

Title: Factors affecting the breeding success of the New Zealand Dotterel (Charadrius obscurus).

Supervisor: Associate Professor P F Jenkins

Introduction:

The New Zealand Dotterel, or Tuturiwhatu, (Charadrius obscurus) is an endangered shorebird, numbering only around 1500 individuals. It is almost entirely restricted to the northern half of the North Island, although it was once widespread, including throughout the South Island. A colony of some 200 birds remains on Stewart Island (Phillips, 1980; Dowding, personal comment).

The N.Z. Dotterel usually breeds among sand dunes or on sand spits, particularly near brackish or flowing fresh water. Their home ranges may be one half to three kilometres long, encompassing a guarded territory around the nest site. The nest is a bare depression that may be lined with a few bits of grass, weed or shell. The normal clutch, laid September to January, is three eggs (McKenzie and Heather, 1984; Dowding, unpublished).

Since the summer period is when humans also use beaches and sand dunes, the nesting dotterels are often disturbed by dogs, motorbikes, and people wandering and playing close to the well-camouflaged nests, unaware of the damage they may be causing (Reed, 1981).

The birds respond to a perceived threat by leaving the nest and enticing the disturber away with the "broken wing" display. Repeated absence from the nest due to frequent disturbance may result in chilling of the eggs, or predation by black-backed gulls (Dowding, personal comment).

The birds, or their eggs and chicks, are also vulnerable to predation by rats, cats, mustelids and hedgehogs. Chicks of 3-4 weeks of age appear to suffer especially high mortality, perhaps because at this time they are much more mobile, and tend to be further away from the protection of their parents, than when younger. Black-backed gulls in particular may take unprotected chicks (Dowding, personal comment).

Human disturbance, and predation, have resulted in low breeding success for the dotterels. As incubation lasts 28-32 days, and the chicks do not fledge for another 40-52 days, the birds are vulnerable for at least 2 months (Dowding, personal comment; McKenzie and Heather, 1984).

The recent poor breeding record of the N.Z. Dotterel has prompted the safe-guarding of a few nesting sites. Breeding areas are cordoned off to prevent accidental disturbance, and a warden may be employed to keep an eye on more malicious damage. Excellent results, in terms of chicks fledged, have been achieved at Wharekawa (Opoutere, Coromandel), with such a system. Other attempts, for instance, Mangawhai, have not been as successful (John Dowding, personal comment).

Research Objectives

1. I wish to compare a protected N.Z. Dotterel breeding area with two unprotected sites, to demonstrate that protecting nesting dotterels from human-associated pressure over the summer period will enhance breeding success.
2. I will attempt to assess the level of predation on eggs and chicks. Is predation as important as human-associated disturbance?
3. What are the essential features of a successful nesting site? I will recommend management strategies for N.Z. Dotterel breeding areas.

Statement of Thesis

Hypothesis: There are a solvable series of environmental problems for N.Z. Dotterel. Identifying them will point to appropriate management strategies.

Research Design

Sites: The protected site will be Wharekawa at Opoutere, Coromandel. The two unprotected sites will be chosen from Matarangi, Whangamata-Otahu, or Tairua-Pauanui, all of which are near Opoutere.

The protected and the unprotected sites are popular recreational beaches under pressure from large numbers of visitors.

The chicks produced at Opoutere are currently colour-banded by Rick Thorpe of DOC, Hamilton. I hope to arrange for him to also band chicks at the unprotected sites. This would allow much easier identification and monitoring of the chicks.

Methods

I intend to be a neutral, invisible observer. At each site I will build a viewing hide, about 2 metres off the ground, from where I will survey the breeding areas, mapping the location of territories and nests. I will record all eggs laid and chicks hatched. With a telescope I will be able to identify individual chicks by their colour bands.

I will establish an observational programme and examine the problems of human disturbance, and of predation.

Human Disturbance

How many people visit the beach? How many of them appear to cause a problem? (Peak numbers will obviously occur at weekends and public holidays). This will be a semi-quantitative measure, which I will plot to give a disturbance index over the breeding season.

I will also survey people on their knowledge of:

- the birds
- influence of pets
- influence of vehicles
- importance of conservation of the bird - what would change their opinions?

How many people are accompanied by dogs? (Dogs with people may tend to act as a disturbance, but roving dogs at night may tend to predate the birds; Dowding, personal comment).

How much time do birds spend on the nest? Why do they leave the nest? (Do not forget changeovers). How close do the chicks stay to their parents at various ages? Do they wander more at 3-4 weeks of age? Look at the peck rates of the chicks. Are they spending too long hiding to feed adequately?

Predation

I will observe the sites at night from the hide towers using a xenoscope, and monitor the activities of cats, rats, mustelids and dogs. John Dowding is particularly interested in the results of such observation.

I will also use tracking tunnels to ascertain abundance of rats and stoats. Smoothing the sand underneath the cover, rather than using ink and paper, should give good results. I will test this as soon as possible.

Do eggs and/or chicks disappear at night or during the day? If the nest cup is emptied, I will carefully rake through it for traces of egg shell. Some predators characteristically remove eggs from the site, some eat them on the spot.

Collect any dead chicks, adults, or eggs for John Dowding to examine. A photograph may be useful (use scale).

Stoats are known to be attracted by rabbits, which may be common in the sand dunes. I will construct an index of stoat and rat usage of beach dune throughout the year (in 3 month blocks).

Other Factors

Dotterel-Dotterel interactions. Are territorial disputes of significance in causing abandoning of nests for example? Dotterel-Variable Oyster Catcher interactions. These two species nest in the same areas, quite close together. Do they co-exist peacefully or do they fight? Do Variable Oyster Catchers protect N.Z. Dotterels incidentally? The Oyster Catchers are large birds well able to protect themselves from dogs for instance.

Is current legislation - national and local - adequate to protect the birds?

Application of Results

Formulate strategy for the management of N.Z. Dotterels (within a coastal reserve?) Consider control of:

1. Humans. Habitat protection, protected nesting sites - cordoned-off areas, information signposting, wardens (students).
2. Predators. Removal of cover, erection of fences, control of alternate prey.

References:

- Dowding, J.E. (unpublished) An Introduction to the New Zealand Dotterel.
- McKenzie, H.R. & Heather, B.D. 1984. The New Zealand Dotterel. In Readers' Digest Book of New Zealand Birds. Readers' Digest, Sydney.
- Phillips, R.E. 1980. New Zealand Plovers. *Emu* 80:180-197.
- Reed, S.M. 1981. New Zealand Dotterel (*Charadrius obscurus*) - An Endangered Species. *Notornis* 28:129-132.