FOREST & BIRD

NUMBER 314 • NOVEMBER 2004

Remote Ruahine • Mokoia Refuge
Prof. John Morton • Castle Hill • Vernon Lagoons
Urban Rivers • Recreational Set Netting

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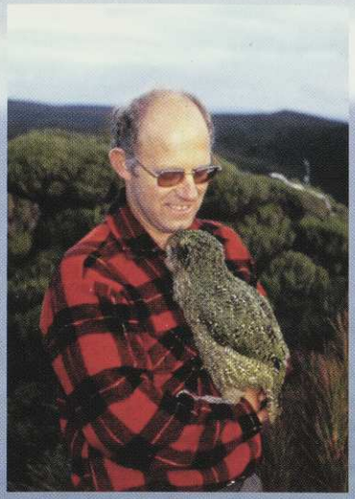

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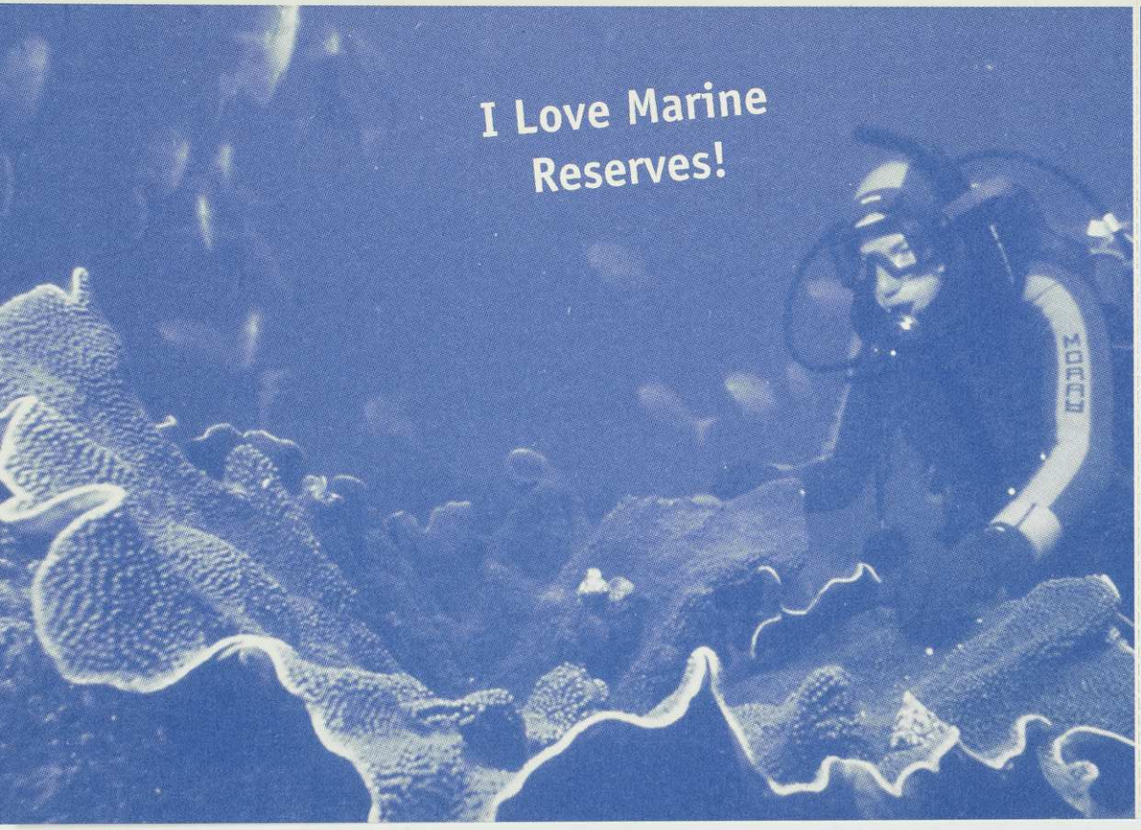
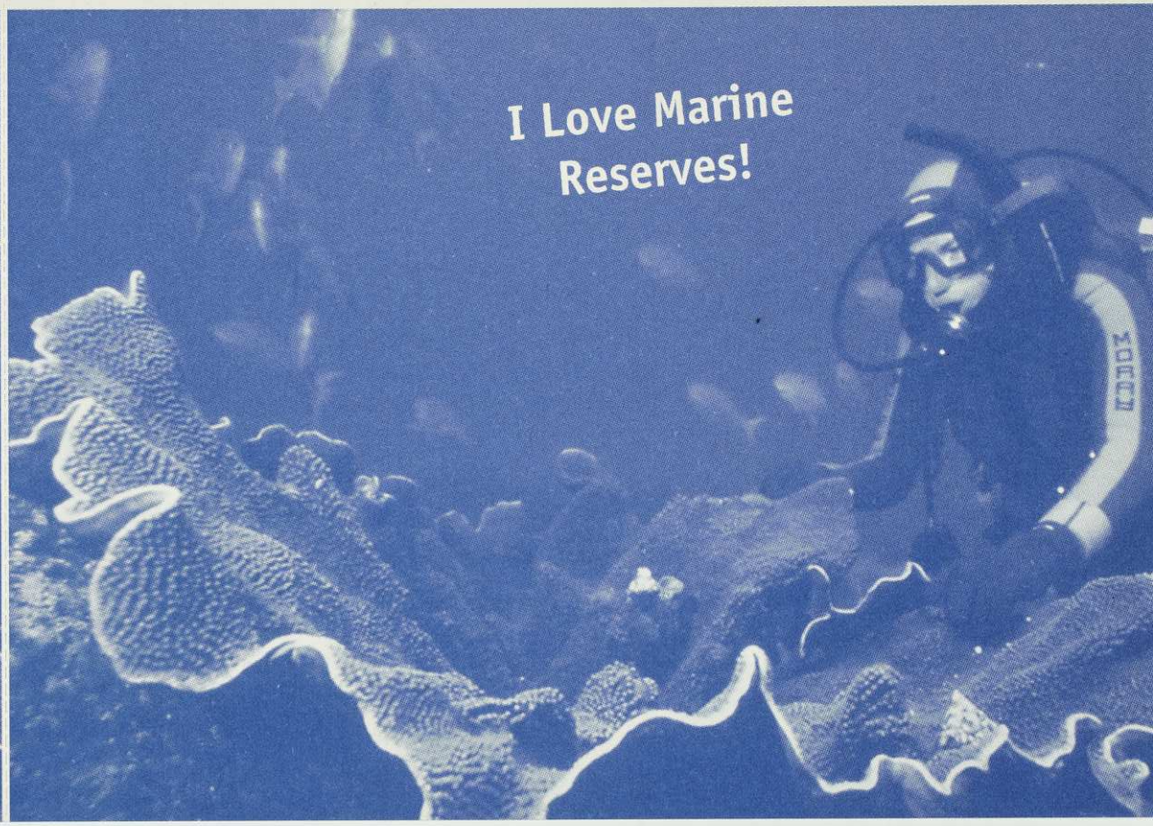
GIVE TO A FRIEND AND ASK THEM TO SEND FREEPOST TO THE PRIME MINISTER



DETACH AND SEND FREEPOST TO THE PRIME MINISTER



Dear Prime Minister

I urge you to rapidly pass the Marine Reserves Bill.

This Bill will allow major progress in marine conservation and help us catch up with Australia, which recently increased protection of the Great Barrier Reef from 4.5% to 33%.

The key changes I welcome in the Bill are that it

* Allows marine reserves to be created out to 200 miles offshore;
* Enables seabird protection to be considered in applications;
* Provides comprehensive reasons to create reserves including for biodiversity, scientific and amenity reasons;
* Streamlines the process by removing the need for the Minister of Fisheries to agree to new marine reserves. Replacing this with consultation, ensuring that all information is placed before the Minister of Conservation at one time, and
* Ensures mining and fishing are prohibited within marine reserves.

I look forward to many more marine reserves being created!

Yours sincerely

Name

Address

FOREST & BIRD

November 2004 www.forestandbird.org.nz Photo:Department of Conservation

Let the Prime Minister know we want better protection for our marine environments!

post free to

Hon. Helen Clark
Prime Minister
Freepost 18888
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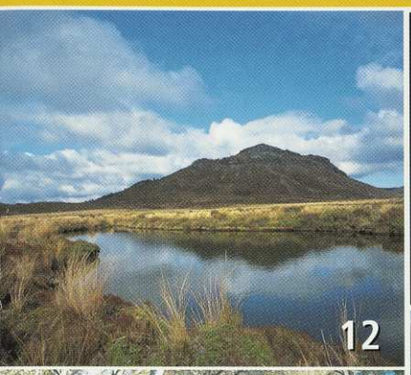

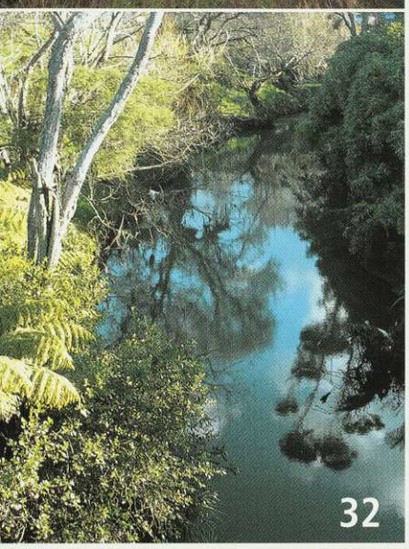

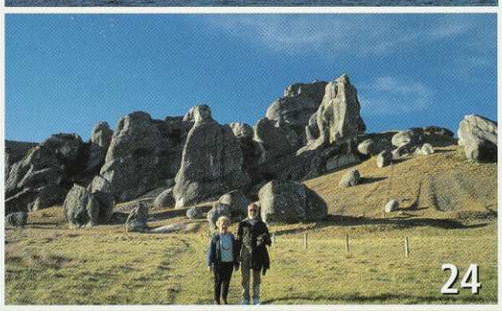

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FOREST & BIRD

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Regulars

COVER: Limestone outcrops on the Mangaohane Plateau in the remote northwestern Ruahine Range, see page 12. **PHOTOGRAPH: Shaun Barnett, Black Robin Photography**

United for Nature Conservation

I recently gave the opening address to the New Zealand Deerstalkers' annual conference in New Plymouth. To my knowledge it was the first time in Forest and Bird's 81-year history that such an invitation had been made and accepted because traditionally we saw each other as adversaries.

We talked about our common love of wild New Zealand. We talked about the severe impact of possums, rats, stoats and goats on our native wildlife and plants. We discussed the access challenges facing young hunters as more and more back-country landowners try to commercialise access for hunting. The deerstalkers agreed that national parks and conservation land are the easiest places to access for their hunting. We also talked about the impact of deer, chamois, pigs and thar on native plants and animals. Not surprisingly we didn't reach agreement on large ungulate numbers but we listened to each other and recognised that there are many issues on which we share a common viewpoint and need to cooperate.

Forest and Bird's greatest conservation achievements have occurred when we mobilise all our members and where we also work in partnership with allied groups for common goals.

Over the last 6 months we have worked with 12 other environmental, conservation and recreation groups to fight efforts to weaken the Resource Management Act and reduce public participation. Ironically, although critics claim the Act has been severely damaging to business, the New Zealand economy has in fact grown at an unprecedented rate over the last five years. Our coalition fears that the attacks on the Resource Management Act are designed to ram through a raft of environmentally destructive schemes to destroy rivers, allow scenic coastline to be further carved up for houses, and sanction unsustainable irrigation and energy schemes.

A tangible achievement from working with Fish and Game is the recent support by the Environment Court for a Water Conservation Order over the Rangitata River.

Our High Country Coalition is a partnership with outdoor and landscape protection groups. We all want nature, the landscape and recreation to be safeguarded in the network of tussockland parks and reserves being created through tenure review and high-country land purchases.

'Forest and Bird's greatest conservation achievements have occurred ... where we also work in partnership with allied groups for common goals.'

Partnerships between nature conservation and farming have recently protected Canterbury's Castle Hill basin and much of the Lake Heron basin described in this magazine. In both cases, decades of tireless effort by our local Forest and Bird branches have been vital in raising awareness of the threats to nature. We welcome the Government's central role in protecting these areas.

Tangata whenua and Forest and Bird have joined forces in many parts of New Zealand to seek the protection of nature. Most recently we worked together to oppose DoC issuing new grazing leases over beech-forested valleys high up the Haast Valley in the heart of the Te Wahi Pounamu-South West New Zealand World Heritage Site.

Our Marine Campaign is also a partnership amongst all the groups which oppose the senseless destruction of marine life. We are working closely with Greenpeace to fight bottom trawling which not only harvests most of the fish species on the ocean floor but also destroys complex and fragile ocean-floor ecosystems. We also work closely with the New Zealand Underwater Association in championing the importance of marine reserves.

Our coalitions extend well beyond New Zealand. Forest and Bird now has Partner Designate status with Birdlife International. Together we are focusing world attention on the plight of albatrosses and working to build support for nature conservation throughout the South Pacific.

Some lobby groups seek to build political parties around outdoor recreation and environment. Forest and Bird owes allegiance to no particular party. Instead we encourage all the political parties to develop sound and far-sighted environment and conservation policies. We support good environmental policies not the political party. That decision we see as our members' individual democratic choice.

Our future challenge is to build even stronger partnerships so that everyone recognises that the protection of the environment — our life-support system — is the world's most important political issue.

— GERRY MCSWEENEY
National President

Stuffed Kiwi Explodes Poison Myth

GEOFF KEEY explains Forest and Bird's position on 1080.

An anti-1080 campaigner from Wairoa was recently convicted of wildlife offences in the Wairoa District Court after falsely claiming a kiwi had been killed by 1080, a synthetic version of a naturally occurring plant poison that is used for pest control.

Over 70 kiwi have been monitored during 1080 operations and not one died from 1080 poisoning. In fact no monitored, endangered, brown kiwi, great spotted kiwi, blue ducks or kaka have died in 1080 operations, so it's not surprising that anti-1080 campaigner Phillip Anderton's claim was proven false.

This unusual saga started on June 30 when a reporter from the *Gisborne Herald* contacted the Department of Conservation about a story in the *Wairoa Star* relating to a photo of Mr Anderton holding a kiwi corpse. Mr Anderton claimed to have found the dead bird in Te Urewera National Park, four days after an Animal Health Board (AHB) aerial application of 1080 in the area.

According to the Department of Conservation's regional conservator, Peter Williamson, 'One of our local officers immediately contacted Mr Anderton to try to get the kiwi autopsied by any agency acceptable to him. Mr Anderton claimed to have returned the kiwi to Te Urewera National Park and buried the body in the bush.'

On Friday July 2, the Department of Conservation executed a search warrant for the kiwi after Mr Anderton refused to cooperate. Three warranted DoC officers accompanied by two police officers found it in a freezer. The kiwi body was sent to Massey University for autopsy.

When a pathologist, Associate Professor Maurice Alley, examined the kiwi it was discovered that all skeletal and internal organs had been removed and the skin was filled with a mixture of felt and polystyrene. A clay mould replaced the skull and wire filled the legs. It appeared to have died well before the 1080 operation that Mr Anderton claimed had killed it. The bird also had a fractured leg at a site where breaks commonly occur in leg trap injuries.

Mr Anderton was subsequently prosecuted for taking and possessing an absolutely protected species, namely a kiwi. At the hearing he pleaded guilty to the charges and admitted that the kiwi in his possession had been photographed by a reporter from the *Wairoa Star* in June of this year.

'Mr Anderton actually told one of our officers that he did not know what killed the kiwi but hoped the photo in the *Wairoa Star* would cause speculation,' the DoC conservator Peter Williamson said.

Unfortunately misleading claims like this have dogged the use of 1080, undermining its legitimate use for pest control.

Forest and Bird supports the continued use of 1080 because it is one of the best ways of protecting native forests and their threatened inhabitants from the destruction wrought by pests.

In a public discussion document on 1080, the Department of Conservation has warned that the decline of native wildlife will continue unless, 'we reverse the onslaught of pests on a massive scale.'

This will involve taking a 'landscape' approach to managing pests, which is where 1080 comes into the picture. The protection of just three pairs of whio (blue duck) in the Flora Stream in Kahurangi National Park requires 57 kilometres of trap lines — extending that approach over all public conservation land is simply not feasible. Aerial use of 1080 provides the possibility of controlling pests over the large areas needed to protect whio and other wildlife.

Contrary to the claims of anti-1080 campaigners, research shows native wildlife benefits from 1080 operations. Research into the breeding success of robins after 1080 control showed robins fledged over eight times as many chicks because of the dramatic drop in predation by pests.

In part of Pureora Forest, the kaka population increased by 33 percent within six months of an aerial application of 1080 poison in 2001. In nearby Waimanoa Forest, stoats killed at least five of nine kaka females during the same breeding season.

One of the benefits of using 1080 is that aerial and ground-based 1080 operations pose an extremely low risk to people, because of the low doses used in baits. The possibility of anyone eating the number of baits required to kill a person is extremely unlikely.

Furthermore, only trace amounts of 1080 have ever been found in water following an operation, and even trace amounts are rare. Water monitoring is a requirement of aerial operations.

Sadly, these facts are unlikely to sway some of 1080's most vociferous opponents. We can only hope that the Environmental Risk Management Authority (ERMA) pays attention to the facts when carrying out its 1080 reassessment early next year.

— A staff member of Forest and Bird, GEOFF KEEY *has responsibilities for biosecurity and pest-control issues.*

conservation*briefs*

Westland Wetland Acquired as a Reserve

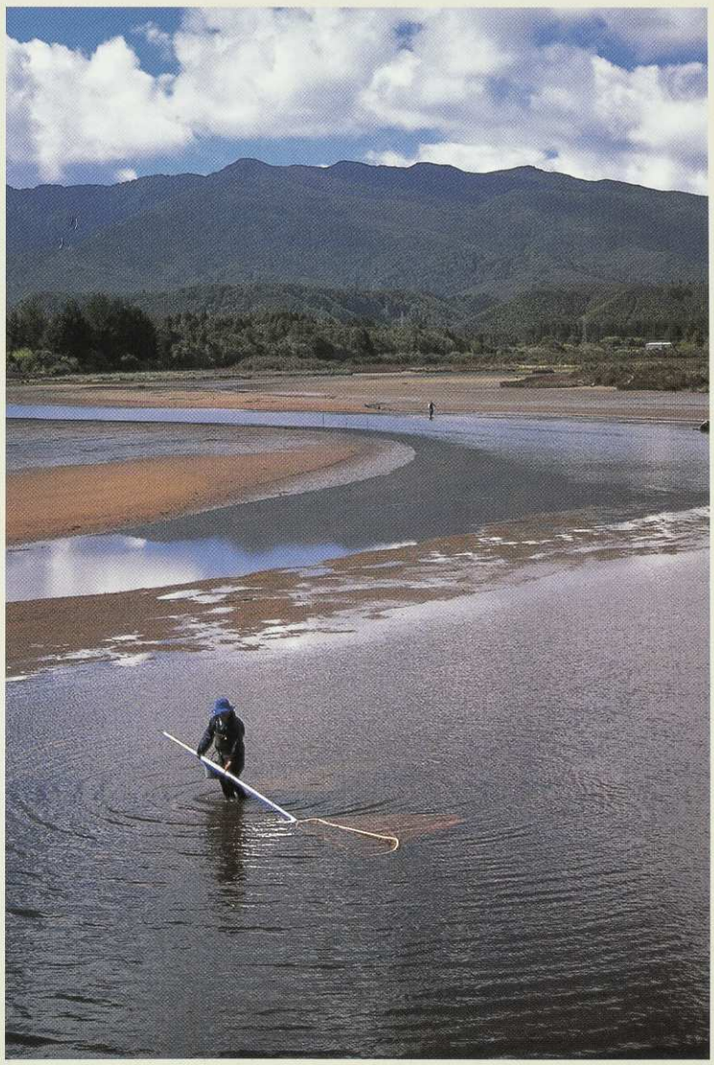
A tidal wetland at Westport in Westland has been preserved as a scenic reserve. The wetland lies on the edge of the Orowaiti Estuary which forms the western edge of the town.

The area has high landscape and scenic values, and is used for such recreational pursuits as boating, walking and bird-watching. From a wildlife point of view, it protects an area where flounder and mullet breed, and is also the spawning grounds for whitebait which inhabit the Orowaiti River.

The combination of saltmarsh with mudflats and sand flats provides a home for birds as varied as white heron/kotuku, banded dotterel and various terns, as well as migratory birds from within New Zealand and the northern hemisphere.

The saltmarsh lies at the southern, upstream end of the estuary and provides a buffer between farmland and the estuary.

The purchase of 21 hectares was negotiated by the Government's Nature Heritage Fund which paid $90,000 for it. The wetland becomes a scenic reserve, adjacent to other Crown land administered by the Department of Conservation.



GERRY McSWEENEY

Orowhaiti Estuary, Westport. The wetlands in the middle distance have just become a conservation area through a Nature Heritage Fund purchase.

Conservation orders over Rangitata, Motueka rivers

Two of New Zealand's most outstanding rivers are to be saved from further development by the imposition of Water Conservation Orders. The Rangitata in Mid-Canterbury, and the larger part of the Motueka watershed in northwest Nelson, are to be preserved in their natural state.

In the case of the Rangitata, a special tribunal and the Environment Court have made an interim report to the Minister for the Environment who has asked for the wording for an Order. Both enquiries found the Rangitata needs protection for a range of outstanding features, including its scenic upper reaches, the salmon run, threatened birdlife, and special cultural values of both Maori and pakeha. Threatened birds which breed in the vast riverbed include wrybill and the black-fronted tern both with world populations of barely 5000. Others nesting on the shingle beds include banded dotterel, the migrant South Island pied oystercatcher, pied stilt, colonies of black-billed and black-backed gulls, and Caspian tern.

Prior to this ruling, the river was threatened by proposals to dam it and extract more water for irrigation, (see *Forest & Bird*, May 2001). One proposal incuded a rock dam 550 metres wide above the Rangitata Gorge, flooding the upper reaches for 18 kilometres, to generate power, and abstracting around 150 percent more water to irrigate a further 95,000 hectares.

The water conservation order will fix current permitted abstraction at 33 cumecs, shared through the season by the needs of existing irrigators and power generation — schemes dating back to 1946. The river is to be maintained at a minimum flow of 100 cumecs and no further abstraction is to be permitted.

The Rangitata application was made by Fish and Game with support from Forest and Bird, the Department of Conservation and Ngai Tahu.

'Parts of the Upper Motueka River and other tributaries are to be retained in their natural state for their wild and scenic features,' according to the Minister for the Environment, Hon. Marian Hobbs.

Among its many outstanding features are special parts of the Motueka River, Wangapeka River, the Rolling River and the Skeet River, which will be protected to retain the natural habitat for blue ducks and the brown trout fishery. The Order also protects specific streams in the Arthur Range, Kahurangi National Park, because of the scientific and recreational values associated with the karst geological formations.

The Order also restricts certain activities, including damming and altering river flows and quality, which would have a detrimental effect on the Motueka River. It is not absolute, however, and will not prevent the exercise of 'current consents' — water can still be taken for domestic needs, the needs of animals and fire fighting. The original application was made by the then Acclimatisation Society (now the Nelson Marlborough Fish and Game Council), and their national bodies, in 1990.

The Pestilential Power of *Potamopyrgus*

A tiny freshwater snail from New Zealand has invaded Britain, Europe and North America, becoming something of a 'pest in reverse' from a country commonly invaded by northern hemisphere plants and animals.

The snail has the tongue-twisting name of *Potamopyrgus*. It is widespread in New Zealand, a little, pitch-black snail seldom more than about 5 mm high, that can be found in most New Zealand fresh waters, especially at low elevations. Its full scientific name is *Potamopyrgus antipodarum*, the species name meaning simply 'from' or 'of the antipodes', from which it has now spread.

About 10 years ago, an American report listed *Potamopyrgus* as one of three recently established species described as being 'of most concern'; some American biologists describe it as 'highly invasive', finding that it has become more abundant than native snails in several different habitat types.

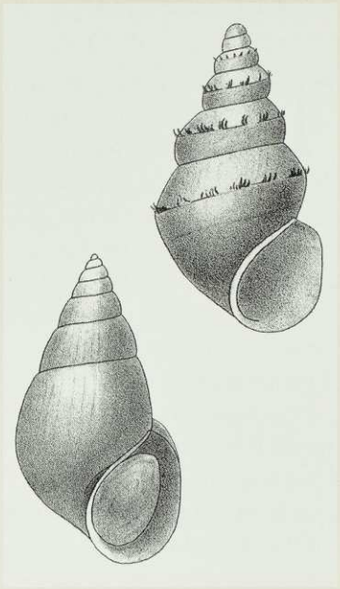
It is not only in North America that *Potamopyrgus* has become invasive. This little mollusc has also been found in Australia, the United Kingdom and parts of Scandinavia.

It actually arrived in the United Kingdom as early as 1859 — so long ago that British biologists thought it was a native species and described it as *Potamopyrgus jenkinsi*. It was not until the 1970s that a New Zealand biologist, Mike Winterbourn, realised that the British populations were actually invasive from New Zealand. In the nearly 150 years since this invasion, it has spread throughout Europe — I found records from Switzerland, Poland, Germany, France, Finland, Denmark, the Czech Republic, and even in Iraq. It seems to be still spreading, the first records for Finland being in the year 2000.

A study in France found that *Potamopyrgus* made up no less than 99.5 percent of the snails in some streams. Some American studies are suggesting that *Potamopyrgus* 'competes strongly' with native snails. Australian studies likewise suggest that it is a 'very successful invader'. Thus, where introduced, *Potamopyrgus* may have some distinctly negative impacts on native aquatic animals.

One of the issues that has gained some attention, internationally, is that *Potamopyrgus* acts as an intermediate host for an array of parasites, raising the possibility that these may have been introduced with the shellfish, and may then have been transferred to native fish species in other countries. It seems that this could have happened already. Moreover, it seems that the snails may be acting as secondary hosts for some parasites in the countries where they have become established. Thus there could be some unexpected impacts.

The Americans have become so seriously concerned about it that Joe Holumovski, an aquatic ecologist from Ohio State University, has been able to obtain funding to study the snail's ecology. He has been to New Zealand several times to undertake experimental studies on environmental factors that might influence its abundance. There has been a whole series of scientific papers written about this animal as an invasive species, to the extent that I suspect it is better known in some of the recipient countries than it is in New Zealand.



The tiny potamopyrgus *snail (less than 5mm long), a New Zealand native which has become a pest in Europe and North America. The drawing is from Suter's* Manual of the New Zealand Mollusca*: note, some shells have a coronet of spines around the whorls, some don't.*

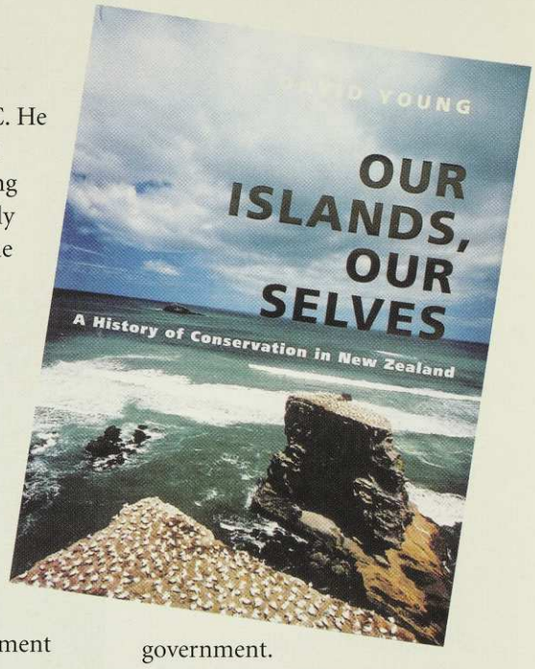
The global ecological theorists would probably not have predicted that a species from a small, isolated group of islands in far off seas, like New Zealand, would be able to successfully invade the supposedly more complex, diverse, and aggressive ecosystems of northern hemisphere lands. So it is against all the predictions, that *Potamopyrgus* has made the reverse relocation/invasion, and seems to be doing 'just fine, thank you' in many northern cool and cold temperate lands. What has enabled it to do so well, against prediction, is quite unknown, but this success does show that widely accepted 'ecological rules' do have their exceptions.

Overall, the global ecosystem effects of *Potamopyrgus* are not serious, but act as a continual reminder of the global issue of invasive species.

— R.M. McDOWALL *is an expert in freshwater ecology with the National Institute of Water and Atmosphere.*

A History of Conservation in New Zealand

Our Islands, Our Selves: A History of Conservation in New Zealand ***by David Young, 297pp hardbound, Otago University Press, Dunedin 2004, RRP$59.95.***



David Young has combined his skills as journalist and historian to produce *Our Islands, Our Selves*, a new book which surveys the growth of the conservation ethic in New Zealand from Maori times. It is a fascinating story, well-told, richly illustrated and beautifully presented, through the combined resources of the Ministry of Culture and Heritage, the Department of Conservation, and the University of Otago Press.

The story begins with the challenges which faced Maori as they exploited the natural world, pressing some species such as moa to extinction. The exploitative settlers from Europe accelerated the impact of people on the land; not only on birds and trees but on the very fabric of the land itself. Erosion quickly followed land clearance.

Parallel with the story of land clearance is the acclimatisation of foreign species into an environment which had developed without them.

The book takes a chronological and thematic approach. This reveals the beginning of conservation awareness in the late nineteenth century, usually in terms of its advocates, backed with a careful assessment of the public mood. What conservation is about — its various and evolving shades of meaning — emerges in subsequent chapters. The author has consulted widely to tell the story of more recent events: the battles for Lake Manapouri, the West Coast and North Island forests, the establishment of DoC. He also points to present failings and continuing challenges, particularly the preservation of the coastal and marine environment.

If this book has shortcomings they would lie in its presentation of 'non-political' events. There's no mention of the involvement of the citizen bodies which devised DoC's conservation management strategies; popular conservation initiatives in the grassroots community (such as building the 'open sanctuary' on Tiritiri Matangi Island) are erratically acknowledged — Waitakere Forest and Bird's 'Ark in the Park' initiative is credited instead to local government.

Within the extremely broad brief the author has chosen, however, these are minor matters: David Young's achievement is generally a comprehensive and well-told story.

— GORDON ELL

Whiteheads Released in Waitakere Ranges

In another step forward for Forest and Bird's 'Auckland Naturally' programme, 55 whiteheads have been released in the Waitakere Ranges, west of Auckland. The release was made into an area being managed as a 'mainland island' within the regional park.

Known as the 'Ark in the Park', it currently comprises 600 hectares of forest where volunteers from Waitakere Forest and Bird provide pest control in a partnership with the Auckland Regional Council.

Whitehead were extinct on the mainland north of about Hamilton till the ARC successfully introduced the bird last year to its Hunua Ranges Regional Park, a rugged mountain block south of Auckland. The birds are peculiar to North Island forests and occupy a similar niche to that occupied by their relative the brown creeper in the South Island. Whitehead tend to form flocks moving in the tree tops, feeding on invertebrates and sometimes small fruits.

J L KENDRICK © DEPARTMENT OF CONSERVATION, TE PAPA ATAWHAI

The whitehead, which in the North Island occupies a similar niche to the brown creeper of the South Island. Fifty five of these birds have been released in the Waitakere Ranges of Auckland, where Waitakere Forest and Bird conducts intensive pest control over 600 hectares. This 'Ark in the Park' programme is planned to extend to 2000 hectares and the release of other locally extinct birds.

The presence of whitehead may also attract the long-tailed cuckoo back to the Waitakere Ranges. The cuckoo lays its eggs in the whiteheads' nest leaving them to care for an offspring which will grow to seven times the weight of their own chicks.

Whitehead are the first of a number of species which could be reintroduced to the Waitakere Ranges under the Ark in the Park project, according to project spokesman Dr John Sumich of Waitakere Forest and Bird. Among them are North Island robin scheduled for 2005, bellbird, kaka, kakariki, and later kokako and possibly kiwi. Other possibilities include kauri snails, Helm's butterfly and mistletoes.

'The quality of this botanically diverse, deer-free bush is such that the site is a prime contender for a mainland release of stitchbird too, when the controlled area reaches a certain minimum size,' he says. 'This will require more volunteer effort but can be achieved by 2006.'

The Ark in the Park area of the Waitakere Ranges is centred on the Cascades Kauri Park, known to Maori as Te wao nui a Tiriwa — the great forest of Tiriwa. Forest life has flourished here since widespread possum control in the ranges by the Auckland Regional Council some five years ago. Since then the Forest and Bird volunteers have maintained trap lines and pest control in the Ark in the Park area.

It is hoped the accessibility of the forest will lead to its becoming another 'open sanctuary' for rare and threatened species at the edge of a conurbation of some 1.2 million people. More details about Ark in the Park, including the Help-a-Hectare programme, can be found on the website: www.forestandbird.org.nz/ark

Landcare Scientists Measure the Mouse Menace

Scientists researching the threat mice pose to beech forests have found the damage may be less to the beech than to other native plants.

'The results raise critical questions about the impacts mice may have through consumption of other native plants, insects and fungi,' according to Landcare Research scientists Dr David Choquenot and Dr Wendy Ruscoe. 'By consuming these species as secondary food items, mice may be having a more insidious effect on forest biodiversity than their consumption of beech seeds alone may suggest.

'The regular irruption of mice in high-seedfall years also has important flow-on effects on the numbers of "mouse predators" — notably stoats — and the prey they subsequently consume, notably our forest birds.'

More than 70 percent of New Zealand's native forest is either dominated by or otherwise contains beech trees. These trees may be particularly susceptible to seed consumption by mice due to their cycle of 'masting', the production of large quantities of seed on an irregular basis every two to four years. Many believe that beech trees use masting to swamp the capacity of seed-eaters to eat all seeds before germination can occur, but our beech trees evolved in the absence of mice.

Dr Ruscoe says that regardless of whether alternative food sources are available to mice, they continue to search for and consume beech seeds until there are none left.

'This means they are theoretically able to eliminate seed reserves in beech forests, whether or not alternative food such as native moth larvae is available,' she says.

The scientists monitored how many seeds mice could find and eat, and the rates of increase and decrease in 'mouse abundance' as seed availability rose and fell.

When combined and built into a specially developed mathematical model, these factors indicate that mice would rarely be able to consume all the beech seed produced during moderate to heavy 'masting' years.

'Therefore, mice are not a likely threat to the continuous presence of beech trees,' Dr Ruscoe says. 'However, seed availability appears to be important to mouse dynamics.

'Our research provides a more reliable basis for predicting when mouse abundance is likely to irrupt, and will help refine our ideas on how to target control measures for them.'

The research also highlighted a lack of understanding of the role mice play in forest ecosystems.

'Given the pervasive nature of mice in beech forests, and difficulties associated with their control, there will be further research on understanding and managing their effects.'

— *Source:* DIANA LEUFKENS, *Landcare Research.*

Rescue Plans for New Zealand's Plant Life

The New Zealand Plant Conservation Network is a major new initiative to halt the continuing decline in indigenous plant life in New Zealand. It is also an attempt to raise awareness of the importance of New Zealand as a global centre of plant diversity.

New Zealand is a botanist's paradise, internationally renowned as a 'biodiversity hotspot' — 80 percent of New Zealand's vascular plant species are found nowhere else in the world. Less well-known is the extent to which New Zealand's plantlife is in decline, a trend that has continued, even since the Convention on Biological Diversity was ratified in 1992.

In a recent conservation assessment, four of New Zealand's vascular plant taxa were listed as globally extinct while 119 indigenous vascular plants were classified as 'acutely threatened'. A further 102 are in serious or gradual decline and 502 taxa (21 percent) are 'at risk' meaning they have a restricted range or are sparse. In addition, 89 bryophyte and 50 fungi taxa are also acutely threatened.

Causes of that decline are not unique to New Zealand. Principal agents include the spread of exotic weeds (there are now more naturalised exotic vascular plants than native), habitat modification, stock and animal pests (not just damage from herbivores such as the introduced possum but also via predators such as stoats that kill pollinators and seed dispersers), plant collection (there is no legal protection for native plants in New Zealand except when they occur in protected areas), and vegetation succession.

Efforts to halt the decline of New Zealand's plantlife have been varied and are driven, to a large extent, by the New Zealand Biodiversity Strategy (adopted in 2000). More recently the Global Strategy for Plant Conservation (ratified in 2002) has also provided a valuable framework upon which to hang plant conservation initiatives.

The need to work towards national implementation of these strategies has led to a variety of responses from government, conservation organisations, communities and individuals alike. The establishment of a New Zealand Plant Conservation Network has brought together botanists, horticulturalists and representatives of restoration groups, botanic gardens, zoos, local councils, universities and the Department of Conservation. The vision of the Network is that 'no indigenous plant species or community will become extinct nor be placed at risk as a result of human action or indifference'.

The work of the Network has been structured around the 16 targets of the Global Strategy for Plant Conservation. The key areas of work are: plant education, developing an 'Important Plant Area Programme' for New Zealand, plant conservation training and achieving legal protection for native plants. Copies of the report are available from the Network (info@nzpcn.org.nz). The Network has also begun disseminating information about the threatened flora of New Zealand and plant conservation literature through its website (www.nzpcn.org.nz).

The Department of Conservation is also a major player in plant conservation and conducts 17 species recovery programmes to protect 50 indigenous plant taxa. DoC has also developed a national plant database onto which all records of native plant occurrences (especially threatened plants) are stored. More than 350 threatened-plant monitoring programmes are now underway in New Zealand to detect change in population conditions over time.

Much of the plant protection work is undertaken in conjunction with private landowners, community restoration groups, and with commercial plant nurseries and botanic gardens, all key allies.

Another part of the programme is the translocation of species to establish new self-sustaining wild populations. Many of these translocations have been to offshore islands that are free of animal pests and have lesser problems with exotic plants. Information about plant recovery plans, monitoring and other initiatives can be found on the Department of Conservation's website (www.doc.govt.nz).

There have already been some notable successes in the protection of threatened plants in New Zealand. For example, *Dactylanthus taylori* was listed as 'critical' 10 years ago but has now dropped out of the 'acutely threatened' category due to a range of DoC programmes.

In the future, collaboration between the New Zealand Plant Conservation Network, the Department of Conservation, Plantlife International, the Australian Network for Plant Conservation and other conservation organisations in Oceania will be vital for increasing awareness of plant conservation issues and improving conservation actions.

— *Source,* JOHN SAWYER, *secretary, New Zealand Plant Conservation Network.*

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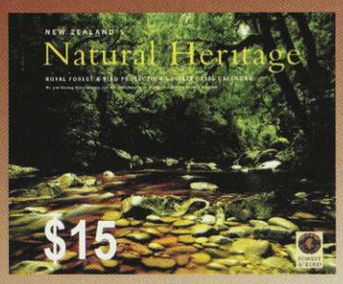

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The Remote Ruahine

SHAUN BARNETT explores a rich enclave of native plants and wildlife in the wilderness of the northwestern Ruahine Range.

The Makirikiri Tarns feature several islands which have preserved pre-Polynesian flora. Bog-pine shrublands on these islands survived the fires which so altered most of the vegetation on the Mangaohane Plateau. Both the Makirikiri Tarns and nearby Reporoa Bog are wetlands that occur in Maori land owned by the Aorangi-Awarua Trust. The Trust allowed DoC to include forests on their land into the recent 1080 operation, and is actively involved in monitoring the ecology of the area.

There's a common perception that national parks contain our most pristine, spectacular and diverse landscapes. But other areas, such as scenic reserves and forest parks, can also feature some of the country's most important ecosystems and striking landforms.

One such place is the northwestern corner of the Ruahine Range, east of Taihape. A Department of Conservation botanist, Vivienne Nicholls from Palmerston North, describes the area as an 'enclave of biodiversity.'

As well as a large number of rare species, including a bidibidi found nowhere else, the area also features red tussock grasslands now scarce in the North Island, as well as the only lake and lowland podocarp forest in Ruahine Forest Park.

Perhaps the area's most striking landscape occurs at Ruahine Corner, in the northwestern extremity of Ruahine Forest Park, where a snug hut overlooks the Mangaohane Plateau. Trampers who visit Ruahine Corner hut could be forgiven for thinking they were not in the North Island, but instead in a landscape of central Otago, or Kahurangi National Park. To the east, limestone cliffs drop away into the beech-clad Ikawatea Valley, a landscape boundary not dissimilar to that of Kahurangi's Thousand Acre Plateau. To the north, the Mangaohane Plateau features rolling, red-tussock grasslands, sinkholes, peat bogs, exquisite tarns, and limestone fashioned into ribbed outcrops.

It is a striking forest boundary, however, that marks Ruahine Corner as unique. Here extensive pahautea (cedar) forests curl over undulating hills to end abruptly at the red-tussock grasslands of the Mangaohane Plateau. The scientist Les Molloy described it as 'one of the most dramatic indigenous vegetation contrasts in the North Island.'

It is perhaps not surprising then, to discover that this is not a natural margin, but a human-induced one.

A DoC botanist, Geoff Rogers, has had a long association with the northwestern Ruahine Range dating back to the mid 1980s and wrote his PhD dissertation on the landforms and biogeography of the area. Later, in the mid 1990s he was employed by Landcare Research in Rotorua to write a Protected Natural Areas report for the Moawhango Ecological Region, of which the northwestern Ruahine is a part. Despite now living in Dunedin, he maintains an enduring interest in the place.

Geoff Rogers says that the pahautea forests at Ruahine Corner are the most extensive of their kind in the North Island, a sizeable remnant of a 300-square-kilometre swathe of this ancient forest type that used to stretch from present-day Waiouru to Ruahine Corner.

Fire, he explains, created the current forest boundary. Early Maori occupation of the area resulted in two significant conflagrations, both lit during the moa-hunting era, probably deliberately.

'The first, which occurred about 570 years ago, burned much of the western pahautea and beech forest about Waiouru. A second fire on the Ngamatea and Mangaohane plateaux followed about 430 years ago.' Geoff Rogers's research on these burn-offs was the first to reveal that 'our wetter montane forests went in huge conflagrations, rather than piecemeal fires.' Subsequent fires — and

Cabbage trees and podocarp forest near Lake Colenso. The only lowland-podocarp forest in the Ruahine park surrounds Lake Colenso.

Left: Sunrise over the red tussock grasslands at Ruahine Corner, with Te Rakaunuiakura beyond, northwestern Ruahine.

there were many — gradually eliminated secondary shrubs such as inaka and mountain toatoa, and 'selected' for today's red tussock grasslands. As the 'fuel load' remained low, these later fires did not substantially alter the pattern of relict forest.

Later, in the 1880s, Pakeha settlers brought sheep and cattle to graze on the Mangaohane Plateau. Initially, stock was driven over the main Ruahine Range back and forth from Hawkes Bay but, as rail and road links improved, Wanganui became the main connection. Much of the lower-altitude red tussock was converted to rye and clover with Government subsidises in the early 1980s.

The last big fire occurred in 1948, and the remaining red tussock grasslands on the plateau have been slowly changing back into shrublands ever since. Without further fires or other disturbances, more shrubs will establish, eventually allowing pahautea forest to regenerate.

While human-induced fires provide an explanation for the current forest boundary at Ruahine Corner, far more complex processes have shaped other aspects of the unusual vegetation of the Mangaohane Plateau.

The Makirikiri Tarns and Reporoa Bog are two peat bogs on the plateau that existed before the fires, enabling some special and wholly local plant species to survive. While both peat bogs lie within a few kilometres of each other, they have distinct ecologies, and both contain quite different plants. Other spots on the plateau also contain rare and locally specific plants.

What many of these plants have in common though, is an uncanny link with South Island flora. For example, one species of eyebright, *Euphrasia disperma*, occurs in the northwestern Ruahine Range but doesn't crop up again until north Westland. Similarly, North Island records for *Myosotis tenericaulis* are restricted to the northwestern Ruahines and Waiouru, but this forget-me-not is more prevalent in the South Island. One creeping native herb, *Tetrachondra hamiltoni,* doesn't occur again until Otago. The foxglove *Ourisia modesta,* known from just one damp location at Ruahine Corner, is also a rare plant in the South Island. Other plants in the area fit the same general pattern.

These biogeographical anomalies confounded early botanists Norman Elder and Tony Druce who, in the 1940s, were amongst the first to study the area's vegetation. Druce went on to describe the area's special plants, and in turn spurred the interest of Geoff Rogers.

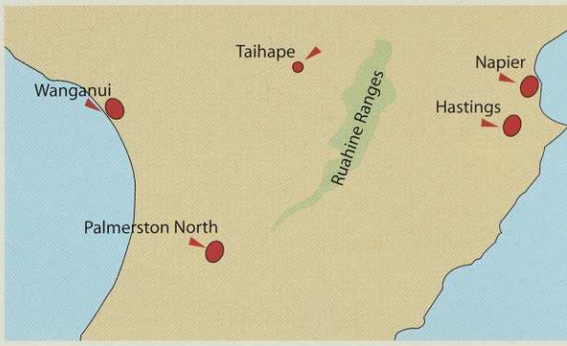
Only as understanding of past landforms increased have plausible explanations of such unlikely plant distributions emerged. Rogers says these plants exist here because of a unique combination of factors: the soils, landforms, altitude, climate and geological history.

'The habitats are just right for those species; here alone in the North Island,' he says.

Two theories can explain what are essentially unusual North Island occurrences of predominantly South Island plants.

The first is to consider them refugees from North Island Miocene landscapes that existed before a more-recent period of inundation. In the late Miocene and Pliocene, some 8-2 million years ago, sea levels rose and flooded much of the lower North Island. During this period of submergence, marine deposits formed a limestone cap in some areas, including the northwestern Ruahine Range (where limestone outcrops are still evident). While the inundation extinguished the 'Miocene refugee' plants from the lower North Island, the central North Island provided a refuge for them. After later tectonic uplift raised the Mangaohane Plateau, in the last 1-2 million years, the ancient plants colonised the area, but were subsequently lost from some of their former refuges in the central North Island.

The second explanation suggests that, after the inundation, the Miocene refugees spread from their South Island strongholds, but survived only at localised spots like the northwestern Ruahine Range where their specialised habitats still exist. Other potential habitat elsewhere in southern North Island has been 'too faulted, folded, and eroded' for the plants to persist. The extent of such geological disruption is evident in the main Ruahine Range, which was upthrust during the last 1-2 million years. Some marine gravels exist on a few summits of the Ruahine Range, but the soft limestone cap has eroded off to expose the underlying greywacke that modern day trampers are so familiar with.



Most of the northwestern area is within the Ruahine Forest Park. The remainder is Maori land. Local detail is available on NZMS 260 U21 Kereru.

Lake Colenso is named after missionary-explorer William Colenso. This small four-hectare lake is the only one in Ruahine Forest Park.

Right: Few New Zealand trees display as much character as pahautea (New Zealand cedar), with their conical shape, vibrant foliage and striking bark. One Forest Service writer, Geoffrey Chavasse, described the pahautea trees of Ruahine Corner as '...stag-headed, split, leaning every which way, looking like little old gnomes, squat, thick in the butt, with rich green pointed caps and russet red trunks.' Pre-European Maori found the bark useful for fashioning into canoe-shaped vessels to store the mutton-birds (mottled petrels) that used to exist in the area.

While both explanations are seductive, one plant doesn't quite fit the biogeographical pattern. The bidibidi *Aceana rorida* seemed to occur only in the northwestern Ruahines and nowhere else. Geoff Rogers calls it 'an enigma.' However, botanist Kelvin Lloyd and colleagues have 'possibly discovered' the same plant in the Idaburn Valley of Central Otago. Even so, this would still mean the bidibidi has one of the largest disjunctions of any species in New Zealand — about 1000 kilometres.

Vivienne Nicholls, from the Department of Conservation in Palmerston North, has been studying the local bidibidi *Aceana rorida*, carrying on from work begun by Geoff Rogers. This small bidibidi is restricted to the Makirikiri Tarns, a large peat bog just north of the Ruahine Forest Park boundary on Maori land owned by the Aorangi-Awarua Trust. Vivienne Nicholls describes the bidibidi as a flat-growing, no-hooks specimen, with leaves of a 'lovely cloudy-pink colour.' Part of her study aims to monitor the potential threat posed to it by the introduced weed *Hieracium* (hawkweed). So far, so good, as the two plants seem to occupy slightly different niches. However, like other rare species, this little bidibidi maybe at risk from hybridisation with a more common species, the native bidibidi *Aceana novae-zelandiae*.

Rare birds as well as rare plants add to the biological diversity of the northwest Ruahine. At Ruahine Corner, North Island brown kiwi are infrequently heard at night, while during the daytime fernbirds, North Island kaka, falcon/karearea and kakariki parakeets might be spotted. In fact, with the exception of kokako, just about every threatened North Island bush bird on the list crops up in the area.

South of Ruahine Corner, while the limestone persists spasmodically, the pahautea forests end, and you find yourself instead in the beech forests so widespread in most of Ruahine Forest Park. In the headwaters of the Mangatera Valley, amidst a sea of such beech forest, an island of lowland podocarp forest exists — the only such area in Ruahine Forest Park. This forest surrounds the sole lake in the park, Lake Colenso or Kokopunui. It is named after the missionary-explorer William Colenso, who made several crossing of the Ruahine Range in the 1840s and early 1850s, although he never visited the lake himself.

Archaeologists have discovered a number of sites around the shallow lake that suggest Maori parties occupied the area seasonally. Kokopunui served as a base during bird and eel-hunting forays.

While the birdlife today has probably declined from when these sites were occupied, an impressive number of species still survive, including New Zealand pigeon, North Island robin, whitehead, fantail, tui and bellbird. Blue duck whistle their lonely *whio* in nearby rivers. And birds are not the only winged creatures either; long-tailed bats inhabit the forests around Lake Colenso, while there are unsubstantiated records of short-tailed bats in nearby areas.

Occupying a shallow depression above the Mangatera River, Lake Colenso lacks any significant in-or outflow. Consequently it remains free of introduced trout and weeds, and forms a haven for native freshwater fish. The scarlet mistletoe *Peraxilla tetrapetala*, the endangered *Pittosporum turneri*, and the root parasite *Dactylanthus taylorii* can also be found in the area. The native snail *Powelliphanta marchanti* also adds to what is a real hotspot of biological variety.

Altogether the northwestern Ruahine Range displays a diversity of landforms, vegetation, and endangered animals rare for such a small corner of country. I doubt there's a comparable portion of any national park that surpasses it.

— SHAUN BARNETT *of Black Robin Photography is writing a book about forest parks, which he believes have lacked the attention they deserve.*

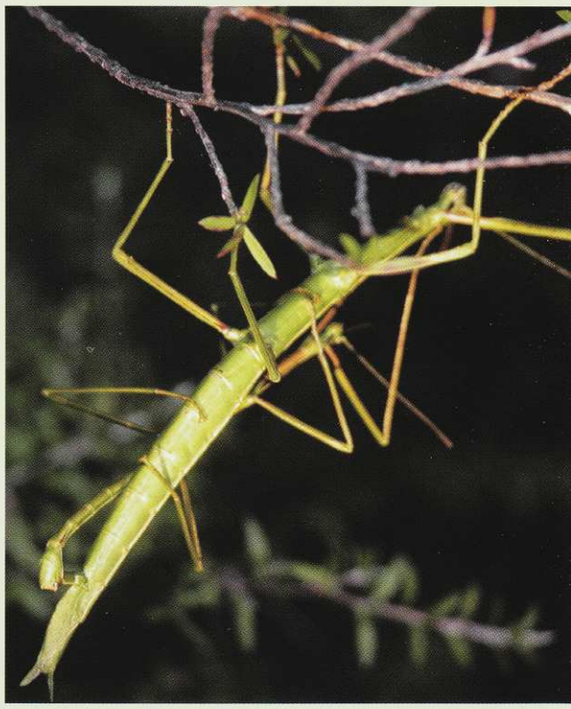
Phantoms of Forest and Garden

SALLY HIBBARD finds stick insects in the dark.

Did that twig just move? If you find yourself asking this question, then you're probably in the company of one of our more unusual insect families.

New Zealand has over 20 species of stick insect, all of which are native. Together with the even more extravagantly shaped leaf insects found in warmer climates, they make up the order Phasmatodea. *Phasma* is Latin for ghost or phantom which is certainly an apt description. The Auckland site in which I regularly observe stick insects is literally teeming with animals in summer; however, it was only after several 'thorough' searches that I located any.

Stick insects are found throughout the country and on many offshore islands. It is likely there are populations on some islands that we are not yet aware of. It is equally likely that many such populations have been wiped out by introduced predators and loss of habitat before their discovery. Two New Zealand species inadvertently left our shores some years ago after hitching a ride on some plant material and continue to thrive in the temperate climate of southwestern England.



Above: the common or smooth stick insect. Clitarchus hookeri *on pohutukawa.*

At right is a mated pair (the male is much smaller). They are frequently found like this, the male riding on the female for days at a time.

Most often observed on manuka or kanuka, the totally herbivorous stick insect feeds on a variety of other plants, including rimu, cabbage tree as well as the garden rose. I have also observed a few individuals feeding on the tips of pohutukawa branches. The mobile and somewhat alien-like head is equipped with two sets of jaws for munching through vegetation. In addition to being found in lowland forest and scrub areas, many backyards and suburban parks are home to the elusive stick insect.

So how does an insect which can easily grow to 15 centimetres in length remain virtually invisible? Apart from its obvious resemblance to a twig, stick insects have a few other camouflage tricks. At rest during the day, they align themselves with plant stems and branches, often with legs extended along the line of the body to further enhance their twiggy appearance. They can sometimes be observed 'shivering' on a branch that is moving in the breeze, presumably another camouflage tactic.

If disturbed, they will sometimes drop to the ground and feign death until the coast is clear. Any attempt to rouse them results in an even lengthier and more determined performance.

All of New Zealand's stick insects are green, brown or somewhere in between and many species have various tubercles and spines adorning their bodies. Unlike some of their overseas relatives, New Zealand species lack wings. Males are even more twig like than the larger females with extremely thin bodies and spidery legs.

JOHN JANSEN

The best time to observe these insects is at night when the majority of feeding and activity takes place. Even at their most active, stick insects could never be described as hurried and seem content to stay in more or less the same area. They often hang from the underside of branches where they can be picked out by torchlight. Tiny hooks and special pads on the undersides of their feet allow them to maintain their grip.

Of course, if you go hunting for stick insects during the colder months you are likely to be disappointed. Virtually all adults die off as winter approaches. During this time stick insect populations are represented only by tiny seed-like eggs scattered in the leaf litter by the females before they die.

Another fascinating aspect of stick insect life is their reproductive abilities. Stick insects are able to reproduce parthenogenically — that is females lay unfertilised eggs which hatch into female clones of themselves. In some species males have never been found suggesting an all-female species. Interestingly, those species where males regularly occur are also able to reproduce parthenogenically.

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A brown stick insect, photographed at night. While it could be a brown form of the common stick insect, experts could not confirm this from the photograph because individuals vary in size and colour within species.

The common stick insect *Clitarchus hookeri* is often found as a mated pair, the much smaller male riding around on the back of the female for days at a time. The female simply drops her eggs onto the ground below, which of course means the young have immediate access to the appropriate food plant upon hatching.

The juvenile stick insects emerge from their eggs in spring in response to increasing temperatures. They are tiny replicas of the adults and, like most insect young, totally independent and focussed on eating. Over the ensuing months, they undergo a series of moults, shedding their old skin and emerging each time as a slightly larger version of themselves. If a leg is lost while the insect is still in this growth phase, it will be regrown in the next moult. After the insect has reached maturity, it can no longer regenerate lost limbs.

Stick insects have a range of predators, with the juveniles being most vulnerable. Potential predators include parasitic wasps, rats, mice, possums and insect eating birds. Eggs are also vulnerable to predation. The use of insecticides has also had an effect on stick insect populations, particularly the historic widespread use of DDT.

Across the Tasman, Australia has an extensive stick-insect fauna. There are around 150 native species including the giant phasmid which reaches 25 centimetres in length. A small percentage of these Australian stick insects are considered pest species due to their ability to defoliate entire trees. One such incident occurred in 1963 resulting in 650 square miles of eucalypt being stripped of leaves! Many Australian stick insect species have wings and use these not just for getting around but to deter predators by 'flashing' them with a startling display of colour.

What the slender stick insect lacks in bulk it certainly makes up for in length and as such qualifies as the longest insect in the world. The longest originates from Borneo and can exceed 32 centimetres in length.

The size and unusual appearance of stick insects makes them a popular pet overseas. The Indian stick insect is well established in the pet trade and in this capacity has reached many parts of the world. It is alternatively known as the 'laboratory stick insect' due to its extensive use in physiological experiments.

Internationally there are around 2500 species of stick insect, and undoubtedly more that have not yet been described. There is still much to learn about these fascinating creatures and their habits. Only recently a new species was discovered in West Auckland, perched on a cabbage tree right next to a well-used walking track! We may have lost hope of finding an elusive moa species deep in the forest but, with these insect masters of disguise, who knows what awaits discovery?

— SALLY HIBBARD *is a writer, and graduate in zoology.*

JOHN JANSEN

Mokoia Island

JASON ELSWORTH visits a wildlife refuge in Lake Rotorua where cultural and conservation values are preserved.

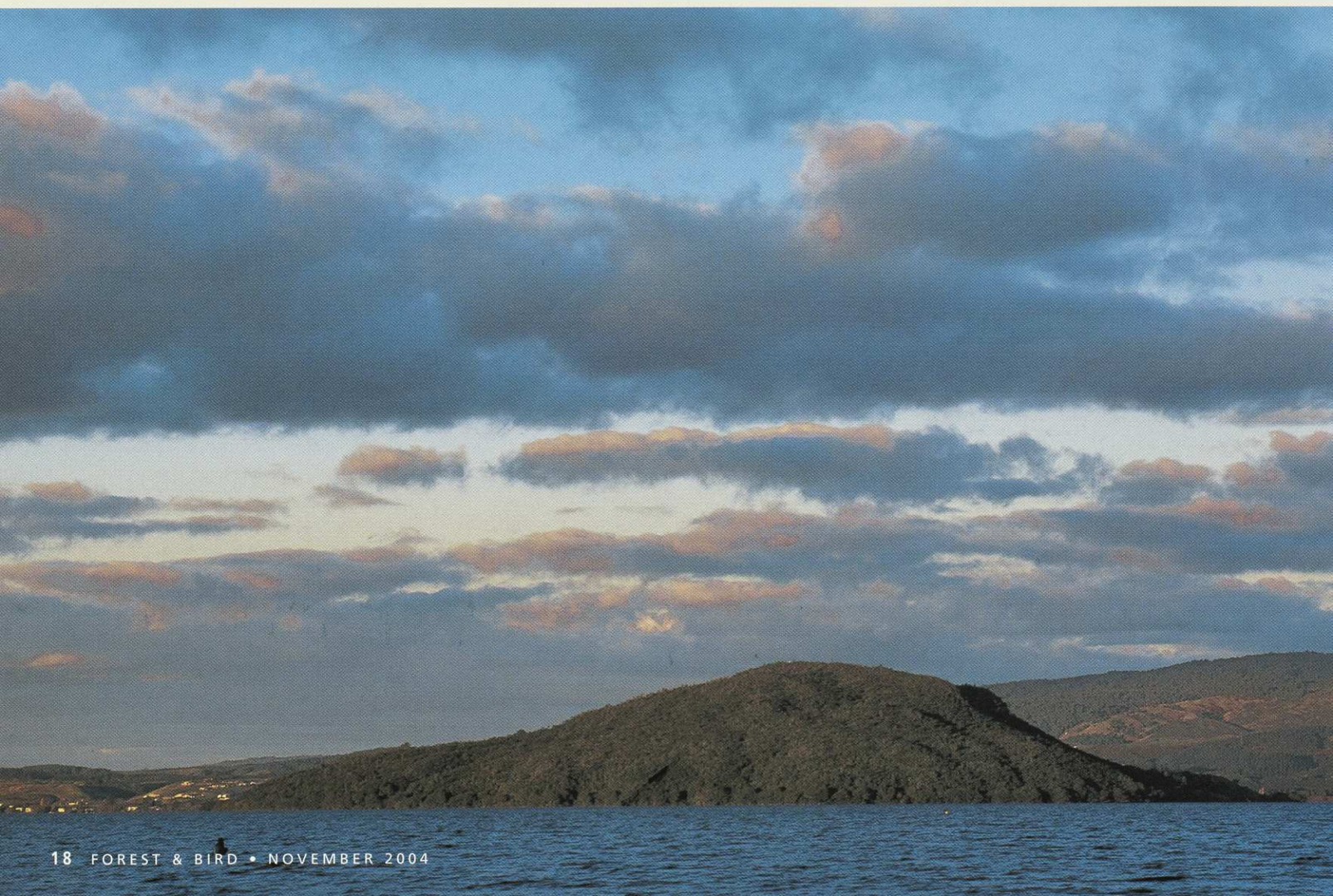
I'm sitting quietly in the bush, doing my best impression of a log, and carefully watching not one but four saddlebacks, foraging contentedly right in front of me. I'm not in some remote offshore reserve, but instead in inland Bay of Plenty.

Mokoia is a 135-hectare predator-free reserve in the middle of Lake Rotorua and is home to the largest mainland population of saddlebacks in the country. It is a place where native flora and fauna can flourish too.

Mokoia was formed when magma that was slowly cooling below the surface of the collapsed volcano that formed Lake Rotorua erupted again. This dramatic beginning was the start of a long and fascinating history for the island, only a few kilometres from the centre of Rotorua city. With its fertile soil and strong defensive position, Mokoia has always been a prized location. As a result it has been the subject of many bloody — and, more recently, legal — disputes.

Mokoia's bloodiest hour came during the musket wars, when in 1823, Ngapuhi, led by Hongi Hika, came down from the north. Hapu around Lake Rotorua sought safety on Mokoia, but Ngapuhi had carried their own canoes inland with them and, as they had many more muskets than the tribes on the

Mokoia Island in the middle of Lake Rotorua is being restored as a home for rare native birds. Already, North Island robin, saddleback, brown kiwi and weka have been successfully introduced.



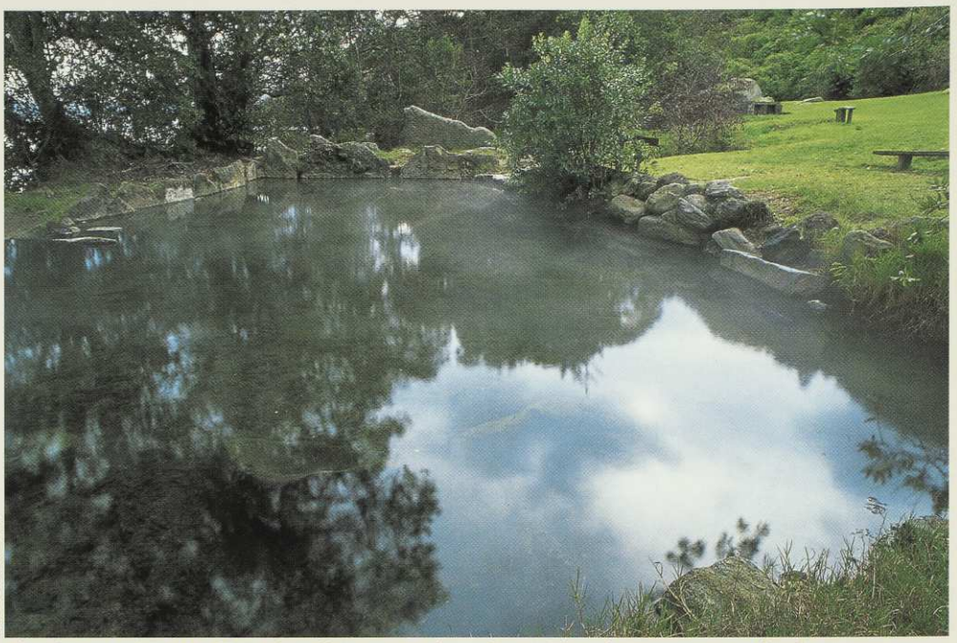
island, a slaughter ensued. Hundreds of men, women and children were killed.

In stark contrast, however, Mokoia Island is also the setting for one of the most romantic of Maori tales — the story of Tutanekai and Hinemoa. The story is a classic tale of forbidden love, which sees Hinemoa swimming to Mokoia, across the lake, to be with her love Tutanekai.

In the twentieth century the battle for Mokoia became a legal one, starting in 1916 with a Maori Land Court hearing. Various hapu submitted 29 claims and after 11 long months the successful hapu were Ngati Whakaue, Ngati Uenukukopako, Ngati Rangiwewehi and Ngati Rangiteaorere. Today Mokoia is a private wildlife refuge, managed by a board of trustees made up of representatives from each hapu.

The Jonz Corporation has a long-term licence from the trust board, and is responsible for the island's day-to-day management and for all visitor activities. John Marsh, the managing director of Jonz Corporation, is a descendant of Hinemoa and Tutanekai and has an inspiring vision for the island and how it can change people. Along with the Mokoia Island Trust Board, Jonz Corporation intends to 'develop the island for iwi cultural and native flora and fauna conservation.'

The journey toward Mokoia becoming a place for conservation has been long and eventful. Broadleaf podocarp forest would once have covered Mokoia, but the island was also perfect for cultivation — kumara being the main crop. Turning Mokoia into a garden, however, required extensive clearing, burning and terracing, destroying much of the original forest. The modification of Mokoia's habitat continued when the first Europeans arrived in the early 1800s, bringing with them non-native flora as well as rats, mice, cows, sheep and goats.



JASON ELSWORTH

This hot pool on Mokoia Island lies on its shoreline with Lake Rotorua. In the famous story, Hinemoa recovered here after swimming across the cold lake guided by the flute played by her lover Tutanekai.

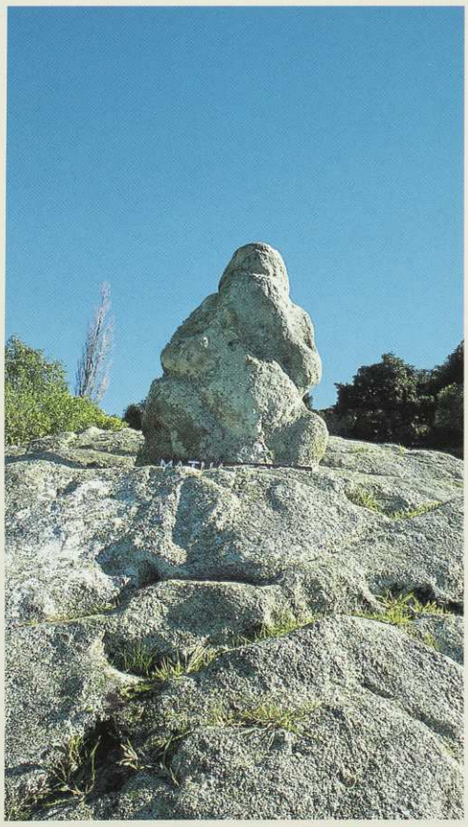
The first attempts to restore Mokoia to a pre-European habitat were made in the 1960s, when thousands of small trees and ferns were planted. Unfortunately rats destroyed most of them. No other restoration attempts were made until 1989-90, when Paul Jansen of the Department of Conservation, coordinated the eradication of rats, goats and sheep. Next, helicopter drops of brodifacoum in 1996 and 2001 eradicated mice. Rats have occasionally reappeared on Mokoia since the eradication so an extensive network of bait stations and tracking tunnels now covers the island.

Eradicating rats, sheep, mice and goats gave the bush the chance it needed to grow and the forest on Mokoia has recovered well.

'The forest is in very good condition,' says Keith Owen of DoC Bay of Plenty. 'It has really regenerated substantially from where it was and the bulk of the centre of the island is weed free.'

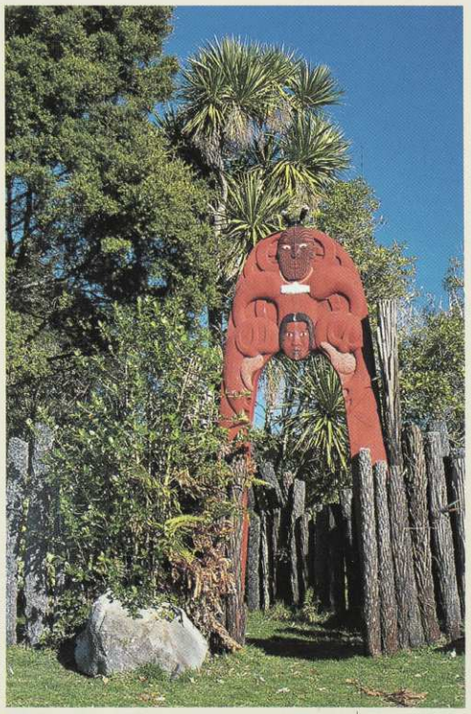
The main plant species now present on Mokoia are five-finger, mahoe, kawakawa, kohuhu, tree ferns (especially on the southern half of the island), whau, cabbage trees, kohekohe, and karaka. In 1999, two species of mistletoe (*Ileostylus micranthus* and *Tupeia antarctica*) were translocated to Mokoia. Some invasive European plants remain, but a huge growth of blackberry which once covered much of the island's flat areas has now been cleared.

The final part of the island's ecosystem is Lake Rotorua itself. Unfortunately, waste from pastoral farming around the lake causes high levels of nitrogen to leach into the water. This leaching, combined with the high levels of phosphorous found in the lake, has introduced an artificially high level of nutrients. These nutrients promote algal growth, which significantly degrades the lake's water quality. To counter this,



JASON ELSWORTH

Mokoia has long been important to Maori. The stone 'kumara god' Matua Tonga once overlooked extensive gardens on the island.



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The ancestors Hinemoa and Tutanekai are acknowledged in this ceremonial gateway on Mokoia Island in Lake Rotorua, Bay of Plenty. This Maori reserve is managed to protect cultural and conservation values. Hinemoa swam the icy lake to join her lover, Tutanekai, on the island.

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The introduction of the North Island robin was an early success for the restoration programme. Birds have since been taken from Mokoia to establish a population on Mayor Island/Tuhua off the coast of the Bay of Plenty.

DICK VEITCH © DEPARTMENT OF CONSERVATION

The introduction of the North Island saddleback to Mokoia Island was another success for the restoration programme. Populations grew from 36 birds introduced in 1992 to 200 in 1997.

DICK VEITCH © DEPARTMENT OF CONSERVATION

Stitchbird (hihi) were introduced to Mokoia but had to be removed because many were dying. Scientists eventually traced the cause to a fungus found in the soil.

Environment Bay of Plenty has developed an action plan, which aims to coordinate the efforts of local stakeholders and reduce the level of nutrients in the lake.

Since the rat eradication, four bird species have been brought back to Mokoia: New Zealand robin (toutouwai), stitchbird (hihi), saddleback (tieke) and North Island brown kiwi. Weka were transferred from the Gisborne area in the 1950s and, according to Keith Owen, there are 'probably between 80-100 weka on the island.'

The first of the reintroductions was seven male and 10 female New Zealand robins in June 1991. The robins have thrived on Mokoia and, in 2003, robins were taken from Mokoia and released on Mayor Island/ Tuhua in the Bay of Plenty.

The next species to come home to Mokoia was the saddleback in 1992. After the reintroduction a team of researchers from Massey University carefully studied the saddlebacks. Research found that the population grew well, from the original 36 released in 1992, to 200 in 1997.

The saddleback reintroduction has been a total success, according to Dr Isabel Castro of Massey University. Not so the stitchbird.

Following the saddleback reintroduction, 40 stitchbird or hihi were released onto Mokoia in 1994. Reintroducing hihi, however, proved to be much more difficult than saddlebacks.

'It was one of the most challenging reintroductions [in New Zealand] so far,' according to Dr Castro. Mokoia, with its modified and regenerating habitat, was unlikely to have enough fruiting and flowering flora to provide sufficient food, and the island lacked the type of large trees hihi prefer for their nests. So to help the hihi get established, they were provided with food, via supplementary feeding of sugar water, and accommodation, via nest boxes.

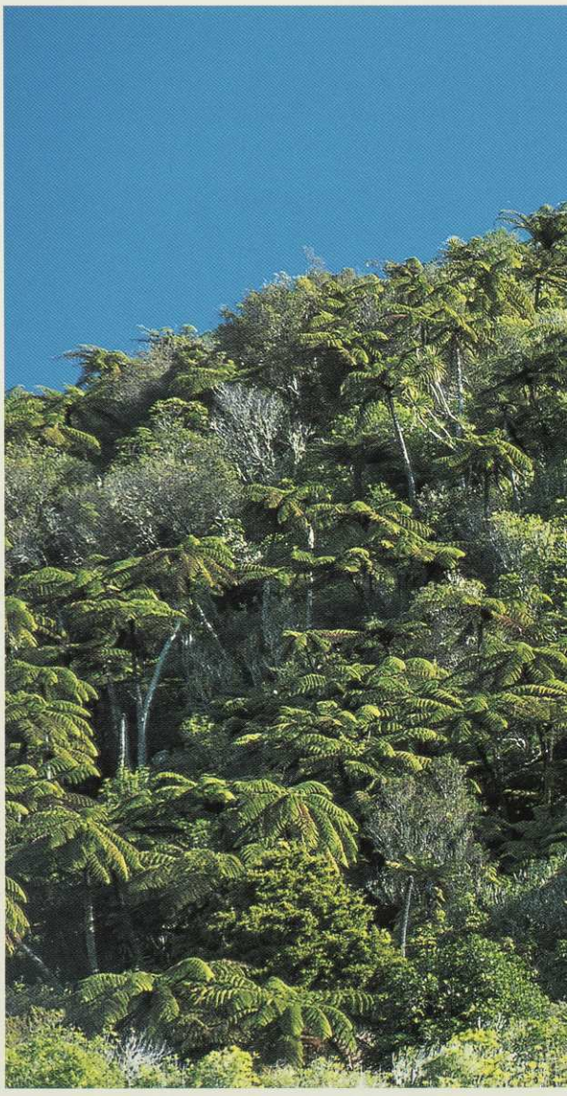
Following the release, extra food was provided every year (except 1998-99) until August 2002, when the birds had to be removed from the island. Initial research, again by the Massey University Ecology Group, unexpectedly found that providing food had no affect on the survival rate of adult hihi. Even with supplementary feeding only four out of every 10 hihi would survive from one year to the next. 'Predictive modelling' showed that the future survival of hihi on Mokoia was far from certain.

The researchers concluded that something other than lack of food must have been affecting the hihi population's chance of survival. But what was it?

A clue to exactly what was killing off the Mokoia Island stitchbirds could be heard in the songs of some of them. Their normally crisp, high-pitched call was developing a slight rasp, one of the initial symptoms of a lung infection known as Aspergillosis. Autopsies of hihi lost on Mokoia between 1995 and 1997 confirmed that in many cases (19 percent) the culprit was indeed Aspergillosis, caused by *Aspergillus fumigatus* fungal spores. A further 44 percent of the birds lost, displayed symptoms of Aspergillosis, but their carcasses could not be found. The fungal spores that cause Aspergillosis are found in the soil and easily inhaled by the birds. Unfortunately, the infection is not treatable in the wild.

Further research, by John Perrott and Doug Armstrong from Massey University, indicates that habitat disturbance and modification (highly prevalent on Mokoia) appears to promote *A. fumigatus*. Mokoia has much higher levels of the fungus than on Tiritiri Matangi Island, where, in 1995, hihi were successfully reintroduced. It now looks likely that Aspergillosis is the reason why, despite intensive management, the introduction of hihi to Mokoia proved so difficult.

In 2002 the Department of Conservation decided to remove hihi from Mokoia and transfer them to Kapiti Island. Despite the



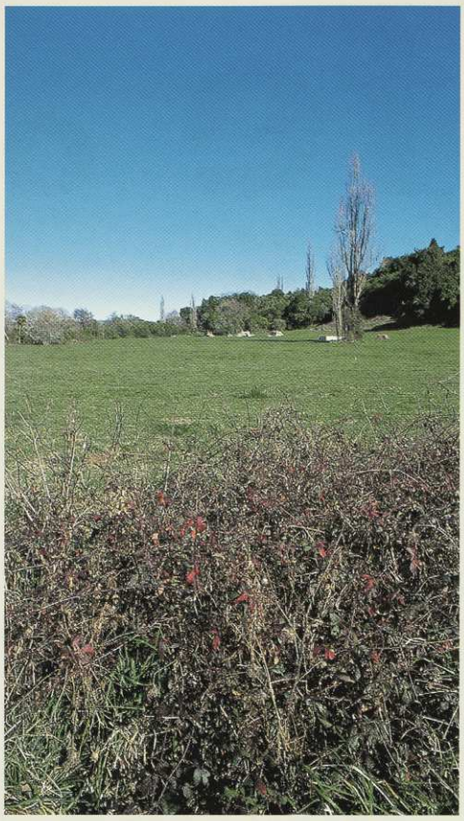
failure, a vital lesson was learnt – in some cases the tiny and easily ignored *A. fumigatus* fungus may be just as dangerous an enemy as any predator.

Today, a predator-free Mokoia Island is alive with birds. Tui dogfight above your head, fantails dance along with your every step, silvereyes and grey warblers flit from tree to tree and, if you pause to stop anywhere in the bush, it won't be long until you have a North Island robin or a saddleback for company. The latest introduction of four North Island brown kiwi in 2003 has also brought our national icon back to the island.

Mokoia Island's journey back to being a place where native flora and fauna can flourish has been long and eventful but, as you sit listening to the chattering of a foraging saddleback, the future for Mokoia certainly looks bright.

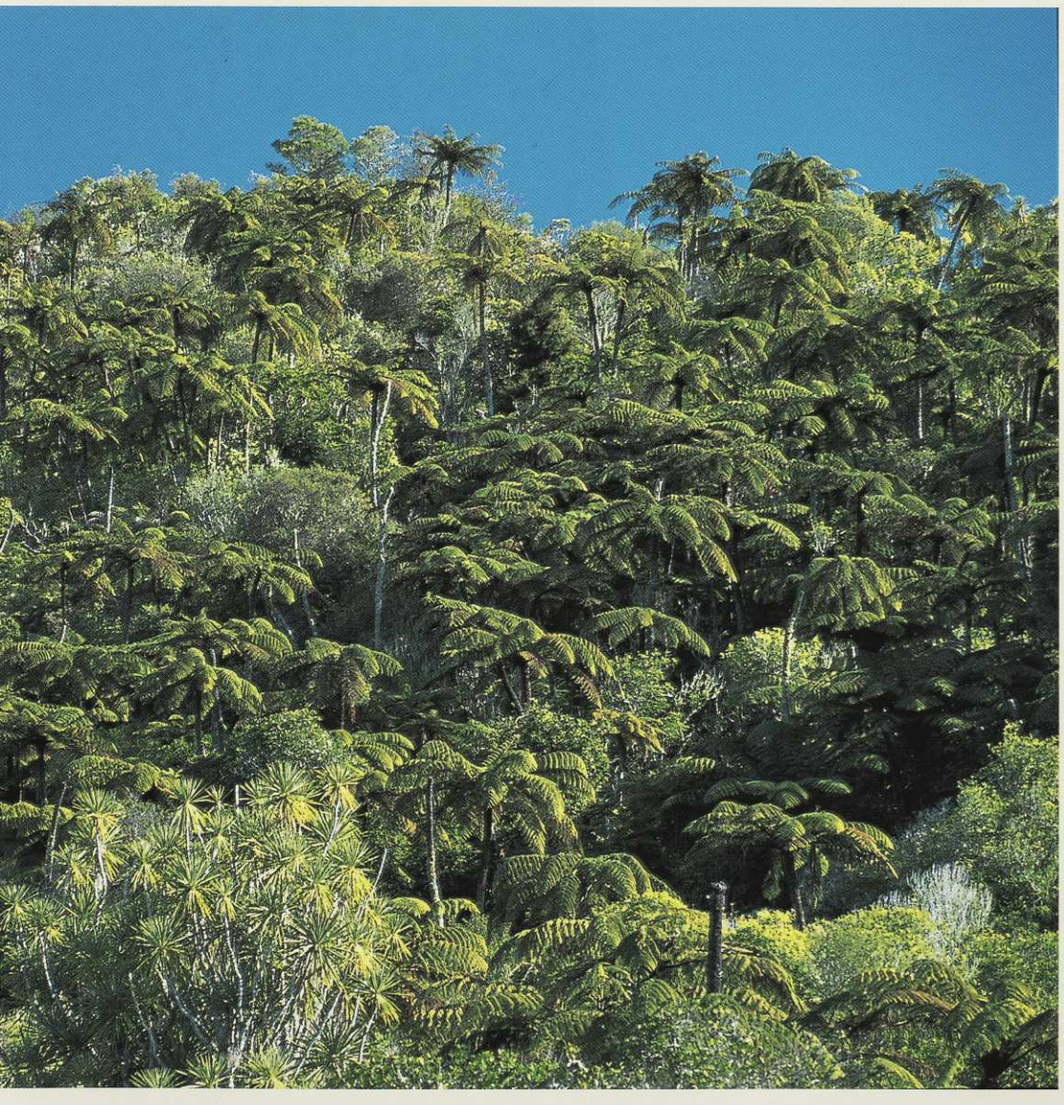
— **JASON ELSWORTH** *is a freelance writer and photographer of nature.*

To visit Mokoia Island contact the Jonz Corporation — 0800 665 642 or mokoia.island@xtra.co.nz



JASON ELSWORTH

Above: blackberry has been largely cleared. Below: forest on the island is recovering following the eradication of introduced pests, specifically goats, rats and mice. Pest control is continuous to prevent reinvasions.

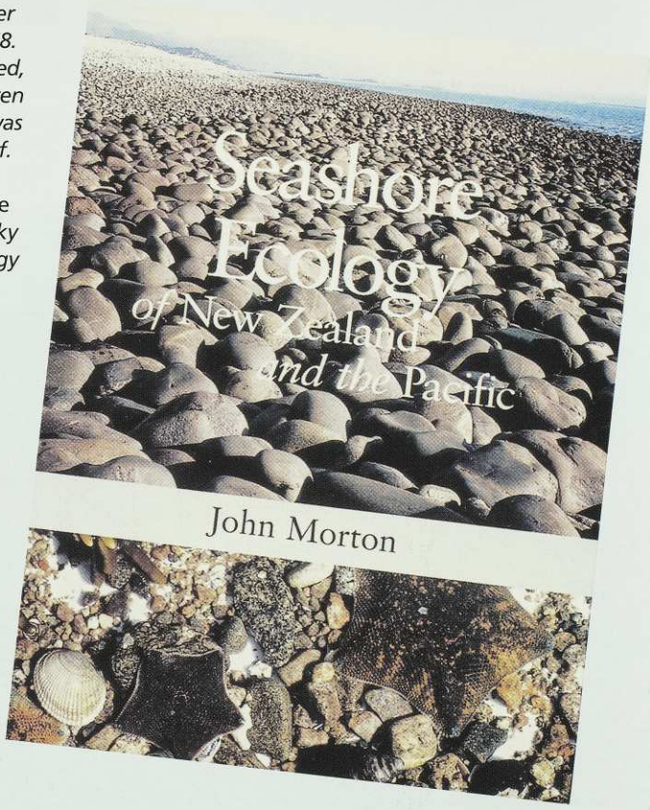


JASON ELSWORTH

A Life on the Shore

GORDON ELL talks with distinguished life member Prof. JOHN MORTON who has just published his magnum opus about the seashore.

The book which made the study of the seashore accessible to a wider audience when published in 1968. Long out-of-print yet still consulted, The New Zealand Seashore *(written with colleague Michael Miller), was to be brought up to date in Prof. Morton's new work.* Seashore Ecology of New Zealand and the Pacific, *however, focusses on rocky shores and compares their ecology about the Pacific rim.*



At 81, John Morton has completed his life work on the rocky shore. His long-awaited magnum opus is entitled *Seashore Ecology of New Zealand and the Pacific*. It is nothing like as frightening to read as it sounds, for John Morton is also a literary man: he writes science in language understandable by lay folk.

The distinguished life member of Forest and Bird, and a Companion of the Queen's Service Order for his work in science, John Morton is an Emeritus Professor of the University of Auckland, and was the first Head of the Zoology Department there.

Many of us still cherish a worn copy of his pioneer work, *The New Zealand Seashore*, which he wrote with a colleague, Dr Michael Miller, and published in 1968. That book recorded for the first time the world of our tidal regions, from rocky shores to sheltered estuaries, and to a degree the new book was expected to be its successor.

This new work, however, focusses only on the rocky shore. It also looks beyond New Zealand to hard shores around the Pacific, from coral reefs to the rocky seaboards of eastern Australia, Asia and the Americas.

'The rocky shore was enough,' John Morton says of the new book which builds on his field work over 40 years in the Pacific. Text and some 380 illustrations explore the creatures and plants which make up the communities which live between high water and low.

'One of the great unities I wanted to draw out was something which hadn't before been realised — the unity of rocky shores and coral reefs around the Pacific. We have in New Zealand a representative fragment but it is only part of a continuous system around the Pacific. . . .

'While this book aims to be the successor to

The popular impression of Prof John Morton, as he often appeared on television. This picture was taken on one of his working trips to the Pacific, which included studying coral shores in the Solomon Islands, Fiji, Samoa, Cook Islands, New Caledonia and Papua-New Guinea.

the old Morton and Miller it is far from being a revision, even if this were possible.' John Morton speaks of changing times. 'The primary need is no longer to identify species . . . some excellent guide books are now available. A new book on our shores can in some sense be synoptic, drawing patterns of species together, to reveal whole communities.'

After graduating from Auckland University College in the University of New Zealand in 1946, John Morton taught for 10 years at the University of London, studying for his doctorate at the Plymouth Marine Laboratory. When he returned to what was now the University of Auckland, in 1960, he became its foundation Professor of Zoology and used the example of Plymouth as a model for the Leigh Marine Laboratory which opened in 1965.

He was 'shifted aside' from the departmental headship in zoology in 1970, a 'happening' he now sees as a valuable one.

'I was relieved of being an administrator and got 19 more years to work,' he says. 'If I hadn't stepped aside then I would have remained a molluscan expert. I wouldn't have been able to do anything new. As it was I was able to break into the tropics, the coral shores. I was able to go to America, able to do a book on Hong Kong, able then to get involved in politics [he was an Auckland regional councillor in the days when the regional parks were set up] and in environmental education.' He retired as an emeritus professor in 1988, determined to complete his book.

Though increasing age slowed him down, 'especially with memory for new scientific names', he has still been able to draw the fine-line illustrations which have long distinguished his work. These record in ink sketches complete communities of animals and plants found in the tidal zone.

One of his mentors was T.A. Alan Stephenson who taught him to read a shore (and to draw it). Stephenson was a natural historian, appreciating all aspects of ecology, the complex mixture and association of plants and animals making up a community. John Morton learnt to record these communities with a pen in the field. They record — better than field notes, he believes — the component parts of an environment; features which can be read just as easily years later by simply looking at the field sketch. His drawings are one of his proudest achievements: they are a feature of his books and a good example of the approach is the 'Zoned shore of Lang's Beach, Bream Bay, east Northland', (pictured) finished with the flourish of a northern variable oystercatcher.

Professor Morton is a long-time conservationist; an influential authority on conservation science, an active lobbyist too. For a period in the later 1970s and early 1980s, he was active with Forest and Bird in efforts to save native forests from millers, serving then on the Society's national executive. His conservation advocacy was broader, however, including many local campaigns, such as trying to preserve the fossil kauri forest on Takapuna Beach from conversion to car-parking, and the restoration of scrublands adjacent to his Castor Bay home, now a young native forest and a focus for school nature studies in North Shore City. On the broader scene he co-authored *Seashores for the Seventies* with the environmental engineer David Thom and biochemist Ron Locker; an influential work which looked at our despoilation of the coast by insensitive development.

He also wrote textbooks about the places he worked as a visiting professor, all illustrated in his distinctive pen drawings. He shows me volumes from Hong Kong, Samoa and British Columbia; a textbook entitled *Guts* is published in English and Japanese.

John Morton's advocacy for nature has extended to radio and television too. His ability to demonstrate biological processes by miming the creatures' habits made him a popular figure on early New Zealand television. Later he 'fronted' nature programmes, providing the New Zealand perspective to largely imported material.

As if this wasn't enough, he has been an active Anglican, a Synod member, and the equally respected author of several

A typical drawing of a marine community of the kind which distinguishes John Morton's work. He often drew such pictures in his field notebook, using sketches in place of words, as a technique for accurately describing what he found.

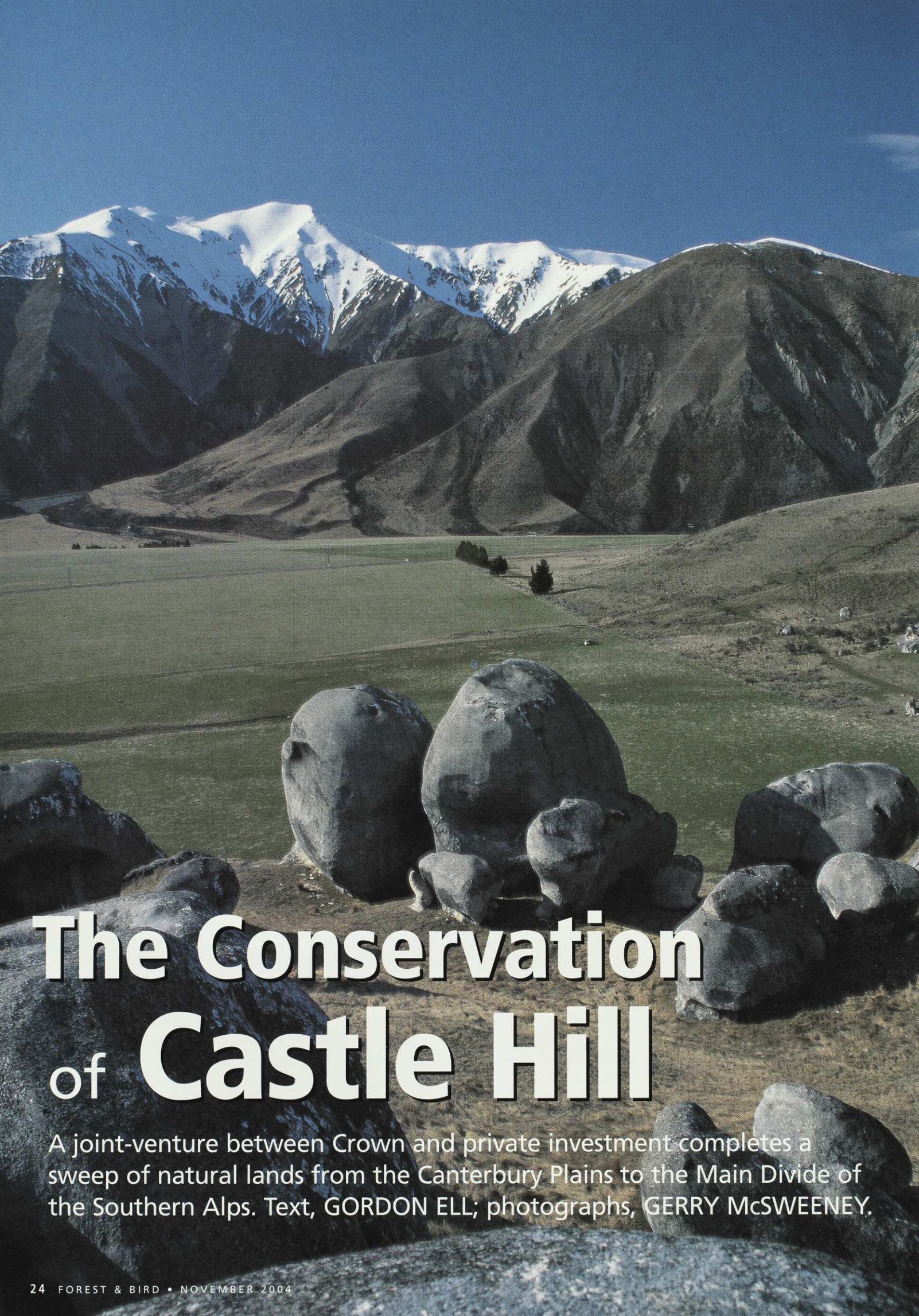
theological volumes. Their themes have included the interdependence of science and theology.

John Morton stresses the importance his wife Pat has had in supporting his work. When they had young children she urged him to accept the honour of leading the marine scientists on a Royal Society expedition to what was then the British Solomons, a six-month stint which introduced him to the marine biology of the Pacific islands, and a highlight of his professional career. Nearer home, on the North Shore of Auckland, the couple have shared a reputation as local activists and joint-patrons of community conservation initiatives.

He also acknowledges a profound debt to palaeontologist Dr Bruce Hayward whose energy as scientific editor helped bring the project to publication. Bruce Hayward, another polymath whose many publications range from Maori traditions to social history and nature guides, also contributes a chapter on the geology of seashores. In John Morton's account, the book would not have been finished without his work.

'Bruce Hayward deserved to be named as a co-author of this book,' according to John Morton, 'but modestly he deferred.'

Seashore Ecology of New Zealand and the Pacific *by John Morton is a hardbound book in A4 format with 504 pages. It is published by David Bateman at $89.95.*

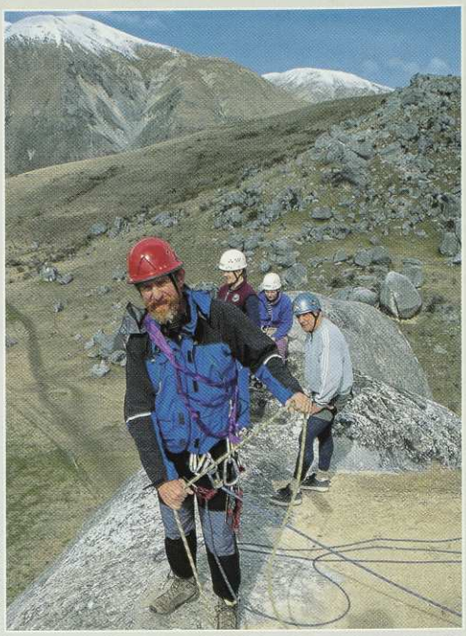


The Conservation of Castle Hill

A joint-venture between Crown and private investment completes a sweep of natural lands from the Canterbury Plains to the Main Divide of the Southern Alps. Text, GORDON ELL; photographs, GERRY McSWEENEY.

GERRY McSWEENEY

Virtually all the land within this photo stretching from the Mt Cheesman Ski-field access road at 1294m to the Torlesse Range in the distance (1998m) is within Castle Hill pastoral lease, 76 per cent of which will now become conservation land.



GERRY McSWEENEY

Rock climbing within the Kura Tawhiti Conservation Area. John Corcoran in the photo runs training courses for under privileged young people within the reserve. The use of bolts and any artificial fixing systems is discouraged in the reserve.

Castle Hill qualifies better than most of New Zealand's outstanding landscapes for the description 'iconic'. Situated on the main west highway from Christchurch to the West Coast, Castle Hill lies in a vast high-country basin clothed largely in windswept tussock but scarred by shingle slides and punctuated by limestone outcrops.

It is these limestone rocks which give it an almost mythical dimension. Some southern Maori have been known to refer to it as their 'Stonehenge' though the dramatic tors and limestone blocks are the result of natural processes not ancestors. There are many traditional associations, however, for Maori and European travellers and the mass of rocks unsurprisingly led to its English naming as Castle Hill.

A vast cave that can shelter a thousand or more sheep has been in the past a summer camp for Maori hunting the basin for birds. European run-holders followed the same route, introducing sheep in the late 1850s. Wander among the standing stones and you can find the remains of Maori rock drawings on some: early shepherds and travellers from the 1860s have engraved their names in classical script onto the flat surfaces of the limestone.

This small part of Castle Hill station has been public for a very long time: the Kura Tawhiti (Castle Hill) Conservation Area covers some 54 hectares and immediately

The move to further-protect Castle Hill Station also adds to the mosaic of publicly owned conservation and recreational land in the mountains directly inland from Christchurch. Drive inland, across the Canterbury Plains and over Porters Pass, and enter a huge valley alongside which much of the landscape has been preserved in recent years. In 2001, the Government was successful in buying a number of properties to create a drylands conservation park — Korowai/Torlesse — running from the Big Ben Range across the Torlesse Range to the boundary of Castle Hill. The area now protected runs beyond the paddocks both sides of the West Coast road, including the inner slopes of the Torlesse Range which is the outer-mountain bastion above the Canterbury Plains. Castle Hill in turn abuts a further conservation park, long-established on the Craigieburn Range, further inland. This includes beech forests which run into Arthur's Pass National Park.

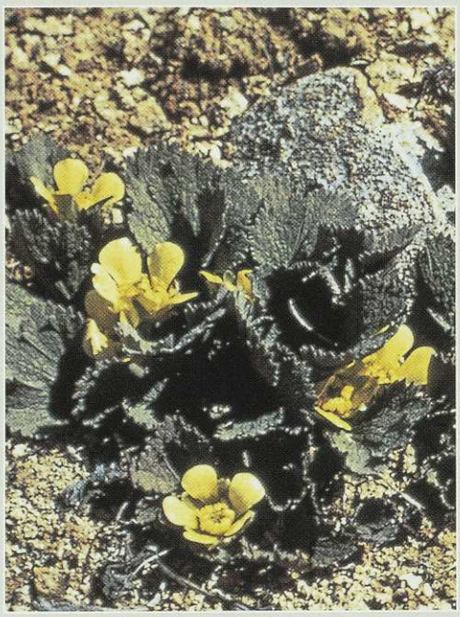
'Not only does this create a huge recreational area relatively close to Christchurch but it secures excellent samples of the native vegetation and wildlife from the Canterbury Plains across high-country grasslands through the beech forests to the mountain tops, across the centre of the South Island,' say Dr Gerry McSweeney, national president of Forest and Bird. 'It is a great step forward in our campaign to see the values of the New Zealand high country permanently protected for recreation and conservation.'

Kura Tawhiti Reserve looking out to the protected Torlesse Range and the pasture of Castle Hill station.

GERRY McSWEENEY

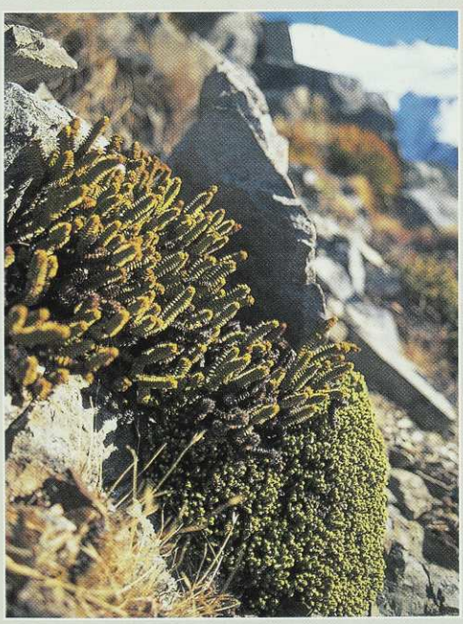
D A NORTON © DEPARTMENT OF CONSERVATION

Castle Hill forget-me-not, Mysotis colensoi



GERRY McSWEENEY

Ranunculus crithmifolius, *Castle Hill buttercup*



GERRY McSWEENEY

Scree hebe, Hebe epacridaea *growing at 1289 metres beneath the Mt Cheesman Skifield, Castle Hill station.*

focusses the attention of any traveller on the West Coast Road. Beside it, also sheltered by limestone blocks, is the Lance McCaskill Nature Reserve a six-hectare patch of largely bare earth in which several rare species of plants are protected. (See 'The Hidden Treasures of Castle Hill' by Sarah Mankelow in *Forest & Bird*, February 2001.)

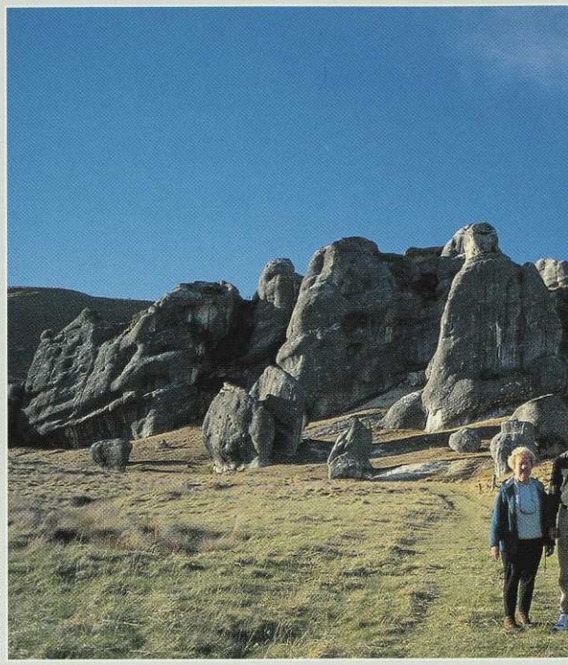
Nearby reserves, recognising the peculiar forms and plants of the limestone outcrops, include Cave Stream Scenic Reserve where a river runs underground between two parallel streams.

Maori claims to the area were recognised in 1998 by the Ngai Tahu Settlement Act which acknowledged a topuni — a symbolic protective cloak laid by a chief — over the Castle Hill Reserve. The tribe has the right to be consulted in the management of what was once a base for hunting birds, including kakapo, in the former beech forests. The Castle Hill reserve is known again as Kura Tawhiti, the 'treasure from a distant land' in recognition of Maori associations..

Castle Hill Station, however, runs well beyond the valley highway, stretching up to 2100 metres on the frequently snowy tops of the Craigeburn and Torlesse Ranges, themselves front ranges of the Southern Alps. As such, they secure the site of the Mount Cheeseman ski-field, an important playground for Cantabrians. That, and the hunting, tramping and mountain-biking potential of the property were strong arguments for the purchase of more than three-quarters of the old station by the Government, for conservation and recreational purposes.

There is another felicity. In 2001, the Nature Heritge Fund secured the Korowai/Torlesse Conservation Park, covering much of the Torlesse Range from near Porters Pass to opposite Castle Hill. Now, Castle Hill in turn abuts the long-established Craigieburn Forest Park, a beech-forested mountain complex which runs right up to the borders of Arthur's Pass National Park spanning the Main Divide. Thus, for the first time, a complete range of high-country landscapes and their biological values are protected in public hands, adjacent to a major highway, and within little more than an hour's drive from Christchurch and the populous Canterbury Plains.

This is the third time this year that the Government has gone in with private investment to secure a key high-country property. In each case the joint-venture purchase has been negotiated by the Government's agent, the Nature Heritage Fund, which has worked with private partners to purchase each property. In the



GERRY McSWEENEY

Above: All these limestone castles lay within the freehold portion of Castle Hill station but will now become conservation reserve and open for controlled public use.

deals, private investors have got use of the farmland while the Crown has acquired key recreation and conservation areas.

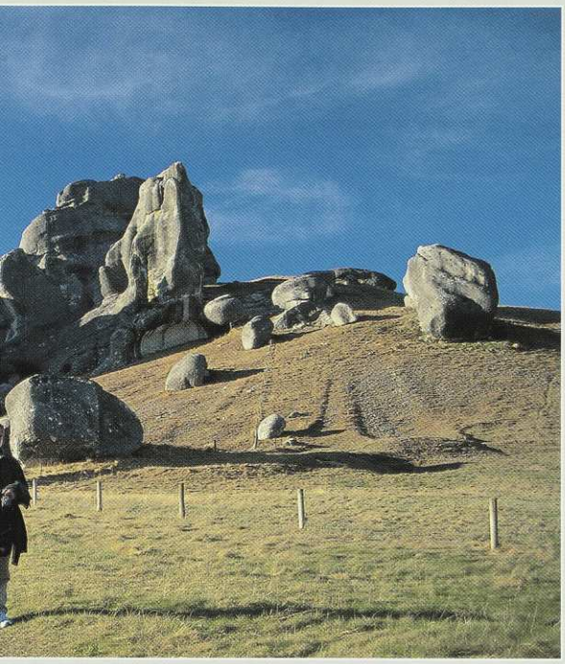
In the case of Castle Hill, more than three-quarters of Castle Hill Station has been purchased by the Crown, in a partnership with an Auckland businesswoman, Christine Fernyhough.

'The Government's conservation land agent, the Nature Heritage Fund, paid $3.5 million for 8517 hectares of the 11,124-hectare station, including the area on which the well-known Mount Cheeseman ski-field is located,' the Minister of Conservation, Hon. Chris Carter, announced.

'At Castle Hill, Christine Fernyhough has

GERRY McSWEENEY

Black scree daisy Legtinella atrata, *on scree at Castle Peak, Castle Hill station.*



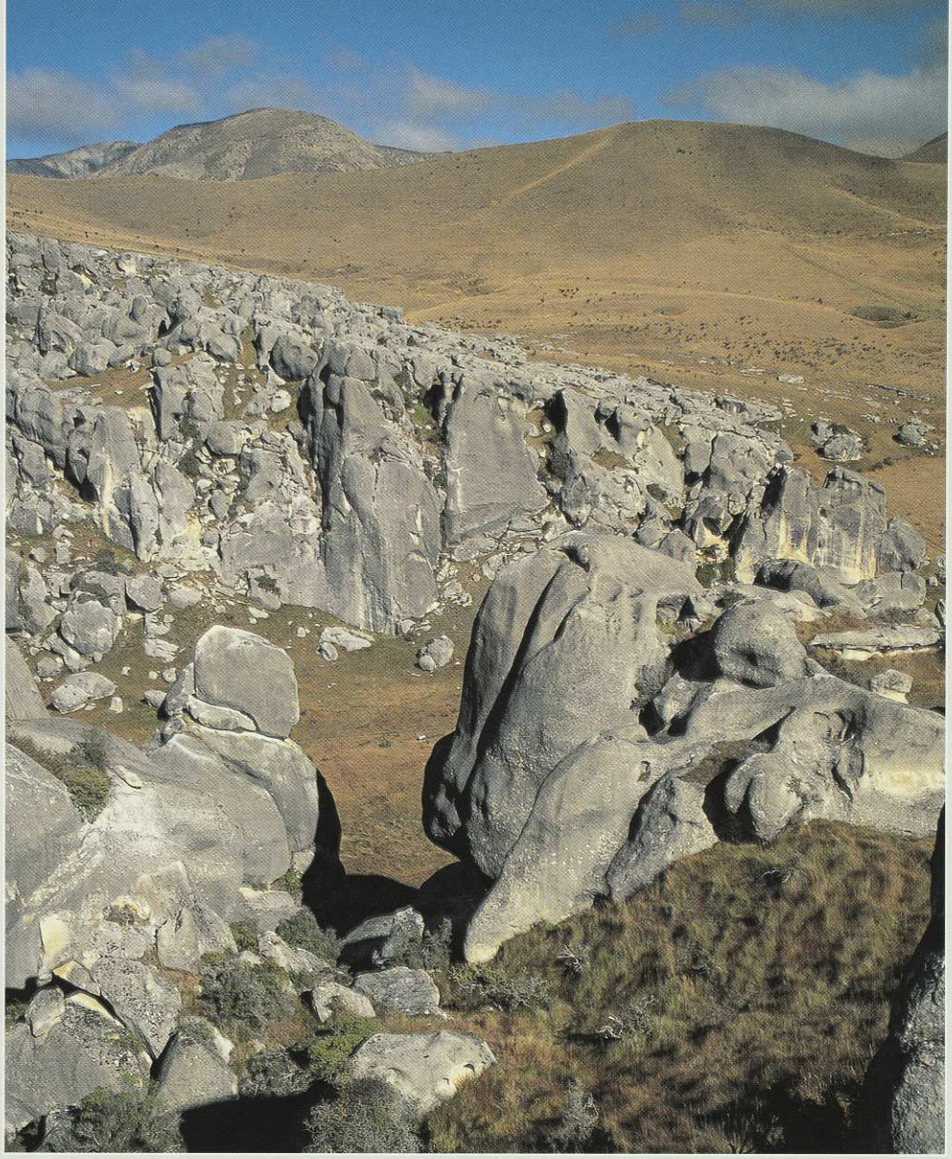
Right: The limestone castles in the foreground were also freehold land. They now become conservation land joined to the Kura Tawhiti Conservation Area.

taken ownership of the best farmland and will continue to farm it as part of her business interests,' Mr Carter says. 'The land purchased by the Crown is to be protected and added to the two surrounding conservation parks. The purchase secures permanent public access to the Mount Cheeseman ski-field, and to two extremely popular rock-climbing areas at Prebble and Gorge Hills. The area also contains some wonderful tramping, hunting and mountain-biking spots, all located not much more than an hour's drive from Christchurch.

'As part of the deal, we have also agreed on a landscape protection covenant over the farmed area of the station and allowed some limited grazing on some of the new conservation areas,' Mr Carter said. This means the property can't be developed as a high-country resort, and its appearance is thereby preserved. [Castle Hill Village, a collection of upmarket weekend cottages on the West Coast road, is not part of the property but with its kerbing and streetlamps is a reminder of how development can compromise wild landscapes.]

The Crown's purchase has occurred as part of the Government's 'Public Wildlands Programme', according to Mr Carter. 'This programme seeks to ensure more lasting protection of, and access to, key recreation and conservation areas, at a time of rapidly changing land ownership, land use, and development.'

— GORDON ELL *is a book publisher, writer, and editor of* Forest & Bird.



GERRY McSWEENEY

Farming Joint-Ventures Make Conservation Dollars Go Further

Two other joint-venture deals involving the Crown and private owners in the high country have taken place in the past 12 months. In both cases, farming areas were separated from conservation and recreation spots in a partnership with private purchasers of former Crown leases. Those properties are Clent Hills in the Ashburton Lakes high country — in future to be known as Lake Heron — and the Poplars Station near Lewis Pass in North Canterbury.

Forest and Bird's national president, Dr Gerry McSweeney, who has himself been a member of the advisory Nature Heritage Fund since 1990, believes the process of joint-venturing, between farmers and conservation, will help the Government's limited protection dollars go much further than before.

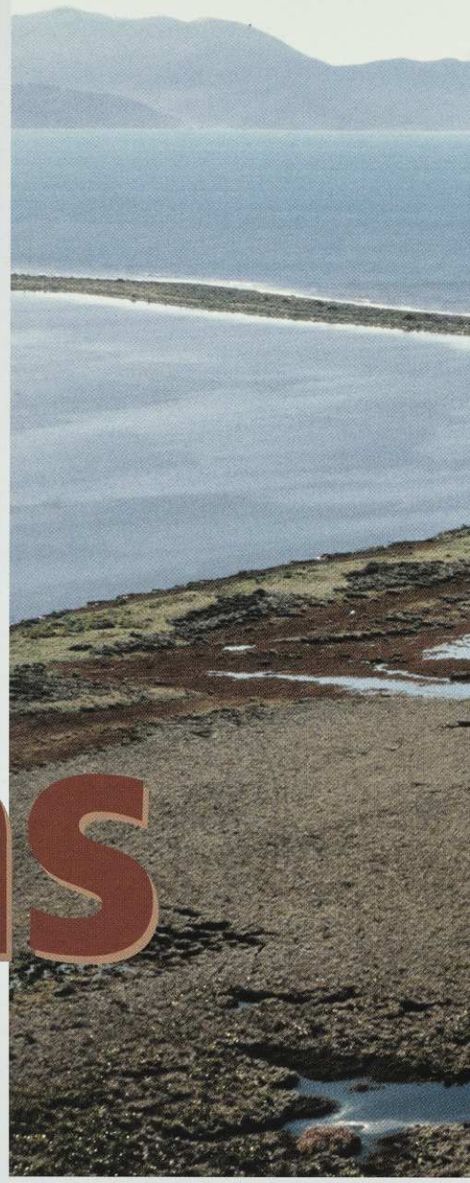
'With rapidly escalating prices for this kind of land such partnerships help considerably,' Dr McSweeney says. 'Having a willing farmer-partner enables the Fund to recommend spending money on the land it really wants for conservation and recreation while helping farmers run their enterprises more economically on the modified farmland.

'The farmers' conservation responsibilities do not cease with the purchase,' he says. 'There remain conservation values on the farmland areas which they continue to value and protect. The farmer also remains a close neighbour and guardian of the conservation area.'

In addition to the joint-ventures, further high-country reserves have been secured for the public this year by the 'whole-property purchase' of Birchwood Station in North Otago (see *Forest & Bird*, May 2004), and an area of Canaan Downs on the Takaka Hill entirely surrounded by Abel Tasman National Park.

The four high-country runs which make up the huge Crown-owned Molesworth property in Marlborough will also be passed into conservation management next year (see *Forest & Bird*, August 2004).

The Troubled Waters of the Vernon Lagoons



DAVE HANSFORD, ORIGIN NATURAL HISTORY MEDIA

DAVE HANSFORD looks at a threatened wetland in Marlborough.

This is an unlovely place. Mounds of dumped tyres, spilling into the Wairau Estuary, mark the end of the road from Spring Creek. A pair of rusting Holdens, held fast by tendrils of boxthorn, will never make the trip back to town. A sign warns against eating the shellfish.

The Wairau River dodges the silvered corpses of drowned macrocarpas and a couple of derelict dinghies before rushing headlong between banks of greywacke boulders into Cloudy Bay. Piles of dumped household rubbish threaten to join it in the next stiff breeze.

There are other middens here, where Marlborough meets the sea. Detritus dating back perhaps 1000 years marks where the moa hunters killed flocks of their staple prey. The giant, flightless birds were rounded up high in the Vernon Hills just south of here, or on the distant reaches of the Wairau Plain to the west and driven along the narrow boulder bank that separates the Wairau lagoons from the open sea.

The end came at the blunt spit by the rivermouth, where the Wairau cut off any escape. Moa bones still lie scattered across the hunters' former camps, along with their instruments, and old fire pits.

In the 1950s, archaeologist Roger Duff began turning over stones here. By the end of his excavations, he'd discovered 18 sites — now listed with the Historic Places Trust — and added volumes to our understanding of prehistoric New Zealand.

As a seasonal base for what Duff called a 'fishing and fowling economy', the Wairau lagoons — nowadays known also as the Vernon Lagoons — were ideal.

Flocks of now-extinct New Zealand swan and a richness of ducks made for feasting and plenty during the moult; and the Wairau teemed with spawning whitebait and kahawai. The entrance was a trove of shellfish. Fires were set on a limitless supply of driftwood.

Today, it's more difficult to see the value people place on the lagoons. They're a receptacle, mostly for trade waste, sewage effluent, wastewater — if Marlborough has any to waste. There are a few walking tracks, but they start from Blenheim's reeking oxidation ponds, which deter all but the hardiest.

The birds, however, are grateful for lagoons, degraded or not. Wading birds, mostly; local and international.

Native swan — and moa — are long gone, but hunters still come here. Their rickety maimai dot the shallow lagoons behind the boulder bank, where shotgunners lie in wait for mallard, shoveller and grey duck.

Vaughan Lynn is the Marlborough field officer for Fish and Game. He says the lagoons

The Wairau Lagoons, Marlborough, from the Vernon Hills. Fed by the sea, the Wairau and Opawa Rivers and a plethora of springs, this 2200-hectare wetland is one of the most important in the country. But pest plants, roaming stock and off-road vehicles are still widespread here. Many are concerned that flood protection works and water allocation that favours the region's burgeoning wine industry are slowly choking the life from the lagoons.

are the most important recreational hunting asset in the region, and account for around 400 licences every year.

Fish and Game and the Department of Conservation have drawn up a 'code of conduct', which urges hunters to make sure they're not drawing a bead on a protected species, or firing at a bird so distant that they will only leave it wounded — a practice known as 'skybusting'.

The biggest management issue of late has seen lead shot banned from ammunition in favour of non-toxic steel pellets. Studies showed that 30 percent of mallards in New Zealand had traces of lead in their blood, from ingesting shotgun pellets left behind in the mud where they dabbled. After a four-year phase out, lead pellets are now illegal, and rangers are out in the lagoons each season to make sure everyone is abiding by the rules.

While they're out there, they keep a watch for coarse fishers — those who eschew trout and salmon in favour of species like perch, rudd, carp and tench. It is illegal to either release or fish for these animals in Nelson/Marlborough. That hasn't stopped a rash of illicit liberations in the region, which has put native fish and ecosystems under real pressure. Vaughan Lynn says that if they found their way into the Wairau lagoons, coarse fish — along with the tiny, dreaded gambusia, or mosquito fish — would have a devastating impact on a wetland already under stress.

Vaughan Lynn says the estuary is getting shallower every year since the Marlborough District Council diverted away half the flow of the Wairau River to protect nearby Blenheim from floods. He says the situation will only get worse if a proposal to take more water from the upper Wairau for a hydro scheme gets the nod.

Trustpower says it wants to take water from Birch Hill, on the river's upper reaches, and run it through a series of hydro dams and canals before returning it 46 kilometres downstream at Marchburn.

That is anathema to Fish and Game, which teamed up last June with Forest and Bird, the Marlborough Environment Centre and various anglers' clubs to fight it.

'We have major concerns with that scheme,' says Vaughan Lynn, 'both over the amount of water they want to take out, and the flow they intend to leave.' He says Trustpower means to maintain a residual flow of 10 cumecs for seven months of the year, a figure well below the river's median flow of 70 cumecs, and that would have serious consequences for the river's instream values and invertebrate productivity.

'Trustpower's own report predicts a 20-25 percent reduction in food for the birds along

DAVE HANSFORD, ORIGIN NATURAL HISTORY MEDIA

These ponds, to the north of the Wairau Estuary, Marlborough, South Island, New Zealand, once hosted flocks of migrant birds, but now lie black, brackish and baking in the summer heat after engineers trapped the roving Wairau River. Denied essential freshwater flushes, their vitality and wildlife has deserted. Proposals to divert flows back into them have so far come to nothing.

the river,' he says. 'Black-billed gulls and 25 percent of the world population of black-fronted terns live and breed along that stretch.'

In addition, the Wairau Valley Water Enhancement Scheme has applied for consents to take another 3.3 cumecs from the river, and another irrigation project, (the Marlborough Water Augmentation Group proposal), which stalled in 2003, has since been resurrected.

Vaughan Lynn is concerned that lower flows would stop fish, like the Wairau's trophy brown trout, making their upstream spawning runs.

Malcolm Brennan, a programme manager with the Department of Conservation in Renwick, doesn't think the schemes would affect the lagoons themselves to any great degree because, he says, the water would be returned to the Wairau well before it flows into them. But he says there's no shortage of other threats, namely the thickets of boxthorn, gorse, barberry, marram, broom, mallow and sweet briar that throng the boulder bank and lagoon flats.

Programmes to deal with the boxthorn and gorse are now well advanced, as is the war on the wattles that threaten the lagoon's islands, but he says there's constant reinvasion from neighbouring properties, and the endless seed source that floats down from the Wairau Plain.

Brian Bell is the Marlborough representative for the Ornithological Society of New Zealand. He used to patrol the lagoons by bicycle as a Wildlife Service ranger in the 1950s.

'It was a difficult place to work,' he recalls. 'You'd hit one of those Maori canals and disappear up to your waist in mud and water.'

It is still a difficult place to work in, which he says is one reason why we still know so little about it.

'Even now, I don't think we know the full importance of the lagoons . . . we don't even have an accurate census for most bird species.'

Brian Bell says it's the resident breeders — the dotterels, the shags, the terns and the spoonbill — that make the place so special. It is also an important stopover for local migrants, such as wrybill and black stilt; and global travellers such as golden plover, turnstone and godwits.

Some of the smaller saltmarsh lagoons on the northern side of the Wairau mouth used to host more exotic vagrants too — lesser yellowlegs and sharp-tailed sandpiper — before they were drained. Today, a few pied stilt still fossick about there in the mud, now black and anaerobic, but the gorse is crowding them in and the area is shredded by four-wheel-drive tracks. There are even wheel marks through the ponds themselves.

Malcolm Brennan of DoC says a priority is to get water flowing through them again. (The Marlborough District Council has offered to fund the culverts if DoC gets the consents.) He sees a need to restore the freshwater processes that have been lost, not just here, but throughout the more than 2000 hectares of lagoon and saltmarsh turfs that make up the greater Wairau lagoons.

A DoC report released in August charges that the Wairau Diversion denied the wetlands much of the freshwater flushes they need; and more salt water flows in since the sandbar at the estuary mouth was removed as a further flood precaution. It says the lagoons nearest the water channels have lost much of their margins to erosion, while deforestation in the Wairau catchment means they're getting shallower as soil is carried in and dumped by the river. When that happens, water temperatures start climbing, and once-extensive beds of eelgrass are being replaced by algae.

No one has measured the impacts of pollution from Blenheim or from intensive farming along the lower river. Until recently the Blenheim freezing works discharged directly into the lagoons. The city's oxidation ponds — recently doubled in size after Renwick was brought onto reticulated sewerage — still do.

Studies of estuarine invertebrates in the 1990s found very low diversity — a sign the lagoons are under stress.

Fish and Game has moved to get more freshwater running back into the lagoons. It has already re-watered a wetland, Copp's, on the true right of the Opawa, which Vaughan Lynn says will stay closed to shooters. And he has a few other ideas.

'There's potential to uncap a couple of old artesian bores downstream of Morgan's Creek to create some more freshwater wetlands. The birds would flock to them.'

Rare black stilt, a visitor.

Resident black swan.

DAVE HANSFORD, ORIGIN NATURAL HISTORY MEDIA

Royal spoonbill breed on the lagoons.

Water is becoming an increasingly scarce commodity in the region, and priorities have to be drawn, according to Brin Williman, a river and drainage engineer with the Marlborough District Council. He says the soaring thirst of vineyards has put Marlborough's groundwater under enormous pressure, and the council's first concern is to ensure adequate supplies for industrial and domestic users.

Besides, he's not at all sure that the lagoons are suffering a shortage of fresh water. In fact, he maintains they receive very little in the first place.

'I suspect the fresh water goes out to sea.' Brin Williman says the ratio of saltwater to fresh in the lagoons could be as high as 10 to one, and that way any changes the Council might make to the Wairau Diversion would probably have little impact on salinity. He points out that in former times, the rivermouth was periodically blocked, sometimes for weeks, by longshore drift of sediment driven north by the wind and currents.

'When that happened, water would be held at high-tide levels in the lower reaches until the river forced a new exit further north.' Brin Williman says the lagoons and their inhabitants would once have been subjected to huge fluctuations in both flow and salinity. 'They would have been very difficult conditions for any fauna or flora to operate in.'

In 1960, the Harbour Board built those boulder walls the car wrecks are parked on at the Wairau entrance, which put a stop to the river's meanderings once and for all.

Brin Williman says that's benefited nature and humans alike.

'For the last 44 years, we've had a very stable situation; there's a full tide every day, and more thorough mixing than previously.' For him the issue is not the mix, it's the quality.

'Winery effluent is increasing markedly,' he says, 'as is the total amount of trade waste going through our system now.' He says canoeists have complained of cuts turning septic in the Wairau's low summertime flows.

Murray Brennan of DoC says many management initiatives — like better public access and interpretation — will have to wait until the Maori Land Court awards mana whenua over the lagoons to one of the seven tribes contesting it.

'It makes co-management difficult,' he says. 'We can't put any signs up yet, because that might be taken as meaning that DoC recognises the mana whenua of a particular iwi.'

In a sense, the future of the Wairau Lagoons is in a similar stalemate. Their every need seems to be at the bottom of a priority list, topped by the local economy — and water.

For now, the lagoons seem to be ticking over. DoC is trying to keep pace with the weeds, but if they're ever going to resemble the 'fishing and fowling' paradise they once were, someone needs to make a start. Soon.

— DAVE HANSFORD *of Origin Natural History Media is a Wellington-based writer and photographer.*

DAVE HANSFORD, ORIGIN NATURAL HISTORY MEDIA

White heron, or kotuku, a winter visitor to the Vernon Lagoons. The birds breed in a colony in South Westland.

The Nature of the Wairau Wetlands

Six thousand years ago, Cloudy Bay reached much further inland into Marlborough. Then the shallow inshore waters began to fill as gravel dumped by the Awatere River, and the detritus eroding off the White Bluffs, were picked up by the Canterbury current on its way north and left as a narrow finger pointing across the bay.

The boulder bank grew until it was big enough to thwart the Wairau River and trap the sediment and gravels it carried. Gradually, the bay filled in, leaving lagoons behind the boulder bank and new beach ridges out from the northern cliffs.

Today, the lagoons, 10.5 kilometres east-southeast of Blenheim, cover nearly 2300 hectares, of which 1800 hectares are in Crown ownership and held as a Conservation Area. Some 40 percent of that is designated as Wildlife Refuge.

The whole area is nationally significant as one of the best examples in New Zealand of a river-mouth lagoon; a bird's-foot delta, with a narrow boulder-barrier.

Twenty per cent of the lagoons is swept by tidal flows. The main channel, Te Aropipi, drains the three lagoons — Big, Chandlers and Upper — which are fed freshwater by the Opawa and Wairau Rivers and various small streams, springs and kidney ponds. The waters are brackish — between 17 and 35 parts per thousand of salt.

The lagoons slumped after earthquakes in the 1840s and 50s, but still only average half a metre deep, with fine sediment bottoms.

Broad flats of glasswort and the coastal grass *Hordeum marinum* surround the lagoons, peppered with flax, sea primrose and bachelor's buttons in the west.

The southern margins are mostly grazed sea rush and flax, with shore ribbonwood on higher ground.

The lagoons are a nationally important birdlife habitat, with 94 bird species on record.

Some 60 pairs of royal spoonbills breed on lagoon islands, and the boulder bank hosts a modest colony of Caspian terns. Other breeders include pied shag, little shag, red-billed gull, black-backed gull, pied stilt, variable oystercatcher, spur-winged plover, banded dotterel, grey duck, grey teal and paradise duck.

Large flocks of waders — bar-tailed godwit, pied stilt, pied oystercatcher and lesser knot — and many species of migrant and vagrant waders have been sighted here. Bittern, crakes and banded rail may still haunt the freshwater raupo margins of the Opawa River.

Yellow-bellied flounder and sand flounder spawn in the lagoons.

A Wilderness of Urban Streams

Lying between two harbours, Auckland is drained by 10,000 kilometres of streams. Text SARAH GIBBS; photographs, GORDON ELL.

GORDON ELL, BUSH FILMS

Auckland is rich in natural corridors, running along its small streams. In Le Roy's Bush, in suburban Birkenhead , a coastal broadleaf forest including kauri and hard beech lines the course of a short stream. Forest and Bird led the campaign to reserve the forest in the 1950s and volunteers from the Society still help maintain it as part of Forest and Bird's 'Auckland Naturally' campaign.

Under the shade of a coastal broadleaf forest, a small stream drops over a waterfall and winds its way through a valley. The waters run slowly past the damp, fern-clad banks the stream has carved out of striated Waitemata sandstone. It is quiet except for the rustle of wind in the trees and the occasional tui call. Tonight glow-worms will adorn the banks like a mini galaxy hidden in the parataniwha. But today the sunlight trickling through the canopy reflects off the water and plays hopscotch on the vegetation along the banks.

The tranquillity belies the fact that the road running down the adjacent ridge is one of the busiest residential roads in the country. You are in Le Roy's Bush, a small reserve on the urban North Shore, and just minutes away is the bustling hub of New Zealand's largest city.

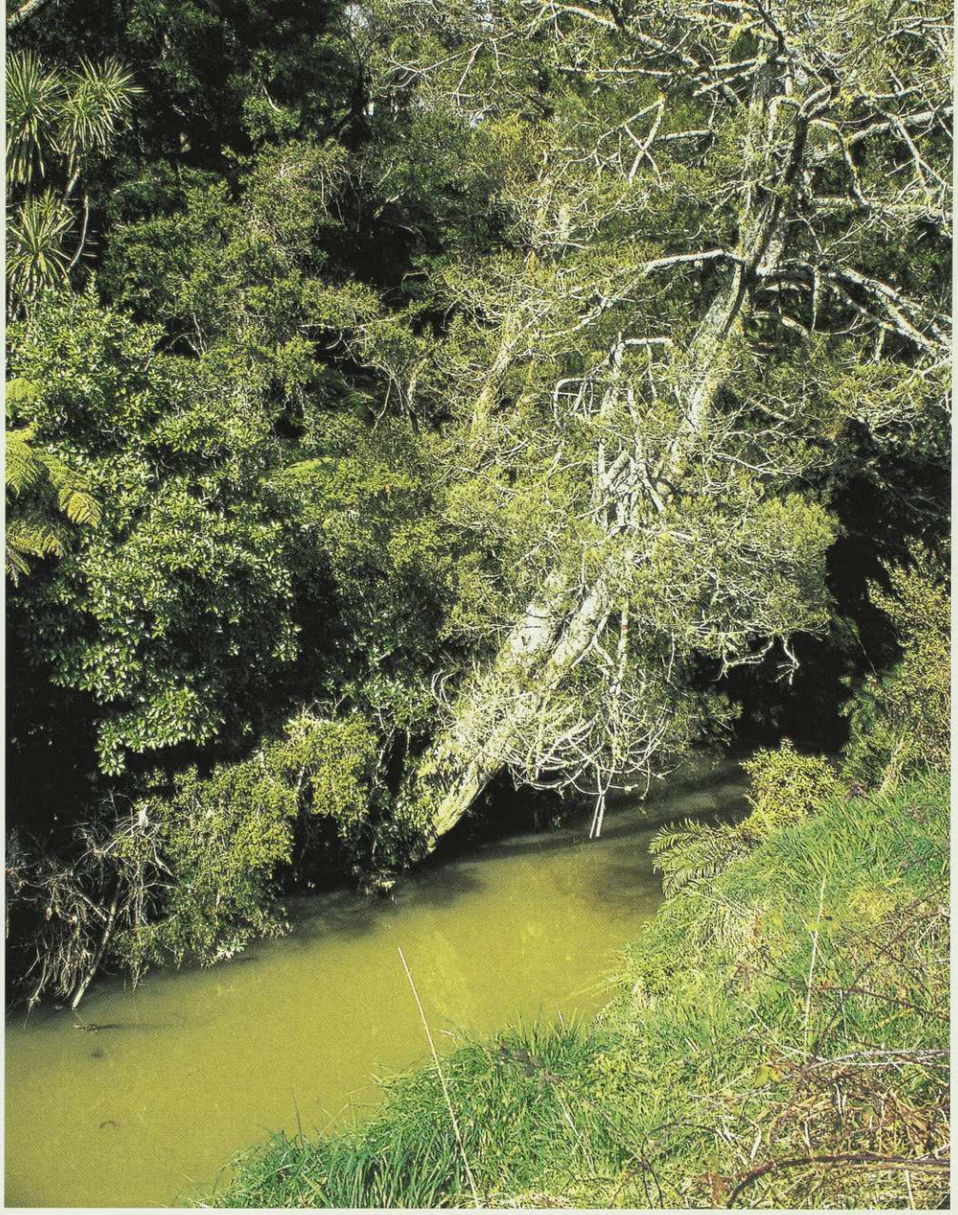
Ten thousand kilometres of streams run through the Auckland region. Many are short in length and less than two metres wide, which is hardly surprising given that Auckland straddles an isthmus. At least 11 of

New Zealand's 27 species of native fish can be found in these urban streams, including the nationally endangered kokopu. In fact, some of Auckland's urban streams are arguably in better health than watercourses in the intensively farmed South Island lowlands.

The Le Roy's stream is unusual in that a reasonable proportion of its catchment is protected — the legacy of a fundraising effort by North Shore Forest and Bird in the 1950s that resulted in the purchase of the valley for a public reserve. In terms of its ecological values it is like a multitude of other Auckland streams. Volunteers here, and on many other streams, are now revegetating riparian areas that used to be covered in South American pampas and other weeds. The Le Roy's Bush restoration is part of Forest and Bird's 'Auckland Naturally' project,

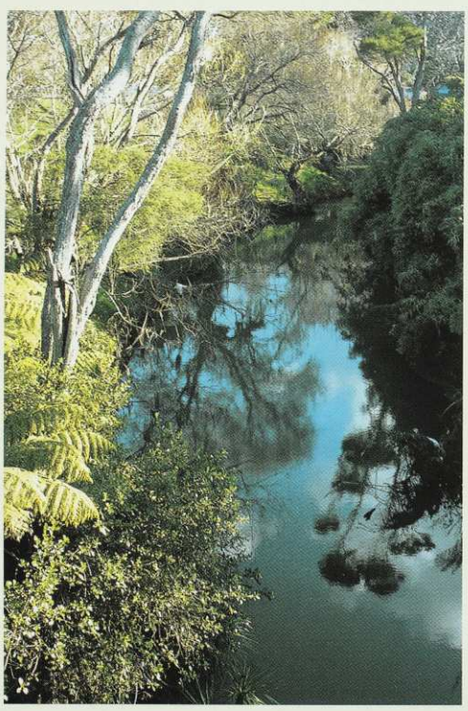
One of the most widely known stream restoration groups in Auckland is also on the North Shore — the Kaipatiki Ecological Restoration Project. KERP'S volunteers work at revegetation, weed and predator control, rubbish clean ups and monitoring of stream water quality. The project also undertakes significant community education projects and has managed to attain sufficient funding to employ both a restoration co-ordinator and an education co-ordinator for several years.

The Three Streams project in Albany, run by local identity John Hogan, has less focus on community education, but provides an important bush area in a place earmarked as the new city centre of the North Shore by urban planners.



GORDON ELL, BUSH FILMS

Little streams, less than two metres wide, are typical of the Auckland isthmus. Here, in North Shore City, the Oteha Stream flows alongside a patch of forest on the Albany campus of Massey University.



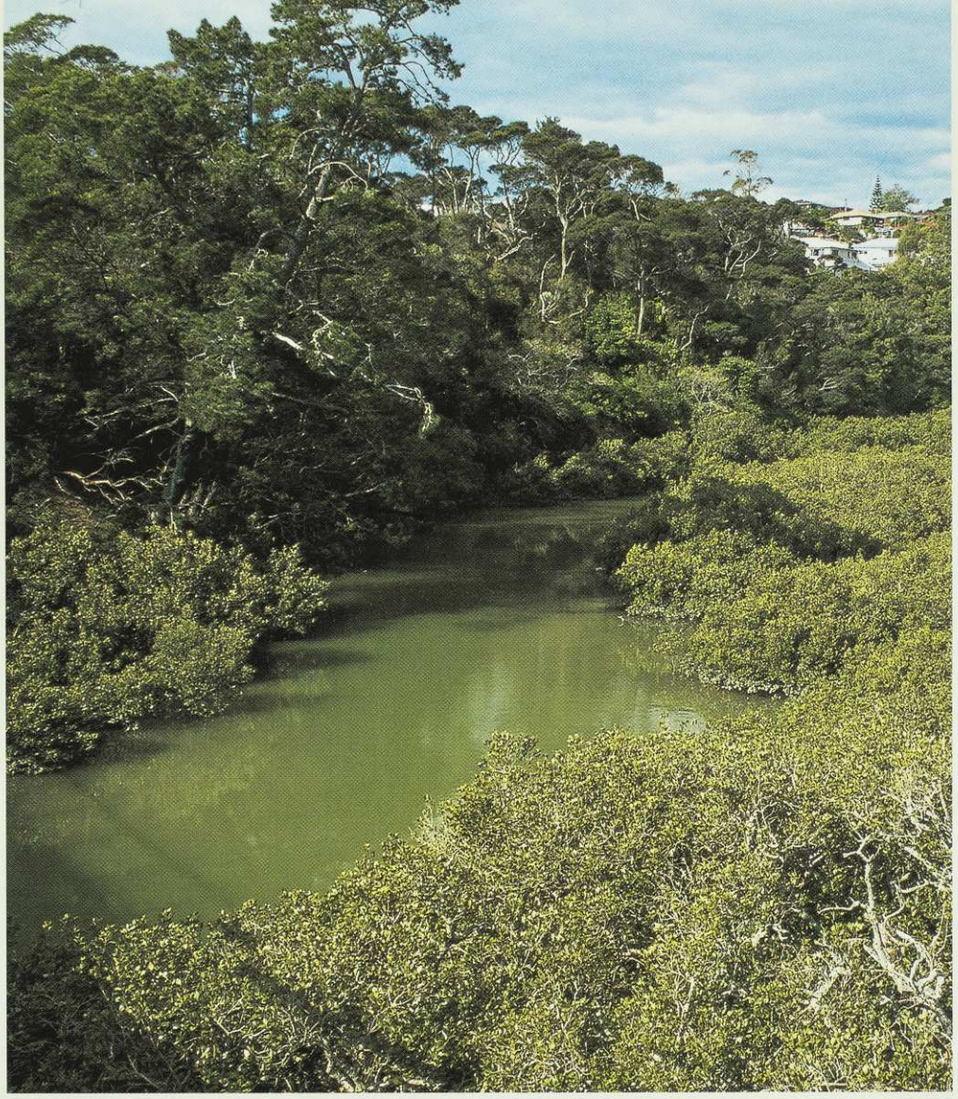
GORDON ELL, BUSH FILMS

Henderson in Waitakere City grew up around water mills at The Falls. The Twin Streams project focusses on community restoration of the Opanuku and Oratia streams which flow down from the nearby ranges.

Across on the southern shores of the Waitemata Harbour, Friends of the Whau was established as a group in 2000. The area has a significant place in Auckland's history. Among other things, Maori used to paddle their canoes from the Waitemata Harbour through what is now the Pollen Island Marine Reserve, then up the Whau estuary and Wai Tahurangi (Avondale Stream) to portage across the isthmus to the Manukau Harbour. The growing Friends of the Whau group monitors water quality in the Wai Tahurangi and the Whau estuary. The group also undertakes regular cleanups and weeding, water monitoring for the Wai Care water project, education and advocacy. Last year alone members planted over 4000 trees in riparian areas.

Replanting and rubbish cleanups go a long way towards decreasing erosion, stabilising water temperature and providing habitat, but do little to alleviate growing levels of water pollution and increasingly erratic stream flows. They also do nothing to stop a growing number of headwaters being piped under new subdivisions and roads as the city grows. While the benefit of volunteer restoration projects to Auckland's streams cannot be underestimated, the long-term health of these waterways is inextricably linked to stormwater quality and urban planning upstream and the health of the harbours downstream.

Stormwater is an increasing problem. Where rain used to soak into the ground where it fell, it now falls on an increasing number of roofs, driveways, roads, carparks and paved areas. On average in urban Auckland today, between 50 percent and 60 percent of residential areas are covered in impervious surfaces. That figure increases to between 70 percent and 90 percent in industrial areas. In the past, two thirds of rainfall would have soaked into the ground where it fell, with only one third running overground and into streams. Today those figures are reversed.



GORDON ELL, BUSH FILMS

Tidal rivers carry a burden of run-off. Deterioration of harbour quality through stormwater pollution costs the Auckland Region an estimated $118-150 million each year.

On a rainy day in Auckland, stormwater rushes across roads and down overloaded drains to the nearest stream. Several times each year there will be so much water in the stormwater system that it will overflow into the sewage system and cause that to overflow as well. When it enters a stream, the force and volume of the water often scours out the streambed it is entering, creating erosion. Naked soil on development sites is also washed down drains. The increased sediment load smothers aquatic species living in the receiving streams and ultimately washes out to sea to create the kind of muddy shores that foster a boom in mangrove populations.

In some areas, increased development upstream (and the resulting increase in water running off from roofs, driveways and roads) has significantly reduced the period between major flood events downstream. In early May this year, a number of properties in the Henderson Valley that sit within what used to be a 100-year flood plain were badly flooded for the second time in five years. Many locals are, with some justification, blaming development upstream.

Stopping growth in New Zealand's largest city is unlikely to be either feasible or desirable, but there are ways the impacts of growth could be better managed. Riparian areas can be protected and restored. Rain gardens, swales and innovative engineering designs can minimise runoff from impervious surfaces. Rainwater tanks can be installed to collect roof water for non-potable uses, such as flushing toilets, thus reducing stormwater runoff from individual properties. Wetlands and stormwater detention ponds can reduce the levels of pollutants and sediment entering waterways from roads, carparks and development sites.

Some of these measures are now being used. Stormwater detention ponds that reduce the amount of pollutants and sediment entering waterways are becoming standard practice. But planning and other non-engineering measures are generally being implemented only on an ad hoc basis. There is a huge variation in attitude towards the management of urban streams and things that impact on them between (and sometimes even within) the four territorial authorities that manage the most populated parts of Auckland.

Waitakere City Council, for example, is attempting to integrate a 'Green Network' policy framework into urban planning, where waterways are protected as 'green corridors' for flora and fauna and as recreation areas for people. The council's 'Twin Streams' project seeks to protect water quality, reduce flooding and erosion and promote public access to waterways in the Oratia and Opanuku catchments.

Waitakere City Council also offers tangible support for volunteer groups wanting to restore stream corridors. Along with North Shore City Council, it also subsidises individuals installing rainwater tanks and provides information on other sustainable stormwater management practices.

Manukau City Council is also undertaking some stream restoration and revegetation work, notably in the Puhinui Stream and Pakuranga Creek catchments.

At the other end of the scale completely, possibly the last stream that ran unpiped from source to sea within Auckland City Council's jurisdiction was piped last year to make way for a new roading project.

The state of urban streams has wider implications than the local survival of native freshwater fish species and the health of riparian bush and birds. Sewage and polluted stormwater running into streams has led to North Shore City Council to issue health warnings advising people against swimming at their local beaches after heavy rain. Flooding occurs with increasing regularity. A Waitakere City Council report calculated the cost to the Auckland region of allowing continued deterioration of harbour quality, through stormwater pollution, to be between $118 million to $150 million annually.

With the preservation of rivers and their margins listed in planning law as 'a matter of national importance', it is a little curious that there are no national guidelines or measures to ensure this is done. This is particularly so with cumulative problems that require widespread and long-term planning

measures. People could ask, for example, why the Building Act is not amended to require all new houses in urban areas to install rainwater tanks to catch roof water to use for flushing toilets, watering the garden and doing laundry, in the same way that the Act requires all new houses to be insulated? This would not only help protect urban streams from increased stormwater runoff, but also stop water taken from the Waikato River being literally flushed down Auckland's toilets. Local authorities acting individually cannot address a problem on this scale.

In general, however, we now have the ability to improve the health of our urban streams and the harbours they flow into. Factors contributing to the degradation of urban streams are now not only being identified; some of the solutions are starting to be incorporated as standard planning and engineering practice by some councils.

Each one of us now has the opportunity to enjoy, even help restore, a local stream. We can also easily take a break from the city within our cities; and watch reflected light dance on damp ferns as inanga slide into the shadows of deep pools and tui sing above our heads.

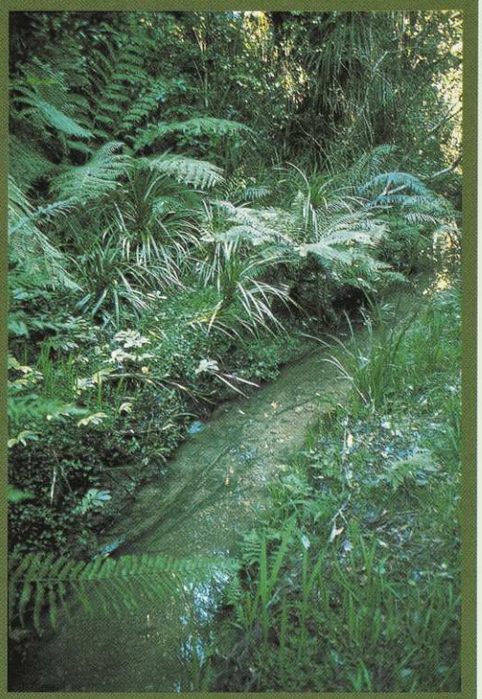
— SARAH GIBBS *was formerly a Forest and Bird field officer in Auckland.*

The Wairau Stream is channelled to prevent flooding through the Wairau valley industrial area of North Shore. Lined channels and piped streams may drain water efficiently but they provide minimal habitat, aesthetic or recreational value. This valley was once a swamp with fernbirds — North Shore Forest and Bird was established in the process of an unsuccessful campaign to save the wetland around 50 years ago.

GORDON ELL, BUSH FILMS

You don't have to travel out of town to enjoy a quiet walk in a natural setting. A few hours or half a day can be plenty of time to explore one of the many local-stream walks hidden within Auckland's urban areas.

NORTH SHORE CITY



Chatswood Stream: Following Chatswood Reserve downstream to Duck Creek and the Chelsea Sugar refinery, this walk can be accessed from Portesea Place, Homewood Place, Ravenstone Place and David Beattie Place in Chatswood. It can also be reached by walking up through the lovely grounds of the sugar refinery from Duck Creek.

Lauderdale Creek: Running through the Birkenhead Domain, Hiwihau Scenic Reserve and Lauderdale Reserve out to the Kaipatiki Estuary; this track offers one of the longer stream walks on the North Shore. There are several access points off Eskdale Road just downhill of the cemetery.

Le Roy's Stream: Dropping down from Highbury, the track along Le Roy's Stream follows the valley down to the raupo wetlands of Little Shoal Bay. Access is from Onewa Road almost opposite Aorangi Pl, from Hinemoa Street on the shops' side of Le Roy Terrace and the ends of Valley Road and Seaview Ave. It can also be accessed from the bottom through the Dudding Park playing fields. At low tide you can continue around the coast of Northcote Point to Halls Beach and return via Queen Street and Clarence Road.

AUCKLAND CITY

Purewa Creek: One of the few urban stream walks on the isthmus; the track starts opposite the Glen Innes police station and follows Purewa Creek down through Taniwha Reserve, Eastview Reserve and Apirana Reserve to St Johns Road. This area could be earmarked for development as a future motorway corridor, so be in quick. Alternatively, head upstream from the Glen Innes police station and along the Tom Court Memorial Walkway to Point England Reserve.

WAITAKERE CITY

Manutewhau Stream: The Manutewhau Stream runs between Massey and West Harbour into Lawsons Creek estuary. It is accessible from Oreil Avenue on the Hobsonville Road side of Holmes Drive, from Oreil Avenue opposite West Harbour School and from Moire Avenue.

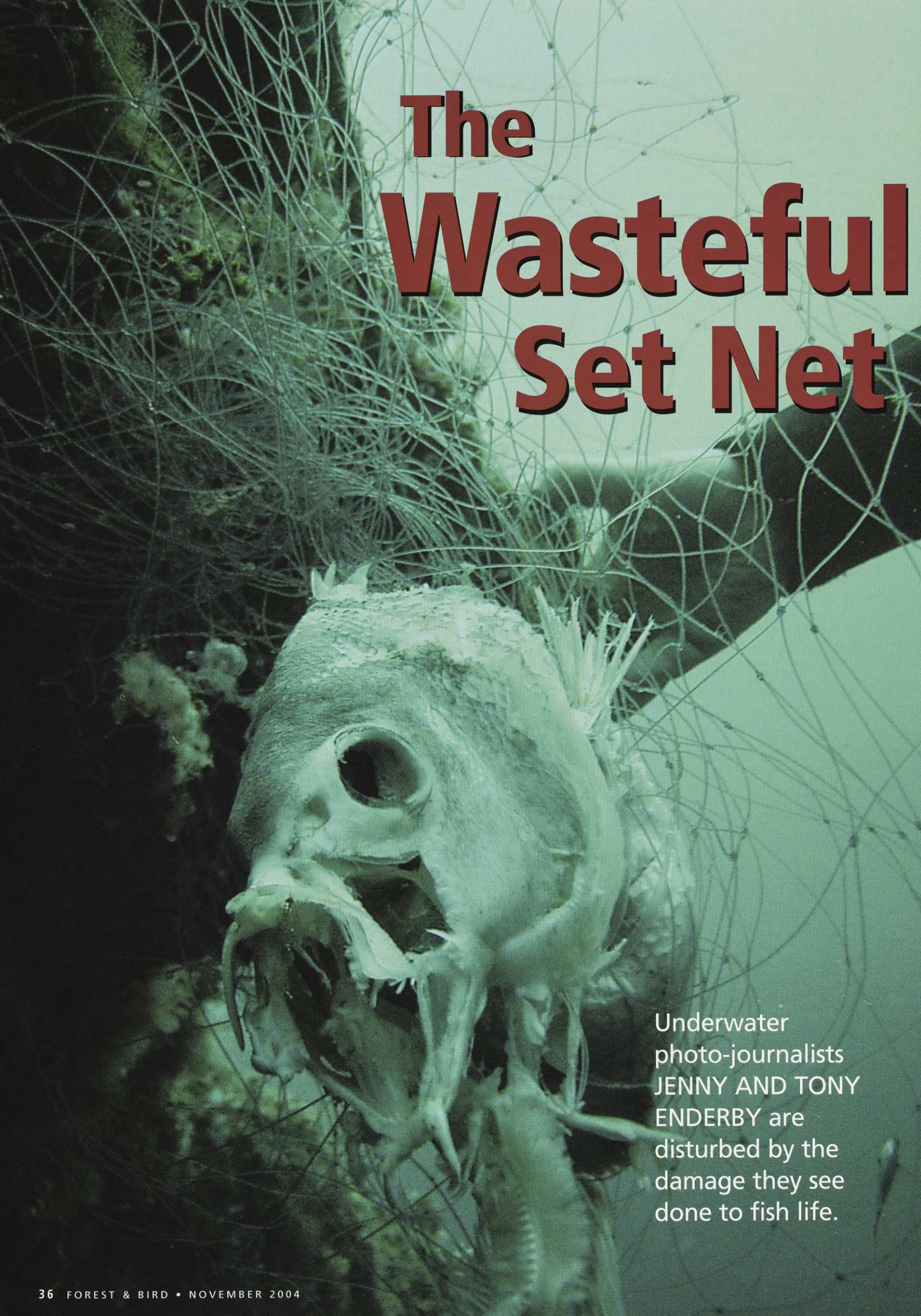
Cranwell Park: A short walk circumnavigating Cranwell Park follows Henderson Creek and the lower reaches of Opanuku Stream. Ample carparking is available off Peacock Drive next to either the Falls Café or the library and recreation centre.

Opanuku Stream: Starting at the Opanuku Reserve just under the rail bridge from the Henderson shops, the track follows the Opanuku Stream upstream through Henderson Park and into Shona Reserve to exit at Keeling Street.

MANUKAU CITY

Botany Creek: Start at Marbeth Cresent off Cascades Road and follow Botany Creek upstream, past the Cascades Christian College and up a tributary into what appears to be an unnamed reserve in Botany Downs. The upstream entrance to the walk is in Lexington Drive off Botany Road.

Pakuranga Creek: Pakuranga Creek runs through the large Lloyd Elsmore Park, which is situated between Pakuranga Road, Cascades Road and Aviemore Drive. Howick Historic Village, Howick Little Theatre and the Highland Park shops are also within or near Lloyd Elsmore Park.



The Wasteful Set Net

Underwater photo-journalists JENNY AND TONY ENDERBY are disturbed by the damage they see done to fish life.

In front of us a large fish seemed to peer through lifeless eyes — a 50-centimetre long silver drummer it was held by fine nylon mesh. Nearby another flapped weakly, near death. On both sides of the drummer, snapper and parore had also succumbed to the invisible wall hanging in midwater.

We swam down to the sea floor to see what was entangled in the lower end of the net where it merged with the ecklonia kelp. Red moki, banded wrasse and scorpionfish, species that are used to pushing their way through the kelp, were also snared.

Most of those fish would be thrown away, some to be devoured by seagulls on the surface. Others would sink out of sight, becoming food for the bottom dwellers, the crabs and shellfish.

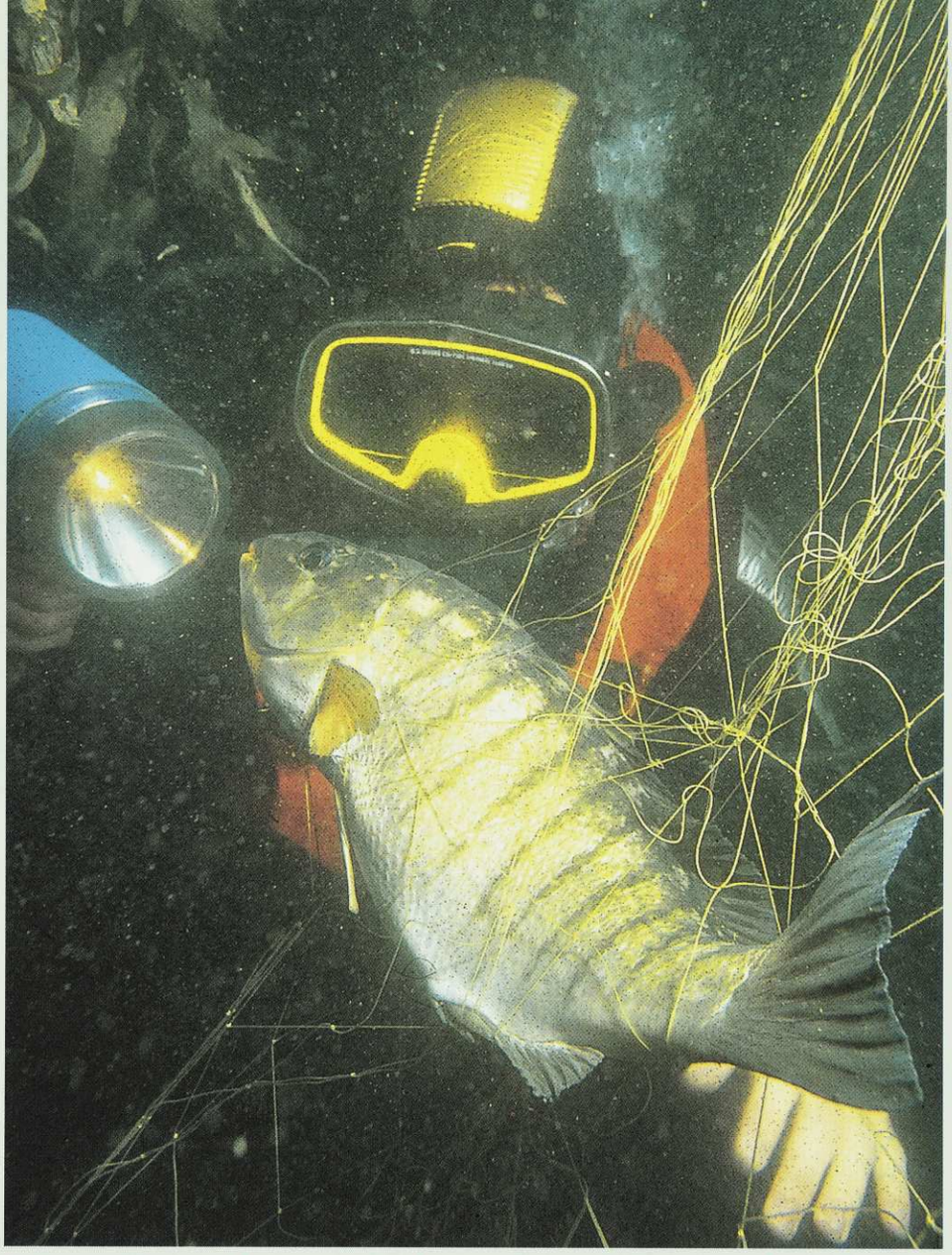
The menace of unattended set nets affects almost all the New Zealand coast. Near Coromandel we saw kahawai, trevally, red moki and butterfish floating in the shallows, discarded by the set netters who took only the snapper.

On a dive just outside Tory Channel, where the inter-island ferry enters the Marlborough Sounds, a set net stopped us in our tracks, luckily before we blundered into it. That net held small blue moki, tarakihi, banded wrasse and butterfish. Neither of its floats had any identification.

Why do people use set sets, often referred to as gill nets? The easy answer is that they are cheap and catch a lot of fish without much effort. In the early 1970s an increase in fish prices saw a huge increase in the use of set nets. The Quota Management System, introduced in 1986 went some way to control the commercial use of set nets although they are still in common use.

Commercial netters have a financial interest in ensuring that the net is cleared quickly and nothing is wasted. Amateur set nets can be left out for days if the weather is bad or some other activity takes priority.

The Ministry of Fisheries has set net regulations covering mesh size, the number of nets per person or boat, and where they can be laid. Netters must also have the net floats marked with their name and contact details.

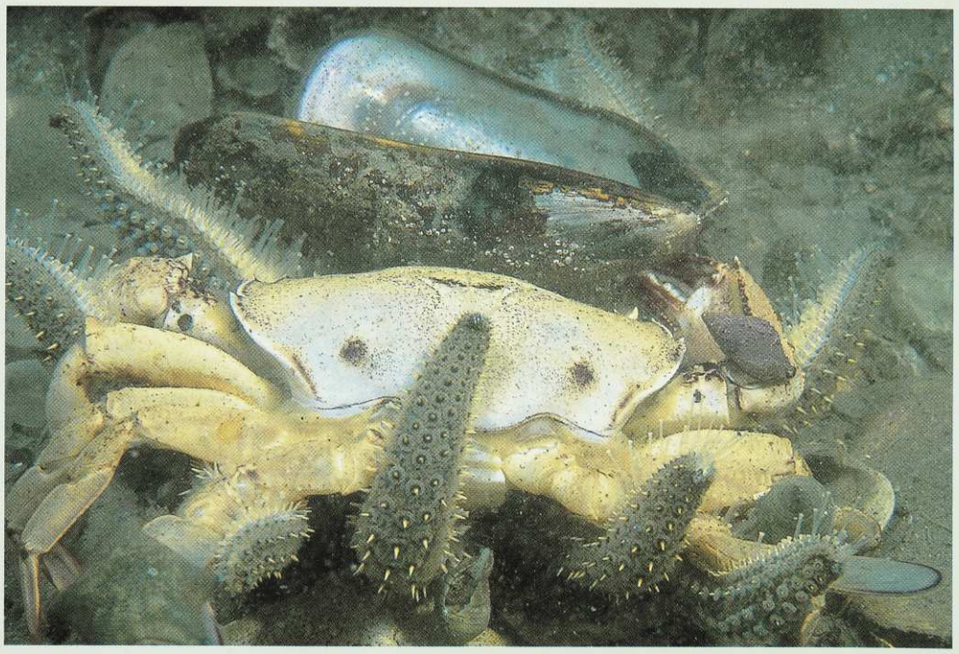


ROGER GRACE

Parore are often caught in nets set for schnapper, but are thrown away and wasted.

In spite of this some people still ignore the regulations. The bycatch is used as an excuse by some as a way of getting a few fish as bait for a crayfish pot.

How many fish succumb to these unattended walls of death is unknown. Yet the use of set nets continues pillaging fish to the detriment of sightseers and genuine



TONY & JENNY ENDERBY

Set nets take species set netters don't want. Here a discarded paddle crab is eaten by a spiny sea star.

SHANE ALDENBROOKE

Left: A commercial set net snagged on Laison Reef near White Island in the Bay of Plenty continued to catch fish up to 70 metres underwater. Fortunately, diving enthusiasts and fisheries officers were able to remove it.

fishermen who sit on boats or on the rocks waiting for a bite. The daily-limit regulations for line fishermen seem irrelevant when a set net can be left overnight or longer. Any fish under the legal size or over the daily limit are easily discarded.

To come home from a day's fishing with a meal or two from the sea is something many New Zealanders enjoy. The majority of fishermen follow the regulations, returning undersized and unwanted catches to the sea. Many line fishermen head back to shore once they have enough for a feed, not needing to catch their legal limit. Those left today are tomorrow's catch and if you don't make it back out tomorrow, there's always the day after.

Others head down onto sandy beaches and drag a net for a feed. Flounder, mullet and kahawai are often caught this way, but as with line fishing the unwanted fish are returned to the sea — alive. For others, yellow-eyed mullet are targeted as bait for the next day's fishing trip. This method of netting ensures that only the target fish are taken and others are released.

New Zealanders complained loudly when the foreign 'wall of death' fishermen began to pillage the South Pacific and Tasman Sea, outside New Zealand's 200-mile limit. These massive nets, some hundreds of kilometres long, caught everything including dolphins, sharks, sunfish and marlin which were thrown back dead into the sea.

Government action in response to public pressure in New Zealand and overseas saw the disappearance of these 'walls of death' and a subsequent increase in the number of game fish caught or tagged and released around our northern coast.

Around Akaroa in the South Island, restrictions on set nets were established to protect Hector's dolphin, the smallest in the world. Research into this endemic dolphin began around Banks Peninsula in 1984. Researchers Steve Dawson and Liz Slooten, found evidence of 230 Hector's dolphin deaths along the coast between Motunau and Timaru. After publication in 1991, these numbers were disputed by officials of the Ministry of Fisheries, but even at half the recorded number of deaths the Hector's dolphin populations were not sustainable.

The Banks Peninsula Marine Mammal Sanctuary was created as a result of those deaths. New recreational fishing guidelines now ban amateur set netting out to four nautical miles, from the Waiau river in the north to the Waitaki river in the south, from October 1-March 31, (with the exception of flounder netting areas in Pigeon Bay, Port Levy and Akaroa, and a reef south of Timaru).

SHANE ALDENBROOKE

Crayfish caught in an abandoned set net.

'The number of dolphins caught in commercial gill-netting still has not been reduced to sustainable numbers,' according to Dr Slooten of Otago University, who is also a member of the national executive of Forest and Bird. An observer programme on commercial gill-net boats in 1997-8 showed dolphins caught just outside the boundaries of the sanctuary.

A near-identical dolphin, now known as the Maui dolphin, lives off the west coast of the North Island, between Kawhia and the Kaipara Harbour. This pod numbers between 100 and 150.

Efforts to ban set nets in the Maui dolphins' habitat met with resistance, but if unattended set netting were allowed to continue, they might have become extinct in a decade or two. Of the seven dead dolphins found since July 2001, four had definite evidence of being caught in set nets and only one died of natural causes.

Set nets have recently been banned within four nautical miles of the coast between Maunganui Bluff, north of Dargaville and Pariokariwa Point, north of New Plymouth.

Yet we still tolerate other coastal set nets that kill more than they are entitled to and waste much of what they catch. Many fish caught don't come under the Ministry of Fisheries regulations. Consequently, there is no 'other species' limit for the silver drummer, parore, mullet and numerous species of wrasse.

Sea horses also fall into this no-limit category in New Zealand even though there is a huge market for them in Asia. Luckily they have great camouflage and are rarely seen and even less taken, but a net that snares their weedy habitat and pulls it up will affect them. Although they will fall under the CITES agreement (Convention on International Trade in Endangered Species of Wild Flora and Fauna), there is no move to limit the daily take under Ministry of Fisheries regulations in New Zealand.

Modern set nets, which are made from nylon and are cheap to buy, are now replacing the older cotton nets which quickly broke down if lost. Now, we often see tangled meshes of these nylon nets with the remains of red moki, butterfish and silver drummer. Crayfish detect the fish carcasses in the net and entangle themselves as they attempt to feed off them.

A large commercial set net recently snagged Laison's Reef, between White Island and the Volkner Rocks. Laison's Reef is one of the top dive sites in the Bay of Plenty and visiting divers noticed it and the carnage it was causing. With the aid of local fisheries officers they dived to the extreme depths of 70 metres to remove it. Without that effort it would have continued to snare marine life for years.

The damage caused by lost nets in non-dived areas remains unknown. Meanwhile, the net's owner just goes out, buys another net and the same situation continues.

In estuaries, nets are often laid right across the channels, rather than running parallel to them. Whangateau Harbour, an hour north of Auckland, often has more than its fair share, especially over the holiday season. The prolific fish life in early summer usually decreases markedly by late summer.

Most netters are after snapper, john dory, kahawai and flounder. But schools of parore also come into the harbour to breed and

these are the main catch. Many become food for seagulls before the nets are cleared. Other nets are not cleared every day, leaving even snapper and kahawai to rot.

At Goat Island Marine Reserve, near Leigh on the Rodney coast, it's not just the snapper that have increased in numbers. Non-line-targeted species have made a huge comeback with hundreds of silver drummer, parore, red moki and butterfish — and of course, no nets.

Not only fish and dolphins succumb to nets. Gannets, shags and little blue penguins become entangled and drown in set nets.

The coastal ecosystem is fragile; remove just a small part and many other species suffer. Surely it is time we did something about set nets. After all, what is taken by them will ultimately affect the catches of real fishermen sitting in boats, on beaches and on the rocks with a line in the water waiting for that tug of success.

— Underwater photo-journalists JENNY AND TONY ENDERBY *are based at Leigh, near Warkworth in lower Northland.*

For further information see Dawson, S and Slooten, E, *Down-under Dolphins, The Story of Hector's Dolphins,* Canterbuy University Press, 1996.

TONY & JENNY ENDERBY

Marble fish get tangled in nets over kelp.

TONY & JENNY ENDERBY

Seahorses have no protection in New Zealand.

The Kinship of Plant

Text: ANNE GRAEME
Illustrations: TIM GALLOWAY

A long time ago, that legendary biologist Professor John Morton came to stay with us. We showed him our new garden. He gazed thoughtfully at a southern rata we had just planted. He was far too kind to point out that a southern rata was out of place and ill-suited to the coastal Bay of Plenty, so he said instead: 'It will be happy beside the feijoa.'

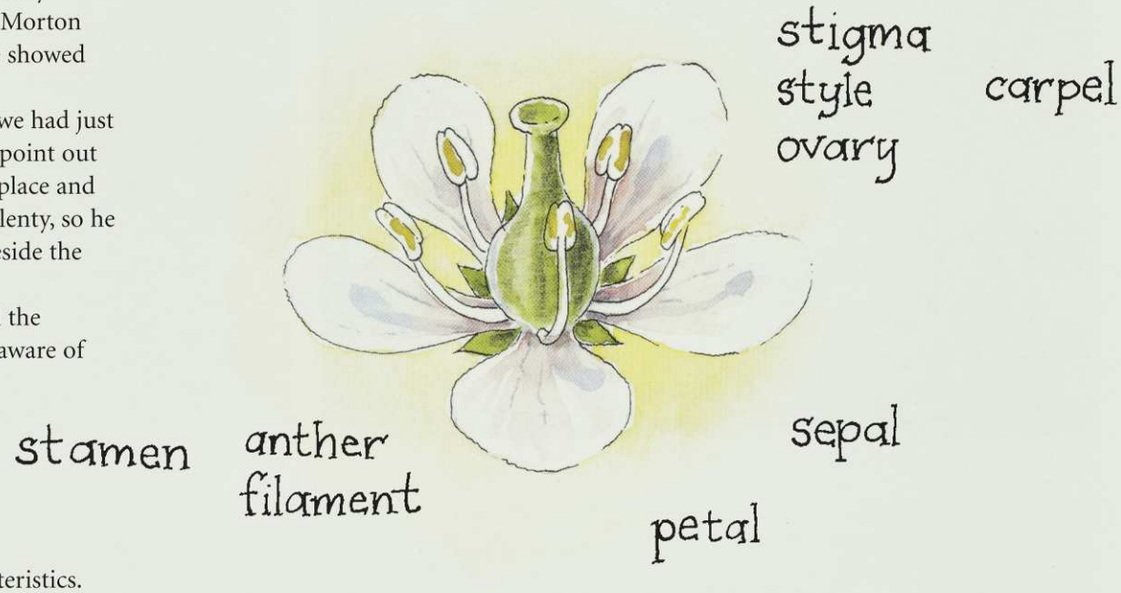
It wasn't. It died, but we recall the moment when we first became aware of the relationship between rata and feijoa. For the feijoa and the rata (and the pohutukawa) are members of the same family of plants, the Myrtaceae, and, like any family, they have similar characteristics.

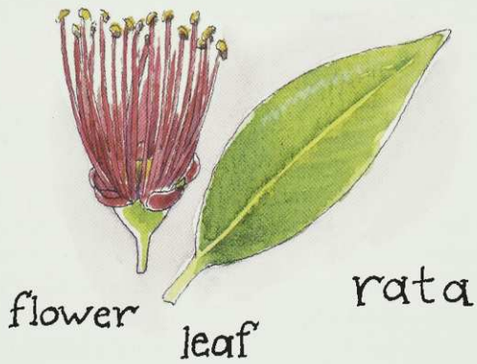
Look at the leaves, particularly of pohutukawa and feijoa. They are similar: oval, grey-green above and whitish underneath. That is a clue, but it is not enough. Neither leaves nor fruits nor even form and stature are a reliable guide to kinship.

Look at the flowers. They are the key: not at a superficial level based on colour or perfume, but in the number and arrangement of petals and sepals, of male stamens and of female carpels.

How similar the rata and feijoa flowers are with their mass of spiky red stamens. The stamens are arranged around a cup made by the joined sepals. The cup is full of nectar and from its centre rises the column of the carpel, with its sticky-tipped stigma ready to catch the pollen grains.

This is the typical flower of members of the Myrtle family, the Myrtaceae (*mer – tay – see*). It is a very old plant family which originated in the ancient supercontinent of Gondwana. Myrtles are best represented in Australia and South America, which were linked through Antarctica up until 49 million years ago. Africa, which broke away much earlier, has only a few members of the Myrtaceae.





The family has evolved from more primitive forms in moist, rainforest climates to specialized forms in semi-arid and desert regions. This is reflected in the form of the fruit, which divides the family into two groups. One group has a fleshy berry and the other has a hard, dry capsule with numerous seeds.

Rata and pohutukawa are typical of the second group. Both have little capsules that rain masses of tiny seeds. They both belong to the genus of *Meterosideros*, of which New Zealand has twelve species. Many of our species have bright red stamens, a colour particularly visible and attractive to the lizards and birds that come to sup nectar and thereby accidentally transfer pollen from flower to flower.

That hard little seed capsule brings to mind the manuka and kanuka which are also members of the myrtle family. They too have stamens arranged around a cup of sepals, but their petals are much more conspicuous than those of pohutukawa and rata.

Flowering Relatives

Flower structure reveals the otherwise hidden relationship between ivy and our native lancewood and five-finger trees (at left). They all belong to the Ivy family, the Araliaceae. The flowers of this family are insignificant but they are arranged in a cluster called an umbel, which is easy to recognize and is characteristic of the family.

Odd Bedfellows

Family relationships are sometimes very difficult to see. Who would guess that the violet and the mahoe both belong to the same family? But they do: to the Violet family, Violaceae, which is described as 'diverse', its members ranging from herbaceous plants with irregular flowers to shrubs, trees and climbers with regular flowers.

The link is in the sophisticated mechanism of their anthers. They have a special flap, so arranged that it is triggered by visiting insects to release a shower of pollen.

From the violet family we have two native genera, the white-flowered native violets and twelve species of *Melicytus*, with which whitey-wood or mahoe belongs.

The feijoa comes from South America. Its fleshy fruit shows its rainforest origins. The fleshy fruited group of Myrtaceae includes the guava, our native swamp maire, and shrubs like the attractive ramarama with its 'blistered' leaves.

Members of the Myrtle family are an important part of the New Zealand flora, but we cannot rival their importance in Australia. This is home to the dry-fruited Eucalypts which dominate the landscapes of Australia. There is a Eucalypt for every conceivable habitat, from the snow gums of the Snowy Mountains to the river red gums that line the ephemeral creeks, to the mallee shrubs of the deserts. In an explosion of evolution, this genus has assumed enormous importance in the ecology of Australia. There are other genera of Myrtaceae in Australia, but their species of *Meterosideros* are long gone, recorded only as fossils.

Our rata species and pohutukawa originally came here from New Caledonia when our countries were linked by a great land mass in Cretaceous times. New Caledonia has an astonishing number of species of Myrtaceae — more than 200 — of which about 70 are species of *Meterosideros*.

A Cress is a Cabbage

Few plants are so ill-named as Cook's scurvy grass. It isn't a grass at all. It is a native cress belonging to the cabbage family, Cruciferae.

The flowers of this family are distinctive and constant. There are always four petals, usually white or yellow, and they are arranged like a cross (hence Cruciferae). The six stamens are attached in pairs inside the tube formed from the petal bases.

Captain Cook tried diligently to provide green vegetables for his crew whenever the opportunity arose. While he did not know that such plants contained vitamin C, he did know that eating them both prevented and treated the loathsome disease of scurvy. His botanist, Joseph Banks, would have identified the plant called scurvy grass as a member of the cabbage family, and thus known that it would be edible.

Subsequently, introduced browsing animals also found Cook's scurvy grass to their liking, and the cabbage white butterfly recognized this kin to the cabbage, so no wonder the plant is now rare!

District Rules Can Protect the Environment

Forest and Bird is keen to see every District Council in New Zealand adopt rules to control the destruction of significant areas of native biodiversity, writes Ann Graeme of Tauranga on behalf of the Society's conservation staff.

'I know everyone hates rules but sometimes they are necessary to make things work,' she says.

'While we support environmental education incentives like rates relief and money for fencing, to encourage landowners to protect their special places, we also know that an entirely voluntary approach is not enough. It still leads to forests cleared from steep slopes, streams burdened with sediment and wetlands drained.'

In Northland, thousands of hectares of kiwi scrublands were roller-crushed for pine planting because the Far North District Plan did not contain any vegetation clearance rules. So, for a decade now, Forest and Bird has been putting in submissions on District Plans, asking for limits on landowners' ability to destroy significant natural areas. This is in line with the Resource Management Act which recognizes that protecting 'significant indigenous vegetation and significant habitats of indigenous fauna' is a matter of national importance, and obliges local authorities to make due provision in their plans.

Introducing a rule about vegetation clearance does not usually mean that clearance is forbidden. It means that a resource consent application is required and the Council must decide whether the activity applied for is appropriate, or whether alternatives or conditions would reduce its effect. From the conservation point of view, this is a vast improvement over the unconsidered and unchecked destruction of the past.

Of the 77 council districts in New Zealand, 72 now have vegetation rules in their plans. Most vegetation clearance rules began or were enhanced by Forest and Bird submissions. Some, in the face of intransigent Councils, had to be pursued and negotiated through the Environment Court.

Our most recent successes have been with the district councils of Dunedin, Grey and Thames/Coromandel, and they have been hard-won.

It has been a hard grind, participating in daunting legal processes, talking and talking with farmers and council staff and waiting in cold courtrooms for a turn to be heard, but this work by our staff and our members is setting the ground rules which will safeguard the environment for generations to come.

— *Source,* ANN GRAEME

Havelock North Member Wins

A tireless Forest and Bird worker has been recognised for her commitment to conservation by the Department of Conservation in Hawkes Bay.

Mary Marshall of Havelock North was recognised with the 2004 Norsewear Conservation Award, along with Les Lemmons of Puketitri who has worked on a museum project.

Catherine Tiffen of the Department of Conservation says Mary Marshall won the natural heritage award for her dedication to the kokako project at Boundary Stream Reserve. This involved three years helping in the care of five pairs introduced via an aviary, from Te Urewera National Park. Mary Marshall also worked on conservation projects organised by Forest and Bird, DoC and the Tongariro Natural History Society.

Manawatu Ramsar Application

An application to have the Manawatu Estuary classified as a wetland of international importance, under the Ramsar Covention, has been lodged with the Department of Conservation by Horowhenua Forest and Bird.

The Forest and Bird branch, headed by Joan Leckie, has spent two years preparing the application to have the estuary at Foxton Beach recognised. (See *Forest & Bird*, August 2003).

A small group of Manawatu Trust members met at the Manawatu Estuary to view the handing over of the application to Vivienne Nicholls from DoC and it is now in the hands of the Minister of Conservation for consideration.

The Estuary is home to some 93 bird species, claimed to be the most diverse range in any one place in New Zealand, and is the largest in the lower North Island. It is a very important feeding ground for migrating birds and many of these birds winter over on the mudflats and in the wetland. A number of threatened fish and plants also live there.

Footnote: access to the estuary area is gained through Holben Parade Reserve at Foxton Beach. It is a great place to visit on a warm winter day to check out birds, but take binoculars and a field guidebook.

DAVE HANSFORD, ORIGIN NATURAL HISTORY MEDIA

Horowhenua Forest and Bird has delivered the case for recognising the Manawatu Estuary as a wetland of international importance under the Ramsar Convention. The estuary is home to some 93 bird species, the most diverse range in any one place in New Zealand.

HELEN CAMPBELL

Forest and Bird sent a strong contingent to protest against a proposed hydro-electric dam on the Wairau River in Marlborough. Members from Nelson and Marlborough joined with other environmental and receational groups. 'Hydro schemes and unbridled irrigation have adverse affects on rivers which can never be remedied,' writes Helen Campbell from Nelson/Tasman Forest and Bird.

Making Popcorn to Save Penguins

It may seem an unusual combination, but making popcorn was the way Room 7 at Waverley Park School raised funds to help the hoiho — the yellow-eyed penguin — at Forest and Bird's Te Rere Reserve in Southland.

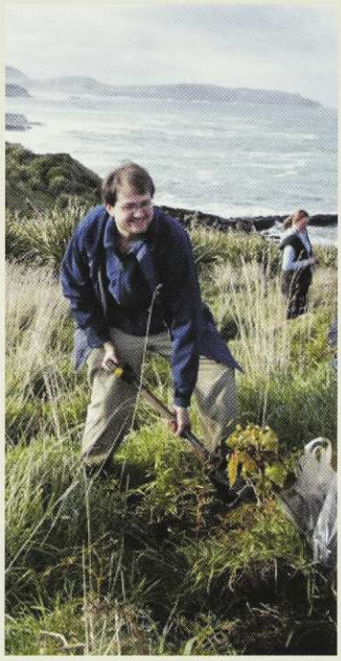
Hoiho is one of the rarest penguins in the world and is found only in New Zealand and its offshore islands.

The class spent a month studying the penguin, making posters, paintings and displays around their classroom. The class then decided to do some fundraising and were looking for a local project to give the money to — Southland Forest and Bird's Te Rere penguin reserve was the lucky recipient.

The pupils had studied Te Rere on the Southland Forest and Bird web site and knew all about the devastating fire that had happened a few years ago. Since the fire the main effort at Te Rere has been planting 1000 native plants a year and ongoing animal pest control. The money from the popcorn will be used to buy native plants for Te Rere.

— **CHRIS RANCE**, *Southland Branch*

Penguin conservation programme: children from Room 7 Waverley Park School show their yellow-eyed penguin posters. The children also raised funds for Southland Forest and Bird's Te Rere penguin reserve by making popcorn.



Left: William Gamble is the third generation of his family to work at Southland's Forest and Bird Te Rere penguin reserve. A celebration of 20 years' work on the project is to be held on Saturday February 19. Because of the difficult access, visitors should pre-register with Brian Rance telephone (03) 213-1161

Cleaning Up the Fiordland Coast

For the second year, Forest and Bird members have joined in a community clean up of the Fiordland coast. Several kilometres of ropes, three large trawl nets and miscellaneous debris were removed this winter between Puysegur Point and Breaksea Sound, some 215 kilometres of coastline.

The weather tried its best to hinder, ravaging the coast with a melange of high winds, stormy rain, hail showers and six-metre sea swells. However the project prevailed, recovering about 250 cubic metres of rubbish and waste.

Last year, rubbish was cleared from 76 kilometres of beaches from Port Craig to Puysegur Point and this wild coast still looks clear of debris.

'The rubbish is not only a visual eyesore to the ever-increasing number of tourists in the area, but is also considered to be a potential hazard to the wildlife,' according to the organisers. It was clear that the rubbish was not solely from New Zealand, or solely from the fishing industry — much of the debris found had foreign text, possibly from tourist cruise ships or other boats, and carried by the currents. Cawthron Institute scientists are interested in investigating the coastal sea currents, in order to help elucidate the origins of the rubbish.

The project is a community partnership comprising Southwest Helicopters, the fishing industry, Guardians of Fiordland Fisheries, the Department of Conservation and Environment Southland, and including violunteers from Forest and Bird. Over the remaining three years the project will move progressively up the Fiordland coast to finish at Milford Sound.

— CAREN SHRUBSHALL, *DoC*

Regional Approach to Protecting the Environment

The Northern branch of Forest and Bird has made a number of submissions to local government authorities expressing concerns about the risks to the environment posed by genetically modified organisms.In its submissions, the branch has indicated support for a strong precautionary approach towards genetic engineering.

Local authorities, Local Government NZ and environmental NGOs have become increasingly concerned about the risks of genetic engineering since the moratorium on release of GMOs was lifted late last year. The failure of central government to put in place a strict liability regime or address the legitimate concerns raised by local government to the New Organisms and Other Matters Bill Select Committee has resulted in Northland local authorities taking the lead nationally in addressing the issue.

The Whangarei, Kaipara, Far North and Rodney district councils, with Local Government NZ and the Northland Regional Council, commissioned an independent GE report and legal opinion relating to GMOs. The legal opinion by Dr. Royden Somerville QC found that local authorities do have jurisdiction to manage land uses involving GMOs in the environment. The mechanisms involve using the RMA and Local Government Act over and above the regulation prescribed nationally in the Hazardous Substances and New Organisms Act.

Changes adopted in the Northland Regional Council's 'Long Term Community Plan' include 'no further development and field-testing of transgenic organisms envisaged for agriculture, horticulture and forestry in Northland until the risk potential has been adequately identified and evaluated and a strict liability regime put in place'.

— ZELKA GRAMMER

The Robins' Return

After an absence of 140 years the North Island robin /toutouwai has been returned to Great Barrier Island. Thirty birds were translocated from Tiritiri Matangi Island, near Auckland, and released at Windy Hill on the southeastern coast of the island earlier this year. Robins were last recorded on Great Barrier in 1860.

Organisers believe this could be a turning point for conservation on the island, being the first reintroduction of a regionally extinct species. (Others still missing from the island include bellbird, saddleback, kokako, whitehead and rifleman.)

After five years of systematically removing pests from over 250 hectares of land, the Windy Hill Rosalie Bay Catchment Trust gained approval from the Department of Conservation to reintroduce the robins into an area where pest densities have been maintained at very low levels.

The robin translocation was funded by the Biodiversity Condition Fund. Early assistance with the Trust's work came from the J.S. Watson Trust which is administered by Forest and Bird.

Society's Management Changes

Niki Francis, who was appointed as general manager of Forest and Bird on a short-term contract, finished with the Society in September.

The Society's national president, Gerry McSweeney, welcomed Niki's major contribution to Forest and Bird over the last year. 'She introduced fresh ideas and helped make us more aware of our social responsibilities,' he said. 'We are enormously grateful for Niki's focus and dedication.'

'As a part of her contract with the Society, Niki reviewed our management structure. She has provided valuable advice to the executive on the merits of appointing a chief executive with a strong administrative and conservation background.'

The Society's national executive is pursuing Niki's suggestions.

Auckland Office Has Moved

The Auckland office of Forest and Bird has been moved to the suburbs. Staff may now be found in Mount Eden village at Unit 5, 476 Mt Eden Rd, Mt Eden, Auckland. The conservation officer, David Pattemore, can be reached on (09) 631 7145. The number for general enquiries and the administration officer, Nick Beveridge, is (09) 631 7142. Their fax number is (09) 631 7149.

Advertising office to Auckland

This magazine's advertising sales agency, Print Advertising Ltd, has shifted its sales base for *Forest & Bird* to its Auckland office. The manager of Print Advertising, Karen Condon, now sells advertising space for *Forest & Bird*. The new contact details for the placing of advertisements are given on page one of this issue.

'Abort a Contorta'

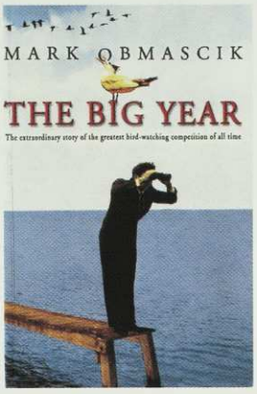
Waikato branch invites fit members and friends to its annual camp to help remove wilding pines *Pinus contorta* from Ruapehu, on February 26-27, 2005. Accommodation at an Ohakune ski lodge is free, and petrol costs are met. Please book early with Philip Hart: prhart@waikato.ac.nz, or write to him at 129 Cambridge Road, Hamilton, or phone 07 856 7992.

Ark in the Park Job

Sandra Jack has been contracted by Waitakere Forest and Bird as the part-time manager of the Ark in the Park project in the Waitakere Ranges. (See page 8, this issue.) The remainder of the week she is an ARC ranger at Muriwai.

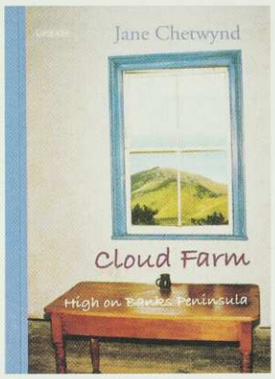
Sandra Jack has come from three seasons working on the 'open sanctuary' of Tiritiri Matangi Island in the Hauraki Gulf near Auckland. There she gained experience working to establish populations of stitchbird and kokako. She has also worked for DoC on the Chatham Islands.

The Big Year, A Tale of Man, Nature and Fowl Obsession



by Mark Obmascik, 268pp limpbound, Doubleday (Random House), Auckland 2004, RRP$37.95.

Obsessive birdwatchers — 'twitchers' — often rush from place to place to glimpse a bird, ticking it off their life list and moving on immediately. Some of the worst-addicted take part in an extraordinary American phenomenon, an annual competition to break the birdwatching record for the most species seen in North America in one calendar year. Journalist Mark Obmascik is a keen birdwatcher himself but this time he is documenting the Big Year exploits of three obsessives. Each travels more than 130,000 miles following reports of rare birds seen in both wild and bizarre places. If you enjoy the travels of Bill Bryson you'll find Mark Obmascik and his birdwatchers similar fun.

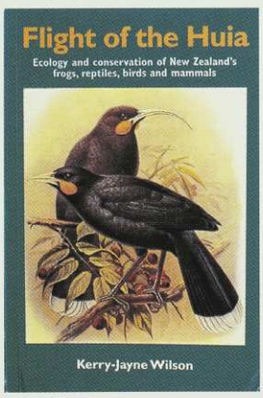


Cloud Farm, High on Banks Peninsula

by Jane Chetwynd, 182pp limpbound, Longacre Press, Dunedin 2004, RRP$29.95.

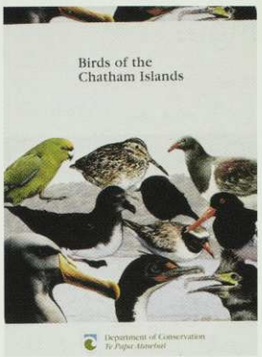
It is possible to 'drop out' in New Zealand, if not quite as romantically as in Tuscany. Jane Chetwynd, then a townie, leaves a medical professorship for a run-down farm high on the exposed slopes of Banks Peninsula. There is a near-ruined wooden cottage to repair, a harsh climate to become accustomed to, and native birds and forest to become familiar with. Also there is the usual smallholder's battle with gorse. Cloud Farm lies over 800 metres up in the cloud zone. Begun as a weekend escape from the city, Cloud Farm finally seduces its new owner. She gives up her stressful job and, in her fifties, adopts a simpler outdoor lifestyle. There are more comfortable places to do this, even in New Zealand, but her story is interesting.

Flight of the Huia



by Kerry-Jane Wilson, 411pp, limpbound, Canterbury University Press, Christchurch 2004, RRP$49.95.

Subtitled 'Ecology and conservation of New Zealand's frogs, reptiles, birds and mammals', this is a serious book about our conservation of threatened species. It traces their origin, and the impact of imported species on them. The book claims to be the first history of 'faunal change' in New Zealand and debates future directions for conservation of the altered ecology. It traces many of the advances made in conservation methodology over the past 50 years. For anyone seeking the facts and details of ecological change, the book is a valuable resource. No light read, it will probably find its market mostly among students and professionals.



Birds of the Chatham Islands

By Hilary Aikman and Colin Miskelly, 116pp limpbound, Department of Conservation, PO Box 5086, Wellington 2004, RRP$24.95.

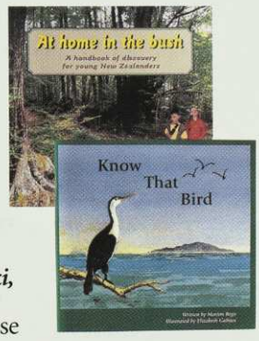
Officers of the Department of Conservation who have specialised in the wildlife of the Chatham Islands here present a straight-forward guide to 72 birds, along with notes on their conservation. The islands are notable not only for popularly known rarities such as the taiko and the black robin, but for a whole range of subspecies and species similar to mainland birds which have evolved there. The New Zealand pigeon appears here as the Chatham Islands pigeon or parea, a larger bird with a tiny population. There are local pipit and oystercatcher, tui and grey warbler too, plus a raft of rare and endangered seabirds. Every bird appears in colour photographs and, while the printing quality varies, the illustrations are functional. Anyone going to the Chathams will use and enjoy this book, available to Forest and Bird members at a mere $15, if buying direct from DoC.

A Photographic Guide to Wildflowers of New Zealand

by Geoff and Liz Brunsden, 144pp limpbound, New Holland, Auckland 2004, RRP$24.99.

Designed for the inside pocket of a jacket, this guide by two keen gardeners illustrates 125 of the more colourful species we mostly know as weeds. There are good notes about the habits of each. The Brunsdens are given some credit for introducing wildflower gardens along some highways. Their book is similarly biassed, toward what the rest of us might call 'garden escapes'. So we have cosmos and sweet william, fresh from the cottage garden, laying alongside such natives as Maori onion and mountain daisy. This is a pretty little book laid out by colour of flower rather than genus. It is a frightening reminder to the purist of what's out there and what can escape into the wild.

At Home in the Bush



by Leonie Garvey, 64pp limpbound, Deed Printing, 16 Bowen Street, Waiuku, RRP$19.95

Know That Bird

by Marion Rego, illustrated by Elizabeth Gabites, 32pp limpbound, Seagull Press, PO Box 211, Otaki,

We don't usually 'notice' children's books but these two originate from keen Forest and Bird members who have published them to encourage an interest in nature in local schools. *At Home in the Bush* offers an interesting text about trees and plants to find in the forest. There are interesting facts, including Maori uses of the plants. Sadly, the colour photographs are not always well printed, but the text and the ideas should be interesting to the beginner. *Know That Bird* introduces a range of 21 species with very simple watercolours. The idea is to learn something about the most common birds, in language that is easy for children to read.

2004*index*

Authors and articles listed by issue, then page numbers.
KEY: Bu = Bulletin BO = Branching Out CB = Conservation Briefs Com = Comment IF = In the Field WW = World Watch

AUTHORS

SUBJECTS

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(Please attach an encoded deposit slip to ensure your number is loaded correctly)

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I/We acknowledge and accept that the bank accepts this authority only upon the conditions listed below.

Information to appear on my/our bank statement

F O R E S T & B I R D | | T H A N K Y O U

Payer Particulars | Payer Code | Payer Reference

Your Signature/s Date / /

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For bank use only
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(a) Has agreed to give written advance notice of the net amount of each direct debit and the due date of debiting at least four business days before the date when the direct debit will be initiated. The advance notice will include the following message:- "The amount of $..... will be direct debited to your bank account on (initiating date)".

(b) May, upon the relationship which gave rise to this Authority being terminated, give notice to the bank that no further Direct Debits are to be initiated under the Authority. Upon receipt of such notice the Bank may terminate this Authority as to future payments by notice in writing to me/us.

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(b) Stop payment of any direct debit to be initiated under this authority by the Initiator by giving written notice to the Bank prior to the direct debit being paid by the Bank.

The Customer acknowledges that:

(a) This Authority will remain in full force and effect in respect of all direct debits made from my/our account in good faith notwithstanding my/our death, bankruptcy or other revocation of this Authority until actual notice of such event is received by the bank.

(b) In any event this Authority is subject to any arrangement now or hereafter existing between me/us and the Bank in relation to my/our account.

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(d) Where the Bank has used reasonable care and skill in acting in accordance with this authority, the Bank accepts no responsibility or liability in respect of:

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The Bank may:

(a) In its absolute discretion conclusively determine the order of priority of payment by it of any monies pursuant to this or any other authority, cheque or draft properly executed by me/us and given to or drawn on the Bank.

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Protecting our
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since 1923
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The **Royal Forest and Bird Protection Society** is Aotearoa New Zealand's leading non-government conservation organisation.

Forest and Bird members enable the Society to carry out important conservation work to protect and enhance New Zealand's native species and habitats.

Members receive the *Forest & Bird* magazine four times a year with the campaign update *Conservation News*.

Members can participate in conservation initiatives and enjoy organised talks and trips with their local branch. They can also stay at Forest and Bird lodges around the country.

Forest and Bird members are at the heart of our success in protecting Aotearoa New Zealand's wildlife and wild places

Join today

Cool club for kids!

Forest and Bird's club for children started in 1988. The magazine now goes to over 17,000 children nationwide.

The **Kiwi Conservation Club** encourages children to enjoy, respect and understand the natural world through fun conservation-based activities.

Members receive the Kiwi Conservation Club (KCC) magazine five times a year. Where there are active groups members receive notification of local trips and events from their local volunteer coordinator.

New members receive a starter pack that includes a member certificate and cool KCC stickers.

To learn more visit www.kcc.org.nz or phone us to receive a free introductory copy of the magazine.

FOREST & BIRD

Royal Forest and Bird Protection Society
172 Taranaki Street, PO Box 631, Wellington
Aotearoa New Zealand
Phone 04-385 7374 Fax 04-385 7373
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Phone 04-385 7374 with your credit card details or join online at www.forestandbird.org.nz

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November 2004

lodge*accommodation*

Arethusa Cottage
An ideal place from which to explore the Far North. Near Pukenui in wetland reserve. 6 bunks, fully equipped kitchen, separate bathroom outside. For information and bookings, contact: John Dawn, Doves Bay Road, RD1, Kerikeri, Tel: (09) 407-8658, fax: (09) 407-1401.

Tai Haruru Lodge, Piha, West Auckland
A seaside haven set in a large sheltered garden on the rugged West Coast, 38km on sealed roads from central Auckland. Close to store, bush reserves and tracks in the beautiful Waitakere Ranges. Double bedroom and 3 singles, plus large lounge with open fireplace, dining area and kitchen. The self-contained unit has 4 single beds. Bring food, linen and fuel for fire and BBQ. For details and rates send stamped addressed envelope to Jan Harvey, 25 Kauri Point Road, Laingholm, Waitakere City, Tel: (09) 817 8282. Email: janharvey@xtra.co.nz.

Waiheke Island Cottage
Located next to our 49ha Wildlife Reserve,10 minutes walk to Onetangi Beach, general stores etc. Sleeps up to 8 in two bedrooms. Lounge, well-equipped kitchen, separate toilet, bathroom, shower, laundry. Pillows, blankets provided. No pets. Ferries 35 minutes from Auckland. Enquiries with stamped addressed envelope to: Robin Griffiths, 125 The Strand, Onetangi, Waiheke Island, Tel: (09) 372-7662.

Ruapehu Lodge, Tongariro National Park
Situated 600 metres from Whakapapa Village, at the foot of Mount Ruapehu, this lodge is available for members and their friends. It may also be hired out to other compatible groups by special arrangement. It is an ideal base for tramping, skiing, botanising or visiting the hotpools at Tokaanu. The lodge holds 32 people in four bunkrooms and provides all facilities except food and bedding. Bookings and inquiries to Forest and Bird, PO Box 631, Wellington.Tel: (04) 385-7374, fax: (04) 385-7373. Email: office@forestandbird.org.nz

William Hartree Memorial Lodge, Hawkes Bay
Situated 48km from Napier, 8km past Patoka on the Puketitiri Rd (sealed). The lodge is set amid a 14ha scenic reserve and close to many walks, eg: Kaweka Range, Balls Clearing, hot springs and museum. The lodge accommodates up to 15 people. It has a fully equipped kitchen including stove, refrigerator and microwave plus tile fire, hot showers. Supply your own linen, sleeping bags etc. For information and bookings please send a stamped addressed envelope to Pam and John Wuts, 15 Durham Ave, Tamatea, Napier. (06) 844-4751, email: wutsie@xtra.co.nz

Matiu/Somes Island, Wellington Harbour
Joint venture accommodation by Lower Hutt Forest and Bird with DoC. A modern family home with kitchen, 3 bedrooms, large lounge and dining room, just 20 mins sailing by ferry from the centre of Wellington or 10 mins from Days Bay. Ideal place to relax in beautiful surroundings, with accommodation for 8. Bring your own food and bedding and a torch. Smoking is banned everywhere on the island, including the house. For information sheet, send stamped addressed envelope to: Accommodation officer, PO Box 31-194, Lower Hutt. (04) 567-1686.

Tautuku Lodge
State Highway 92, Southeast Otago. Situated on Forest and Bird's 550ha Lenz Reserve 32km south of Owaka. A bush setting, and many lovely beaches nearby provide a wonderful base for exploring the Catlins. The lodge, the Coutts cabin and an A-frame sleep 10, 4 and 2 respectively. No Animals. For information and rates please send a stamped addressed envelope to the caretaker: Diana Noonan, Mirren St, Papatowai, Owaka, RD2.
Tel: (03) 415-8024, fax (03) 415-8244.
Email: diana.n@clear.net.nz

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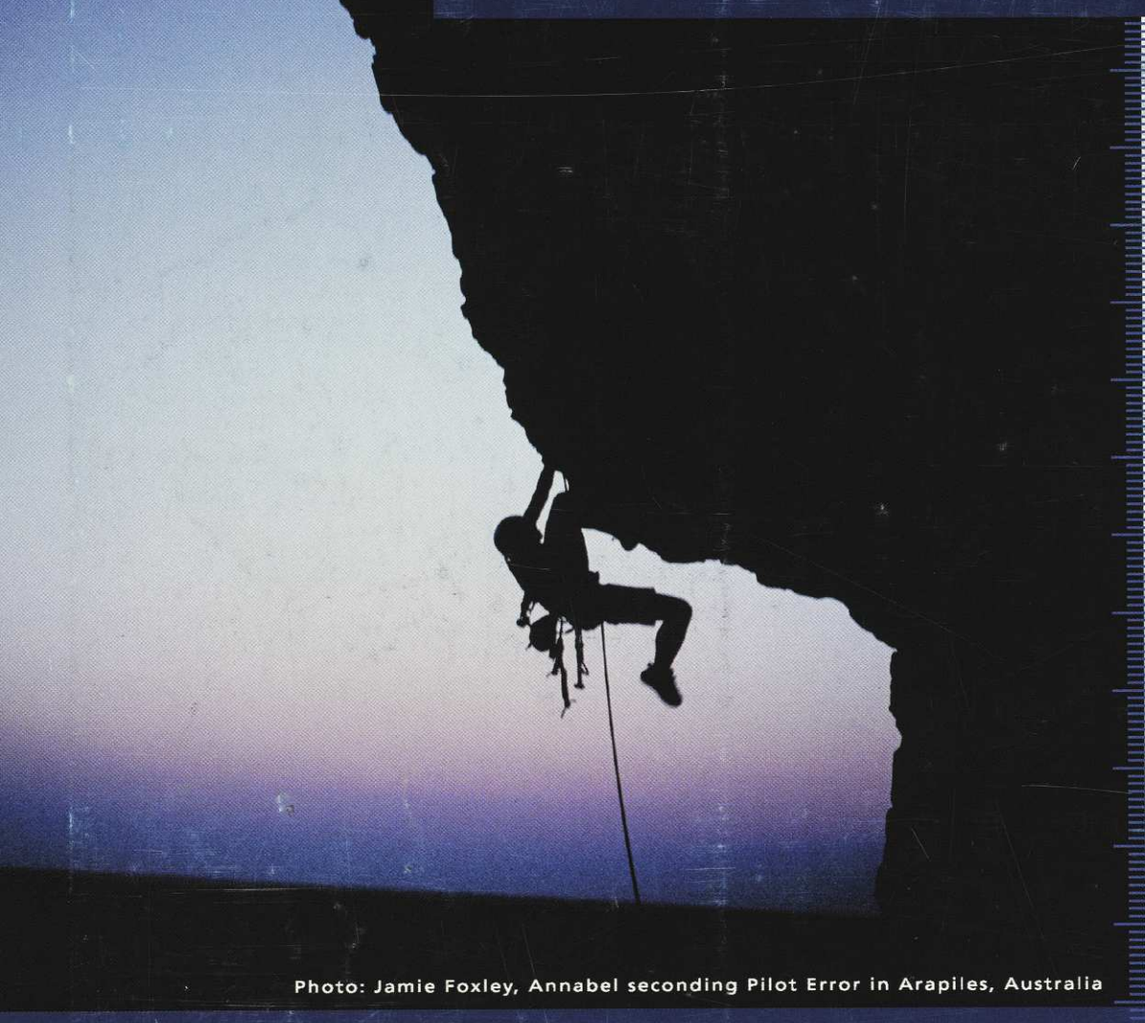

Photo: Jamie Foxley, Annabel seconding Pilot Error in Arapiles, Australia

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