

DESKTOP REVIEW OF WADING BIRD DIVERSITY AND ABUNDANCE WITHIN THE WAIKOKOPU CREEK ARM, OMAHA



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DESKTOP REVIEW OF WADING BIRD DIVERSITY AND ABUNDANCE WITHIN THE WAIKOKOPU CREEK ARM, OMAHA

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1. INTRODUCTION

Watercare wishes to increase the wastewater discharge from the Omaha Wastewater Treatment Plant. The existing discharge of treated wastewater is to the golf course and the Jones Road forestry block. From these areas, the groundwater primarily flows to the west, through coastal swamp forest and wetlands, into the Whangateau Estuary.

Watercare requires an assessment of ecological effects on the coastal wetlands at Omaha. The first part of this assessment is to carry out a desktop review of all available published and unpublished information on shorebird and wading bird populations present in the Waikokopu Creek Arm (southern end of Whangateau Harbour) and surrounding environment, which form a significant part of the Omaha Wetland complex.

To this end, the client has engaged Wildland Consultants Ltd to prepare a desktop literature review that includes the above mentioned information together with recommendations for future field surveys.

2. METHODS

A review of literature relevant to the Waikokopu Creek Arm and surrounding environment was undertaken, including Auckland Council Technical Publications, academic papers, websites, books, reports, and theses. Consultation was carried out with representatives from Omaha Shorebird Protection Trust, Auckland Council, and the Department of Conservation (Warkworth office), together with amateur and professional ornithologists who have experience at the study site.

3. ECOLOGICAL CONTEXT

3.1 Location

The Waikokopu Creek Arm of Whangateau Harbour is located in the north-eastern corner of Rodney Ecological District (c.200,250 ha), which is one of eight ecological districts that comprise Auckland Ecological Region. Rodney Ecological District lies to the north of Auckland City, between the Kaipara Harbour to the west and the Hauraki Gulf to the east. It adjoins Waipu Ecological District to the north, Otamatea and Kaipara Ecological Districts to the west, and the Tamaki and Waitakere Ecological Districts to the south.

Information below on Rodney Ecological District is from Mitchell *et al.* (1992).

3.2 Physical character

Rodney Ecological District is an area of relatively subdued lowland hill country. Hills extend to the coast, which forms the eastern boundary and comprises an intricate pattern of dunes, headlands and peninsulas, broad harbours and penetrating tidal inlets. The drowned valleys of the Kaipara Harbour extend to within a few kilometres of the east coast. The climate is generally warm and moist with high sunshine hours (2,000 per

annum), high humidity, and a prevailing westerly wind, although the most destructive winds come from the east and north-east. Summer temperatures average 19°C and winter 10°C. Annual rainfall varies from 1,200 mm in the Kumeu rain shadow area to over 1,600 mm in the elevated hills of central Rodney. Generally the Rodney Ecological District is sheltered in the east by the Hauraki Gulf islands and in the west by the Kaipara South Head dune barrier and the Kaipara Harbour. The topography is characterised by steep south-facing escarpments and hill slopes, which tend to be cooler and wetter than elsewhere.

3.3 Pre-human natural areas

Rodney Ecological District was originally extensively forested with mixed kauri (*Agathis australis*)-podocarp-broadleaved species forest (c.102,757 ha), inland kauri forest (c.12,417 ha), and coastal broadleaved forest (c.16,773). Freshwater wetlands and swamp forests occupied dune slacks and alluvial valleys, originally covering approximately 24,614 ha. Extensive areas of dune vegetation (c.1,351 ha) were present between Mangawhai and the southern end of Pakiri.

3.4 Existing natural areas

Rodney Ecological District has a long history of human occupation and modification of the natural landscape. Natural areas are highly modified and most remaining indigenous vegetation is fragmented. There are, however, sizeable areas of regenerating forest, often dominated by kanuka (*Kunzea ericoides*). There is very little original kauri forest left, except in a few small reserves. Totara (*Podocarpus totara*)-dominant remnants are a feature of the Rodney Ecological District, with characteristically distinctive riverside forests. Kahikatea (*Dacrydium dacrydioides*) forest is common away from the coast (except for swamp forest at Omaha) and is associated with poorly-drained sites.

Freshwater wetlands and swamp forests have been reduced significantly from their original extent. Many former wetlands have been modified or destroyed by vegetation clearance and drainage, and wetland loss has been particularly rapid in the last 40 years. Existing wetlands are small and scattered and consist mainly of raupo (*Typha orientalis*) reedlands.

Most dunelands have been converted to farmland or radiata pine (*Pinus radiata*) plantation forest. There are, however, significant areas of spinifex (*Spinifex sericeus*) and pingao (*Ficinia spiralis*) in sand dune communities on the Mangawhai and Pakiri foredunes. These communities are threatened by human activities such as off-road vehicles and invasive weeds such as marram (*Ammophila arenaria*), brush wattle (*Paraserianthes lophantha*), lupin (*Lupinus arboreus*), and wilding pines.

Approximately 15% of the remaining indigenous vegetation remnants are in protected areas. The largest blocks are Atuanui/Mt Auckland, Moirs Hill, and Mt Tamahunga, all of which are administered by the Department of Conservation.

4. SITE DESCRIPTION

4.1 Overview

The Waikokopu Creek Arm (c.195 ha) comprises the southern estuarine area of Whangateau Harbour, south of the Broadlands Drive causeway (Figure 1). It is bounded to the east largely by the Omaha-Taniko Wetlands Scientific Reserve and to the west and south by land used for horticulture and agriculture, including Tokanui Point. Several watercourses discharge into the study site, the largest of which is Waikokopu Creek. The creek drains a relatively small catchment near Te Kie Point and Karamuroa Point, which lie south-east of the site.

Whangateau Harbour is one of the most important and highly valued estuaries on the Auckland east coast (Kelly 2009). It is a shallow harbour of 750 ha, with over 90 percent of the water being exchanged on each ebb tide. Freshwater inputs into the harbour are relatively low and drainage channels are a small component of the total landscape. Consequently, extensive intertidal flats, predominantly medium- to coarse-grained sands with a low percentage of mud comprise c.85 % of the area (Townsend *et al.* 2010).

Habitats within the Waikokopu Creek Arm are largely estuarine in character, and include sandy intertidal and sub-tidal seabed, muddy habitats, mangroves (*Avicennia marina* subsp. *australasica*), seagrass (*Zostera muelleri* subsp. *novozelandica*) beds, and large areas of sea rush (*Juncus kraussii* var. *australiensis*) and saltmarsh comprising oioi (*Apodasmia similis*) sedgeland and saltmarsh ribbonwood (*Plagianthus divaricatus*) (Parker 2002; Kelly 2009).

Over the last ten years, intertidal habitats have shown some changes in type and distribution across the harbour with the expansion of several vegetation and habitat types, although the majority have remained stable. The most commonly seen changes are an increase in the abundance of mangroves, which has occurred most prevalently in the Waikokopu Creek Arm. Increases may have been caused by a combination of disruption to flow patterns from the causeway, increased sedimentation within the harbour section and favourable conditions for recruitment (Townsend *et al.* 2010).

4.2 Ecological values

The high ecological values of Whangateau Harbour arguably make it the most valuable mainland estuary in the Auckland region. The clear waters of the harbour reflect the strong tidal influence of coastal waters from the outer Hauraki Gulf, and the high degree of tidal flushing. The harbour is uncontaminated, apart from an isolated area near the disused Whangateau landfill, which is being addressed. Its productive shellfish beds are highly valued by local iwi and recreational harvesters throughout the region. The quality and range of habitats in the harbour is reflected in high species diversity and abundance, including numerous fish and coastal bird species, including several threatened species (Kelly 2009).

The entire Whangateau Harbour is within a Significant Ecological Area–Marine 1 (83c), while a subset of this – including part of the Waikokopu Arm – has been identified as a significant area for wading birds (SEA–M1–83w1). The harbour supports

the third largest post-breeding flock of New Zealand dotterels (*Charadrius obscurus*) in the country (last counted at 155 individuals on 21 March 2015) (G. Pulham, pers. comm. 2015).

The Waikokopu Creek Arm comprises a significant portion of the harbour, and is part of a nationally significant ecological sequence that runs from kahikatea swamp forest to saltmarsh and intertidal flats (Kelly 2009).

Omaha Spit is located *c.*3 km to the north of the site and is itself a critically important area for threatened shorebirds. The Spit has been managed as a Wildlife Reserve since 1999, and despite not currently designated as a Ramsar site for New Zealand, the regular presence of more than 1% of the total New Zealand dotterel population makes the site one of international significance under the Ramsar Convention on Wetlands 1971 (Dowding and Davis 2007).

4.3 Threats

Coastal birds in Whangateau Harbour are threatened by a mix of direct disturbance, habitat loss, and mammalian predators, including cats (*Felis catus*) and dogs (*Canis lupus*). Human population growth will increase the potential risk to coastal birds, but education and active management may reduce the actual risk. Similarly, population growth, roading improvements, and the potential for increased shellfish harvesting and fishing will place additional pressure on the harbour (Kelly 2009).

The potential for contaminant impacts is likely to increase as the area becomes increasingly urbanised and as infrastructural improvements increase human access to the harbour. These pressures are of concern, as the high value of the Whangateau Harbour and Omaha settlement is intrinsically linked to the quality of the natural resources (Townsend *et al.* 2010). Although stormwater contamination does not appear to be a significant issue, the potential effects of horticultural chemicals have not been assessed (Kelly 2009).

The ongoing, long-term effects of the Omaha causeway are of particular concern, and could lead to mangrove expansion and the associated loss of large areas of valuable intertidal habitat (Kelly 2009).



Data Acknowledgment
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Figure 1. Location of the Waikokopu Creek Arm, Omaha, Auckland

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Scale: 1:15,000
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 Cartographer: FM
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5. BIRD RECORDS

5.1 Specific records from the Waikokopu Creek Arm

A total of 22 shorebird and saltmarsh bird species were recorded by Kevin Parker within the Waikokopu Creek Arm between 2001-2003 (Table 1). Six bird species are classified as ‘Threatened’ and nine are classified as ‘At Risk’ by Robertson *et al.* (2013).

Table 1. Indigenous bird species recorded in the Waikokopu Creek Arm and their conservation status.

Species	Common name	Origin	Threat status
<i>Anas superciliosa</i>	grey duck	Indigenous	Threatened - Nationally Critical
<i>Botaurus poiciloptilus</i>	Australasian bittern	Indigenous	Threatened - Nationally Endangered
<i>Bowdleria punctata vealeae</i>	North Island fernbird	Endemic	At Risk - Declining
<i>Charadrius bicinctus bicinctus</i>	banded dotterel	Endemic	Threatened - Nationally Vulnerable
<i>Charadrius obscures</i>	NZ dotterel	Endemic	Threatened - Nationally Vulnerable
<i>Egretta novaehollandiae</i>	white-faced heron	Indigenous	Not threatened
<i>Gallirallus philippensis assimilis</i>	banded rail	Indigenous	At Risk – Naturally Uncommon
<i>Haematopus finschi</i>	South Island pied oystercatcher	Endemic	At Risk - Declining
<i>Haematopus unicolor</i>	variable oystercatcher	Endemic	At Risk - Recovering
<i>Himantopus himantopus leucocephalus</i>	pied stilt	Indigenous	At Risk - Declining
<i>Hirundo tahitica neoxena</i>	welcome swallow	Indigenous	Not Threatened
<i>Larus dominicus dominicus</i>	black-backed gull	Indigenous	Not Threatened
<i>Larus novaehollandiae scopulinus</i>	red-billed gull	Indigenous	Threatened - Nationally Vulnerable
<i>Limosa lapponica baueri</i>	eastern bar-tailed godwit	Migrant	At Risk - Declining
<i>Phalacrocorax carbo novaehollandiae</i>	black shag	Indigenous	At Risk – Naturally Uncommon
<i>Phalacrocorax varius varius</i>	pied shag	Indigenous	Threatened - Nationally Vulnerable
<i>Phalacrocorax melanoleucos brevirostris</i>	little shag	Indigenous	Not Threatened
<i>Porzana tabuensis tabuensis</i>	spotless crake	Indigenous	At Risk - Relict
<i>Sterna caspia</i>	Caspian tern	Indigenous	Not Threatened
<i>Sterna striata</i>	white-fronted tern	Indigenous	At Risk - Declining
<i>Todiramphus sancta</i>	NZ kingfisher	Indigenous	Not Threatened
<i>Vanellus miles</i>	Spur-winged plover	Indigenous	Not Threatened

5.2 Additional records from Whangateau Harbour and surrounds

Table 2 lists an additional eleven bird species recorded in Whangateau Harbour, based on observations between 1968 and 2004 (see citations in Kelly 2009) and several more recent observations. Three of these bird species are classified as ‘Threatened’, one is classified as ‘At Risk’, and three are classified as ‘Non-resident Native’ by Robertson *et al.* (2013). With the exception of Australasian gannet (*Morus serrator*), it is likely that these species occasionally visit parts of the Waikokopu Creek Arm Brown teal (*Anas chlorotis*) (At Risk – Recovering) are present in wetland habitat at south Omaha, and have most likely self- introduced from neighbouring Tawharanui Regional Park (G. Pulham, NZ Ornithological Society, pers. comm. 2015). Brown teal are known to forage on mudflats and in intertidal habitats, so it is likely that this species utilises the Waikokopu Creek Arm.

Table 2: Additional sea and shorebird species recorded in Whangateau Harbour and their conservation status.

Species	Common name	Reference	Origin	Threat status
<i>Anarhynchus frontalis</i>	wrybill	4	Endemic	Threatened - Nationally Vulnerable
<i>Anas chlorotis</i>	brown teal	10	Endemic	At Risk – Recovering
<i>Ardea ibis coromanda</i>	cattle egret	10	Migrant	Non-resident Native
<i>Arenaria interpres</i>	turnstone	11	Migrant	Non-resident Native
<i>Egretta garzetta</i>	little egret	3, 6, 7	Vagrant	Non-resident Native
<i>Egretta sacra</i>	reef heron	5, 8	Indigenous	Threatened - Nationally Vulnerable
<i>Limosa limosa melanuroides</i>	Asiatic black-tailed godwit	1	Vagrant	Non-resident Native
<i>Morus serrator</i>	Australasian gannet	8	Indigenous	Not threatened
<i>Numenius phaeopus</i> spp.	whimbrel	10	Migrant	Non-resident Native
<i>Pluvialis fulva</i>	Pacific golden plover	1	Migrant	Non-resident Native
<i>Sterna nereis davisae</i>	NZ fairy tern	2, 9	Endemic	Threatened - Nationally Critical

Data sources: 1 – Parrish (2000); 2 – Parrish (2002); 3 – Edgar (1977); 4 – Edgar (1976); 5 – Edgar (1978); 6 – Sibson (1979); 7 – Sibson (1978); 8 - Larcombe (1968), Parker and Brunton (2004), Parker (2002); 9 – Rodney District Council (2003); 10 - Gwenda Pulham (pers. comm. 2015); 11 - Robertson *et al.* (2007).

6. CONCLUSIONS

It is evident that Whangateau Harbour is one of the most important estuarine systems in the Auckland region. The harbour supports at least 33 species of indigenous and endemic birds, including nine ‘Threatened’ species, ten ‘At Risk’ species (Robertson *et al.* (2013), and six migratory and vagrant species. It is also an important feeding ground for the NZ fairy tern (G. Pulham, pers. comm.), one of the world’s rarest birds (<50 birds remaining). Twenty-two shorebird and saltmarsh bird species have been recorded from the Waikokopu Creek Arm, including six ‘Threatened’ species and nine ‘At Risk’

species. It is acknowledged that the bird records from the Waikokopu Creek Arm are over 10 years old and it would therefore be useful to undertake successive surveys of shorebirds during summer. Another limitation is the lack of bird counts, i.e. abundance of each species.

The study site contains an array of good quality saltmarsh, intertidal and sub-tidal habitats that are likely to provide excellent feeding grounds for birds. Although the site has been subjected to increased sedimentation and the spread of mangroves, it is less likely to be affected by contaminants than parts of the harbor bounded by residential dwellings. However, the study site - and Whangateau Harbour as a whole - face mounting pressure from residential development and horticultural activities. There is also the prospect of a marina being constructed in the harbour.

In addition, further sedimentation and increased nutrients entering the Waikokopu Creek Arm could lead to an expansion of mangroves and the subsequent loss of habitat for some wader species. Habitats within the arm were last mapped in 2009 by Townsend *et al.* (2010); previously the site had been mapped by Hartill *et al.* (2000). A comparison of the maps shows a distinct increase in the area of mangroves, particularly in the south-west and north-east areas of the site. It is recommended that an updated vegetation map of the arm is completed during the bird survey in order to ascertain if mangroves have since expanded and available wader bird habitat has subsequently decreased.

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