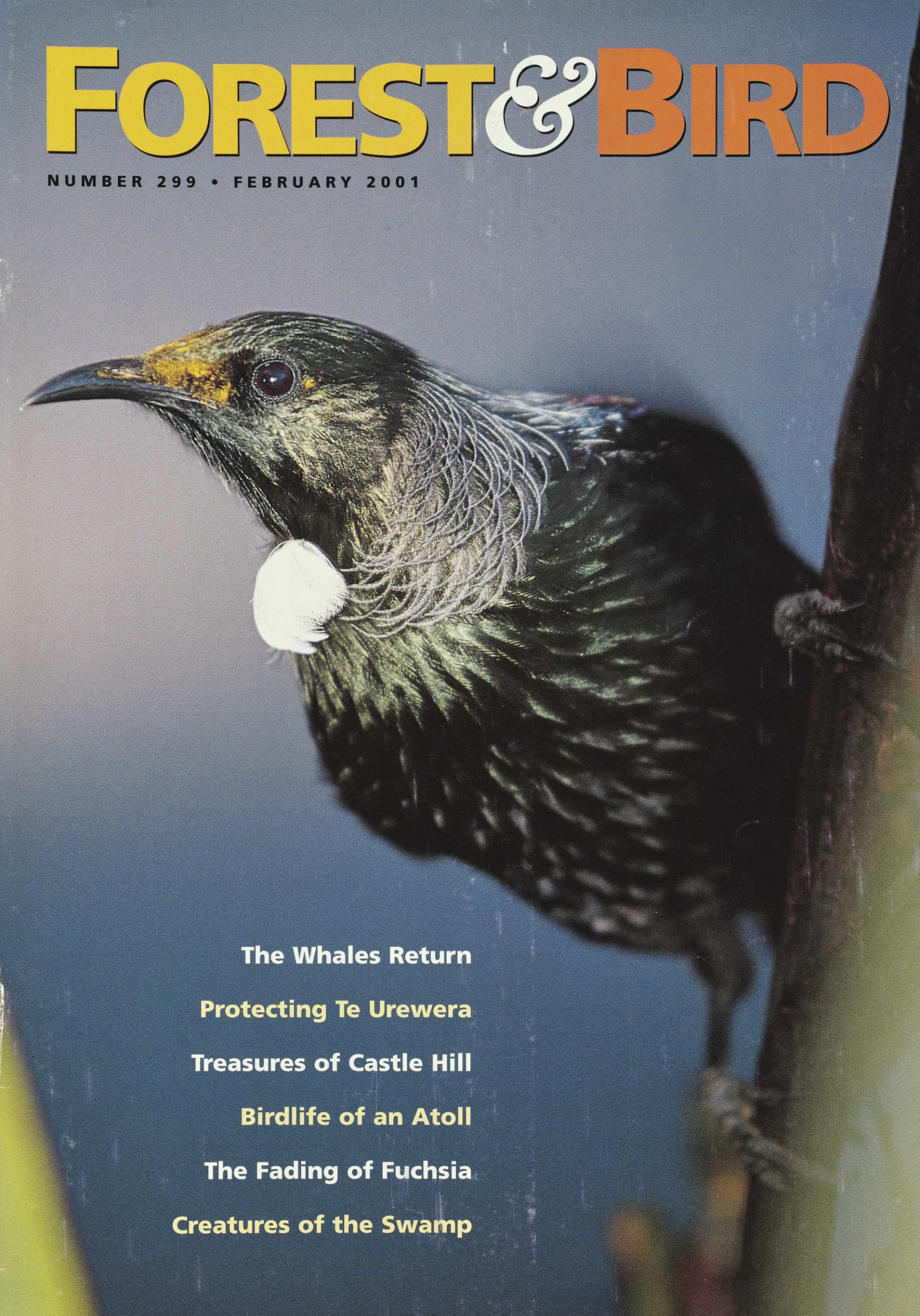
FOREST & BIRD

NUMBER 299 • FEBRUARY 2001



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Thank you for assisting the Society to protect New Zealand's natural heritage.

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FOREST & BIRD

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Features

Regulars

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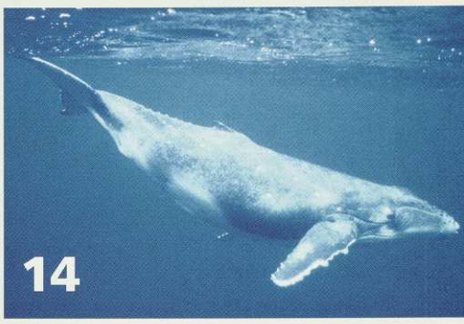


comment

Beyond the 'Mainland Islands'

Two articles featured in this edition of *Forest & Bird* raise issues central to conservation management in New Zealand, and to species survival. 'Restoration — Windy Hill' and 'Island in the Mist' both deal with the restoration of indigenous forest habitats and give rise to a number of matters that I think would benefit from wider public debate.

Congratulations, first though, to resident Maori of northern Te Urewera and to the shareholders of the Little Windy Hill Company of Great Barrier Island. The work in which these people are engaged throws up some interesting statistics.

The pitifully low bird counts leap out of the pages, as does the enormity of the threats facing native species. The number of these threats is quite staggering: on Great Barrier Island, 1,600 rodents, 21 feral cats, 12 pigs, and 155 goats were taken out of one 20-hectare valley in 18 months. In Te Urewera, 400 possums were taken from a 300-hectare block in just one week.

'Mainland islands', as these areas are fashionably called, seem to be sprouting everywhere. What began as an initiative of the Department of Conservation has also been taken up by territorial authorities and private restoration groups. These 'mainland islands' help native species in their struggle against introduced predators, because they are isolated from the surrounding countryside by intensive pest control.

It might be timely to consider the name 'mainland island' itself for, on the face of it, 'island' on the mainland is a contradiction in terms. There are of course other names that could be used. We already talk of 'protected natural areas'; 'representative areas'; 'sanctuaries'; 'zones'; and no doubt a few I haven't recalled. Could we perhaps settle on just one name? Personally, I rather like the term 'ecological sanctuary' because it means what it says.

Keith Chapple asks what happens to our rare birds when they leave the shelter of a 'mainland island'.

For private landowners, these restoration projects will often be 'pockets' of nature surrounded by developed land of one sort or another. When we refer to developed land we often think of farmland and the like, but there are of course many pockets of nature existing in urban areas. Collectively, these areas are important and their establishment and management needs to be encouraged. They provide ecological corridors and go some way — depending on their size — to restoring the natural character of New Zealand.

But encouragement will have to go a lot further than words from the sideline. The Urewera and Windy Hill projects trumpet the need for collaboration between local people, local government, central government, DoC, conservation groups such as Forest and Bird, and (in the case of the Windy Hill Project) Work and Income New Zealand.

Indeed, the Government itself might examine these projects in greater depth for they encompass its policies in each of the environmental, employment, and social service areas. If people can be gainfully employed saving nature, it must surely be of interest to Government agencies.

But what happens outside these ecological sanctuaries? More importantly, what happens *immediately* outside these sanctuaries?

It seems to me the Urewera project is something of a Greek tragedy; it is both a spectacular success and a great sadness. The project is so successful that kokako are now 'seeding' the surrounding forest. What happens to these kokako? I suppose they get eaten by the ravenous horde of pests immediately outside the 'treated' area.

It defies the imagination to suggest that this was the intention of the project, but this must surely be what is happening. One effect must surely be that the spillover of birds from a recovering sanctuary must provide extra rations for neighbouring rats, stoats, ferrets, dogs, cats and so on. Is this something that Forest and Bird is comfortable with?

One way to obviate this very unfortunate side-effect would be to gradually extend such sanctuaries in size, to provide a safe-haven for those birds that are seeded from the core area, until all the core areas join up.

Another way would be to examine the lessons learned in South America. At the beginning of the rainforest destruction in that region, an experiment with variously-sized reserves clearly showed that so far as nature is concerned, 'big is good, small is not so good'.

New Zealand's special species did not evolve in little pockets; they evolved over vast tracts of forest. Logic tells us that if they are to survive they still need large tracts of safe habitat.

KEITH CHAPPLE QSO *is national president of Forest and Bird.*

mailbag

Diplomatic Protest

In his November column, Keith Chapple wrote that there are now other ways to achieve good environmental outcomes besides the protests of a generation ago, and warned us that too frequent protests are counterproductive. But we cannot think of any environmental protests or civil disobedience at present. If there is any, it certainly is not much.

So what are his generalities hinting at? That we should try to ingratiate ourselves with business. We see no good environmental outcomes there. That we should reduce our RMA advocacy to be less 'adversarial'? How will that help?

Increased environmental awareness now, is to a considerable extent because of environmentalists' past efforts. Certainly, let us be diplomatic, but there is still a long way to go. Now is not the time to reduce our efforts.

Lois Griffiths for Branch Committee, North Canterbury Forest and Bird

My comments were not that we should reduce our advocacy or efforts; simply that we should also grasp the opportunities presented by the modern political mood and greater environmental awareness in the community to work with others when appropriate. — Keith Chapple, national president.

'Friendly Coasters'

In his last editorial, Keith Chapple again talks of extending the hand of friendship to the people of the West Coast. This is something we do wherever possible, but there's still lots of situations where we must confront that section of the Coast population who promote resource extraction with no thought for the environment. At present, the Resource Management Act virtually guarantees developers a win. We experienced this when Talleys Fisheries applied to build a fish offal plant in a public park, with waste water discharged direct to the Buller River. Under the RMA rules, our development-at-any-cost council selected the commissioners and they found in favour of Talleys. We appealed to the Environment Court who agreed we had a case, but demanded a $16,000 bond before it would proceed. With only $50 in the kitty, of course we had to pull out.

The factory is now a reality. There've been scores of complaints over fish smells, and the regional council is currently prosecuting Talleys for allegedly polluting the river.

On a familiar front, Coast greenies are still battling Timberlands continued logging in Okarito and other old-growth forests.

Pete Lusk, Westport

Squaring Off

There appears to be a discrepancy in areas quoted for the mainland island in 'Fighting them in the beeches' *Forest & Bird*, November 2000. The location map refers to Hurunui as 4600 hectares whereas in the body of the article it is twice referred to as 12,000 hectares. Is there some confusion between hectares and acres? The second figure does appear a little large, marvellous as it would be!

Quentin Roberts (emailed)

DoC's official map was a little out-of-date. The area is now 12,000 hectares, following the comparatively recent addition of the 'control area' in the North Branch where pest control is not yet carried out. The Otamatuna area in northern Te Urewera has also been expanded substantially (see 'Island in the Mist' feature page 18 this issue).

The Science and Romance of the Cabbage Tree

Philip Simpson is a scientist who also has a romantic affection for his life-long study, the cabbage tree. Now he has combined the science and art of this New Zealand icon into a biography of the tree *Dancing Leaves, The story of New Zealand's cabbage tree, ti kouka* (Canterbury University Press).

As one of the scientists who studied the sudden decline, which began killing these landmark trees in the 1980s, he also feels a personal loss; of stories, of art, of a symbol of New Zealand.

The image of a cabbage tree blowing in the wind, indeed the sound of its rustling leaves, is ingrained in the New Zealand psyche. 'Everyone,' he says simply, 'has a cabbage tree story.'

'I see the loss of these trees, through disease and development, as a tragedy — a loss of national identity,' he says.

Dancing Leaves is a large format, full-colour tribute to the tree; something quite different in writing about nature in New Zealand, in the way it combines good science with the arts. Dr Philip Simpson explores the ancestry of the New Zealand *Cordylines* — like the podocarps they date from the Age of the Dinosaurs — then pursues their cultural history through Maori and subsequent times. Maori use of ti kouka as a food source, and material for baskets and cloaks is examined, along with illustrations of places and artefacts from early times; subsequent European uses are also documented.

Central to the book are human stories about the trees. There are chapters too about cabbage trees in design and art, and in literature. There are literally hundreds of colour pictures in a book which, at 324 pages, still represents a much cut-down version of his original manuscript.

The progressive loss of trees from sudden decline, and the prospects for their restoration, provides an ecological challenge.

'I was part of the debate between scientists, as to why the cabbage trees were dying off,' says Philip Simpson recalling the genesis of his work. 'Some said the reason was the sudden decline disease caused by a phytoplasma bacterium spread by the introduced vinehopper. Others argued the trees died because of ecosystem destruction weakening their hold on the land.

'I was on a Ngatiwai marae in Northland when an elder said "the tree has lost its mauri". This Maori perspective, that the trees had lost their life force, summed up the situation in a nutshell — both scientific arguments were correct, and the Maori perspective tied the fate of the dying trees to our ecological health. You can't drain 90 percent of our swamps, destroy baby trees, and expose older trees to development, without epidemic consequences. What we had was not "sudden decline" but "slow decline".

PHILIP SIMPSON

Found throughout New Zealand, Cordyline australis *achieves the most massive size of any* Cordyline *species. This tree at Pakawau in northwest Nelson is probably about 400 years old and grew in a former dune swamp.*

WENDY PARR

'Every cabbage tree has a story, and the landscape is poorer when they are gone. To the author's family "the cabbage tree" had ony one meaning: it marked a boundary to our place at Ururwhenua,' writes author Dr Philip Simpson, also pictured here. Sudden decline has since killed the tree. The disease has meant the loss of many personal and communal landmarks.

PHILIP SIMPSON

The cabbage tree's links with the ancient supercontinent of Gondwana are captured here in primeval forest in South Westland. The cabbage trees provide a coastal fringe to ancient podocarps which also evolved in the Age of Dinosaurs.

Philip Simpson who had worked as a scientist on 'monocotyledons with secondary thickening in their stems' (his PhD was written about the broadly related Joshua tree, icon of the Mojave Desert) now turned to studying the cultural history of cabbage trees. Obtaining a Stout Research Fellowship, he advertised for personal stories 'about cabbage trees, and I got hundreds....

'Because the tree is so widespread it seems to be the major species with which New Zealanders identify their homeland.' He also gathered a wealth of anecdote and art about cabbage trees, set off in the book by pictures ranging from landscape painting to postage stamps and trade marks. 'Sadly, thousands of trees are still dying on our farms and cities, and there is no way they can replace themselves naturally because there is no natural habitat,' Philip Simpson says of the future for cabbage trees. We've done well setting aside 30 percent of our countryside in national parks and reserves, but the occupied part of New Zealand is an ecological desert.'

'Cabbage trees are a bush-edge plant — they belong in wetland remnants, on riverbanks and along coastlines, all habitats under great stress. Their best prospect is for us to replant our riverbanks. There's multiple advantages here, including improved water quality, arresting erosion and creating natural corridors for nature through the countryside. Because they're still common, many people don't realise cabbage trees are at such risk. I hope this book will mean people won't be able to say too late "I did not know" about the crisis they face.' — *Gordon Ell.*

'Better Red than Dead' — Project Crimson's First Decade

Project Crimson has made a measurable difference to the survival of New Zealand's rata and pohutukawa over the past 10 years, but these species are 'not out of the woods yet', according to a scientist concerned with the plight of 'New Zealand's Christmas trees'.

In the late 1980s, 'dying twigs' would have been a better description of these Kiwi icons. Thanks to the Project Crimson Trust set up to protect pohutukawa and rata — and help from thousands of people around the country — the last 10 years have seen an impressive turnaround in the fortunes of these trees.

The picture looked bleak when, in 1989, Dr Gordon Hosking surveyed 190 pohutukawa sites in Northland, the Coromandel, Bay of Plenty/East Cape and along Northland's west coast. He found up to 90 percent of New Zealand's original pohutukawa had died. The survivors were older trees in poor condition and little regeneration was evident.

Concern that pohutukawa might become extinct in some areas led to the Project Crimson Trust being formed in 1990. Its mandate was to protect pohutukawa and, in 1996 its focus widened to include the pohutukawa's cousins, the tree rata.

In late 1999 Gordon Hosking, now a Project Crimson trustee, resurveyed 105 of the original sites researched in 1989.

'The results were most encouraging with pohutukawa regeneration increasing tenfold in Northland and similar results found in all other areas surveyed,' he says.

While Project Crimson's success in establishing 200,000 new trees over the past decade has played an important part in saving pohutukawa and rata, Gordon Hosking says a combination of factors has made the difference. Importantly, Project Crimson has enjoyed ongoing financial support from its sponsor Carter Holt Harvey. The regional support network provided by its project partner, the Department of Conservation, has proven invaluable in taking the work out to the public.

Every year Project Crimson funds pohutukawa and rata protection and research activities, including some Forest and Bird branch projects. Besides tree planting and maintenance it also supports many other projects, such as ground-breaking research at Auckland University which suggests all pohutukawa and rata relatives within the Pacific Rim originated from New Zealand up to 10 million years ago. It has also aided the compilation of a bibliography of pohutukawa and rata; and helped fund possum-control programmes. Last year Project Crimson assisted nearly 80 projects, including several by Forest and Bird members

Other highlights include a 2.5-kilometre, 9000-volt, solar-powered electric fence stretching across Rakaumangamanga (Cape Brett) that resulted in major regeneration for pohutukawa and other flora in the area.

The trust has increased its focus on rata protection and, in 1999, it appointed trustee Philip Simpson as its first South Island co-ordinator, with rata his key concern.

While Project Crimson and its supporters have taken huge steps in their journey to protect pohutukawa and rata, Gordon Hosking cautions that the trees are not 'out of the woods' yet.

'New Zealand is at a crossroads because it would very easy to sit back and congratulate ourselves for pulling these trees back from potential extinction in some parts of the country. Yet now, more than ever, the challenge is to avoid complacency and to keep progressing in what will be a continuous journey. Project Crimson is fully committed to the task ahead of us but we can't do it alone. It's ultimately up to everyone in New Zealand to make a difference.'

— Anna Radford, Project Crimson.

KEITH A LOGAN, PROJECT CRIMSON

J.A.NIALL,PROJECT CRIMSON

Prize winners in Project Crimson's photographic competition included Keith Logan (above) and J.A. Niall (right)

Getting help from Project Crimson

Project Crimson makes annual grants to help conservation initiatives with pohutukawa and rata. Funding for 2001 closes on 30 April. More details are available on Project Crimson's web site *www.projectcrimson.org.nz* or by contacting the trust on Ph: 09 480 8864.

DEPARTMENT OF CONSERVATION (HOKITIKA)

Dead rata in a Westland forest — a more recent concern of Project Crimson.

Conservation Minister Meets With Society's Council in Marlborough

Hon. Sandra Lee

'For me it has been a unique journey from being an ordinary Forest and Bird member, and later an executive member, to becoming Minister of Conservation,' the Hon. Sandra Lee told the November council meeting of the Society in Blenheim. 'I am as proud of my conservation roots as I am proud of my tangata whenua roots. The interweaving and overlapping of these two components of my life now assists me in my roles as both Minister of Conservation and Associate Minister of Maori Affairs.

'Tremendous opportunities exist in treaty settlements to advance conservation and for weaving the role of Maori as kaitiaki (guardians) into conservation, working together with the Department of Conservation, Forest and Bird and others,' Sandra Lee said.

In a speech which paid tribute to Forest and Bird's activists, and surveyed the conservation advances of the Government, the Minister challenged the view 'in some quarters of the conservation movement' that there is a political consensus in support of most of the Government's conservation policies.

'Most of the Opposition parties sent clear messages that this is not so, though I have found the Greens to be very helpful.

'I am aware there is also a perception that under the previous administration DoC was forced into the role of an apologist for conservation,' Sandra Lee said. 'I intend to be a totally different Minister of Conservation.

'DoC's biggest task will be the implementation of the New Zealand Biodiversity Strategy over the initial five-year period,' she said. 'It will be required to build good working partnerships with local authorities, and with a range of non-Government organisations from Forest and Bird to Federated Farmers, and of course, most importantly, iwi.

'One of the challenges arising from that basic commitment is to address how best to safeguard our endangered biodiversity on private land. DoC must play a critical role in encouraging private landowners to the point where they become enthusiastic advocates of nature on their land, and want to look after it.

'New Zealanders have a general commitment to conservation but DoC must make this a more informed commitment.' The Minister gave as an example the recent funding of conservation awareness programmes to effect this, including making technical help available both by way of the internet and through advice from 'real people on the ground'.

'DoC will also continue to play an important role in the processes of the Resource Management Act, helping to ensure the best ecological information is available to support local authorities in making decisions.

'New Zealand's rural and urban economies can develop to meet our needs without imperilling our natural heritage,' the Minister said. 'I look forward to furthering cooperative relationships which DoC has already forged with many landowners, iwi, community groups and local authorities, to ensure nature flourishes in the countryside, and in our towns and cities.'

New Weapon Targets Weeds in Sensitive Sites

HortResearch scientists have developed a new weapon in the arsenal for anyone battling invasive weeds in ecologically sensitive areas. The herbcide is in the form of a gel which is applied directly onto the cut stem of the weed, thus avoiding problems of spray drift and the contamination of soil and adjacent plants.

In trials funded by the Department of Conservation, close to a 100 percent kill rate has been achieved on old man's beard *Clematis vitalba*, Japanese honeysuckle *Lonicera japonica*, climbing spindleberry *Celastrus orbiculatus*, and grey willow *Salix cinerea*. No regrowth was detected when the plants were reassessed two years after the first application. Just as importantly, no damage was observed on surrounding native trees.

Subsequent HortResearch trials on a wide range of other weed species (including kahili ginger, gorse, Darwin's barberry and elaeagnus) are showing equally promising results.

Known commercially as Vigilant, the gel contains five percent picloram as the active ingredient — a level that ensures effectiveness yet is of low toxicity.

Department of Conservation staff and volunteers were equally successful in obtaining the high kill rates using the gel technology, which does not require a special licence to use.

Stems and vines are cut with secateurs or pruning saw some 50-100 millimetres above the ground. The gel is then applied directly from the bottle to cover the entire surface of the cut.

The gel can be used throughout the year, although effectiveness may drop off slightly in colder months and cooler climates. On fine warm days the gel is absorbed into the treated plant over two to four hours. In cooler locations of New Zealand, for example, Stewart Island, the gel may take up to two days to be absorbed by the cut stem. The gel is not totally rainfast, so application during rain is not recommended.

— *Helen Percy.*

For further information contact: Helen Percy, HortResearch, Private Bag 3123, Hamilton. Phone 07 858 4742; Fax 07 858 4705; email hpercy@hort.cri.nz

Forest and Bird Approves J.S. Watson Grants

Funding for four exciting new projects has been approved by the Forest and Bird administration committee for the J.S. Watson Conservation Trust. Since its establishment in 1986, the Trust has played an intrinsic part in facilitating conservation projects beneficial to New Zealand's endangered plants and wildlife.

Funding recipients for 2000-2001 are:

- John Perrot, Palmerston North, will be investigating the effect of *Aspergillus* fungi on hihi (stitchbirds) inhabiting Mokoia and Little Barrier Islands. Aspergillosis, contracted through inhaling large amounts of the fungal spores, is a threat to birds and mammals worldwide.

This project will include soil sampling, to analyse the ecological effects of increased temperature and decreased moisture, in the disturbed forest soils of the birds' environment.

- Nicholas Ling of Waikato University, Hamilton, will be publishing a comprehensive guide to New Zealand mudfish. These freshwater fish are under threat from excessive wetland drainage. The guide is an attempt to increase public awareness of the importance of wetland management in the conservation of the mudfish and wetland ecosystems.
- The Little Windy Hill Company Limited of Great Barrier Island, will continue to implement its pest management strategy to minimise the ecological impact of pests such as rats, feral cats, pigs and goats on the island (see feature page 44, this issue). To date, the project has been effective in culling these pests, along with the elimination of several types of weed. The funding will go towards further pest control and monitoring of success in increasing bird populations.
- Michael Pearson of the University of Auckland, will be investigating whether certain viruses are responsible for the decline in growth and distribution of *Sycios australis* (the New Zealand cucumber, or mawhai). His project will use 'ELISA' methodology and electron microscopy to compare the virus status of both mainland and offshore island populations of the plant. This will include susceptibility of *Sycios* seedlings to a variety of viruses well established in New Zealand's flora.

— *Lyn Bates, general manager, Forest and Bird.*

Loder Cup to Nurseryman for Native Plant Advocacy

The manager of a native plant nursery in Canterbury, Jorge Santos, has been awarded the Loder Cup for the year 2000. The Loder Cup, New Zealand's premier conservation award, honours people and organisations for their outstanding contributions.

'The award goes to Jorge Santos for his outstanding work in helping to return native plants, some threatened with extinction, to their rightful place in the landscapes of the South Island,' the Minister of Conservation, Hon Sandra Lee, announced.

Jorge Santos manages the Department of Conservation's native plant nursery at Motukarara at the base of Banks Peninsula. Born in Portugal, he came to New Zealand in 1974.

'The Motukarara nursery is at the hub of work underway to restore the diverse and unique native plant communities which extend in a patchwork across the Canterbury region,' Sandra Lee said. 'The long-term vision is to restore distinctive landscapes that could otherwise be lost to Canterbury and other parts of the South Island.'

Sandra Lee says a key part of this work involves educating the community to use locally sourced native plants instead of exotic species.

'This year Mr Santos will be coordinating a $25,000 project as part of a $2.5-million conservation-awareness package,' she said, 'He will be developing a user-friendly native plant restoration and protection resource kit for farmers, community groups, and local bodies around New Zealand.'

An Englishman, Gerald Loder, donated the conservation cup in 1926 to encourage and honour New Zealanders who work to investigate, promote and cherish the country's indigenous plants and animals. Recent recipients include Southland Forest and Bird members Chris and Brian Rance (1999) who created a community garden and nursery on their property for some of the most threatened of Southland plants, and the Auckland-based Supporters of Tiritiri Matangi (1998) who helped turn the Hauraki Gulf Island into a haven for endangered birds.

DEPARTMENT OF CONSERVATION

Jorge Santos, manager of the Department of Conservation's native plant nursery in Canterbury, has been awarded the year 2000 Loder Cup for conservation. The award recognises his work, helping to return native plants to the Canterbury countryside. A key part of this has been encouraging people to use native plants instead of exotic species.

New Foundation to Help National Parks and Conservation

A charitable trust set up by a former Minister of Conservation, Hon. Denis Marshall, is aiming to raise at least $2 million to establish an endowment fund supporting New Zealand conservation programmes.

The National Parks and Conservation Foundation has already raised more than a quarter of a million dollars and begun allocating grants to various conservation projects, including a project undertaken by a Forest and Bird branch.

The foundation was set up last year as a fundraiser and grants administrator. It is modelled on similar organisations in the United States and Australia.

Trustees are Denis Marshall; Murray McKee, formerly a conservation board chair and member of the Conservation Authority and currently a member of the Tongariro/Taupo Conservation Board; Jim Guthrie, lawyer and a former chair of the New Zealand Conservation Authority; and Dick Hubbard, businessman.

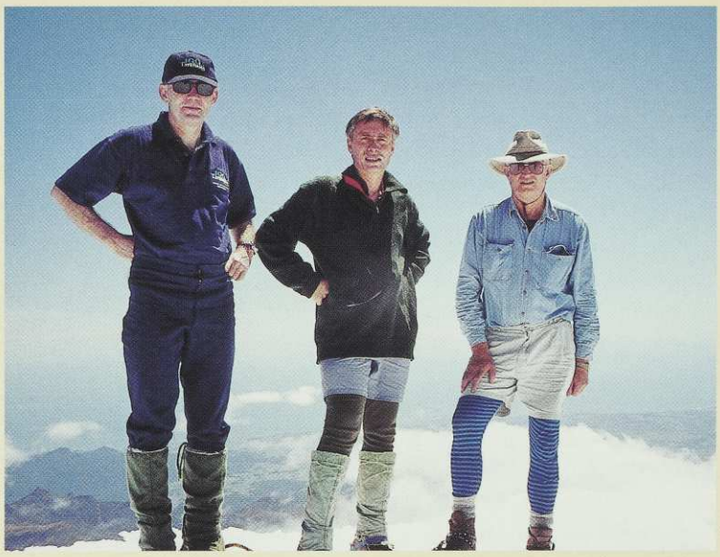
Denis Marshall says the foundation has been set up to provide an independent, apolitical mechanism for the corporate sector and individuals to invest in New Zealand's conservation cause.

'The National Parks and Conservation Foundation will be complementary to organisations such as Forest and Bird. It is not a membership or advocacy organisation and does not aim to compete with other conservation organisations in this way.

'We are not fundraising to replace government funding of conservation. However I am acutely aware that governments will never be able to fund everything that can and needs to be done for conservation in New Zealand.

'The foundation provides an independent mechanism for the private sector to invest in conservation through sponsorship, donations, and marketing ventures,' he says.

It aims to align itself with a number of corporate supporters to establish an endowment fund from which annual grants can be made to community conservation projects.



Celebrating the centenary of Egmont National Park with a climb of Mount Taranaki, is a former Minister of Conservation, Hon. Denis Marshall (at right), with the Director-General of Conservation, Hugh Logan (at left) and the central regional manager of DoC, John Ombler. Denis Marshall is chairman of the new National Parks and Conservation Foundation set up as a charitable trust to benefit conservation projects.

'We are focussing particularly on funding particularly community conservation projects and those that give "added value" to things already being done,' Mr Marshall said.

Several conservation projects have already been allocated funding by the foundation through a sponsorship from Transpower. These include mistletoe restoration in Tongariro, grants to the Little Barrier Island Supporters' Trust and Rangitikei Forest and Bird for weed control projects, a grant to the Limestone Island Restoration Committee and funding for the first stage of a buff weka translocation project in Wanaka.

The foundation's fundraising was kick-started by a generous donation by the Foundation's patron and Fiordland Travel founder Les Hutchins, who has formerly served on the National Parks and Reserves Authority and the Conservation Authority.

Other corporate supporters have also joined to help establish the endowment fund, including Fujitsu New Zealand.

The Director-General of Conservation, Hugh Logan, says he is delighted with the establishment of the foundation and its success to date.

'Internationally these foundations have raised significant amounts of money and they have been able to make a real difference to conservation outcomes.

'All the early indications are that this foundation can and will significantly assist the conservation effort in New Zealand. It will sit alonside the project-specific "sponsored" work of the sort overseen by the Threatened Species Trust,' (a partnership involving the department, Forest and Bird, and sponsoring companies).

'The foundation will provide another funding option for the many important community conservation projects being undertaken around the country. The expertise and knowledge of the trustees in the conservation, political and business environments will ensure the foundation is seen as a credible and important asset to conservation in New Zealand,' Hugh Logan says.

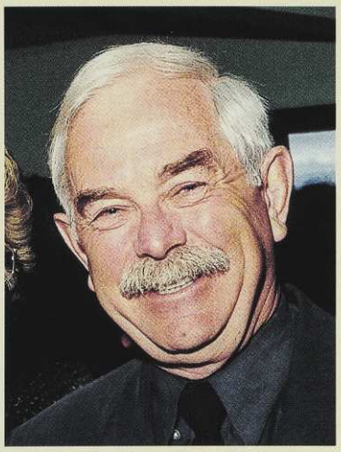
— *Alison Corich*

New Chairperson for Conservation Authority

The New Zealand Conservation Authority, which advises the Minister of Conservation and the Department of Conservation on national policy, has a new chairperson. Kerry Marshall, a former mayor of the Tasman District, succeeds the Rt Hon Sir Duncan McMullin who has retired.

Kerry Marshall has served as a member of the Authority since 1996, having originally been appointed on the recommendation of the Minister of Local Government. A keen tramper, he has been president of Local Government New Zealand, and is the current chairperson of the New Zealand Lotteries Commission.

'We are fortunate to be able to harness Kerry's substantial experience with public-sector organisations,' said the Minister of Conservation, Hon Sandra Lee, when announcing the appointment. She also paid tribute to Sir Duncan McMullin for his 'heartful and notable contribution while he served on the Conservation Authority' from 1996 to August 2000.



Kerry Marshall of Richmond, Nelson, has been appointed chairperson of the New Zealand Conservation Authority till May 31, 2002.

World's 1186 Threatened Birds

The ancient and long-isolated nature of New Zealand is regularly blamed for its having an undue number of rare, threatened and endangered birds. Some 103 New Zealand birds are now on the Red List of threatened species compiled by the International Union for the Conservation of Nature.

New Zealand's sorry state is dramatically amplified to a universal tragedy when the world list of 1186 threatened birds is examined. In all, one in every eight bird species worldwide may become extinct in the next 100 years unless urgent attempts are made to effect their recovery. In 85 percent of species, birds are in jeopardy because of loss of habitat.

BirdLife International, to which Forest and Bird belongs, has been undertaking world-wide research to draw up the present profile, just published in book form as *Threatened Birds of the World*. A dismayingly large tome, A4 in size, and totalling 852 pages, its size only serves to emphasise the massive scale of the problem.

How to stem the rush to extinction, and improve the chances for the survival of the world's birds is one of the major challenges of the BirdLife International alliance. The book, jointly published with Lynx Edicions of Spain, claims to be the first world-wide survey of threatened birds. It presents the birds, species by species, with distribution maps, breeding details, conservation efforts, academic references, and a smallish but adequate illustration. If the New Zealand text is anything to go by, the book is a thorough and contemporary survey.

Birdlife International hopes *Threatened Birds of the World* will move governments towards better protection for their birds. At a mail order price of 125 Euros it is likely to appeal mostly as a reference for institutional purchasers.

New Zealand Team Saves Wildlife in the Seychelles Islands

New Zealand conservation expertise has brought three Seychelles islands back from the brink of ecological disaster.

Rare-species expert Don Merton and a small team of fellow New Zealanders worked three and a half months to eradicate rats, cats and mice from Denis, Curieuse and a neighbouring 219-hectare island in the tropical Indian Ocean group. The pests were threatening to wipe out endemic birds, reptiles and insects, including two high-profile bird species, the Seychelles magpie robin and the Seychelles fody.

The trip was a result of Don Merton's earlier work in the Seychelles which brought his skills to the attention of its government. The first was in the early 1990s when he helped BirdLife International rescue the magpie robin, then down to about 20 individuals. His management techniques are credited with helping bring the species back from the edge of extinction and there are now more than 90 birds. The bad news, he says, is that rats recently invaded the key island refuge.

Then, in 1996 Merton, an internationally known conservationist, again took leave from the Department of Conservation to run a successful rat and rabbit eradication project on Bird Island, most northerly of the Seychelles group.

These visits led the Seychelles government to ask him to carry out an eradication feasibility study as part of its national strategy for restoring island biodiversity. The study was completed in 1998 and this year's operation was the first step in making it happen.

For Don Merton, it was an opportunity to help prevent a repeat of the nightmare he witnessed on Big South Cape Island, near Stewart Island, nearly 40 years ago. In 1964 that island, valued as the final refuge for several southern New Zealand species, succumbed to an irruption of ship rats. In what has been billed as one of the worst ecological disasters in New Zealand's recorded history, the then Wildlife Service made a desperate bid to save the Stewart Island snipe, Stead's bush wren and the greater short-tailed bat. Sadly all were exterminated. Fortunately, Merton and colleagues were successful in saving the South Island saddleback from imminent extinction.

Don Merton says that this time the efforts appear to have come in time and extinctions have been averted. The New Zealanders worked through a great many challenges to complete the task. These included high temperatures; having to confine several hundred individuals of four resident threatened species for three months; some island residents removing bait for their own uses; and passive resistance by some local Hindus who opposed the killing of pest animals.

For a country facing major economic difficulties, where cigarettes were rationed to one per customer until they ran out completely, island restoration is ordinarily a low priority. However, Merton says rat populations had reached the point where they were impacting on the country's key industry, tourism. Rat infestations were driving people away.

Only time will tell whether the New Zealand team has successfully eradicated the target pests. If so, rat-free habitat for sensitive Seychelles animals will have been increased several-fold, from about 280 hectares on a handful of tiny islands, to more than 1000 hectares.

— Marieke Hilhorst is a natural history writer based in Wellington.

DON MERTON

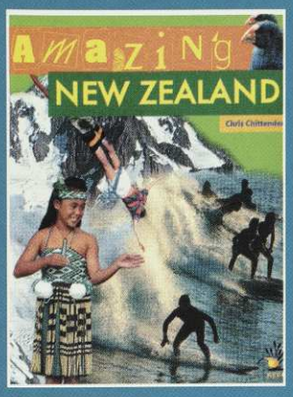
Coralline Denis Island (143 hectares) in the tropical Seychelles group, one of three islands cleared of rats, cats and mice by a New Zealand team led by Don Merton. Creatures saved include a giant tenebrionid beetle, and the Seychelles magpie robin.

DON MERTON

GIDEON CLIMO

In safe keeping: around 140 Aldabran giant tortoises were rounded up and held in captivity on Curieuse Island, while pests were eradicated there.

DON MERTON



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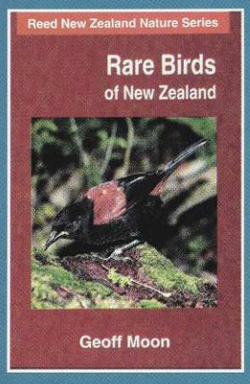
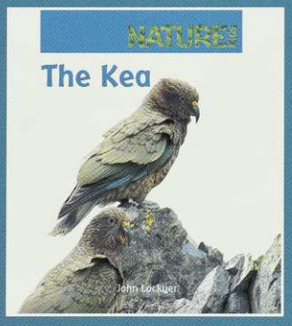
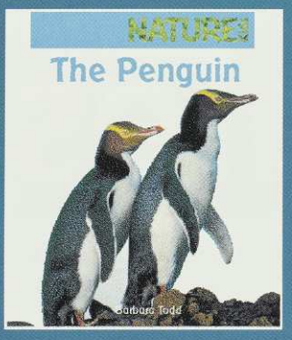
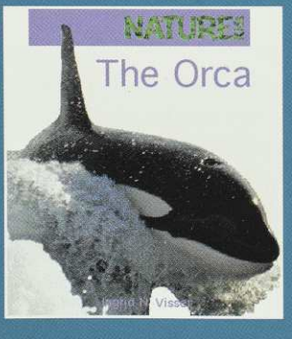




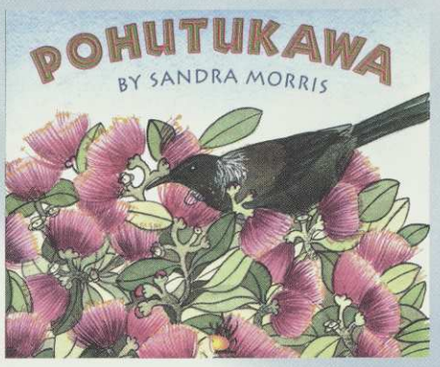




Amazing New Zealand • Chris Chittenden

From North Cape to Stewart Island – this book covers all the things in our natural and human geography that make New Zealand unique and different. The text is lively and informative and makes the information easily accessible. Photographs, diagrams and maps complement the text. Chris Chittenden has written a number of books covering geography, atlases and social studies. $19.95

Pohutukawa • Sandra Morris



Bees, tui, geckos, and bats all make their home in the Pohutukawa tree, but the possum threatens the life of the tree and all the creatures that live there ... until a boy comes to the rescue. Then the cycle of life continues and the seeds of the tree are blown to the ground. New seedlings spring up and soon there are more trees by the sleepy blue sea.

The last two pages of the book provide factual information about the Pohutukawa tree and the insects, birds and animals that live around it.
This is award winning author Sandra Morris' third book for Reed Publishing. Her other books include *One Lonely Kakapo* and *Discovering New Zealand Birds*. Sandra has a keen interest in the environment, and loves to paint birds, flowers and native creatures. $14.95

REED NATURE SERIES: Rare Birds • Geoff Moon

A companion volume to *Common Birds One* and *Two*, this book details rare native birds and uncommon introduced species. All the photographs are by the renowned bird photographer Geoff Moon and many appear in print for the first time. Other titles in the Reed Nature series include: Ferns, Seashells, Mushrooms & Fungi and Butterflies & Moths. $14.95

NATURE Kids

The Nature Kid series is aimed at 5-8 year old children, and is designed to introduce popular aspects of natural history to a younger age group. The series has been warmly welcomed by teachers, librarians, the media, and – most importantly – by children. Also available in the Nature Kids series are: *Weta and Kiwi*. Each book is $12.95

The Kea • John Lockyer

DID YOU KNOW that kea are called the 'clowns of the mountains'? In this book you can explore their cheeky behaviour, see where they live, study their babies, find out what they eat and see just how close they get to humans!

The Penguin • Barbara Todd

DID YOU KNOW that seven types of penguins live in New Zealand? This includes the Blue penguin, which stands at only 35–45 centimetres tall. This book includes facts about where penguins live, what they eat, the differences between them and how they look after their babies.

The Orca • Ingrid Visser

Publication date: March 2001

DID YOU KNOW that when an orca goes to sleep half of its brain stays awake? In this book you can explore how long orca can breathe underwater, what they eat in New Zealand waters, what makes each orca an individual and how orca babies are brought up.

Available from leading booksellers nationwide
Visit the Reed Publishing website:
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TONY AND JENNY ENDERBY encounter the whales and dolphins of the Hauraki Gulf.

The Return of the Whales

The sight of a large whale surfacing, its spout blasting upward, is unforgettable. From close range the sound has an almost resonant ring to it. The warm air from the whale's lungs vaporises as it meets the cooler surface air, creating the spout that whales are best known for.

We experienced both the sight and sound of a spout as a large whale circled our yacht.

We were drifting, sails down, watching the best show in the Hauraki Gulf. Every minute or so the whale surfaced, and dived again but never showed its tail above the surface.

As it passed only metres from our stern we saw the massive tail, driving the whale silently forward, through the plankton-laden water. This was a 14-metre Bryde's whale which then moved off and joined several others nearby.

We continued to watch. The whales rolled on their sides, occasionally showing a pectoral fin or part of a tail above the water, as they lunged through the masses of fish and small crustaceans.

Above: a five-metre long humpback whale baby.

There are more whales in the Hauraki Gulf than most people realise. The Bryde's whale (pronounced broodahs), lives around the northern New Zealand coast most of the year. They are the whales most often seen, as they surface in a fish shoal feeding along with diving gannets.

At Labour Weekend last, passengers on the glass-bottom boat at the Goat Island Marine Reserve, near Leigh, were given a

JENNY & TONY ENDERBY

JENNY & TONY ENDERBY

JENNY & TONY ENDERBY

bonus when a large whale surfaced and blew close to the boat. Further away the curved dorsal fins of several others appeared at the surface. Immediately the passengers began to ask about the whales — 'What kind are they?' 'Why are they so close to land?' 'What do they eat?' … and many more questions. Our answers were limited, as not much is known about these whales.

We do know Bryde's whales grow to 15 metres long, making them New Zealand's largest resident mammal. They are found in most of the world's seas where the temperature is more than 14° centigrade. The Department of Conservation is now doing studies of these animals to increase knowledge of the species.

Other kinds of whale travel along the New Zealand coast as part of their annual migration from the Antarctic to the tropics and back each year. These include humpback, sperm, sei, minke, blue and fin whales.

Humpback and southern right whales were probably common around the New Zealand coast until whaling began in the early 1800s. Between 1843 and 1845 over 100 shore stations were engaged in hunting these 'right' whales. In addition, more than 200 whaling ships called at New Zealand ports annually and the effect on whales was massive. The southern right whale, which grows to 18 metres, was almost completely wiped out by 1850, but is slowly making a comeback at the Auckland Islands south of New Zealand.

A Bryde's whale surfaces and blows noisily beside our boat.

The whale most often seen in documentaries and photographs is the humpback whale. These magnificent animals grow to 16 metres and migrate between the Antarctic in summer and the Pacific Islands in winter, where they give birth and mate again.

The 40-tonne animal can lift most of its body clear of the water in a display called breaching. It can also roll over and lift its long, white pectoral fins out of the water and let them crash back.

During the winter of 1998, a pair of humpback whales spent a month in the Hauraki Gulf, between Leigh and Little Barrier Island, and the splashes as they breached were seen from the shore.

During 2000, a large sei whale spent a few weeks in the same area, at times in the company of the Bryde's whales.

The recent change by the Japanese to include Bryde's whales in their 'scientific' whaling hunts created outrage. This farcical use of the word 'scientific' is just an excuse to kill them, as the end result is still whale meat for the Japanese markets.

Bottlenose dolphin make great kayaking companions.

Dead Bryde's whale in Omaha Bay.

JENNY & TONY ENDERBY

Bottlenose dolphin.

JENNY & TONY ENDERBY

Perhaps this attitude is similar to the 'scientific' killing of the last huia for museum collections. Hopefully, it won't have a similar end result.

The whaling station that operated at Whangaparapara on Great Barrier Island, until the late 1960s, caught several Bryde's whales but they were considered too slim to be economic.

In late October 2000, a dead Bryde's whale floated ashore near Leigh, and earlier that year three Bryde's whales, between seven and 15 metres long, washed up on Great Barrier Island. Another dead Bryde's whale floated into Omaha Bay in 1999 and another washed up on Pakiri Beach in 1997. Collisions with ships travelling through the Hauraki Gulf are thought to be responsible for at least some of these whale deaths.

Our first experience of Bryde's whales was while watching gannets dive into a huge fish school off Leigh some years ago. A dark, curved dorsal fin and back broke the surface in the middle of the melée. The whale spouted several times then dived again for five minutes without showing the spectacular raised tail of a humpback or sperm whale. Several more whales then appeared, in and around the feeding frenzy, which included common dolphins, petrels, shearwaters and gulls, as well as the gannets.

Since then, we have recorded dozens of whale sightings in the Hauraki Gulf between Leigh, Little Barrier and Coromandel. In October, 1999 we recorded 42 spouts over a five-minute period, from a pod of Bryde's whales a kilometre off Cape Rodney, near Leigh. Their most spectacular act is a half roll with a huge splash. Occasionally they 'spy-hop', lifting their heads clear of the water.

Usually Bryde's are a shy animal and will move away from boats, dive for five minutes, and resurface several hundred metres away.

New Zealand's marine mammal regulations prohibit approaching closer than 50 metres to a whale. This is for the safety of both the whale and the boat. During exuberant whale mating overseas some scientists' boats have been rammed and damaged.

Other visitors to the Hauraki Gulf are pilot whales. These large black dolphins, with bulbous heads, grow to around five metres long. They are well know for their unfortunate habit of beaching themselves in large numbers, usually on gently-shelving sandy beaches. Several hundreds have died around the coast over the years, although more recently whale rescue groups have managed to save many stranded victims.

For most New Zealanders, whale or dolphin watching is a rare experience. A recent development has been the establishment of a dolphin and whale-watch venture operating in the Hauraki Gulf out of Auckland.

Dolphins are the most common marine mammal in the Gulf, usually seen as they join boats for a bow ride. This activity brings great enjoyment to all who see it — it also appears to bring enjoyment to the dolphins. The two most common species in the Gulf are the bottlenose and the common dolphins.

The grey, bottlenose dolphins are usually seen close to the coast and regularly visit harbours and estuaries to feed on school fish. We have been approached by bottlenose dolphins when kayaking around the Leigh coast. They are delightful travelling companions and have developed a variation to the 'dolphin on the bow wave' trick. If we continue paddling they move alongside and under the bow of the kayaks. The bow moves upwards and the kayak speed doubles on the pressure wave created by the dolphins. A 3.5-metre bottlenose dolphin can create quite a wake.

The common dolphin is less than two metres in length with dark grey on the top of their bodies, and white and cream on their sides and underneath. They live further offshore, and form pods of up to several hundred animals. In late autumn and early summer these groups move through the Hauraki Gulf, feeding on fish schools of mackerel and kahawai. From September to November we often see pods of these dolphin two to three kilometres offshore between Leigh and Little Barrier Island. When the pod is on the move dozens of dolphins can be seen jumping simultaneously.

To be in the water with bottlenose dolphin is an unforgettable experience

JENNY & TONY ENDERBY

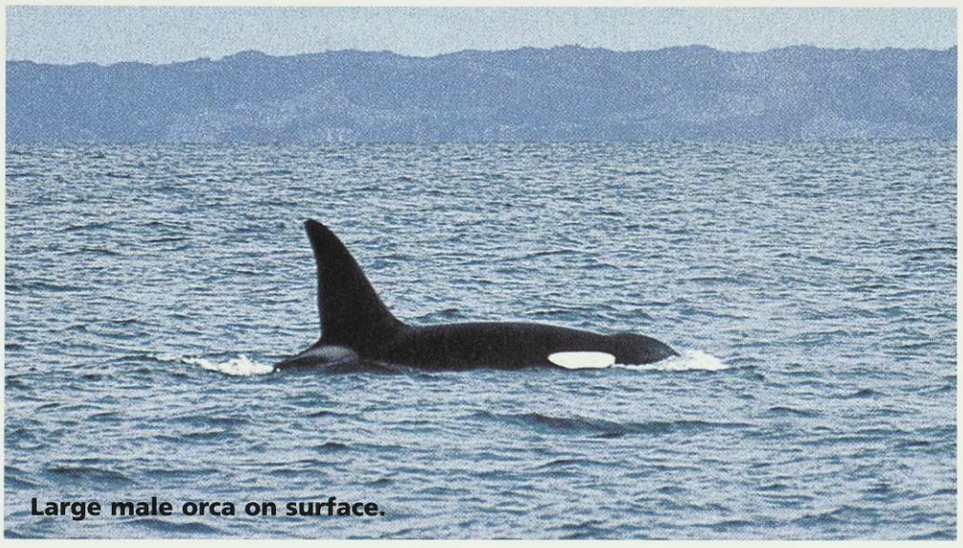
Orca, also known as killer whales, are arguably the most beautiful and largest dolphin. Most pods consist of five to 15 of these distinct black and white animals. The large males grow to nine metres long and have a dorsal fin 1.8 metres high. Their visits to the Hauraki Gulf include travelling right up the Waitemata Harbour into Auckland. They hunt stingrays and eagle rays in the coastal shallows.

In 1997, a pod of orca came into the Goat Island Marine Reserve and continued towards Cape Rodney. We drove to a vantage point above Leigh Harbour in the hope we would see them as they followed the coast. Below us, a pod of 20 bottlenose dolphins were playing in the harbour cove. Suddenly each dolphin turned as one and sped out of the harbour, into the open gulf.

About a minute later we saw the majestic sight of four orca dorsals, in line abreast, moving round the point and into the harbour. Dolphin was not on the menu that day but the dolphins seemed very aware that some days it is!

It seems there may now be an increase in dolphin and whale numbers in the Hauraki Gulf, or perhaps there is just an increase in the number of observers. One thing is certain — the best kept secret of the Hauraki Gulf is now common knowledge. As long as the whales and dolphins are given respect, and space, more people will now be able to see and enjoy these gentle residents and visitors.

— TONY AND JENNY ENDERBY *are underwater photographers based at Leigh in lower Northland.*



JENNY & TONY ENDERBY

Large male orca on surface.

Bryde's Whale Study in Northern New Zealand Waters

A study of Bryde's whale numbers in the Hauraki Gulf is being made by the Department of Conservation. Led by Dr Alan Baker of DoC's science and research unit, the study began in July 1999 with the objectives of determining Bryde's whale numbers in the outer Hauraki Gulf, and their movements in, and migrations along, the northeast coast of New Zealand.

After a pilot study it was found that the Bryde's whales could be identified from the air. Regular flights were then carried out and the whales examined from 150 metres above and photographed. Four species of whale were identified; Bryde's, minke, sei and one blue whale.

Bryde's whales, which are similar to sei whales, can be identified by three prominent longitudinal ridges on the rostrum — the head behind the blowhole — which are evident when the whale surfaces.

The pilot study indicated areas of the Gulf where Bryde's whales might concentrate at certain times of the year. The flight path was plotted on a GPS route, enabling repeat flights to follow the same track.

The research from November 1999 to October 2000 indicated a concentration of Bryde's whales in the Gulf from September to May.

Usually groups of two to four individuals were seen, mostly feeding. They were often in massive 'workups' of gannets, shearwaters, and common dolphins and/or orca.

Two calves were sighted in early summer.

Few whales were sighted further offshore and these were usually travelling rather than feeding. The Bryde's whales were noted to be in large concentrations in the spring of both 1999 and 2000.

Other baleen whales were also present at this time. The whales appeared to come from the north rather than northwest, but there is no information on their whereabouts during the winter months.

— *Tony and Jenny Enderby.*

Island in the mist

MEG COLLINS

MEG COLLINS visits a 'mainland island' where people not poisons are controlling the pests.

In the north of the isolated Te Urewera country, resident Maori have joined with the Department of Conservation to restore the health of the forests in a 'mainland island' covering nearly a quarter of the national park.

The vision for the Northern Te Urewera Ecosystem Restoration Project is 'To acknowledge and nurture the mauri (life force) of the northern Te Urewera ecosystem'. This vision reflects the long history of Tuhoe in Te Urewera National Park, and acknowledges the relationship between the Tuhoe people and this taonga (treasure).

The intention is to restore 50,000 hectares or more of the northern Te Urewera. The total park area is 213,000 hectares.

Te Urewera is the heart of the Tuhoe Country. Traditional Maori legend says that Hine Pukohurangi the Mist Maiden, fell in love with Te Maunga (The Mountain). They had a child, Potiki Tikitiki (The Lofty One), and Tuhoe is descended from him. Hence the frequent references to Tuhoe as 'children of the mist'.

The Department of Conservation has an active policy of working with the Tuhoe, as the tangata whenua in Te Urewera.

Formerly, the use of poisons such as 1080 and brodifacoum (Talon) for pest control was a big issue because of the flow-on effects on deer and pigs, which are part of the staple diet of local Maori. Trapping is now preferred, with rat traps baited with peanut butter, leg trapping of possums and special stoat traps using freeze-dried rats (see *Forest & Bird* August 2000) or plastic eggs.

Local Maori have been trained as trappers and hunters and are used as much as possible in the ongoing pest control programmes.

Te Urewera is rugged, a huge region of forests stretching south and east of the Bay of Plenty to surround Lake Waikaremoana inland from the East Cape town of Wairoa.

PETE SHAW

GAYE PAYSE

Clematis (pictured) and mistletoe have made a comeback since the reduction in the number of possums.

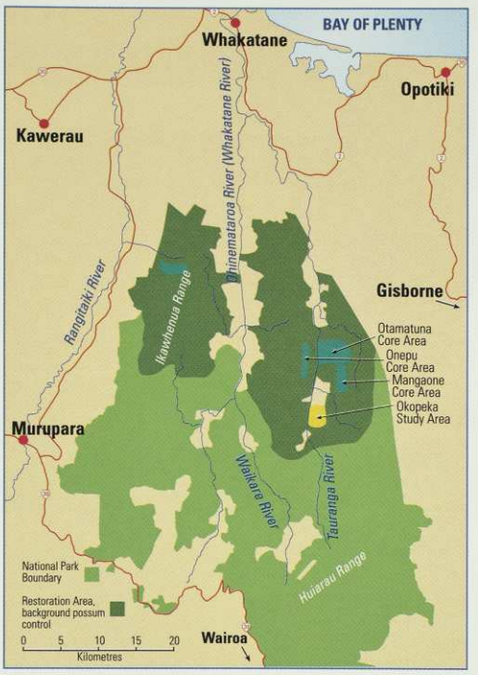
In the northern quarter, the landforms are a series of complex, steep-sided, broad-crested ridge and valley systems. Most of the ridges rise between 500 metres and 800 metres above sea level with the valley floors at 100 metres to 200 metres above sea level.

The forest is predominantly tawa with emergent rimu and rata, and includes semi-coastal elements such as kohekohe towards the northern boundary. Red beech becomes more prominent on ridges towards the south.

The understorey of the forest has a profusion of ferns, especially crown, kiwikiwi, kidney and umbrella ferns. There are also New Zealand iris *Libertia grandiflora*,

MEG COLLINS

Healthy ground cover now lines the banks of streams feeding the Waimana River.



Restoration in the northern quadrant of Te Urewera National Park is concentrated on four core areas.

Using the Park

Te Urewera is a well-used park, particularly by Tuhoe who regard the forest as a 'food basket'. Local hunters hunt for deer and pigs.

Anglers and trampers have a wide range of tracks and huts to choose from.

The Whakatane Lions Club built a 40-bed education hut in 1969. The 'Lions Hut' is available for all to use, and many school parties make it a base for their summer camps.

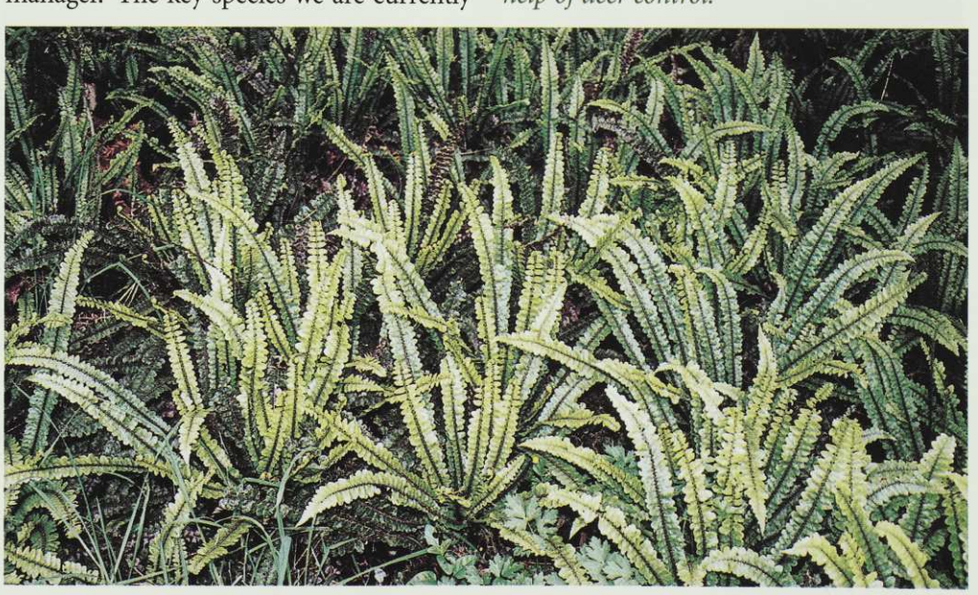
St Peters School in Cambridge have been regular visitors since the hut was opened. Their pupils often help on voluntary track maintenance with DoC, during their annual stay at the camp.

ground and tree-dwelling orchids, mosses, and smaller trees such as *Olearia rani* (a forest tree daisy). The climbers, especially *Clematis paniculata*, are now growing in profusion since effective pest control was implemented.

The restoration program is now in its fifth year and the results have been spectacular. Not only is there a dramatic increase in the kokako population and mistletoe numbers, but there have been many experiments conducted, leading to the successful development of new pest control techniques.

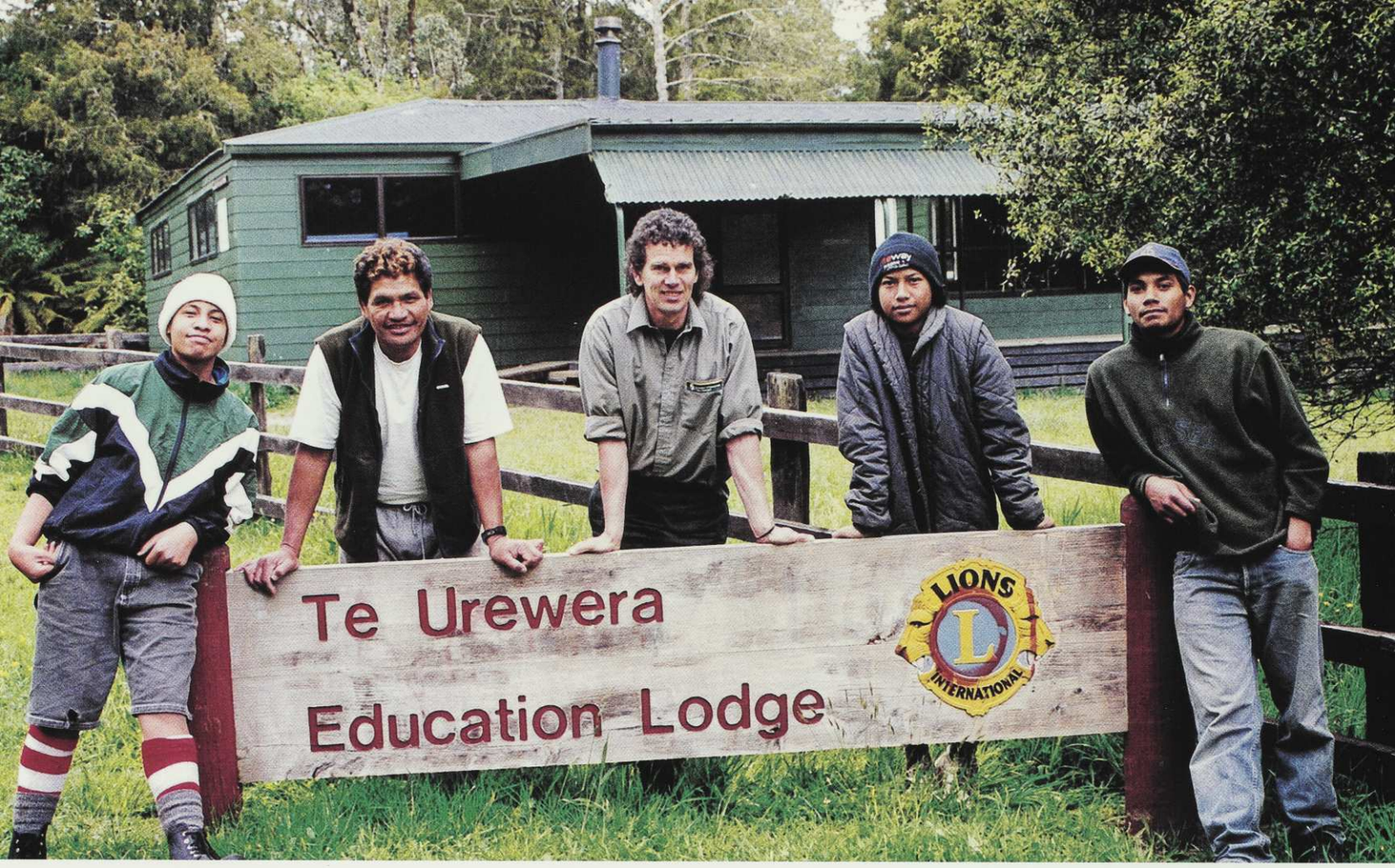
'Originally we started at Otamatuna (2510 hectares) and now we have added three other core areas at Mangaone, Onepu and Waikokopu. These areas are intensively trapped for rats, stoats and possums, while the surrounding "background area" of 50,000 hectares is intensively trapped for possums only,' says Pete Shaw, the project manager. 'The key species we are currently trying to protect in this ecosystem are kiwi, kokako and mistletoe,' he says. 'Other bird species, such as kereru, kaka, tui, robins and bellbirds, are also benefiting from the lack of predators. We are still in the early stages of ecosystem restoration, and we have to learn to crawl before we can run.

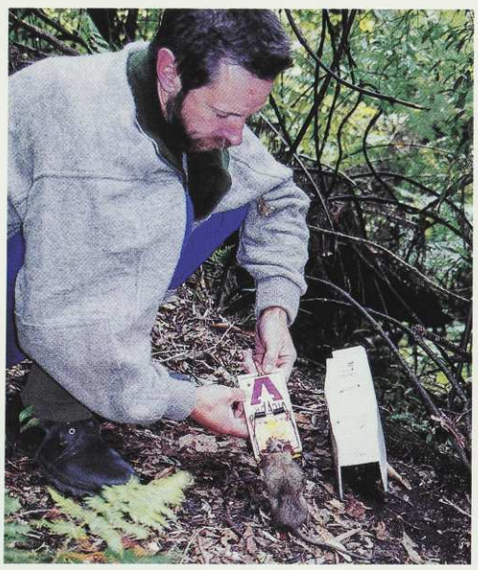
'At Otamatuna there has been a dramatic regrowth of new seedlings, including rimu, mahoe, miro, five finger and kanono. This year is the first year I can remember that the native tree fuchsia has bloomed,' Pete Shaw says. 'Since 1997 we have employed a contract hunter in this area and so far his tally has been 231 deer and 44 pigs. We are relying on recreational hunters to lower the pig and deer populations in the other areas, but in the last few months two commercial helicopter hunters have been working this area, as the price of venison is high at the moment.'



Kiwakiwa ferns have recovered with the help of deer control.

MEG COLLINS





PETE SHAW

At the Lions-sponsored education lodge, from left Tane Rangi, possum-hunter Gary Peratiaka, project leader Pete Shaw, Luke Temoni and Gary Peratiaka Jnr.

At left: Lindsay Wilson clears a rat trap baited with peanut butter.

Below: Sara Owen, of the Department of Conservation, bands a kokako chick so it may be traced as it grows.

Jeff Hudson, now the kokako recovery group leader, was originally a possum trapper in Te Urewera in 1991. He noticed that after one concentrated possum control operation, the few remaining kokako successfully bred the following year. After lobbying the government, the ecosystem programme was commenced in 1996 by the Department of Conservation. The main animal pests in the park are possums, stoats, rats, deer, feral cats and pigs.

Weed pests include pampas and buddleia, but these are not considered a major problem.

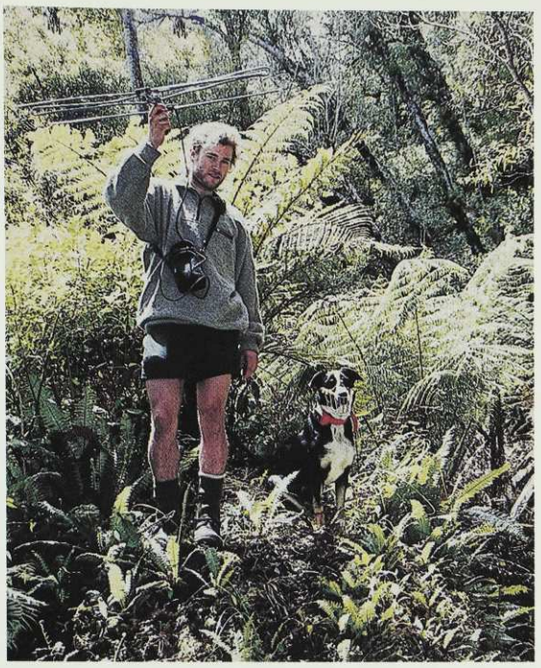
Kokako recovery in the longest established core areas of Otamatuna and Onepu has been spectacular. The original eight pairs in 1994, have grown to 44 pairs as at June 2000. The birds from both these areas are now extending their territory outside of their range on to the next ridges at Oruamananui/Pohatu and Ogilvies.

Eight of the 11 juvenile kiwis (73 percent) monitored in the Otamatuna nests over four years, have survived to reach a weight of a kilogram, at which size they can defend themselves against stoats. This indicates that stoat control has been effective, as the general survival rate of kiwis with no predator control is five percent. It is estimated that there are now 30 adult kiwi pairs and at least 25 juveniles.

Other threatened bird species including kereru, kaka, and robins, and most common forest birds, are benefiting from pest control, as there is more food available for them to feed and breed.

The continual recovery of pirirangi (red mistletoe, *Peraxilla tetrapetala*) at Otamatuna is partly a direct response to relief from possum browse. It also reflects the revitalising of the processes of mistletoe pollination and seed dispersal. Only 32

PETE SHAW



PETE SHAW

Rhys Burns with Burt, the kiwi-tracking dog, also uses a radio-tracking device to locate young birds released into the wild.

MEG COLLINS

pirirangi were recorded in 1997. There are now 87 individual plants identified, mostly located in quintinia. Flowering rates of these plants are now up to 98 percent, as pressure from possums has been reduced.

A small population of the yellow-flowered mistletoe, *Alepis flavida*, has been discovered at Otamatuna, in 10 beech trees, 42 kilometres north of its previously known northern limit.

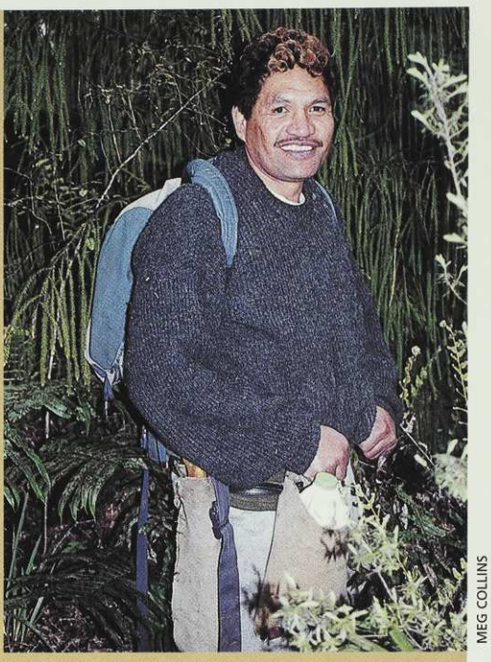
Kokako numbers have also increased markedly in the 'background area' in at least two sites up to several kilometres outside the intensively treated Onepu and Otamatuna core areas. There is a noticeable improvement of forest-habitat growth at Otamatuna, because of less browsing from deer and pigs. More new seedlings are emerging, through the increased pollination of flowers by nectar-feeding birds, and increased seed dispersal by fruit-eating birds, now that they are under less predation pressure. There is more growth of mahoe, and one of the more palatable plants for deer, kanono *Coprosma grandifolia*, is making a comeback.

Overall bird numbers have increased nearly three-fold since 1997.

'The dawn chorus is sometimes deafening with the kokako leading the song, with their unique organ-like calls,' says Jeff Hudson.

— MEG COLLINS is chair of the Eastern Bay of Plenty branch of Forest and Bird, and a part-time freelance journalist.

Trapping Possums Tough Work



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Gary Peratiaka (aged 42, at right) is now trapping possums on a 300-hectare, Maori-owned block near the Otapukawa stream. Originally born in the area, Gary's parents and their 14 children packed up when Gary was 13 and went to live in Wellington. Gary left school and worked for the Ford Motor Company and in other factory jobs. It was hard for him to make ends meet in Wellington, so when his father died 10 years ago he returned to his homeland along with his family and mother. He enjoys the outdoor life of a possum trapper, although it is hard and sometimes cold work.

'I have a contract for three months to reduce the possums in this area to less than five percent,' Gary explains. 'In the first week I caught 400 possums and that represents a 54 percent possum-kill rate. I use Victor No1 leg traps, place the traps 100mm off the ground, to prevent catching kiwi, and use a pre-feed to attract them — a mixture of eucalyptus oil, icing sugar, corn and flour.

'I caught 97 possums in the first night, so I suggested to my young fellows to come and pluck the possums for their pocket money. It is good money now for them, as one kilo of fur can be plucked from 20 possums. It is icing on the cake as far as I am concerned but I can't do it by myself,' Gary says. 'I try to bring up to four boys out here to help, but it is hard work motivating them. I don't know about all these young people today. They seem rather plastic to me — too soft and can't take the hard work.'

Gary is worried that more young people are not taking up trapping for a living. 'You can make pretty good money, and it is far better than being on the dole,' he says.

'The average age of the 12 hunters in the park at the moment is well over 50,' says Pete Shaw. 'The local polytech trains young guys to trap possums, but very few of them take it up for a living. They haven't got the motivation, as there are too many other things young kids can do.'

Lindsay Wilson has another team of hunters trapping rats.

'Since the Department decided not to use Talon poison, we now use Victor Professional rat traps baited with peanut butter. It's like ice cream to rats, and we can achieve high catch rates,' says Lindsay. 'On the Opepu line 3018 rats were caught, in a four-month period, with over half caught in the first 10 days.'

Gary Peratiaka Jnr and Tane Rangi pluck possum fur for extra pocket money.

MEG COLLINS

The Hidden Treasures of Castle Hill

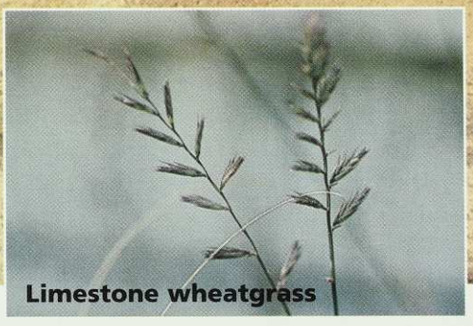
by SARAH MANKELOW

DEPARTMENT OF CONSERVATION

Castle Hill buttercup

DAVID R. GIVEN

Carex inopinata



G.M. CROWCROFT

Limestone wheatgrass

On the skyline, grand castellated limestone outcrops create the battlements that led early European travellers to rename Kura Tawhiti as Castle Hill. Amongst these 'fortifications' lie hidden treasures, some of the rarest and most endangered plants in Canterbury, and indeed the world.

Castle Hill Conservation Area lies in the high-country, inland from Christchurch on the road to Arthurs Pass, encompassing some of the limestone tors that dominate the basin between the Torlesse and Craigieburn ranges.

The Castle Hill of today is quite different to the landscape that was an important mahinga kai, or food-gathering area, for nomadic Ngai Tahu. Once covered in Hall's totara and tall shrubs, it was cleared mostly by fire and has been grazed for almost 150 years. Tussock and pasture now prevail, with only one stunted specimen of Hall's totara remaining, a survivor that found sanctuary on a boulder of limestone. A number of rare plants hang on in small areas, however: in fact, several species were first discovered here.

Castle Hill attracted botanical interest as early as the 1860s when one of the first European settlers in the area, John Enys, found rare plants amongst the limestone outcrops. Enys's name has been remembered in the Enys Scientific Reserve, established to protect bog pine from the ravages of grazing animals, opposite Castle Hill Village. In doing so, an even rarer plant was fortuitously protected. It was later discovered the reserve contained five adult plants of *Hebe armstrongii*, the first positive identification of the plant growing in the wild for more than 100 years. Today, seed from these plants is the heart of restoration initiatives and research to ensure it does not become extinct in the wild.

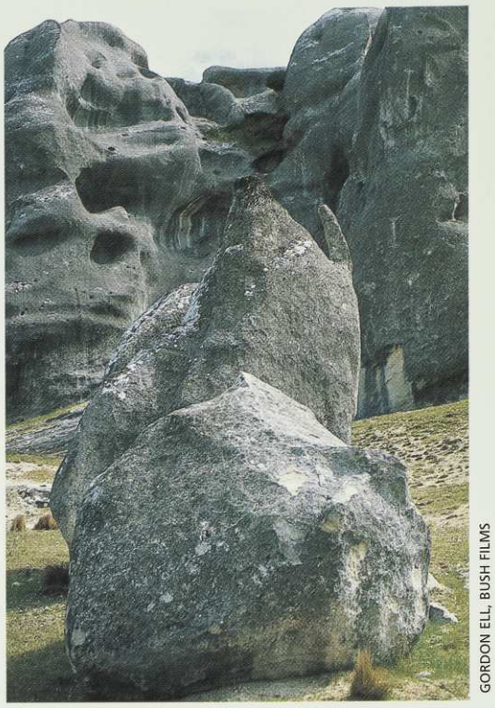
Castle Hill is the site of the first reserve in New Zealand established specifically to protect a plant. Dr Lance McCaskill led a remarkable conservation effort in the early 1950s to save the Castle Hill buttercup, increasing numbers from 32 plants in 1948 to more than 300 today.

These days, the reserve's scientific value as the longest running plant-monitoring project in New Zealand is very important, even though the buttercup has been discovered to be not as unique as originally thought. Once thought to be a separate species, the Castle Hill buttercup has proved to be just a different form of *Ranunculus crithmifolius*, which is widespread on the screes of the surrounding mountain ranges.

The fenced Lance McCaskill Reserve has, however, protected several other small plants that are now rare and endangered, including a forget-me-not *Myosotis colensoi*. Both plants can be looked at in a small garden just inside the reserve, as entry beyond the fence is by permit only.

Myosotis colensoi, commonly known as the Castle Hill forget-me-not, is small but pretty. Its blue-green leaves grow into rosettes, forming attractive cushions. The white flowers are huge compared with the rest of the plant. The forget-me-not prefers open bare areas of limestone scree; because of its small size it is vulnerable to larger plants, in particular introduced grasses that can smother it.

Other endangered plants at Castle Hill are not as favoured with looks as the buttercup and forget-me-not. Two in fact, a sedge and



GORDON ELL, BUSH FILMS

GORDON ELL, BUSH FILMS

DAVID R. GIVEN

Hebe armstrongii

DAVID R. GIVEN

Castle Hill forget-me-not

a grass, may to most people lack charisma. But looks aren't everything and in botanical circles, these 'plain-Janes' are special.

Small and critically endangered is the sedge, *Carex inopinata*, only three centimetres high, fine-leaved, sprawling and very difficult to identify. It prefers to grow under a canopy of native shrub species around limestone tors.

Limestone wheatgrass, *Australopyrum calcis* subspecies *obtatum*, was first described only six years ago when it was discovered on pastoral lease land, on Prebble Hill in Castle Hill Basin. Like the *Carex*, it is confined to limestone ecosystems where it grows under rock overhangs and under the shade of native shrub species. Limestone wheatgrass belongs to an ancient family of grasses; New Zealand's only diploid grass. Compared to introduced grasses that grow more vigorously, it struggles to compete.

Both the *Carex* and limestone wheatgrass grow in partial shade and would once have inhabited the floor of the forest and shrublands of Castle Hill. The best remnants of suitable shrub cover are amongst the limestone tors on private farmland, owned by Castle Hill Station. With landowner cooperation, these areas have been fenced off to protect them from stock, rabbits and hares.

A revegetation programme has been underway for the last five years attempting to recreate shrubland habitat on public conservation land. It is hoped that once a shrubland is re-established, these rare plants will be planted out underneath.

Behind the fortifications of limestone, the botanical battle rages on. The battlefield is scarred by 150 years of fire and grazing and yet, pockets of original shrubland harbour refugees. The challenges that face those working to protect these survivors are many — habitat reduction, competition from weeds, impacts of grazing animals, rabbits, hares and other human impacts. Promoting the protection of plants that are small, shy and hard to find is no less of a trial. Kura Tawhiti keeps its riches close to heart.

SARAH MANKELOW, *works for DoC, in Christchurch.*

The Topuni of Kura Tawhiti

Castle Hill has recently had its Maori name, Kura Tawhiti, restored under the Ngai Tahu Settlement Act 1998. Kura Tawhiti literally means 'the treasure from a distant land'.

The area is designated a 'topuni' a public acknowledgement of the manawhenua authority held by Ngai Tahu over the land. The term comes from the traditional custom of chiefs extending power and authority over areas or people by placing a cloak over them.

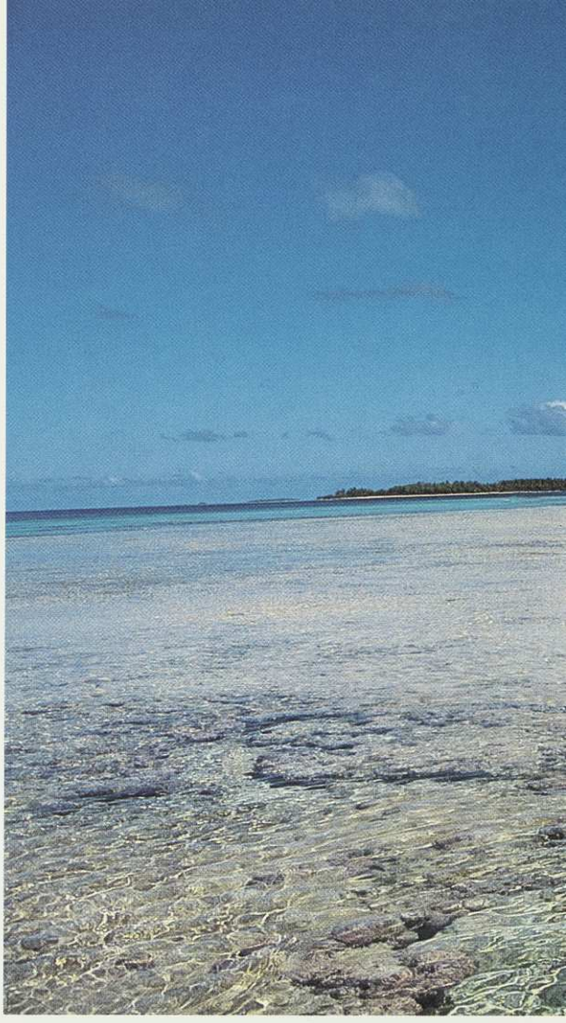
Under the topuni, the existing status of the land as a conservation area is unchanged, but the topuni status ensures that Ngai Tahu values are recognised, acknowledged and respected and Ngai Tahu may take an active role in management.

The area is of special significance to Ngai Tahu. The Ngai Tahu ancestor Tane Tiki, son of the celebrated chief Tuahuriri, claimed Kura Tawhiti (Castle Hill). The nearby mountains were famed for kakapo and Tane Tiki wanted their glowing green feathers to make a cloak for his daughter Hine Mihi.

These and other stories link Ngai Tahu to the landscape. The traditional knowledge of trails, rock shelters and places for gathering food in the area known as Kura Tawhiti form an integral part of past and present tribal identity.

Suwarrow Atoll

Exploring a bird sanctuary at risk



RHYS JONES finds harsh realities threaten a South Pacific paradise.

The reef islets of Suwarrow atoll lie like pearls strung around a vibrant lagoon. Described by Robert Louis Stevenson's wife as 'the most romantic island in the world,' the motu which make up Suwarrow are small but have a history rich beyond their size.

From ghosts of Spanish soldiers, through murder and mayhem, to a hide-out for German raiders during World War One, Suwarrow has for centuries provided the stuff of romance and an idyllic breeding ground for seabirds and turtles. However, these days all is not well in this tropical paradise and a battle is looming over the future of one of the last undeveloped islands in the South Pacific.

Suwarrow (or Suvarov) lies roughly 800 kilometres northwest of Rarotonga and as such falls at the centre of the 15 islands that make up the Cook Islands. The atoll was a New Zealand territory until the Cooks gained independence in 1965. New Zealand's connections with Suwarrow go much further back than this, however, both historically and ecologically.

New Zealander Tom Neale, 'the hermit of Suwarrow,' called the islets home between 1952 and his death in 1977, bringing the atoll to international attention through his best-selling book *An Island to Oneself*. His house, built by New Zealand coast-watchers during World War Two, still exists and is maintained to accommodate modern-day caretaker families.

Inner reef, Gull Group, Suwarrow

In earlier times, James Cowan wrote of the nineteenth-century exploits of Henry Mair a New Zealand 'rover and blackbirder'. Henry Mair went to Suwarrow in 1876 to aid a friend threatened with eviction by the Auckland-based copra company Henderson & MacFarlane. During the ensuing stand-off Mair discovered Spanish gold and jewels buried in the sand — one of several caches discovered during the nineteenth century and possibly originating from shipwrecked Spanish sailors or British ships lost hunting the *Bounty* mutineers. Mair never lived to enjoy his discovery and legend has it that some of his find lies buried in the vaults of the Auckland War Memorial Museum.

Suwarrow's Wild-West days have long gone. These days the atoll is viewed by environmental groups, such as BirdLife International, as an increasingly important site for seabird breeding and the overwintering of migratory birds. Endangered green and hawksbill turtles frequent the lagoon and nest in the sandy motu beaches during September-November. As well, the increasingly threatened coconut crab inhabits untouched forests on the larger motu.

Suwarrow lies in the hurricane belt and its creatures have to contend with occasional cyclones. In 1942, American writer Robert Frisbie was marooned there with his young family during a particularly devastating hurricane which not only removed most of the atoll's vegetation but several islands as well. That any of the family survived was miraculous, probably due to the foresight and good luck of Frisbie who tied his children to one of the few trees not to be blown away. Nowadays the creatures of Suwarrow have a new challenge to their existence — pearl farming.

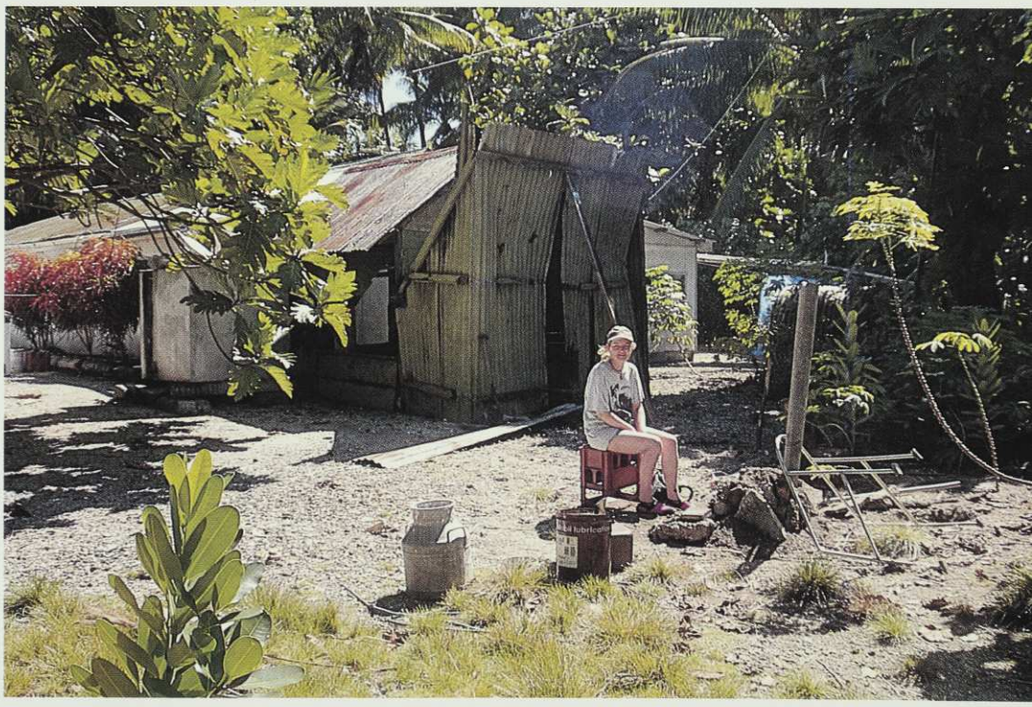
Frisbie's daughter 'Johnny', familiar to many Kiwis from her appearances on the 1970s television show 'Beauty and the Beast', now lives in Rarotonga and is actively involved with the Taporoporoanga Ipukarea Society (TIS) in providing stiff opposition to government plans for pearl farming in the Suwarrow lagoon. Such development is seen by the Cooks as generating much-needed foreign exchange. However, groups such as the TIS and the Cook Islands Natural Heritage Trust (CINHT) are concerned that development will impact disastrously and irreparably on birdlife in an area declared a national park and mooted for world heritage park status.

Important tropical seabirds, such as the sooty tern *Sterna fuscata*, red-tailed tropicbird *Phaethon rubricauda*, frigatebird *Fregata* sp., and masked booby *Sula dactylatra*, all breed on Suwarrow. Long-tailed cuckoos visit from New Zealand. White herons, and Arctic migrants such as the bristle-thighed curlew and wandering tattler overwinter here, making the future of the region important not only to the biodiversity of the Cook Islands but also to the ecological fabric of regional countries including New Zealand.

Tapi Taio, chairman of the newly created Suwarrow Development Corporation, supports the Cook Islands Government view that development, including the importation of oyster spat and housing of up to 150 workers on the Suwarrow motu, can be done without significantly affecting the viability of seabird colonies. 'Not so,' says Jolene Bosanquet, president of the TIS, who argues that any economic benefits associated with such a high-risk venture are more than outweighed by the threat to Suwarrow's delicate ecology.

In early 2000, the Cook Islands Government decided that up-to-date data was needed to assess the current health of Suwarrow's seabird colonies, and to serve as

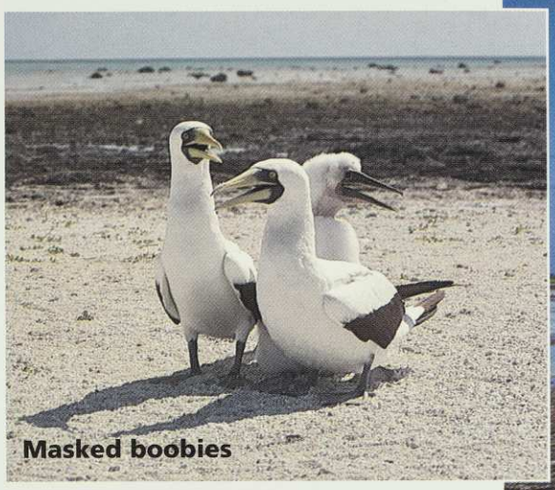
Cathy Fitzgerald at Tom Neale's old house on Anchorage Island, Suwarrow.



base-line data to assess the potential impact of development. Myself and fellow-Kiwi Cathy Fitzgerald were sent as volunteers under a United Nations Development Programme to live on Suwarrow between July and September for the collection of bird, turtle and coconut crab data. (As on Niue — see Pam Crisp's article in *Forest & Bird* November 2000 — coconut crabs are threatened with over-harvesting in the Cooks.)

We first flew to Rarotonga, organised our supplies and left for Suwarrow aboard a San Diego yacht, having convinced the skipper he would enjoy visiting Suwarrow much more than Niue, his intended destination. The sail north took six days — two days longer than planned due to being caught in a storm which, amongst other things, ended with some of our camera gear being destroyed by sea water when a wave washed over the yacht and came through the main hatch. When we finally did reach the calm of the Suwarrow lagoon we had to moor for two nights off the southeastern islet of Motu Oneone until the weather calmed enough to move to Anchorage Island, our intended home base.

We were fortunate to have Tom Neale's house to stay in during our visit — a caretaker had not been appointed for 2000. 'Mod-cons' were limited to tank water and a reasonably leak-proof roof. We took a small solar panel to keep our torch and camcorder batteries charged, and cooked using a camp oven made from pieces of yachts that had been wrecked on the reef. Our food supply was always under threat from ants and we had to be careful to keep our matches well wrapped in plastic to prevent them getting damp due to the high humidity. The

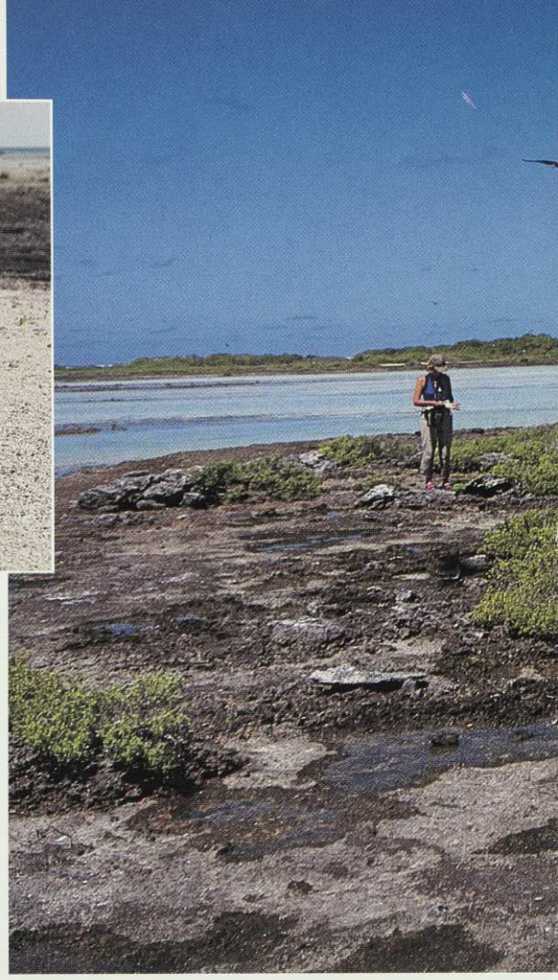


Masked boobies

weather was generally pleasant however being moderated by easterly tradewinds.

Of all the Suwarrow motu we found Anchorage Island the most affected by humans. There has never been a permanent Polynesian settlement on the atoll, probably due to the land area being too small to maintain a population and because of its vulnerability to storms — the highest point is only three metres above sea level. Nevertheless, bush clearing and copra planting in the nineteenth century, followed by periodic habitation and the harvesting of birds for food in the twentieth, has had the effect that no birds now nest on Suwarrow's largest motu. It may sound as if Anchorage has been intensively developed — not so. In fact, much of the motu has reverted to its natural state. However, many species of seabird, sooty terns in particular, just plain don't like to live near humans. In contrast, we discovered that seabirds breed on all the other (largely untouched) motu.

The lagoon of Suwarrow is approximately 80 kilometres in circumference and 10 kilometres across. To get about we took a 2.6-



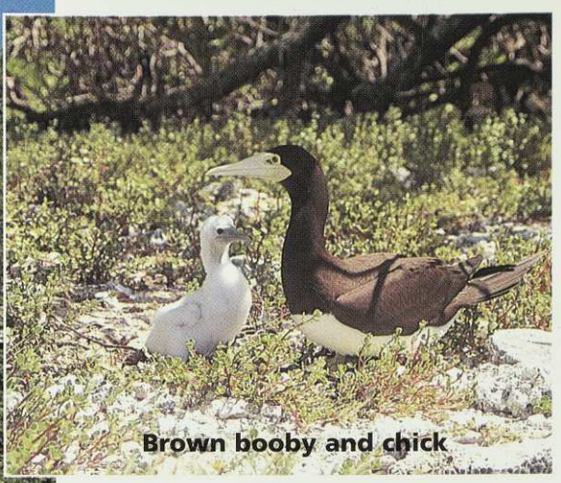
Above: Cathy Fitzgerald counting frigate birds.

metre inflatable dinghy and a 2.5hp outboard motor. This was adequate although we had to pick our days to travel because in such a small craft little waves can look and feel like giants. Much of the outer reef is exposed during low tides so it was possible to tie up our boat on a motu and survey several adjoining motu while the tide was low. This worked well, although on one occasion we spent a bit too much time counting birds and taking photographs only to find ourselves having to beat a hasty retreat along a reef rapidly disappearing under a rising tide. As we scrambled along, a school of black-tipped reef sharks waited impatiently in the lagoon shallows for stunned fish to be washed over from the outside ocean (us included!).

We surveyed the small motu whole, and sampled larger motu using transects. We calculated there were approximately 90,000 sooty tern chicks on Suwarrow during our visit — most of them concentrated on the two motu of One Tree Island and Motu Manu (Bird Island). These birds, like most of the species they share the atoll with, spend their days ranging hundreds of miles out to sea in search of fish and squid to bring home to their young. Frigatebirds were present in their thousands on Motu Manu and the Gull Group. Frigatebirds are robbers, spending their time flying high

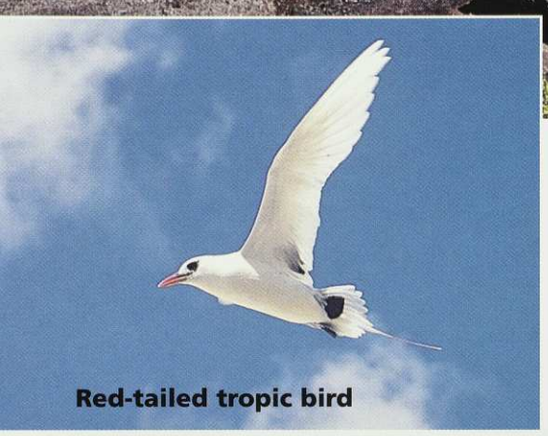
At left: entrance to New Island.

All photographs with this article are by RHYS JONES.



Brown booby and chick

Frigate bird



Red-tailed tropic bird

above other birds and attempting to steal the fish they catch. Of the other tropical species, red-tailed tropicbirds, noddies and red-footed boobies are present throughout the rest of the atoll in healthy numbers. Of particular interest was the discovery of a small colony of masked boobies in the Seven Sisters Islets. These are the largest booby and are most beautiful fliers, swooping down and nearly touching the surface of the water with their wing-tips, before landing into the wind on an area of beach resembling a small airstrip.

Long-tailed cuckoos visit Suwarrow from New Zealand although we didn't see any during our visit. Kotuku (reef herons) and visitors from Arctic regions, such as bristle-thighed curlew and wandering tattler, were commonly seen.

We found a few small coconut crabs on Anchorage Island (probably the motu under the greatest harvesting pressure) and fairly healthy populations of bigger crabs on the larger motu of Turtle Island, Motu Tou and Motu Oneone. Coconut crabs are becoming scarce in the Cook Islands and moves are afoot to control harvesting on Suwarrow. The crabs don't reproduce until they are around seven years old and it is hoped that a size limit will restrict harvesting to adults over 12 years old. From thorax measurements it is doubtful that any of the crabs we saw were over 12 years old. Tighter harvesting controls will therefore be needed to ensure a steady replacement population in future years.

Of concern to Cook Island authorities is the increasing numbers of yachts visiting Suwarrow. In Tom Neale's day a yacht may not have been seen for months. However, the success of Tom's book and the increased wealth and mobility of modern-day travellers has led to a large influx of visitors during the peak cruising season of June-September. We counted up to 16 yachts in the Suwarrow lagoon at any one time. Generally we found yachties to be a good bunch. However, they had travelled a long way to see Suwarrow and, in the absence of a caretaker, the rules laid down by the Cook Islands Government for protecting the birds were often flaunted.

Clouds of birds first led Lieutenant Lazarev of the Russian American Company to discover Suwarrow in 1814. Whether the bird population on Suwarrow today is as healthy as it was back then is doubtful. Anchorage Island alone supported a sizeable sooty tern population in the early 1950s when Tom Neale first arrived. Now there are none.

What hope is there for Suwarrow as a bird sanctuary and how can New Zealand benefit from our experience? Two areas come to mind. Firstly, the health of our environment is influenced by factors that do not necessarily stop at our national borders. We should therefore continue to support international environmental efforts which in turn help to preserve our own biodiversity. Secondly, in the Cooks as in New Zealand, wealth is still viewed by many in terms of consumption and economic growth rather than in terms of preserving ecological fabric. Our own national parks are constantly being coveted by developers as places where the species we want to preserve are asked to give way a little for the sake of commercial gain (proposals for gondolas in Fiordland and a road through Kahurangi being two examples). If we can keep an eye on what is happening in our Pacific neighbourhood we will gain a better understanding of the forces that chip away at the remnants of our own pristine areas.

— RHYS JONES *is a scientist with AgResearch in Hamilton.*

The Fading of Fuchsia

LAURA A. SESSIONS wonders if the fate of tree fuchsia is an early-warning signal.

DOUGAL HOLMES

Native tree fuchsia, once common throughout New Zealand, is becoming increasingly rare in many areas. Scientists trying to figure out why it is disappearing have recently been led to the startling realisation that its decline may signal a similar decrease in numbers of other native plants. Like a canary in a coal mine, tree fuchsia may warn us of where the dangers are the greatest for these other species.

New Zealand tree fuchsia, or kotukutuku *Fuchsia excorticata*, is the most common of New Zealand's three fuchsia species and one of our few deciduous native trees. Of the 100 fuchsia species worldwide (all are confined to the

This flower rises direct from the typical peeling bark of a mature fuchsia. Below, fruit form from fertile flowers.

DAVE KELLY

Americas except the New Zealand species and one in Tahiti), kotukutuku is the largest, occasionally growing up to 12 metres high.

In 1910, Cockayne noted that 'There is hardly a forest in New Zealand where the native fuchsia, the kotukutuku of the Maoris, may not be seen.' Now, almost a century later, tree fuchsia is becoming increasingly rare in many areas, though it still has a wide geographical distribution from North Cape in the subtropics to Auckland Island in the subantarctic.

The most obvious threat to tree fuchsia comes from introduced possums, which devour its tender leaves. A study in South Westland in the 1990s found that the amount of damage to fuchsia depends directly on the number of possums at a site, so fuchsia suffers the most 'die back' in areas with high possum densities. Similarly, the longer possums occupy an area, the less likely large tree fuchsia and young seedlings will survive. On the other hand, once possums are controlled, fuchsia can recover, suggesting that pest control is an effective — if temporary — solution to its decline.

Possums threaten many of our native plant species but, as a highly preferred possum food, fuchsia can be especially sensitive to possum damage in some areas. At these sites, fuchsia can serve as an early indicator of how severe overall

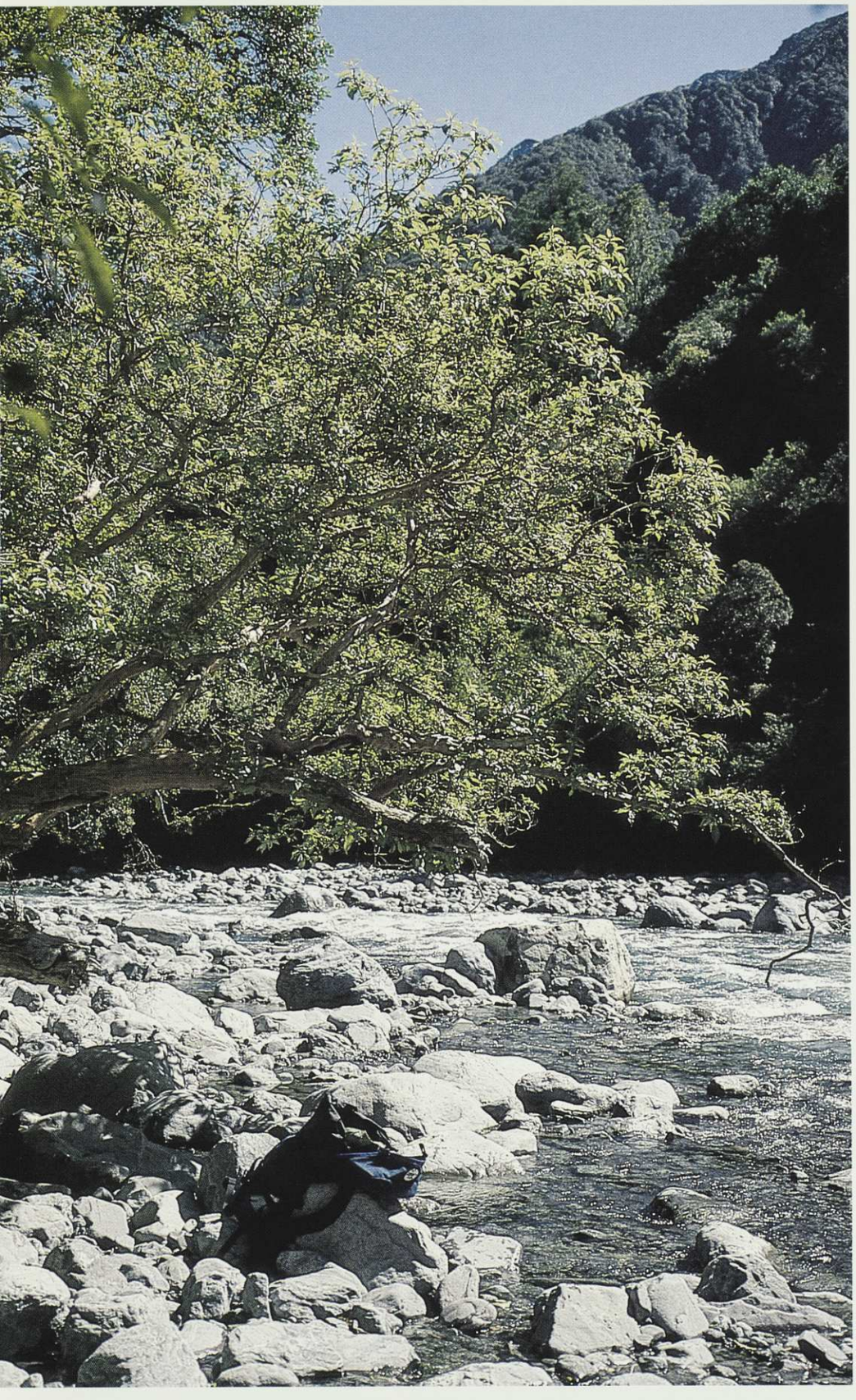
DAVE KELLY

DOUGAL HOLMES

How good is pollination in your area?

With a little knowledge of how fuchsia pollination works, you can find out how well pollination is working in your area. Fuchsia pollination is easy to study because flowers have bright yellow stigmas (for receiving the pollen) and bright blue pollen (you may have noticed it before on the head of a tui or bellbird). You can examine the stigma to see how many blue pollen grains are glued to its sticky top. The more pollen grains on the stigma, the more likely the flower is to produce a fruit, and the more seeds it will produce within that fruit — up to 500 of them. After looking at a number of flowers from different plants, you can get a feel for the success of pollination by counting the percentage of stigmas with lots of pollen. If you rarely see pollen on the stigmas, the plants may be in trouble.

Hermaphrodite flowers (right) are generally larger than females, and the anthers in female flowers are shrivelled into short stumps (left). Hermaphrodite flowers with close anthers and stigmas usually have more pollen on their stigmas, because they can receive pollen from their own anthers as well as from pollinators. This makes it easier for them to produce more seeds. Hermaphrodite flowers with widely separated anthers and stigma rely on a pollinator to bring pollen from another flower, just like female flowers do.



Tree fuchsia overhangs a southern stream. Fuchsia is one of New Zealand's few deciduous trees.

possum damage is in that habitat. However, this alarm system does not always work, because healthy populations of fuchsia survive in some areas that have been occupied by possums for many years. Other plants at these sites are often damaged by possums more than fuchsia, and why these fuchsia populations have mostly escaped the possum threat is still largely a mystery.

Two Landcare Research scientists, Peter Sweetapple and Graham Nugent, have found that the browse-tolerant populations are just as palatable to captive possums as the browsed fuchsia populations, and it is unlikely that the unbrowsed plants are genetically different from the browsed ones. Instead, the difference is more likely to be related to variations in the relative abundance of different food sources between sites.

It now seems that, in addition to possums, fuchsia may also be at risk from a less-obvious but potentially more-dangerous threat that scientists around the world are calling 'the pollination crisis'. This crisis, which has been found on every continent, involves the dismantling of complex ecological relationships between plants and their animal pollinators. In most cases, the animal pollinators have declined due to diverse ecological pressures (such as habitat destruction and the introduction of exotic predators). Many plant species rely on these pollinators to move pollen between flowers, and without them, plants cannot produce new seeds or plants to replace old and dying ones.

Scientists have begun documenting this crisis in New Zealand, and fuchsia is one of the first potential victims that they have found. It is likely that other native plants are suffering similarly, but fuchsia may provide clues to help identify where pollination is most limited.

Tree fuchsia has a complex reproductive system with two different genders of plant. Female flowers have no functioning male anthers to produce pollen, and they must receive pollen from another plant to produce seeds. In contrast, hermaphrodite plants have flowers with both functioning male anthers, that produce pollen, and a female stigma that receives the pollen.

Many of these hermaphrodite flowers can pollinate themselves just by transferring the pollen from their anthers to their own stigma. Some hermaphrodite flowers are unable to self-pollinate, however, because of the distance between their anthers and stigma. Additionally, gene exchange through pollination also helps populations maintain their genetic diversity, which would be limited if plants only reproduced through self-pollination.

DAVE KELLY

The relative position of the anthers and stigma varies between hermaphrodite flowers, with some flowers having them very close together and others having them more spread apart. The farther apart the anthers and stigma are, the less likely it is that the flower will be able to pollinate itself.

DOUGAL HOLMES

When fertile flowers of the fuchsia fall away, they reveal berries, known in Maori as konini. These are spread through the forest by birds.

Tui and bellbird are the primary animal pollinators of fuchsia and they also help disperse its seeds to sites that are suitable for germination. Silvereyes and bumblebees may rob nectar from fuchsia flowers, but they do not help pollination by spreading pollen. Both are too small to reach the nectar from the mouth of the flower, so they usually steal the nectar by cutting holes near the flower's base. Limited dispersal is probably less of a problem for fuchsia than limited pollination, because the fruits (known as konini) have more time to be dispersed than flowers have to be pollinated. Also, the fruits are dispersed by a wider range of birds, including kereru and silvereyes.

A team of ecologists led by Alastair Robertson (Massey University), Dave Kelly and Jenny Ladley (both of Canterbury University) have found that the more pollen a fuchsia flower receives the greater its chances are of making a fruit, and producing more seeds within that fruit (fruits can contain up to 500 tiny seeds). Knowing this, they have compared the amount of pollen that flowers are receiving through pollinators to the amount received when no pollinators can reach the flowers (by placing flowers in bags). The results show that in many areas there were so few natural pollinators still living in the forest that they did little to help fuchsia reproduce.

This low level of cross-pollination by birds at many sites may be a result of the recent decline in the number of honeyeaters due to an increase in introduced predators such as stoats, cats and rats. The densities of tui and bellbird on the mainland are now much lower than those seen on island sanctuaries such as Tiritiri Matangi, Little Barrier and Kapiti.

It is not known how many other plant species might be affected by the loss of these bird pollinators, but at least one other species, red mistletoe *Peraxilla tetrapetala*, is also suffering from lack of natural pollinators which suggests that the crisis extends beyond fuchsia alone. Ecologists are currently studying other plants that rely on similar bird pollinators to find out whether these species also have low pollination rates.

Perhaps because fuchsia is still relatively common, especially along roadsides and in urban areas where they are easy to see, we have not fully appreciated how significant its decline in many areas could be. Its flowers and fruits are an important food for many native birds, it is an important coloniser of recently disturbed areas, and it may help prevent erosion near rivers and streams. Most importantly, as a species sensitive to threats such as possum damage and loss of bird pollinators, tree fuchsia may provide an alarm system to warn of the potential dangers many other plant species may face.

— LAURA A. SESSIONS *is a PhD student.*

Why fuchsia flowers turn red

The flowers of many plants change colour to signal to their pollinators that they are mature and ready for visitors to take nectar and pollen. Scientists have long thought that red flowers evolved to attract birds to a plant, because most birds worldwide have very poor senses of smell but good colour vision.

Fuchsia illustrates an opposite phenomenon, however: the red flowers dissuade rather than attract birds. Fuchsia flowers change from green to red like other flowers, but turn red only after they stop producing nectar and can no longer be fertilised. Thus, the green flowers are attractive and are visited, while red flowers have virtually no nectar and are mostly ignored by birds and bees.

The strange colour change probably occurs because it allows birds to spend the maximum time possible on receptive (green) flowers that can still be fertilised, rather than wasting time on (red) flowers that have already been pollinated. The red colour might not be needed as an attractant to birds in New Zealand, because our honeyeaters spend enough time in one area to learn the location of trees without flashy floral displays.

You might wonder why the plant doesn't just drop the flower petals once the flowers are pollinated rather than wasting the energy needed to change colour. The further colour change makes sense because once a flower receives pollen, it can take four or five days for the pollen to grow down through a pollen tube in the female style to reach and fertilise the female ovary. Because the style is attached to the flower petals, the pollen would be lost if the petals were to fall off during this period.

DAVE KELLY

DAVE KELLY

Creatures of the Swamp

CORINNE WATTS and BRIAN PATRICK explore some wetland habitats and discover special plants and animals.

Peatlands on the southern end of the Blue Mountains are extensive, with a mosaic of shrubland, cushionfield and open water. Much smaller areas on the northern end of the range are at a higher altitude, but are no less diverse in terms of native flora and insects.

Wetlands are an interesting feature of the New Zealand landscape and also an important habitat for some of the country's special flora and fauna. Sadly, during the past 150 years more than 90 percent of lowland wetlands have been destroyed or strongly modified.

These wetlands have been lost in many ways: through drainage and conversion to pasture; through fertiliser input; by fire; or by the mining or harvesting of peat, kauri gum, sphagnum moss, gold, timber; and recently through the cultivation of horticultural crops such as blueberries. Consequently, lowland wetlands are now among some of New Zealand's most threatened natural ecosystems.

Lowland wetlands provide specialised habitats for a broad variety of birds, fish, invertebrates and plants. Several native birds, such as bittern, fernbird and spotless crake, favour relatively pristine wetlands. For example, approximately 25 percent of all New Zealand bittern live in one wetland, the Whangamarino in the Waikato. The secretive fernbird also inhabits the remnant wetlands of Whangamarino, southern Lake Taupo, Westland, Otago, Southland and Stewart Island.

Many native plants are wetland specialists, and loss of habitat is threatening their very survival. The giant jointed rush *Sporadanthus ferrugineus* of the northern North Island peat swamps is now confined to the Moanatuatua, Kopuatai and Torehape bogs of the Waikato. A sister species, *Sporadanthus traversii*, is confined to the peat bogs of Chatham Island.

Wetland is a generic term, however, that embraces swamp, marsh and peatland. Peatlands are wetlands of a special kind, originating from the accumulation of organic matter in wet areas known as peat bogs. These are areas of low nutrients (partly decomposed and waterlogged plant material) and are fed by rainwater alone. They are often called cushion bogs, moss bogs, finger bogs, mires, or high moor, depending on the setting and their biological community.

A small area of Donatia *cushionfield survives within Seaward Moss Conservation Area in an isolated part of the reserve. Elsewhere within the reserve a lowered water-table has enabled taller vegetation to out-compete low herbs and cushion plants.*

GEOFF MOON

An Australasian bittern with its chick in the Whangamarino Swamp of the lower Waikato valley. Around one-quarter of all bittern in New Zealand rely on this one peat swamp for their habitat.

Peatlands important for nature conservation

Peatlands support many wetland plants, birds, fish, reptiles and invertebrates. In addition, they provide:

- exclusive habitat for some New Zealand endemic flora and fauna
- they are a refuge for creatures normally confined to higher latitudes and higher altitudes
- they are homes for creatures not found elsewhere
- they add to the diversity of New Zealand landscapes
- also, peatlands are an integral and dynamic part of other adjacent ecosystems such as forest, shrubland, saltmarsh and dune
- they are valuable reservoirs of fresh water that nurture freshwater flora and fauna at lower altitudes through the seasons
- they are historically important as reservoirs of pollen spores.

The moth Heloxycanus patricki *is one of the largest insects in the Seaward Moss peatland, but surprisingly escaped detection until April 1981. Named in 1994, it has sphagnum-feeding larvae that feed from within a deep subterranean tunnel which is often below the water-table. The fact that adults only emerge every second year and only in late autumn through to winter has contributed to its relative obscurity.*

BRIAN PATRICK

GEOFF MOON

Spotless crake depend on swamplands for their habitat. They are secretive birds seldom seen, and only then when lured to the swamp edge by calling. This bird, too, was photographed in the Whangamarino Swamp, Waikato.

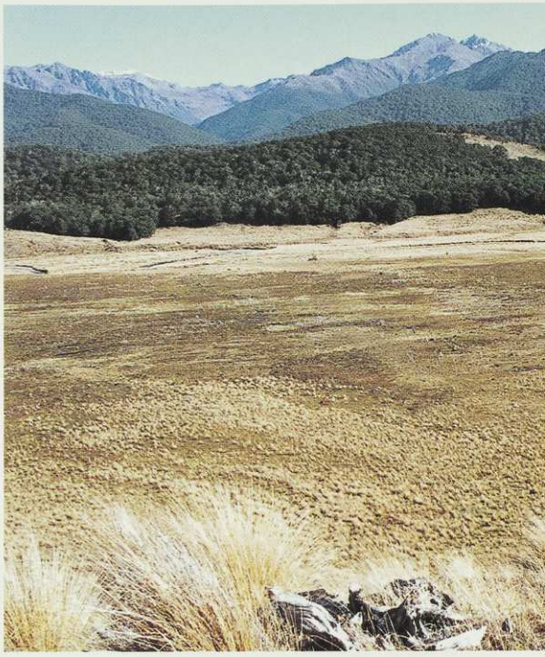
A nationwide survey of peat resources, published by the University of Waikato in 1978, reported on 67 peatlands in both North and South Islands. These wetlands covered an estimated 1400 square kilometres. All showed evidence of human disturbance in the form of drainage, grazing by stock, burning and general development.

The distribution of peatlands in New Zealand is scattered, with a concentration of sites in Northland and Waikato, and a large number of sites in southern New Zealand. The peatlands of the northern North Island are primarily found in the lowlands (below 500 metres altitude). Those in the southern regions are found from sea level to the flat summits of numerous mountain ranges to an altitude of 1650 metres.

In the high rainfall areas of Fiordland, West Coast, upland Central Otago and Stewart Island, the peatlands — locally termed blanket bogs — are the most unmodified peatlands remaining in New Zealand. Those of eastern Southland and lowland Otago, such as in the Catlins, are of the raised or 'domed' bog type, similar to those in the northern North Island.

Seaward Moss is an extensive complex of peatlands between the Mataura River and Bluff Harbour on the Southland coast. Although greatly reduced in size by development, the Seaward Moss wetlands nevertheless extend over some 180 square kilometres. They are nationally significant as breeding sites for native bird species such as South Island fernbird, bittern and marsh crake. The vegetation is surprisingly alpine in character with an array of cushion species such as *Donatia novae-zelandiae*, shrubs including *Dracophyllum oliveri* and manuka, ferns such as *Gleichenia dicarpa*, and wirerush.

Joseph Crosby Smith described the vegetation of Seaward Moss in detail in the early 1900s but sadly, due to drainage and general development, much of the cushion fields he pictured have since been lost. At about the same time, the entomologist Alfred Philpott explored these vast wetlands and collected many insects, including a number of moth species he or his colleagues subsequently described for the first time.



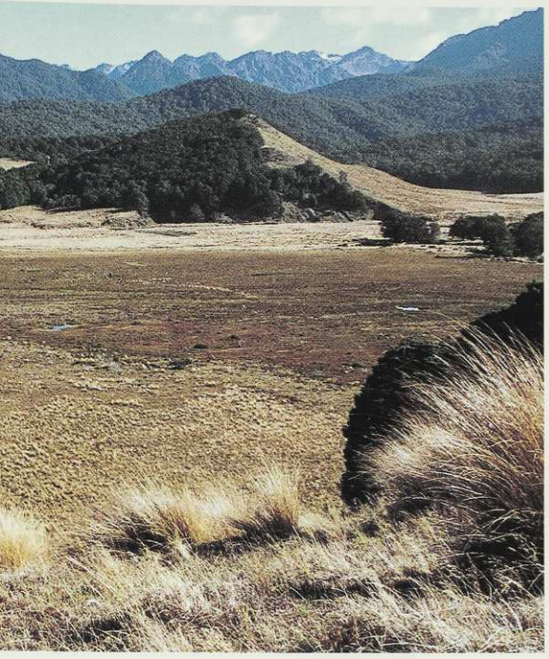
Like the flora, the insect fauna of Seaward Moss shows much affinity with upland areas in the southern South Island. In a more recent study of this fauna, Brian Patrick records 42 moths that are typically members of the alpine fauna, with strong affinities to the uplands of western and northern Southland, the Catlins, Blue Mountains and Stewart Island.

The 1984 flooding of the Great Moss Swamp in eastern Otago, for hydroelectricity and irrigation, was an ecological disaster. This diverse upland system of blanket bog and tarns — some 20 square kilometres in extent — was drowned by the construction of the Loganburn Reservoir. Both its insect and plant communities were considered internationally significant, with a rare moss, *Sphagnum squarrosum*, present.

The harvesting of sphagnum moss is a

An Australasian bittern in the Whangamarino Swamp hunts for small fish. The bird is related to the herons but has streaky plumage to disguise it amongst the reeds.

GEOFF MOON



current threat to low-altitude swamp sites in Westland and Southland. Sphagnum is the larval food-plant of several moths, particularly *Cladoxycanus minos* and *Heloxycanus patricki*, and habitat for a myriad of other flora and fauna. Thus moss harvesting, especially where it utilizes natural communities rather than managed sites, is a threat to nature conservation. Illegal harvesting of sphagnum has been observed in various upland areas of eastern Otago and the Catlins in recent years.

On the positive side, many peatlands in Otago and Southland have been given increased protection in recent years. Although small, protected sites such as Tahakopa in the Catlins and Black Swamp in eastern Otago are significant as some of the last remnants in their regions.

On a much larger scale, the alpine tops of the Lammermoor Range in eastern Otago have been protected for both their high conservation value and for their significant water yield to catchments that supply Dunedin City's water. Further west in the uplands of Central Otago, the review of pastoral lease land has led to the protection of large areas of alpine communities, including finger bogs, cushion fields and other peatlands.

Although the peat-mining industry on the Southland Plains continues to erode the many scattered areas of wetland, this activity has heightened awareness of wetland conservation. A large part of the ecologically significant Otautau wetland has been protected in a recent land-swap deal.

In the Hamilton ecological district of the North Island, peatlands originally covered 100,000 hectares — now approximtely 3000 hectares remain. Their vegetation is dominated by rushes, *Empodisma minus* and *Sporadanthus ferrugineus*. The Waikato peatlands of Moanatuatua, Whangamarino, Torehape and Kopuatai are home to a large variety of invertebrate species. In some drier sites of these peatlands, spiders, flies and grass moths fly up when disturbed by day. The Waikato peat bogs are interesting, as the region is the northernmost limit for some butterfly and moth species (for example, the red-tussock bog army worm and sphagnum porina moth). However, until recently little research on invertebrates had been done in these peatlands.

Now there is some evidence of attempts to repair the damage and restore some peat habitats. At Torehape peat bog (northwest Waikato), the top metre of peat is being removed by peat mining, but the surface has to be restored to original bog vegetation. There is limited knowledge about the most effective method of restoration, particularly about the development of invertebrate communities in peatbogs after such disturbance. A field experiment by Landcare Research in 1998 was established on mined peat at Torehape to assess appropriate techniques for restoration.

Black field crickets, scarab beetles and wolf spiders were most frequently caught on the mined surface, and all invertebrates were correlated with plant cover. Mobile insects will have invaded the restoration trial from surrounding pasture once a vegetation cover was established. Raised islands of peat allowed vegetation to establish and invertebrates therefore colonised these areas first.

Looking into the life of peatlands reveals yet another special habitat, with its own special plants and wildlife, in need of protection.

— CORINNE WATTS *works as an invertebrate ecologist at Landcare Research.* BRIAN PATRICK *is an entomologist based at Otago Museum.*

BRIAN PATRICK

A striking day-flying moth of southern Southland peatlands is Aponotoreas synclinalis. *The elongated larvae feed on wirerush* Empodisma minus.

BRIAN PATRICK

The winter ghost moth Cladoxycanus minos *is a moss-bog 'specialist' with larvae often found in tunnels within sphagnum moss. Adults emerge mainly in winter.*

Seaward Moss Conservation Area south of Invercargill is one of the largest peatlands nationally. Significant tracts of copper tussock, manuka, wirerush and open cushionfield surround numerous tarns, and lie alongside dunes, gravel beaches and saltmarsh around Awarua Bay and Waituna Lagoon.

Lenz Reserve Recovers From Early Logging

PETER WHITE reports on the Society's largest reserve, in the isolated Catlins region.

At 550 hectares, Lenz Reserve is the largest of all the reserves administered by Forest and Bird. The reserve is in the remote Catlins region, lying at the southernmost corner of the South Island between Dunedin and Invercargill. Access is via the coastal State Highway 92, just south of the township of Papatowai, with a driveway into the Society's Tautuku lodge complex.

Despite early modification by logging, the Lenz Reserve is still representative of the original natural character of the Catlins area and has a high diversity of species and habitats. An area of old-growth forest is traversed by the Long Track.

The reserve is surrounded on all sides by various reserves managed by the Department of Conservation, including the 15,000 hectares of Catlins Coastal Rainforest Park. The Fleming River, the only catchment in the Catlins fully forested from hilltop to coast, meanders through the central and southern parts of the reserve before emptying into Tautuku Bay.

Significant logging of rimu, miro and kahikatea started in the reserve in 1902 and two mills, Gwyns (1910-1914) and Cooks (1936-1963), were located there. The legacy of the logging era can still be seen in the reserve today; in the historical relics to be found on the lower Fleming River flats and along the various tramlines used in connection with the mills. The Department of Conservation, with local volunteers, erected an interpretive display centring round the Traill Tractor with its log bogies (named after the designer who developed this logging equipment).

The Fleming River is bordered by areas of exotic grassland and kahikatea forest, with rimu and pokaka, grading into extensive areas of hill slope kamahi forest with miro, rimu and occasional Hall's totara. Drier areas immediately adjacent to the river support a distinctive low forest dominated by horopito *Pseudowintera colorata, Coprosma rotundifolia*, tree fuchsia, putaputaweta, papauma *Griselinia littoralis*, lowland ribbonwood and some impressive old-growth matai. Matai are now relatively rare in the area.

Amongst the kamahi are patches of forest dominated by tree fuchsia and wineberry. At higher elevations in the northern end of the reserve, southern rata becomes co-dominant with kamahi and there are smaller amounts of miro.

To the east of the lower Fleming River there is an area of sphagnum mossfield with wire rush *Empodisma minus*, pigmy pine, turpentine scrub, tangle fern, and manuka. On the south side of the river there is a wetland dominated by sphagnum moss, manuka, Coprosma species and the sedges *Carex secta, C. virgata* and *Eleocharis acuta*.

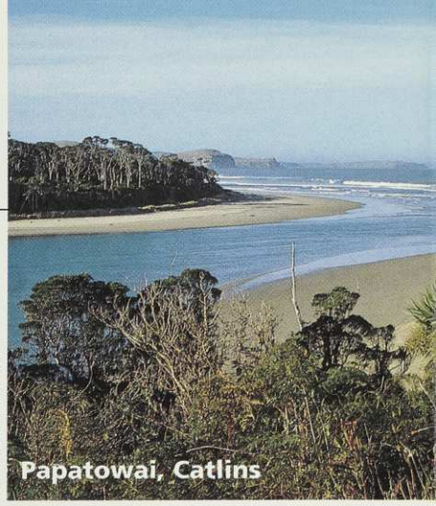
This range of habitats provides for a variety of native bird species.

Bellbird, tui, yellow-breasted South Island pied tit, fantail, brown creeper, silvereye and grey warbler are particularly prominent in the forested areas of the reserve. New Zealand native pigeon are common in all habitats. Shining cuckoo are common throughout the reserve in spring and early summer. The regionally rare South Island fernbird are found in good numbers in the wetland areas, while along the river bank forest sacred kingfisher and grey duck can be seen. Australasian harrier are often seen flying overhead. If you are lucky you may be privileged with a rare sighting of the threatened yellow-crowned or red-crowned parakeet.

Lenz Reserve is named after Mrs Ivy Lenz of Opoho, Dunedin, whose generous bequest enabled its purchase in 1964. It is managed by the Lenz Reserve Management Committee, which is made up of representatives from the Dunedin, South Otago, and Southland Forest and Bird branches. Over the years the committee has organised the control of broom and ragwort, along with tree planting and track development. It is planned to encourage natural regeneration on the lower Fleming River flats.

— Peter White, a member of the Forest and Bird national executive, is undertaking a review of the Society's reserves and their management plans.

(For a more complete description of the Lenz Reserve vegetation see Parmenter, G A, 'Vegetation Survey of Lenz Reserve, Otago' an article in Forest & Bird *Journal Number 201, August 1976.)*



FERGUS SUTHERLAND

Papatowai, Catlins

Purakaunui falls

FERGUS SUTHERLAND

Lenz Reserve

FERGUS SUTHERLAND

Fur Seals

FERGUS SUTHERLAND

Tautuku Lodges Are A Good Base For Exploring the Catlins

Way down at the southernmost corner of the South Island lies the Catlins, a land of isolated beaches, rugged coastline and expansive areas of broadleaf and podocarp forest. In places there is an unbroken forest sequence running from the coast to inland hilltops.

Increasingly, this natural haven is becoming a holiday destination for both New Zealand and overseas tourists. Forest and Bird's Tautuku Lodge, situated at the entrance to the Society's Lenz Reserve, is well sited for exploring the the many natural attractions of the Catlins region. There are three lodges available: Tautuku Lodge, itself accommodating 10 people; the Francis Coutts Cabin sleeping four; and the A-frame hut sleeping two. The buildings were financed by Society branches and, in the case of Coutts Cabin, from the estate of Francis Coutts. Both members and non-members can stay in the lodges. Educational groups and an increasing number of casual travellers are also using them.

From the lodges three marked tracks provide easy walking for exploring parts of the 550-hectare Lenz Reserve. The Nature Walk features identification plaques and follows a roughly circular route through regenerating forest.

The much longer Long Track, branching off from the Nature Walk at both ends, follows the old bush tramline in places, and crosses the Fleming River twice. At a high point of the track a raised platform provides views over the reserve.

The Boardwalk Track branches off the Nature Walk and finishes at a 30-metre boardwalk into a wetland area.

Also on the reserve, a short shingled track maintained by DoC provides access to a restored 'bush-tram' historical display and is used by tourists and lodge visitors.

Several other interesting tracks are within easy walking distance of Lenz Reserve. To the south of the reserve, a track and boardwalk developed by the Society out into the Tautuku Estuary give excellent views of the forest on the south side of the river and offer an ideal opportunity for viewing estuarine birds, including fernbird. Further to the east, near Tautuku Beach, a short track leads from SH 92 through mature forest to peaceful and reflective Lake Wilkie. There is also a track leading to Tautuku Beach itself through old-growth forest. From the seaside holiday settlement of Papatowai there is the two-day (and privately operated) Top Track walk along the coast and through forest and farmland.

Further afield there are a range of 'natural wonders' within 30 minutes to an hour's driving distance. Cathedral Caves, rising to more than 30 metres in places, resonate to the sound of the sea. Inland from Tautuku Bay there is McLean Falls, the tallest accessible waterfall in the Catlins area, while beyond Papatowai are the picturesque Matai and Purakaunui Falls.

At Curio Bay (best viewed at low tide) is an internationally significant fossil forest where petrified trees similar to kauri and matai, the remains of a Jurassic-age forest 180 million years old, lie embedded in coastal bedrock. North-eastwards at Purakaunui Bay is Jack's Blowhole, a collapsed sea cave whose margins are being revegetated by Society members (see *Forest & Bird* November 2000).

The Catlins region is also home to some of New Zealand's most notable wildlife. At tranquil Porpoise Bay, a safe and popular swimming and holiday spot, one of the world's rarest dolphins, Hector's dolphin, is found. New Zealand fur seals, Hooker's New Zealand sea lions and the odd, formidable southern elephant seal, can be found sunning themselves on the Catlins beaches. Nugget Point, with its spectacular coastal views, is the only place on mainland New Zealand where all three co-exist along with hoiho (yellow-eyed penguin), sooty shearwater and other seabird species.

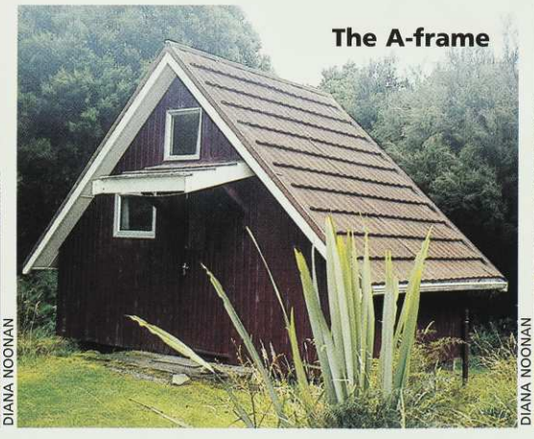
— *Peter White.*

Bookings for Tautuku Lodge are available from the caretaker (see Lodges, page 49 of this journal, for details).

Tautuku Lodge

DIANA NOONAN

The A-frame



DIANA NOONAN

Francis Coutts cabin

DIANA NOONAN

Summer Visitors

By ANN GRAEME Illustrations TIM GALLOWAY

It's summer. The doors and windows stand wide open. The scent of warm earth and mown grass drifts indoors — and so do the blowflies and other insect visitors. I am looking at the praying mantis sitting on the window sill. The mantis turns her head and looks at me. With her distended abdomen, she is clearly pregnant, and she holds a struggling blowfly in her spiky front legs. Having decided I am neither a threat nor a potential meal, she lowers her head and begins munching the blowfly. I am repelled — and fascinated.

'This is an insect having dinner,' I remind myself. 'She is not a miniature human sadist.'

For the mantis has such a human-like construction it is hard to remember she is driven by instinct, not reason. The way she swivels her triangular head on a mobile neck is a thing few insects can do, encased as they are in a rigid exoskeleton. Her face, with its large eyes, seems so intelligent because the eyes face forward, like ours do. Most animals have their eyes set on the sides of the head, to provide the all-round field of view which is essential if a predator may be creeping up. But eyes facing forward can focus together, giving a more limited but three-dimensional picture. This ability to judge distance is very useful for climbing animals like monkeys, or hunting animals like owls and humans and mantises.

My mantis is a formidable hunter. Although the window sill lacks the camouflage of a leafy branch, she stalked the blowfly ... slowly ... slowly — then stood quite still. Insects perceive movement more readily than form, and the blowfly, unaware of danger, blundered closer. The mantis's spiked front limbs, folded so demurely above her tiny waist, shot out in a lightning lunge, and it was curtains for the blowfly!

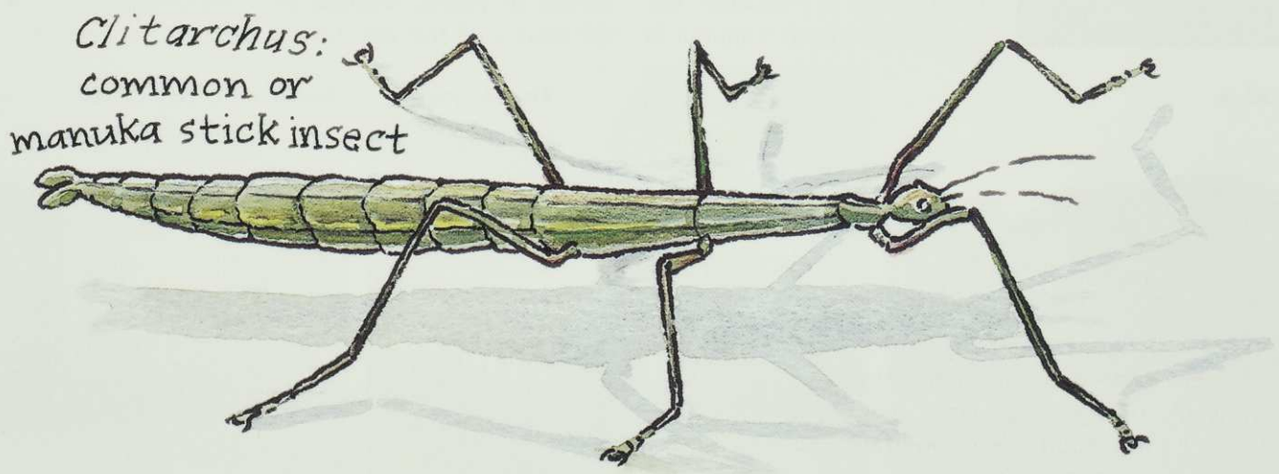
The mantis's appetite is insatiable. She will catch again and again, carelessly dropping half-eaten flies. And that's not the worst of it.

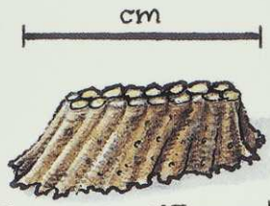
The nineteenth-century French naturalist, Jean Henri Fabré, wrote: 'I once surprised a male, apparently in the performance of its vital functions, holding the female tightly embraced — but he had no head, no neck, scarcely any thorax! The female, her head turned over her shoulder, was peacefully browsing on the remains of her lover! And the masculine remnant, firmly anchored, continued its duty.'

The mating mantises I have seen have never behaved in such a grisly way, though I have seen a female chewing on a fly during the mating act. A New Zealand entomologist, Richard Sharell, recorded finding the males of our green mantis *Orthdera novaezealandiae* dead on the ground, spent and exhausted after mating. Perhaps, in the ruthless economy of the natural world, eating one's spouse usefully pre-empts their approaching demise.

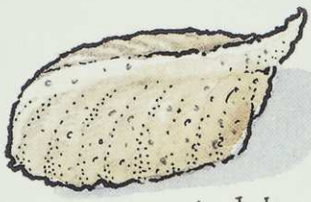
The brown mantis *Miomantis caffra* that I was watching is a species recently arrived as a stowaway from South Africa. Over the past decade this slender, feisty mantis has become increasingly numerous in northern parts of the country and it often comes into the house, where it inconsiderately lays its eggs on the curtains. Outside, dozens of its egg cases are cemented in the corners of the brickwork and under the roof overhang. The more sturdy native green mantis was never so numerous, and now seems even less common. Mantises make the most elegant egg cases. From her grotesquely swollen abdomen, as if from a kitchen whiz, the female produces a foamy mass. Her feeler-like cerci at the tip of the abdomen stir and mould the foam and gradually an oval box emerges consisting of two rows of egg cells, each neatly capped. The foam hardens and the egg cells become clearly visible in the egg-case of the green mantis, The egg-case of the brown mantis remains shrouded in soft foam, however, looking like a blob of whipped cream.

It seems the mantises invented foam packaging some millions of years before New Zealand Post. Their foam construction not only insulates the eggs from the cold and heat, and protects the eggs from the winter rain, but also lets in air for the developing larvae which emerge in early summer.

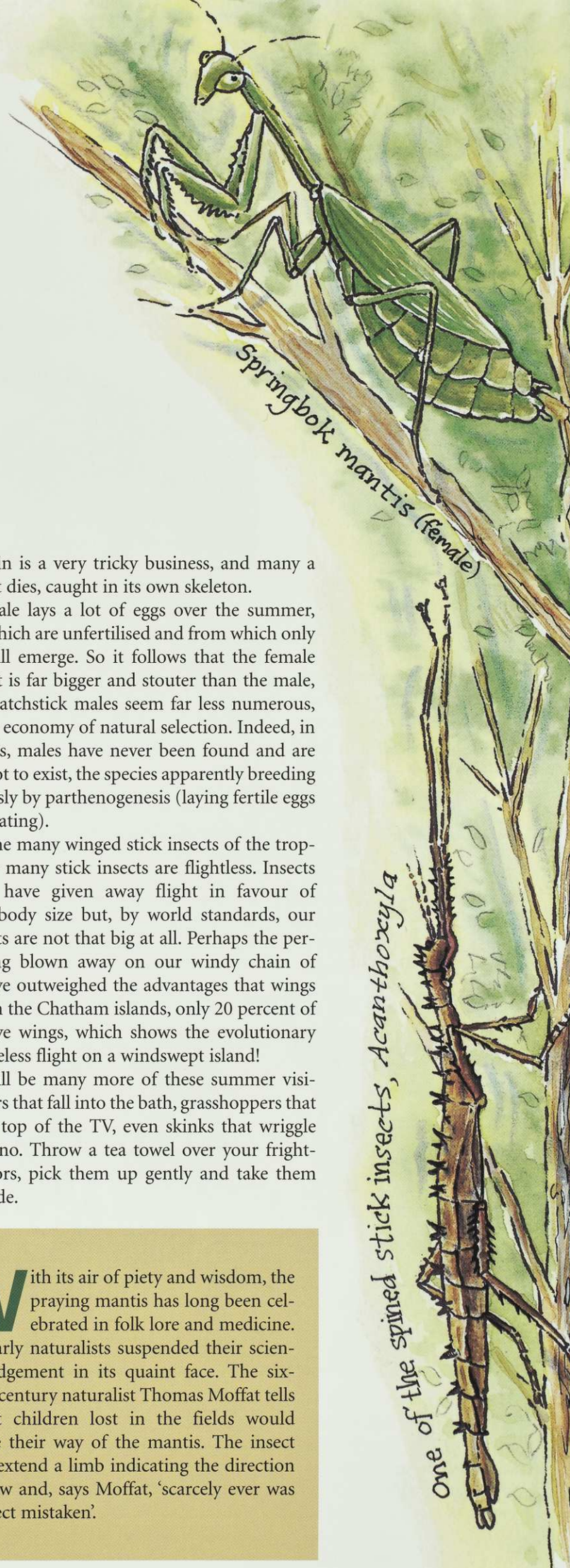




Egg case, NZ mantis.



Egg case, springbok mantis.



My favourite summer visitors, however, are the stick insects. New Zealand has 21 species of stick insect which browse on a variety of native plants, favouring manuka and kanuka as well as introduced plants like willow and roses.

In his book, *The Stick Insects of New Zealand*, Professor John Salmon tells us that stick insects were common throughout New Zealand before the 1950s. Then, when farmers began using DDT to kill grass grubs, they almost disappeared. Although DDT was banned in the mid-1960s, the professor reckoned it was twenty years before stick insect numbers seemed to be recovering and in 1991 he wrote, 'they are still relatively scarce and hard to come by in many parts of the country.' This is a sobering story and I am glad stick insects seem now to be thriving, at least in my garden.

Stick insect are masters of disguise. Not only do they arrange their thin, often knobbly bodies to match the twigs and branches, but they act like twigs. A frightened stick insect will stand perfectly still with its forelegs stretched out over its head. Then it may sway gently from side to side creating a very fair resemblance to a twig swaying in the breeze. If this act doesn't work, (as it doesn't on the sitting-room wall), the stick insect will 'play dead', falling to the ground or the carpet, its legs held out stiffly as if in rigor mortis. I wait ... and wait ... and wait, but the stick insect can stay motionless for an hour or more. So I pick it up, all stiff, lay it on a branch of kanuka, and in no time it scrambles away.

Stick insect eggs look like little droppings, and are well disguised on the ground where, without ceremony, the female drops them. To watch a stick insect hatch is to witness a tiny miracle.

Eggs of spined stick insect.

When the little creature has struggled free of the egg case, it seems impossible that all those frail and tangled legs could ever have been fitted into such a tiny box! Then it must moult at least four times as it grows to maturity. Extracting those long legs from the old skin is a very tricky business, and many a stick insect dies, caught in its own skeleton.

The female lays a lot of eggs over the summer, many of which are unfertilised and from which only females will emerge. So it follows that the female stick insect is far bigger and stouter than the male, and the matchstick males seem far less numerous, such is the economy of natural selection. Indeed, in some kinds, males have never been found and are thought not to exist, the species apparently breeding continuously by parthenogenesis (laying fertile eggs without mating).

Unlike the many winged stick insects of the tropics, all our many stick insects are flightless. Insects like weta have given away flight in favour of increased body size but, by world standards, our stick insects are not that big at all. Perhaps the perils of being blown away on our windy chain of islands have outweighed the advantages that wings bestow. On the Chatham islands, only 20 percent of insects have wings, which shows the evolutionary cost of careless flight on a windswept island!

There will be many more of these summer visitors; spiders that fall into the bath, grasshoppers that goggle on top of the TV, even skinks that wriggle over the lino. Throw a tea towel over your frightened visitors, pick them up gently and take them back outside.

With its air of piety and wisdom, the praying mantis has long been celebrated in folk lore and medicine. Even early naturalists suspended their scientific judgement in its quaint face. The sixteenth-century naturalist Thomas Moffat tells us that children lost in the fields would enquire their way of the mantis. The insect would extend a limb indicating the direction to follow and, says Moffat, 'scarcely ever was the insect mistaken'.

Kumarahou Making a Comeback Beside Ohiwa Harbour

MEG COLLINS

The bright yellow flowers of kumarahou are replacing gorse around the shoreline and edges of Ohiwa Harbour, in the eastern Bay of Plenty.

Maurice Walker, a resident near the harbour, burnt a large infestation of gorse three years ago and to his amazement out of the ashes grew hundreds of kumarahou seedlings. He contacted the local Forest and Bird nursery caretaker, Meg Collins, who potted up many of them. Once the shrubs were established, she distributed them around the harbour edge properties, and in Whakatane District Council's rehabilitated reserve known as the 'pumice pit'.

In spring, many of these new groves of kumarahou burst into flower, adding to the sparse natural distribution of them in the district. *Pomaderris kumerahou*, or golden tainui, is found naturally in Northland and some parts of the Bay of Plenty, but can be obtained commercially as an interesting and spectacular garden plant. It prefers clay, barren sites, and is usually found in low scrub or roadside banks. Unfortunately when flowering finishes it looks rather an uninteresting woody shrub, and can easily be mown off by over enthusiastic roadside mowing contractors.

According to a Maori tradition, the flowering of kumarahou was used as a marker for the tribes to plant kumara, when risks of frosts had passed. It was also used as a relief for lung and chest complaints. The leaves are said to make a type of beer with an unusual bitter taste but a remarkably sweet aftertaste.

The kauri gumdiggers of the north also used the leaves to make a soapy lather for washing. So the plant became locally known as 'gumdiggers soap'.

Another kumarahou *Pomaderris hamiltonii* has a pale yellow flower. This plant is on the threatened and endangered list and is found naturally in small stands about Warkworth and on the west coast of the Firth of Thames. — *Meg Collins, Eastern Bay of Plenty.*

Forest and Bird Member in Senior Achievers Awards

SENIOR ACHIEVERS CHARITABLE TRUST

Forest and Bird identity, Reg Janes of Tauranga, (centre) receives a certificate of excellence at the Tower Senior Achievers Awards in Havelock North. Making the award is Mrs Lesley Harrison, chairman of the Senior Achievers Charitable Trust, and Sir Rodney Gallen, a former High Court judge.

Three conservationists have received certificates of excellence from the Senior Achievers Charitable Trust. Forest and Bird identity, Reg Janes of Tauranga, received an award on the nomination of Tauranga Forest and Bird. Mrs Shirley Sparks, also of Tauranga, and Dalraith (Ted) Wilson of Pakuranga in Auckland also received certificates for working in the conservation area.

The citation for Reg Janes records he has worked for conservation for 70 years, joining Forest and Bird as a primary schoolboy, and serving as a dominion councillor of the Society for 30 years. He has been both secretary and chairman of the Tauranga branch, and organiser of the local Conservation Week.

Locally, he led the revegetation of l'Anson Reserve which involved growing and planting out about 18,000 trees. He is a key member of the Bay of Plenty Tree Sociey which created McLaren Falls Park from farmland to become one of New Zealand's leading arboretums, and donated thousands of native trees to local schools. His award also recognised work with the Scout Association and the Salvation Army Friendship Club.

Shirley Sparks received her award as a prime mover in transforming an ugly, disused quarry into the Te Puna Quarry Park, an 11-hectare reserve and venue near Tauranga, the first level of which was completed this year. She has also worked in drama, music and the arts.

Ted Wilson was recognised for his work as co-ordinator of Project Crimson, helping restore and protect pohutukawa and rata forest. He has also helped people in need.

Hamilton 'Junats' Celebrating 40 Years

KAY RUMNEY PARRY

The Te Kauri Lodge of the Hamilton Junior Naturalists Club was built in forest on the slopes of Mount Pirongia in 1967. Catering for 95 people it has hosted many Forest and Bird camps too.

If you know someone between the ages of 18 and 55 who spent their childhood in or near Hamilton check out if they were ever a 'Junior Naturalist,' and if so are they attending the reunion next Easter? More than 1000 children have belonged to the club which, during the 1980s, inspired similar groups in Auckland, and provided some of the impetus behind the formation of Forest and Bird's Kiwi Conservation Club.

Begun in 1961, Junior Naturalists were developed by the Hamilton science advisers of the Department of Education, as an organisation for those of intermediate and high school age who wanted to further their knowledge of natural history. They began weekly meetings and regular field trips which are still main events on the programme today. The club built its own Te Kauri Lodge in 1967, on forest land donated on Mount Pirongia.

Many past members are now employed in the environmental field, and others carry on their interest as adult members of Forest and Bird. Currently, the club liaises with Waikato Forest and Bird, and the groups promote each other's activities. A combined track maintenance working bee at Te Kauri Lodge is planned for next month.
— *Source: Kay Rumney Parry, H.J.N.C, PO Box 7030, Hamilton East.*

Gulf Branch Planting Guide

Three members involved in restoration projects with Hauraki Gulf Forest and Bird have produced a 52-page guide for planting natives. Entitled *Greening our Gulf Islands* it contains a lot of practical experience, some of its also useful on the surrounding mainland.

The authors have been involved in revegetation projects on Waiheke Island, near Auckland, and indeed subtitle their booklet *A manual for native revegetation with special reference to Waiheke.* Don Chapple has been working as a volunteer, albeit full-time, on the Society's Atawhai Whenua reserve for seven years (*Forest & Bird*, August 2000). Rachel Ebbett and Ivan Kitson are the other authors.

Inexpensive modern methods of book publishing are certainly helping groups like this to make a permanent record of their experience. Together, such publications are beginning to amount to a useful store of knowledge on the practical side of conservation.

The book has been nicely designed, has a short colour section, and appendices of plant names.

bulletin

Northern Conservation Officer

Forest and Bird has appointed Sarah Gibbs as its Northern Conservation Officer based in Auckland. She formerly woked with the Department of Conservation, and also as a piano teacher.

Sarah Gibbs has recently completed an MSc thesis examining the habitat overlap between immature North Island brown kiwi and predators at Trounson Kauri Park 'mainland island' in Northland. She has a Bachelor of Resource Studies from Lincoln University. She has also studied at the University of Idaho and completed an internship with the US Bureau of Land Management in Alaska. Her passion for conservation includes being an active member of the Ornithological Society of New Zealand, and she has many outdoor interests.

Sarah Gibbs takes over the position formerly held by the late Jacqui Barrington. In announcing the appointment, national president Keith Chapple paid tribute to the team of volunteers and others who have kept the northern office open on at least a part-time basis over the past two years. Volunteers are still needed to assist Sarah on a regular basis.

Devising a Policy on Cats

Forest and Bird is currently developing a policy on the management of cats in relation to their impacts on wildlife. This arose from involvement with other organisations working on cat issues.

By developing a clear policy on cats, we can identify where we are in agreement with other organisations, and can work together towards our shared goals. It will also identify areas where our views are different, and in those matters a clear statement of our policy can reduce misunderstandings and conflict between groups.

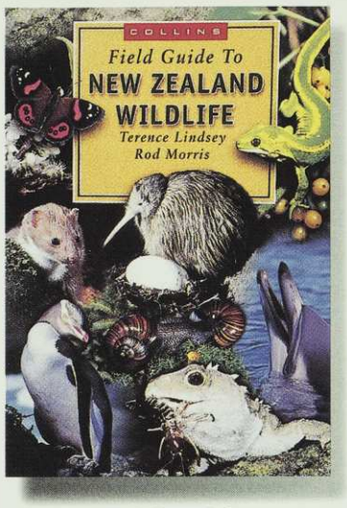
If members would like the opportunity to read and comment on this policy please contact Karli Thomas, Biosecurity Awareness Officer at the address below. Comments should be sent by March 10th 2001 to: Forest and Bird, PO Box 631, Wellington, or emailed to k.thomas@wn.forest-bird.org.nz — *Karli Thomas, biosecurity officer, Forest and Bird central office.*

Forest and Bird Groups Dissolved

Both the Mana branch and the Kauri Coast section of Forest and Bird have been dissolved — because not enough people volunteered to serve on their committees. Mana branch called a special general meeting of its members on October 24, 2000, to decide the future of the branch, following 18 months' effort to rejuvenate the committee. Only two nominations were received for committee positions. As this is not sufficient to form an effective committee the nominations were withdrawn. A subsequent motion then moved to recommend that the branch be dissolved. This recommendation was passed by the national council of Forest and Bird, meeting in Blenheim on November 19, 2000. Mana Branch members will now be attached to Wellington or Kapiti branches in accordance with their wishes.

Members of the Kauri Coast section (centred around Dargaville) were invited to re-form their committee. No members volunteered their services, so the National Executive moved to dissolve the Kauri Coast section. Members were to be amalgamated back into the Northern branch, based on Whangarei, during December 2000.

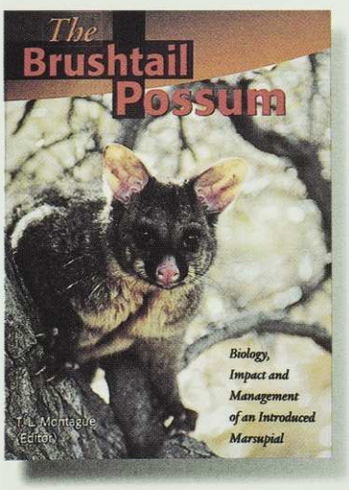
booknotes



Collins Field Guide to New Zealand Wildlife

text by Terence Lindsey, photographs Rod Morris, 263pp limp, Harper Collins, Auckland 2000, RRP$39.95.

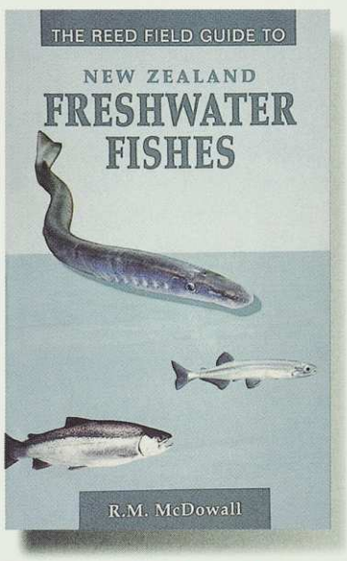
Yet another beautifully illustrated guide to nature in New Zealand, this time extending to include birds, mammals, amphibians, reptiles, freshwater fish and selected invertebrates. (There are for example seven spiders, and many invertebrates are introduced as group rather than species.) It is in no way definitive but provides a colourful introduction to the range of native and introduced creatures in a portable format. Rod Morris's great photographs are supplemented with contributions from other leading photographers. The author is not a local which may account for a few curiosities, such as Captain Cook discovering the Magenta petrel or taiko of the Chatham Islands, a place he never found.



The Brushtail Possum: Biology, Impact and Management of an Introduced Marsupial

edited by T.L. Montague, 292pp hardback, Manaaki Whenua Press, Lincoln 2000, RRP$59.95.

This is a very serious book, and rightly so given the damage inflicted by this Australian marsupial on New Zealand's forests and nesting birds. The editor wanted to draw together the information and research spread over many other publications to make the facts readily available to those concerned with the possum problem. There are contributions from more than 40 experts touching on possum biology, possum impacts, controls and management, the benefits of control, and possible future directions. This book should be valuable for anyone concerned, or working to eliminate this pest.



The Reed Field Guide to New Zealand Freshwater Fishes

by R.M McDowall, 224pp hardback, Reed Publishing, Auckland 2000, RRP$34.95.

Dr McDowall has written several technical and popular books about the freshwater fish of New Zealand. For the amateur naturalist, this book is an excellent guide to the various native and introduced fish in New Zealand lakes, streams and swamps. It is well illustrated with line drawings and colour photographs, supplemented with recognition notes, including how to distinguish some of the more difficult by special features. The distribution maps from the databases of the National Institute of Water and Atmospheric Research are small but fascinating guides to the widespread places where our native fish still survive. Notes on life histories, habits, diet and status make this a very useful addition to the reference shelf.

Stewart Island: a Rakiura Ramble

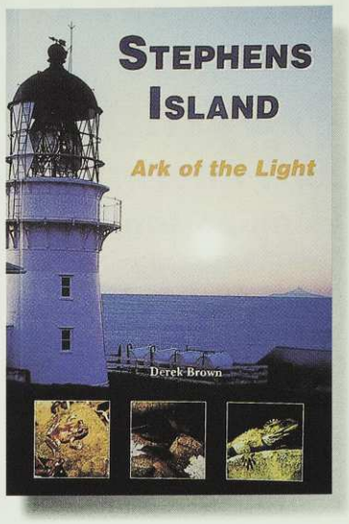
by Neville Peat, 64pp, limp, University of Otago Press, Dunedin 2000, RRP$19.95.

Here is a guidebook and fine souvenir to what should be New Zealand's next national park. (The Conservation Authority recommended to the Government the creation of a national park over most of the island last April.) Extensively illustrated with good photographs, the book looks succinctly at the nature of the island, its special plants and birds, local walks and trips, and the course of longer tramps and trails around the island. It should recreate some nice memories for visitors.

Stephens Island: Ark of the Light

by Derek Brown, 248 pages, limp, published by Derek Brown, 212 Main Road, Havelock North, 2000, RRP$30.00

This is one of those enthusiast's books, written by someone



immersed in first-hand experience, and believing sufficiently in the value of their chosen subject to publish their findings personally. In this way a number of special places have been recorded for posterity, and Stephens Island in Cook Strait is equally deserving. Derek Brown first went there in 1984 as a cadet with the former Wildlife Service: the island is home to an estimated 50,000 tuatara, (some say 30,000, others 100,000) and once had its own wren (eaten to extinction by the lighthouse keeper's cat). Subsequently Derek Brown has been involved in the island's management — it was part of his bailiwick as a Department of Conservation officer from 1987-1996 — and he spent around two years on the island, doing research, managing threatened species, and restoring the habitat. Derek Brown writes of nature and local history, including Maori times, and the significance of cooperation with Ngati Koata over the management of Takapourewa as a Nature Reserve. The book is packed with details about the island's special nature and the course of efforts to preserve it.

Rare Birds of New Zealand

by Geoff Moon, 80pp, limp, Reed, Auckland 2000, RRP$14.95.

This little book sits alongside two volumes of *Common Birds* in the Reed Nature Series. Rare native birds appear alongside unusual introduced ones. Excellent photographs by Geoff Moon.

Preying on the Predators

JUDY GILBERT reports on managing pests without using poisons on Great Barrier Island.

Showing the way to improving habitat for nature on private land is one of the inspirations behind Little Windy Hill, a restoration project on Great Barrier Island. The project also sets an example of how birds and plants can benefit without the use of poisons to control pests.

The Little Windy Hill Company has a 230-hectare property on the southeastern coast of Great Barrier Island, bastion of the outer Hauraki Gulf. Windy Hill is a mosaic of inter-connecting ecosystems, including pohutukawa-clad cliffs and podocarp-broadleaf coastal forest, streams, small wetlands, and dry exposed areas of regenerating kanuka and manuka. There are populations of threatened kaka, kereru, and black petrel. Streams have native fish and freshwater crayfish, and there is good habitat for paua slugs and a variety of skinks and geckos.

The company, made up of 15 individuals, purchased the land in 1972 with the goals of community and conservation. Over the years shareholders limited development in accordance with their 'rural property management plan' and covenanted 116 hectares with the QEII National Trust. The various forests continued to grow and regenerate, with fences kept stockproof, and recreational hunting of the feral goats and pigs.

By the mid-1990s, however, it became clear well-intentioned passive conservation was not turning the tide for the waning biodiversity, declining populations of native birds being the most obvious indicator. In response, the company decided on a five-year 'integrated pest management' project focused on actively managing plant, animal, and bird pests.

The objective is 'to sustain and enhance the biological diversity of the land through pest management, to increase bird life by reducing densities of pests predating on birds, and to nourish the dream of providing a new home for the declining numbers of mainland kiwi....'

The project was approved in October 1998 but it took six months to complete the tasks of finding funding — applying to WINZ Task Force Green for a subsidised field worker, sourcing equipment, selecting the area of land to be established as a 'mainland island', and networking for information. Since Great Barrier has no possums or mustelids (ferrets, stoats and weasels), feral cats and rodents are the primary competitors and predators. Advice was sought from the local Department of Conservation and the biosecurity unit of the Auckland Regional Council on the methods for trapping them.

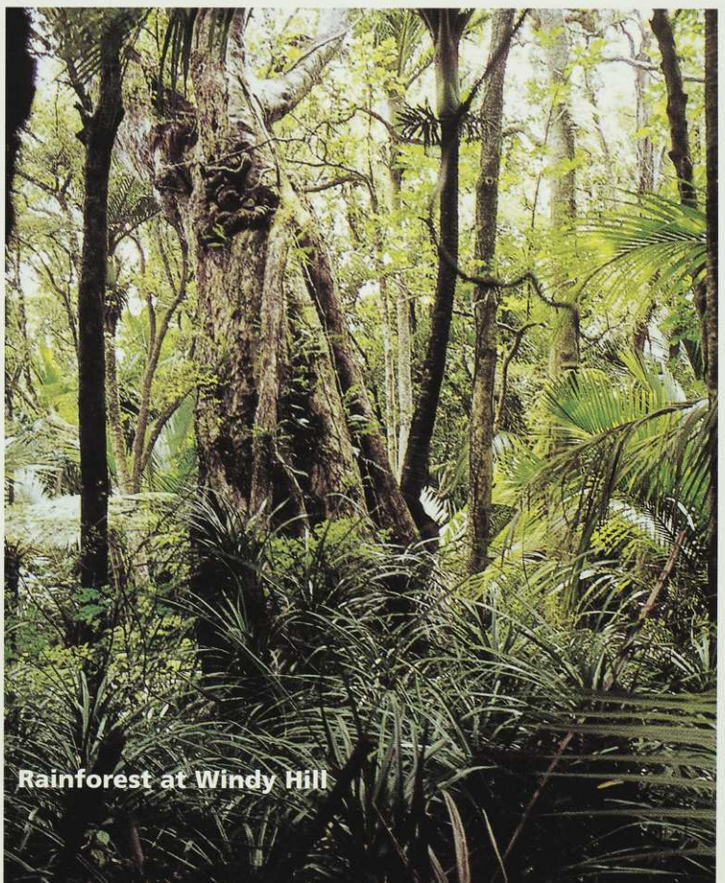
The project became operative in April 1999 with a Task Force Green field worker establishing tracks and traps in a 20-hectare valley of mature forest. The area was selected for its ease of access, good bird habitat, and as a suitable area to 'cut ones teeth' on pest management. The initial funding ($3000) was privately provided to get the project underway with the J.S. Watson Trust (administered by Forest and Bird) granting the first funding from an outside organisation. The local branch of Forest and Bird also provided funding for rat traps.

Over the 18 months the project has been in operation the efficiency of tracks and trapping has improved with the field worker taking a trip to Te Urewera to check out the 'mainland island' there. (See page 18 this issue.) Tracks are set at a maximum of 150 metres apart on the contours and traps at 25 metres spacing. Five different types of cat traps are established all around the perimeter, with around 200 metres between each trap. To date, 1600 rodents, 21 feral cats, 12 pigs, and 155 goats have been culled. Plant pests such as pampas, Mexican daisy, and cotoneaster have also been removed. Mynas and magpies are eradicated.

The Windy Hill company has a philosophical commitment to managing pests without the use of poisons, and the effectiveness of this form of pest management is being followed with interest by local and central government agencies who are also keen to limit the toxic effect of poisons in the environment.

From the outset, the company has been keen to monitor its progress to ensure that its objectives are achieved. Recently, the Auckland Regional Council's environmental initiatives fund paid for the first year of the Windy Hill ecological monitoring programme prepared by Dr Sam Ferreira, a DoC ecologist. The programme sets out over five years a comprehensive monitoring of forest-bird communities, seed and litter fall, seedling density, reptile and invertebrate communities. There are already indications of improved bird numbers in the mainland island area. The rodent data indicates a significant and sustained reduction in densities proving this is possible without the use of poisons.

The company has been so encouraged by the success of the pest management that it will be extending the 'mainland island' area over the summer to about 100 hectares and has a second project on a neighbouring farm ready to begin a similar integrated pest-management programme. — *Judy Gilbert supervises the Windy Hill project.*



Rainforest at Windy Hill

'Gardening' the Forest

Pruning and thinning can speed native forest regeneration, says KEN MASON.

The time taken to build the structure of a native forest, with plantings or natural regeneration, can be at least halved by helpful shaping of trees to bring more light into the forest. By intervening in the natural process, trees can be helped to gain height more quickly, while a broader range of forest floor species can be established.

Over more than 30 years' involvement in forest restoration, I have developed a number of techniques which I'm now applying to seven ecological restoration projects about Dunedin.

In essence, given space, both regeneration and plantings tend to spread overground in bush form. These can be pruned to a leader or two, and thinned below so they grow upward, rather than outward. This promotes the upward growth of a forest canopy, and allows in more light and rain, so other species can establish and not be smothered. These restoration techniques are based on observations over many years, but a number of examples stand out in my mind.

As a schoolboy in the early 1960s I took part in a Dunedin City Council planting at Craigieburn Reserve. The plantings then had as much space to grow outward towards the light as upward, resulting in subcanopy trees growing as multi-stemmed giant bushes rather than as trees. Nearly 40 years on, the forest floor was dark and lacked any regeneration. Slower-growing, planted species were either 'out-competed' or stunted dwarves. Only where a large 'bush' had died, leaving a lightwell, were than any 'second phase' tall saplings or forest floor species.

My second area of observations involved natural forest regeneration, a prime example being the Society's Moore Bush in Leith Valley, Dunedin. Formerly a dairy farm, it was purchased by Ellie and Percy Moore in 1946 to actively encourage bush regeneration. Many of the podocarps were by then reduced to standing alone in pasture. When the property was bequeathed to the Society in 1973, natural regeneration either side of some of the tracks formed a dense physical and visual barrier. By the mid-1980s fierce competition for light had reduced the number of track-side stems to the point where there were now glimpses through them to the big rimu and miro trees. By the mid 1990s the tall regenerating stems had so reduced themselves in number that the tracks had been totally absorbed into the forest. There were now largely unobstructed views of the big trees above the subcanopy, and a healthy forest-floor fern cover.

To replant as densely as in natural regeneration would need a large number of trees and acceptance of considerable casualties. There would also be the problem of a lingering, dark, forest floor. So at this point observations of plantation forestry practices came into play. In exotic forestry, side-pruning helps form a single clear trunk, and pushes the tree upward while allowing more light to reach the ground. Often the number of trees is further reduced to allow the remaining stems to grow to a larger diameter. Something similar must happen in nature: ever notice how relatively few stems support an enclosed canopy. Pruning and thinning of native vegetation is a way to accelerate its upward growth and encourage greater biodiversity in the form of plants which would otherwise by smothered.

KEN MASON

After 35 years, the forest floor is still bare at Dunedin's Craigieburn Reserve. The plantings have grown more as bushes than trees, thus preventing light and much moisture from reaching the ground.

KEN MASON

On Quarantine Island in Dunedin Harbour, a planted forest only six-years old already has the feel of a natural place. A basic forest structure and sheltering seaward canopy have been developed by pruning methods outlined in this article. There is enough shade, moisture, light, and shelter from salt winds, to start returning forest floor species next planting season.

At Kanuka Bush, a small Dunedin City gully, I applied these observations in the restoration process. In 1985, the big old kanuka were reduced in number and the remainder were fighting for their survival against large sycamore trees and domestic goats. By 1987 both the sycamores and goats were gone, revealing largely bare ground.

Regeneration, both from nearby relict seed sources and plantings, was subsequently managed. Young trees are side pruned to one or two stems to help them push upward. As the process continues, whole trees are removed by cutting them into small lengths and leaving them on the ground as humus. At the more advanced stages, stems are further thinned to select the final canopy trees. This is done by shallow ring-barking, and poisoning, as at this stage felling would damage the developing forest structure.

KEN MASON

Removing sycamore trees at Kanuka Bush in 1985, part of an urban forest restoration. The kanuka trees, above, were losing the battle with the aggressive sycamores. Below, large, thriving kanuka rise emergent above enhanced regeneration now 10 metres high.

KEN MASON

This process also allows light to reach the ground and enables ferns, shrubs and second-phase trees to develop.

The outward-reaching branches of fast-growing trees near the bush edge are also trimmed back to a main stem. This creates room for further edge planting which also helps form a dense shelter against the wind.

KEN MASON

Some reintroduced trees need their neighbours trimmed back to give them a chance to enter the canopy and become seed sources. Often they are planted in clumps for ease of looking after and increase their chances of establishing a niche.

To enhance their growth, plantings are helped with added compost, water crystals and slow-release fertilisers. On really dry sites water penetrants are added to the soil.

Micro-organisms, fungi and invertebrates are established by bringing in nearby soil and leaf litter. Missing local ferns, tree ferns, astelias, bush grasses, perchers, mosses, scramblers and shrub species are reintroduced. It is most satisfying to see these plants spread once there is a seed or spore source.

Ken Mason contemplates another phase of 'stem reduction' at Kanuka Bush in 1999. At his feet, club mosses and filmy ferns are amongst the small plants re-established. The 13-year-old canopy forest is up to 10 metres high.

After 14 years, the Kanuka Bush sub-canopy is now up to 10 metres under open-spaced, large, emergent kanuka. This is very good growth for this southern latitude. Suitable micro-climates have formed for the re-establishment of delicate species such as filmy ferns. The formerly muddy ruin of a creek is now a delight, restocked with freshwater crayfish enjoying a shady bush environment.

Over the past five years, methods trialled at Kanuka Bush have been applied to a number of much-larger restoration projects about Dunedin, including replantings on Quarantine Island in Dunedin Harbour, and in an area of silver beech.

The methods outlined are not necessarily applied to the whole of a revegetation project. Better growth and moister areas are targeted first, along with sections along the visitor tracks where visual enhancement can add another dimension to restoration. The increased biodiversity created can then be left to spread into adjoining, untreated areas.

If feeling a little hesitant to try these methods, because they involve pruning or removing native trees, consider these points from nature. The race for light and resources in the bush is not very pretty. Losers die. That nice little fern will throw its fronds over the adjacent seedling to kill it, for the alternative is a tree and a dead fern. The methods outlined are just speeding up what nature is doing, but more within our lifetimes.

— KEN MASON is vice-chairman of Dunedin Forest and Bird, co-ordinator of Dunedin Teen Conservation, and an adviser to the New Zealand Ecological Restoration Network.

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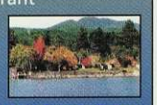

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