

THE STATE OF
NEW ZEALAND'S BIRDS
2005

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COMPILED AND EDITED BY KERRY-JAYNE WILSON

The *State of New Zealand's Birds 2005* report presents an overview of the status of the country's birds. It seeks to identify species that are in decline and not subject to active management, and those for which there is insufficient knowledge to know their true status. This statement has been written by New Zealand ornithologists who share a concern for the wellbeing of our birds and their habitats. While we are members of the Ornithological Society of New Zealand, or Fish and Game, and some are employees of the Department of Conservation, the views we present here do not necessarily reflect those of the organisations. We hope this publication will highlight the plight of our birds and encourage NGOs and authorities to focus on solutions that address the problems identified.



Fox Glacier; forests in the area are home to Kea. Photo by Brent Stephenson

The Stitchbird (here a male), or Hihi, extinct on the New Zealand mainland since about 1885 and all but one island in the 1980s, because of habitat loss, introduced predators and perhaps disease, and survives in managed populations on two islands. Photo by Brent Stephenson.

INTRODUCTION

This report presents an overview of the current status of New Zealand's birds. It seeks to identify native species that are in decline and their main threats. Publication will coincide with the 3rd Australasian Ornithological Conference, held in Blenheim in December 2005. While this is an opportune time to focus on the nation's birds, 2005 is not the ideal time to produce such a report. The Ornithological Society of New Zealand (OSNZ) finished fieldwork for their second bird atlas in late 2004 and publication is scheduled for 2006. For many species this will be the first robust evidence we have for changes in distribution since the first bird atlas project 25 years previously. The Society, along with government agencies, is currently setting up monitoring programs for terrestrial birds. A revised *State of New Zealand's Birds* should be produced in 2008.

The Department of Conservation (DOC), and its predecessor the Wildlife Service, have been successful at saving species from the brink of extinction, and most endangered species are currently being managed. For most managed species declines have been halted or reversed. When it comes to bird conservation DOC's focus is likely to remain on critically endangered species. We hope this report will identify those threatened species for which additional conservation action is required and those species which are or may be in decline but not yet sufficiently rare to have become a DOC priority. We trust it will provide OSNZ, conservation NGOs, regional councils and universities with direction, so that they can supplement the good work undertaken by DOC.

The New Zealand avifauna shows a high level of endemism and an alarmingly high proportion of the extant species are under threat of extinction (see table). New Zealand's endemic birds evolved in the absence of terrestrial mammals (three species of bats are the only native, non-marine mammals) and the major threats faced by birds are a direct result of the introduction of 33 species of terrestrial mammals.

BY KERRY-JAYNE WILSON, *Bio-Protection & Ecology Division, Lincoln University, Canterbury*

The status of native birds that breed in the New Zealand region

	Non-marine birds (137 species)	Seabirds (85 species)	Total (222 species)
Endemic to New Zealand	120 (87%)	38 (44%)	158 (71%)
Extinct	53 (39%)	5 (6%)	58 (26%)
Threatened or endangered	23 (17%)	20 (23%)	43 (19%)

Source: Wilson (2004)

THE KEY FINDINGS

- Predation by introduced mammals is the single most serious threat to New Zealand birds.
- Many species survive only on predator-free islands and these populations are constantly at risk from invasion of their island sanctuaries by introduced predators.
- The eradication of introduced mammals, in particular rats from islands, is vital.
- Habitat loss, in particular the loss of lowland forests and wetlands, has dramatically reduced the range occupied by most native species, but further loss is not a critical threat to extant species.
- Habitat degradation by rodents and browsing mammals threatens some herbivorous birds, but predation appears to be a more serious threat. More research is needed to quantify the relative roles of predation and competition in the decline of these species.
- The number of seabirds that are under threat is increasing. Fisheries bycatch is a serious threat to most New Zealand breeding albatrosses and some petrels. Mitigation measures are being developed.
- Reliable estimates of population size have been made for very few seabird species.
- With the loss of virtually all the once huge mainland petrel colonies, over-crowding on small islands and stacks is apparent, and burrow competition may be contributing to declines in some species. There has been no research to document this.
- On the mainland, conservation of many species depends on the annual use of poisons and, while these strategies are successful there is increasing resistance to their continued use. There is an urgent need to develop more acceptable strategies for mammalian predator control.
- Fences that can exclude all introduced mammals, including rodents, have been developed. While the capital cost is high, they allow the partial restoration of mainland ecosystems, including the return to the mainland of bird species that survive only on offshore islands.
- Declines have been reversed for most endangered species that are being managed.

Birds to watch

The species in greatest need of further management include the Chatham Shag, Pitt Island Shag, Blue Duck, Weka, New Zealand Dotterel, Orange-fronted Parakeet, Mohua, Hiihi (Stitchbird), Rock Wren and Stewart Island Fernbird. On the mainland, many species including most parrots and kiwi, Wrybill, Black-fronted Tern and robins are probably declining in range and abundance, but there are insufficient data to verify this.



Above: The dainty, flightless Rock Wren inhabits alpine and subalpine rockfalls and crevices, and is in need of increased management to ensure its survival. Photo by Brent Stephenson

Below left: Tui, also known as the Parson Bird: rare but increasing in numbers and range. Photo by Brent Stephenson

The Bird Distribution Atlas, 1999–2004

New Zealand's first bird distribution atlas was undertaken between 1969 and 1979. The data collection for a new atlas was completed in late 2004. About 97% of the 10 km (10,000 yard) in the earlier atlas) grid squares were visited for both atlases, with only very remote mountainous areas not covered. There were 31,800 data sheets (up from 18,500 in the previous atlas) returned by just over 1000 contributors. The mean number of species recorded per square was 35.

The computer database is complete and rigorous checking of records will be finalised early in 2006. Publication of the atlas in book form is scheduled for late 2006. An abbreviated web-based version will be available early 2007.

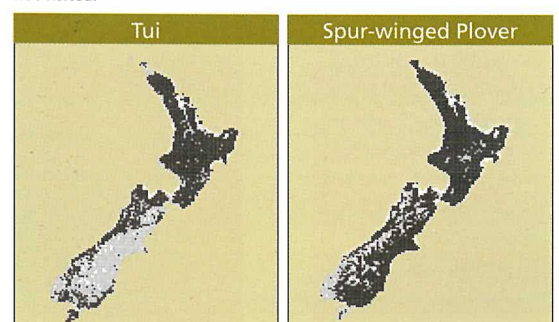
There have been some significant changes in the distribution of some species. Two common species illustrate the shifting geographic use of the country. The endemic Tui, widely distributed in the central and eastern

North Island (see map at right), was once less widespread.

The Spur-winged Plover, first recorded in Southland in 1932, has continued its spread, reaching most of the North Island during the past 30 years (see map at right).

BY C.J.R. ROBERTSON,
P.O. Box 12397, Wellington

Distribution of the Tui and Spur-winged Plover 1999–2004. Black squares indicate where the species were recorded; grey squares were visited but the species were not recorded; white squares were not visited.





The Kokako—a highly endangered endemic New Zealand wattlebird, which eats leaves, fern-fronds, flowers, fruit and invertebrates—is threatened by predation at the nest.
Photo by Brent Stephenson

The long-legged South Island Robin spends much of its time hopping over the forest floor in search of invertebrates, making it vulnerable to mammalian predators.
Photo by Brent Stephenson



ENDEMIC FOREST BIRDS

Although New Zealand has relatively few native forest birds, they are the most distinctive and one of the most threatened elements of the avifauna. Most forest species are endemic, many belonging to orders or families that are endemic to New Zealand. A high proportion is threatened or extinct (see table below).

Species such as the Saddlebacks, Hihi (Stitchbird), and Red-crowned Parakeet, have gone from the mainland and survive only on small offshore islands. Although confined to a minute proportion of their natural ranges, these species are secure providing predatory mammals do not reach their island refuges. The Little Spotted Kiwi and Kakapo are true island refugees as neither occurs naturally on any of the islands they inhabit today. Of those species that are confined to island sanctuaries, the species of greatest concern are Hihi and Kakapo. With a global population of just over 80 birds the Kakapo is subject to intensive and ongoing management. Its biology makes it a most difficult species to save, but thanks to interventionist management numbers are slowly increasing. The Hihi has only two secure populations despite repeated attempts to translocate birds to new islands. Supplementary feeding and the provision of nest boxes have proven necessary to allow Hihi to establish on new islands.

A few species with few or no island refuges must be managed on the mainland in the face of the threats that have made them rare. A predator control strategy that allows Kokako to breed successfully has been devised, but control is expensive and so far few populations are

managed. Most Kokako populations are in small disjunct habitats. Research shows that with North Island Brown Kiwi eggs, juveniles and adults are each vulnerable to different predators. The most effective way to assist populations to recover is to increase juvenile survival through Stoat control, or by holding juveniles in predator-free locations for their first three months after hatching. Computer simulations suggest that predator control has to extend over 11,000 ha to accommodate juvenile dispersal, or the juveniles must be fenced in to prevent dispersal into untreated areas. Dogs are a serious threat to adults of all kiwi species.

Of those forest birds with no safe island populations the most seriously endangered are the Rowi (Okarito Kiwi), the genetically distinctive Haast Kiwi and the Orange-fronted Parakeet (each with 100–250 individuals), and the Mohua (2000–3000). These are subject to multiple threats and despite management their survival remains tenuous. All mainland parrots are probably in decline but only the most critically endangered benefit from management.

Habitat degradation and competition for food from herbivorous mammals no doubt compounds the threat mammals pose to plant-eating birds such as Kokako and Kereru. However, even for these species, predation of eggs, chicks and incubating females appears to be the most immediate threat. Ship Rats and Brush-tailed Possums are the two most serious nest predators.

The 'mainland islands' are islands of intensely managed forest in a sea of unmanaged habitat. Their purpose is to conserve rare species and restore indigenous ecosystems. Management of rare species on the mainland is expensive and requires annual application of huge quantities of poisons or intensive trapping (or both). While this is of proven benefit to most native species (not just birds) there is vocal opposition to toxin use both within New Zealand and abroad. Predator fences offer an alternative approach. The first fence that excluded all introduced mammals was erected in 1999, enclosing a 250 ha sanctuary in Wellington city. Under construction is a 45 km fence that will encircle 3,400 ha of native forest on Maungatautari Mountain in the Waikato.

BY KERRY-JAYNE WILSON, *Bio-Protection & Ecology Division, Lincoln University, Canterbury*

The status of landbirds that belong to sub-families, families or orders endemic to New Zealand

	Total species	Extinct	Threatened or endangered
Dinornithiformes (Moa)	11	11	–
Apterygiformes (Kiwi)	5	1	4
Aptornithidae (Aptornis)	2	2	–
Strigopinae (Kakapo)	1	0	1
Nessorinae (Kea and Kaka)	3	1	2
Acanthisittidae (New Zealand wrens)	6	4	1
Turnagridae (Piopio)	2	2	–
Mohouinae (Mohua etc)	3	0	1
Callaeatidae (New Zealand wattlebirds)	5	2	3

Source: Wilson (2004)

Brown Teal (Pateke)

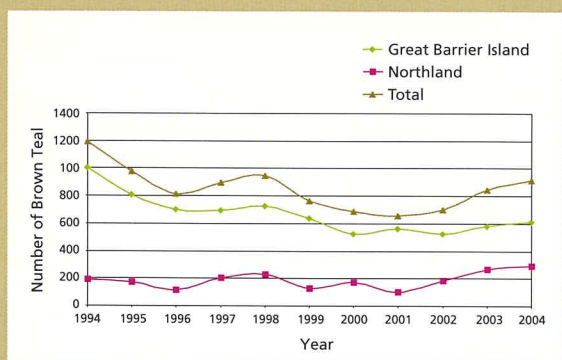
Before mammalian predators and Mallards were introduced, and large-scale clearance of wetlands took place, the endemic Pateke were probably common throughout New Zealand. By the 1990s, fewer than 1000 individuals remained and recovery measures begun in the 1980s did not succeed. In 2000, the Pateke Recovery Program was reviewed, and extensive changes made including:

- A program to establish new breeding populations
- Identifying and specifically targeting predation as the primary cause of decline
- Integration of predator control, captive management, public awareness, and releases at key sites.

Since 2000 numbers at managed sites in Northland and Great Barrier Island have shown a consistent increase (see graph below).

BY JASON ROXBURGH, *Department of Conservation, Thames*

Population trends in Pateke on Great Barrier Island (GBI) and Northland prior to and since changes in management were implemented in 2000.



Blue Duck (Whio). Photo by Brent Stephenson

Blue Duck

Blue Ducks are of increasing concern; many former robust populations appear now to contain a disproportionate number of males or have disappeared entirely. South Island populations have declined more extensively than many in the North Island, and the problem appears most acute in rivers with catchments dominated by beech. Video-monitoring of nests has shown Stoat predation of females and eggs, disturbance by possums and visitations by rats. Whereas 15 years ago, a national population of 2400–4000 was trumpeted, today the breeding population is unlikely to exceed 600 pairs. A recent audit of DOC's Blue Duck Recovery Program has recommended:

- That further management be confined to three South Island and two North Island localities each of which have 40–50 pairs
- That no expansion of conservation effort beyond these sites take place until effective predator control is possible.

Since Blue Duck pairs forage over 0.7–1 km of river, predator control sufficient to protect 50 pairs presents a daunting task.

BY MURRAY WILLIAMS, *Research, Development & Improvement Division, Department of Conservation, Wellington.*

WATERFOWL

There are 14 extant species of Anatidae in New Zealand—four endemic, four native, and six introduced—of which six can be legally harvested. Population trends for the hunted species are monitored annually by Fish and Game Councils.

The introduced Mallard is now the most common and heavily harvested waterfowl. Since its introduction the population has increased exponentially, replacing the Grey Duck as the primary species in the hunter's bag. As Mallards increased there was an insidious decline in the native Grey Duck that can be attributed to a number of factors, but of greatest concern is interbreeding with Mallards. Post-breeding counts of Australasian Shovelers indicate a small decline over the last five years.

The endemic Paradise Shelduck is common and Fish and Game counts indicate that nationally the population appears stable. This is one of few native birds to benefit from the change from a forest dominated to a pastoral landscape. The Black Swan was hunted to extinction by Maori, reintroduced in 1863, and numbers have increased

since, except for a major setback in the 1960s when a storm decimated the population. Resightings of marked birds suggest about nine sub-populations and there is no evidence of any change nationally.

Introduced as a game bird, the Canada Goose has increased to pest proportions in some regions, particularly in the South Island. The South Island population is subject to a Canada Goose management plan, with input from Fish and Game, Federated Farmers and hunters. An estimated 15,771 were shot by hunters in 2004. Additional birds are shot each year as part of a Fish and Game cull.

The Grey Teal is a common native species, hunted in Australia but fully protected in New Zealand. The population status is not clear but it appears to have proliferated since an influx in 1957 following drought in Australia. Lastly, the endemic New Zealand Scaup is fully protected with an estimated population of 20,000.

BY MATTHEW McDUGALL, *Fish and Game NZ, Eastern Region, Private Bag 3010, Rotorua*

Signs near Okarito warn drivers to take care because of the presence of the nocturnally active Brown Kiwi (Rowi), rarest of the kiwis. Photo by Brent Stephenson

Predator fences to exclude introduced mammalian predators—Stoats, Brush-tailed Possums and Black Rats—are an effective but expensive approach to the protection of birds such as kiwis, Kokako and Kereru (a fruit-pigeon). Photo by Kerry-Jayne Wilson



Right: Chatham Island Oystercatcher.
Photo by Kerry-Jayne Wilson

Below: A Wrybill at its nest among the pebbles of a braided river. Photo by John Dowding



ENDEMIC SHOREBIRDS

The main threat to most New Zealand breeding shorebirds is predation by introduced mammals, which either reduces breeding success and/or survival, or restricts some taxa to predator-free islands. On the mainland, coastal development and increasing recreational use of beaches degrades habitats used by some species.

Sixteen species of shorebirds breed in New Zealand and 13 species (comprising 15 discrete taxa) are endemic. Thirteen of the 15 endemic taxa are threatened (see table below). New Zealand has five of the world's rarest shorebird taxa, all with effective populations of fewer than 200 individuals.

The certain extinction of the southern subspecies of New Zealand Dotterel has been averted by cat and rat control around breeding areas on Stewart Island. The population has increased, but predator control must be ongoing. The northern subspecies has also responded to recent management with an overall increase in population during the past 15 years, although declines in range continue.

Seven taxa are largely or entirely confined to outlying island groups, three of them to

the Chatham Islands. The Chatham Island Oystercatcher has responded rapidly to predator control and the population has doubled from an estimated 142 in 1998 to 278 in 2004.

The Shore Plover was once widespread on the New Zealand mainland, but for a century it survived only on predator-free islands in the Chatham group. In the Chathams, numbers are stable on Rangatira Island (c. 45 pairs) and Mangere Island (4–5 pairs). The small but genetically distinct population discovered on Western Reef in 1999 declined rapidly, and the last bird was taken into captivity in 2003. A population of about 80 birds has been established from captive-bred stock on a small island off North Island. Further translocations are planned.

Distinct taxa of snipe are endemic to most of the outlying island groups. The Chatham, Auckland, Snares and Antipodes Island Snipe are all confined to islands that remain largely free of introduced predators. These populations are all believed to be stable. The Campbell Island Snipe probably numbers fewer than 50 birds, but has re-colonised the

main Campbell Island since the eradication of rats and cats.

BY JOHN DOWDING, *ecological consultant*,
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Red Knots. Photo by Brent Stephenson



Threat categories, population estimates and population trends of endemic shorebirds in New Zealand

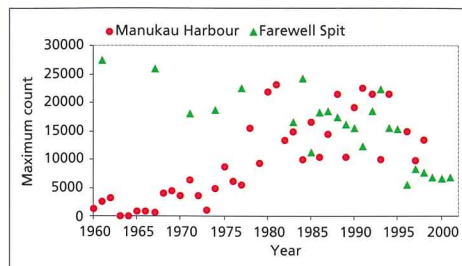
Species / subspecies	Threat categories		Estimated population	Population trend / management
	IUCN	Molloy et al. 2002		
New Zealand Pied Oystercatcher			130,000	Increasing, no management
Variable Oystercatcher			4,500	Increasing, small part of population benefits from management of other taxa
Chatham Island Oystercatcher	EN	Nationally Critical	280	Increasing in response to intensive management (mainly predator control)
Black Stilt	CR	Nationally Critical	15 pairs	Slow increase, wild population still very small, continuing intensive management
New Zealand Dotterel	EN			
– Southern New Zealand Dotterel		Nationally Critical	250	Increasing in response to intensive management (mainly predator control)
– Northern New Zealand Dotterel		Nationally Vulnerable	1,700	Increasing overall, particularly where managed; declining in some areas
Banded Dotterel				
– Banded Dotterel		Gradual Decline	<50,000	Declining slowly, very small fraction of population managed
– Auckland Island Banded Dotterel		Range Restricted	730	Possibly increasing, no management
Shore Plover	EN	Nationally Critical	70 pairs	Increasing following captive-breeding, translocations and intensive management
Wrybill	VU	Nationally Vulnerable	2,000 pairs	Probably declining slowly, range contracting; small fraction of population managed
Auckland Island Snipe		Range Restricted	20,000	Apparently stable, no management
Snares Island Snipe		Range Restricted	400 pairs	Apparently stable, recent translocation to island near Stewart Island
Antipodes Island Snipe		Range Restricted	8,000	Apparently stable, no management
Campbell Island Snipe		Nationally Critical	<50	Should increase following re-colonisation of Campbell Island
Chatham Island Snipe	VU	Range Restricted	1000 pairs	Apparently stable, no management

MIGRATORY WADERS

New Zealand hosts internationally important numbers of Red Knot, Bar-tailed Godwit and Turnstone during their non-breeding season. While pressure on tidal flats through reclamation has generally been small, the habitats of migrant waders are affected by both man-made and 'natural' pressures. Residential subdivision is causing increased disturbance in many areas, while intensification of dairy farming and associated nutrient runoff may be affecting intertidal sediments and food supplies at key sites such as Golden Bay. Legal and illegal stopbank construction continues to encroach onto tidal flats. Mangrove growth in northern New Zealand is dramatically changing the coastline and roost site potential at sites such as the Firth of Thames. The effect of this on nutrient cycling and feeding habitat is unknown. Aquaculture and shellfish harvesting, particularly oyster farms and cockle harvesting can have local impacts. Large-scale mussel farming could potentially affect food-web dynamics near the Firth of Thames. Global warming could change weather patterns and wind assistance for migrating birds while sea level rise would reduce tidal flat area.

The stability (or otherwise) of populations of Northern Hemisphere waders in New Zealand is not well documented. Some local changes are known. Knots have declined on Farewell Spit, Northwest Nelson, over the past 30 years (see graph below), while numbers have increased on the Manukau Harbour. The timing of these changes indicates that birds have not simply redistributed themselves—the steep decline in numbers at Farewell Spit since 1985 occurred when Manukau numbers were stable. The change in numbers on Farewell Spit is not mirrored at other sites or on the flyway. In contrast, Godwit numbers on Farewell Spit have remained stable, suggesting changes in particular prey items important to Knots may have occurred. A recently completed survey of benthic invertebrates at Farewell Spit allows the establishment of a long-term monitoring program of both migratory shorebirds and their foods. Renewed emphasis on population monitoring means that by 2010 the status of migratory waders in New Zealand should be better documented.

BY PHIL BATTLE, *Department of Mathematics and Statistics, University of Otago, P.O. Box 56, Dunedin*, AND DAVID MELVILLE, *Dovedale, RD2, Wakefield, Nelson*.



The numbers of winter visiting Red Knot at Farewell Spit (green triangles) and Manukau Harbour (red circles) from 1960 to 2001.

Source: Phil Battle and David Melville

Charadriiformes of the braided rivers

The braided rivers of the eastern South Island have wide expanses of gravel with multiple channels that form a unique, constantly changing habitat, with a specifically adapted biota. The ground-nesting river birds face multiple threats including predation by introduced mammals, loss of breeding habitat through weed encroachment and loss of feeding and breeding habitat through water and gravel abstraction. Recreational activities including 4WD vehicles, jet-boaters, picnickers and anglers also disturb breeding birds.

Four endemic species Wrybill, Black Stilt, Black-billed Gull and Black-fronted Tern are largely reliant on braided river habitats, and are probably in decline. The Black Stilt is the only braided river specialist that is extensively managed (see box 'Black Stilt recovery effort').

Although dispersed and cryptic during the breeding season, counts of over-wintering Wrybill flocks make this one of the easier braided river endemics to monitor trends. The current population is approximately 5,000. The breeding range continues to contract, with the majority of the population now confined to four large South Island catchments. Stoats are one of the major predators of Wrybill adults.

Black-fronted Tern survival rates appear to be low, and population modelling indicates that in the absence of management a steady decline is inevitable. Predation across all life stages is the main contributor to poor survival. There has been no



One of New Zealand's ever changing braided rivers, eastern central South Island.

Photo by Brent Stephenson

comprehensive population survey, trends are unclear but estimates put the population at under 10,000.

Survival rates are less well understood for Black-billed Gulls. Recent counts in Southland and the Mackenzie Basin indicate serious declines and, as with other braided river birds, predators are probably the main threat.

Over the past 30 years, predator control has been the major management tool but its effectiveness has varied. Until adequate predator control techniques are developed, braided river species will continue to decline. Declines may be exacerbated by proposals for further irrigation and hydro-electricity schemes.

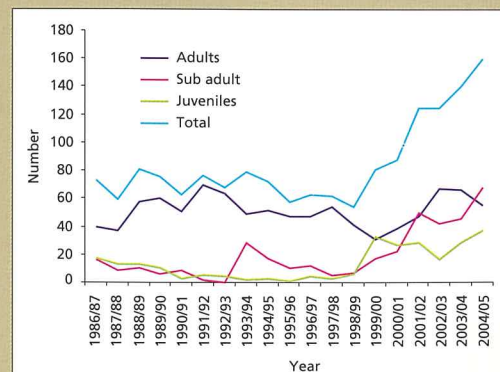
BY RACHEL KEEDWELL, *ecological consultant, P.O. Box 5539, Palmerston North*



Black Stilt (Kaki) recovery effort
Intensive management and captive breeding of the endangered Black Stilt has resulted in an increase in the overall population. From a low of 23 birds in 1981 when intensive management began, the population increased to 55 wild and 21 captive adults in 2005. Despite management there were still only 15 known breeding pairs in the wild in 2003/04. The population recovery is primarily due to captive rearing, with up to 60 juveniles being released annually. Double and triple-clutching of wild and captive pairs is used to maximize production. High mortality of wild adults continues. Despite this apparent increase in population size, the species' survival will remain dependent on captive breeding until predator-free breeding habitat can be maintained.

BY RACHEL KEEDWELL, *ecological consultant, P.O. Box 5539, Palmerston North*

Above: Flocks of over-wintering Wrybills (foreground) and Black Stilts (back left) make census possible; both species are suffering declines largely because of loss and disturbance of breeding grounds and predation by introduced mammals. Photo by Brent Stephenson



The number of wild Black Stilts.

Source: Richard Maaloney, Department of Conservation, Twizel



SEABIRDS

New Zealand is the global centre of seabird diversity. At present 85 species (95 taxa) are known to breed in the region. New Zealand has a high diversity of albatrosses (14 species), other *Procellariiformes* (34 species), shags or cormorants (12 species), and terns and noddies (10 species). Thirty-five species (including 49 taxa) are endemic.

There are many threats to seabirds, perhaps the most important being introduced mammals—with rats, cats, feral pigs and mustelids being the major species of concern. Roaming dogs also cause problems, especially to penguins. The Weka, an endemic rail, has been introduced to some offshore islands where it has contributed to declines in some seabird populations. Fisheries interactions pose other major threats, with surface and demersal long-lining, trawling and set-nets all causing seabird mortality. Gibson's Albatross and Campbell Albatross have declined in parallel with observed peaks in fishing activities. On land, human disturbance and coastal development have resulted in localised loss of suitable breeding habitats for seabirds. Disease

in seabirds is little studied but mortality events in penguins have been linked to avian diseases including avian cholera, pox and malaria. Recently, an outbreak of diphtheritic stomatitis was observed in Yellow-eyed Penguins.

Changes in the ocean environment may be altering food chains or access to food stocks for some seabirds. The decline of some sub-Antarctic breeding crested penguins appears linked to oceanographic changes. Man-made pollutants don't appear to affect birds within the New Zealand region, but species that migrate to distant oceans may be at risk during the non-breeding parts of their annual cycle.

How have New Zealand seabirds fared in the past decade? Fourteen taxa are in decline, nine taxa appear to be stable or increasing thanks to management, 42 taxa are stable or probably stable and 15 are known to be increasing (see table below). The population trends in 15 taxa are unknown.

Many of the species with stable populations are small petrels that nest on offshore islands and their populations should be secure so long as introduced predators do not reach those islands. Several seabird species have increased. The best

known of these are Australasian Gannets and Southern Buller's Mollymawk. A change in food availability seems to be the key factor even though many Buller's Mollymawks are taken as fisheries bycatch.

Of concern is that much of the data on seabird colony distribution and abundance is based on surveys made over 20 years ago. Reliable population estimates have only been made for gannets and some mollymawks and albatrosses, and for some of the very rarest species such as the New Zealand Fairy Tern and Chatham Island Taiko. Repeat counts that allow population trends to be determined are available for very few species. Accurate information on the basic biology and demography for most species is lacking.

Nonetheless, in the past decade, New Zealanders have undertaken some important projects that benefit seabirds. The most significant breakthrough has been the development of techniques that enable the eradication of introduced mammals from large islands. Aerial delivery of poison bait has safe-guarded the breeding habitats of numerous seabird populations including: Pycroft's Petrel in the Mercury Islands; Cook's Petrel and South Georgian Diving-Petrel on Codfish Island; and Kermadec Petrel and White Noddy on Raoul Island.

The development and subsequent refining of translocation techniques has led to the establishment of a new colony of Common Diving-Petrels and the seeding of new colonies of Chatham Petrel and Pycroft's Petrel. The New Zealand Fairy Tern is perhaps our rarest seabird (30–40 individuals), but numbers are increasing thanks to protection by wardens.

Research programs have helped to improve our knowledge of the biology and demography of several species. For example, an assessment of harvesting impacts by muttonbirders on the Sooty Shearwater found that the population is in decline, but that decline is most likely due to bycatch during the birds annual migration to the North Pacific. Nevertheless, at least a third of New Zealand's seabird species have received little or no research attention in the past decade and there is still a need to carry out some very basic monitoring to assess the distribution, numbers and population trends of seabirds at most breeding sites.

BY GRAEME TAYLOR, *Department of Conservation, P.O. Box 10420, Wellington*

Population status of New Zealand seabirds in 2005

Trend	Number of breeding taxa (Total = 95)	Examples	Reasons for population change
A. Population in decline	14	Grey-headed Mollymawk; Sooty Shearwater; Rockhopper Penguin; Erect-crested Penguin; White-flipped Penguin; Chatham Shag; Brown Skua; White-fronted Tern	<ul style="list-style-type: none"> • Changes in oceanography • Fisheries interactions • Predation by mammalian predators • Habitat loss • Human disturbance and exploitation
B. Population stable or starting to increase due to intensive management	9	NZ Fairy Tern; Chatham Island Taiko; Chatham Petrel; Cook's Petrel; Pycroft's Petrel; Yellow-eyed Penguin; Sooty Tern	<ul style="list-style-type: none"> • Island pest eradications • On-going pest management • Nest manipulations and protection • Habitat protection and restoration
C. Population probably stable	42	Salvin's Mollymawk; White-faced Storm-Petrel; Fairy Prion; Chatham Mollymawk; Hutton's Shearwater; Antarctic Tern; Red-tailed Tropicbird; Grey Ternlet	<ul style="list-style-type: none"> • Breed on offshore islands free from introduced predators • Management of breeding habitat • Reduced human disturbance
D. Population increasing without management	15	Australasian Gannet; Southern Buller's Mollymawk; Southern Royal Albatross; Black-winged Petrel; Soft-plumaged Petrel; Spotted Shag; Brown Noddy	<ul style="list-style-type: none"> • Changes in food supply • Recovery from past human disturbance
E. Population trends unknown	15	Campbell Island Shag; Light-mantled Sooty Albatross; Flesh-footed Shearwater; Grey Petrel; White-chinned Petrel; Fiordland Crested Penguin; Red-billed Gull	(No monitoring of populations)

Far left: The declining Campbell Albatross, threatened by long-line fishing. Photo by Brent Stephenson

Left: The Weka, an endemic rail that is extinct in its natural range; where it has been introduced to off-shore islands it has become a threat to seabirds, eating their eggs and nestlings. Photo by Brent Stephenson

BIRDS OF THE CHATHAM ISLANDS: AN ENDANGERED AVIFAUNA

The Chatham Archipelago, 800 km east of mainland New Zealand, comprises two large inhabited islands (90,000 ha and 6,300 ha) and a number of smaller outliers, the largest being 218 ha. The smaller islands are now free of introduced predators. The larger islands are farmed and support a suite of introduced predators, including the Buff Weka, a sub-species endemic to eastern South Island. Extinct in its native range, the Weka poses a threat to several Chatham endemics.

Nearly half of the 61 species native to the Chatham Islands are endemic (see table below right). The only secure endemic species are the Warbler and Snipe, and they are classified as range restricted.

Most critically endangered species are managed with at least some success. The Chatham Taiko is perhaps the rarest of all petrels and one of New Zealand's most endangered birds. It has been intensively managed ever since its breeding grounds were discovered in 1987, yet only 8–10 pairs are known to nest each year. Recovery of this species is especially challenging as it survives only in a remote densely forested corner of the main island that harbours all the introduced predators. This remnant is also the stronghold of the endangered Parea (fruit-pigeon) which has benefited from predator control aimed at protecting Taiko.

Of most pressing current concern are the two species of endemic shag. Since 1997 numbers

have declined significantly, perhaps by 60% for the Chatham Island Shag. Virtually nothing is known of the biology or threats faced by either.

As long as no mammalian predators reach their island sanctuaries other rare species—including the Chatham Snipe, Tomtit and Tui—are under no immediate threat. Quarantine procedures are in place to prevent this.

While introduced predators are the primary threat to most Chatham endemics, hybridisation with the Red-crowned Parakeet is the main threat to the endangered Forbes Parakeet. Loss of forest habitat has probably given the Red-crowned Parakeet a competitive edge.

The recovery of the Black Robin is one of New Zealand's most celebrated conservation successes. Of the five birds remaining in 1980, only one female was reproductively active. Ten years of intensive management raised the population to 99, at which point active intervention ceased. Numbers continued to increase and by 1998 there were 200 spread between two predator-free islands. Recent observations suggest a possible decline in the larger of the two populations. Attempts to establish a third population within a predator-fenced remnant on neighbouring Pitt Island have met with little success.

BY KERRY-JAYNE WILSON, *Bio-Protection & Ecology Division, Lincoln University, Canterbury*



Below left: Brought back from the brink: before 1871 the Black Robin are thought to have ranged throughout the Chatham Islands; 25 years ago one reproductively active female remained. Initially by multiple-clutching and cross-fostering eggs, the population has been rebuilt to over 200 wild birds on South East Island and Mangere, both free of mammalian predators. Photo by Kerry-Jayne Wilson

Above: The Pitt Island Shag, one of two shags endemic to the Chatham's that have declined for unknown reasons. Photo by Kerry-Jayne Wilson



Chatham Petrel

In 1996 the Chatham Petrel appeared doomed—it was confined to a single island and chicks fledged from fewer than 40% of breeding attempts. The major threat was competition for burrows with the locally abundant, native Broad-billed Prion. Locating petrel nests among the estimated 1.3 million burrows on the island was the first challenge. Initially, prions found in petrel burrows were culled, but the development of a simple, cheap burrow flap—a behavioural barrier that deters prions from entering petrel burrows—has raised breeding success to >70%. During the last four years 200 Chatham Petrel chicks have been relocated to a predator secure site on Pitt Island.

BY KERRY-JAYNE WILSON, *Bio-Protection & Ecology Division, Lincoln University, Canterbury*



Chatham Petrel. Photo by Kerry-Jayne Wilson

The status of the native birds of the Chatham Islands

	Endemic species	Endemic sub-species	Native species that also occur in NZ	Total species
Secure	2	4	25	26 (43%)
Threatened	1	1	4	6 (10%)
Endangered	9	2	1	10 (16%)
Extinct	13	0	6	19 (31%)
Total	25	7	36	61

THE SUB-ANTARCTIC ISLANDS

New Zealand's sub-Antarctic islands include five different archipelagos spread over approximately 450 km² of the Southern Ocean, and range in size from the 140 ha Bounty Group to 55,000 ha for the Auckland Islands.

The recent eradication of Norway Rats, the last of the introduced mammals from Campbell Island, has allowed the reintroduction of the flightless Campbell Teal using captive-bred birds. Campbell Pipit and Campbell Island Snipe have both naturally recolonised the main island. The latter species was only discovered in 1997 and, like the teal, survived on a single islet a kilometre from the main island. It is hoped that storm-petrels, diving-petrels and prions, that have survived on outlying islets, will also recolonise the main island. Proposals to trial introductions to Campbell Island of species endemic to mainland New Zealand, such as Takahe and Kakapo, remain contentious.

Introduced animals have also significantly affected the Auckland Islands. Rabbits and cattle have been removed from 600 ha Enderby Island, and goats from the main island, but pigs, cats and mice remain on the main island. The habitat changes on Enderby caused the local extinction of South Georgian Diving-Petrels and temporary loss or declines in population of other species, including Auckland Island Rail (rediscovered on Adams Island in 1990), Auckland Island Snipe and various small seabirds. Snipe and some of the seabirds are now recolonising Enderby Island, while other species such as Auckland Island Teal have increased in abundance. On the main island pigs and cats prevent recolonisation by most ground-dwelling species, and pigs in particular threaten the remaining mainland White-capped Mollmawk colony.

Whereas the bare granite stacks that comprise the Bounty Islands have no terrestrial birds, the Snares support three, and Antipodes four, endemic land birds.

The sub-Antarctic islands are best known for their seabirds, with nine species of albatross and mollmawk and 16 species of burrow-breeding petrel. Several of these, including Grey and White-chinned Petrels and Salvin's and White-capped Mollmawks, are significant components of long-line fisheries

bycatch, both in New Zealand waters and elsewhere. For most species, the effect bycatch has on New Zealand populations is unknown, but current and proposed research should help quantify the impact.

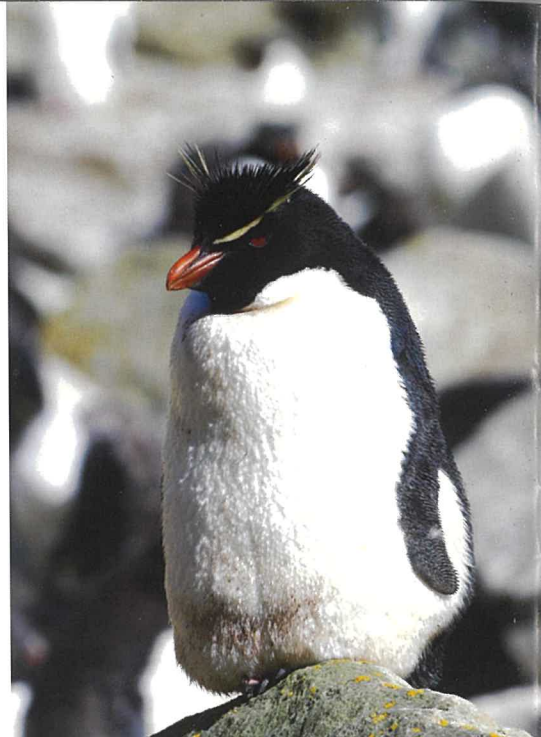
Unpublished data suggest that Southern Royal Albatrosses have increased overall during the 20th century. On Campbell Island, both Campbell and Grey-headed Mollmawks have declined significantly since the 1940s. The endemic Campbell Mollmawk declined by about 40% between the mid 1970s and mid 1980s, followed by a slow recovery. In contrast the Grey-headed Mollmawks that nest nearby appear to have been in long term decline from the 1940s to the 1990s, dropping by over 80%.

A 2004 count of Salvin's Mollmawks on one of the Bounty Islands was 13% lower than the same count in 1997, although this may be due to breeding failures as Fur Seals encroach onto the colony, rather than a reduction in the breeding population. Both Antipodes and Gibson's Wandering Albatrosses appeared to decline significantly (50–60%) through the late 1970s and 1980s. Antipodes Albatrosses are now increasing at about 3% per annum. Little recent change is evident for Gibson's Albatross. More work is proposed for Salvin's and White-capped Mollmawks, the two species believed to be at greatest risk.

Of the four species of sub-Antarctic-breeding penguins, at least two, Rockhopper and Erect-crested, are in serious decline—Rockhopper numbers on Campbell Island declined from over one million birds in the 1940s to around 90,000 today. This is believed to be due to increased water temperatures pushing prey species further south. While solid data are lacking for other sites, the decrease in colony size at other islands gives serious concern. On Campbell Island, Yellow-eyed Penguins declined between 1987 and 1994 but numbers have since shown some recovery. The status of the major Yellow-eyed Penguin population on the Auckland Islands is currently unknown but a survey is planned. Only the Snares Crested Penguin is not currently at risk, with the population being stable or possibly increasing slightly.

BY PETER MCCLELLAND, *Southland Conservancy, Department of Conservation, Invercargill*

Eradication of rats allowed the nocturnally active, flightless Campbell Teal, which feeds on kelp, to be reintroduced to Campbell Island. Photo by Kerry-Jayne Wilson



The western subspecies of The Rockhopper Penguin—a vagrant to New Zealand, where numbers of the local subspecies are plummeting. Rising ocean temperatures are thought to be driving prey species further south, away from the penguin's breeding islands. Photo by Brent Stephenson

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Salvin's Mollymawks, Western Chain, Snares Islands. Photo by P.M. and J.L. Sagar



Antarctic Tern, North East Island, Snares Islands. Photo by P.M. and J.L. Sagar

Back cover: Snares Fernbird, Snares Islands. Photo by P.M. and J.L. Sagar

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