approximately 4.5 km). A similar line of traps / tracking tunnels should also be established along the (Rodney District Council administered) northern margin of the wetland. Pest control would require support from local landowners, residents, and care groups. While the northern portion of the wetland area is under the jurisdiction of the Rodney District Council, as Forest and Bird and the Department of Conservation also manage parts of the area, any predator control would need to be undertaken as a joint operation. The mechanisms for a joint operation between the WCC and the RDC are already in place through the willow control project. A pest control operation to protect the birds of Te Henga Wetland could be implemented as an extension of the existing willow control programme

Recommendations

The highest priorities for Waitakere City's wetland bird populations are:

1. To determine the status and trends of populations of Australasian bittern, banded rail, North Island fernbird, marsh crake, and spotless crake by implementing a thorough monitoring programme; and
2. To minimise the impacts of predation on wetland birds by implementing an annual pest control programme (for rodents and mustelids) immediately prior to each breeding season at Harbourview - Orangihina and Te Henga Wetland.

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Appendix. Literature review list*Selected literature relating to the birds of Te Henga Wetland:*

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