

# Minimising visitor impacts on threatened shorebirds and their habitats

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# Abstract

The Waipu and Ruakaka Wildlife Refuges in Northland are recognised as habitats of international importance as they provide regular breeding sites for the endangered New Zealand fairy tern and the threatened New Zealand dotterel. Despite management initiatives, the level of human related disturbance upon these shorebirds is increasing.

This study was conducted with the aims of identifying: the current levels and patterns of visitor use; visitors' level of awareness about shorebirds and the impacts upon them; and the compatibility of visitors' activities with the needs of shorebirds.

An on-site questionnaire was used at both Waipu and Ruakaka to enable this information to be collected.

The results show that the average visitor utilising the Wildlife Refuges was aged between 33-45 and from Auckland. They usually visited once a year, but for a considerable number it was their first visit. Most stayed locally and used the refuge for swimming, fishing and surfing. An important difference between the two sites was that more local residents appeared to utilise the Waipu Wildlife Refuge than the Ruakaka Refuge.

The respondents least likely to take notice of signs were those who visited a refuge less frequently, those who were under 19 years old, and those who came to the refuge to surf, fish or go boating. Signs are currently the primary way to communicate with the public about the refuge. These groups were therefore less aware of the refuge and the birds which breed within it than other groups. The responses of these groups indicated they were also more likely to continue their activities even if they became aware they were disturbing a nesting shorebird.

Regular beach users were more cautious about any management initiatives which would involve closing the beach to protect the birds, whereas irregular visitors were less concerned with the suggestion. Most people did not want dogs on the beach and felt that fines should be issued to dog owners found with their dog on the beach.

It is recommended that present management is continued, although it would be desirable for a more active approach to be taken towards managing and in some cases limiting public access.

## 1. Introduction

Since 1985, the Department of Conservation's Northland Conservancy has been protecting and monitoring shorebird breeding at three key sites,

Mangawhai, Waipu and Ruakaka Wildlife Refuges (Booth 1998, unpubl.). Each of these sites comprises an estuary and a sandspit which are relatively unmodified.

The Waipu Refuge is classified as an 'internationally important habitat' as it supports a significant number of threatened shorebird species, including New Zealand dotterel (*Charadrius obscurus*), variable oystercatcher (*Haematopus unicolour*), white-fronted tern (*Sterna striata*), and Caspian tern (*Sterna caspia*). It is also an important breeding area for the critically endangered New Zealand fairy tern (*Sterna nereis*), with only 7-8 breeding pairs, of which two currently breed at Waipu (Pierce in press).

The focus of current management practices is to protect the remaining shorebird populations by improving their breeding success. In order to achieve increased success the impacts of negative factors which are limiting shorebird productivity need to be reduced as far as possible. Negative factors include human disturbance, predation, weather and tidal impacts (Booth 1998 unpubl., Pierce in press).

Many national and international studies have shown a clear relationship between levels of human disturbance and the success of shorebird breeding programmes (Burger 1981; Lord et al. 1996; Anderson & Keith 1980; Barlow 1995; Davidson & Rothwell 1993; Duffus & Dearden 1990; Watson et al. 1996).

In New Zealand, a study into the frequent failure of New Zealand dotterel breeding attempts showed sites with low human visitation were, on average, twice as productive as highly disturbed sites (Cumming 1991).

During the summer months there is a large increase in the number of people who visit beaches. The east coast of Northland is becoming particularly popular due to its warm weather and safe beaches (Auckland Regional Council 1997). Because of this, however, wildlife refuges such as Waipu, Ruakaka and Mangawhai are being used more intensively than in previous times. Evidence shows that this influx in visitor numbers over the breeding season contributes to a significant impact on the numbers and breeding success of threatened shorebird species (Pierce 1998).

Waipu and Mangawhai Refuges are entered by fewer visitors than Ruakaka Refuge. This is reflected in the maintenance of stable shorebird populations since management first began in these two areas. At the southern end of Ruakaka beach, where human disturbance is constant, NZ dotterel and variable oystercatchers have continued to decline in numbers. On the northern side of the Ruakaka estuary, where disturbance levels are much lower, bird numbers have shown the same positive signs as the other refuges (Pierce in press).

New Zealand fairy terns, our most endangered shorebirds, appear to have abandoned the Ruakaka Refuge as a breeding ground, instead using areas where visitor disturbance is less frequent (Pierce in press).

In recent years, despite the presence of shorebird wardens, increased signage and temporary fences surrounding nesting sites, it seems apparent that the

levels of human visitation are increasing.

This study was carried out with the aim of identifying ways that the refuges could be managed to produce increased breeding success while accommodating the needs and aspirations of the growing number of visitors to the refuges. Specific questions which needed to be answered through this work were:

- What are the current levels and patterns of visitor use, and the characteristics of the visitors?
- What are the needs and aspirations of the visitors in the shorebird refuges?
- What level of awareness about such things as birds, impacts and the refuges do visitors have?
- What visitors' needs are compatible with the refuges, and how can they best be accommodated?
- Are there ways in which the visitors' impacts on threatened shorebirds can be minimised?
- What new initiatives such as eco-tourism would be compatible with the role of the refuges?

## 2. Methods

An on-site visitor questionnaire was formulated to be administered by interviewers. The questions were constructed to be short and concise. The questionnaire concentrated on five different aspects of each respondent:

- Visitor information was about the characteristics of respondents, including their home province, age and the activities which they intended to perform while at the beach.
- Visitor awareness gauged the level of awareness amongst the visitors about a refuge and the wildlife which inhabits it.
- Visitor knowledge was assessed on their knowledge of shorebird species and their behavioral patterns when distressed.
- Visitor opinions on the future management of the reserve were sought and used to assess the level of public support for different management approaches.
- Visitor impacts assessed what current refuge management activities were having on the activities of those using the area.

Prior to the final survey two pilot trials were used to identify and remedy any faults with the survey questions or style.

The survey was administered during the breeding season of 98/99, and encompassed a mix of week days and weekends, high and low tides at both Waipu and Ruakaka. Visitors were surveyed within the wildlife refuge boundaries on a 'next to pass' basis. Where groups were encountered, every third person was surveyed.

The differences in the awareness, knowledge and opinions of visitors was assessed according to their response characteristics using the SPSS statistical package.

## 2.1 SITE DESCRIPTION

The Waipu and Ruakaka Wildlife Refuges are found on the east coast of Northland about 30 minutes travel south of Whangarei. Both sites contain estuaries, dune systems, beaches, and sand spits. The sand spits provide a favoured breeding area for many shorebird species (Pierce in press). The sites are relatively unmodified by humans, but the breeding success of shorebirds has suffered greatly from indirect human impacts, such as the introduction of mammalian predators.

# 3. Results

From 26 December 1998 to 13 January 1999, 100 people were questioned in each of the Waipu and Ruakaka Wildlife Refuges. Visitors who chose not to answer the survey were included in the sample as non-respondents. This has resulted in percentages which are less than 100%.

## 3.1 VISITOR INFORMATION

### **Hometown**

Local residents included all people who said they were from Waipu, Ruakaka or the surrounding areas, including Langs Cove. The majority of people visiting the Waipu Refuge were from Auckland (31%) or were local residents (26%) (Figure 1a). The majority of visitors to Ruakaka were also from Auckland (59%). Very few were local residents (2%) (Figure 1b).

### **Holiday accommodation**

The majority of respondents at Ruakaka were staying locally (83%). Seventy one percent of people surveyed at Waipu were also staying locally.

Ninety one percent of the respondents at Ruakaka were on holiday, compared to 58% of those at Waipu.

### **Age groups**

The most common age group of respondents at both Waipu (33%) and Ruakaka (36%) was 35-44 years old. There were very few respondents under the age of fifteen, Waipu (3%) and Ruakaka (9%) (Figures 2a, 2b).

### **Frequency of visits**

The majority of those who responded at Ruakaka routinely visited the area once a year (52%), but very few people visited the refuge more frequently than once a month. In comparison, the majority of visitors to Waipu (33%) were there for the first time.

Only 18% of visitors at Waipu and 8% of visitors at Ruakaka came on a regular basis (once a fortnight or more frequently). Of those who did, 89% were local residents at Waipu, compared to only 25% at Ruakaka.

Thirty three percent of the visitors to Waipu and 26% of visitors to Ruakaka said it was their first visit to the area.

### **Main activities**

At Waipu the most popular activities identified were swimming (18%), fishing (17%), surfing (13%), walking (10%) and gathering shellfish (9%) (Figure 3a).

Fishing (46%) and surfing (38%) were activities commonly carried out by local beach users.

At Ruakaka the most popular activities were swimming (26%) and relaxing (13%). Bird watching, and shellfish gathering were amongst the least popular activities (Figure 3b).

### **Alternative beaches**

Of those people who visited the Waipu estuary, 68% regularly visited other beaches. Alternative beaches most commonly referred to were Waipu Cove and Langs Cove, with 30% of the respondents spending time there.

Sixty seven percent of respondents at Ruakaka had other beaches that they used regularly. A large proportion (78%) used beaches outside the Waipu and Ruakaka districts, such as Mission Bay in Auckland and Piha on the west coast of Auckland.

## 3.2 VISITOR AWARENESS

### **Sign awareness**

Seventy six percent of respondents at Waipu had noticed some kind of signage on their way to the beach, but only 67% saw signs that were of relevance to the wildlife in the area. People visiting Waipu for the first time appear to have a low awareness of signage, with 57% failing to see any. Twenty percent of yearly visitors also failed to notice signs (Figure 4a).

At Ruakaka 80% of the respondents reported seeing signs, but only 61% saw signs relating to the shorebirds or the refuge. People who visited Ruakaka only once a year (15%) or were visiting for their first time (17%) appeared to have taken less notice of signage in the area (Figure 4b).

### **Knowledge of the wildlife refuge**

The majority of people visiting Ruakaka (88%) and Waipu (72%) knew that they were in a wildlife refuge, but 13% of visitors to both Waipu and Ruakaka who had reported seeing wildlife signs failed to relate this to the fact that they were in a wildlife refuge.

At Waipu 36% of first-time visitors were unaware that they were in a refuge. Twelve percent of first-time visitors to Ruakaka did not know that they were in a wildlife refuge.

Of all the age groups at both the Waipu and Ruakaka Refuges, visitors under the age of 19 were the least aware of the refuges.

### **Awareness of the shorebirds utilising the area**

Most of the respondents at Waipu (80%) and Ruakaka (85%) were aware that nesting shorebirds were protected.

All local and regular visitors to Ruakaka knew there were rare birds nesting nearby ( $\chi^2=0.080$ ) and that they were protected. At Waipu 8% of yearly visitors and 24% of first-time visitors were unaware that the birds were protected ( $\chi^2=0.05$ ). Small sample sizes, however, meant this relationship was not significant.

## 3.3 VISITOR KNOWLEDGE

### **Ability to detect disturbed nesting shorebirds**

The majority of respondents at Ruakaka (79%) and Waipu (66%) thought that they would be able to detect a disturbed nesting shorebird.

Of the identifying factors that would enable respondents to determine if a bird was being disturbed, aggression was the most common answer (Ruakaka 31% and Waipu 32%), followed by squawking (30-24%). Only 9-6% of respondents mentioned feigning injury (Figures 5a, 5b).



At Ruakaka the regularity of visitation to the area had a significant effect on a respondent's perceived capability to detect distressed breeding birds ( $\chi^2=0.001$ ). All regular visitors felt capable of detecting distressed birds, while 27% of first-timers and 29% of once a month visitors did not.

At Waipu, however, there was no such correlation between regularity of visits and visitor knowledge.

### **What you would do if you were disturbing a bird**

The general response of visitors, if they thought they had disturbed a bird, would be to move away (Ruakaka 77% and Waipu 78%). One respondent at Waipu carefully explained how they would attempt to catch the bird and place it back on its nest!

Ninety seven percent of visitors from both sites who had seen wildlife signs said they would promptly move away.

Overall only 7% of respondents at Waipu and 8% of respondents at Ruakaka said they would continue their activities if they thought that they were disturbing a nesting shorebird. At Ruakaka most of these people (63%) had seen signs about nesting birds or the wildlife refuge. At Waipu only 29% of these people had seen signs referring to nesting birds and the refuge.

The regularity of visitation has a highly significant effect on how respondents react to distressed birds ( $\chi^2=0.000$ ). All Ruakaka respondents who said they would not move away from a distressed bird were first-time visitors to the site.

The age of the respondents also affected how they would respond, with 31% of 15- to 19-year olds at Ruakaka saying they would do nothing if they had disturbed a nesting bird compared to an average of 8% for all other visitors over 20 years.

## **3.4 VISITOR OPINIONS**

### **Protecting the shorebirds**

All respondents agreed that protecting the shorebirds while they are nesting is good.

### **Fencing off areas while shorebirds are nesting**

At both sites only 2% of respondents did not agree with the fencing off of areas where the birds are nesting.

### **Penalties for entering into the fenced areas**

Nine percent of respondents at Waipu disagreed with the imposition of fines compared to 26% of respondents at Ruakaka.

There is a strong correlation ( $\chi^2=0.001$ ) between where visitors are from and their opinions on the imposition of fines. At Waipu 12% of locals and 10% of Auckland visitors disagreed with fines being awarded to people for entering into the fenced areas, compared with 66% of visitors from Whangerei. A similar pattern was obtained at Ruakaka, although a higher proportion of Auckland visitors (30%) disagreed with fines.

The age of visitors had a strong correlation ( $\chi^2=0.026$ ) with their opinions on fines. At Ruakaka, 56% of those under 15 and 80% of those between 15 and 19 years of age, disagreed with fines being issued to people for entering into the fenced areas.

People who visited the sites regularly appeared to be more supportive of fines, with all daily and most once-a-week visitors agreeing. In contrast, 9% of yearly visitors to Waipu and 28% of yearly visitors to Ruakaka disagreed with fines being issued. Nine percent of first-time visitors to Waipu and 27% of first-time visitors to Ruakaka also disagreed with fines.

All respondents who said they rode their horses or walked their dogs along the beach strongly disagreed with fines.

### **Prepared to go to other beaches**

Over half the respondents at both Waipu (54%) and Ruakaka (52%) agreed that they would happily go to some other beach so that they would not disturb the nesting birds.

There is a strong correlation between a visitor source and their willingness to use alternative beaches ( $\chi^2=0.006$ ). At Waipu the local respondents appeared to dislike the idea of being forced to use other beaches more than any other respondents, only 38% of local visitors agreeing to go elsewhere, compared with an average of 59% for all other visitors.

This is also reflected in a correlation between the regularity of visitation and the willingness of visitors to use other beaches. At Waipu 75% of daily visitors were not willing to use other beaches for the sake of the birds. Once-yearly (28%) and first-time visitors (18%) were the least concerned. At Ruakaka a greater percentage of annual visitors (46%) were unwilling to use other beaches.

Respondents carrying out activities specific to that part of the beach appeared to be less willing to go elsewhere than general users. At Waipu 67% of surfers and 41% of fishermen would not be happy to go elsewhere, compared with 15% of general beach users.

### **Dogs should be allowed on the beach**

The majority of respondents at both Waipu (78%) and Ruakaka (68%) disliked dogs being allowed access to the beach.

At Ruakaka, fishermen and visitors from Auckland were the most accommodating towards dogs, with 41 % and 35% agreeing with allowing dogs on to the beach.

Not surprisingly the visitors who identified "walking the dog" and "riding the horse" as their main activities also thought that dogs should be allowed on the beach.

Of those respondents who felt dogs should NOT be allowed access to the beach, most appeared to be more concerned with the impacts dogs have on their experience at the beach than with problems associated with shorebird disturbance.

### **Risk posed by dogs to nesting shorebirds**

Most people agreed that dogs were a threat to nesting shorebirds. This included some of those who thought dogs should be allowed on the beach, and was true at both Waipu (87%) and Ruakaka (92%).

### **Penalties for dogs found on the beach**

Few respondents disagreed with the imposition of fines to those people caught with dogs on the beach (8-9%).

Regular refuge visitors were more likely to agree with the imposition of fines than infrequent visitors. Comments were made such as: "Yes, but how would you police it"? Others felt that only owners of 'big dogs', uncontrolled dogs, or those caught chasing birds should be prosecuted.

### **Increasing awareness of nesting shorebirds**

Most people agreed that the awareness of visitors needed to be increased (Waipu 85% and Ruakaka 77%). The others felt that there was already sufficient information available, or that too much information would draw unwanted attention to the site.

## **3.5 DOG OWNERSHIP AND RELATED OPINIONS**

Most of the respondents at both beaches did not own dogs, with 70% at Waipu and 58% at Ruakaka.

There was a strong correlation at Ruakaka between dog ownership and whether a respondent believed dogs should be allowed in the refuge ( $\chi^2=0.003$ ). Forty two percent of dog owners thought that dogs should be allowed on the beach compared to only 13% of non-owners of dogs.

There was also a correlation ( $\chi^2=0.010$ ), between dog ownership and a respondents opinion to the issuing of fines. At Ruakaka, 20% of dog owners said they disagreed with fines compared to only 3% of non-owners. These patterns were very similar for Waipu.

### 3.6 IMPACTS ON ACTIVITIES

Most respondents said their activities had not been impacted on by shorebird management practices in any way (Waipu 77% & Ruakaka 72%). Very few (3-0%) visitors felt that their activities had been heavily impacted upon.

Of the 18-21% of respondents that felt their activities had been affected by management at the refuges, 4-2% said that it had enhanced their visit and 14-19% felt they had been negatively affected through restrictions on access or dogs. All respondents who came to the sites to ride horses or walk dogs complained that they had been heavily affected (n=3).

## 4. Discussion

### 4.1 CURRENT LEVELS AND PATTERNS OF VISITOR USE

The large number of respondents staying locally was greatly influenced by the amount of accommodation available in both areas. This includes camping grounds, backpackers, numerous bed and breakfast houses and hundreds of batches and holiday homes (pers obs.). This was also likely to have an influence on the regularity of visitation, especially the large number of first-time and once-yearly visitors to the sites.

It is clear that the majority of visitors to the Ruakaka Wildlife Refuge were from Auckland. In contrast, Waipu appeared to attract visitors from a wider range of origins. While a third of Waipu respondents were from Auckland, there was a higher proportion of residents and visitors from other parts of New Zealand than at Ruakaka.

The small proportion of local residents visiting the Ruakaka refuge is likely to be caused by its locality. The refuge is several hundred metres up the beach from the surf club and car park where most people access the beach. The refuge appears to be used mainly as an access way for those people staying at the camping ground (which borders the refuge) to reach the main beach (pers obs.). It would be preferable for these people to access the surf club along a route that was less intrusive to the nesting birds.

The origins of respondents at Waipu were more diverse than at Ruakaka. The large number of international visitors to the Waipu refuge was influenced by the presence of the backpackers' hostel situated on the boundary of the refuge and by the popular coastal tourist route which runs past it. The moderate number of people found at Waipu that were from 'other parts of New Zealand' was possibly influenced by the annual Waipu Highland Games. The site also lends itself to regular visitation by certain groups of people whose activities are non-seasonal. These include fishing, shellfish collecting and surfing (pers. obs.).

The number of regular visitors to the site (and therefore the number of locals using the beach) may have been underestimated by the survey method employed, as visitors were only recorded once.

The age of visitors to each site appears to be influenced by the features of the sites. The popularity of Waipu as a surf beach is reflected, to an extent, in the number of respondents aged between 20 and 24. In contrast, this age group was not well represented at the more sheltered Ruakaka beach. The camping ground at Ruakaka and its setting are especially appealing to holidaying families with young children. Because the camp is on the water's edge, visitors can access the beach without the need for transport, giving younger visitors (up to age 19) much freer access to the beach than is available to them at the Waipu Refuge.

The safe swimming and easily accessible fishing spots provided by both the Waipu and Ruakaka estuaries make the refuges popular amongst families. This is reflected in the large number of people in the 25 to 44 year old group visiting the sites.

One of the main activities carried out at Waipu was fishing. Most of this took place from the rock groyne at the northern end of the estuary, and appeared to have a minimal impact on the birds nesting on the other side of the channel.

Other popular activities such as swimming, surfing and walking may not be as compatible with the requirements of the birds, as they all require the visitor to be able to pass through the nesting grounds, where disturbance is likely. A less disruptive route through the breeding grounds to the ocean beach may be necessary if the refuge is to continue to be an important breeding area.

Most of the respondents at Ruakaka enjoyed carrying out more generalised beach activities such as swimming, relaxing and spending time with their families. These activities tend not to be site-specific and do not require any special features such as shellfish beds.

Fewer respondents came to the Ruakaka Refuge to watch the birds than at Waipu. This suggests that the Ruakaka Wildlife Refuge is not recognised as being of the same ornithological value as the Waipu refuge.

## 4.2 NEEDS AND ASPIRATIONS OF THE VISITORS

The main types of activity respondents were participating in were walking/relaxing, swimming, surfing, fishing and boating. Respondents were asked to comment on how present and potential management activities had impacted on their visit to the beach that day.

### **General needs**

Respondents at Ruakaka generally felt that their activities at the beach had been impacted upon more than those at Waipu. The major impact reported at

both sites was restricted access because of erection of fences. Visitors at Ruakaka also identified the lack of picnicking space available on the edge of the estuary due to the proximity of the fences to the high-tide mark as a problem.

The results from Waipu are encouraging, as the perceived impacts are currently minimal, suggesting that there is an opportunity to increase management efforts without impacting too heavily on the refuge users.

Unfortunately the results obtained were subject to a level of bias through the survey technique employed. In every group that was approached the oldest or most confident individual in the group would answer any questions. This often resulted in the exclusion of the opinions of children from the survey. This is reflected to a degree in the lack of respondents under 15 years of age, especially at Waipu, where children were often unable to visit without the aid of an adult because of the refuge's isolation from most areas. In other cases a respondent's opinions were probably influenced by their parents' or partner's points of view.

### **Restricting beach access**

There were mixed responses to the prospect of the beach being closed during the breeding season at both refuges. Local beach users at Waipu were almost evenly split between those willing to go elsewhere and those who were not.

Opposition to the beach being closed is an understandable reaction from local respondents, whose lifestyles and possibly incomes would be impacted upon.

Some encouragement can be taken from this, as it once again shows a willingness by local users to make some concessions in order to protect the threatened birds at the site.

The majority of daily visitors were not willing to go elsewhere. Because of the small sample size of daily visitors, these results may not be statistically significant. However, considering these people come every day, it is important that they are consulted and their concerns and aspirations are accommodated in any future developments involving the management of the refuge.

People from other areas and those who visit less frequently were less concerned about the suggestion of closing the beach. This too offers encouragement for future management options, in that closing the beach or enforcing heavy access restrictions might be possible without causing conflicts. As can be expected, respondents from other parts of New Zealand and the world were less concerned at the prospect of beach closure.

Of the major activity groups, surfers, fishermen and boaties were most unwilling to go elsewhere. These people need to be targeted through signs or other means of delivering information, especially if the future management involves closing the beach or parts of it.

## **Fishing**

At Waipu the majority of fishing was from the rock groyne near the river mouth. Even if future management involved closing the beach, access to this point need not be restricted, as it does not appear to interfere with the management goals of the refuge. Similarly those that use the beach to collect shellfish would not need to be excluded, as this activity can probably be accommodated within the refuge.

The prime need of refuge users at Ruakaka was direct access to the ocean beach and the Surfclub. This could easily be catered for through the formation or construction of a proper walkway over the dunes away from the majority of nesting birds.

## **Dogs**

Most respondents were in favour of keeping dogs off the beaches. Their reasons, however, were not for conservation but rather their own personal enjoyment at the beach. A small number of people said that dogs should be allowed on the beach as long as they were restrained on a leash or well controlled.

Prior to being asked whether dogs posed a risk to nesting shorebirds, very few visitors suggested that dogs should be banned from the beach because of the danger to the birds. This suggests that the information behind the banning of dogs at the refuges is not explained clearly or sufficiently enough.

Only a quarter of all respondents owned dogs. Of these, nearly half thought that dogs should be allowed in the refuge. Dog owners were seven times more likely to think that dogs should be allowed on the beach than non-owners.

Likewise dog owners were five times more likely to disagree with the issuing of fines for having dogs in the refuge than non-owners.

## **Fines**

There was a surprising difference in the levels of support for the issuing of fines between the two refuges. At Waipu there was strong approval for fines to be issued to people who entered into the fenced areas, especially from those who lived locally and used the refuge frequently. This is significant, as this portion of visitors would be the most heavily impacted upon by any changes in the management of the area. This shows there is a level of concern amongst local beach users and they feel that there is a need for some enforcement measures to be used to improve the chances of bird survival.

At Ruakaka the issuing of fines was more contentious, with many of the respondents disagreeing with the idea. This opinion was strongest amongst visitors under 19 years old, possibly because of what they regard as a threat to their activities.

### 4.3 LEVELS OF KNOWLEDGE AMONGST VISITORS

A significant proportion (27%) of visitors to Waipu, for whom it was their first visit to the refuge, felt that they would be unable to detect a disturbed nesting shorebird. At Ruakaka all of the respondents who said that they would not worry if they were disturbing a breeding bird were first-time visitors to the area.

Thus an abundance of first-time and infrequent visitors to the refuges has the potential to severely impact upon nesting shorebirds. Younger visitors also appeared to have little knowledge of shorebird behaviour, and they need to be targeted in any awareness programme.

As expected, most visitors said they would move away if they were disturbing a bird. Personal observations suggest that people will only move away if they actually feel threatened by the birds. On one occasion I observed a visitor enter the fenced area, where he was obviously disturbing the birds, and he did not move away until he had thrown objects at them, chased them and tried to run across the dunes. By entering the fenced areas these people are significantly increasing the risk of standing on a nest or chicks.

Other people would picnic on the edge of the fenced area while a nesting bird would attempt in vain to draw them away from the nesting area, but as the bird was not showing aggressive signs and was not threatening them they did not alter their activities. By keeping an incubating adult off the nest for more than ten minutes, these people are increasing the risk of the embryo or chicks dying of exposure or being predated upon.

The main signs in the car park at Waipu and on the walkway at Ruakaka describe these nest protection behavioural traits shown by shorebirds, but it appears to have had little effect on the level of knowledge of most visitors about shorebird behaviour. Respondents generally felt confident that they would be able to tell if they had disturbed a nesting shorebird. The majority gave answers revolving around aggression, such as divebombing and squawking.

Unfortunately these reactions are only found in some of the species that nest in the refuge, and it would be only in extreme cases of disturbance that these birds would show this kind of reaction. Few visitors were aware that some birds nesting at the site, such as the New Zealand dotterel, will walk off the nest and try to draw attention from its nest by feigning injury. Thus although the perceived level of knowledge on shorebird behaviour was high, it was in fact very low.

A significant number of visitors were unaware that they were in a wildlife refuge. This is of concern, especially considering the importance and sensitivity of the refuges. The Waipu Wildlife Refuge is an internationally important habitat, yet 23% of those that visit the site are unaware of this. This suggests more emphasis needs to be put on the status of the refuge and its importance as a breeding habitat for endangered birds.



Even some of the respondents who had seen signs about the birds were unaware that they were in a Wildlife Refuge or that the birds were protected.

Likewise, respondents who had identified signs referring to the rules of the area were often unaware that the reason behind them was the protection of many rare and threatened bird species.

A common answer when asked if people had seen any signs on their way to the beach was, "Just the bird signs". People often asked, "What kind of birds are in there,... gulls or something?" This suggests that many visitors, although aware of nesting shorebirds, gave them little regard, dismissing them as common seagulls. This suggests that the signs may be failing to portray all the necessary information. It is possible that the title 'refuge' does not portray the message required and a name change may be advisable. It may be necessary to consider names which, although not scientifically correct, capture the public's imagination. Such names could include: 'Threatened species recovery area', 'Sanctuary' or 'Breeding sanctuary',

Visitors that live locally appear to take more heed of the signs than those from other areas. They also appear to take more notice of the rules which apply to the refuge, possibly because they have had an impact on the way in which they are allowed to use it. It is likely that this awareness of signs by local residents is related to their regularity of visits.

Surfers, dog walkers and boaties generally took less notice of signs than any other group of people. It appears that other people who come to the refuge to relax tend to take more time to look at what is around them, thus observing the signs. From my observations, those entering the Waipu refuge from the backpackers' hostel and those who were fishing off the groyne were not likely to encounter signs on their way to the beach. The main sign situated at the end of Johnston Point Road is missed by most people entering the refuge from the hostel, as they tend to walk straight across to the sand spit from the backpackers' walkway 50 metres south of the sign.

The signs may need to be clearer about the necessity for the rules which have been made to protect the wildlife. People's awareness is probably also affected by the increasing local knowledge of the plight of the NZ fairy tern through the work of wardens to educate the public through the likes of community papers.

#### 4.4 MINIMISING VISITOR IMPACTS ON SHOREBIRDS

Creating the 'minimum-disturbance' environment needed for successful breeding of ground-nesting shorebirds while allowing for public access is the single biggest management conflict at the Waipu and Ruakaka Refuges.

## 5. Conclusions

Closing the site during the breeding season would be the most desirable option in terms of increasing the breeding success of shorebirds in the area, but would almost certainly be highly contentious. The approach in overseas countries in a case such as this is to increase the legal protection of the entire reserve to a 'nature reserve' (WBM 1997). However, this can create problems with enforcement and public relations. A preferred option would be to increase the protection status of the most sensitive areas to sanctuary/nature reserve, while managing the rest as a wildlife refuge.

Anecdotal evidence indicates that school visits, articles in local papers and the distribution of pamphlets has been successful in raising the awareness of the public. This is possibly the only real long-term management option, and it is very important that advocacy work continues, especially amongst regular users and members of the local communities.

A long-term management goal should be to move the beach access points at both Waipu and Ruakaka away from the breeding areas. This could be achieved at Waipu by shifting the current car park towards the new motor-camp, ensuring that access is concentrated in one area, which is away from nesting birds. This would allow the remaining tip of the spit to be closed to the public over the height of the breeding season, while still allowing traditional beach activities to occur. At Ruakaka the development of a 'board-walk' would provide a more direct access route to the surf-club area through the back of the dunes. This would again allow the remainder of the spit to be closed to public access over the breeding season.

If this is not considered an option, impacts could be reduced by moving walkways away from birds or by screening all walkways. Trenches or lanes with shade cloth along the edges could significantly reduce the amount of disturbance to nesting birds created by people as they walk to the ocean beach. These would have to be portable to allow for their movement as circumstances changed. These could, however, act as a barrier restricting bird movements across the dunes and might also have the ability to work as hides for predators.

The signs currently being used at the two refuges are important educational tools in terms of managing people's use of the area. This survey has shown that the signs currently being used are relatively ineffective in some cases. It is recommended that signs continue to be utilised as an educational tool, but that they might need to be modified. For example signs may need to be made more attractive to younger visitors, using brighter colours and interesting patterns. It might also be possible to make the signs interactive.

Although interpretative signs are usually preferred, for many people a more demanding approach is sometimes necessary. Signs would preferably read,

" Warning. No Access Past this Point. Threatened Bird Recovery Area".

Sign colour would preferably be red, a colour associated with danger, and signs should be positioned in a way which allows them to be seen from a distance.

As people often do not read lengthy messages, the signs may be more effective if they simply explain the distance at which shorebirds can be disturbed and tell people not to enter or to stop beside the fences.

A variety of other methods to educate the public should be continued and encouraged. Volunteers could be stationed at the beach access points, talking to visitors and making sure that they understand the importance of keeping to the tracks and the importance of protecting the nesting birds.

Consultation with local iwi is important and should not be ignored. Having iwi involvement in community programmes often gives them more scope and increases their potential to obtain funding and land protection status. This is particularly important in coastal areas such as Waipu, where subdivision is a continuous threat.

## 6. Acknowledgements

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Figure 1. Home town of visitors to (a) Waipu (n = 95) and (b) Ruakaka (n = 93).

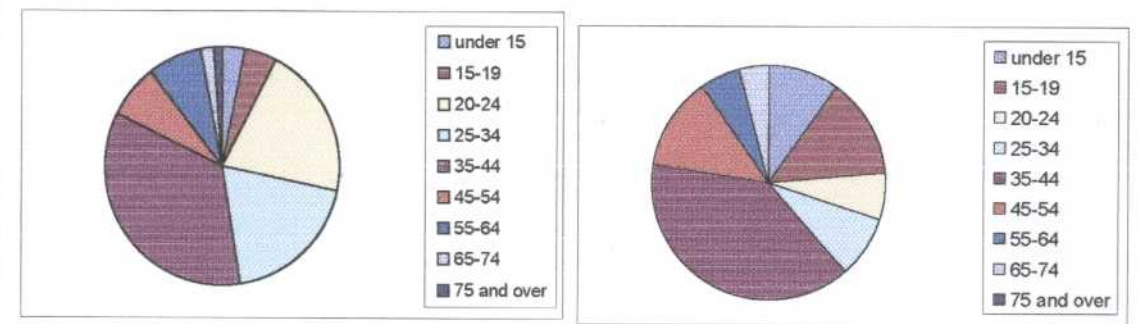


Figure 2. Age of respondents at (a) Waipu and (b) Ruakaka.

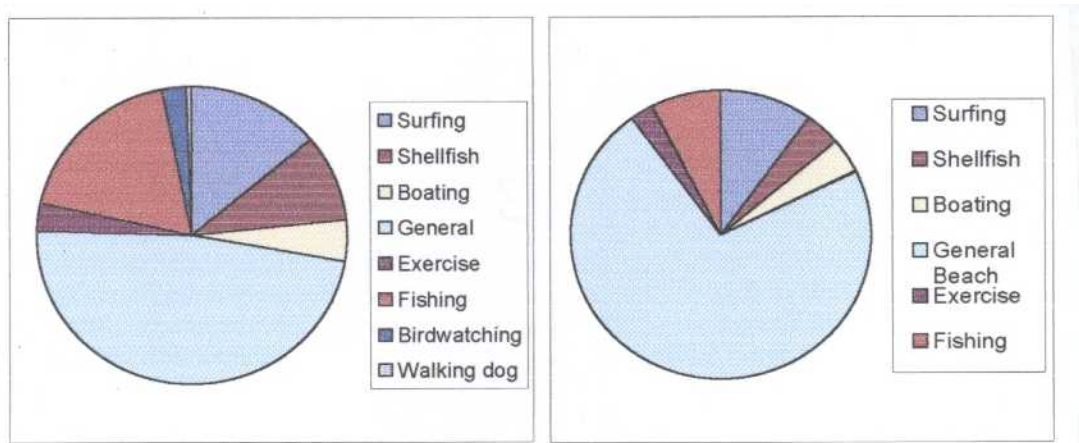


Figure 3. Main activities of respondents at (a) Waipu and (b) Ruakaka.

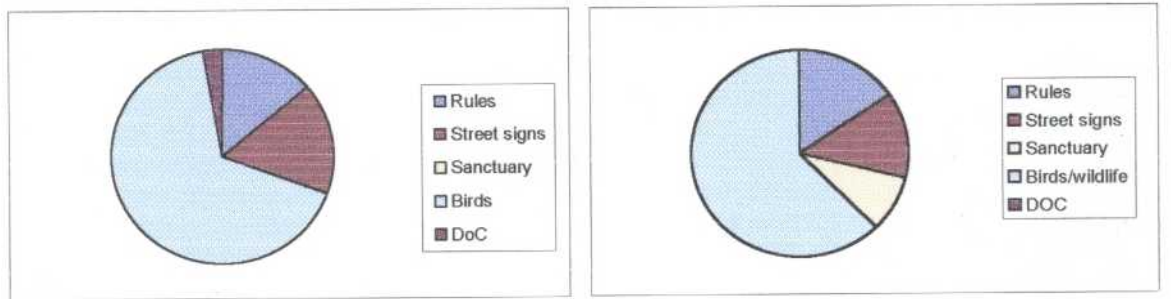


Figure 4. Types of signs seen by visitors at (a) Waipu and (b) Ruakaka.

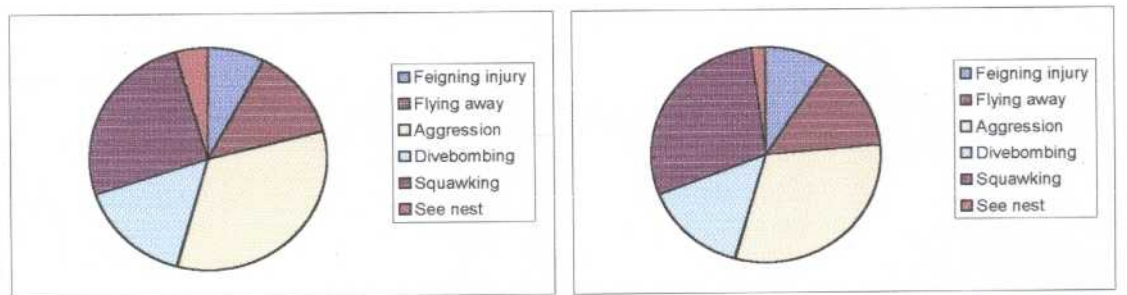


Figure 5. Types of bird responses that would indicate to visitors that they were disturbing a nesting bird at (a) Waipu and (b) Ruakaka.