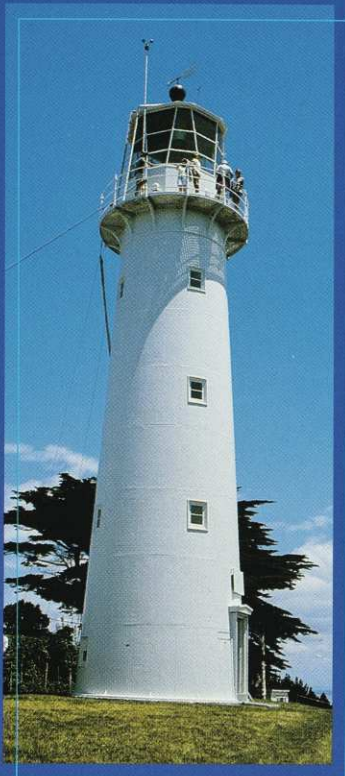


FOREST & BIRD

NUMBER 310 • NOVEMBER 2003

**Secretive Grey Warbler • Our Favourite Plants
Discovering Native Fish • Vanishing Rock Wren
The Magic of Mangere • Denizens of the Deep
Kaitorete Spit • Wellington's Wilderness**

tiritiri matangi



WILDLIFE BIRD ISLAND

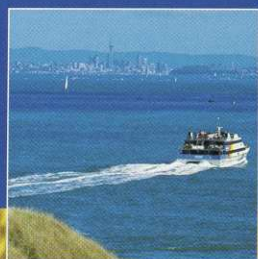
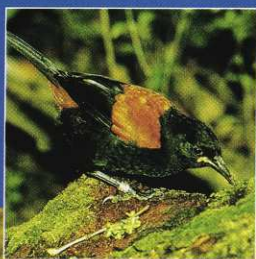
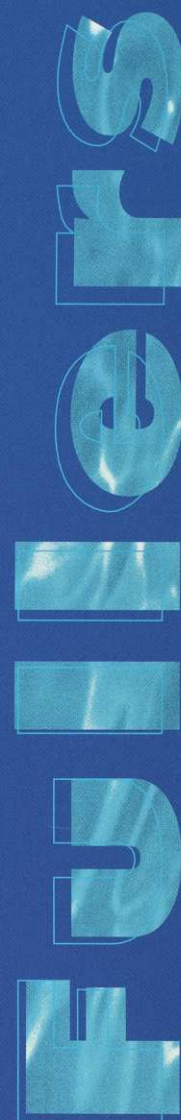
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Forest and Bird is helping to:

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- Save dolphins, seals and seabirds by ending damaging fishing practices.
- Promote a safe environment, free from pollution.

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- Inform others about conservation by expressing concern and encouraging action.
- Assist with volunteer projects in your local area, through your local Forest and Bird branch.

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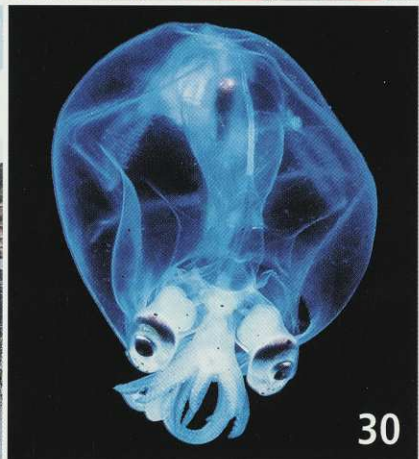
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& BIRD

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PHOTOGRAPH: GORDON ELL, BUSH FILMS

Taking Precautions With Genetic Engineering

The Society's Executive has recently addressed the topic of genetic engineering.

Our concerns centre on the 'precautionary principle' and how this is applied. Specifically, we see two issues: that of the process for considering GE applications and that of the scientific work relating to the environmental effects of GMO's (genetically modified organisms).

At present all applications for work on, or release of, GMO's into New Zealand are processed through the Environmental Risk Management Authority (ERMA). We believe that it is very important for ERMA to apply the 'precautionary approach' in assessing applications. Issues such as 'Corngate' and the tamarillo trial ('Tamsam') in Northland need to be properly addressed and potential threats to the environment avoided. This applies particularly to any 'contained field trial' experimentation. What does 'contained' mean in situations where millions of bacteria are present and are able to move across boundaries easily?

Of even greater concern is the lack of scientific work on the potential environmental effects of GMO's. There seems to be very little understanding of the pathways that may occur when a GMO is either eaten by another organism or when it decays naturally in the soil or water.

The huge importance of bacteria in these breakdown processes seems to be little understood. The finding that 'free DNA' does not survive for long in the soil — say up to 28 days — seems hardly surprising, when zillions of bacteria are

present to gobble it up. Since bacteria are almost all pervading in nature, Forest and Bird is naturally concerned about where any genetically modified material ends up.

Then there is the issue of horizontal gene transfer (HGT) — that is the transfer of genetic material from one species to another (gene-hopping). A few years ago,

there was scant support in the scientific community for the possibility of HGT occurring, but more recently there has been an acceptance that not only does it occur, but that it occurs far more frequently than at first thought.

So why is the Society concerned?

Consider that a modified gene is incorporated into a crop and that this gene gives resistance to one or more herbicides. What happens if that gene jumps into an environmental weed? This weed would then not be controlled by the herbicide and could become a 'superweed' threatening our native forest or wetland. Or a pest could pick up a gene making it more resistant to pesticides. Or the gene for sterility, already being investigated for pines transfers to kauri or kahikatea.

You may think that these, like the toad genes in potato, are somewhat scary. Our worry is that we don't know what can happen because the science is in its infancy.

Genetic engineering has the potential for many beneficial applications, but also the potential for some disastrous environmental consequences. That is why the Society is promoting the 'precautionary principle'. We are however pleased to see that the Foundation for Research, Science and Technology (FoRST) is now funding research into some of the environmental issues surrounding genetic engineering. In the meantime — tread carefully!

Dr PETER MADDISON,
Deputy National President

World Trade and Nature

At the time of writing, our National President, Dr Gerry McSweeney, is away in Cancun, Mexico, as part of the New Zealand Government delegation to the World Trade Organisation conference.

The invitation from the New Zealand Government recognises that trade policy affects and can be important for the protection for nature.

Forest and Bird's policy is to ensure that trade and investment treaties support and do not undermine New Zealand's ability to protect our unique native plants, animals and natural features.

Gerry's attendance at the WTO Ministerial is an important step towards ensuring that international trade works better for the environment.

— DR PETER MADDISON

Royal Forest and Bird Protection Society of New Zealand Inc. (Founded 1923)

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Mailbag

Forest & Bird welcomes brief comments or criticisms about items or issues in the magazine. We reserve the right to edit letters for length. The deadline for our February 2004 issue is November 20.

Saving Our Birds

As an ordinary New Zealander, I have been fortunate to witness what few of us ever have — the dramatic revival of our native birds. These include threatened species; kiwi, kokako, weka, brown teal and New Zealand dotterel in over 7000 hectares of diverse protected habitat in Northland and central North Island.

May 2003 kiwi 'call counts,' on six sites monitored around Russell Peninsula, Bay of Islands were up an average 170 percent over 2002 counts. All this has been achieved with a good dollop of community support and tiny pest management budgets.

I have become increasingly concerned of late at our inability to halt the decline of our biodiversity and the remedies proposed. I attribute success protecting native birds to the unglamorous mantra of

sustained, effective diligent, rat control.

The black ship rat is the driving force behind the destruction of our forest ecosystems (with possums chipping in) directly through predation of nests, and indirectly by competing for food and most seriously by ensuring a healthy food supply for stoats.

Ignoring rats will fail the birds miserably as stoats are notoriously difficult to trap. (Okarito and the plight of kiwi there are a prime and recent example of this.)

Project Nest Egg, hugely expensive predator fences and relying on offshore island havens are symptoms of defeat. We should not give up on the mainland. The Russell Peninsula shows it can be done.

— LAURENCE GORDON, *Haruru Falls, Bay of Islands*

Lovely Lindis

I was very disappointed to read the caption to a photograph of the Lindis Pass ('Lindis Pass is one of the most striking tussock landscapes in Otago') in the May issue. In fact, the tussock landscape of the Lindis Pass is quite degraded — even idly looking out a car window one can tell that the tall tussocks are restricted to patches in the wetter areas, there is little in the way of herbs and the ridges and convex slopes are dark grey, indicating bare ground or hieracium.

The geomorphology and emptiness of the Lindis definitely makes for a grand landscape but we should be careful to be scientific in our assessments of the vegetation, and not repeat urban myths about the high country.

— MARY RALSTON, *Methven*

Regional Bird Guide

The Royal Australasian Ornithologists Union (known as Birds Australia) raises the \$A1 million needed to compile each volume of *The Handbook of Australian, New Zealand and Antarctic Birds*. Your article (August 2003) only mentions the publisher, OUP.

Maori names of New Zealand Birds are listed in Appendix III of each volume — on page 1220 in Volume 6 just after Appendix II — the Aboriginal names for Australian birds. The placement of these names in these two appendices was an early editorial decision for Volume 1, and has been retained for consistency.

— SID COWLING, HANZAB, *Manager, Australia*

For responses to letters about the Society's position on genetic engineering see *Comment*, opposite.

ENVIRONMENTAL RISK MANAGEMENT AUTHORITY

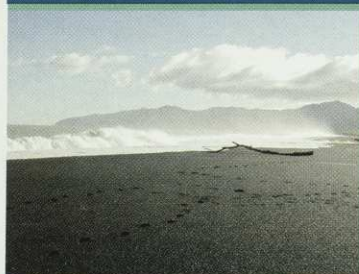
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Managing Genetic Modification in New Zealand

→ understanding the issues → making it work



You are invited to come along and participate in the areas that interest you.

The public session on day one (3.30 to 7pm) is your opportunity to come along to meet members of the Environmental Risk Management Authority and Ngā Kaihautū Tikanga Taiao.

Ask questions directly in an informal setting and visit the ERMA New Zealand Gallery to find out who we are and what we do.

November National Roadshow

- 4-5 November:** Hamilton Quality Hotel | 100 Garnett Avenue, Hamilton
- 6-7 November:** Auckland Centra | Cnr Kirkbride & Ascot Roads, Mangere, Auckland
- 11-12 November:** Palmerston North Quality Hotel | 110 Fitzherbert Avenue, Palmerston North
- 13-14 November:** Wellington Convention Centre | 111 Wakefield Street, Wellington
- 18-19 November:** Christchurch Holiday Inn | 356 Oxford Terrace, Christchurch
- 20-21 November:** Dunedin Public Art Gallery | 30 The Octagon, Dunedin

► Day One

Session One | Making it work: The impact of amendments to the law (HSNO Act)
This session focuses on informing those who will be directly affected by the legislative changes.

Session Two | Understanding the issues

This session is designed for public participation and focuses on understanding how HSNO works and how the Authority deals with the issues: listening to public concerns and answering questions.

► Day Two

Session Three | Hands-on delegated decision making for IBSCs

Designed for applicants. This session is focussed at details associated with application and decision-making processes for low risk Genetically Modified Organisms.

Session Four | Meeting with local iwi

Designed for applicants, IBSC members and ERMA New Zealand staff.

For more information enquiries should be directed to:

Tina Suter
Events Co-ordinator

ERMA New Zealand

Ph: 04 916 2426
DDI: 04 918 4825
Fax: 04 914 0433

roadshow@ermanz.govt.nz

Forest and Bird President Wins Loder Cup

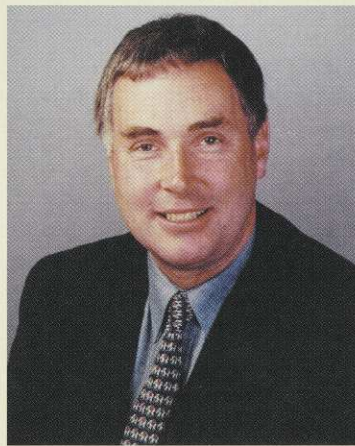
The national president of Forest and Bird, Dr Gerry McSweeney, has been awarded the prestigious Loder Cup award for 2003. The Loder Cup is one of New Zealand's oldest conservation awards, made annually by the Minister of Conservation for outstanding contributions to the conservation of New Zealand's native plant life.

'Dr McSweeney has made a significant contribution to preserving New Zealand's native flora,' said the Minister, Hon Chris Carter, announcing the award. 'He has been a lifetime champion of New Zealand's native plants.'

'Dr McSweeney's work has

included close involvement in the creation of the Department of Conservation, the establishment of the South West New Zealand World Heritage Area, and winning a halt to forest clearance and wetland drainage,' the Minister said. 'He was instrumental in the signing of the West Coast Forest Accord and the Tasman Forest Accord. He was also on the Government's expert panel on the future management of the 130,000 hectares of Timberlands West Coast native forests, with an outcome that all of the forests were added to public conservation lands.

'His advocacy for tussock grasslands has led to the



Dr Gerry McSweeney, winner of the 2003 Loder Cup, is currently National President of Forest and Bird.

establishment of the Korowai/Torlesse Tussocklands Park.

'Since 1990, Dr McSweeney

has been instrumental as a member of the Nature Heritage Fund in protecting 180,000 hectares of conservation land,' said Mr Carter.

'These are some of the contributions which demonstrate how Dr McSweeney's outstanding leadership and campaigning skills have resulted in the protection of large tracts of native flora in perpetuity for all New Zealanders,' said Mr Carter.

Earlier this year Gerry McSweeney was awarded an honorary second doctorate by his alma mater Lincoln University in recognition of his environmental work.

DOC to start public consultation on recreation opportunities

The Department of Conservation wants your ideas about the best mix of recreational opportunities in areas managed by the department. A public consultation process will be held in DOC's thirteen conservancies to look at the facilities required to provide the recreational opportunities for you, your family and friends.

From October 2003 to the end of January 2004, the department will have information that describes the recreation opportunities provided by each conservancy, and will hold meetings to introduce people to the consultation process.

If you want to know more about the process and the detail of proposals, information will be on the DOC website (www.doc.govt.nz) from October 2003, or enquire at your local DOC office.

John Ombler, Regional General Manager



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High Country Purchased for Public and Nature



HOWARD KEENE

Aerial view over the alpine valley leading toward the Hope-Kiwi Lodge. It is conservation and recreational routes like this which will be preserved through the purchase by the Nature Heritage Fund of 4000 hectares of the Poplars high-country run near the Lewis Pass.

A large chunk of a high-country station in North Canterbury has been purchased by the Nature Heritage Fund for recreation and conservation. The area of 4000 hectares has been taken out of the Poplars Station near Lewis Pass at a cost of \$1.89 million.

The land now preserved is almost completely surrounded by Lake Sumner Forest Park, and the Lewis Pass road, State Highway 7, runs through it. The new reserve includes all the land surrounding the Hope-Kiwi hut and the Upper Hope, Doubtful and Boyle river valleys, all popular tramping areas.

Mixed beech forest and shrubland covers much of the newly purchased land, home to numerous native birds including the severely threatened yellowhead/mohua and the great spotted kiwi.

'This purchase marks another step in ongoing efforts by the

Department of Conservation and the Government to secure some of New Zealand's iconic high-country landscapes for the public,' says the Minister of Conservation, Hon Chris Carter.

'Protection of the area has come about through co-operation between the landowner and the Nature Heritage Fund,' the Minister said. 'In addition to the sale price, DoC has agreed to erect fencing and signage to direct the public who use the area away from farmland and into the newly purchased open spaces.'

'This arrangement is a classic example of how DoC can work with landowners in the high country to mutual benefit. I hope other farmers who use much of the iconic landscape down the eastern side of the Southern Alps will recognise that working with DoC carries very real opportunities for them,' says Mr Carter.

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conservation**briefs**

Success of Weka Project

The last North Island weka to be raised by Forest and Bird's weka-breeding team have been released at Russell, Bay of Islands. The 21 adults and juveniles join 17 birds released last year in a bid to reintroduce this threatened sub-species of weka to Northland.

The 2500-hectare Russell peninsula has been cleared of most of its possums, rats, stoats, feral cats and goats. Poisoning is keeping these pests at low levels and reinvasion is now restricted by a predator fence at the neck of the peninsula near Opuia.

Laurence Gordon, the man driving pest control for the Russell Landcare group, reports seeing chicks and says that weka

calls are so numerous that they interfere with his kiwi call monitoring! This suggests that the weka are going to do well.

Forest and Bird's weka-breeding project was established 12 years ago in response to the catastrophic decline in North Island weka in its last stronghold around Gisborne. Over the years Forest and Bird members have reared nearly 200 young weka.

The initial releases in the Karangahake Gorge failed after ferrets destroyed the fledgling weka population. Subsequently captive-bred weka were released on to Pakatoa Island in the Hauraki Gulf near Auckland, and then to Whanganui Island, near Coromandel. Both island



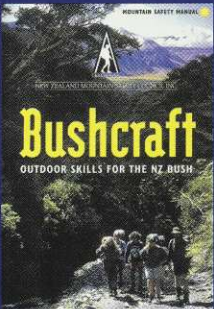
Adult weka with chick raised in an aviary run by Ann and Basil Graeme to help provide birds for release back into the wild. Forest and Bird members raised aviary birds for release for 12 years, to re-establish the weka in the wild.

ANN & BASIL GRAEME

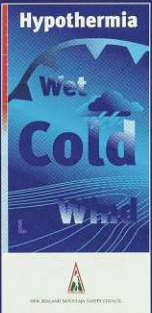
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populations are growing and the Pakatoa Island birds are so prolific that they can provide a source of young birds for future releases.

With 'wild' weka now available for reintroductions, the work of the weka breeders has come to an end. The project has involved dozens of Forest and Bird members. Although the bird-breeding programme

has now ceased, Coromandel Branch members continue to monitor the Whanganui Island weka.

Our members can take pride in contributing to the successful establishment of new North Island weka populations, and in raising public awareness and empathy for this engaging native bird.

— ANN GRAEME



Upper Coromandel Forest and Bird members carrying aviary-raised weka to release back into the wild, on Whanganui Island near Coromandel, in 1997. Further releases can now be made from wild birds bred in such protected environments.

ANN & BASIL GRAEME

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WINTER 2003

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PATAGONIA The Kingdom of the Wind

Adventures are funny old things. You spend all your spare time dreaming them up, then, once you're in the middle of them you quickly start wishing you were somewhere else. It's a love/hate relationship, a fatal attraction and our mountaineering expedition to South America this past summer was to fit the bill perfectly.

I was brought up reading the 'legends' of the great British expeditions with their stiff upper lips, the inevitable sea voyage en-route to their destinations. To me the idea of sailing the Chilean fenders down to the wonderful looking granite towers of the Torres Del Paine in Patagonia seemed irresistibly romantic. Rowington and Whillans of Himalayan fame had sailed to Patagonia in the 60's to claim the first ascent of the Central Tower climb, and it was their route we were keen to

Think Patagonia and you think impossibly inhospitable landscapes, swept by hurricane force winds and lashed with rain, so the flat calm sea under wide blue skies that greeted us as we boarded the good ship M/V Magellan had us gleefully surprised and more than a little wary. Steaming south towards Puerto Natales our suspicions were confirmed as the weather began to life up to its reputation and the clouds slowly lowered over the snow-capped mountains. At the same time the scenery became increasingly spectacular, the walls of the fjords closing in

around the ship and the huge glaciers cascading into the sea.

After four days on board and a drunken 'Fiesta Final' we arrived in Puerto Natales, a somewhat dirty, frontier town on the edge of the barren pampas. This was to be our last home and we need around buying three weeks worth of food and base camp equipment, negotiating the obligatory knowledge from the locals as we could. We also did plenty of last minute fastening up and drank coffee by the bucket load.

I'll never forget my first view of the Towers. I'd been asleep on the bus and when I stepped off, there they were, three colossal granite teeth piercing the distant Patagonian sky. That first view was like a physical blow and I literally took an involuntary step backwards. What were we thinking trying to climb those?

Slowly, over the next few days, as we lugged loads up the beautiful Rio Aysen valley to our basecamp, the Towers became more familiar. We stopped often to gaze in gob-smacked wonder up at the soaring walls and crack systems that seemed to go on and on forever, impossibly aloof. Finally we deposited our last load at Campamento



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conservation**briefs**

The Lost World of the Moa

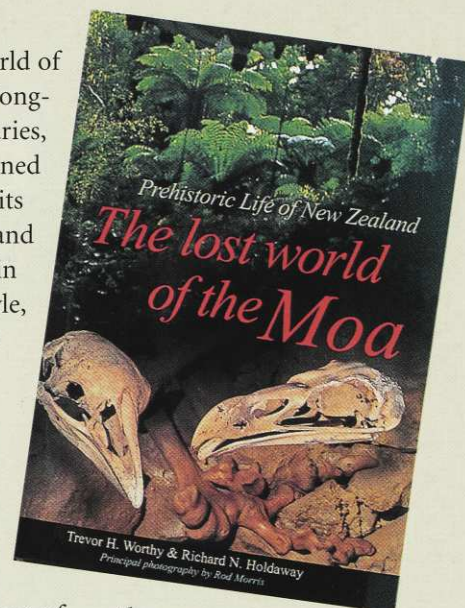
The fascinating world of the moa, and its long-gone contemporaries, is the subject of this learned tome. Tome, because of its 718 dense pages of text and tables; learned because, in both scholarship and style, it makes no concessions to the popular reader.

Despite its populist and striking jacket, the authors' vocabulary assumes a degree of scientific literacy, and preparedness to struggle through the jargon of academic zoology and paleontology. The gems are slowly revealed, however, in the descriptions of New Zealand's vanished wildlife and what happened to it.

Much of the earlier part of the book traces the discovery of moa and the progress of scientific description through nearly two centuries. Each contribution is picked over and analyzed as if it were a fragment of bone itself.

Trevor Worthy and Richard Holdaway have been at the forefront of modern research, however, and it is their work in renewed moa 'digs', and amid the bone deposits in caves, which has so expanded knowledge of our prehistoric birdlife. The results of this independent research forms the substance of the modern part of this book.

Of particular interest, and much more readable, is the extensive treatment of other species from the time of moa. Their evolution and subsequent extinctions are traced in detail. Richard Holdaway is the author of the



theory that Pacific rats were present in New Zealand 2000 years ago, and here the authors tell how 80 million years of isolation and evolution was ended by invading mammals, including latterly man, in only two millennia.

The book is heavily illustrated including historic photographs of early research, and of bone assemblages. Sadly for a book of this significance (and price) the paper doesn't always serve the half-tone images well. Nevertheless, the joint publishers have produced a significant volume which will surely become the starting point for any serious researcher, and an exhaustive reference for anyone interested in what became of our prehistoric birds. — GORDON ELL

The Lost World of the Moa, Prehistoric Life in New Zealand, by Trevor H. Worthy and Richard N. Holdaway, principal photography by Rod Morris, Canterbury University Press in association with Indiana University Press, Christchurch 2002, RRP\$169.50.

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Precarious Paradise in the Pacific

Visitors to Aitutaki, in the Cook Islands, are greeted with 'Welcome to Paradise'. The greeting is ironic, for, while burgeoning tourism offers the 1900 inhabitants much-needed income, it could also destroy their fragile world.

The lush, volcanic island of Aitutaki sits in a magnificent lagoon fringed with 45 kilometres of coral reef and 21 uninhabited sand islands (motu). The red-tailed tropic bird (tavake), whose long tail feathers were prized for chiefs' head-dresses, nests under scrubby bushes on low-lying Maina Island. Lagoon cruises allow visitors to view the birds at close range but, if tourist numbers increase, will the birds abandon this rare nesting site?

Until recently, most passengers on the 45-minute flight from Rarotonga were day-trippers, but tourists now stay longer. Luxury accommodation has increased and a new road, bulldozed through the jungle, opens up virgin coastline for development.

Though giant sea turtles are now protected, the islanders say the animals no longer come ashore to lay their eggs on the motu.

Only a few giant clams, *Tridacna maxima* (pa'ua), remain in the lagoon. The edible clams were protected in 1989 after their numbers were devastated by pollution. [In the 1980s, when Aitutaki exported bananas to NZ, the fruit was dipped into a drum of paraquat before shipping. The used insecticide was simply tipped into the lagoon, killing, among other things, giant clams, sea grapes (an edible seaweed), and coral.]



Tourists may disturb the nesting place of the red-tailed tropic bird.

Some coral is regenerating, baby clams have reappeared, and small fish abound. Yet a Tongan marine biologist thinks Aitutaki's lagoon 'looks dead' from the air, and a local tour guide feels the coral is going downhill.

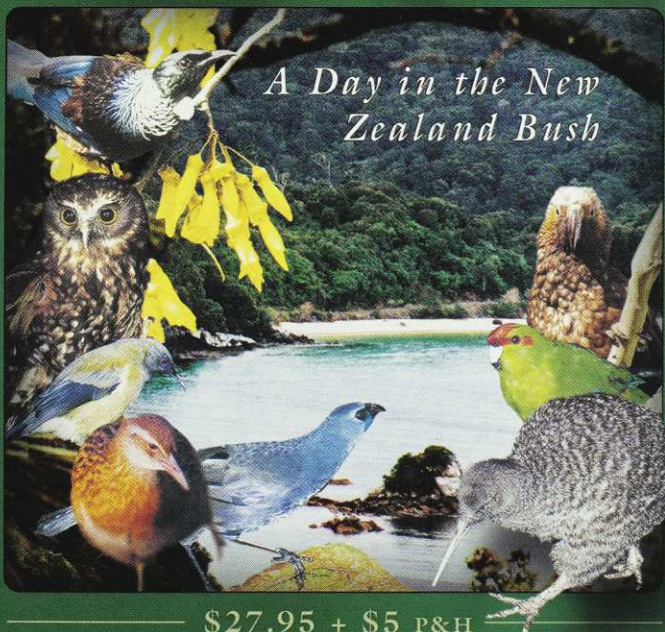
There is some good news. Formerly, banana palms in flower were sprayed with insecticide, a practice which poisoned a nectar-feeding lorikeet, the 'Blue Nun', or pur_mo'o. Since spraying ceased, the little birds have become common again.

Some of the differences between a pristine tropical environment and one degraded by pollution may not be evident to most tourists. But they certainly notice if the lagoon smells of sewage, as it does after heavy rain. Rubbish disposal is also a problem on a small island. With no recycling, glass and tins must be buried, while plastic can end up as litter or floating in the lagoon. Other Pacific Islands such as Tonga and Fiji already have major litter problems. Can remote, beautiful Aitutaki benefit from tourism, but avoid the pitfalls?

— ANNE RIMMER More about Aitutaki on <http://www.cook-islands.com>

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Red-tailed tropic bird is vulnerable while nesting on the beach.



Getting Rid of Rats on Pacific Atolls

DEE PIGNEGUY meets two New Zealand environmentalists aboard their catamaran on Aitutaki Lagoon.

Ecologist Ed Saul and zoologist Dr Graham Wragg were returning from an expedition to Suvarrow Atoll National Park where — with the help of volunteers — they had completed the first phase of a rat eradication project funded by the New Zealand Ministry of Foreign Affairs 'Pacific Initiatives for the Environment' program. They had been trapping rats to establish the population and species of the rodents on the 25 motu (islets) of Suvarrow. (See *Forest & Bird*, February 2001.)

'We found only Pacific rats (kiore), and they were only on motu west of the pass, which makes about half the land area of Suvarrow already rat free.' This is very good news they say, pointing out 'the less poison used the less the danger to the local environment.'

They also want to promote small-scale ecotourism on Suvarrow and other remote islands of the Cooks, and have submitted an environmental impact report to the local Environment Service for permission to do so.

They talked excitedly of New Zealander Elspeth Wingham who works for UNESCO administering the World Heritage Convention in the Pacific. She has put together a plan involving the governments of the Cook Islands, French Polynesia, Kiribati, and the USA to consider forming a Line Islands World Heritage Site. This could involve some 20 remote uninhabited islands belonging to these nations being classified under the UNESCO convention. At present all of the candidate islands have rats and many have cats, so there should be plenty of restoration work for volunteers willing to pay their keep during these efforts.

'Overwhelmingly, New Zealand leads the world in rat eradication and island restoration,' says Ed Saul, and this expertise may be put to the test after the recent Manu Tuamotu Expedition, which was financed jointly by the New Zealand Ministry of Foreign Affairs and the U.S. Fish and Wildlife Service. The Bounty Bay and her crew of scientists spent five weeks visiting 10 uninhabited islands in March this year. The only other recent visitors had been islanders collecting birds and turtles to eat and harvesting coconuts. The islands had been virtually unknown scientifically for many decades.

'We struck gold with Morane, the southernmost of the

archipelago,' said Dr Wragg. 'There were no rats or cats and the motu had populations of two species of land birds, the endangered Tuamotu sandpiper and the critically endangered Tuamotu ground dove.' The Tuamotu ground dove is known only from one other population in the world (on Tenararo in the Actéon Group).

Dr Philippe Raust of the French Polynesian Ornithological Society (SOP-Manu, an affiliate of BirdLife International) and Dr Ray Pierce of Whangarei were also involved with the expedition. As well as counting bird populations, the expedition was looking for suitable islands for rat eradication and ecological restoration. This would be followed by the re-introduction of plants and animals that had been eradicated by rats and cats and the monoculture of the coconut plantations.

Unwilling to disturb the resident endangered bird species, the overnight shore expedition was unable to find a suitable campsite on Morane. Finally settling on a 'little bit of unused dirt', they were surprised to discover a couple of leeches crawling on their legs. The question, 'Has anyone ever seen a leech on an eastern Pacific atoll?' was answered by the thought that perhaps elsewhere the rats have exterminated even the leeches. Another mystery for future expeditions to solve... — DEE PIGNEGUY



Kermadec Petrel, Morane Atoll, Tuamotu, French Polynesia.

ERIC VANDERWERF



Masked Boobies, Morane Atoll, Tuamotu.



Young male Lesser Frigatebird.

ERIC VANDERWERF

The Secretive Singer

It's 'drab but lyrical' says BRIAN GILL who has studied our tiniest songster, the grey warbler. Pictures by GEOFF MOON.



Grey warblers are restless birds, almost never still as they flit about the foliage in search of food.

GEOFF MOON



GEOFF MOON

Only the female builds the nest. She alone incubates the eggs and broods the nestlings, but the male helps to feed both nestlings and fledglings.

Small and dull-plumaged, grey warblers might rarely be noticed were it not for their tuneful singing. Yet, with the fantail and silvereye, they are one of our commonest native garden and bush birds, found almost throughout the country wherever there are trees and shrubs.

The grey warbler or riroriro *Gerygone igata*, at around 6.5 grams, is just as small in body-weight as the rifleman — only one third the weight of a house mouse. Yet we think of the rifleman as New Zealand's smallest bird because its truncated tail makes it look so small.

Like riflemen, grey warblers are restless birds, almost never still as they flit about the foliage in search of food. The grey warbler's body plumage may be dull grey, but close inspection reveals outer tail feathers boldly patterned with black and white bars, and an eye that is ruby-red (in adults).

There are about 20 species of *Gerygone*, mostly in Australia and New Guinea, with a few extending west to south-east Asia, one to the Solomon Islands (also Vanuatu and New Caledonia), and two to New Zealand. The second New Zealand species is the Chatham Island warbler *G. albofrontata*, which, at

about 9.5 grams, is the giant of the genus.

The grey warbler's song is a plaintive wavering trill that rises and falls. It is given only by males. They sing throughout the year but most vigorously in spring when they nest. Such a New Zealand sound!

The warbler's energetic singing was never more eloquently described than by our great natural history writer, Herbert Guthrie-Smith. In his 1910 book *Birds of the Water, Wood and Waste* Guthrie-Smith described how: 'Presently, from some manuka thicket, a sombre plumaged little bird will emerge, light on some topmost twig, and pour forth to three-quarters of the globe — for in his ecstasy he nearly sings a circle — this faint sweet trill that heralds fuller spring.'

There is a similar quality to the songs of many of the Australian species. Writing of the western gerygone (*G. fusca*) Alan Bell wrote very poetically: 'I have never heard sounds so plaintively microscopic, so clear and yet scarcely perceptible. The ghost of a kitten's mew — the echo of dwarf violins played in the moon — these were the bird's notes.'

The generic name *Gerygone* ('ger-ig-onee' or 'jer-ig-onee') is compounded from

ancient Greek words that can be interpreted as meaning something like 'child of sound'. The specific name *igata* was bestowed in 1830 by French zoologists, and was said to be the grey warbler's Maori name as used in Tasman Bay during the voyage of the French ship *Astrolabe*.

Grey warblers eat insects and other arthropods. Their light weight enables them to hover momentarily in mid-air and snatch prey at the tips of delicate twigs that they and other birds are too heavy to perch upon. Our other small insectivorous birds either cannot hover, or rarely do so, and in this way grey warblers have their own specialisation that gives them a competitive edge in the search for food.

Grey warblers are unique among mainland New Zealand song birds in building an enclosed, pear-shaped nest with a small entrance at one side. The nest begins as a small wad of material attached around a twig and this is enlarged and extended downwards before the cavity is formed and the nest is expanded to its final shape. The nest has a framework of rootlets and grass stems and is filled out with fine material, such as dried moss, that is bound in place

with silk from spiders' webs. The chamber is lined with soft material like feathers, downy seeds and tree-fern scales. Some nests hang completely free, apart from their point of attachment at the top, while others are attached at the back or sides as well. Only the female builds the nest. She alone incubates the eggs and broods the nestlings, but the male helps to feed both nestlings and fledglings.

The warbler's tiny egg, about 17 millimetres long and 12 millimetres wide, is white with fine, reddish-brown speckles. It weighs about 1.5 grams which, however, is very large (23 percent) relative to the adult weight. No wonder, then, that the female lays the eggs of a clutch 48 hours apart, rather than 24 hours apart which is typical of song-birds. The usual clutch-size is four, so in seven days the female lays a clutch equal to 92 percent of her own body weight!

The globular nest may play a critical role in conserving heat for such a small bird whose first clutches may be laid at the end of winter (late August).

The incubation period (17-21 days) is quite long. The nestlings have fluffy white natal down that camouflages them against the feathered nest-lining when they are at rest. They spend 15-19 days in the nest.

Though the warbler's nesting cycle is relatively long, the breeding season is also long, and they are able to raise two successful broods per year.

The enclosed nest, the two-day laying interval, and other aspects of the warbler's breeding are shared by other members of the distinctly Australasian family (the Acanthizidae) to which, with groups like the thornbills, the grey warbler belongs.

The grey warbler is the host of the shining cuckoo on mainland New Zealand. This brood-parasite slips an egg into the warbler's nest, and the warblers rear the baby cuckoo alone after it has evicted the warblers' own eggs and young (see *Forest & Bird* August 1989). Most birds are not particularly intelligent, driven instead by instinct and the hormones that govern reproduction. When feeding nestlings, adult warblers are 'programmed' to deliver food to the nest, and just do not respond to their own chicks once the cuckoo has pushed them out of the nest. The warbler chicks soon die. Being larger than the warbler, the cuckoo's chick fills the nest by the time it is ready to fledge.

Neither parasitism by the cuckoo nor depredation by rats and other introduced mammals seem to threaten grey warblers in the long term. Though so tiny, they can live

for more than five years once they reach adulthood, which gives them plenty of opportunity to replace their numbers.

Many New Zealand birds have an innate tameness, not seen to the same degree in typical birds of the northern hemisphere. During my study of grey warblers, one female at a low nest allowed me to remove small nestlings from beneath her (for weighing) while she continued to brood. Once an entire nest with feathered young came away in my hand and I wired it to a new position 30-40 centimetres away. The parents were confused at first and continued to visit the point where the nest had been, but guided by the chicks' cheeping they soon resumed feeding them.

Drab and insignificant to look at to be sure, but grey warblers have a fascinating life history as well as a beautiful song. We are lucky indeed to number them among our common native birds.

— **BRIAN GILL** Curator of Birds at Auckland War Memorial Museum, studied grey warblers in forest near Kaikoura. He has written several books, including *New Zealand's Unique Birds* (Reed, 1999), with **GEOFF MOON** who took the photographs for this story.

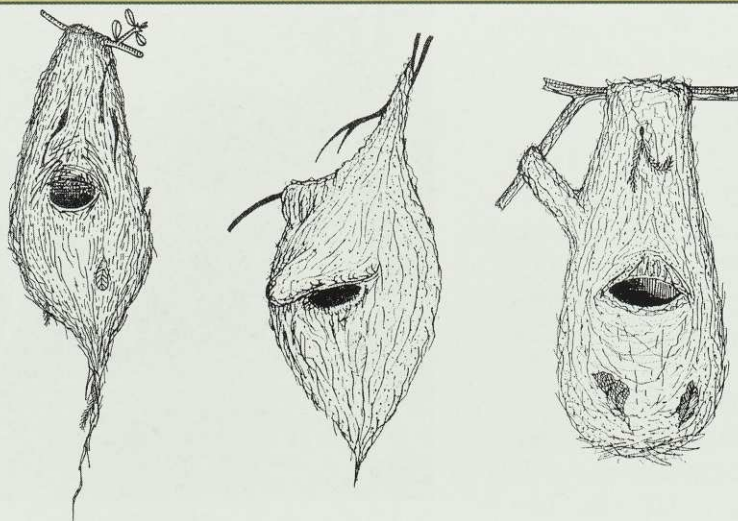
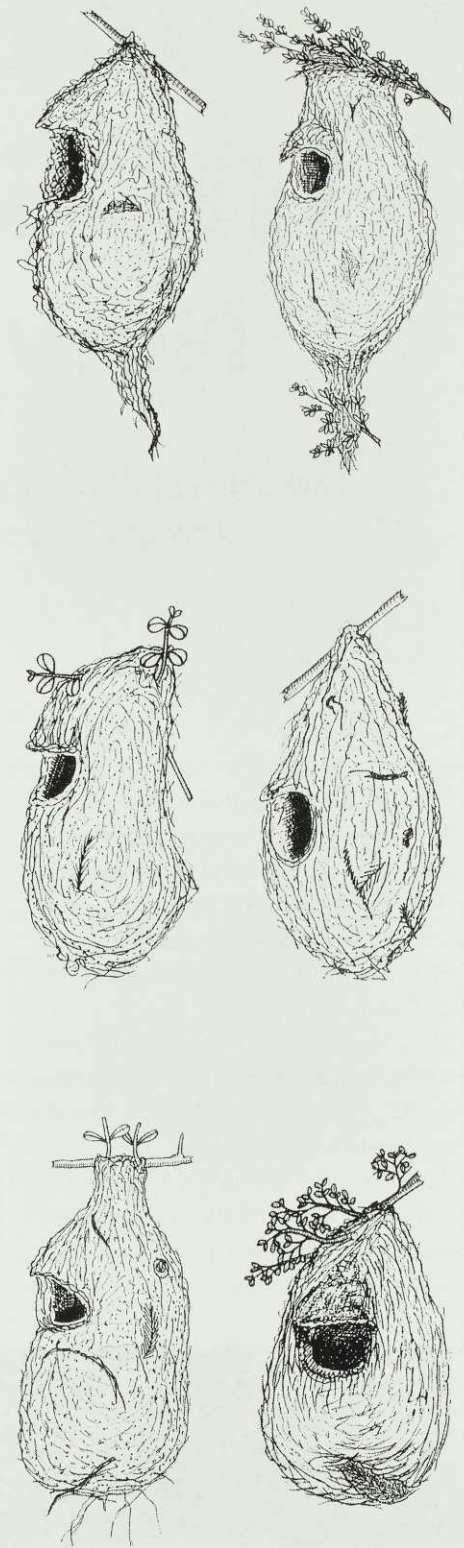


The shining cuckoo lays its egg in the hanging nest of the grey warbler. The warblers rear the baby cuckoo alone after it has evicted the warblers' own eggs and young.



GEOFF MOON

The grey warbler's body plumage may be dull grey, but close inspection reveals outer tail feathers boldly patterned with black and white bars, and an eye that is ruby-red (in adults).



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The search for the 'most favourite' New Zealand plants

IAN SPELLERBERG and RICHARD HUIISH had some surprises when they asked New Zealanders to name their favourite trees and other plants.

If you were asked to name your favourite native plants, what would be your answer and what would be your reason? A survey last year to find the 10 most popular plants in New Zealand produced some unexpected results and is to be conducted again, through *Forest & Bird* this year.

Based on a similar project carried out in Britain, by the conservation organisation Plantlife, the aim is to help raise a greater awareness of native plants.

Last time, 260 entries were received from throughout New Zealand and one from Australia. The entries came from all ages including a 92-year-old lady who said she

liked kowhai because of 'its tracery of stems against a blue sky, then rows of dainty leaves on thin stems, followed by beautiful golden flowers'.

As each entry arrived the 10 chosen plants were scored from 10 to 1 (10 for the person's first choice and 1 for the tenth choice). Then total scores were calculated for each species.

The project (supported by the Department of Conservation) was greeted with enthusiasm ('neat project,' 'great initiative') and many people said they were challenged but rewarded by the survey. Many responded to the invitation to give reasons for their choice.

One comment made many times was that New Zealand native plants are so underrated as garden plants. A sample: 'Only in the last five years have I begun to really appreciate how our natives can make wonderful forms in an urban garden. I hope to transform my garden into a native garden that reflects our fantastic diversity in plants'. Another added: 'New Zealand native plants are among the best in the world for companion planting, texture and colour. They sustain our wonderful bird life and need very little maintenance'.

Some choices evoked happy childhood memories of walks in native bush or school exercises involving native trees. Occasionally native trees brought back memories of homesickness. Other people remembered their first work experience at native tree nurseries.

Surprisingly, two well-known New Zealand plant emblems were absent from the popular choices. The silver fern and the Mt Cook lily are not in the top ten. Trees

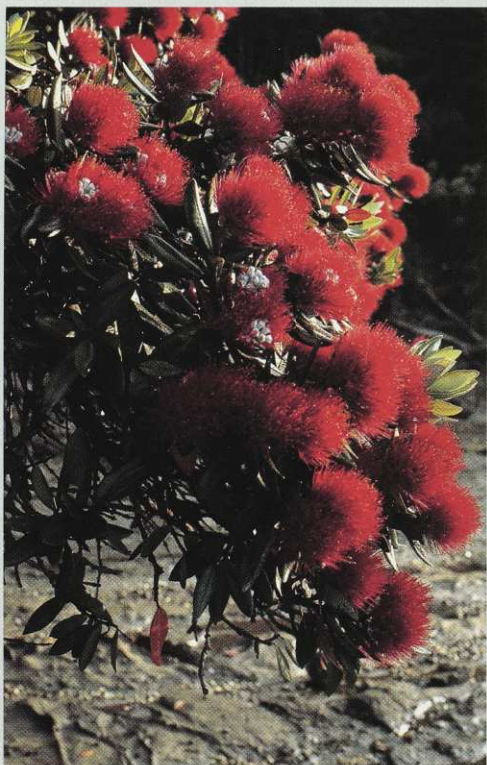
rather than ferns or wildflowers dominated the list, from the 'elegant, graceful, tall and stately rimu' to the 'majesty of old and proud kauri'.

A few surveyed mentioned wildflowers. The orchids such as *Pterostylis* prompted comments such as 'shy green orchids—their fragile beauty of their flowers always amaze me'.

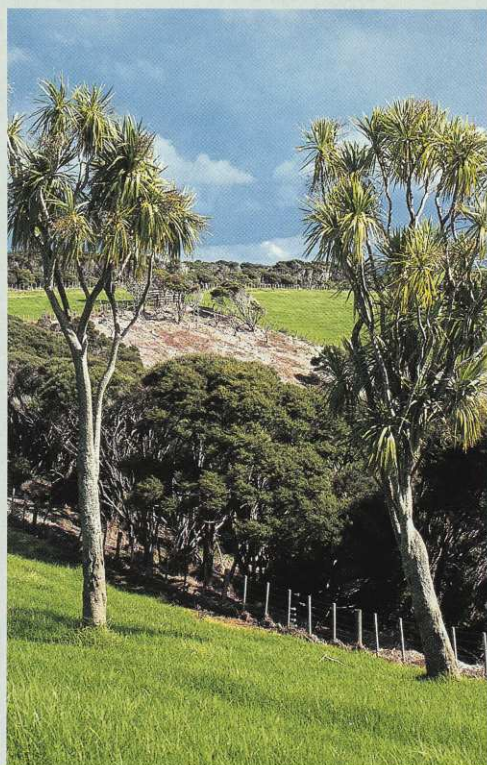
The fragrant *Alseuosmia* was often mentioned and one person suggested that there should be whole fields of *Alseuosmia*.

Rock daisies, rock lilies and buttercups were frequently mentioned.

The few references to natives grasses was disappointing but the reference to the



Pohutukawa most popular.



Cabbage trees, second most-popular.

significant role of native grasses in the landscape made up for that. Non-flowering native plants such as the seaweeds (particularly kelp) and liverworts were mentioned by just a few. As one person said in justification for liverworts: 'I adore them.'

Comments and explanations for individual choices were many and varied; some poetic, some moving. With many thanks to all those who contributed, we would like to share these examples:

Akeake: 'Under-rated — has amazing flower bracts'. 'Beautiful foliage, colour both vibrant and soft at once.'

Beech trees: 'the light plus the black trunks set against blue sky makes a mystical experience,' 'Grandeur of the South Island beech forests,' 'The sight of the mountain mists shifting through the hill sides of layered branches.'

Cabbage tree: 'handsome plant,' 'love the clacking sound of the leaves in the winter,' 'great social, cultural and ecological value.'

Carpodetus. putaputaweta, marble leaf: 'I love the vibrant leaf colour.'

Dianella or turutu: 'a real gem when a shaft of sunlight catches the brilliant blue berries.'

Dracophyllum, neinei: 'the striking Dr. Zeuss plant,' 'this one gives me most pleasure.'

Flax: 'Simmering displays in otherwise barren areas,' 'The perfect theatre for watching Tuis feed,' 'it has strength,' 'their history, uses and traditions,' 'so mathematical and tidy.'

Kowhai: 'always a thrill to see that splash of colour,' 'Purenness of the colour of the flowers and it heralds spring.'

Lancewood: 'Fierce and startling when young, intriguing when adolescent and stately when mature.'

Libertia: 'wonderful form and colour,' 'such pretty plants.'

Manuka: 'the coloniser and healer of the land,' 'En masse you can't beat it for summery blossom with that heartland New

Zealand feeling,' 'great smell,' 'now a garden show piece.'

Marlborough rock daisy: 'as the spring growth emerges it is like a flight of grey moths or butterflies hovering over dark greens leaves frosted with grey.' 'The petals radiate and cluster around a golden ball of stamens, just right for summer and Christmas.'

Mistletoe: 'like a group of candles, they illuminate the dullest kanuka or manuka.'

Muehlenbeckia: 'So versatile and yet so underrated as a garden plant.'

Northern rata: 'The stunning flowers, combined with bees buzzing about and birds taking shelter make for fantastic viewing,' 'What a perfect Christmas present from Mother Nature.'

Pohutukawa: 'beach holidays, blue sky, old and knarled,' 'glorious blaze of colour.' 'Adorable and symbolic — it should be used more often at Christmas,' 'To see their huge roots clinging to the banks and covering rocks gives on a feeling of forever and a day.'

Ponga: 'so graceful,' 'so perfectly shaped,' 'ethereal form,' 'layers of symmetry,' 'I am lost in admiration.'

Puriri: 'flowers and fruits all year with benefits to so many forms of our native wildlife,' 'I love the glossy leaves.'

The 2002 top ten native plant project prompted an enthusiastic response and for many people it brought back happy memories of place or childhood experience.

However, the question was asked, is this a useful exercise and what contribution, if any, does it make to conservation? Some people (who didn't contribute to the survey) were critical and considered such a survey to be of little value and indeed rather



Kauri (centre) was third.

eccentric. By way of contrast surveys of this kind in Britain have a huge response. Why don't we celebrate our native plant heritage with as much enthusiasm. We remain convinced that the survey, if it were to be done again, perhaps annually, would contribute to a greater awareness and appreciation of our native flora. (See questionnaire in box).

— IAN SPELLERBERG is Director of the Isaac Centre for Nature Conservation at Lincoln University, and RICHARD HUISH a visiting student from the University of the West of England.

The Most Popular Plants

The 2002 vote for the top ten New Zealand native plants rated them 1-10.

1. Pohutukawa
2. Cabbage tree
3. Kauri
4. Nikau palm
5. Kowhai
6. Rimu
7. Puriri
8. Flax
9. Lancewood
10. Totara

What are your ten 'most favourite' New Zealand native plants and why?

The Isaac Centre for Nature Conservation at Lincoln University is now conducting a further vote for the 10 'most favourite' New Zealand native plants.

This is an invitation to enter the 2003 draw for one of three prizes.

To enter, simply write down a list of your 10 favourite native plants in order of preference (starting with your top favourite) and where possible give a brief explanation. The survey is supported by the Department of Conservation.

Send your entry with your name and postal address to:

The 2003 Top Ten Most Favourite Native Plants,

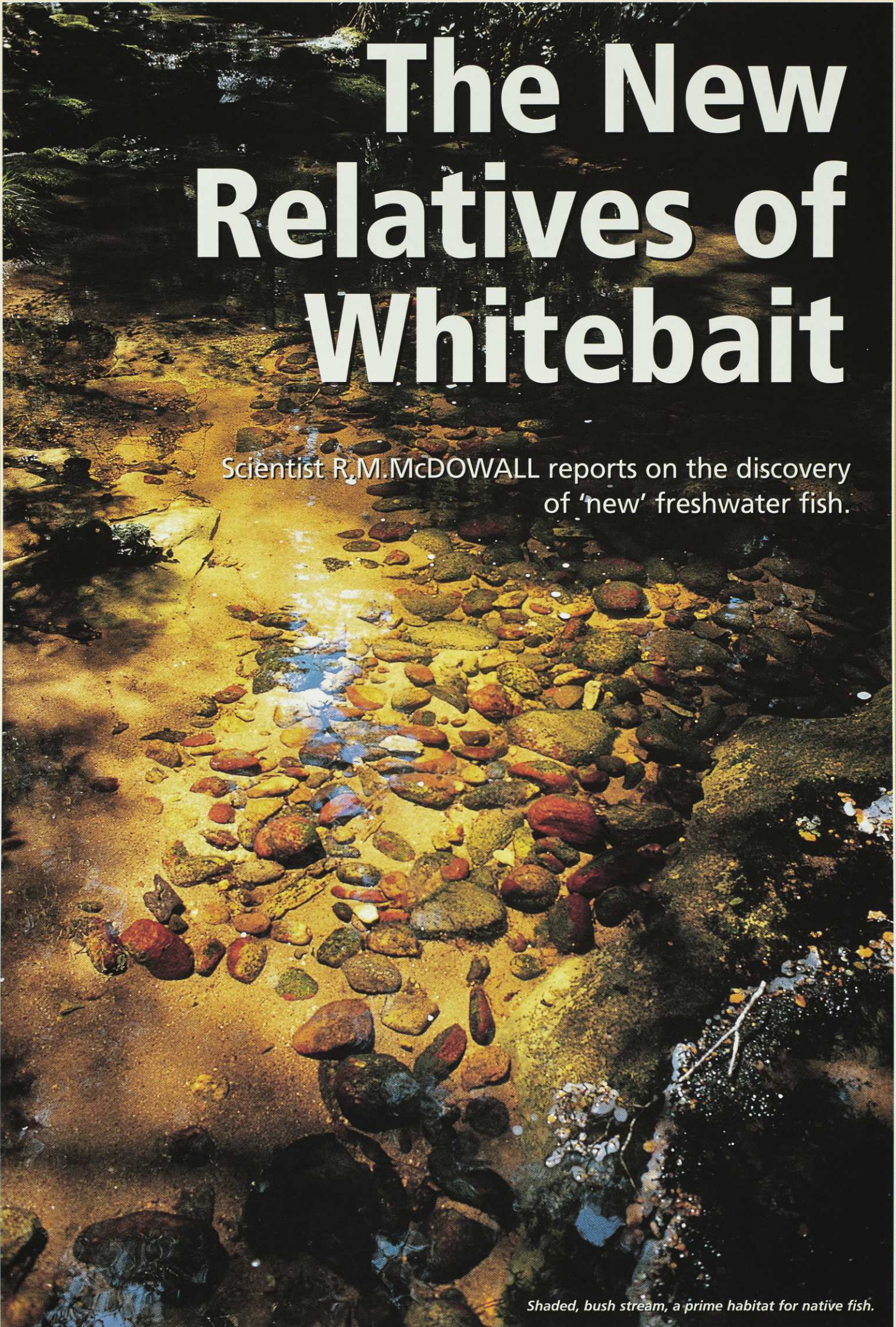
The Isaac Centre for Nature Conservation,

P.O. Box 84, Lincoln University, Canterbury.

OR email your entry to Spelleri@lincoln.ac.nz (but please include your postal address — not email address).

All entries go into a draw: the prizes are national garden vouchers to the value of: \$250 (First Draw), \$150 (Second Draw), \$100 (Third draw). To be in the draw, entries must be made by December 20, 2003. Because of expected numbers, it is not possible to confirm or acknowledge every entry.

The results for the top ten most favourite native plants and the winners will be announced in the February issue of Forest & Bird.



The New Relatives of Whitebait

Scientist R. M. McDOWALL reports on the discovery of 'new' freshwater fish.

Shaded, bush stream, a prime habitat for native fish.

GORDON ELL, BUSH FILMS

All whitebait tend to look alike. Even when they grow into small adult fish they can look quite similar.

These native fish, which include common whitebait and their relatives such as kokopu, kaoro and mudfish, all belong to a group called galaxiids. They live in freshwater streams, though many migrate to the marine environment to breed, hence the run of various whitebait in our rivers.

Science is presently proving New Zealand has many more species of these galaxiids than formerly thought. When I finished my university training in the 1960s, writing a thesis on the taxonomy of New Zealand's galaxiid fauna, I recognised only 14 species. Subsequent studies, soon afterwards, reduced that number to only 13.

Personally, I thought every thing was 'neat and tidy' and that it was time to move on to the galaxiids of other lands — Patagonian South America, Australia, southern Africa, and so on.

What a different perspective we have now! I got it wrong, and have spent nearly the last decade reconsidering and revisiting the situation. As of May 2003, we recognised no less than 22 galaxiid species, an increase of around three quarters, and from time to time I ask myself how I was so wrong. I can imagine that conservationists and naturalists also are wondering what is

going on. Some might ask: 'Does it really matter?' but in my view, it matters a great deal — a good understanding of biodiversity is really crucial to effective conservation.

If we do not know what species are out there, and where they are distributed, it is impossible to plan to protect our biodiversity and our natural heritage.

In some ways the process of scientific discovery is as interesting as the product. This discovery of 'new' species stems from when Colin Townsend arrived as Professor of Zoology at the University of Otago in the late 1980s. He established a Long Term Ecological Research Project on the Taieri River, where his group began to see differences in the ecology of the so-called '*Galaxias vulgaris*'. There seemed to be two different ecological forms in the Taieri which also looked different.

Specimens were given to Graham Wallis, a geneticist at Otago University, and he found them to be genetically different. Moreover, in one small stream the two forms were present together, indicating that they were looking at two distinct species (there was minimal hybridisation going on). One of these species turned out to be Stokell's *G. anomalus*, which we now call 'roundhead galaxias', and the other an undescribed species that was named

G. depressiceps, or 'flathead galaxias'.

At the time, we thought that these two forms were widespread across Otago and Southland. On the basis of the separation of these two forms, I returned to a peculiar population I knew of from the Waipori River that was also quite distinctive and ended up describing two more species, *G. pullus*, which we call 'dusky galaxias', and *G. eldoni* referred to as 'Eldon's galaxias'. Another oddity turned up in Stewart Island, a 'dark little fellow with big round eyes who sometimes frequents a swamp', and so we called it *G. gollumoides*.

Meanwhile, the geneticists pressed on with broad-scale sampling across the eastern South Island of the *Galaxias vulgaris* 'complex', as this group of fishes has become known. The genetic diversity seemed to explode. Part of this work showed our view — that flathead and roundhead galaxias were widespread across Otago and Southland — was wrong. Instead, another five galaxiids were identified. How many of these will eventually be recognised as distinct species has yet to be decided.

All these changes demonstrate the value of a multi-disciplinary approach to questions about biodiversity — with taxonomists, geneticists, ecologists, biogeographers and geologists all playing a

The Variety of New Zealand Galaxiids



Canterbury Galaxias



Gollum Galaxias



Roundhead Galaxias



Eldon's Galaxias



Burgundy Mudfish



Flathead Galaxias



Dusky Galaxias



Big Nose Galaxias



Lowland Longjaw

role in clarifying understandings. What this collaboration is showing for freshwater fishes is paralleled by what others are finding in albatrosses and lizards, and various other groups.

Taxonomic change has not ended there, however. Charles Mitchell found a rather odd-looking, undescribed galaxiid on the Chatham Islands, which he named *G. rekohua*, though ongoing studies indicate that it is really a form of *Neochanna* mudfish.

Nick Ling and Dianne Gleeson were looking at mudfish genetics and came across a new lineage in the Kerikeri area, 'smack-bang' in the middle of the range of black mudfish, *N. diversus*. They named the new form *N. heleios*, which I call 'burgundy mudfish' owing to its deep reddish lower surfaces.

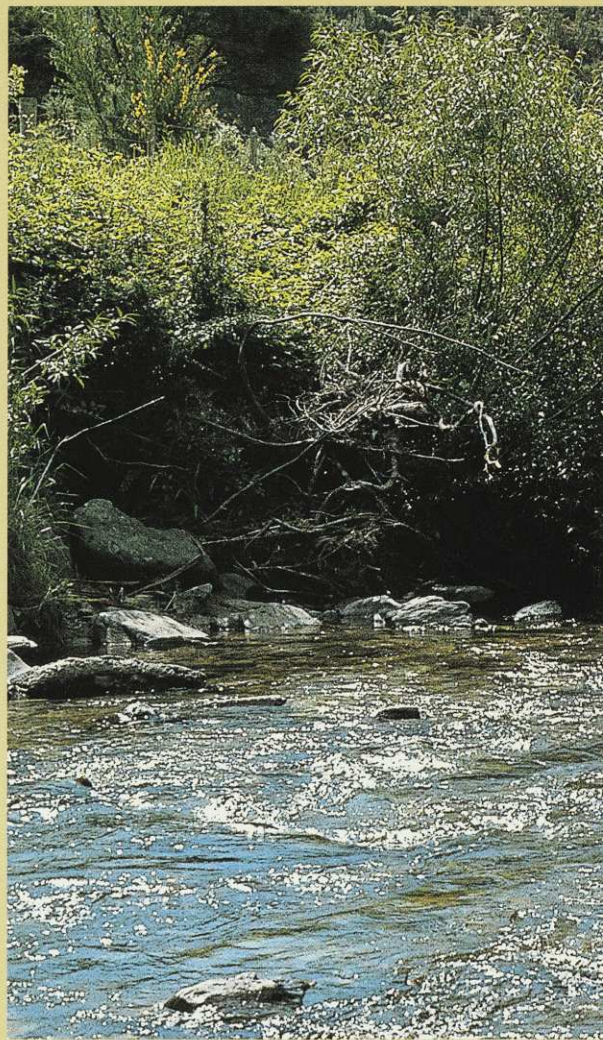
There is yet more! We knew for more than 25 years about a population of longjaw galaxias in the Kauru River (a Kakanui River tributary) inland from Oamaru. We thought it belonged with *Galaxias prognathus*, but we never really looked at the fish carefully — as one longjaw looks rather like another longjaw, we never suspected anything odd. But geneticist Jon Waters at Otago University

found that these were actually a different kind of longjaw which is greatly different genetically. This drove us to look more carefully, and prove its difference — and now the Kauru fish is known as the lowland longjaw, *G. cobitinis*. The fish turns out to also be quite widespread through the mid and lower Waitaki River.

Soon afterwards Simon Elkington of the Department of Conservation in Twizel phoned and said 'I have this peculiar-looking alpine galaxias — you'll probably say it is just an alpine!', but by this time I'd become somewhat 'sensitised' to the likelihood that it really might be something odd, and it's just as well.

As a result, yet another new species is being added to our galaxiid fauna. This one we refer to as 'bignose galaxias' for reasons that are obvious to anyone who knows galaxiids. Were it not for Simon's knowledge and alertness, we would probably just have gone on calling the fish alpine galaxias, and thought no more of it, missing a really fascinating bit of biodiversity. This species is proving to be quite widespread in the Mackenzie Basin.

This story of species discovery had an interesting beginning. A farmer had a small wetland and became sick of getting bogged



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Rushing freshwater stream may contain native fish but the chances are introduced trout will have greatly reduced numbers.

in it, so he drained it. Having done so, he found that there was not enough moisture to get his grass to grow, and so then sought a resource consent to pump water from a pond and stream, back onto his pasture. To get a resource consent, he needed to get DoC approval, and it was in the process of checking out the fish fauna in the stream that Simon Elkington first noticed the bignose galaxias. It is hard not to think: 'Wouldn't have been better if the wetland had never been drained, in the first place?' — except that we might not have discovered the species.

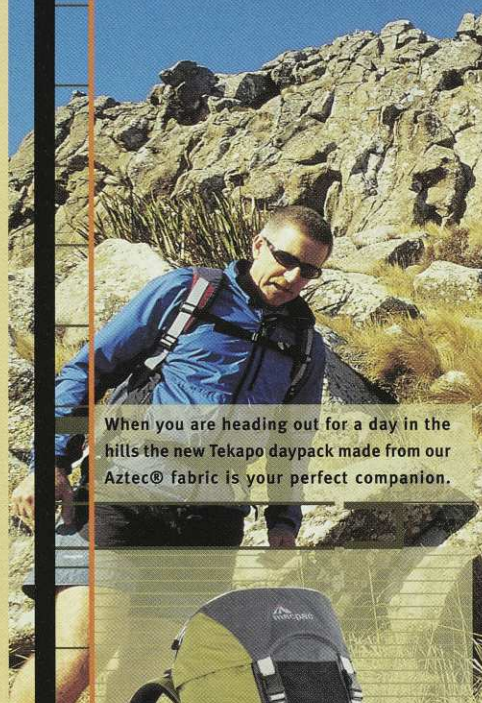
For those interested in New Zealand's natural history and conservation it is impossible to emphasise how important these discoveries are. These additional

species are not just names on a list, but the evidence for the evolutionary processes that created our country's animal and plant species. The interplay between taxonomists, geneticists, geologists and conservationists, allows us to, in part, unravel this history.

For DoC, there is a real challenge in ensuring this biodiversity is protected. For me personally, this is what makes natural history so fascinating — exploring the distributions of the various life forms, and seeing how these match events in our geological history.

— **R.M. MCDOWALL** can be contacted at the National Institute of Water and Atmospheric Research, P.O. Box 8602, Christchurch

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The Vanishing Rock Wren

CHRIS PETYT reports on an alpine bird in trouble.

Alpine habitat of the rock wren, Henderson Basin, beyond Lake Cobb in Kahurangi National Park, northwest Nelson.

One of New Zealand's ancient birds, which evolved with the moa more than 24 million years ago, is in serious trouble. Fears are held for the survival of the tiny rock wren which lives in the South Island alps.

The New Zealand wrens are an ancient family of small, nearly tailless birds, peculiar to New Zealand and with no close affinities to other groups of birds. They are as unique to New Zealand as the moa. Their history in recent times has not been a happy one.

The Stephens Island wren was discovered for science by a lighthouse keeper's cat, which brought in a number of specimens before exterminating it, with the help of professional bird collectors and deforestation. It was only seen alive a few times; it seemed to be semi-nocturnal, was not seen to fly, but scurried around like a mouse.

Bush wrens were apparently widely distributed in the North and South Islands when Europeans arrived, but their arboreal habits were no protection against the



CHRIS PETYT



DICK VEITCH, DEPARTMENT OF CONSERVATION

The tiny rock wren eats insects and grubs.



ROD MORRIS, DEPARTMENT OF CONSERVATION

This rock wren is nesting in the base of a mountain flax.

introduced rats and stoats. The last recorded sightings were about 1955 in the North, and the 1960s in the South. Stead's bush wren was common on Stewart Island and several outlying islands, but by the 1960s survived only on Big South Cape Island. In 1964 the wreck of a fishing boat allowed ship rats to invade the island, and the desperate transfer the next year of a few remaining birds to a nearby rat-free island was unsuccessful.

There remain the rifleman, the smallest of the group, which is apparently holding its own, especially in the South Island, though in reduced numbers, and the rock wren.

The rock wren is known mainly by mountaineers and trampers of the alpine tops of the Southern Alps, from northwest Nelson down to Fiordland. Its name is apt as its preferred habitat is areas of jumbled fallen rocks with crevices and airholes, preferably interspersed with subalpine scrub. The birds hop around on and under the rocks, with much bobbing and flicking of the wings, as they search for insects and grubs.

A few years ago I heard there was a concentrated population in the Henderson Basin, near the top of the Cobb Valley inland from Takaka in the Kahurangi National Park. I made my way up there a couple of times and managed to see some birds, but not in the numbers I was expecting, so in 1999 I spent a couple of days camping there to try and estimate the numbers.

I found three pairs, all with one or two young, and possibly two more pairs; a lot

fewer than the nine pairs plus young and odd birds found in a study by Alison Ballance for the Department of Scientific and Industrial Research in 1989.

The next summer I took up a visitor from the North Island and we found a family party soon after entering the basin after walking up from Fenella hut. My companion spotted a stoat within metres of the birds, alerting me to the fact that stoats will range up into the mountains almost to 1600 metres altitude in this case, and were likely responsible for any decline.

A small group of local Forest and Birders decided we would try and help the birds. Peter Gaze of the Department of Conservation lent us 14 Fenn traps and boxes and flew them into the basin for us. We made many trips into the basin during the summer of 2000-01, driving past the Cobb reservoir to the end of the road, then

walking a couple of hours up the valley before climbing up steeply through the beech forest and open tops and crossing a small pass into Henderson Basin. Many different people, including children, accompanied us.

We trapped a total of eight stoats, and colour-banded eight wrens to try and follow their progress. Five nests were located, all on bluffs and inaccessible to us, which was interesting as in a study in Fiordland most nests could be reached.

The nest is usually made of tussocks and grasses in a sheltered crevice, enclosed with an entrance tunnel in the side. It is usually lined with feathers; Guthrie-Smith counted nearly 800 in one nest, including those of kiwi and kakapo. (Perhaps a lack of feathers for insulation is another problem nowadays.) Despite trapping some stoats there were fears that predation was

occurring; we saw no juveniles from the first nest we located and the banded male was never resighted. At another nest young were being fed one morning but nothing was seen at the nest that evening and no young were ever seen. So it seems stoats were still taking their toll, with mice another possible predator at nests. (Rats don't seem to venture above the bush-line.)

The days in the mountains that summer were very special, with a sequence of blooming flowers to delight us as we roamed the basin and mountains. Walking up the valley we'd often see kaka and kakariki, robins, tomtits and falcons, whilst pipits sang over our camp-site. I remember lying in the tent one morning watching a pair of young keas play-fighting just outside.

The wrens were often so friendly, popping up right next to one on the rocks, and disappearing just as quickly underneath



Alpine habitat of the rock wren, Henderson Basin, beyond Lake Cobb in Kahurangi National Park, northwest Nelson. Inset, trapping stoats in alpine zone.

them. They were usually heard before being seen; a high-pitched note above the audible range of some humans, but probably easily heard by a hungry stoat.

The next summer was a bit of a washout, with bad weather preventing much activity in the mountains, but we caught another four stoats. The start of the 2002-03 summer was pretty bad too, and other commitments meant we didn't get into Henderson as much as we would have liked, but it appeared there were only two pairs of wrens in the basin. One pair was seen with a young bird, but when next found the female was missing and a stoat had been spotted close by. So it appears the population may have dropped from five to two pairs in a couple of years. We appealed for records from the public for the surrounding area but few sightings were notified, and I searched several areas where there'd been records in

There is no official recovery plan for rock wren but its plight concerns Peter Gaze of the Department of Conservation in Nelson. He is presently seeking sponsorship to remove a population of the birds to a pest-free island in Fiordland as an emergency measure pending a wider scientific review.

The Department of Conservation classifies rock wren as 'nationally vulnerable' which puts it in the 'acutely threatened' group of birds at risk. Little scientific work on the decline has been done, however.

Once widespread, the rock wren is now confined to the South Island including the Tasman Mountains of northwestern Nelson and the Victoria Range of northern Westland, down both sides of the Southern Alps and on some side ranges to the east, to Fiordland. Over the last few decades their distribution has become patchy and numbers have declined in most areas. Fires and introduced mammalian predators, especially stoats and mice, are major reasons for their decline. 'There is good reason to believe the rock wren may be heading toward a very critical situation,' says Peter Gaze. 'Rock wren are as special to New Zealand birdlife as kiwi, kokako and huia, yet their conservation has been largely ignored.'

'Prompt intervention to establish rock wren on at least one predator-free island would be an important first step,' he says.



CHRIS PETYT



ROD MORRIS, DEPARTMENT OF CONSERVATION

Fears are held for the future of the rock wren in its alpine habitats throughout the South island.

the past but with no success.

It seems that the rock wren is declining with disturbing rapidity in the Kahurangi National Park at the northern end of its range. Although we feel stoats are the main problem, it is possible that climate change may also be important.

The birds stay in the mountains all year round, the generally accepted story being that they feed amongst the rocks and scrub under the snow-cover all winter. Personally I find it hard to believe that they could find enough food this way to keep them active all winter and feel it more likely that they hibernate, or at least go into a state of temporary torpidity, but winter climate change especially could affect them either way.

Certainly wrens seem to be in trouble in our area, and it is likely the same is happening further south. DoC has been informed and they are looking at funding for research and management of this species. Would any offshore islands be suitable for them? Are there populations

that could be more easily protected than the one we're trying to study and protect? We feel that something should be done now, before numbers drop too much further.

— CHRIS PETYT is a scientific fisheries observer with MFish, a committee member of Forest and Bird's Golden Bay branch and, author of a book about Farewell Spit.

Help at Last

As we went to press, some cheering news: Forest and Bird's representative on the Threatened Species Trust, Lyn Bates, advises rock wren will have a 'sponsor' this year. Chemical technology company B. Dent Global has pledged \$35,000 towards capturing and moving a population of 15-25 birds to the safety of the alpine zone on Anchor Island in Fiordland. The funds will also aid assembly of basic information about the plight of the bird and what to do about it.

Protecting Our Landscapes

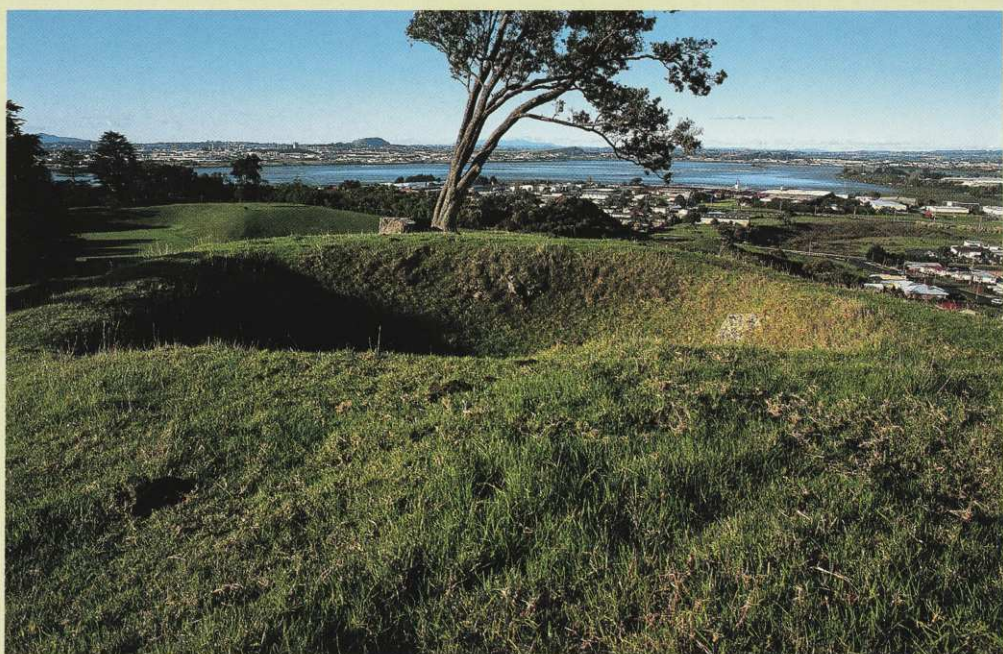
Heritage Tales From An Extinct Volcano

PAT BASKETT explores the natural features of a volcanic cone in South Auckland. Photographs, GORDON ELL.

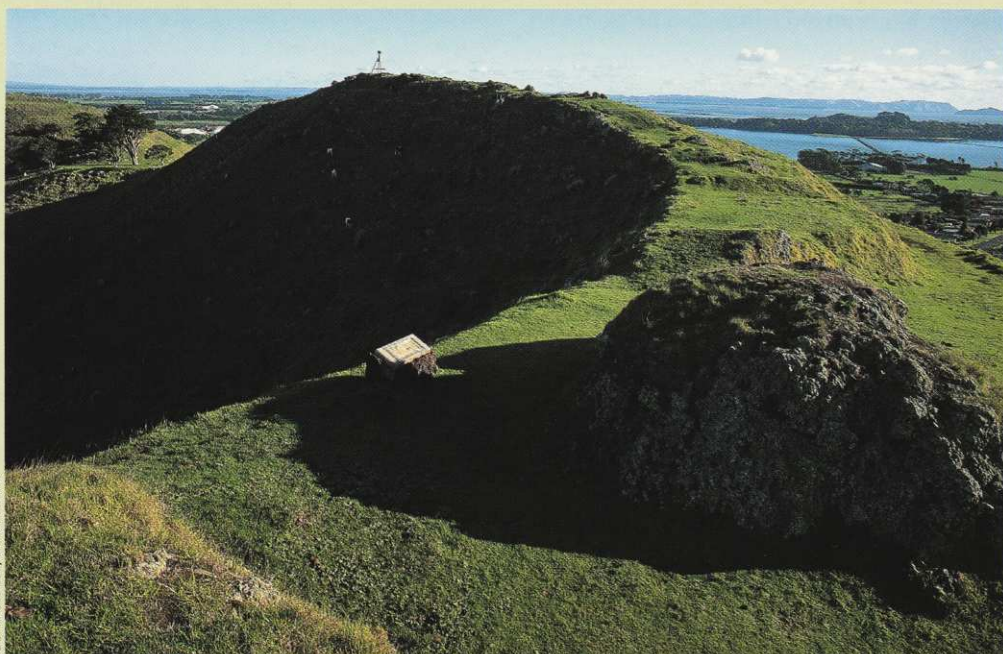
Of the 48 volcanoes that distinguish the Auckland landscape, Mangere is easily by-passed. Yet, culturally, historically and geologically, it is one of the city's most interesting and significant cones.

Situated to the west of the main thoroughfare from the city to the airport, on a quiet loop of land overlooking the Manukau Harbour, it is also one of the best preserved of the volcanoes, having been spared much of the quarrying that destroyed or defaced so many others.

Its geological interest lies in the nature of the volcanic activity which around 30,000 years ago began dramatically transforming a forested plain that stretched from Mangere south to Papakura. The rocks and plumes of steam, grit and dust that burst out of the earth from as deep as 100 kilometres left the landscape littered with a chain of scoria



Remains of large kumara storepit on crater rim.



Rim of Mangere crater with huge boulder thrown from the volcano.

mounds and lava flows, craters that became lagoons, and a small volcanic island — Puketutu — close to the shore in the Manukau harbour. As E.J.Searle so picturesquely wrote, 'volcanic forces . . . created a rash of pimples on the landscape rather than concentrating on building one major structure.'

While 'mountain' seems a euphemism when applied to Auckland's volcanic hills, Mangere is more than a mere pimple. At 107 metres, the higher of its twin peaks dwarfs its south Auckland neighbours such as Te Manurewa o Tamapahore (Wiri Mountain) and Matukutureia (McLaughlin's Mountain). Its two craters contain remnants of the extraordinary events of its creation some 18,000 years ago. In the main crater — a spacious concave field ringed with macrocarpa trees —

declivities mark individual fire vents and out of its floor rises a surprising mini-cone or volcanic plug 30 metres high.

Embedded in the walls of this crater are rocks varying in size from several tonnes to small stones which Searle calls bombs and which were formed from splashes from lava fountains. They owe their strange shapes, he explains, 'to the fact that larger splashes were torn apart as they spun and twisted while hurtling through the air.' A gap in the crater wall on its eastern flank marks the site of a later eruption that also formed the second, smaller but steeper crater.

Near the mountain's southwesterly base lies another curious remnant of volcanic activity — a circular inlet of the harbour called Mangere Lagoon, identified by the scoria cone which rises in its centre a few metres above the sea, like a miniature castle and moat.

Volcanoes are good news for gardeners, as Maori knew at least 800 years ago, possibly as long ago as 1000 years. They discovered the area's advantages — its fertile, easily worked loamy soils, the wealth of sea food in the shallow harbour at their doorstep, and the warm microclimate.

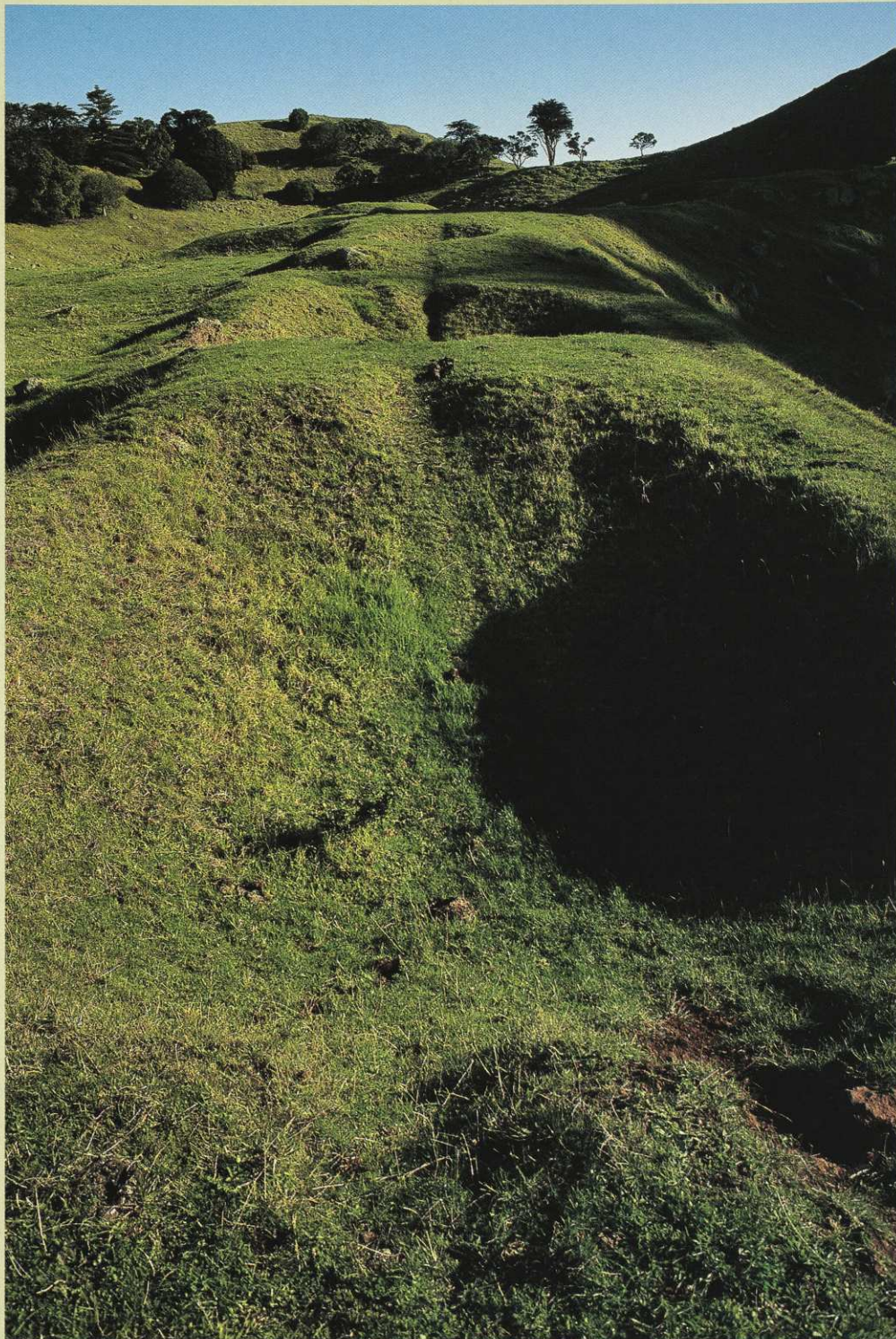
It was then called Haumangere, or the place of lazy winds, but it was also known as Te Pane or Te Upoko o Mataaho, the brow or head of Mataaho, the giant associated with several other volcanic features on the isthmus. This second name reflects its importance as a site of major settlement, covering about 500 hectares, over a long period.

Waiohūa were the first people known to occupy and cultivate this beautiful area but, by the late 1700s, the Te Taou branch of Ngāti Whatua from Kaipara had overrun much of Tamaki and controlled the southern shores of the Manukau.

Modern visitors standing on the crater rim can turn their backs to the city and, looking across the Manukau to the bush-clad Waitakere Ranges, believe that this was, and still is, a good place to live. The removal of Auckland's sewage ponds from the foreground has restored a measure of integrity to much of the foreshore, despite the sight of dredged sludge which was dumped in one spot as the cheapest means of disposing of it.

Most of the area is open space, grazed by young cattle whose light weight makes them less damaging to the archeological features than mature beasts. Sheep would be preferable, says Manukau City's parks' manager, Dr Digby Whyte, but wouldn't survive the attacks of marauding dogs.

The crater's ageing macrocarpa signal the recent pakeha predominance in this ancient



Inside the crater, a ridge is marked by a line of former kumara pits, once roofed for protection of the sweet potato crop, and flattened living sites.

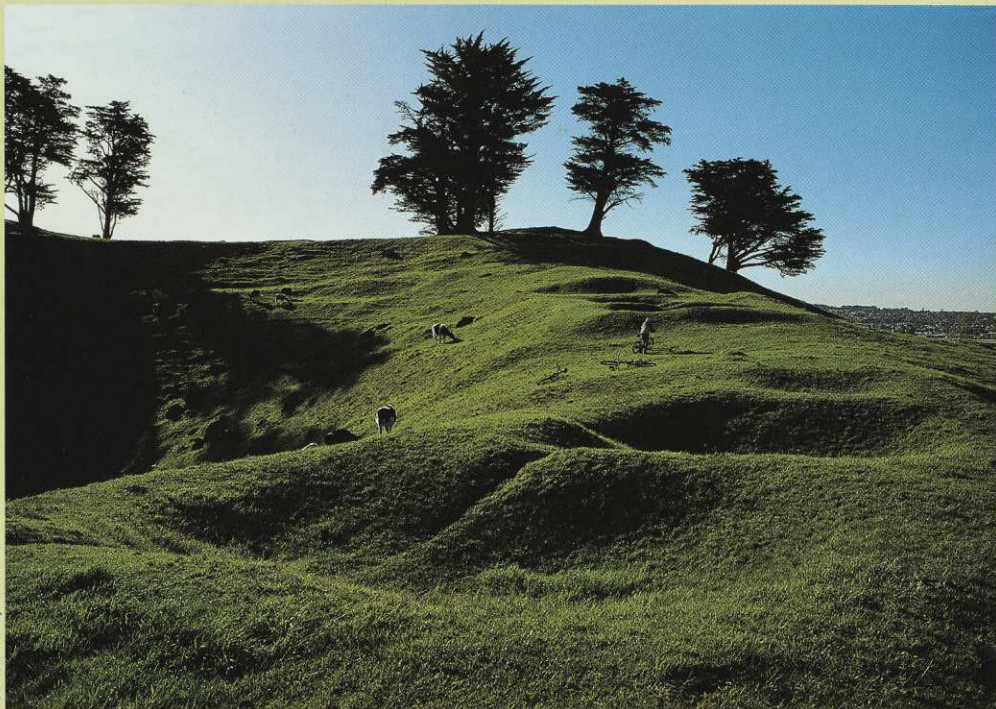
environment but there are no plans to remove them; nor to replace them as they fall. A stand of young puriri along the eastern rim and more plantings of natives will gradually allow a more indigenous character to prevail.

Adjoining the mountain reserve to the north-west is Ambury Regional Park, an Auckland Regional Council domain where Riding for the Disabled, recreation, teaching and farming activities take place. Lava caves lie beneath its surface — in these Waiohūa are said to have hidden from the Ngāti Whatua invaders.

To the south stretch the stonefields of Otūataua at Ihumatao (93.3 hectares were bought by Manukau City Council in 1999)

and Matukurua at Puhinui where for hundreds of years people lived and grew crops.

The many deep rua, or storage pits that are clearly visible on the mountain are proof of the abundance of these crops — kumara for the most part, but of different varieties from the red or golden ones we eat today. The first Maori immigrants brought sweet potato *Ipomoea batatas* with them from their Pacific homeland, along with other crops, such as taro *Colocasia esculenta*, uwhe or yam *Discoreia* species, and hue or gourd *Laganaria siceraria* which gradually became less important as a food source. Elsdon Best, writing in *Maori Agriculture* (1925), gives 82 different names for what we



Bike riders have eroded a path from pit to pit.

know simply as kumara. Other earlier writers recorded the great variety of shapes, colour and texture of the vegetables they saw. Some were said to be the size of a finger while others weighed 'several pounds'. These kumara were rough or smooth-skinned, the flesh red, white or purple.

Elsdon Best refers to new varieties introduced in the early 1840s that were more easily cultivated. While most but not quite all of the old cultivars have been lost, Ian Lawlor, the Auckland Regional Council's senior archaeologist and team leader for cultural heritage, has grown three varieties which give us some idea of what might have been grown on Mangere's slopes and stored

in its pits. (See box.)

Called hutihuti, rekamaroa and taputini they are different in habit from the kumara we know: the modern plant sends out vines and shoots whereas the older varieties are bushy and grow in clumps. Ian Lawlor says his plants were very hardy and produced a large number of tubers, not inferior to modern produce. Their bushy character would have made them suitable for traditional methods of production and storage.

To compensate for the cooler climate here, Maori learned to utilise the millions of stones littering the ground. They heaped them into mounds and filled the interstices with soil so that the stones absorbed the



From the rim, looking into the crater of Mangere Mountain — note small cone at centre and bare volcanic rock.

Getting to Know A Volcano

Quarrying, the scourge of Auckland's volcanic cones, took a large chunk out of Mangere mountain but it's hard now to see where. The wound has healed well and the site has become an education centre administered by the Mangere Mountain Education Trust. This collaborative body consists of two representatives each from the Department of Conservation, the Auckland Regional Council, Manukau City Council and Te Waiohū Trust.

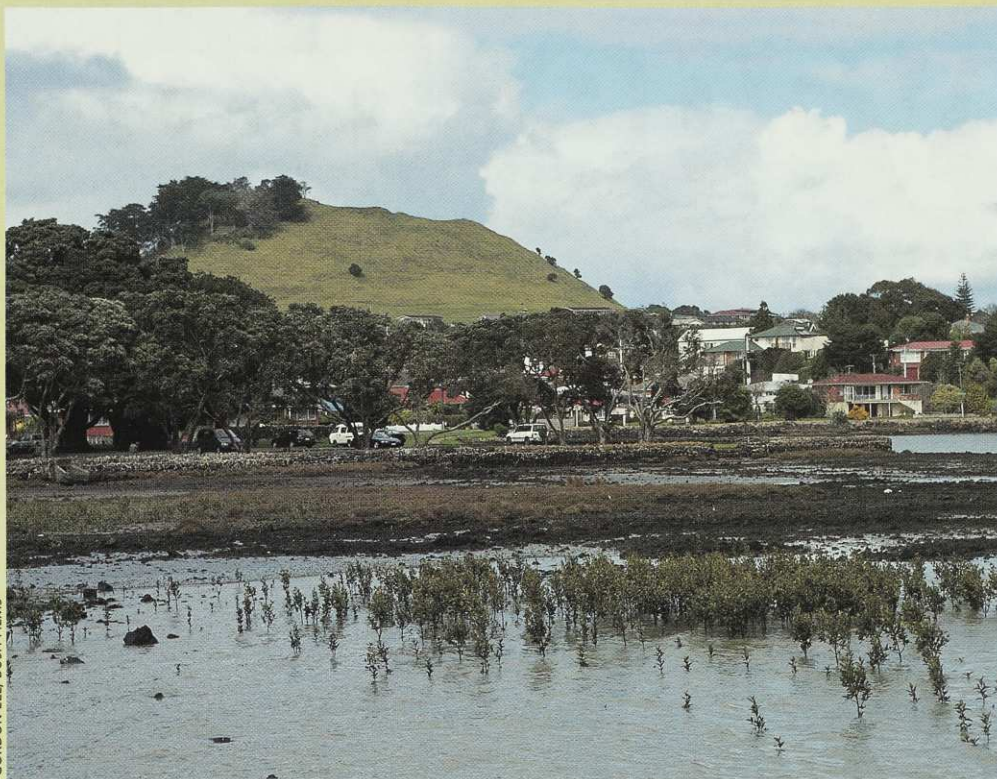
The former quarry depot office has been refurbished as the centre itself and the old pumping station, which houses a deep well, has been restored. Beside it a kumara garden has been established, as a trial patch using modern varieties. It is hoped eventually to propagate tubers of older varieties.

Illustrated panels provide information on Maori gardening and occupation and on the mountain's volcanic origins. A native plant garden, the Children's Nature Park which won a gold medal at last year's Ellerslie Flower Show, has been recreated next to the centre. Designed by Jan Latham, this was commissioned by Manukau City Council.

Weeds on the old quarry wall have largely been dealt with. The few straggly remnants of gorse will, it is hoped, provide a nursery for the spread of natives from a thickly planted neighbouring plot. A path from the centre joins a walk that leads past a sports field and circles the mountain, taking in its most important traditional, archaeological and geological features.

The education trust's aims include the protection of the mountain, the development of an education programme and visitor centre, and the initiation of scientific investigations into the area. It hopes in the future, to employ a director and a teacher.

Activities have a strong bi-cultural focus with particular relevance to the many schools in the district with high numbers of Maori and Polynesian students.



Mangere Mountain is surrounded by housing and the volcanic shores of the Manukau Harbour.

sun's heat, warming the soil and creating a microclimate in which to grow tropical vegetables. They also built low walls for wind shelters and used the stones to delineate the boundaries of family gardens and to form house-wall foundations.

Remnants of these boundary walls, which radiated out from the base of Mangere and up its slopes, can be seen from above or picked out when the light is right. Walking along the crater rim one is struck by the immense industry involved in the creation of what was the hub of a populous Maori town. More than 160 terraces, dug using a ko, or digging stick, rib the outside of the two cones. In some places they extend from the rim right down to the base of the mountain, and at others spill over into the inside.

These terraces were mostly living areas. It is likely that, while evidence of some ditch and bank defences have been found at Mangere, this mountain was never a pa or completely fortified village in the manner of other Auckland cones such as Maungakiekie (One Tree Hill) and Maungawhau (Mt Eden).

Mangere was, nevertheless, in a strategic position since it overlooked two portages from the Manukau to the Tamaki river. It was along one of these routes that two of the earliest Europeans to visit Mangere, the missionaries Samuel Marsden and John Butler, walked in 1820. They both left accounts of the thriving communities at Mangere and Onehunga and of the gardens they saw. Canoe trade and traditional communication routes had already spread a

range of European vegetables. The introduction of potato revolutionised Maori gardening because careful management allowed at least two crops a year — twice as many as kumara. The missionaries noted that maize was well established, as were pumpkin and watermelon. They also saw herds of pigs.

They would likely have met the eminent Ngati Whatua chief Apihai Te Kawau who was born at Mangere and who negotiated the sale of the first Tamaki land to Governor Hobson. But hardly a year after his birth, Apihai's people fled the place in fear of Hongi Hika who, with his muskets, decimated the nearby pa at Mokoia (Panmure) and on Maungarei (Mt Wellington).

Apihai and his people returned in about 1835 and by the early 1840s the gardens of Mangere were once more in full production, providing meat and vegetables for settlers in the newly established town of Auckland.

A few years later large chunks of Mangere land passed into settler hands and Maori gardens became market gardens. This land-use persisted until well into the twentieth century when population growth resulted in houses covering the fertile fields.

Mangere Mountain became a public domain in 1890. It encompasses an area of about 65 hectares, 70 percent of which is an historic reserve. The remainder is recreation or local purpose reserve.

— PAT BASKETT is an Auckland-based feature writer.

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A Voyage into Inner Space

Marine Biologist ANDREW STEWART talks with DAVE HANSFORD about deep-water discoveries north of New Zealand.

Scientists aboard the research vessel *Tangaroa* got their first tantalising glimpse of life on the seamounts and underwater abyssal plain to the north of New Zealand, earlier this year. The deep gave up some secrets, but kept many more. As biologist Andrew Stewart recalls: 'We came away knowing how little we know.'

Andrew Stewart shows me one of the discoveries. It's a vision from a watery hell. Little more than a mouth full of murderous fangs and a way of aiming it, but he cradles it gently, teasing out the black gelatinous features with a practised eye for detail.

He's excited. He thinks he could be on to a new species of deep-sea anglerfish here, but the trouble is, his lab is chock-full of new species and he only has one lifetime to try and identify them all.

All about, stainless benchtops groan under ranks of specimen jars. Peering back through the alcohol are some of evolution's most fantastic expressions. Even without the crazy-mirror distortion of the glass these are bizarre animals, confirmed by the pejorative names on the labels floating inside; spookfishes, snaggletooths, gulpers, slickheads, rattails.

This — plus a freezer full of bigger corpses — is some of the bounty

Transparent squid, a deep-water species, photographed by Peter Batson whose book Deep New Zealand is previewed on pages 32-33.

reaped by the National Institute of Water and Atmospheric Research (NIWA) vessel *Tangaroa* as it towed nets and dredges about the deep in New Zealand's northern waters in May-June.

Supported by Australia's National Oceans Office and the New Zealand Ministry of Fisheries, the NORFANZ expedition took a first, albeit sketchy, look under the waters of a triangle between Lord Howe and Norfolk Islands and the northwestern tip of New Zealand.

They began with the Norfolk Ridge, a spine of submarine scarps and volcanoes stretching between Cape Reinga and New Caledonia. While the scientists aboard had never been there, they had seen the results of earlier French projects to the north which had discovered a wealth of oddities, some of which were relics presumed to have gone extinct tens of millions of years ago.

Andrew Stewart, the fishes collections manager at Te Papa, was looking for answers.

'If you look at charts of the region, you see a series of seamounts running down the Norfolk Ridge,' he says. 'We know that during

PETER BATSON

Gondwanan times, the ridge was at one point a coastline, which poses all kinds of questions. For instance, do ancient species still follow a possible migration route along the ridge? Were the seamounts acting as oases? What were the effects of various currents and boundaries that cross at right angles to this feature, that perhaps acted as barriers to these migration movements?

Four weeks at sea wasn't enough to solve all the mysteries.

'It was very tantalising,' he says. 'We sampled down to 2000 metres, which sounds impressive until you realise that the average depth of the world's oceans is about 4000 metres. That sort of depth around New Zealand has only been sampled a handful of times.'

'Because of time constraints, we only grabbed a snapshot. It's like taking a spaceship to a far planet and only having the time to make one pass, with all your cameras and sensors firing, then having to return to earth.'

For all that, the haul was impressive. *Tangaroa's* nets and dredges disgorged around 500 species of fish (some that were readily identifiable, many more that weren't), and some 1300 species of invertebrates.

Part of the booty was eight drums of 'gribble', or fine, shelly seabed sediment, which Te Papa malacologist Bruce Marshall began sifting for tiny molluscs. During the first 10 hours of work, says Stewart, a new mollusc emerged about every two minutes, eventually topping 600 new species.

On first assessment, there are about 34 new fish records for New Zealand, roughly half of which are also likely to be new to the planet.

But what is all this good for? Why should we know — or even care — about what burrows through the mud and darkness two kilometres under the sea? Clearly, Andrew Stewart has his own reasons, but he gives the official line: 'New Zealand is a signatory to the Rio Convention on Biodiversity which means that we're obliged to care about the biodiversity within our region. And with that obligation comes the duty to answer the questions: "What is the fauna and flora of New Zealand? What is unique here? How do we care for it?"'

'Often the little things get overlooked in the stampede to examine the big things,' he says, 'but the little things are the key to the survival of the big things.'

Especially in the endless cold night that is life at 2000 metres.

'In the midwater, animals are born, live and die without ever seeing the sea floor or the sun, floating in a kind of inner space.'

'Although the ocean is the world's largest habitat, it's not the most densely populated [*Tangaroa* trawled the midwater for hours to



It's a vision from a watery hell, little more than a mouth full of murderous fangs and a way of aiming it. Marine biologist Andrew Stewart thinks this could be a new species of deep-sea anglerfish, discovered in deep water north of New Zealand.

capture a single tray of fish], so fishes such as anglerfishes have huge mouths and elastic stomachs, so they can accommodate any type of prey that comes their way.' Useful, when meals could be months apart.

In this frigid netherworld, finding sustenance — or a mate — takes on a whole new level of difficulty. In response these creatures have produced, with little more than DNA and the evolutionary millennia, devices that the world's military have spent billions of dollars devising.

Most of the denizens down here are coloured black, or blood red. There is no red light at these depths (it's the first band of the spectrum to fail in the fading light), so a red-coloured animal is all but invisible to predators.

Some hunters, however, have developed eyes that can detect the faintest of silhouettes against the barely perceptible glow from the surface. In defence, some of their prey possess banks of light-emitting organs along their underbellies. They can switch them on to match the exact hue and shade of the faint surrounding light so that their narrow bodies simply blend into the background.

Other predators have learnt to 'see' in infrared — a normally invisible wavelength. Their hapless prey have no idea they're being stalked, except for those that have responded by producing their own 'cloaking devices' which block infrared emissions.

Others have learnt to escape by startling their pursuers with brilliant flashes of bioluminescence.

It's this sheer ingenuity that's captured

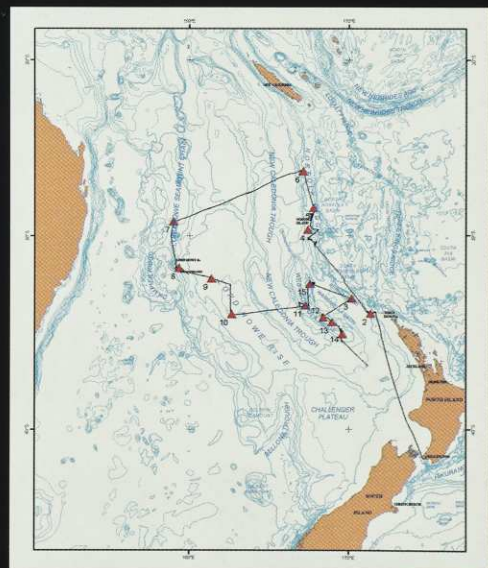
Andrew Stewart: 'The incredible diversity of ways in which these fishes successfully answer the demands of life at depth. That's the wonder of it.'

It's said we know more about the dark side of the moon than our own seabed. Stewart points out that the space probe 'Magellan' mapped the surface of Venus down to just metres, yet we're familiar with perhaps only 10 per cent of the continental shelf and the abyssal plain beyond.

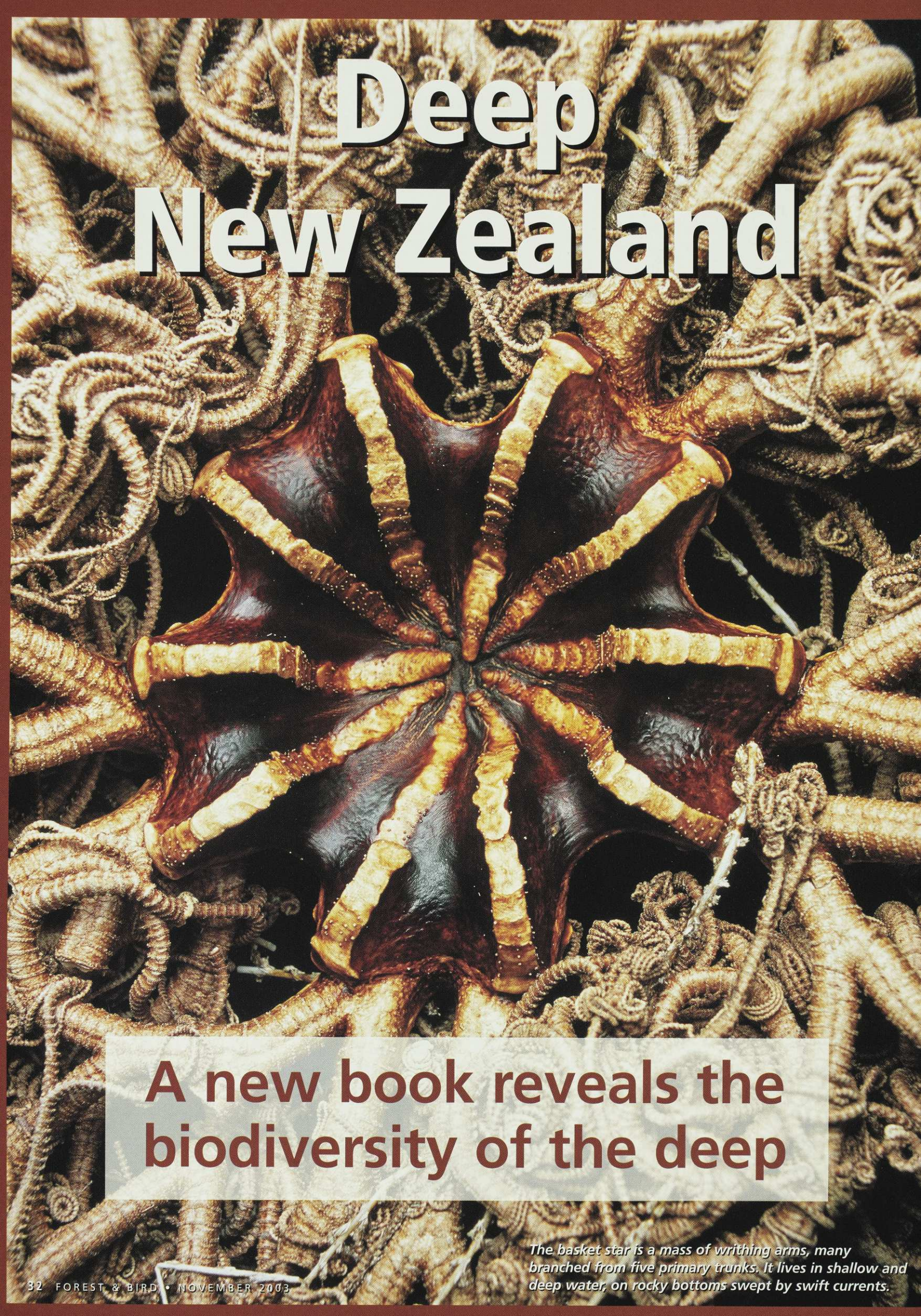
By Andrew Stewart's reckoning, a stranger to New Zealand science turns up, on average, every two or three weeks; which is why he's champing at the bit to go back to the deep. He would love to bring one of the world's few 4000 metre-capable submarines out here for a closer look.

'I'd go back tomorrow. There are other ridges to the north — the Three Kings Ridge, the Kermadec Ridge, then there's the Puysegur Trench, the Tasman Basin off Fiordland.

'I want to know what's down there.'



The course of the NIWA research vessel Tangaroa on its voyage, supported by Australia's National Oceans Office and the New Zealand Ministry of Fisheries.



Deep New Zealand

**A new book reveals the
biodiversity of the deep**

The basket star is a mass of writhing arms, many branched from five primary trunks. It lives in shallow and deep water, on rocky bottoms swept by swift currents.

The illustrations on the adjacent pages of this journal are a tiny sample of the wonders to be found in New Zealand's marine world. Taken by author Peter Batson, they demonstrate dramatically the diversity of our regional life underwater.

Peter Batson writes about the 'other nine-tenths of New Zealand' in his recent book *Deep New Zealand, Blue water, black abyss*, which examines the underwater nature of our Exclusive Economic Zone, falling to 10 kilometres under the surface of the sea.

This is the world where underwater mountains bigger than Aoraki/Mount Cook rise from darkling plains to peak often still a kilometre underwater. This is the deep ocean where fishing trawls may accidentally raise fish which make gargoyles seem comparatively handsome, and where there live giant squid 'as long as a bus'.

Peter Batson knows about these waters and writes lovingly and clearly about their values. His book describes the bottom of the ocean and the ecology of our surrounding seas. Chapters are devoted to the various life forms underwater. Photography by Kim Westerskov (and others who have studied deep water life forms), reveal dramatically the rich diversity of life in our waters.

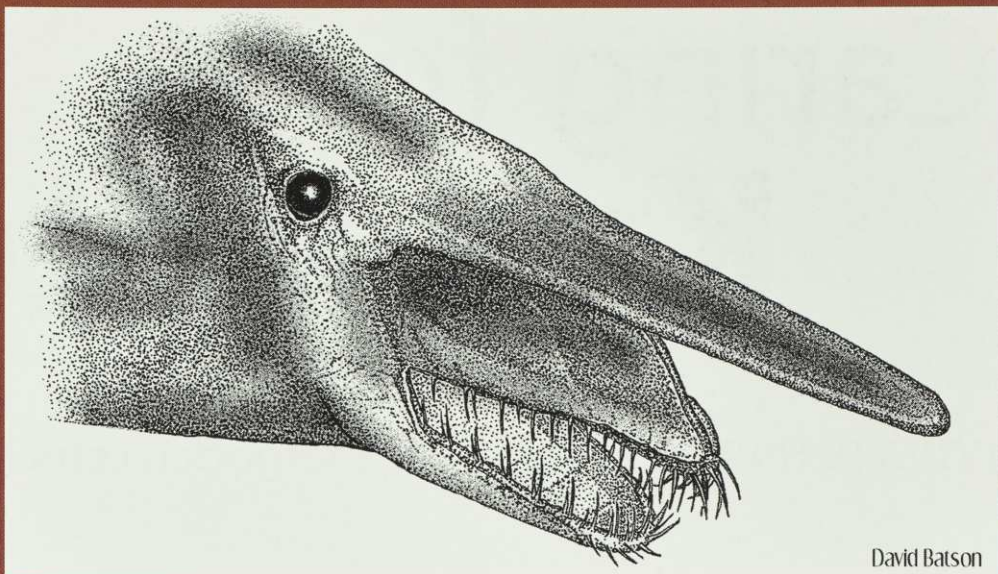
Exploration of our deep sea is still in its infancy compared with the land, and discoveries of new species are mounting at a dramatic rate — for fishes alone, around one new species a fortnight. Peter Batson then records an estimate that only one two-millionth of our Exclusive Economic Zone, stretching 200 nautical miles (370 kilometres) offshore, has been thoroughly sampled by scientists.

Since the establishment of this huge EEZ, New Zealand commercial fishing has extended far into the deepwater zone. Its conservation has become of serious concern.

New Zealand has some 500 seamounts standing taller than 250 metres from the ocean floor (see *Exploring Our Underwater Mountains, Forest & Bird*, May 2000). Only a few are protected from increasing pressure from commercial fishing.

Compared with our well-known environments of the mainland, New Zealand's deepwater world is some 10 times as extensive and still largely a mystery. The visual impact and lively expression of this book makes it important as an accessible outline of the wild values of our ocean empire. It is also a significant and timely reminder of the need for further conservation of our seas. — GORDON ELL

Deep New Zealand, Blue water, black abyss by Peter Batson, principal photography by Kim Westerskov, Canterbury University Press, Christchurch 2003, RRP\$49.95



David Batson

The goblin shark probably hunts prey in the darkness of deep water by detecting their electrical fields. David Batson drew this portrait, for like many deep water creatures, their soft bodies collapse when fished up.



Hagfish are an evolutionary remnant of the earliest fish which lived some 450 million years ago. They live at depths down to a kilometre. Disturbed, an hagfish can instantly produce a bucketful of thick slime earning its other name, snot fish.



A juvenile ghost shark, an abundant species on the continental slope, which falls from New Zealand's shallow continental shelf at round 130 metres to the Pacific depths, 4-5 kilometres below.

Caring for Kaitorete Spit

LYNETTE HARTLEY reports on a forgotten corner of coastal Canterbury.



Kaitorete Spit looking toward Banks Peninsula in Canterbury. Native pingao backs the shingle beach which contains Lakes Forsyth and Ellesmere from the open ocean.

Standing on the first row of dunes that rise behind the beach at Kaitorete Spit you can sometimes glimpse the rounded dorsal fins of Hector's dolphins as they feed in the disturbed water beyond the surf line.

The dunes, which run the full 24-kilometre length of the spit, disappear in the distance in the misty salt-laden air. The coarse grey sand and gravel is covered in meandering clumps of wiry, reddish-orange pingao, the native sandbinder that once covered much of New Zealand's foreshore.

Kaitorete Spit forms a natural barrier between Te Waihora /Lake Ellesmere and the Pacific Ocean. Strictly speaking it is a barrier not a spit because it is joined to the mainland at both ends. It is approximately 6000 years old and gravel is still being

added by currents sweeping up the east coast of the South Island. A series of old, low dunes stretch back behind the younger, active dunes at the ocean edge.

At the eastern end, where the spit butts up against Banks Peninsula, it is five kilometres wide but it tapers to about 250 metres at the western end. Contained behind it, the large, shallow, brackish lake of Te Waihora is one of New Zealand's most important wetland systems, particularly for wildlife. The International Union for the Conservation of Nature recognised it as being internationally important in 1981.

On its outside, Kaitorete Spit is special. The environment is very dry and exposed — more reminiscent of an alpine than a coastal environment. The spit has the largest continuous population of pingao in

New Zealand and a distinctive flora and fauna which some have suggested merits its own ecological district. The introduced marram grass is present but the spit escaped mass plantings of marram that occurred on many other New Zealand sand dunes in an attempt to stop sand movement.

There is a very high level of endemism — life forms peculiar to this place — among the plants and invertebrates on the spit. Examples include a native broom *Carmichaelia appressa*, a woolly-head *Craspedia 'kaitorete'* which is still to be formally named, and at least three species of moth, *Kiwaia jeane*, *Kupea electilis* and a new *Notoreas* species. The invertebrate and moth fauna is diverse and the spit is also home to several species of skink and gecko. In addition, many species found on the spit

such as *Muehlenbeckia astonii* are becoming rare elsewhere.

Despite its high conservation values, little of Kaitorete Spit has formal protection. Most of the land on the spit is farmed and has been for many generations. Public conservation land comprises a strip of land running the length of the ocean side of the spit including the dunes (but not associated grasslands) and three small scientific reserves further inland.

‘Unauthorised off-road motorbike and four-wheel-drive use is a significant problem on both conservation and private land, crushing threatened plants, damaging the dunes and archaeological sites,’ says Forest and Bird field officer Eugenie Sage.

‘Grazing needs to be considerably reduced. Stock, especially cattle, damage pingao and mature shrubs, inhibit regeneration and spread weeds. DoC is reviewing its grazing licences and working with the three private landholding families on the spit to improve fencing and control stock access. Environment Canterbury and the Banks Peninsula District Council as other landholders could do the same,’ Eugenie Sage says.

‘The distinctive landscapes, plants and wildlife and outstanding conservation significance of Kaitorete Spit and Te Waihora mean that the area deserves a higher profile, more resources and better co-ordinated management.’

DoC and Ngai Tahu are in the final stages of preparing a joint management plan for Te Waihora/Lake Ellesmere. This plan covers the lake edge of the spit. The department is currently working on a restoration plan for the seaward side of the spit.

Most of the area behind the dunes and stretching to the lake edge is farmed by three separate families. It is a mixture of freehold and leasehold land. It is covered in grasses, shelter belts of pine trees and patches of low native shrubs. The land is currently owned by Environment Canterbury, Banks Peninsula District Council and private owners.

The Maori marae at Taumutu, on the mainland at the western end of the spit, owns a substantial section. The farmland in the central part of the spit is dotted with knee- to waist-high rounded shrubs of shrubby tororaro *Muehlenbeckia astonii*. Of approximately 2600 plants in the wild in New Zealand 2500 are on the spit.

M. astonii is a divaricating shrub with wiry branchlets and small heart shaped leaves. Given a chance it lives for up to 80 years and grows up to 4 metres high. It is home to many invertebrates peculiar to the



An interpretation panel, urges visitors to go gently on the fragile dunes.



From Banks Peninsula, Kaitorete Spit defines the coastline, with Lake Forsyth in foreground, Lake Ellesmere beyond.



The rare *Muehlenbeckia astonii* is host to many invertebrates.



Kaitorete Spit has New Zealand's largest spread of the native dune plant pingao. Unfortunately, threatened and rare plants can be victims of off-road vehicles and bikes.

spit, particularly moths. Individual *M. astonii* plants can survive grazing by stock but no young plants are found in the grazed pastures of the spit. DoC has a nationwide recovery plan for *M. astonii*. With farmer co-operation, an area on the spit containing 30 *M. astonii* was fenced three years ago to exclude stock. Outside the enclosure the grass is short and the *M. astonii* shrubs are rounded by grazing. Inside the grass is long and the shrubs are starting to send out straggly shoots. So far there are no young plants in the enclosure but the DoC botanist for Canterbury conservancy, Nicholas Head, is optimistic.

A strip along the ocean side of the spit from the high-tide mark to roughly 300 metres inland is public conservation land. In a couple of places scientific reserves increase the width of this strip by up to a kilometre.

This area is particularly vulnerable to

damage. It includes the front dunes and the older lower dunes behind them. It also contains the pingao community and most of the endemic and rare plants. At present cattle and vehicles can get in to the dune area along much of the Banks Peninsula end of the spit. It is ironic, Nicholas Head says, that plants capable of withstanding the extremely harsh conditions of the spit cannot cope with disturbance from animals and vehicles.

There is a formed road running the length of the Spit with limited access to the beach and several informal vehicle tracks through

the dunes. A management report for DoC describes motorbike use along the length of the dunes as killing adult pingao, causing dune erosion and vegetation damage and disturbing and exposing sites important to Ngai Tahu.

How to discourage the inappropriate use of vehicles is a major challenge for DoC and local councils. DoC does not intend to stop vehicle access along the beach, however, signage and proposed new fencing along the back of part of the dunes should help reduce vehicle damage. DoC senior biodiversity officer, Robin Smith, says vehicles do little



Pingao in seed.



Kaitorete woolly head, *Craspedia 'Kaitorete'*, peculiar to the Spit.

Maori Links With Kaitorete Spit

With the massive wetland of Te Waihora/Lake Ellesmere on one side and the Pacific Ocean on the other, Kaitorete Spit was, and still is, important for Maori. Lake and ocean food would have been prolific and the nearby forests of Banks Peninsula (Horomaka) would have provided still more resources.

A natural resource manager of Te Runanga o Ngai Tahu, David O'Connell,

says there is rich evidence of overnight and semi-permanent camps on the spit and of gathering fish and seabirds. With the extensive, and impassable wetlands stretching inland, the continuous spit was also a major route for Maori travelling between Banks Peninsula and South Canterbury. There were permanent settlements on the mainland at either end of the spit.

David O'Connell says the Taumutu marae to the west recently purchased land on the spit to re-establish a link between the runanga and its heritage. The land is on a perpetual lease to the existing farmers. David O'Connell says the runanga has established a good relationship with farmers. Stock numbers are kept low and the runanga wants to maintain the ecological values of the spit.

damage if they travel below the high tide mark. Unfortunately soft sand can force them higher up. A minority of vehicles and bikes deliberately go in to the dunes to hoon.

The Department of Conservation has put in considerable effort to removing pockets of marram grass and, where necessary, replanting pingao. Some other weeds such as gorse, lupins and boxthorn on the spit are also being controlled by the department. Limited animal pest control occurs. Farmers on the spit are opposed to any restrictions on grazing although they are willing to work co-operatively with the department.

Albert Birdling, whose family has farmed on the spit for over 100 years, says the spit's farmers are very aware of its special nature and farm responsibly and sustainably.

'If we were going to stuff it up we would have stuffed it up long before now,' he says.

To date, the ecological values of the spit have been partly protected by the fact that few people are aware of its beauty and accessibility and the fact that it has been under a stable and relatively conservative farming regime. The Department of Conservation has been hampered by lack of resources but for the last seven years has funded protection and restoration programmes.

Nicholas Head of DoC says a long-term possibility is establishing a reserve running from one side of the spit to the other. It could contain a representative sample of each habitat and link the dunes with Te Waihora/Ellesmere.

The spit has the potential to become increasingly important over time if Te Waihora is returned to a more natural state but it will also come under increasing pressure from off-road users. Let's hope that future generations can also stand on the dunes at Kaitorete Spit, surrounded by pingao, watching Hector's dolphins in the surf.

Lizards on the spit

A Kaitorete Spit resident's distress, every time her flatmate's cat caught a lizard, has led to a three-year study on the merits of providing hidey-holes for lizards. Marieke Lettink, who describes herself as a lifestyle biologist, has been living at Birdlings Flat, a small cluster of baches at the Banks Peninsula end of the spit, for four years.

The spit is home to a species of gecko, the Canterbury gecko *Hoplodactylus aff. maculatus*, and three species of skink, the common skink *Oligosoma polychroma nigriplantare*, McCann's skink *O. maccani* and the spotted skink *O. lineocellatum*.

Both the Canterbury gecko and the spotted skink are known to have declined in numbers over the last 30 years.

The germ of the idea for Marieke Lettink's study was planted several years ago while replacing the roof of an old shed. She found hundreds of geckos living under the old roof which was made from corrugated asbestos. Marieke Lettink used the old asbestos to make new lizard homes by stacking it four or five sheets high in the back yard. There are one centimetre gaps between the sheets and Marieke Lettink says the asbestos is perfect for lizards because the sun heats it slowly and it retains heat.

Over the years Marieke Lettink has found more and more geckos, including young ones living under the sheets despite the presence of the cat. The observation has led Marieke Lettink to start a PhD through the University of Otago looking at what happens if lizards are provided with habitat that lets them escape from predators. The study will have implications for lizard conservation in parts of New Zealand where it is impossible to remove predators.

Marieke Lettink deliberately chose Kaitorete Spit for her study because she loves the environment.

'There's not much of this type of habitat left in New Zealand. It's an example of an ecosystem that's really worth protecting. You live and you work out here and you get a feel for the place. It's so open, you get a real feeling of space with an expanse of sky.'



Marieke Lettink is studying artificial lizard habitat; Canterbury gecko inset.

Coming Home to Roost

DAVE HANSFORD finds native birdlife is spreading beyond the Karori Wildlife Sanctuary into the capital's suburbs.

In the heart of Wellington, a kaka plucks fruits for a hungry brood. Saddleback fossick about in the leaf litter, chattering their insistent staccato. Robins and tomtits flit from trunk to trunk, gleaning insects from the leaves and lichens, and the blooming canopy is a whirl of whiteheads. As the shadows of dusk creep across the valley, kiwi call to one another through the frosty half-light.

It's a scene from a New Zealand of long ago, stolen from the mainland by possums, stoats, rats, cats, pigs, goats and deer. Yet this is not an offshore island. The kiwi are calling just four kilometres from Wellington's Central Business District.

The Karori Wildlife Sanctuary is an inspired vision. The idea was to take an old water reservoir and surround it with a fence that would keep out the legions of predators and browsers that have destroyed the forests elsewhere. A carefully considered programme of reintroductions is bringing the New Zealand forest of old back to the capital.

Left to feed and breed in peace, the birds have exceeded all expectations. Last season, one pair of bellbirds raised 13 chicks. And a pair of falcons has moved in, a sure sign that an ecosystem is cranking up again.

The Sanctuary has filled with birds so quickly that many have jumped the fence and spread into suburbia, to the delight of the neighbours.

For now, the bird programme has slowed for staff to catch their breath and interpret

*Wellington personality
Peter Bush was sitting down to
lunch in his Island Bay garden,
only to have his meal pinched by
a kaka. And he didn't mind a bit.
The success of the Karori Wildlife
Sanctuary has reunited
Wellingtonians with old friends
they thought were lost for good.*

the fruits of their labours (though the release of red-crowned kakariki is planned, and the tomtits and bellbirds will be 'topped up').

'We want to make sure we thoroughly

document the work that's been done,' says the Sanctuary conservation manager Raewyn Empson. 'It was always an integral part of the plan. We want to learn as much as we can, even though we're stretched to monitor the releases we've done so far.'

There's still trouble in paradise. On the wall, in Empson's chaotic office, is a photo of a mouse with its head between the mesh wires of a 'pest-proof' fence. Despite the best of research and development, mice are still breaching the Sanctuary. Rachel Empson thinks the fence is still a barrier to adult mice, but young animals — perhaps



Pest-proof fence (in foreground) separates suburb from Karori Wildlife Sanctuary.

DAVE HANSFORD/ORIGIN NATURAL HISTORY MEDIA



DAVE HANSFORD/ORIGIN NATURAL HISTORY MEDIA

Conservation Manager Raewyn Empson introduces Juliette Desborough-Mitcalfe, aged 4, to a little spotted kiwi *Apteryx oweni* at Karori Wildlife Sanctuary. The bird was one of 11, captured on nearby Kapiti Island, released into the Sanctuary as part of a restoration project.

10 grams and under — are somehow able to squeeze through.

The key, she thinks, is the depth of the animal's skull. It's the largest solid part of its body. If it can get that through, the rest will follow.

'Their bodies can flatten out to the point where they can get through 6mm mesh,' she says. One option being investigated is to re-orient the fence's rectangular mesh from vertical to horizontal. She says the mice may not think to turn their heads to one side to start squeezing through. Other options, include the addition of a solid sheet of cladding around the fence's base, but trials will have to wait until next summer, when they can catch plenty of baby mice.

For the time being, reptile reintroductions — including plans to bring tuatara home to the Wellington mainland — are on hold. The same goes for the large-bodied invertebrates — giant weta and speargrass weevil.

'I think we'll eventually be able to stop the mice; the right fence is out there somewhere,' says Rachel Empson. 'But in the meantime, without any larger predators inside the Sanctuary, bird numbers are exploding, which is providing an interesting research project in itself. There's no evidence of direct predation on eggs or chicks, but mice are known opportunists.'

Other work goes on apace. Once permits are secured to use the fish toxin Rotenone, brown trout and a plague of perch will be eradicated from the lower of the Sanctuary's two lakes, which have two distinct mixes of fauna.

Once that's done, the lakes will get the same treatment as the forest, says Empson. 'We already have short-finned eel and banded kokopu; we want to introduce mudfish, other galaxiids, long-finned eel.'

When that happens, researchers from the Department of Conservation and Massey University will be watching closely, documenting the response of native freshwater fauna as the invaders are removed.

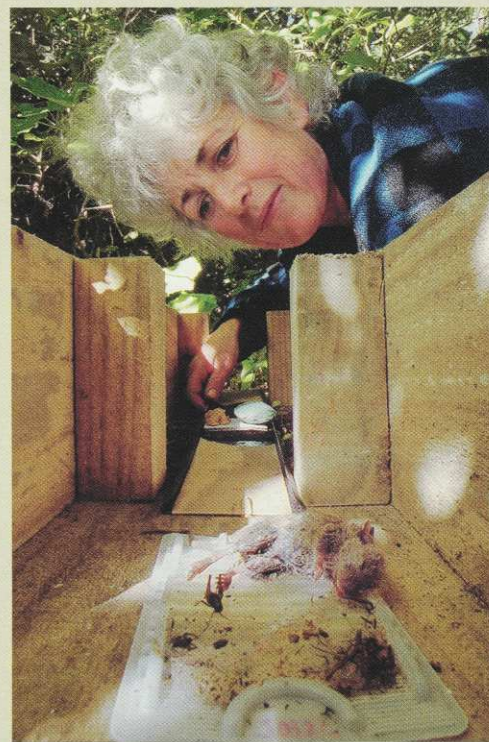
Therein lies another of Karori Sanctuary's great gifts. It's a living laboratory, a test bed for valuable research in several disciplines. 'What happens when we remove this? What happens when we add that?' Currently there are four theses in progress on plants, six research projects on birds and two fish projects, plus the Sanctuary's own monitoring work.

Karori Sanctuary is pioneering techniques. People elsewhere with restoration plans are watching closely as Karori's staff tackle and surmount problem after problem.

'We've learnt an awful lot already,' Rachel Empson says, 'and the lessons will be really

valuable for other reserves and potential "mainland island" projects.'

In the meantime, ordinary Wellingtonians are just happy to see some old friends come home at last.



DAVE HANSFORD/ORIGIN NATURAL HISTORY MEDIA

Raewyn Empson with glue trap set for mice. Plans to reintroduce some of the country's most endangered invertebrates and reptiles are on hold as mice continue to penetrate the Sanctuary's 'predator proof' fence.

The Lives of Leaves

A leaf is a factory for making food. It makes food for the plant, and the plant in turn is food — for animals, fungi and bacteria that haven't got leaves and therefore can't make their own food. So, leaves are much more than just an abstract interest to us animals!

The leaf-factory is efficiently designed. It has a transport system to bring in the raw materials, water from the roots along the xylem vessels or pipes in the leaf veins, and carbon dioxide from the air through the portholes in the leaf called stomata. The food-making machinery is the palisade cells, which contain the chloroplasts.

The sun is the source of energy that powers the leaf-factory and the leaf is angled to catch the sunlight. To enable the chloroplasts to function efficiently, the palisade cells are packed along the upper, sunny side of the leaf.

In the chloroplasts the raw materials of water and carbon dioxide are combined in a chemical reaction which yields sugar, oxygen and water. The secret of the process, the spark that makes it happen, is the green pigment, chlorophyll, contained in the small chloroplast bodies. The manufactured sugar is then dispatched through the phloem tubes in the leaf veins around the plant to the stems, roots and growing buds.

Food-making is the primary function of the leaf; so, all things being equal, the best food-producing leaf would be large, thin and green. But all things are not equal in the natural world. The friendly sun, the source of energy, can also be the plants enemy, evaporating so much water out of the stomata portholes that the plant wilts and dies. The drying wind sucks out water too, and wind and rain and hail hammer the soft leaf and damage its machinery.

So leaves must compromise. They are modified in a host of ways to cope with the environment while still carrying out their food-making functions. Big, soft leaves like those of the whau grow in cool, sheltered forests.

Leaves in windswept places like rangiora, or exposed to burning salt spray like



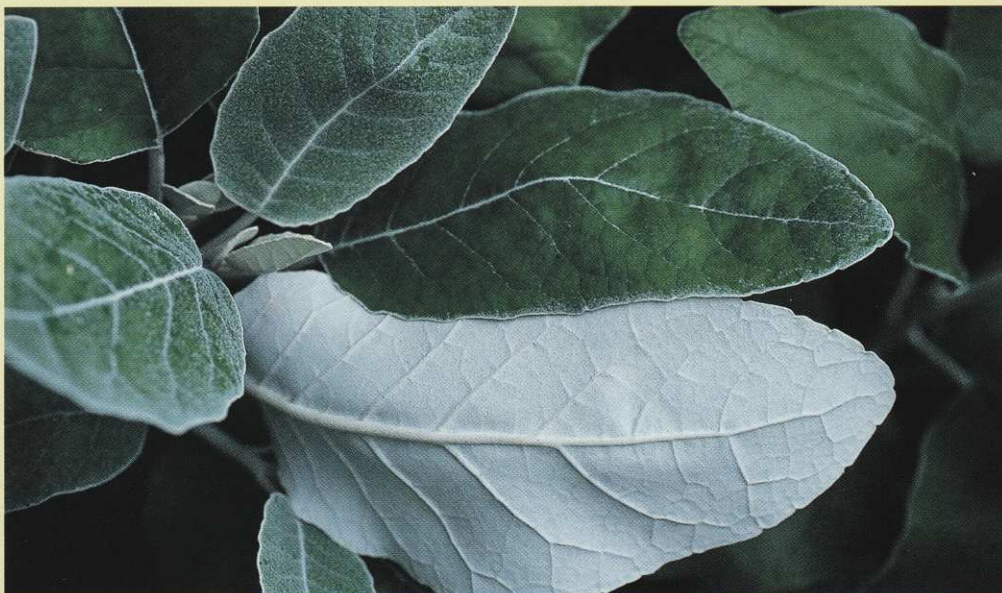
Leaf of whau, large and heavily veined, grown in forest shelter.

GORDON ELL, BUSH FILMS.

pohutukawa, are often leathery and may have a waxy covering on the upper surface and a downy coat of hairs underneath the leaves. This is smart. The waxy upper surface protects the leaf from damage and seals in moisture but still lets in the light. But being impervious to water precludes having stomata on the top of the leaf so they are on the undersurface amongst the hairs. There they can be open to admit air but lose little water in their shady, hairy shelter.

High up in the mountains where the sunlight is intense and the temperatures freezing, leaves may be woolly-coated all over like the native edelweiss. The young, tender leaves and shoots of alpine plants are often coloured with red pigments known as anthocyanins, which acts as a sunscreen.

Just as the wide, flat leaves of the dicotyledons are adapted to their environment, so too are the spear-like leaves of the monocotyledons. In harsh environments they may have a waxy or



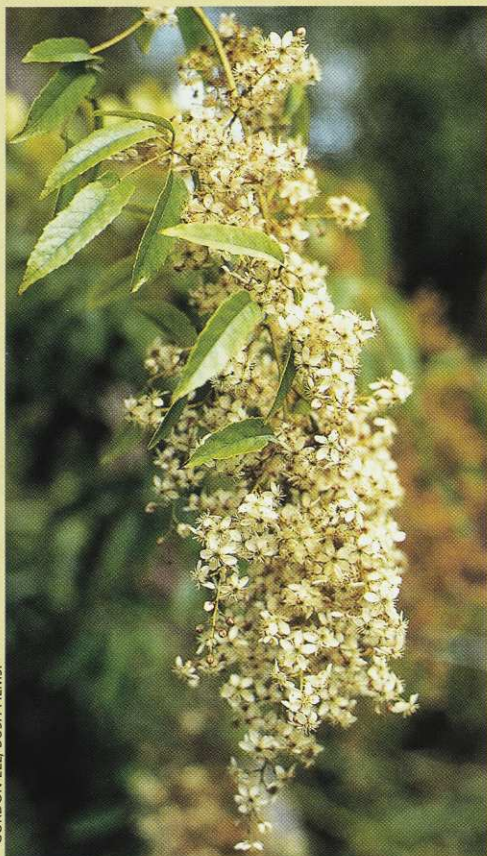
Rangiora: the silvery under-leaf has stomata to breathe among protective hairs.

GORDON ELL, BUSH FILMS.

ANN GRAEME looks at what leaves do. Photographs, GORDON ELL.

hairy surface, and some tussock grasses have curled blades so that the vulnerable stomata on the undersurface are wrapped inside.

It's not just the weather that threatens the leaves. Countless animals eat them. Losing all their food factories would kill the plant so there are many ingenious adaptations for defence. Leaves may be thorny or have stinging hairs, or be loaded with poisonous by-products to make them unpalatable.



Some leaves of bush lawyer have protective marginal prickles.

All leaves have a 'use-by' date. The leaves of deciduous trees develop in the springtime and fall off in the autumn. As they mature to old age they often accumulate unwanted chemicals which are shed when the leaves fall. These chemicals cause the brilliant reds, oranges and yellows of autumn leaves.

Evergreen trees follow a less rigid pattern. Some leaves age and are shed throughout the year, but leaves can live and function for



The deciduous leaves of introduced maple fall in autumn, shedding accumulations of unwanted chemicals.

several years. Pohutukawa is one of the trees which keeps individual leaves for several years, so if possums continue to chew off the new shoots the pohutukawa will in time run out of replacement leaves and die.

Outside the concrete canyons of the city, we are surrounded by leaves. They cover the lawn, the garden, the fields of grass and

crops and the forests. They are the green wallpaper of our world and it is easy to overlook them, so it is good to remind ourselves how much we owe to the humble leaf.

— ANN GRAEME is national co-ordinator of Forest and Bird's Kiwi Conservation Clubs. She lives in Tauranga.



If young pohutukawa leaves are destroyed by possums, the tree in time dies from lack of replacements.

Protecting Natural Character of Coastal Landscape

Increasingly, more New Zealanders are feeling a sense of loss as lonely hilltops are crowned with mansions and remote coastal shores cut up into 'lifestyle' blocks. They ask what is the worth of natural character? What is the value of landscapes empty of human development?

Such questions are the nub of the campaign by the Okura Environment Group, a coalition of community groups including North Shore Forest and Bird. The group is seeking to protect the natural character of the Okura estuary, just north of the

city, which is already a marine reserve, and the sweeping views from its ridges of the Hauraki Gulf.

The southern side of the estuary is degraded farmland in four-hectare titles, which were granted 20 years ago. In the first Environment Court battle in 1996, the local Environment Group stopped the farmland from being zoned residential. For the new rural zoning, the Council proposed subdividing to two hectares with remedial and mitigating requirements. The owner of half of the farmland put forward a plan for cluster housing at an average density of one house per hectare.

The Environment Group

opposed both of these plans in a second Court case this year. Their case, presented by Di Lucas, a Forest and Bird member and nationally recognised landscape architect, sought to maintain the natural wild character surrounding the estuary shore. Part of the Court case expenses was met by a grant from the Ministry for the Environment.

In his decision, Judge Bollard declined the cluster housing proposal and the Council plan for two-hectare subdivisions in the coastal zone. He accepted the case to protect the natural character of the coast as much as possible by imposing stringent conditions on potential buildings. These included discretionary conditions on single-storey buildings and a stipulation that they are built on sites deemed acceptable to all parties. The buildings must blend with the landscape and be only partially visible from the estuary shore where people walk.

This result means those visitors to the Okura estuary, now and in the future, can enjoy a natural vista largely uninterrupted by human development. This is a happy precedent for the protection of other vulnerable landscapes.

— JIM LEWIS AND ANN GRAEME

New Conservation Manager for Forest and Bird

A seasoned campaigner and conservationist, Kevin Hackwell, has been appointed Forest and Bird's conservation manager. He replaces the former conservation manager Eric Pyle, who is now manager of social and environmental science policy at the Ministry of Research Science and Technology.

'Kevin's special interest has been the conservation of native forest ecosystems,' according to



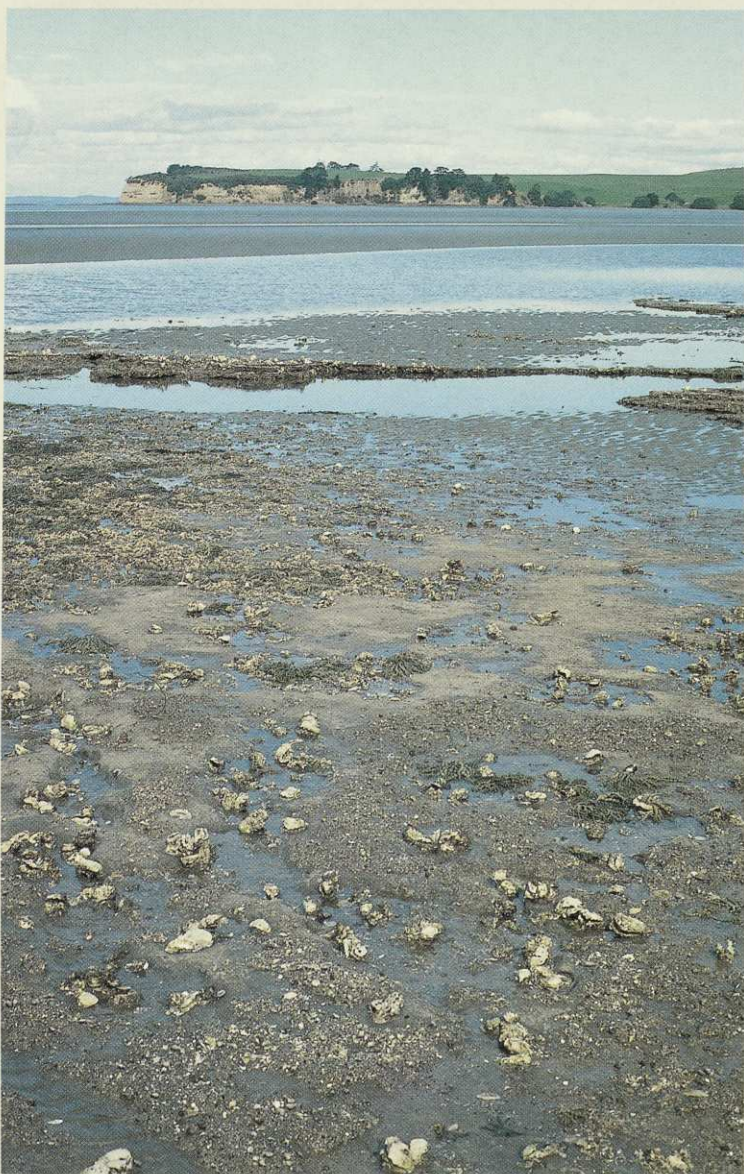
Kevin Hackwell, newly appointed conservation manager of Forest and Bird. He succeeds Eric Pyle.

the national president of Forest and Bird, Dr Gerry McSweeney. 'At a time when the future of blue duck, yellowhead, kiwi and kaka has never been more in doubt because of the impact of predators, Kevin's conservation campaigning skills will be crucial.'

Long active in the conservation movement, Kevin Hackwell served 19 years on the Tongariro/Taupo Conservation Board and its predecessor. In the 1980s, he was actively involved with Forest and Bird, campaigning to protect the forests of the South Island's West Coast. He is also a former chair and deputy chair of Greenpeace New Zealand.

Kevin Hackwell trained as an ecologist and worked as a scientist for the Ecology Division of the former Department of Scientific and Industrial Research. In 1999, with economist Geoff Bertram, he co-authored the report *Pests and Weeds: The Cost of Restoring the Dawn Chorus* for the New Zealand Conservation Authority.

Kevin Hackwell combines a strong background in the natural sciences with the desire to involve more people of all ages in celebrating and



The Okura Estuary is part of a marine protected area. Subdivision is planned for the far side.

protecting New Zealand's heritage.

'Those of us who have been campaigning for years need to nurture and encourage a new generation of young adult conservationists,' Kevin Hackwell says. 'Forest and Bird is a great organisation with a strong and committed membership and staff. I want to build on those outstanding strengths.'

— GEOFF KEEY

Winemaker Helps Waitakere Wetland

The Society's Te Matuku wetland in the Waitakere Ranges has become the third beneficiary of funds from an Australian winemaker, Banrock Station. The company is currently involved in 40 wetland projects in Australasia and eight in other countries.

The two-year programme at Te Henga will help Waitakere Forest and Bird with pest control in the 100-hectare reserve, and to build an 'education platform' for visitors.

'New Zealand was once a country rich with wetlands. Today it is virtually depleted of wetlands with less than 10 percent remaining,' the manager of Banrock Station, Tony Sharley says. 'Te Henga wetland is a great example of New Zealand's original wetlands that need to be protected through partnerships such as this.'

The company has previously given assistance for wetlands in the Karori Wildlife Sanctuary and at Masterton Intermediate School. It is presently conducting a 'national search for wetlands in need of restoration' and has worked in partnership with Wetland Care New Zealand in making sponsorships.



Six-year-old William John Poulgrain, a sixth-generation descendant of William Hall, is also named after the pioneer botanist. He is helping measure the circumference of a 130-year-old miro in William Hall Memorial Reserve, Thames.

Hall's Reserve Has Historic Links

A forest planted by a pioneer botanist is now in the care of the Thames-Hauraki branch of Forest and Bird. William Hall Memorial Reserve is named for the man who described Hall's totara.

A lesser-known aspect of Hall's life is that, living in Thames in the nineteenth century, he planted an arboretum there, mostly of native trees because in his words, 'the extensive and frequently wanton destruction of native bush has been going on at such a pace that it will soon be difficult, if not impossible to get sight of some of the rarer species.' After Hall's death his arboretum of about three acres fell into neglect and was overrun by invasive plants such as wattle, pine, privet, and woolly nightshade.

The arboretum was 'rediscovered' for Forest and Bird members when Allison Williamson, a botanist and

committee member of Forest and Bird, heard it mentioned at a scientific meeting in Auckland. On coming home she was surprised to find her home touched directly on it.

After talks with the local Council, which has ownership of the reserve, Thames-Hauraki Forest and Bird arranged for a group of volunteers to tidy it up. An inventory was made of the trees which are now 130 years old. The tallest was found to be a Norfolk pine at 40 metres. In comparison, two kauri reached 33 metres.

The engagement of volunteers with the reserve is

to continue. The exact boundaries of the reserve remain blurred and some heavy clearing is needed to take out large invasive trees. The Forest and Bird branch is working on a five-year programme to attract funds needed for fencing out wandering cattle, restoring public walkways, and dealing with unwanted trees and plants.

If this can be done, the district would gain a precious heritage asset, and Hall's great vision could become a reality.

— KEN CLARK Thames-Hauraki Forest and Bird.

Bulletin

Valder Conservation Grants From Waikato

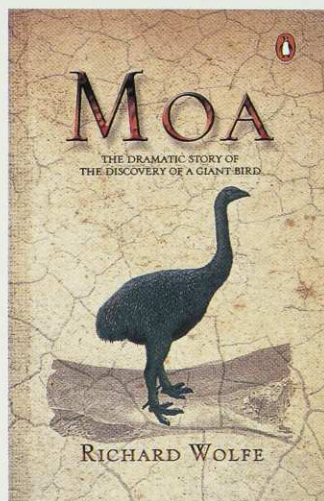
Grants of up to \$10,000 are again available from Waikato Branch of Forest and Bird, for conservation projects in the coming year. The grants could help fund research, practical projects, or advocacy for conservation. There is no specific restriction on the type of project, but criteria relate primarily to relevance to local and national Forest and Bird objectives. To apply, send four copies of your proposal, together with a budget, to the Secretary, Waikato Forest and Bird, PO Box 11-092, Hillcrest, Hamilton by November 30. For further details contact Jim MacDiarmid (branch secretary), on 07 849 3438 or macd@wave.co.nz or Philip Hart (chairperson) at prhart@waikato.ac.nz.

Plucking Pines on Ruapehu

Waikato Forest and Bird welcomes fit members and friends to its annual camp on February 28-29, 2004 to help remove wilding pines, *Pinus contorta*, from Ruapehu. The branch offers free accommodation in an Ohakune ski lodge, and will meet petrol costs. Please book early with Philip Hart: email at prhart@waikato.ac.nz, or write c/- 129 Cambridge Road, Hamilton, phone 07 856 7992.

National Executive Membership

An Otago University biologist, Dr Liz Slooten, has been re-elected to the national executive of Forest and Bird. Dr Slooten was omitted from the photograph of the national executive at the annual general meeting (in our August issue) as she was overseas at the time.



Moa, the dramatic story of the discovery of a giant bird

by Richard Wolfe, 250pp limpbound, Penguin Books, Auckland 2003, RRP\$27.95.

Well-known for his writing about kiwi icons, Richard Wolfe here joins the international trend for books which re-present history for its human interest. From the story of mauve, to railway engines, sugar and dictionaries, such non-fiction writing reinvests the familiar with the fascination of initial discovery.

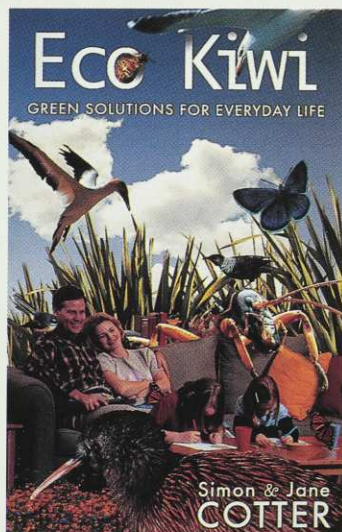
The moa is a natural for this treatment. Here is anatomist Richard Owen making the original deduction, from a single piece of bone, that New Zealand once had gigantic birds; then the gradual discovery of more skeletal remnants, the reconstruction of actual birds. The story, however, turns about the status of that early bone, the gradual discovery of more moa evidence by traders and missionaries, and explores the scientific debate it excited. The science of all this is detailed in another book, reviewed on page 8 of this magazine. Richard Wolfe, for his part, realises the romance of the story.

Eco Kiwi, Green Solutions for Everyday Life

by Simon and Jane Cotter, 240pp limpbound, Random House, Auckland 2003, RRP\$29.95.

This is a complete sampler for the 'alternative' lifestyle, redolent of more caring times in the 1970s. While there's detail about eco-friendly homes, for example, the authors concentrate on tips to live more gently with the earth around existing buildings — a more practical choice for everyday life.

The book takes four sectors of daily life. Shelter spans from houses down to the paint finishes and utensils in them. Under The Elements, are notes on energy including alternative sources but focussing on how to use power more efficiently. The Life Cycle includes food, gardening, permaculture and recycling. Resources lists local help and organisations, even 'green' traders. This is a resource book of familiar concerns, adding the advantages of being ready for the 2000s and referenced to local conditions.

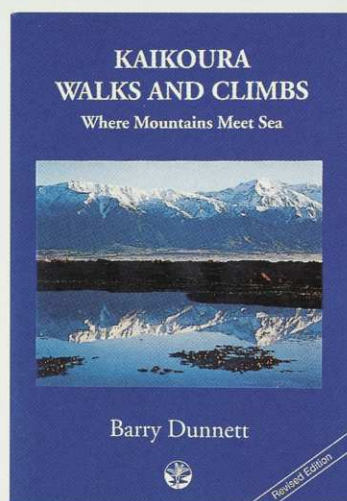
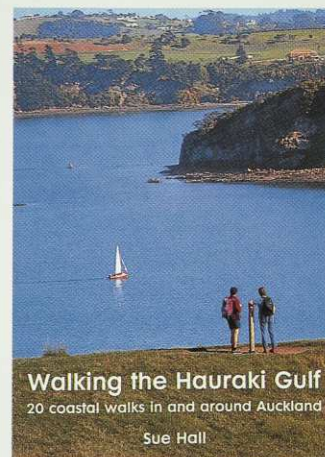


Walking the Hauraki Gulf

By Sue Hall, 120pp limpbound, New Holland Publishers, RRP\$24.95.

Not exactly the islands of the gulf, though Kawau, Rangitoto and Waiheke get a mention. This book is more a walking guide to the mainland shores of the gulf, so is more accurately described by its sub-title '20 coastal walks in and around Auckland'. That begins in

the north at Mangawhai, a couple of hours' drive north on a good day, to regional parks on the shores of the Firth of Thames to the south of the city. In between there are cliff walks and beach walks, including some suburban shores and the east coast regional parks. Sue Hall does pencil drawings of the wildlife and major features of each walk, and provides a sketch map and indication of track conditions. Coastal walking proves an interesting way to enjoy nature close to town.



Kaikoura Walks and Climbs

by Barry Dunnett, 80pp limpbound, Nikau Press, Nelson 2003, RRP\$19.95.

If you had any doubts about the recreational values of the country inland from Kaikoura, Barry Dunnett quickly dispels them. This is the region at the centre of Forest and Bird's campaign to create a Kaikoura national park. Barry Dunnett, himself, has long been a Forest and Bird advocate for the proposal to upgrade the

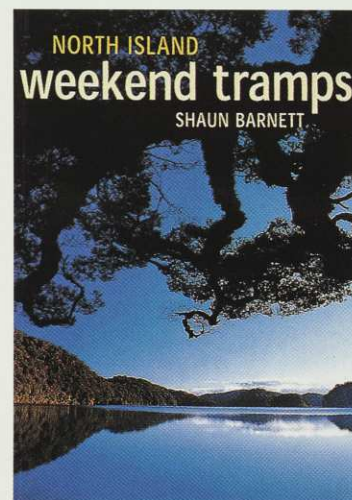
reserve status of the Inland and Seaward Kaikoura ranges, along with the Clarence Reserve. Much of it is wild country, as a good national park should be, but beside the climbs the author details shorter walks, from 30 minutes to a day, more suitable for families and the less-fit. Useful for members wanting to get to know the Kaikoura behind the whale-watching and birdlife.

North Island Weekend Tramps

by Shaun Barnett, 146pp limpbound, Craig Potton Publishing, Nelson 2002, RRP\$29.95.

Shaun Barnett knows the bush and what a fit person can encompass in a weekend. Time out, of course, would depend in what part of the North Island is nearby. This book begins in the Bay of Islands, heading south by way of Great Barrier Island and the Waitakere Ranges in Auckland.

Each region of the North Island gets two or three walks, sometimes more. Some are relatively simple, such Waikareiti in Te Urewera, or the Cape Kidnappers gannets. Others are for those more familiar and fit for the bush. Sketch maps and Shaun Barnett's spectacular colour photographs make this a book to savour possible trips.



NEW BOOKS FROM REED

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Tramping experiences of the South Island hinterland

Pat Barrett \$44.95

With his pack and boots and a companion or two, Pat Barrett explores the awesome terrain of the South Island's wild hinterland in words and photographs, delighting in the sparkling lakes, the clear mountain streams and cool bush, and the views that sweep across mountain ranges to the ocean.

The **Day Walks** series provides concise and informative descriptions of various walks throughout the North Island. Information is included about each walk's grade of difficulty, estimated completion times, access details, and safety. Illustrated with maps and photographs, the guides also offer introductions to the history, geology, forests and birdlife of each region. \$19.95 each.

DAY WALKS OF NORTHLAND

Marios Gavalas

A concise guide to 65 walks in Northland, divided into six areas with brief overviews. The terrain covered ranges from the secluded bays of the east coast to the majestic kauri forests and the wild and dramatic west coast.

DAY WALKS OF GREATER AUCKLAND

Marios Gavalas and Peter Janssen

This book covers the greater Auckland area from Goat Island in the north to the Hunua Ranges in the south. The majority of the walks are within an hour's drive of downtown Auckland, and the region has been divided into five areas, each with a distinctive flavour: City, South, West, North and Islands.

DAY WALKS OF WAIKATO & KING COUNTRY

Sonia Frimmel

Long-time Waikato resident and avid walker Sonia Frimmel introduces easy urban walks and more adventurous back country trips in this handy volume. The 49 walks take in farmland, bush, goldmining relics, spectacular landforms and much more.

DAY WALKS OF THE BAY OF PLENTY & ROTORUA

Marios Gavalas

The Bay of Plenty and Rotorua Lakes offer spectacular coastal and lakeside scenery, forested ranges and geothermal zones. Marios Gavalas introduces his pick of 59 day walks divided into five areas in this useful companion to the region.

DAY WALKS OF THE COROMANDEL

Marios Gavalas

These walks explore the spectacular mountain and coastal scenery of the Coromandel Peninsula – subtropical rainforest, old gold mining remains, long sandy beaches and rocky headlands. Each walk is graded, and interesting features are described in the track notes.

202 GREAT WALKS

Mark Pickering \$29.95

In this book you'll find walks ranging from 1–2 hours to 5–6 hours, with notes on track conditions, access, facilities and walking times, and topographical maps. You'll also find many city walks that explore the scenically surprising corners of New Zealand's urban areas.

101 TOP NORTH ISLAND BEACHES

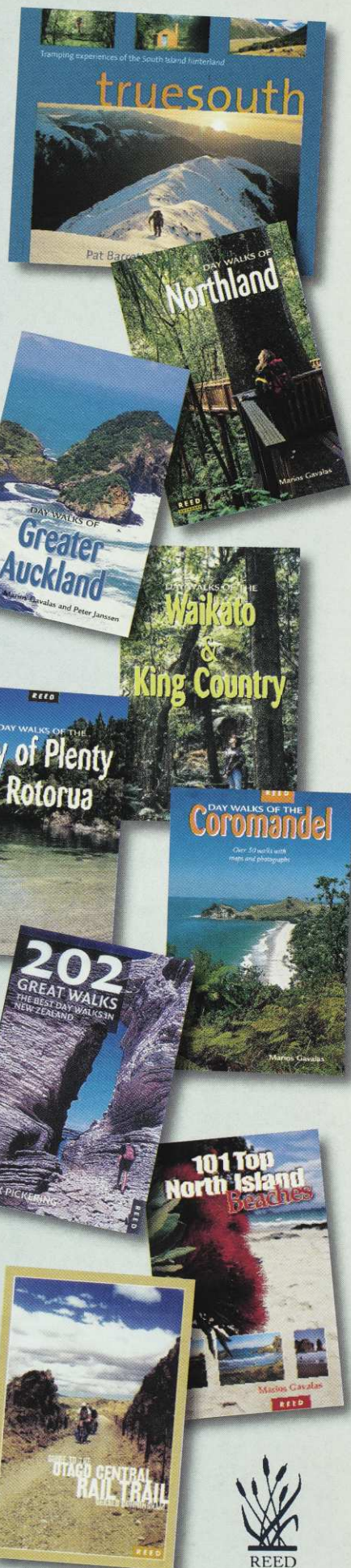
Marios Gavalas \$29.95

Discover the North Island's beautiful beaches; whether they're patrolled by Surf Life Saving Clubs; the location of walks and fishing spots; availability of picnic facilities, toilets, children's play areas, barbecues, and nearby accommodation; and information on the suitability of each beach for activities such as surfing, windsurfing, and kayaking.

GUIDE TO THE OTAGO CENTRAL RAIL TRAIL

Gerald Cunningham \$24.95

Developed for the use of walkers, cyclists and horse riders, the Otago Central Rail Trail follows the old railway line that was built through Central Otago in the late 19th century, at a time when bridges and viaducts were constructed from local hand-shaped stone. This guide divides the 150km Trail into 12 easy sections and describes the landscape, wildlife, old structures and buildings.



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KEY: Bn = Bulletin BO = Branching Out CB = Conservation Briefs Com = Comment IF = In the Field WW = World Watch

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HARTLEY, Lynette, Caring for Kaitorete Spit, Nov 34; Living With The Land, May 22; Scaup in Christchurch, CB Feb 10; View From the Plains, May 20
HUISH, Richard and Ian Spellerberg, Most Popular Plants, Nov 16
JOHNSTON Peter and Peter Buchanan, Foraging for Fungi, Aug 32
KEEY, Geoff, Changing World Underfoot, Feb 32; Life on a Humble Shrub, May 16; Parrot Trade, CB Feb 6
LYONS, Keith, Energy Nightmares for Conservation, Aug 36; Helping Hand for Nature, May 24
MADDISON, Peter, The Precautionary Principle and GE, Cm Nov 2
MASON, Ken, Silver beech, Feb 40

McDOWALL, R.M., New relatives of Whitebait, Nov 18
McSWEENEY, Gerry, Managing the Land 'Sustainably', Cm Aug 2;
MEEHAN, Hayley, J.S. Watson Awards, CB Feb 38
MOORE, Peter, Chatham Oystercatcher 'Comeback', Feb 28
OLIPHANT, Fiona, A Big Bite of the Barrier, Aug 22
PEAT, Neville, Preserving Snow Tussock Country, Aug 24
PETTYT, Chris, The Vanishing Rock Wren, Nov 22
PIGNEGUY, Dee, Suwarrow, WW Nov 11
PYLE, Eric, Alarming Discovery About Stoats, Aug 30; Fourth Wave of Extinctions, Cm May 2
RIMMER, Ann, Forest Mimic (Tui), CB Feb 8; Tourists and Nature in Aitutaki, WW Nov 10
SPELLERBERG, Ian and Richard Huish, Most Popular Plants, Nov 16
STEPHENSON, Gordon, Dawn Chorus in South Waikato, Feb 41
STUPPLES, Polly, Weka Released, CB Feb 9
WHITE, Peter, Lodges and Reserves, Feb 48, May 48

SUBJECTS

Aitutaki, Cook Islands, WW Nov 10; albatross, Feb 20; Asian flyway, WW Feb
Blue Duck Trust CB Feb 4; Bushy Park, BO Aug 42
Canterbury mudfish, CB Aug 6; Chatham oystercatcher, Feb 28; conservation manager appointed (Kevin Hackwell), BO Nov 42; conservation manager resigns (Eric Pyle) Bu Aug 48; Conway's Bush, May 48; Council meeting, BO May 40; Crowe, Andrew, May 18
Deep New Zealand (Peter Batson,) Nov 32; deer escapes, BO Feb 39; deputy president, CB Aug 43
Ecclesfield Reserve, May 48; energy conservation, Aug 36; Executive, CB Aug 43
Fungi, fungal foray, Aug 32;
Great Barrier Island marine reserve proposal, Aug 22; grey warbler, Nov 12 Hackwell, Kevin, conservation manager, BO Nov 42; Hall Reserve, Thames, BO Nov 43; HANZAB guide book, CB Aug 7
Invasive animals, Feb 32
Kaitorete Spit, Nov 34; kakapo breeding CB May 4; Kapiti Island, May 10; Kapiti Marine Reserve May 14; Karori Sanctuary, Nov 38;

kowhai, Aug 12;
Lake Omapere CB May 4; Lake Pearson CB May 6; Leaves, IF Nov 40; Loder Cup, (McSweeney) CB Nov 4; Loder Cup, (Maddren) CB May 9
Maddren, Margie, CB May 9; Manawatu Estuary, Aug 28; Mangere Mountain, Nov 26; marine reserves: Auckland west coast, May 30; Great Barrier Island, August 22; Volkner Rocks, Feb 5; Maddison, P, Aug 43; marine survey, Nov 30; Matuku (Waitakere) grant, Nov 43; McSweeney, Gerry, Loder Cup CB Nov 4; membership cards, BO Feb 39; Meuhlenbeckia, May 16; Minister of Conservation, Feb 18; Moore, Percy Leonard Moore Reserve, May 48; Moutohora, CB May 7
Native fish discoveries, Nov 18; Nature Heritage Fund, May 24
Okura subdivision, BO Nov 43; Old Blue awards, CB Aug 9; oral history, Bn May 42
Parrot pox, CB Feb 6; Pauatahanui, Aug 14; Peat, Neville, Aug 20; pipit and skylark, Aug 18; Poor Knights Islands, Feb 24; Poplars, CB, Nov 5; popular plants survey, Nov 16; Port Hills preservation, May 20

QEI National Trust, CB Feb 11; Queen's Birthday honours, CB Aug 8
Ramsar: Japan, WW Feb 12; Manawatu estuary proposal. Aug 28. Reserves: Kapiti, Taranaki, Auckland Feb 48. Restoration: silver beech, robins, sewage farm, Feb 40; rock wren, Nov 22;
Scaup, CB Feb 10; skylark and pipit, Aug 18; Society history, Bn May 42; southern seabirds, Feb 20; stoats, Aug 30; sustainable land management, Cm Aug 2; Suwarrow, WW, Nov 11
Taiko breeding, CB Aug 5; Taranaki 'muttonbirds', CB Aug 4; Tawharanui (Tokatu) fence CB Aug 10; Te Papanui Conservation Park, Aug 24; thismia, CB May 8; Tiritiri Matangi Island, Feb 14; tourism effects, Aitutaki, WW Nov 10; treasurer, Bu Aug 48; tui talk, CB Feb 8; Turner, E. Phillips, May 34
Underwater discoveries, Nov 30
Volkner Rocks, CB Feb 5;
Watson JS, conservation awards, BO Feb 38; weka reintroduced, CB Feb 9, CB, Nov 6; Whale Island CB May 7; wild horses, CB Feb 7; Wilson, Hugh, May 22

Mail FREEPOST No. 669, Forest and Bird, PO Box 631, Wellington.
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