Habitat networks of indigenous shorebirds in New Zealand

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Cover: South Island pied oystercatchers roosting. *Photo: Peter Reese.*

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CONTENTS

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ABSTRACT

This report reviews current knowledge and collates information on the important regions, habitats and sites used by seven endemic shorebird species in New Zealand: New Zealand pied oystercatcher (*Haematopus finschi*), variable oystercatcher (*Haematopus unicolor*), pied stilt (*Himantopus himantopus leucocephalus*), black stilt (*Himantopus novaezelandiae*), New Zealand dotterel (*Charadrius obscurus*), banded dotterel (*Charadrius bicinctus*) and wrybill (*Anarhynchus frontalis*). For each taxon, we outline its status, range and numbers, and describe important breeding and non-breeding sites. We summarise information on movement patterns and links between breeding and non-breeding areas. We also identify sites where there is significant overlap between these endemic species and Arctic-breeding migrant waders. Many of the wintering sites are important to several of these taxa. Nineteen sites (mostly well-defined harbours or estuaries) are identified as having national significance to endemic shorebirds, and 15 of these have been previously identified as wetlands of national significance. Key regions for breeding or wintering shorebirds were northern North Island east-coast beaches and estuaries; large northern North Island harbours (particularly Kaipara, Manukau and Firth of Thames); northern South Island estuaries, particularly Farewell Spit and Tasman Bay; smaller estuaries and lagoons on the east coast of the South Island; and large braided riverbeds in the central South Island. Shorebird flocks are often highly mobile. Little is known about the important feeding areas for many taxa, and little attention has been given to potential threats in non-breeding areas. All significant populations of all indigenous shorebird species come into contact with Arctic-breeding migrant waders to some degree.

Keywords: New Zealand, shorebirds, waders, habitat, estuaries, wetlands, breeding sites, migration, movements, wintering sites

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1. Introduction

Globally, wetlands provide essential habitat for many of the 200 plus species of waders or shorebirds (Suborder Charadrii). New Zealand's estuaries and other wetlands are vital for many species; some of these species breed only in this country, whilst others are annual migrants that breed in eastern Asia or North America.

Effective conservation management of shorebirds in New Zealand requires an understanding of the habitat network used by each species. In the case of indigenous-breeding species, this will include a knowledge of which sites are important during both the breeding and non-breeding seasons, and an understanding of movements between these sites. For Arctic migrants, information is required on which sites are important numerically (i.e. which hold significant numbers of the regular migrant species) and whether individual birds or flocks move between these sites within or between years.

This report, produced in response to a request from the New Zealand Department of Conservation (DOC), considers the indigenous-breeding species. Its main objectives are to:

- Review current knowledge of the habitat network of each species (particularly the links between wintering and breeding sites)
- Identify gaps in existing information
- Assess the degree of spatial and temporal overlap between indigenous-breeding and Arctic-migrant species

Currently, 13 species of shorebirds breed in the New Zealand region (Checklist Committee 1990)[1]. Two of these (spur-winged plover *Vanellus miles novaehollandiae*, and black-fronted dotterel *Charadrius melanops*) are primarily Australian species that have recently self-introduced to New Zealand and have secure populations overseas. Of the remaining 11 species, four (Chatham Island oystercatcher *Haematopus chathamensis*, shore plover *Thinornis novaeseelandiae*, New Zealand snipe *Coenocorypha aucklandica*, and Chatham Island snipe *Coenocorypha pusilla*) are naturally confined to outlying island groups and are not considered in detail. In this report, we present detailed accounts for the remaining seven species, two of which include two subspecies, making a total of nine taxa:

- New Zealand pied oystercatcher (*Haematopus finschi*)
- Variable oystercatcher (*Haematopus unicolor*)
- Pied stilt (*Himantopus himantopus leucocephalus*)
- Black stilt (*Himantopus novaezelandiae*)

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[1] Nomenclature follows the third edition of the New Zealand Checklist (Checklist Committee 1990), except for the following: the South Island pied oystercatcher (*Haematopus ostralegus finschi*) is considered an endemic species (New Zealand pied oystercatcher, *H. finschi*) (Marchant & Higgins 1993; Holdaway et al. 2001); and two subspecies of the New Zealand dotterel are recognised (Dowding 1994).

- New Zealand dotterel (*Charadrius obscurus*)
  - Southern New Zealand dotterel (*C. o. obscurus*)
  - Northern New Zealand dotterel (*C. o. aquilonius*)
- Banded dotterel (*Charadrius bicinctus*)
  - Banded dotterel (*C. b. bicinctus*)
  - Auckland Island banded dotterel (*C. b. exilis*)
- Wrybill (*Anarhynchus frontalis*)

We refer to these as the indigenous-breeding species or taxa. Three of the seven species are internationally listed as Threatened (BirdLife International 2005), and six of the nine taxa are nationally classified as Threatened (Hitchmough & Bull 2004). The pied stilt is cosmopolitan, but the other eight taxa are endemic (breed only in New Zealand).

Following the recent outbreak of the highly pathogenic H5N1 strain of avian influenza in poultry in eastern Asia, there has been renewed concern about the ability of migrant birds to act as vectors both of this and other pathogens. The arrival of disease by this route could have implications for human health, could have economic impacts (e.g. on the poultry industry in the case of avian influenza), or could pose a threat to endemic biodiversity. As a result, the extent to which northern-hemisphere migrants using the East-Asian-Australasian (EAA) flyway interact with endemic shorebirds is of considerable interest. Consequently, where we have listed important wintering sites for the indigenous-breeding shorebirds, we have also noted which of those sites carry significant flocks of Arctic migrants.

There are five transequatorial migrant-shorebird species that reach New Zealand annually in significant numbers; these are listed below with their approximate numbers (Heather & Robertson 1996):

- Pacific golden plover (*Pluvialis fulva*): 600–1200
- Turnstone (*Arenaria interpres*): 5000–7000
- Lesser knot (*Calidris canutus*): 50 000–70 000
- Red-necked stint (*Calidris ruficollis*): 150–300
- Bar-tailed godwit (*Limosa lapponica*): 85 000–105 000

Together, these species comprise the majority of Arctic-migrant shorebirds reaching New Zealand. It should be noted that although these species do not breed in New Zealand, they are also considered indigenous (= native) in the New Zealand Biodiversity Strategy (Anon. 2000). The habitat networks of these species while in New Zealand are currently under study (P. Battley, pers. comm.).

The amount of contact between indigenous-breeding taxa and Arctic migrants depends to some extent on the annual movement patterns of both groups. Most Arctic migrants arrive in New Zealand in September and depart in March or April. For the more sedentary endemic species in coastal areas (e.g. variable oystercatcher and New Zealand dotterel), there is potential for contact with large numbers of Arctic migrants throughout the September–April period. For internal-migrant indigenous-breeding species that breed inland in the South Island (particularly pied oystercatcher and wrybill), highest rates of contact with Arctic-migrant species are most likely between January and April, when

the indigenous-breeding species are at their northern wintering sites. However, it should be noted that c. 10%–15% of Arctic migrants (mostly sub-adults) remain in New Zealand for the austral winter, and that sub-adults of endemic species (particularly pied oystercatcher) also remain on wintering grounds in northern harbours and other coastal areas during the breeding season (Sagar et al. 1999). Overall, there is the potential for some contact between endemic and Arctic-migrant shorebirds throughout the year, but levels of contact are likely to be highest between January and April.

2. Methods

2.1 SOURCES

The international and national threat classifications used in this report are those assigned by BirdLife International (2005) and DOC (Molloy et al. 2001; Hitchmough & Bull 2004) respectively. Population estimates, distributional information, movement data, and bird counts were obtained from a wide variety of sources, including published papers and books, university theses, Classified Summarised Notes (CSN) of *Notornis*, unpublished reports (particularly from DOC), unpublished databases held by individuals or institutions, and personal communications. Two published works were of particular importance: Marchant & Higgins (1993) provided a detailed account of the state of knowledge of each taxon up to 1993, and Sagar et al. (1999) summarised the data from national winter and spring shorebird counts undertaken between 1983 and 1994 by members of the Ornithological Society of New Zealand (OSNZ). Counts from CSN are identified by the volume and part number of *Notornis* in which the count appeared, e.g. CSN 50/2 refers to a record in CSN for the North Island 2001/02, published in *Notornis* volume 50, part 2.

For each taxon we provide:

- A short introduction outlining range, numbers and conservation status
- A description of the breeding range
- A list of important non-breeding sites (including a list of the top-ten ranked sites)
- Information on movements between breeding and non-breeding sites and between different non-breeding sites
- Identification of sites where there is significant overlap with Arctic migrants
- A discussion of issues specific to the taxon, including identification of any gaps in our knowledge

2.2 SIGNIFICANCE OF SITES

Many of the species considered here are widely and thinly spread, even during the non-breeding season, making it impractical to list all sites for them. Therefore, in the majority of cases we have only listed sites known to contain 1% or more of the population of a taxon. This level is widely accepted as an indication that a site is of international significance for a taxon in terms of the Ramsar Convention (1971). In spite of this limit, some of the lists (particularly those of non-breeding sites) are long. However, they are likely to be useful and are therefore included as appendices. Within the text we have provided an indication of the most important areas by including a ranked list of the top-ten sites for most taxa; in these lists, sites that regularly hold 30% or more of any taxon have been designated as 'critical' habitat.

2.3 NATIVE / MIGRANT OVERLAP AND BIOSECURITY ISSUES

In response to recent biosecurity concerns, we have attempted to address the issue of overlap (and hence potential for disease transfer) between flocks of non-breeding endemic shorebirds and flocks of Arctic migrants. However, assessing the level of overlap that may be of biological significance in these circumstances is difficult. We have therefore noted which of the top-ten wintering sites for each indigenous-breeding taxon also typically holds 100 or more and 1000 or more Arctic-migrant shorebirds. Data on numbers of Arctic migrants at each site were from the same sources as listed in section 2.1, particularly Sagar et al. (1999) and CSN. We have attempted to indicate the extent to which each indigenous-breeding taxon could, during its normal annual movements, spread any disease that it may have come into contact with.

2.4 LOCATION OF SITES

A very large number of sites are mentioned in this report (particularly in the appendices), and it would be almost impossible to show them all on a small number of maps. Therefore, in Fig. 1 only the most important harbours, estuaries and rivers are shown, as well as provinces and regions referred to in the text. Virtually all the sites mentioned that are not shown in Fig. 1 can be found on the NZMS 262 series (1:250 000) New Zealand topographical maps.

Figure 1. Map of New Zealand, showing the main regions and localities mentioned in the text.

Continue to next file: sfc261a.pdf