

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.

#### LITERATURE CITED

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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  $\geq 25\%$  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  $\pm$  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<sup>2</sup> and 560 m<sup>2</sup> at 2 sub-colonies in Scotchman's Creek, using burrow scopes. We found an average burrow density of 0.24 burrows m<sup>-2</sup>, with burrows on average 1.1 $\pm$ 0.4–1.2 $\pm$ 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