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Keywords willie wagtail; *Rhipidura leucophrys*; Chatham Islands; first record

Abstracts of papers presented at the Ornithological Society of New Zealand, Inc., AGM and Conference, 1 June 2002, Hokitika, New Zealand

Westland birds symposium

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West of the South Island's Main Divide are the largest remaining tracts of native forest in New Zealand and some of the most extensive areas of temperate rainforest anywhere. These forests are now the stronghold for several endemic birds. Recently there has been controversy over plans by Timberlands West Coast Ltd to mill large parts of these forests and increasing opposition to the use of the poison 1080 (Sodium monofluoroacetate) to protect the endemic species that live there. These controversies have highlighted the need for information on West Coast birds. The Ornithological Society of New Zealand AGM and Conference held in Hokitika on 1 June 2002 was an opportune time to convene a symposium on Westland birds. The purpose of the symposium was to review our knowledge of Westland birds, to highlight current research and conservation, and to identify where further work is needed.

The symposium began with 4 presentations by Department of Conservation staff detailing current efforts to save 4 threatened or endangered bird taxa, 3 of which are endemic to Westland. The fourth, Fiordland crested penguin (*Eudyptes pachyrhynchus*) also occurs in Fiordland and Stewart Island. The efforts underway to save the 2 kiwi taxa (taxonomy follows Baker et al 1995) – the Okarito rowi (*Apteryx mantelli* "Okarito") and the Haast tokoeka (*A. australis* "Haast") – are nothing short of heroic. The lesson was clear, that without the dedication of the teams involved, the extensive use of poisons to control predators and the financial backing that has made this possible, these kiwi would now be extinct or the deaths of the final few birds imminent.

The contrast between the situation with the kiwi and the two equally distinctive seabird taxa was revealing. Both the Westland petrel (*Procellaria westlandica*) and the Fiordland crested penguin are faced by a variety of threats but conservation of these birds is piecemeal. Conservation relies on the dedication and commitment of a few Department of Conservation staff who have neither the research needed to quantify the problem, nor the financial and logistical backing required to underpin their efforts. The research proposed by Sue Waugh and discussed in the symposium will build on previous

studies by Sandy Bartle and recent work by Freeman & Wilson (2002) to provide some of the research needed to underpin conservation. However, further research on the impacts of predators and the interactions between the petrels and fisheries is needed in order to more effectively focus conservation efforts. Even less is known of either the current status of the penguins (McLean *et al.* 1997) or the threats they face.

Colin O'Donnell presented a retrospective overview of an extensive survey of forest birds in South Westland undertaken between 1983 and 1986 (O'Donnell & Dilks 1986). The presentation left us wondering how much has changed since the Fauna Survey Unit of the Wildlife Service undertook this and other surveys of Westland birds. While the current distribution and status of the critically endangered forest birds is well studied there is little or no recent information on most other species. There are no longer the resources required to undertake these wide ranging surveys and only surveys such as these can provide information on the changing fortunes of common, vulnerable or even threatened species. Twice last century species thought to be extinct, the takahe (*Porphyrio mantelli hochstetteri*) in 1948 and the Chatham Island taiko (*Pterodroma magentae*) in 1978 were rediscovered by private searches. Could this happen again? Some ornithologists think it could, and this time not too far from the symposium venue. Ron Nilsson presented an update on the search for the elusive South Island kokako (*Callaeas cinerea cinerea*), undertaken with minimal support by a small private group.

Richard Holdaway rounded off the symposium by explaining how certain newly developed techniques can reveal insights into the ecology of Westland forests in prehistoric times. He reminded us how important it is to understand the past if we are to put present concerns into context. The symposium finished with a half-hour question session where the audience had the opportunity to put questions to the symposium presenters. It was with regret that the question session was drawn to a close for lunch. Grateful thanks to all the speakers and to John Lyall and others from the West Coast Conservancy of the Department of Conservation who supported this symposium. Thanks to Adrian Paterson and Colin O'Donnell for comments on this introduction. The afternoon session comprised contributed papers and these abstracts are also presented here.

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Rowi (Okarito brown kiwi) research and management 1992 – 2002

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Rowi (previously referred to as the Okarito brown kiwi) is a unique taxon of kiwi apparently restricted to the 10,000 ha South Okarito Forest. It is a threatened taxon thought to number about 150-250 individuals. Genetically they are more closely related to North Island brown kiwi than South Island brown kiwi but behaviourally they are more similar to South Island kiwi. Rowi have been the subject of research and management since 1992. Adult survival is high, but the period of maximum mortality is the 1st year of life, when a chick is particularly vulnerable to predation, mainly by stoats (*Mustela erminea*). As with other kiwi elsewhere on the main islands of New Zealand, without intervention rowi seem to have extremely low recruitment with fewer than 5% of chicks surviving to adulthood. A variety of methods have been trialed to increase chick survival. Two methods (large-scale trapping of predators and island rearing of juvenile kiwi) have shown great promise and resulted in what is possibly the first significant recruitment into the population for many decades. The merits of each method are discussed and the results of the 2001-2002 breeding season are presented.

Haast tokoeka sanctuary

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The Haast tokoeka is a threatened taxon of brown kiwi found only between the Waiatoto and Arawhata rivers in South Westland. Most birds

inhabit the lowland podocarp forest and subalpine tussock of the Haast Range, living at altitudes from near sea level to c. 1500 m. Since monitoring began in 1997 no recruitment has been detected and the population is estimated to be 250-300 birds. Although adult tokoeka can successfully defend themselves against stoats (*Mustela erminea*), all confirmed chick deaths have been by stoat predation. Since 2001, extensive predator control has been undertaken in the newly-created Haast Tokoeka Sanctuary, one of 5 kiwi sanctuaries supported by the Biodiversity Strategy and sponsorship from the Bank of New Zealand. Predator control within the sanctuary is aimed at reducing the stoat population to a level at which sufficient kiwi chicks survive to allow the population to be self-sustaining. A minimum chick survival rate of 25% is needed for population replacement. Because the predator trapping effort needed for chick survival of ≥ 25% is unknown, present management is based on an experimental approach. Radio tracking of tokoeka allows study of breeding success and chick survivorship in response to predator control. In addition, ecosystem response is being measured to give an indication of the wider impacts and long-term sustainability of this type of management.

Westland petrel (taiko) (*Procellaria westlandica*) management

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The Westland petrel (*Procellaria westlandica*) is endemic to New Zealand and breeds only near Punakaiki on the South Island's West Coast. The birds return in winter to breeding colonies in the coastal foothills south of Punakaiki. The colony areas within the Paparoa National Park have "Specially Protected Area" status, and access is restricted. The Westland petrel is listed as 'Vulnerable" by the IUCN because of the restricted breeding distribution and small population size (*c.* 20,000 birds ± 5,000). Westland petrels are among the last of many petrel species that formerly bred on the mainland, surviving despite the threats posed by introduced mammalian predators, human exploitation, and habitat loss. The breeding success of the Westland petrel has been studied for many years, with efforts focusing on a selected number of study burrows. Gridded areas are being set up to monitor burrow density, occupancy, and breeding success. The rapid increase of tourism on the West Coast, and particularly in the Punakaiki area, brings with it new pressures on the Westland petrels. Particular problems are increased levels of lighting near flight paths (that disorientate petrels), land subdivision (which results in greater numbers of uncontrolled pets), and powerlines.

Burrow occupancy by Westland petrels (*Procellaria westlandica*)

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Westland petrels (*Procellaria westlandica*) nest in a restricted area on the West Coast of the South Island of New Zealand, and are classified by the IUCN as vulnerable. They are thought to number *c.* 2000 breeding pairs. However, no systematic survey of burrow densities or numbers of breeding birds has been made. During the incubation period in 2001, we examined burrow occupancy in 2 quadrats of 1250 m^2 and 560 m^2 at 2 sub-colonies in Scotchman's Creek, using burrow scopes. We found an average burrow density of 0.24 burrows m^{-2}, with burrows on average 1.1±0.4-1.2±0.5 m deep at the 2 colonies respectively. An average of 21% (range 19-22%) of burrows were occupied by breeding pairs. The implications of these findings are discussed.

Status, patterns, and threats in West Coast forest bird communities

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The West Coast of the South Island is the most extensively forested part of the country. Thus, the region is an important centre of forest bird biodiversity in New Zealand. Extensive forest bird surveys, particularly in the 1970s and 1980s, provide a comprehensive baseline with which to monitor changes in distribution and status in the future

(see bibliography below). Over 31 bird species were characteristic of West Coast forests when Europeans arrived in the 1800s. Six are now extinct but 25 indigenous (and 11 introduced) species still occur. Over 40 coastal, wetland and open country species are also associated with forest margins. West Coast forests contain representative fauna communities, rare and distinctive species, and birdlife that is important in maintaining ecological processes (e.g., pollination and seed dispersal). The region supports bird communities representative of forests dominated by podocarps (e.g., kahikatea, rimu, mountain totara), beech (red, hard, mountain, silver beech), and broad-leaved evergreen trees (e.g., southern rata, kamahi, tawheowheo). Many species are characterised by seasonal movements in relation to changing climatic conditions or food availability. Forests are important for maintaining populations of threatened species (3 kiwi taxa, kaka, falcon, mohua, yellow-crowned parakeet, orange-fronted kakariki, blue duck, Westland petrel, weka). Major threats to forest bird communities include predation of nesting birds by introduced mammals, and loss of components of the forest structure important for food, shelter and nest sites through selective browsing by mammals, predation by exotic wasps, and logging.

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The South Island kokako: some thoughts on mystery birds, pieces of moss, feathers and skeptical audiences

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The South Island kokako *Callaeas cinerea cinerea* was widely dispersed throughout South Island and Stewart Island forests at the time of European colonisation. Following the arrival of additional mammalian predators the birds had become rare by the end of the nineteenth century. The species was last confirmed as extant in 1967, but until the 1980s circumstantial reports of kokako continued to be made. Sufficient evidence for their survival prompted the formation of the South Island Kokako Investigation Team (SIKIT), an informal group of ornithologists dedicated to verifying the bird's existence. Evidence comprised glimpses of birds, kokako-like calls, moss-grubbing not associated with any other animal, and most convincingly, a feather found on Stewart Island in 1986 and shown to belong to a member of the family Callaeatidae (New Zealand wattlebirds). Since 1990, on the West Coast alone, 51 people have reported sightings, calls, or moss-grubbing from 22 locations. SIKIT continues to search for the birds throughout their original range. Publicity about these searches has resulted in a steady stream of new reports. Search effort is handicapped by a shortage of resources and, despite the encouragement of some officials, by the reluctance of government agencies to assist. This reluctance perpetuates a history of institutional skepticism about rare species, exemplified by the private rediscoveries of Chatham Island taiko, takahe, and other "officially extinct" species. SIKIT now considers the fate of South Island kokako to rest with a few widely scattered pairs and individuals. As time passes and numbers dwindle further, conservation management by official agencies will become significantly more likely to fail.

Palaeobiological perspectives on Westland birds

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Traditionally, fossil bones have been seen as static evidence for the former presence and possibly structure of a species in a particular area. In addition to providing material for dating individual bones, the bones can contain information on the diet and feeding sites of some extinct species. Ongoing research suggests that even aspects of the ecosystem dynamics and palaeoenvironments might have left signals in the bones. Mass spectrometry of stable and unstable isotopes promises a revolution in palaeobiology in New Zealand. Some of the first of the new data have been obtained from bird fossils from the West Coast. Palaeobiological studies can provide insights into a variety of issues. For example fossils of the upland moa *Megalapteryx didinus* may provide information on the return of the West Coast forest after the most recent glaciation. A possible palaeo-rainfall indicator resides in bone protein, and this could also indicate where in West Coast forests some moa fed. Although the Westland petrel is an icon species on the Coast today, before humans reached New Zealand, several other species of petrel bred in large numbers in these forests and their effects may still be detectable in the present environment. The variety of new information from old bones demonstrates the potential of palaeobiology to give an historical and evolutionary context to present ecological and conservation studies on the West Coast and the rest of New Zealand.

Contributed papers

An unexpected pattern of molecular divergence within the blue penguin (*Eudyptula minor*) complex

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The blue penguins (genus *Eudyptula*) have been subjected to extensive taxonomic revision. In 1976, the genus was reduced from including 2 species to a single species (*Eudyptula minor*) with 6 subspecies, based on a morphometric analysis. Despite the later proposed rejection of the of subspecies in *Eudyptula minor*, following analysis of allozymes in some populations, the 6 subspecies have continued to be recognised in some popular and scientific literature. We compared the sequences of 3 mitochondrial gene regions (small ribosomal subunit, cytochrome oxidase *b* and the control region) from the 6 hypothesised subspecies to examine relationships within *Eudyptula*. We found evidence for 2 unexpected clades: the 1st consisting of Otago and Australian populations, the 2nd consisting of northern, Cook Strait, Chatham Island, and Banks Peninsula populations. Some support for these 2 clades was also found from a re-analysis of morphometric data and from a preliminary examination of vocalisations.

Full paper: Banks, J.C.; Mitchell, A.D.; Waas, J.R.; Paterson, A.M. 2002. An unexpected pattern of molecular divergence within the blue penguin (Eudyptula minor) complex. *Notornis 49*: 29-38.

Effects of intervention on the royal albatross population at Taiaroa Head, 1937-2001

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The northern royal albatross (*Diomedea sanfordi*), classified by the IUCN as endangered, breeds at a small publicly viewed colony at Taiaroa Head on the New Zealand mainland. The colony has been monitored since the 1st chick was reared successfully in 1937/38, and has been security fenced since 1964. Since 1951 various programmes to control the effects of introduced predators (cats, dogs, mustelids, and, more recently, blowflies) have been maintained. From a 100% immigrant breeding population in 1938, the proportion of breeding immigrants has declined to 8% today, with the balance having hatched at the colony. For the past 30 years various management practices have been used to maintain or improve productivity. Methods developed include the use of dummy eggs, hatching in an incubator to avoid fly strike, fostering of eggs and chicks, hand rearing, and the recovery of birds to the colony after a failed first flight into the Otago Harbour. The hatching rate is 60-62%. Without management intervention, the mean fledging would have been 54% of eggs hatched rather than the 74% achieved. A mean 75% of non-managed fledged chicks survived to the age of 5 years (pre-breeding), but only 60% of managed chicks survived over the same period. With significant climatic stress and introduced blowflies in the past 12 years, management intervention at the egg and chick stage (up to 100% of nests in some years) has ensured that productivity was raised to 72% from a probable 33% if those birds managed had been allowed to die. The cumulative effect of significant management interventions has ensured that the present population of the colony is 109 individuals instead of a probable 72 individuals, if the managed birds had been allowed to perish and their subsequent progeny had not been added to the population.

Full paper: Robertson, C.J.R. 2001. Effects of intervention on the royal albatross population at Taiaroa head, Otago, 1937-2001. *DOC Science internal series 23*. Department of Conservation, Wellington.

Why study the foraging patterns of non-breeding albatrosses?

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Since 1992 a joint NIWA/Te Papa team has been studying the foraging of southern Buller's albatrosses (*Thalassarche bulleri*) at sea using satellite transmitters. This work is funded by the Foundation for Research, Science & Technology to allow construction of a simulation model that could be used to predict (and avoid) longline bycatch. Earlier results showed major differences between the foraging patterns of males and females, and between birds from different colonies (Solander Island compared with the nearby Snares Islands). To add to the complexity, these birds foraged over different sea areas according to the stage of the breeding cycle. However, almost half of the world population of Buller's albatrosses are non-breeders (failed breeders, divorced breeders, young birds). Work on other species (especially grey-headed albatrosses *Thalassarche chrysostoma*) showed that most birds dying on longlines were young. Could this mean that young birds forage in different areas and, if so, at what age do they start foraging like adults? Are there differences that would make them susceptible to longline capture? Eight pre-breeders have now been tracked throughout most of the season from Snares and Solander colonies. In this paper we show the results of this new work.

Hatching failure in South Island robins (*Petroica australis australis*): a consequence of inbreeding depression or food limitation?

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A population of the South Island robin (*Petroica australis australis*) on Motuara Island in the Marlborough Sounds was founded in 1973 by only 5 individuals. Subsequent inbreeding has resulted in the current population of *c*.600 having much lower genetic variability than outbred mainland populations. This has been implicated as the cause of a high level of hatching failure in the Motuara population, which is also characterised by smaller clutch sizes and fewer clutches year^{-1} than in outbred populations. However, the high density of robins on Motuara Island means that resource limitation could be an alternative explanation.

Between August and November 2001 I performed a food supplementation experiment to determine which of these 2 hypotheses best accounted for hatching failure in the Motuara Island robins. Preliminary results indicate that pairs in which the female's diet was supplemented by *Tenebrio* larvae had higher hatching success than control pairs, but hatching success was still lower than in outbred mainland populations. Incubation attentiveness and egg size did not vary between treatment and control birds. Eggs and sperm samples were collected from Motuara Island and will be examined in an attempt to determine the mechanism causing hatching failure. This study has implications for the conservation of endangered birds, as translocation to offshore islands is a technique widely used in New Zealand and elsewhere.

Waders of the northwestern South Island, New Zealand

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Waders have been counted regularly at Farewell Spit since 1961 and in Golden Bay and Tasman Bay since 1984. Data are presented from 20 study sites within this area that show the distribution of each species and changes in their abundance between seasons and over the duration of the study up until the winter of 2001. Of 163,000 mainly migratory waders from overseas that visit the New Zealand coast during the southern spring, 23% were found in the northwestern South Island. During winter, 130,000 mainly New Zealand breeding waders visit New Zealand shores, and 14% of these occur in the study area. During spring, c. 30,000 waders visited Farewell Spit, increasing to almost 40,000 in the late summer. More than 1% of the total population of South Island pied oystercatcher (*Haematopus fisnchi*), variable oystercatcher (*Haematopus unicolor*), banded dotterel (*Charadrius bicinctus*), eastern bar-tailed godwit (*Limosa lapponica baueri*), red knot (*Calidris canutus*), and ruddy turnstone (*Arenaria interpres*) used Farewell Spit during the year. Motueka Sandspit was similarly important for both oystercatchers and bar-tailed godwit. Waimea

Inlet supported at least 1% of all pied oystercatcher, variable oystercatcher, wrybill (*Anarhynchus frontalis*), and bar-tailed godwit. Bells Island and Grossis Point were the most important sites in the Waimea Inlet, near Nelson. The number of red knot at Farewell Spit declined during the 40-year study. Pied oystercatchers declined at all sites except for Farewell Spit.

Shorebird migration in East Asia – a conservation perspective

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Every year some 5 million shorebirds migrate through East Asia, including some 170,000 birds which breed in the Arctic and spend the non-breeding season in New Zealand. Conservation efforts in New Zealand are of vital importance to the survival of these birds but will be for naught if staging areas in East Asia are lost. This presentation will highlight some of the threats shorebirds face in East Asia, where the birds have to share limited resources with a large and ever growing human population. East Asia represents 14% of the Earth's land area but supports over 56% of its human population. New Zealand has a role to play in supporting conservation efforts elsewhere in the flyway, as well as at home.

Poster

Penguins, parasites and phylogenies: an analysis of penguin and louse coevolution

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The penguins (order Sphenisciformes) are parasitised by 14 species of chewing lice (Ischnocera: Phthiraptera). Little is known about these lice. Chewing lice of penguins are obligate ectoparasites and feed on feathers: they are usually benign parasites although heavy infestations may cause problems. Because chewing lice survive only briefly away from their host they rely primarily on physical encounters, such as host copulation, to transfer between hosts. Lack of opportunities for lice to transfer to novel host species has been proposed as having led to "speciation by isolation". If this has occurred, host speciation events should lead to parasite speciation. Penguins represent habitats with ideal conditions for isolation of louse populations and subsequent coevolution. However, alternative events, such as colonisation of new host species (host switching) or intra-host speciation by lice, will also lead to the formation of new louse species.

We constructed a phylogeny for the chewing lice using morphological and molecular characters (mitochondrial 12s and cytochrome oxidase 1 regions) and used the phylogeny in conjunction with a penguin phylogeny in a reconciliation analysis to examine mechanisms of speciation in the penguin chewing louse group.