

# New Zealand shore plover recovery plan

2001-2011

THREATENED SPECIES RECOVERY PLAN 44

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Cover: Male New Zealand shore plover. (*Colin Miskelly*)

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# Recovery plans

This is one of a series of recovery plans published by the Department of Conservation. Recovery plans are statements of the Department's intentions for the conservation of particular plants and animals for a defined period. In focusing on goals and objectives for management, recovery plans serve to guide the Department in its allocation of resources, and to promote discussion amongst a wider section of the interested public.

After a technical report which had been refined by scientists and managers both within and outside the Department had been prepared, a draft plan was produced in 1997 (Kennedy et al. 1997). The current plan covers recent developments in NZ shore plover recovery. A review of this plan is due after ten years (in 2011), or sooner if new information leads to proposals for a significant change in direction. This plan will remain operative until a reviewed plan is in place.

The Department acknowledges the need to take account of the views of the tangata whenua and the application of their values in the conservation of natural resources. While the expression of these values may vary, the recovery planning process provides opportunities for consultation between the Department and the tangata whenua. Departmental Conservancy Kaupapa Atawhai Managers are available to facilitate this dialogue.

A recovery group consisting of people with knowledge of the New Zealand shore plover, and with an interest in their conservation has been established. The purpose of the New Zealand Shore Plover Recovery Group is to review progress in the implementation of this plan, and to recommend to the Department any changes which may be required as management proceeds. Comments and suggestions relating to the conservation of New Zealand shore plover are welcome and should be directed to the recovery group via any office of the Department or to the Biodiversity Recovery Unit.

# 1. Introduction

The New Zealand shore plover *Thinornis novaeseelandiae* is one of the rarest plover species in the world. It is endemic to the New Zealand region. It was once widespread in coastal areas of New Zealand, but by the late 1800s became confined to the Chatham Islands.

The Department of Conservation presently ranks NZ shore plover as Category B, the second highest priority category for conservation management (Molloy & Davis 1994). NZ shore plover are also ranked as Endangered internationally by the IUCN Red List Categories (BirdLife 2000).

This plan sets out the recovery programme for NZ shore plover over the next ten years (2001–2011). It is largely based on a revised NZ shore plover recovery plan prepared by Kennedy et al. (1997), which itself was based on the first NZ shore plover recovery plan prepared by Davis (1987a). Recent developments in NZ shore plover recovery are covered in the present plan.

## 2. Past/present distribution and population numbers

Historically, NZ shore plover were distributed throughout New Zealand (Oliver 1955). Past records of NZ shore plover sightings and the course of its decline have been documented in Davis (1987b). Until 1999 it was assumed that NZ shore plover were confined in the wild to one sedentary breeding population on Rangatira (South East Island) in the Chatham Islands. A second, remnant population of 21 NZ shore plover was discovered in February 1999 on Western Reef in the Chatham Islands. The tiny Western Reef population appears to have survived, undetected and completely separate from the Rangatira population, for a hundred years or more.

Recently, small populations have been established on Motuora in the Hauraki Gulf and Portland Island off Mahia Peninsula, Hawkes Bay, using captive-bred birds (Watson 1999; Fastier & Smith 1999; Smith 2000). Historically, NZ shore plover occupied a wide range of coastal habitats. These included exposed and sheltered rocky coast, sandy beaches, river mouths, mud and sand flats of estuaries. On Rangatira, which has no sandy beaches, they occupy rocky shore, salt meadow and tussockland. The Western Reef habitat is primarily rocky shore platform with little terrestrial vegetation present (S. O'Connor pers. comm.).

Comparisons with observations of the bird's distribution on Rangatira by Fleming (1939) and Dawson (1955) indicate that NZ shore plover numbers on Rangatira have declined. This decline is attributed to significant reductions in habitat area after the grazing of domestic stock ceased in 1961 and Rangatira's open spaces reverted to regenerating forest. Since 1970, when colour-banding

NEW ZEALAND SHORE PLOVER

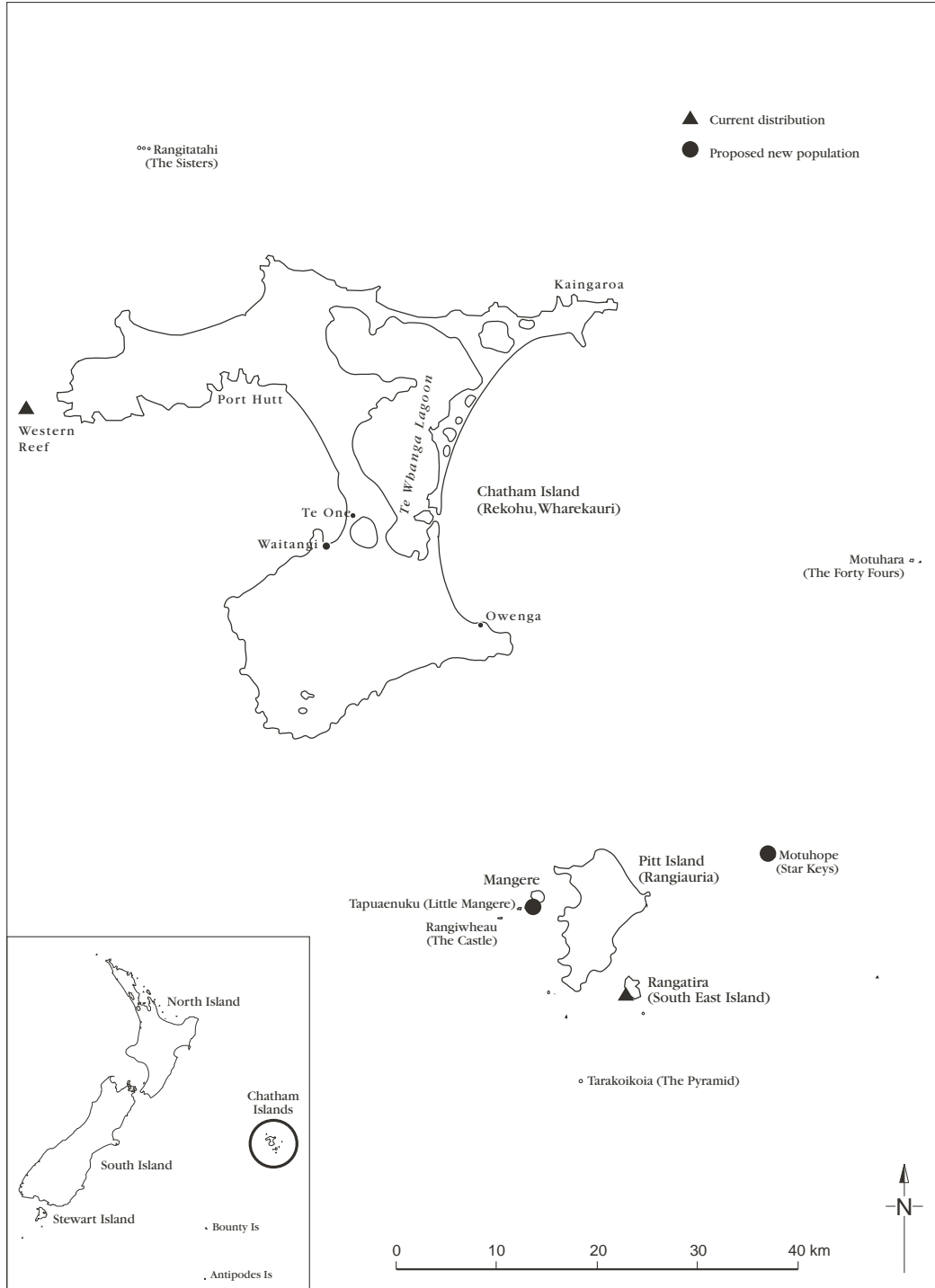


Figure 1. Distribution of NZ shore plover in 2001.

of the population began, the numbers have fallen further, though only slightly. The birds are now confined to the rocky shoreline and to an area known as 'The Clears', a broad flat plateau on Rangatira's exposed southern coast.

Regular census on Rangatira began in 1981 and shows that this population has remained relatively stable since then. Numbers have fluctuated between 37 and 45 breeding pairs, and between 100 and 130 individuals, although variable standards of monitoring have exaggerated these fluctuations (Dowding & Kennedy 1993).

Research from 1985 to 1988 (Davis 1987b), and 1992 to 1993 (Dowding & Kennedy 1993) has shown that the age structure of the population has remained constant, despite the severe constraints imposed on recruitment by habitat size. An average total of 128 NZ shore plover were recorded during three whole-island counts conducted at the beginning of the 1999/2000 breeding season (Gummer 2000). Over the last two seasons (1998/99 and 1999/2000) there has appeared to be a sex imbalance in the population, with more males than females (Thurley 1999, Gummer 2000). However, research by Davis (1987b) and Dowding & Kennedy (1993) showed a consistently even sex ratio among NZ shore plover on Rangatira. A single census conducted on Western Reef on 20 February 1999 recorded 15 males, five females and a single fledgling, all unbanded (O'Connor 2000). One female NZ shore plover that was bred on Rangatira in the 1997/98 season flew to Mangere at the end of that breeding season, and was still present a year later, before disappearing (O'Connor pers. comm.).

### 3. Cause of decline and present-day threats

The probable causes of the NZ shore plover population decline were documented by Davis (1987a). The retreat of NZ shore plover from their traditional range coincided with the spread of introduced predators in New Zealand last century. Cats and Norway rats are proposed as the principal causes of loss on mainland New Zealand, since NZ shore plover disappeared after the arrival of these species but prior to the arrival of ship rats and mustelids (Dowding & Kennedy 1993). NZ shore plover disappeared from Mangere and Pitt Island after the introduction of cats. The survival of NZ shore plover on Rangatira and Western Reef is presumably due to their mammalian predator-free status.

The present-day threats to the survival of NZ shore plover on Rangatira are the introduction of predators, fire, and irruptions of disease. Visitors to the islands heighten these threats. A less immediate threat is the modification of habitat through natural and human-induced processes. As Rangatira's vegetation recovers from the effects of burning and grazing, breeding opportunity will be reduced by the loss of open spaces and low cover in the upper littoral zones and The Clears.

The impact of storm events has been proposed as a significant threat to NZ shore plover on Western Reef. However, birds have apparently survived here for 150 years so it appears that adults are able to survive storms even if eggs and chicks are lost. Storms are likely to impact severely on productivity in some years. If this were to occur for a number of years in succession, it might threaten the survival of this very small population. A further threat to the Western Reef population is human disturbance, leading to nests being crushed by seals, nest abandonment and chick starvation, or increased predation by skuas and gulls. The introduction of rodents or other predators or of disease are also threats to this population.

## 4. Species ecology and biology

NZ shore plovers are medium-sized plovers. Sexes are fairly similar in size, although males are slightly larger in some measurements (Dowding & Kennedy 1993). They are sexually dimorphic; the female has more brown colouring on the cheeks and a more extensive black tip on the bill (Davis 1987a). Information on NZ shore plover ecology and biology on Rangatira is extensively covered by Davis (1987b), while Davis & Aikman (1997) documented aspects of NZ shore plover ecology on Motuora.

NZ shore plover form monogamous pair bonds, with each pair establishing a separate breeding territory. They are largely sedentary on Rangatira (including juveniles and unpaired adults). Fidelity to mates and breeding sites is high. Bulky nests are built under cover (vegetation or boulders) from early October. A clutch of two to three eggs is laid over long and irregular intervals. Both sexes share incubation of the eggs for 28 days, and share in raising of the chicks. The fledgling period is highly variable (31-63 days), and is related to habitat quality. The breeding season extends from September to April, with egg-laying peaking in October. Breeding is generally completed by mid-February.

NZ shore plover are a long-lived species, with a mean longevity of 6 years, and the oldest bird in the Rangatira population was at least 21 years of age. Productivity on Rangatira was a mean of 0.64 fledglings per pair (Davis 1987b). Mortality was highest in juveniles and in winter. The high juvenile mortality (possibly after emigration) may be the result of insufficient habitat on Rangatira. It is estimated that approximately 30% of the juvenile population could be removed annually without loss to overall recruitment to the breeding population (Davis 1987b). On Rangatira, NZ shore plover have not bred before two years of age, although many do not start breeding until later, due to a shortage of breeding territories. In captivity, however, individuals readily breed at one year. A female NZ shore plover on Motuora also bred at one year of age. A high proportion of non-breeding adults is found in the Rangatira population. This, along with the more-or-less constant number of breeding pairs, suggests that Rangatira is supporting the maximum number of breeding pairs possible.

NZ shore plover feed on a wide range of small-sized, locally abundant, marine and terrestrial invertebrates. The most abundant prey types are copepods,



insect larvae, and amphipods. Chicks feed on smaller prey than adults and this limits their feeding sites to microhabitats such as freshwater seeps, where abundant small-sized prey are found (Davis 1987b).

## 5. Past conservation efforts

Regular counts of the Rangatira population began in 1978 and have continued until the present day (files of NZ Wildlife Service—now Department of Conservation; Davis 1987a, 1987b; Dowding & Kennedy 1993; Thurley 1999; Gummer 2000). Until the late 1980s most shore plover were colour-banded, but band problems resulted in most colour bands being removed in the early 1990s. A banding trial was initiated at the beginning of 1998, when 21 NZ shore plover had colour bands applied using a different technique (Dowding 1998). The suitability of the new technique has now been judged successful and colour banding can resume where needed (Dowding 2000). NZ shore plover continued to be banded with numbered metal bands throughout the colour-banding trial. Preliminary research on shore plover habitat requirements and breeding biology from 1972 and 1974 (Flack 1976) were later comprehensively added to by Davis (1987b).

Three attempts to establish NZ shore plover on Mangere from 1970 to 1973 failed. Transferred birds either returned to Rangatira, or disappeared (Aikman 1995). Primary feathers were pulled in the 1972 release, and wing feathers were clipped in the 1973 release but the birds failed to establish. Both adults and juveniles were translocated. Research is currently under way to establish the movements and causes of loss among juvenile NZ shore plover on Rangatira (O'Connor 1999).

Fresh eggs were transferred to the National Wildlife Centre (NWC) and Otorohanga Zoological Park in the 1981/82 and 1982/83 breeding seasons, with poor hatching success and long-term survival. Further egg transfers took place to the NWC in the 1990/91 and 1993/94 and to NWC and Peacock Springs in the 1995/96 season, the progeny reared now forming the basis of captive stock. In March 2000 there were 33 birds in captivity at two institutions (23 at National Wildlife Centre, 10 at Peacock Springs) (Holland 2000).

In September 1994, releases of captive-reared NZ shore plover were initiated on Motuora in the Hauraki Gulf, after an initial habitat assessment (Davis 1994) concluded that the island could support NZ shore plover. Between September 1994 and March 2000, 75 NZ shore plover were released on Motuora. Predation by morepork and dispersal of birds to nearby mainland habitats was a significant problem with these releases, and by the end of 1998 only four birds remained on Motuora. However, both pairs nested, with one pair successfully fledging two offspring. Only one breeding pair remained on the island at the end of the 1999/2000 breeding season (Watson 2000). Concern at the low survival rate of NZ shore plover released on Motuora led to the search for an alternative site to establish a second population. Portland Island, off Mahia Peninsula, was selected and, in August 1998, 15 captive-bred NZ shore plover were released

there. The rate of survival and retention of birds on the island was high compared with that on Motuora (10 birds remained on Portland by February 1999) and another 10 birds were released in July 1999. Three pairs bred on Portland Island in 1999/2000, fledging five chicks between them (M. Smith pers. comm.).

The Western Reef population was surveyed thoroughly after its discovery and, on 20 February 1999, 21 NZ shore plover were counted on the island. This comprised 15 males, 5 females and 1 juvenile (O'Connor 2000).

## 6. Recovery goal

Three goals are proposed—a long-term goal, a medium-term goal, and a short-term goal. The short-term goal of five years is to be achieved by the year 2005, and a medium term goal of ten years is to be achieved by 2011, when this plan expires.

### LONG-TERM GOAL

Restore NZ shore plover to sites in New Zealand and the Chatham Islands which cover parts of their original range.

### TEN-YEAR GOAL

Maintain and/or establish wild NZ shore plover at a total of five or more locations with a combined population of 250 or more birds

**THIS WILL CHANGE THE IUCN CONSERVATION RANKING OF NZ SHORE PLOVER FROM ENDANGERED TO VULNERABLE.**

### FIVE-YEAR GOAL

Protect self-sustaining populations of NZ shore plover on Rangatira and Western Reef, and establish at least one new population in the wild in New Zealand

# 7. Options for recovery

## 7.1 OPTION 1

### **Do nothing**

This option is not recommended. If there were no further management efforts for NZ shore plover, it is unlikely that additional populations could be established. Evidence to date has shown that a large management input is required to maintain shore plover on Motuora, although the extent of management input required to sustain a population on Portland Island is yet to be determined. This would leave the species with two small populations and extremely vulnerable to extinction.

## 7.2 OPTION 2 (PREFERRED OPTION)

### **Protect the NZ shore plover populations on Rangatira and Western Reef, restore habitat on Pitt Island, and establish new populations in the Chatham Islands and New Zealand**

This is the preferred option for recovery. It is essential for the long-term survival of the species that further populations are established. Attempts to establish NZ shore plover populations on Motuora and Portland Islands are currently under way, and further locations for NZ shore plover establishment are proposed, including Mangere and the Star Keys. Removal of cats and weka from Pitt Island could allow the expansion of the Rangatira population, thereby increasing the security of the main population of the species. Protection of NZ shore plover on Western Reef is important as a second natural population. Establishment of additional populations would improve the conservation status (IUCN 1994) of NZ shore plover from Endangered to Vulnerable.

The maintenance of NZ shore plover in captivity is recommended while new wild populations are being established in New Zealand. NZ shore plover are successfully held in captivity at present and the purpose of the captive programme is to produce birds for release at new sites. This minimises the impact on wild populations. Consideration should be given to obtaining eggs for the captive-breeding programme from the Western Reef population to increase the genetic diversity among captive stock and within reintroduced populations. Once the goals of this plan have been met it should no longer be necessary to maintain a captive population.

### 7.3 OPTION 3

#### **Protect the NZ shore plover populations on Rangatira and Western Reef, and restore habitat on Pitt Island to provide a location for NZ shore plover to expand**

This option is not recommended. While restoration of Pitt Island will provide further habitat for NZ shore plover to occupy, the species would still be confined to the Chatham Islands. Being confined to Chatham Islands limits the size the total NZ shore plover population can reach. More importantly, confining NZ shore plover to the Chatham Islands prevents the establishment of the species in New Zealand locations that were part of its historic range.

## 8. Objectives for term of plan

The objectives for shore plover recovery for the term of this plan are:

1. Protect the NZ shore plover populations and habitat on Rangatira and Western Reef.
2. Undertake research on the Western Reef population and investigate means of increasing productivity.
3. Produce captive-reared NZ shore plover suitable for release to the wild.
4. Establish and maintain additional NZ shore plover populations in the Chatham Islands and other parts of New Zealand.
5. Record the presence of NZ shore plover at new sites in the Chatham Islands and investigate juvenile dispersal from Rangatira.

## 9. Work plan

Specific tasks required to achieve each objective, and performance measures to assess success in meeting objectives are set out below.

### **OBJECTIVE 1. PROTECT THE NZ SHORE PLOVER POPULATIONS AND HABITAT ON RANGATIRA AND WESTERN REEF**

#### **Performance measures**

NZ shore plover maintained on Rangatira with a population of around 37-45 pairs and on Western Reef at no less than four pairs over the term of this plan.

### ***Explanation***

Currently, remnant populations of NZ shore plover exist only on Rangatira and Western Reef. Mitigation of threats and careful monitoring are the principal means of insurance against loss through either slow (incremental) decline or catastrophe. The Western Reef population has apparently survived in isolation for perhaps 100 years, but whether it is sustainable in the long term is unknown.

### **Actions required**

#### **Action 1.1 Maintain habitat quality on Rangatira and Western Reef**

##### ***Explanation***

The quality of NZ shore plover habitat is influenced by human activities and by natural change on the coastal margins of Rangatira and Western Reef. Specific measures are recommended to minimise the impacts of activities associated with humans (see Actions 1.2 and 1.3). No priority is given presently to managing natural changes such as the increase in vegetation cover or the encroachment of NZ fur seals on breeding sites, since it is neither practical nor appropriate to reverse these at present. This approach may be reconsidered if changes are threatening the species with extinction.

#### **Action 1.2 Implement quarantine measures and restrict visitors to Rangatira**

##### ***Explanation***

With the majority of NZ shore plover being found on Rangatira, it is essential that this population is protected from a range of risks. The arrival of introduced predators and of alien diseases must be prevented. Quarantine measures have been in place for many years—new people visiting the island need to be made aware of these measures, and there should be regular audits to ensure they are being followed vigilantly. Details of procedures to be followed are set out in the Rodent Contingency Plan (Couchman 2000). Rangatira is a Nature Reserve and entry is by permit only. Currently, numbers permitted entry are restricted and this needs to continue. Restrictions are also required on use of the coast as an access route around the island to prevent undue disturbance of nesting NZ shore plover. Prevention of illegal entry needs to be rigorously enforced.

##### ***Priority***

Essential

##### ***Responsibility***

Chatham Island Area Office

#### **Action 1.3 Minimise human impacts on Western Reef**

##### ***Explanation***

NZ shore plover on Western Reef require protection from human disturbance. DOC should restrict its visits to those essential for gathering basic information about the NZ shore plover population there and should discourage other visits to the reef. Legal protection for the reef should be sought if considered appropriate.

***Priority***

High

***Responsibility***

Chatham Island Area Office

Wellington Conservancy

**Action 1.4 Monitor NZ shore plover populations on Rangatira and Western Reef to determine their population trends and habitat range**

***Explanation***

Monitoring of the NZ shore plover populations is essential to provide early detection of any decline in population from the threats identified earlier. Twice a year censuses (late October and early March) will be undertaken on Rangatira with information collected on total number of individuals, sex and age of birds. Closer monitoring of productivity per pair will be conducted on a sub-set of the population as an indicator of population health. Colour-banding of birds on the northern coast and all juveniles is being conducted in 2001/02 to determine causes of a suspected sex imbalance in the Rangatira population. A census of the Western Reef population should be undertaken at each visit, which should be at least annually. Visits to Western Reef should be restricted to those essential for monitoring and research, mainly because of the large seal population there and the risk that disturbance of the seals may pose to shore plover. A protocol has been developed for Rangatira that includes details on techniques of monitoring and data recording. Similar protocols will be developed for Western Reef by the end of the 2001/02 season.

***Priority***

Essential

***Responsibility***

Chatham Island Area Office

**Action 1.5 Monitor environmental change on Rangatira and Western Reef**

***Explanation***

Natural change in the character of breeding habitat should be assessed as part of census and productivity monitoring. Habitat monitoring being undertaken for other species such as black robin on Rangatira should be integrated with monitoring of NZ shore plover habitat. Simple means of recording change are needed, including the following components:

- Record the effect of catastrophic events (such as storms) on breeding habitats during annual censuses.
- Establish marked photo points and take photos every five years.
- Compare changes in breeding pair distribution, abundance and territory extent in discrete localities every five years. (On Rangatira, Davis' territory numbering system should be updated and territory occupancy monitored at five-year intervals.)

***Priority***

Moderate

***Responsibility***

Chatham Island Area Office

**OBJECTIVE 2. UNDERTAKE RESEARCH ON THE WESTERN REEF POPULATION AND INVESTIGATE MEANS OF INCREASING PRODUCTIVITY**

**Performance measures**

The number of breeding NZ shore plover pairs on Western Reef remains stable or increases for the term of the plan.

***Explanation***

The small habitat area on Western Reef means the population will remain small, but it is assumed that it can support a minimum of five pairs. With such a small population and limited habitat area, problems may arise with sex imbalances and birds unable to find sufficient habitat space to establish a breeding territory. This may require active management to correct.

**Actions required**

**Action 2.1 Investigate specific aspects of the ecology of the NZ shore plover population on Western Reef**

***Explanation***

To effectively manage the NZ shore plover population on Western Reef, information is required on trends in the total population, number of breeding pairs, non-breeding to breeding ratio, productivity and survivorship, territory occupation and territorial behaviour. The extent to which the population is isolated from the Rangatira population also requires investigation. The implications of recent work comparing DNA samples taken from birds in the Western Reef population with samples from the Rangatira population require further consideration (Lambert et al. 2000). Integration of these genes into other NZ shore plover sub-populations may be required to ensure they are retained over the long term.

***Priority***

High

***Responsibility***

Chatham Island Area Office

Wellington Conservancy

**Action 2.2 Investigate means of increasing number of pairs and/or productivity on Western Reef and implement as appropriate**

***Explanation***

Actions to increase the number of pairs and/or productivity of NZ shore plover on Western Reef may prove to be necessary. This could include creation of artificial nests sites, required because of the lack of natural sites there. Translocation of the surplus of males, which are currently in much larger numbers than females, from Western Reef to the captive population may decrease pressure for territorial space while adding genetic diversity to the captive population. Fostering of eggs from Rangatira to Western Reef could be considered.

***Priority***

Moderate

***Responsibility***

Chatham Island Area Office

**OBJECTIVE 3. PRODUCE CAPTIVE-REARED NZ SHORE PLOVER SUITABLE FOR RELEASE TO THE WILD**

**Performance measures**

(1) Maintain two interdependent, self-sustaining captive populations of NZ shore plover, using current best practice, over the term of the plan.

(2) Produce 15-30 captive-reared NZ shore plover per annum that are fit for release to the wild.

***Explanation***

Two interdependent captive populations have already been established at the National Wildlife Centre and Peacock Springs. They provide birds for release into the wild to establish new NZ shore plover populations.

**Actions required**

**Action 3.1 Maintain a captive population of NZ shore plover producing excess birds for release to the wild**

***Explanation***

In order to produce shore plover for release to the wild, the captive NZ shore plover population must be maintained in a healthy condition and have excess production. The number of birds available for release should be maximised where possible, but not at the expense of the viability of the captive population or by compromising the quality of the birds produced for release. Ensuring that the captive population is managed to meet the objectives in this plan will be the responsibility of the captive co-ordinator. To date, eggs for the captive rearing programme have come from Rangatira; there is now also the opportunity to collect eggs from Western Reef, thereby possibly increasing genetic diversity



among captive stock. However, collection of eggs from Western Reef must not threaten the survival of that population.

***Priority***

Essential

***Responsibility***

Captive Coordinator (National Wildlife Centre)

Peacock Springs

**Action 3.2 Produce a captive husbandry and incubation manual and update as appropriate**

***Explanation***

Captive management techniques undergo constant development. Techniques need to be documented and continue to be updated in a NZ shore plover husbandry manual. NZ shore plover eggs taken from the wild for captive rearing have proved most successful when taken from at least 8 days of incubation. Recent captive trials with incubation of fresh eggs have also been successful, and these techniques need to be documented. By taking eggs from the wild early in incubation, donor pairs are more likely to re-nest earlier in the season, improving their chance of successfully rearing chicks.

***Priority***

Moderate

***Responsibility***

National Wildlife Centre

**OBJECTIVE 4. ESTABLISH AND MAINTAIN ADDITIONAL NZ SHORE PLOVER POPULATIONS IN THE CHATHAM ISLANDS AND OTHER PARTS OF NEW ZEALAND**

**Performance measures**

- (1) A self-sustaining population of NZ shore plover established at a minimum of one new site (other than Rangatira and Western Reef) by 2005, and at a further two sites by 2011.
- (2) Rodent Contingency Plan prepared for Portland Island by 2002.
- (3) The next priority site for release of NZ shore plover selected and a detailed site-assessment conducted at least one year prior to being required for the release programme.

***Explanation***

The establishment of at least one additional self-sustaining population of NZ shore plover in the wild should be achieved within the next five years, and

additional populations should be established in the ten-year term of this plan. The establishment of these additional populations will provide increased security to the survival of NZ shore plover and improve its conservation status.

### **Actions required**

#### **Action 4.1 Implement quarantine measures for Mangere, Motuora, and Portland Island, and any other potential sites for NZ shore plover release**

##### ***Explanation***

NZ shore plover require habitats free of mammalian predators (other than mice) and with low levels of disturbance during the breeding season. Protection from stock, which may trample nests, will also be important. Mangere is a Nature Reserve with strict quarantine measures in place. Motuora is a Recreation Reserve which has high visitor numbers, particularly over the summer. Measures are in place on Motuora to minimise the risk of rodent and other mammalian predator introductions, and visitor disturbance. Portland Island is privately owned, and, with the cooperation of the landowners, there are various measures put in place to minimise the risk of rodent introduction. Although few people visit Portland Island, it is important to encourage the implementation of quarantine measures. As other sites for NZ shore plover release are identified, an assurance that quarantine measures are in place is required.

##### ***Priority***

Essential

##### ***Responsibility***

Warkworth Area Office

Wairoa Field Centre

Chatham Island Area Office

#### **Action 4.2 Continue efforts to establish self-sustaining NZ shore plover populations on Motuora and Portland Island**

##### ***Explanation***

The establishment of NZ shore plover on Motuora has required repeated releases of captive-reared birds. Between 1994 and 2000, 75 NZ shore plover were released on Motuora. Dispersal to mainland sites has been the major cause of loss, followed by morepork predation (Davis & Aikman 1997, Aikman 1999). A sole pair has remained on Motuora and bred successfully in 1998/99 and 1999/2000 (Watson 1999, Watson 2000). While the breeding attempts on Motuora are encouraging, the removal of morepork, at least in the short term, may be needed to establish a self-sustaining population. No further releases on Motuora are planned currently. There have been three releases of captive-reared NZ shore plover on Portland Island. Fifteen birds were released in August 1998 (Fastier & Smith 1999), ten in July 1999 (Smith 2000), and thirteen birds in May 2000. There have been high retention rates on Portland from these releases, with 22 of the released birds still present in October 2000 (M. Smith pers. comm.). During the 1999/2000 season, three pairs fledged five chicks between

them (M. Smith pers. comm.). Given the very encouraging signs to date, further releases should be undertaken on Portland Island.

***Priority***

Essential

***Responsibility***

Warkworth Area Office

Wairoa Field Centre

National Wildlife Centre

**Action 4.3      Initiate transfer programme to establish NZ shore plover on Mangere, using birds from Rangatira**

***Explanation***

NZ shore plover were released on Mangere in the 1970s, but did not establish. While NZ shore plover habitat on Mangere is limited in area, the recent discovery of birds on 8 ha Western Reef suggests that the island could support a small population. The main reasons NZ shore plover have failed to establish from earlier transfer attempts are likely to be the small numbers released and the release of mainly territorial adults. A transfer proposal will be prepared giving details of the release to be conducted in 2001 and providing criteria for determining the success of the transfer and requirements for future transfers to Mangere.

***Priority***

High

***Responsibility***

Chatham Island Area Office

**Action 4.4      Develop, monitor and document NZ shore plover release techniques**

***Explanation***

Releases of NZ shore plover require careful monitoring, including measuring the survival of all released birds at set intervals, measuring dispersal and/or territorial behaviour, and developing appropriate monitoring regimes and management of resulting breeding populations. Performance measures to evaluate the success or failure of each release and to decide if further releases should be undertaken are required for each release site. The results of releases on Motuora and Portland Island will be used to determine the best release design for captive-reared birds. Release of wild-reared juveniles and possibly non-breeding adults should be trialed when establishing a third NZ shore plover population in the Chatham Islands. All sightings of NZ shore plover on the mainland or other islands will be recorded and reported to the annual meeting of the recovery group.

***Priority***

Essential

***Responsibility***

Chatham Island Area Office

Gisborne Area Office

Warkworth Area Office

**Action 4.5      **Select and conduct a detailed assessment of the next release sites for NZ shore plover****

***Explanation***

Additional release sites will be required to meet the ten-year goal of this plan. Appendix 1 provides a preliminary list of potential sites considered suitable for further assessment as release sites. New information gathered from ongoing releases will allow the refinement of site selection criteria and eradication programmes on offshore islands around New Zealand may make additional sites available. Factors to be considered when assessing new sites have been documented by Davis (1994) and Davis & Aikman (1997).

***Priority***

High

***Responsibility***

NZ Shore Plover Recovery Group

**Action 4.6      **Research interactions of NZ shore plover with aerial predators****

***Explanation***

Research is required on the impacts of avian predators on newly released NZ shore plovers, particularly the potential or actual impacts of morepork, harrier, skua, and southern black-backed gull.

***Priority***

Lower

***Responsibility***

All Conservancies with release sites

**OBJECTIVE 5.      **RECORD THE PRESENCE OF NZ SHORE PLOVER AT NEW SITES IN THE CHATHAM ISLANDS AND INVESTIGATE JUVENILE DISPERSAL FROM RANGATIRA****

**Performance measures**

- (1) All NZ shore plover sightings on Pitt Island recorded and reported annually.
- (2) Star Keys to be visited every three years to check for the presence of NZ shore plover.

(3) Record any sightings of NZ shore plover during five-yearly CI oystercatcher census.

***Explanation***

The recent discovery of NZ shore plover on Western Reef highlights the importance of checking sites in the Chatham Islands where the birds are not known to have occurred in the past. The presence of NZ shore plover at new sites needs to be recorded and followed up as soon as practicable to ensure that any newly established or undiscovered NZ shore plover population is located. An improved knowledge of juvenile dispersal patterns from Rangatira will aid understanding of the existing distribution of NZ shore plover in the Chatham Islands and will also aid understanding of dispersal from release sites.

**Action required**

**Action 5.1 Record presence of NZ shore plover on Pitt Island, Star Keys and other new sites in the Chatham Islands**

***Explanation***

Any sighting of NZ shore plover on Pitt Island will be recorded and reported to the recovery group annually. NZ shore plover have been observed in the past on Pitt Island—at North Head beach (A. Davis pers. comm.) and at Glory Bay (S. King pers. comm.). Surveys of other locations in the Chatham Islands should be undertaken as opportunities arise, and any NZ shore plover observed during the five-yearly CI oystercatcher census will be recorded.

***Priority***

Moderate

***Responsibility***

Chathams Area Office

**Action 5.2 Research juvenile survival and dispersal from Rangatira over the next three years**

***Explanation***

Research has been initiated on Rangatira into the fate of juveniles post-fledging (O'Connor 1999). Using radio-transmitters attached to juvenile shore plover, this research will provide information on movement, survival and behaviour after fledging and determine whether mortality mostly occurs on Rangatira or after dispersal. These findings will add to understanding of NZ shore plover dispersal within the Chatham Island Group and can also be applied to understanding the dispersal of released NZ shore plover from Motuora or Portland Island, or any further release sites.

***Priority***

Moderate

***Responsibility***

Chatham Island Area Office

## 10. Review date

This plan will be reviewed after ten years, or sooner if new information leads to proposals for a significant change in direction. The plan will remain operative until a reviewed plan is in place. The date that is proposed for review of this recovery plan is **July 2011**.

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# Appendix 1

## PROSPECTIVE RELEASE SITES FOR NZ SHORE PLOVER

ISLAND SITES	AREA (ha)	CONSERVANCY	PRIOR SITE MANAGEMENT REQUIRED	SOURCE OF BIRDS
Ruamahua/ Alderman Is	134	Waikato		Captive population
Auckland Is	50 000+	Southland	Main island requires cat removal. Assess impact on endemic dotterel.	Captive population
Breaksea I.	173	Southland		Captive population
Cavalli Is	380+	Northland	Kiore removal needed	Captive population
Chicken Is	155+	Northland	Morepork present	Captive population
Whenua Hou/ Codfish I.	1396	Southland	Morepork, black-backed gull, removal of latter needed	Captive population
Repanga/Cuvier Mana I.	195 217	Waikato Wellington	Morepork present Black-backed gull control. Assess carrying capacity.	Captive population Captive population
Mangere/ Chatham Is	130	Wellington	Preferably, establishment of Pitt I. breeding population.	Transfer from wild. No captive-reared birds to be reintroduced.
Mercury Group Mokohinau Is	363 75+	Waikato Auckland		Captive population Captive population
Motiti	690	Bay of Plenty	Some black-backed gulls. Pest species unknown. Rodents/cats present, removal needed. Domestic dogs present.	Captive population
Motuora	80	Auckland	Liberations in progress—birds first released in 1994.	Captive population
Pitt I.	6190	Wellington	Cat, weka eradication.	Migration or transfer from wild. No captive-reared birds to be reintroduced.
Portland I.	150	Hawkes Bay/ East Coast	Liberations in progress—birds first released in 1998.	Captive population
Solander I.	120	Southland	Weka removal.	Captive population
Tiritiri Matangi	196	Auckland	Motuora birds presently visiting but not remaining.	Motuora natural dispersal.
Whale I.	143	Bay of Plenty	Mammalian predator-free.	Captive population
Motuhope/ Star Keys	25	Wellington	Mammalian predator-free.	Transfer from wild. No captive-reared birds to be reintroduced.
Te Kakahu o Tamatea (Chalky I.)	518	Southland	Mammalian predator-free.	Captive population