FOREST & BIRD

NUMBER 292 • MAY 1999

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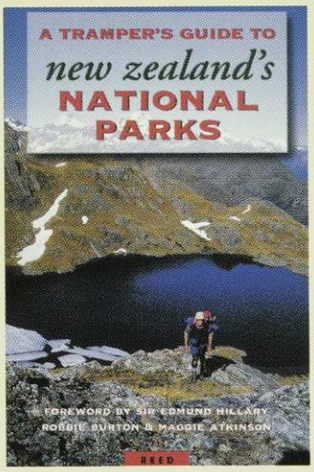

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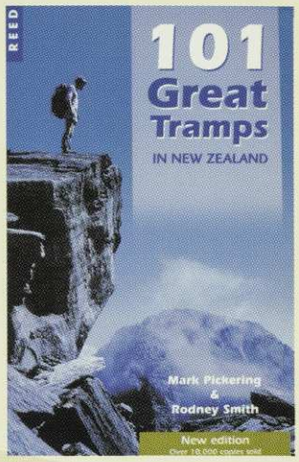

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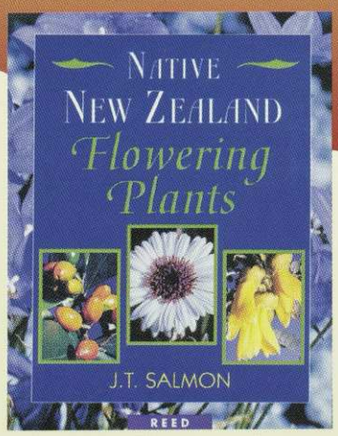

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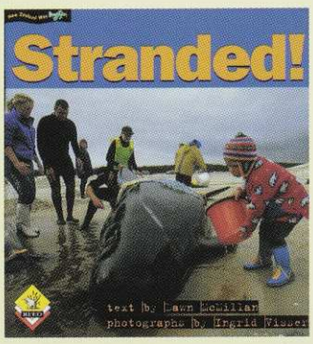

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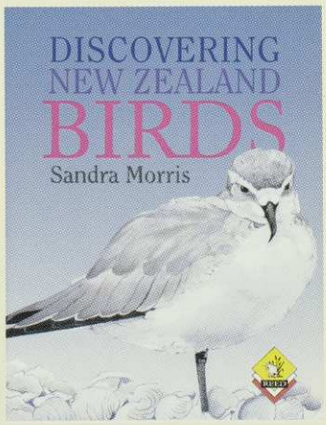

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FOREST & BIRD

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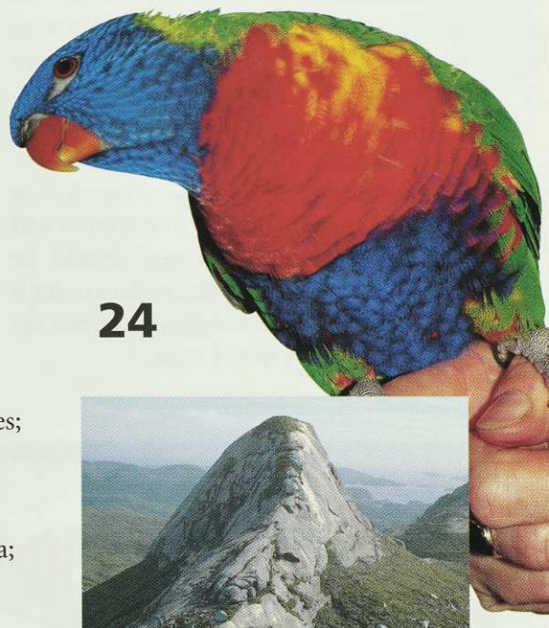
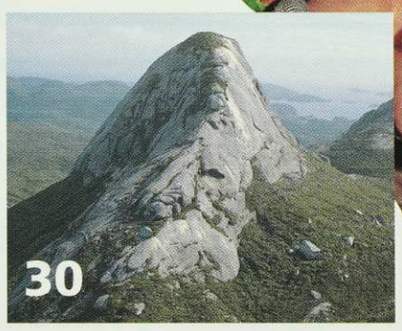
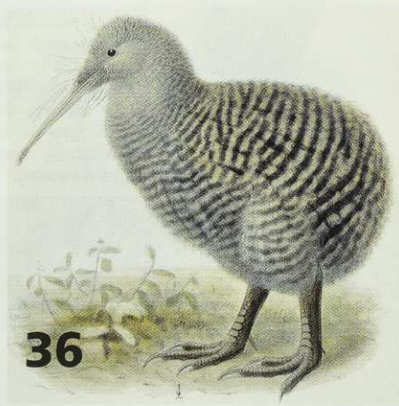
FOREST & BIRD

Features



Regulars





Cover: High in the mountains of South Westland, a radio tracker searches for the Haast tokoeka. See 'Kiwi Recovery Discoveries' from page 14. Photograph: Roger Colbourne.

fair go for the kiwi

I commend an article in this edition by Dr Hugh Robertson, one of New Zealand's leading ornithologists, and the scientific leader of the Kiwi Recovery Programme, sponsored by the Bank of New Zealand. In a concise compass, he discusses the issues confronting our national bird.

At the present rate of decline, 12 kiwi die every day. Since the launching of Forest and Bird's Kiwis for Kiwis campaign last September, around 3000 kiwi have died — about four percent of the surviving population on the mainland. They've been killed by ferrets, stoats, dogs, cats, traps, poison; a few have been run over by vehicles. The carnage continues everywhere because the agents of decline are everywhere.

Hugh Robertson tells us that about 200 kiwi once lived in a reserve near Tangiteroria, in Northland. Ferrets appeared in 1987. Six years later the kiwi population crashed to 30 birds. Yet ferrets are bought, sold, pampered and flaunted as a modern designer pet.

What foolishness is this? Surely, the threat posed by these imported serial kiwi-killers is well understood? Parliament should ban and be damned. The sale, distribution and private ownership of ferrets should be banned, if for no other reason than it sends a clear message — even though ferrets are already here, they're not wanted.

The popular image of New Zealand is of magnificent scenery, wonderful nature walks, exciting rivers, pristine mountains, clean air, healthy outdoor pursuits and splendid rain forests. But the forests are empty, the birds all but gone. In her foreword to the Draft Biodiversity Strategy, the Prime Minister, Mrs Shipley, acknowledges this. Since New Zealand was first settled our unique plants and animals have been in retreat, driven back by burgeoning pests and destruction of habitat. And, she says ... 'we are keen for all New Zealanders to get involved and become champions of biodiversity...we must act now'.

Fine sentiments. There can be no question that they are well intentioned. But, as the proverb says, the road to hell is paved with good intentions. What sense are we to make of a Government that acknowledges the importance of saving natural habitats and ecosystems, yet gives conditional approval for Timberlands, (a company it owns), to destroy natural habitats and ecosystems?

The kiwi epitomises the dramatic decline and fall of natural New Zealand. Forest and Bird embarked on this keynote campaign because (as Hugh Robertson says) 'the kiwi is a good indicator of environmental health'. If we cannot save our national bird, what hope is there for the other plants and animals, or indeed the people of New Zealand?

'If we cannot save our national bird, what hope is there for the other plants and animals, or indeed the people of New Zealand?

Whilst recognising there are fiscal limitations and other constraints, Forest and Bird has developed a realistic proposal that provides a range of representative areas. We have proposed establishing 11 'kiwi zones' of 10-20,000 hectares each, at a cost of $1 million per zone per year for 10 years. If these kiwi zones are established and managed accordingly, Forest and Bird is satisfied the future of the kiwi will be improved.

Of its own, the Kiwi Recovery Programme will not ensure the survival of the mainland kiwi. Neither should we expect it to do so; the programme was always intended as a means toward an end, not an end in itself. As Dr Robertson says, the aims of the programme were to find out the kiwi's distribution and genetic variation, its threats, and start to manage the recovery of the most endangered populations'.

Operation Nest Egg has unearthed some valuable conservation management tools. But again, we should not expect more than is reasonable from this very successful project. It's time to move on.

The kiwi may be clawing its way back, but only in those quite small areas actively managed as part of the kiwi recovery programme. Around the rest of the country the kiwi is in desperate straits and will continue to be so until such time as the lessons learned these past seven years are put into practice in the field. Hugh Robertson correctly identifies changes to legislation and public attitudes as important issues to be addressed. The bottle-neck, however, is in Parliament and the funds it authorizes for conservation management. Adequate resources and funds can make a difference.

So my fellow kiwi, how about giving the kiwi a fair go?

– Keith Chapple

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

mailbag

Maori Perspectives

As members proud of our organization's 75-year record, we were delighted the November 1998 issue devoted a section to visioning the society's next quarter century. We were stimulated by the range of thoughtful opinion presented by you and your five colleagues, but also we were left with serious misgivings at what was not said. Where was the recognition of partnership with Maori? Apart from Gordon Stephenson's mention of advice to rural marae on native plantings and your own aside about 'socially concerned [members]... sharing concerns with other groups and Maori', there was no acknowledgement that Maori should and will have a major role in shaping the ecological future of this country.

Are we blind to the centrality for Maori of concerns about this land and its life-forms embodied in their self-definition as tangata whenua, 'people of the land'?

We believe our society will be guilty of both neglect and arrogance if we rely solely on the brief 150 years of Pakeha experience of New Zealand ecosystems to the exclusion of the 1000 or more years of Maori experience. It is from this experience that the ecological concepts kaitiaki (guardian), mauri (life force), wairua (spirit) and whenua (land as nurturer) have emerged. There is much here for us to learn. We believe the environmental future of New Zealand can best be prospered in relationship with Maori.

John Broomfield, Pelorus Sound
Susan Forbes, Paekakariki Hill
Peter Horsley, Palmerston North
Geoff Park, Wellington
Joan Ropiha, Wellington

Dark Moons

I was very pleased to find pictures of visiting butterflies in the February number of *Forest & Bird*, but frankly I am puzzled by the black butterfly being named blue moon.

In the 1950s I lived near the port in New Plymouth and early one summer a bright blue butterfly, about the size of a monarch appeared in the garden. I was told this was a female blue moon and frequently it was joined by a rather smaller and darker male. I do not recall the markings but am sure it was not black.

During the summer the butterflies apparently bred, as they were more numerous by autumn and I very much hoped they had come to stay. However they died off in the winter and I have never seen them since.

At the time I had never heard of these large blue butterflies or of the name blue moon which suited them so well.

So if, as I assumed, they had come over from Australia, I find it hard to see how that name has become attached to a black butterfly, beautiful as it evidently is.

Edward Hill, Wellington

– The blue moon in our February 99 issue was a male, with white 'moons' fringed with blue on its wings; the female is distinguished by two orange-tinted flashes. Our author Peter Maddison also provided notes on the blue tiger (as pictured), another Australian butterfly of about the same size which is only rarely reported here, though there was an invasion in 1995.

Buller Devastation

I wonder if members are aware of the degree of devastation caused to Buller native forest by state-owned Timberlands West Coast. In its propaganda, TWC claims to 'love' the forest, 'care for' the forest, and enhance wildlife habitat. But in the area of the Buller 'overcut' they are stripping the forest of rimu from centuries-old giants to baby trees only 20 centimetres (8 inches) through at the top of the log. Everything millable is taken.

In a recent inspection by Native Forest Action, Forest and Bird and Buller Conservation Group, we saw a huge rimu felled and chopped in three ready to be helicoptered out. Beneath this forest is the cave containing a whale skeleton which was filmed by the Jacques Cousteau team, and not far away a magnificent limestone arch which rivals those at Oparara in Kahurangi National Park. The forest is home to kiwi and kaka.

K. PFEIFFER, AUCKLAND WAR MEMORIAL MUSEUM

The Australian blue tiger butterfly rarely visits New Zealand.

The tragedy of the Buller logging, which is agreed by all sides to be unsustainable, is that already there is ample exotic forest nearby ready for milling, so no jobs need be lost. The rimu plunder is all about fattening up Timberlands West Coast for sale to a multinational.

Peter Lusk, email

Putaputaweta Too

I was very pleased to see the puriri moth account in your recent *Forest & Bird* article. I worked on the biology, ecology, and evolution of this insect for about six years.

It was my good fortune to discover that the caterpillars fed on bracket fungi but I found the period to be no more than three months (and it could be quite a bit less). Larvae may climb hosts to begin the next phase of their existence but they may also climb non-hosts.

In my study of puriri moth larvae in putaputaweta, development varied from nine months to about four years.

These points are not to detract from what I found to be a fine article. It's always a pleasure to see integration of plant and animal interactions.

J.R. Grehan, Assistant Curator, Frost Entomological Museum, Pennsylvania State University

Stoat Dangers

Forest & Bird journal has done an excellent job over the past few years in highlighting the threat posed by stoats. While possum control is having positive benefits for some of our forest birds, such as kokako and kereru, others remain under considerable threat. Hole-nesting birds such as mohua (yellowhead), kakariki and kaka — particularly the nesting females — are being wiped out by stoats, except in those few areas where intensive control is being carried out, or on islands free of stoats.

As a starting point, the integration of stoat control with possum control would seem to be of the highest priority.

The more strongly we can get the stoat message across to the maximum number of people, the greater the chance of earlier success in developing effective control methods. Current methods for the widespread control of possums and rats were not possible or even contemplated 10 or 20 years ago. With funding, vision and commitment, the same results could be achieved for stoats.

While there is a whole suite of predators out there, stoats would seem to be the number one threat at the present time.

Stephen L Westgate, Onerahi, Whangarei

– Stephen Westgate's account of stoats on the property of Far North Forest and Bird members Ian and June Wilson appears on page 43 of this issue.

Forest & Bird *welcomes comments on items in the magazine or on environmental matters generally. Please address letters (maximum 250 words) to the Editor, Forest & Bird, Box 33-029, Takapuna, Auckland. We reserve the right to edit letters for length and space. Deadline for August letters is May 31.*

Weeds and pests cost $840 million a year

The cost of weeds and pests to the New Zealand economy is around $840 million a year, according to economist Geoff Bertram in a report commissioned by the New Zealand Conservation Authority. Quantifying the damage introduced weeds and pests do to the country, Dr Bertram produces evidence that more than one per cent of the gross domestic product may be lost in this way.

The Conservation Authority called for the report to alert government and business to the need for better control of introduced pests and weeds. A complementary report on the species which cause the damage includes a 'blueprint for action' prepared for the Authority's pests and weeds committee.

Geoff Bertram estimates the loss of output suffered by the New Zealand economy each year is around $440 million a year. To prevent the level of infestation increasing, he believes the public and private sectors spend another $400 million a year.

'The ecological, cultural and economic impacts of introduced pest organisms are immense and ongoing,' he says. 'When intangibles such as the cost of pest damage to the conservation estate is added on, the bill comes to around one percent of gross domestic product.'

Theoretically, the advantage to New Zealand of getting rid of all pests is between $9 billion and $19 billion, according to Dr Bertram. (For serious economists, these figures represent a 'capitalized burden' of five percent and 10 percent on the annual costs to the economy.)

'In New Zealand, large numbers of introduced species have positive economic value, including most pasture and crop species and domesticated animals,' Geoff Bertram allows. 'Introduced species represent an increase in biodiversity but they also pose a threat to indigenous ecosystems and hence reduce biodiversity.' He defines pests as 'those introduced species the impact of which has turned out to be negative'.

'Pests are the downside of the large-scale experiment of colonizing the countryside with introduced species.' he says. Many species now regarded as pests were introduced originally in the hope of positive economic gains; examples are rabbits, possums, deer, goats, thistle and blackberry. Others, such as ship and Norway rats, mice, pasture weevil and insect pests, arrived naturally.

'Once established, pests present a dilemma of whether to eradicate or control them. Generally speaking, eradication is very costly and has generally been regarded as not "cost effective" except in special places such as offshore islands. Most pest populations are capped in size by public spending, not eradicated.

'Time is on the side of every potential pest organism which enters the country. Sooner or later it will end up in the wild where it may eventually wreak havoc on our economy, the environment, our cultural values, or our health'.

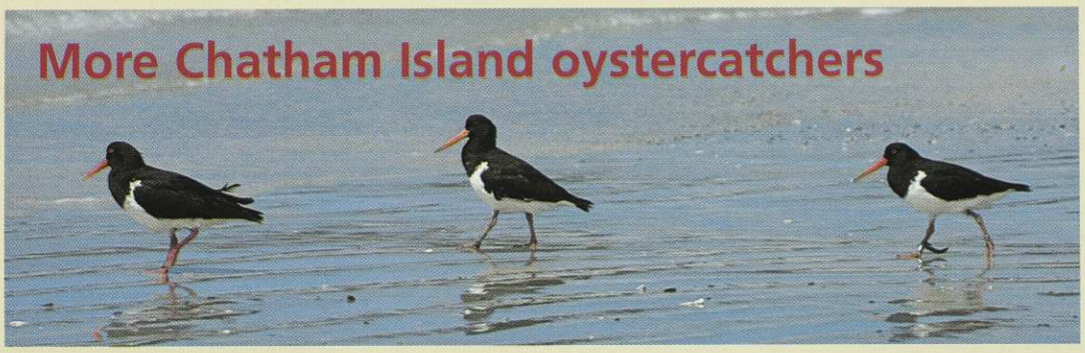
Better border control is advocated. Preventing further introductions is far more effective than any 'cure', the report argues. Past systems have had an unbalanced emphasis on potential pests which threaten export markets or primary production rather than those affecting the natural environment and our unique fauna and flora.

Where it is cost efficient to eradicate existing and potential pest organisms this should be done as soon as possible. Although the initial costs of eradication may be high they usually outweigh the real and opportunity costs of management. Eradication and control of pests is a long-term investment in conservation and primary production.

The recently released draft of the New Zealand Biodiversity Strategy sets its sights too low, according to Dr Bertram and his co-author Kevin Hackwell. Despite suggested expenditures of $46 million a year, the recommended goals will do little more than just hold the line over the next 20 years.

'Poor biosecurity in the past has led to a pest problem which is a massive drain on the economy,' they say. 'A more ambitious biodiversity strategy should have a vigorous biosecurity regime dealing with existing and potential pests. This would not only help the recovery of many threatened species but also the economy, and greatly enhance our economic competitiveness.'

More Chatham Island oystercatchers



FRANCES SCHMECHEL

The endangered Chatham Island oystercatcher superficially resembles pied phases of the variable oystercatcher found on mainland New Zealand. Their habits are similar too. However, the Chathams bird is stockier and larger. Its distribution is limited to the Chatham islands.

An apparent increase in the number of endangered Chatham Island oystercatchers is revealed by a recent census covering nearly 97 percent of the coastline of the main Chatham Island and 100 percent of Pitt, Southeast/ Rangatira and Mangere islands. Within one week a total of 141 adults were found by local volunteers and conservation staff, where previous counts between 1996-98 gave an estimated population between 65 and 120 adults.

Frances Schmechel, who is researching the behaviour of the birds, believes the higher count could in part be due to covering all four islands more efficiently with a larger survey team.

'There is very good evidence, however, for an actual increase in population, including an increase in breeding pairs on the north coast of the main island,' she says. This is the area where the Department of Conservation has been concentrating much of its management effort to protect nests and control predators.

'While no proof is yet available, it is possible the last few years of management is paying off,' says Frances Schmechel.

In another survey, a previously unknown population of the endangered New Zealand shore plover has been found on a pest-free reef in the Chatham Islands. Altogether, 21 new birds, (15 males, five females and a fledgling) were located after a commercial fisherman reported their possible presence on the remote islets.

Back to the 70s ... near Wanganui

Native forest is being stripped off the hill country north of Wanganui in a forestry scheme designed to attract investment from Taiwanese immigrants. In scenes reminiscent of the forest 'battlegrounds' of the1970s, huge roller crushers plummet down steep slopes smashing the protective cover of freely regenerating native forest. This is happening in the catchment of the already stressed Waitotara River — its waters laden with silt from weeping slips on the surrounding cleared hill country.

The forest clearance has the blessing of the Taranaki Regional Council which the forestry media describe as adopting a 'pragmatic approach' to environmental issues. The New Zealand Forestry Group's managing director, Wesley Garrat — a former immigration consultant — has marketed the forestry scheme to Taiwanese immigrants who hold individual 20-hectare titles. The company's Paparangi Station straddles the boundary between the Taranaki and Manawatu-Wanganui regional councils, and between the South Taranaki and Wanganui district councils.

Wesley Garrat praises the Taranaki local authorities for their having a different attitude to native forest clearance from their Wanganui counterparts. His company has been blocked from clearing native forest on its land which lies within the Wanganui River catchment. The Manawatu-Wanganui Regional Council's soil conservator, Alan Kirk, said he did not believe commercial forestry would be feasible on the upper slopes of the block which are consolidated sandstone with little top soil.

'I think there's a potential for an environmental hazard occurring because the soils are not proven sustainable forestry soils, he says.

The resource management director of the Taranaki Regional Council, Bill Bayfield, defends the clearance. He describes it as a model forestry project with good environmental management. Because Taranaki local authorities do not require resource consents for forest clearance, there is no opportunity for public submissions on the development and for the impacts to be properly assessed against the requirements of the Resource Management Act.

The Department of Conservation has identified the area as providing habitat for a range of native birds including kiwi.

Forest and Bird's Wanganui Branch spokesperson, Derek Schulz, says the clearance looks more like a scene from Indonesia than from a country that claims to be at the leading edge of sustainable management. He said because the New Zealand Forestry Group were not members of the New Zealand Forest Owners' Association, they were not bound by the Forest Accord. He feared further native forest clearance would occur in the Taranaki area because of the absence of land clearance rules and the reliance on voluntary conservation initiatives. — *Kevin Smith.*

... and in the Bay of Plenty

Regenerating forest shrublands recommended for protection have been crushed by Tasman Forest Industries near Kawerau. The company is one of the Fletcher group of companies which is signatory to the New Zealand Forest Accord to protect native forest from felling.

The chief executive of Tasman Forest Industries, Barry Poole, has vigorously defended the clearance, arguing it was only 'blackberry and scrub'.

However, a report by a Department of Conservation planner, Fiona Hennessey, identifies the cleared vegetation as predominately successional forest shrubland — developing forest — with emergent rewarewa, kamahi, kanuka and mamaku over a manuka canopy. The cleared vegetation was part of an area recommended for protection by the Department of Conservation (an RAP) because of its 'significant ecological values'. It was also a 'significant natural heritage feature' in the proposed Whakatane District Plan.

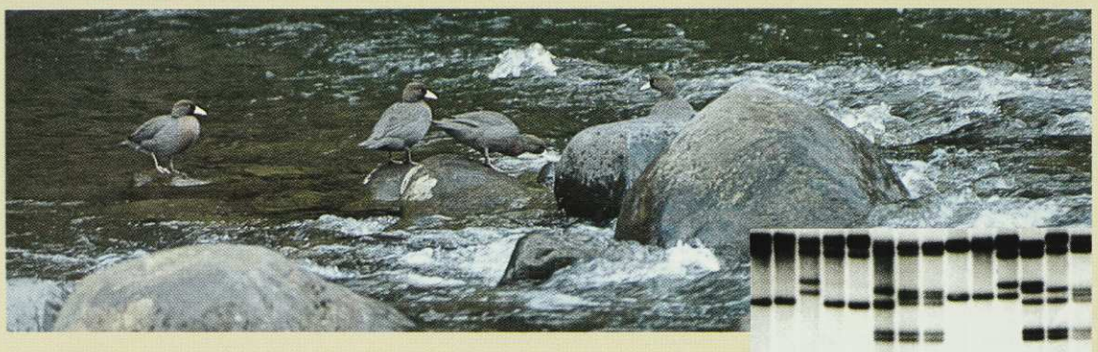
Planning and conservation staff of the Department of Conservation in the Bay of Plenty recommended opposing the clearance of the indigenous vegetation. In their view, little indigenous vegetation remained in the semi-coastal zone of the Rotorua ecological district (only 600 hectares in 5500 hectares), giving the area significant conservation value. They feared that if the forest shrubland was cleared the remaining forest vegetation on the block would be left as fragmented pockets with little habitat value. An independent report commissioned by TFI confirmed the conservation significance of this vegetation.

DoC staff also pointed out that under the New Zealand Forest Accord, which Fletchers played a leading role in negotiating, Tasman Forest Industries could not clear the forest shrublands.

Unfortunately, DoC's Regional Conservator, Chris Jenkins, under pressure from Tasman and the block's Maori owners, agreed to the clearance. In his defence, Jenkins says he reminded TFI of the need to consult with Forest and Bird under the terms of the Forest Accord.

TFI chose not to consult and bulldozed aside the regenerating forest. Forest and Bird has since commenced discussions with Fletchers and the New Zealand Forest Owners' Association over the clearance, which is the most significant reported breach of the Forest Accord since it was signed in 1991. — *Kevin Smith.*

'Fingerprinting' the blue duck



GORDON ELL, BUSHFILMS

MASSEY UNIVERSITY

DNA 'fingerprints' of New Zealand blue ducks. Such molecular genetic analysis of blood samples can establish parentage and relationships among birds as surely as it does between humans.

Blue duck populations may not always be limited to the territory where they are born, according to Dr Tania King of Massey University. DNA analysis of birds in the central North Island reveals some movement, between some rivers with too many birds, and those with spare habitat.

Just as in human paternity cases, the process of DNA 'fingerprinting' can reveal the truth about the ancestry of animals. Research at Massey University reveals that DNA can tell a lot about what New Zealand's wildlife species are doing.

With the secretive blue duck, for example, DNA analysis can reveal which duck has mated with another, and which ducks are related to one another. This provides information from which to deduce how far individuals are moving and where they are going.

A recently completed genetic study has tried to answer some basic questions about the movement patterns of blue duck. Such questions and many others can be answered (to some degree) by looking at patterns of variation in DNA.

The blue duck is a native species which lives on fast flowing rivers. They are territorial and it is generally believed that fledglings set up new territories not far from their parents. Previous genetic studies have shown that blue ducks tend not to move between North and South islands or between river systems, but scientists don't know to what extent they are moving between geographically closer rivers.

The primary issue was to establish where new recruits to a population were coming from. Do some birds move between populations? Are some rivers acting as 'sources' and others as 'sinks'? 'Source' populations are those whose production is higher than the river can accommodate, causing birds to move further afield in search of a territory. 'Sinks' on the other hand, are unable to produce enough new fledglings to keep the population going and rely on input from elsewhere. Populations can be at either extreme of these two situations, or somewhere in between.

Individual blue duck from four different rivers in the central North Island — Manganuiateao, Whakapapa, Whanganui and Tongariro — were genetically examined in a joint effort between Massey University, ECNZ which provided funding, and the Department of Conservation which coordinated blood sampling.

Perhaps the most interesting discovery was that not all populations are behaving in the same way. Populations from the Manganuiateao, Whakapapa and Whanganui rivers (all a continuation of the same water system) were found to be genetically very similar. If two individuals from within a river were compared, their DNA revealed levels of similarity not much lower than that expected between parents and their offspring, or between brothers and sisters. From this it seems that the blue duck populations on the Whakapapa, Whanganui and Manganuiateao rivers are more likely to be self-sustaining. If there is movement into or out of those rivers, it is not happening over large distances.

The Tongariro population of blue duck is a different story, however. Individuals from this population are much more genetically variable. This suggests that the Tongariro river is likely to have recruited birds from further afield than do the Whakapapa, Whanganui and Manganuiateao rivers.

This finding is important for the management of blue duck populations. It was previously thought that there was little migration among river populations, and that birds fledged on a particular stretch of water would not move far from it. The Tongariro result, however, clearly shows that this is not the case for all populations.

The Tongariro population is probably acting as a 'sink', relying on birds from elsewhere to sustain its population. While scientists cannot say how productive the Tongariro population is, it seems likely that because birds are moving onto the Tongariro river from further afield, such 'immigrants' may well be an important factor in the long-term viability of the population. For this reason, authorities must be aware that the success of one river population could depend upon the success of a number of other populations, and that no single population can be considered in isolation.

A wide range of molecular genetic techniques are being used in the Molecular Ecology laboratory at Massey University to study many aspects of bird populations. These include genetic sexing of both living and extinct birds (using for example, kakapo eggs and museum skins, or moa bones), and the mating patterns among takahe and hihi (stitchbird). — *Tania King*

DAVID MEDWAY

Endangered bird breeds in Taranaki

The breeding range of the endangered New Zealand dotterel has extended southward with reports of a pair breeding in Taranaki. Formerly restricted to northern New Zealand, with another subspecies on Stewart Island, the birds were observed and photographed by David Medway a former branch chairman of North Taranaki Forest and Bird.

At its various breeding grounds, on sandy beaches in the north, nesting attempts suffer from the vagaries of high tides, predatory animals, and interference by humans. Nesting pairs are often unable to raise their young successfully, and this has been the position at Taharoa Beach, near Kawhia in the King Country, until recently the most southerly nesting area on the west coast of the North Island.

During the past few years, two New Zealand dotterel have been seen regularly on and near a sandspit at the mouth of the Pungaereere Stream just south of Cape Egmont. The birds were obviously resident on this bit of coast and not mere transients. A third New Zealand dotterel was first seen with them in April last year. On various occasions the general behaviour of the original birds indicated they might be breeding in the area, but there was no confirmation until this summer.

Breeding distribution of the endangered New Zealand dotterel has extended southward into Taranaki with the confirmation of breeding at the mouth of Pungaereere Stream just south of Cape Egmont. Nest scrape on the sand, and the successfully raised chick, are photographed by David Medway, a former chair of North Taranaki Forest and Bird.

In early December, a New Zealand dotterel nest with three eggs was found near the tip of the sandspit. When visited again, a few days later, there was no trace of the nest scrape and only one egg, apparently deserted. Branches of wood in the immediate vicinity appeared to have been disturbed, perhaps by an unusually high tide.

Shortly afterwards, however, two very agitated dotterel were seen about 400 metres away. The small chick with them ran under a log. While it was not seen again till mid-January, the young bird was then found actively feeding with one of the adult birds on a nearby sandy area. A week later it was flying and difficult to distinguish from its parents.

Four New Zealand dotterel were seen in the area when last visited. – *Source: David Medway.*

The total population of New Zealand dotterel is estimated at around 1400 birds.

Neighbourhood watch for birds

Country people have a reputation for caring about their neighbours — yet in the rural community of Kaharoa, north of Rotorua, this goodwill is not just confined to the human population.

A couple of years ago a local forester, Peter Davey, learned that a group of kokako living in the nearby forest was in serious trouble. Concerned that the Department of Conservation was unable to allocate funds for pest control, he consulted his partner, Rachael Vellinga.

'Well, I guess that means we'll need to save them ourselves,' she replied. So began a remarkable community effort to help a precious part of the Kaharoa neighbourhood.

A long time proponent of forest and bird conservation, Peter Davey thought it would be straightforward, undertaking pest control in the nesting area. Inherently practical by nature, he swung into action, but soon encountered pitfalls.

'It's not just a matter of going out and setting a few traps. We needed to use poison which involves money and lots of red tape,' he says.

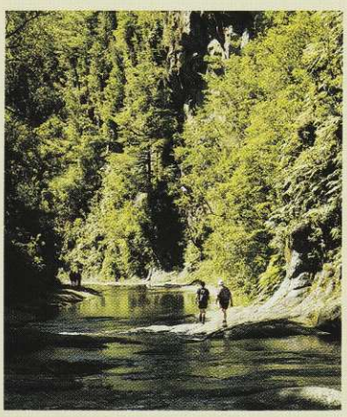
The remaining kokako are concentrated in 300 hectares of bush known as Aislabie's Block, purchased by the Department of Conservation after a campaign in the 1980s by Forest and Bird.

The couple needed expert help, and that's when they encountered Dale Williams. Not only is Dale a local, fortunately he is also a wild animal management officer for DoC. Familiar with pest control operations, and resource consent requirements, he was able to fulfil the technical needs of the project. Once local residents heard about the problem, they were keen to help. A Trust was formed, headed by Peter Davey, and proposals put forward for possum, rat and ferret control.

'At first there was some opposition to using 1080 poison, but when we explained how it would be applied and what the options were, people soon came round,' he says. Through educating and informing the community, a tremendous reservoir of manpower and support has been tapped. 'I'm really amazed at the response. We never expected this level of local support. Not only has it enabled us to protect this block, it encourages local farmers to consider the bush on their own land as well.' By joining forces to make the neighbourhood a safer place for kokako, locals have boosted other bird life and the ecosystem in general.

Going from strength to strength, the Kaharoa Kokako Trust has gained funding from private donations, as well as from State Insurance, in association with the Kokako Recovery Programme. Also, they recently received an award for their efforts from the Rotorua District Council, along with a cash sum funded by Transpower.

After two seasons of pest control, at minimal cost using voluntary labour, monitoring has shown heartening results. As Peter Davey points out, however, 'This must be kept up forever or it's all for nothing. If these birds aren't helped, they disappear.' Through involving the whole community, young and old, the long-term success of this project seems assured. — *Margaret Richardson. For more information contact Peter Davey phone/fax (07) 332-2299.*



MARGERET RICHARDSON

Kokako country near Kaharoa, Rotorua district where a community trust is undertaking predator control to protect the birds. The area, known as Aislabie's Block, was purchased by the Department of Conservation in the 1980s after a campaign by Forest and Bird. Deep gorges almost surround the block forming a natural barrier against predators.

Climbing trees in Pureora — yet again

Veteran conservation campaigner Stephen King (on left) marked 20 years since his 'tree sit' to save Pureora Forest by climbing this totara again. He wants more native trees planted to reunite the two remaining blocks of forest. He claims the proposed corridor could be planted and fenced using funds from milling pine trees now maturing on the linking land.

When veteran conservation campaigner Stephen King returned to Pureora to mark 20 years since his landmark tree-sitting protest to save the forest, he climbed the trees again. This climb was another call for action to reunite the two surviving blocks of Puereora Forest by replanting native trees in a linking corridor.

The largest rimu, matai and totara grow on the ash soils of the Volcanic Plateau. These, the most splendid podocarps in the North Island, have been heavily logged and most of their forests converted to farmland or pine forest. Only two forests remain, Whirinaki, south of Rotorua, and Pureora, west of Taupo. Both forests were rescued from clear felling after conservation battles, and both are ragged entities, bounded and pierced with exotic pine forests.

Pureora is divided in two by pine forest and farmland. It has long been the aim of Stephen King, and other conservationists, to reunite the forest segments and provide an ecologically viable future for Pureora's biodiversity.

This vision was supported by the former Prime Minister Jim Bolger, and would involve replanting and predator-fencing a 6000-hectare corridor between the northern and southern blocks. The project could be financed by the imminent harvest of the pine forest within the corridor.

Stephen King argues the vision must be rekindled. Without it, the margins of Pureora's remnant forests will wither, and their outstanding diversity of wildlife will shrink under the onslaught of weeds and animal pests.

As Stephen says, 'If the Government is serious about saving biodiversity, this is the place to start .... Such a project would cost a fraction of Te Papa's bricks and mortar and would be of inestimable and enduring worth.' — *Ann Graeme.*

Ann Graeme writes about podocarp forests in her In the Field feature on page 38 of this issue.

Monitoring lizards on the Chickens

Getting rid of rats has been a boon for lizards on two of the Hen and Chickens Islands off Northland. A week-long lizard monitoring programme this summer has shown some encouraging results.

Both Lady Alice and Coppermine Islands, which form part of the northern Chickens group, are now rat free and monitoring the response of the lizards to these removals is now entering its sixth season.

The islands are managed by the Department of Conservation's Northland Conservancy, with one of the main objectives being to restore ecological communities and maintain a predator-free status. The reintroduction of some species of lizard, and monitoring the response of existing populations, are important parts of this programme.

Much of the work on the Chickens is being guided by offshore-island restoration 'guru' Dave Towns who works for DoC Science and Research in Auckland. The lizard monitoring programme is managed by Whangarei-based conservation officer Richard Parrish.

Pacific rats *Rattus exulans* were removed from Lady Alice Island in 1994 and from Coppermine in 1997. One beach site and two forest monitoring sites have been set up on each of the islands to measure the response of the lizards, with Coppermine being used as the control until the rats were removed.

Species found on the islands include Duvaucel's Gecko *Hoplodactylus duvaucelii,* moko skink *Oligosoma moco*, ornate skink *Cyclodina ornata*, shore skink *Oligosoma smithi*, Suter's (or egg-laying) skink *Oligosoma suteri*, and the copper skink *Cyclodina aenea*. A number of lizards found on the Chickens Islands are no longer found on the mainland.

While the lizard numbers will take some time to recover in the forests, DoC staff have been encouraged by what is being caught on the beaches. During the December monitoring 27 lizards were caught on the beach on Lady Alice Island, the best result so far according to Richard Parrish.

Several species of lizards have been re-introduced onto Lady Alice and Coppermine. The animals released to date include the Pacific gecko *Hoplodactylus pacificus*, Mokohinau skink or marbled skink *Cyclodina 'oliveri'*, and McGregor's skink *Cyclodina macgregori*. These have been taken from some of the smaller Chickens Islands and Sail Rock off the Hen (Taranga) where the species have managed to survive because these places have remained free of rats.

The assumption behind these re-introductions is that these species would all have lived on the islands at some time in the past but disappeared as the result of the arrivals of humans and rats.

The most recent re-introduction took place in March 1998 when 30 Mokohinau skinks from Muriwhenua Island and 39 McGregor's skinks from Sail Rock were released into two separate areas on Lady Alice Island.

Richard Parrish believes it's particularly important to note that work on the islands is not just focusing on threatened species, but is also looking at the restoration of plant and animal communities. — *from Wanda Vivequin, DoC Northland.*

WANDA VIVEQUIN/DEPARTMENT OF CONSERVATION

Since rats were removed from Coppermine and Lady Alice islands, off Whangarei Heads, lizard populations have recovered and new species introduced. The Department of Conservation recovery programme is focussed on restoring the island communities, not just threatened species. Here Richard Parrish of DoC Northland checks one of the pitfall traps (a sunken tin) on Lady Alice Island.

New natural history galleries in Auckland

K. PFEIFFER, AUCKLAND WAR MEMORIAL MUSEUM

Casts of dinosaurs which inhabited prehistoric New Zealand loom above one of the new natural history galleries at Auckland War Memorial Museum. This 'origins' gallery is one of five, which also includes land, oceans, and human impacts. A gallery displaying Maori perspectives on the natural world is still under construction.

A new kind of museum 'experience' featuring ecological displays with specimens in their natural environment is emerging at the Auckland War Memorial Museum. Four new galleries are already open with a fifth, about Maori and their knowledge of natural history, still in preparation.

The new displays are presented in galleries devoted to New Zealand's origins, life on land, ocean life and human impacts.

In the first, giant dinosaurs stand above fossil birds, animals and plants; in the land gallery ecosystems, based on Auckland region and beyond, display animals and plants in their natural settings; the oceans include beaches and underwater reef systems; the human impacts feature the onslaught of introduced animals and plants, with a conservation perspective.

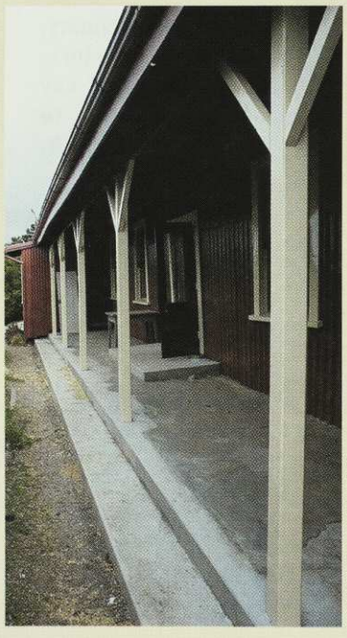
Among the environments is the kauri forest, represented by a cast from a kauri tree which stands four-storeys high in an old stairwell, with a 24-hour cycle of forest life presented every eight minutes. A South Island mountain scree slope and life in a beech forest are also parts of the land gallery. A wetland is modelled on the Forest and Bird Society's Matuku Reserve at Te Henga, West Auckland (see Branching Out this issue).

In the oceans gallery, a mangrove forest and an open beach are reproduced as the setting for common shells, appropriate birds and beach life. Also among the marine collections are reproductions of shore platforms and cliff faces showing the environment of the inner harbour, complemented with live specimens in rock pools including one covered by glass over which visitors walk. A reproduction of an underwater cliff at the Poor Knights Islands is the background setting for ocean-dwelling species of fish and plants.

A librarian runs a resource centre within the galleries, so people can make enquiries about things they have found, utilising library books, computers and type specimens.

The new natural history galleries are part of the total refurbishment of Auckland War Memorial Museum which is due for completion by the year 2000. Galleries are designed to be 'collections rich', each featuring a broad range of specimens. When reconstruction is complete it is expected the museum will present a greater area of galleries than Te Papa. — *Gordon Ell.*

Heritage building in Taranaki national park



GORDON ELL, BUSH FILMS

The historic Camphouse at North Egmont in Egmont National Park has been restored at a cost of $216,000. The building was prefabricated in Australia in 1855 as a military barracks for the Taranaki Wars and was re-erected on the mountain for tourists in 1891-92. Accommodation is available for 32 visitors.

An historic lodge on Mount Taranaki has been restored at a cost of $216,000. Known as The Camphouse, the building is the oldest accommodation building in any national park in New Zealand but its days go back even further. The building originally housed colonial soldiers serving in the Taranaki Wars, at Marsland Hill, New Plymouth. It has a Category 1 listing with the Historic Places Trust for a number of reasons.

Prefabricated in Australia it is a very early example (1855) of a building made from hand-wrought corrugated iron. After its use as a military barracks the building was used in 1874 to house immigrants.

It became the Camphouse when shifted to North Egmont in the summer of 1891-92, in the pioneering days of tourism on the mountain. The initiative was led by the Taranaki Scenery Preservation Society which lobbied the Government for £67 to relocate the building. The Society later played a major role in the creation of the park.

The Camphouse is close to North Egmont Visitor Centre on the slopes of Taranaki and can accommodate 32 people in bunks. It now has an electric kitchen, flush toilets and hot showers, with locker and drying rooms to come. It offers budget accommodation to backpackers and tour groups.

Conservation on the world-wide web

Over the last 10 years conservationists across the globe have spent less and less time in the field observing and enjoying nature and more time at desks using their computers to defend nature. With the development of the worldwide web, this trend has escalated and some say has become an unhealthy computer obsession. Computers certainly aren't the most environmentally friendly invention, with their built-in obsolescence and massively increasing collective electricity consumption. They are, however, an amazing tool for finding and sharing information, and for communicating with conservationists and scientists across the globe. Now, at the 'click of the mouse', you can rapidly research an environmental issue, monitor media stories on the environment, check progress on conservation campaigns almost anywhere in the world, then lobby your local MP by email.

The Internet is a boon for activism as it encourages interaction and opens up communication channels between people and organizations not previously possible. In New Zealand, many submissions on the Government's West Coast forest logging proposals were made by email. People could readily check out the proposals then click over to the Forest and Bird web site and access the Society's views and submissions on the subject. Forest and Bird provided an email submission form on our web site making submission writing far less of a chore. Children, too, can benefit, with fact sheets on endangered species readily available from Forest and Bird or the Department of Conservation (www.doc.govt.nz). Here are some interesting sites to visit on the web:

● For native bird calls visit www.bigjude.com/BIRDSONG/Goodmorning.html. At the click of a button you can hear the dawn chorus on Little Barrier or the calls of kakapo, tui, kiwi, morepork, saddleback and others.

● If South Island high country conservation interests you, try www.publicaccessnewzealand.org. It's an interesting site with information on the high-country pastoral-lease tenure review process — also useful maps of the high country leases and detailed information on issues such as the Queen's chain and public roads.

● Fired up and want to send off an email to the Minister of Lands encouraging him to create high-country conservation parks? Then get his email address from the main government site www.executive.govt.nz. From here you can click on to the Prime Minister's statement on goals and priorities for 1999-2002. You will be surprised and pleased to learn that one of the key goals is to 'safeguard indigenous biodiversity by protecting habitats and controlling introduced pests'.

● Want to see how other countries cope with alien weeds and pests? Key in 'alien pests' into your search engine and discover sites such as www.botany.hawaii.edu/botany/news/silent.htm. Read horrific tales of Hawaii's battles to prevent the arrival of even more pests which 'threaten our environment, lifestyle and livelihood'.

● For a seriously challenging (and depressing) view of the future, try www.dieoff.com. Hosted by cyberworld's most well known eco-activist, Jay Hanson, this site contains absorbing material on subjects such as the end of cheap oil, the sustainability of human society, and global warming. For the latest on global warming, Britain's Hadley Climate Centre has an important recent report (www.meto.gov.uk/sec5/sec5pg1.html) and the NBC's page provides a comprehensive overview (www.msnbc.com/news/GLOBALWARMING_Front.asp).

● Looking now for an influential quote for your next letter to the Prime Minister? Try www.princeofwales.gov.uk/speeches where Prince Charles's speeches on the environment can be found. In one of them he gets inspiration from 'a short walk in the old growth forests of New Zealand's West Coast'.

● For some hopeful images of nature, to reassure yourself that beauty and wonder survive still, go to www.africam.com for updated images of a water hole in a South African nature reserve. If you are lucky you may see 'live elephants, monkeys, buffalo, giraffes or antelopes'. Try the highlights if you don't strike it lucky.

● End your web browsing with a visit to Forest and Bird's site at www.forest-bird.org.nz and click through to www.kiwirecovery.org.nz for a great kiwi screen saver and a kiwi recovery email postcard.

— Kevin Smith, conservation director, Forest and Bird.

Rangitikei tree daisy is now third-rarest tree

An endangered tree daisy found in and around Taihape has become the country's third-rarest tree. Recent research shows the North Island species of tree daisy, now known as *Olearia gardneri*, is different from its South Island relative, *Olearia hectorii*, with which it was formerly confused.

The 'tree daisy' has masses of sweetly scented daisy-like flowers which cover the tree in small bunches in early summer. It can grow up to six metres in height and live for 150 years. It is also deciduous, losing its leaves in winter, which is very unusual for a native tree.

A Department of Conservation scientist, Colin Ogle, says there are fewer than 60 known *Olearia gardneri* in the wild, and only about nine are protected. There are probably six in the Paengaroa Scenic Reserve and three in Ngaurukehu Scientific Reserve.

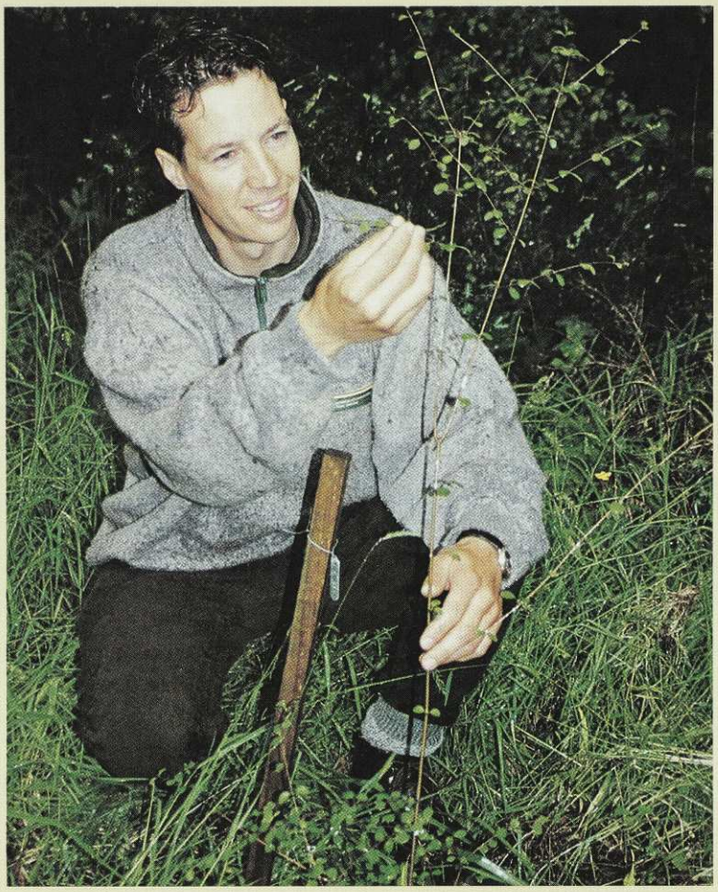
The tree which tops the country's rare list is *Pennantia baylisiana* in the Three Kings Islands, of which there is only a single female. Next on the list is *Metrosideros bartlettii*, or white rata, which number 30.

Now the tree has become New Zealand's third rarest, its position in the wild has become critical. Much of its future lies in the hands of private landowners and DoC is keen to talk to them about protecting the trees. Half of the total *O.gardneri* population is on private land in the Hautapu Valley between Paengaroa and Ngaurukehu, with another 17 or so on private land in the Turakina Valley.

Until 1973, the trees were also growing in the Taihape Scenic Reserve, but sadly, are now extinct there after being smothered with Old Man's Beard. It became extinct in Hawkes Bay some time after 1958. The three that remain in the Wairarapa are on private land and have been fenced with DoC's help.

'As a stop-gap measure, we've planted 16 plants at Paengaroa over the past two years, grown from cuttings from nearby trees, and they seem to be doing well. However, although the cuttings came from some 20 wild plants, there was a poor strike rate and we don't know how much genetic variability there is amongst those that survived,' says Colin Ogle.

O. gardneri likes fertile river flats, generally a much sought-after type of land for farming. Land clearance has undoubtedly contributed to the critical status of this plant, while grazing, coupled with loss of habitat, prevents new seedlings from establishing. *– Jo Priestley, DoC, Wanganui*



JO PRIESTLEY, DEPARTMENT OF CONSERVATION

New Zealand's third rarest tree is now this Rangitikei tree daisy. According to the Department of Conservation, there are fewer than 60 wild plants of Olearia gardneri, *recently identified as different from the South Island tree daisy* Olearia hectorii. *Here a DoC conservation officer, Wayne Beggs of Palmerston North, examines a cutting-grown plant at Paengaroa.*

'Loathsome' wild vine appears in Rangitikei

COLIN OGLE, DEPARTMENT OF CONSERVATION

A new weed threat has appeared mysteriously in a remote section of Rangitikei in the central North Island.

White bryony *Bryonia cretica* ssp. *dioica* has not been found anywhere else in New Zealand, and its discovery in and around Makino Scenic Reserve in the middle reaches of the Rangitikei River is a worrying new record. It is mentioned in Culpeper's *Complete Herbal* (17th century) as having berries 'of a very loathesome taste, provoking vomit' and a root with 'a sharp, bitter, loathesome taste'.

It resembles a cucumber plant, with masses of cream flowers over summer. It is fast-growing, but dies back in the autumn to a massive perennial tuber. The plant produces an abundance of small yellow to red berries, so its seed is probably dispersed by birds.

A weed expert from the Wanganui Conservancy of the Department of Conservation, Graeme La Cock, says white bryony is not known as a garden plant in New Zealand, and it is difficult to explain how it ended up in such an out-of-the-way place.

'It can be very poisonous, and even cattle won't eat it,' he says.

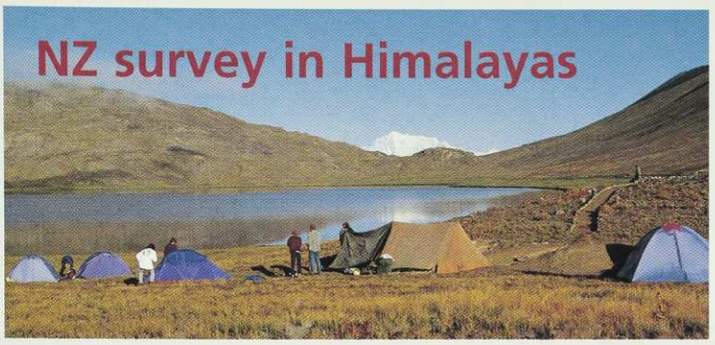
White bryony was first collected in 1991 from Makino, where there were about 20 plants. Reports from local farmers indicate it was near the reserve some 20 years before this, though. A survey last year revealed isolated plants along a three-kilometre stretch of the Rangitikei River.

'Exotic vines have a history of being among the most damaging invaders of our forests,' according to Graeme La Cock. 'Quite frankly, the last thing we need is another old man's beard.'

DoC staff are still experimenting to find the most effective way of killing the vine and more importantly its massive tuber, as the tuber has a nasty habit of resprouting after the vine has died. The success of current control work will become obvious next spring, when the plant is due to resprout. — *Jo Priestley, DoC, Wanganui*

worldwatch

NZ survey in Himalayas



JO MACPHERSON

Surveying high-altitude wetlands in the Pakistan Himalayas — a campsite of the Pakistan-New Zealand botanical expedition beside Lake Sheosar in the remote Deosai region. The peak of Nanga Parbat rises in the background.

A team of eight New Zealand conservation specialists has conducted a survey of important high-altitude wetlands in the Pakistan Himalayas. A West Coast freshwater biologist, Dr Philippe Gerbeaux, headed the team which included several staff from the Department of Conservation, a stream ecologist from the National Institute of Water and Atmosphere, two students from Tauranga Polytechnic, and two Tasmanians.

The Deosai Plains form a large wilderness area located at the north-western extremity of the Great Himalayan Range. It is a high plateau of moorland and swamp with numerous small lakes and ponds. The wetlands are fed by snow melt from the surrounding high snow-clad peaks and are drained by many rivers and streams. There are also large expanses of alpine meadows and drier stony areas. At the height of 4000 metres, summer does not begin until June when the snow melts, then many varieties of wildflowers bring colour to the undulating landscape.

The team made the journey by road from Lahore and up the Indus Valley before reaching the base camp on the plateau. Local staff of the World Wide Fund for Nature and the Adventure Foundation for Pakistan participated in the expedition. The team studied numerous wetlands and streams important to the survival of a brown bear population living in the Deosai Plains. The remnant population is being sustained thanks to the actions of the Northern Province government which declared the area a national park in 1993, and the efforts of the Himalayan Wildlife Project (HWP), a non-governmental organization dedicated to safeguarding the biodiversity of Pakistan's northern areas.

Other mammals, such as wolves, foxes and snow leopards occur in the area. Grazing by domestic stock occurs on the plateau in the summer. Some people still shoot at bears or other animals and a major task of the HWP manager, M. Abdul Haleem Siddiqui, is to educate the shepherds on the biodiversity values of the Deosai. HWP personnel have a basecamp on the plateau and stay there from June till October. Access to the plateau is regulated and access to the core zone is prohibited. These are important measures considering the increasing numbers of tourists travelling by jeep across the area.

The team has gathered some important information on plants (including algae), birds, fish and aquatic invertebrates which will help in developing a management plan for the park. The information will also help support a case to designate the area as a wetland of international significance under the Ramsar Convention. Another trip is planned in 1999 to complete some studies on fish fauna which is very abundant in the streams and consists essentially of snow-carp.

The 1998 Pakistan-New Zealand Deosai Wetland/Wildlife survey team was sponsored by Rubicon Travel Consultants, WWF-Pakistan and the Adventure Foundation of Pakistan (AFP).

— *Philippe Gerbeaux*

to save

Southern tokoeka, Stewart Island

The Kiwi Recovery Programme is sponsored by the Bank of New Zealand. For further information look on the Internet for the Kiwi Recovery web-site: www.kiwirecovery.org.nz

the kiwi
kiwi recovery discoveries

The Kiwi Recovery Programme provides both science and know-how which could help save the kiwi from extinction, says HUGH ROBERTSON.

Kiwi are in serious trouble. During millions of years of isolation, kiwi evolved a nocturnal flightless lifestyle and characteristics that equipped them well to escape from avian predators. But, like many other native birds, they are unable to cope with the motley collection of predatory mammals brought here by people. Loss of forest habitat, combined with carnage by introduced mammals, has seen kiwi populations collapse from tens of millions a thousand years ago to about 70,000 today.

The Kiwi Recovery Programme was launched eight years ago to try to save our national bird from extinction. The aims were three-fold:

- to find out about the numbers, distribution and genetic variation of kiwi;
- to find out what was threatening kiwi populations;
- and to start to manage the recovery of the most endangered populations of kiwi.

Forest and Bird is an active partner in this programme alongside the Bank of New Zealand which funds much of the research, the Department of Conservation, and the many Kiwis who help with management or who make donations to the programme. The results are considerable progress in understanding the ecology of the various species of kiwi, the threats they face, and the development of heartening management techniques which could arrest the birds' free fall to extinction.

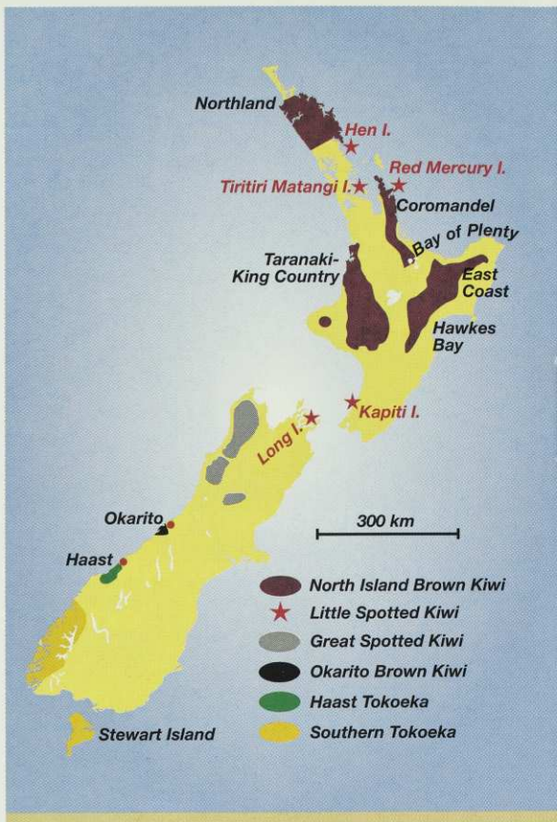
In the early 1990s, we established where kiwi still survive. The news was worse than expected – some important populations had recently collapsed. Pat Miller and Ray Pierce documented the almost complete disappearance of brown kiwi in southern Northland since the 1970s, even though abundant habitat remains. Major declines were also apparent in the Waikato, King Country, Bay of Plenty, East Coast, Ruahine Ranges, West Coast and eastern Fiordland.

Kiwi scientists pooled data from their mainland studies and found that adult mortality averaged seven to eight percent per year, while 'recruitment' (new birds) was only one to two percent each year. The sum of these figures meant that mainland populations were declining at an alarming six percent per year, which equates to a halving in numbers every decade. At this rate of decline, the kiwi population on the mainland would have been close to five million birds when Forest and Bird was established in 1923, but another 75 years hence, there will be a paltry 600 birds left, probably living as widely separated and lonely individuals.

When the programme started, the main threats to kiwi were not well known, apart from the obvious dangers of habitat loss, possum traps and dogs attacks.

ROGAN COLBOURNE

ROGAN COLBOURNE



Kiwi Recovery Programme has identified six varieties. Top left, great spotted kiwi; above, North Island brown kiwi. At right, top, little-spotted kiwi; middle, Okarito brown kiwi; bottom, Haast tokoeka.

Kiwi were hunted by Maori and their dogs, and fires swept through large parts of the drier eastern side of both main islands in pre-European times. Habitat loss accelerated rapidly with settlement by Europeans as they carved farmland out of prime kiwi habitat. Over 80 percent of the lowland forest standing in 1840 has been lost, and much upland forest has also gone.

Potential and existing kiwi habitat across the country is still being cleared for farming and forestry. Breaking in a farm represents a permanent loss of habitat for kiwi, but plantation forestry may provide replacement habitat. The main effects of forest or scrub clearance is to destroy nests. Adults may also be killed under roller-crushers or bulldozers, and the social structure of the local kiwi population is disrupted as refugees move into the territories of neighbouring birds

Kiwi eggs take a long time to hatch, and some kiwi varieties leave them unattended for long periods of the night while the male is out feeding. About 50 percent of eggs fail to hatch. This may be because of accidental breakage (perhaps caused during disputes over burrow ownership with possums or other kiwi), microbe attacks, predation, abandonment or infertility. On the mainland, the worst predators are possums, mustelids and kea. Weka take many little spotted kiwi eggs on Kapiti Island, but numbers of both species have increased on the island during the 20th century, and our work shows that little spotted kiwi are thriving, and are close to the carrying capacity of the island.

Once the egg stage has been successfully traversed, the kiwi enters the most dangerous part of its journey to adulthood. Kiwi chicks hatch as miniature adults, fully feathered and able to feed themselves. In some varieties they become completely independent at two to five weeks old. In the case of the southern tokoeka on Stewart Island, however, the first chick hatched continues to return to the nest while the next egg is incubated, and the chicks remain in the family group for up to seven years.

On the mainland, an appalling 95 percent of young kiwi die before they reach six months old. Most fall prey to stoats or cats. Once juveniles reach a weight of about one kilogram at about six months old, however, they become safe from these voracious predators. This discovery is behind the techniques adopted by Operation Nest Egg which takes eggs from the wild and raises chicks in captivity until they are big enough to defend themselves. (See box, page 18.)

Kiwi have the potential to live to 30-40 years of age, but mainland birds face many threats. The kiwi's chest is fragile as it lacks a sternum and wing muscles to protect the lungs and so a dog can kill a kiwi just by picking it up. The kiwi has a very strong scent and dogs can quickly learn to find birds. In one tragic incident at Waitangi State Forest in 1987, a German Shepherd may have killed up to 500 kiwi — or 50 percent or the resident birds — during a six-week rampage. Unfortunately this was not an isolated incident; between 1990 and 1995, there were 135 reports of kiwi being killed by dogs in Northland, including several other 'massacres'.

Although dogs are an obvious problem, ferrets probably pose a greater threat to adult kiwi in most parts of the country. These large mustelids were introduced to New Zealand in the 1880s in an unsuccessful bid to control rabbits. Despite being a voracious killer of native animals, they may legally be kept as pets, and are farmed for their fur.

Fitch-farming was popular in the 1980s, but when the fur market collapsed many unwanted animals were released to the wild. These ferrets probably went on a killing spree and to compound matters, they were released into parts of the country where ferrets were rare or absent. For example, in the mid-1980s, about 200 kiwi lived in a reserve near Tangiteroria in Northland, but ferrets appeared in the area in 1987 and by 1994 the kiwi population had crashed to about 30 birds. In central Northland, a male ferret killed three of 10 radio-tagged male kiwi in a 35-hectare bush

Six varieties, four species

An early result was the discovery, by genetic studies in 1993, that there are at least four, not three, species of kiwi. What had been known earlier as the brown kiwi through the country, was found to be two or more quite distinct, although physically similar (cryptic) species. They are now known as the brown kiwi in the north and tokoeka (their Ngai Tahu name which literally means 'weka with a walking stick') in the south.

The split is not at Cook Strait, but between Okarito and Haast on the West Coast. The Okarito brown kiwi, or rowi, of South Okarito forest is more closely related to the brown kiwi of the North Island than to those living less than 200 kilometres away near Haast, even though they look more like their southern cousins.

Among tokoeka, the birds living in the mountains behind Haast are genetically and physically different from those in Fiordland or Stewart Island, being rufous in colour, with a down-curved bill. They are now called Haast tokoeka, while the others are called southern tokoeka.

The great spotted kiwi and little spotted kiwi complete the kiwi family. (The current distribution of the six varieties of kiwi is shown opposite.)

The path to extinction

Estimated kiwi population figures, projected from the year of Forest and Bird's foundation and its 1998 jubilee, show the birds will be functionally extinct on the mainland in another 75 years. The figures track the effect of a 5.8 percent annual decline in mainland populations. The offshore island populations, protected from mustelids, are stable for the North Island brown kiwi and the southern tokoeka. Only the number of little spotted kiwi (already extinct on the mainland) shows some improvment on predator-free islands.

	1923	1998	2073
North I Brown Kiwi			
North I	2,640,000	30,000	340
L Barrier I	1000	1000	1000
Okarito Brown Kiwi			
South I	11,000	130	1
Haast Tokoeka			
South I	18,000	200	2
Southern Tokoeka			
South I	530,000	6,000	68
Stewart I	20,000	20,000	20,000
Great Spotted Kiwi			
South I	1,760,000	20,000	226
Little Spotted Kiwi			
South I	3000	0	0
Islands	50	1100	1500
Mainland	4,962,000	56,330	637
Offshore islands	21,050	22,100	22,500
Overall	**4,983,050**	**78,430**	**23,137**

ADAM LEAVESLEY

C. RODERICK

Operation Nest Egg

Operation Nest Egg was established as an experiment to see if the vulnerable stages in the life history of some kiwi populations could be bypassed. The idea is to protect the eggs and young birds while they are at risk from predators. Operation Nest Egg consists of taking eggs from wild kiwi, incubating them in artificial incubators, and rearing the chicks in captivity or on predator-free islands. The birds are released back into the wild once they are big enough to defend themselves against cats and stoats.

To find out more about kiwi incubation so that conditions could be replicated in incubators, dummy eggs with internal temperature sensors were put under wild incubating North Island brown kiwi. It was found that the dummy egg was rotated through an average 180 degrees per day. During the last three weeks of incubation, real eggs are not turned as much: because the increasingly large airsac causes an imbalance in the weight of the egg, when kiwi try to turn their eggs at this stage, they end up only rocking them.

By applying these findings to eggs in incubators, the success rate for artificially hatching eggs has been steadily improved. In the last two years at Auckland Zoo, 21 out of 24 fertile eggs from Northland were hatched. The ages of the eggs when collected was between 15 and 75 days. All chicks survived to the release weight of one kilogram. Raising chicks is now very straightforward. They are put onto an artificial diet within two weeks after enticing them to first feed on earthworms.

The first research steps to getting these birds back into the wild have been to protect them from predators, and from the territorial behaviour of other adult kiwi during reintroduction, to see if they could simply cope with the transition from captivity to the wild.

A predator-free and kiwi-free island (Motukawanui in the Cavalli Islands group) was chosen as the first introduction site. Ten captive-raised kiwi were released with transmitters and their progress followed. Not only did they cope well right from the start, the two oldest pairs have also bred successfully. After this achievement, 25 juveniles were returned to the Northland mainland where their eggs came from. Deaths have since occurred from a ferret (it killed at least four wild adult kiwi at the same time), dogs, illegally set possum traps and one bird fell into a deep hole. Just over half of the re-introduced birds are still alive; the oldest have been in the forest for almost two years and are starting to pair with wild kiwi.

A Tongariro Operation Nest Egg programme has had even more success with 13 juveniles released into the Tongariro Forest with no known deaths. One kiwi had so much stamina it twice swam across the Wanganui River and ended up 12 kilometres from its release site! At Lake Waikaremoana four released kiwi settled in well. These releases have been small-scale while we are learning the techniques.

The greatest optimism is caused by releases at Okarito. Birds there are more problematic in that, unlike North Island brown kiwi, adults will not tolerate new juveniles in their territories and will promptly kill them. Early losses have been overcome through making the young kiwi more 'bush-wise'. Rather than raising the birds in pens, the chicks are released onto a small predator-free island in the Marlborough Sounds where they learn to interact and feed in a natural way. As a consequence, these youngsters when returned into Okarito are settling back into the forest much more successfully. Twenty-five juveniles via Operation Nest Egg have raised the critically endangered Okarito population by about 16 percent in three years.

Operation Nest Egg has been highly successful in showing that captive-bred kiwi can cope with the transition back to the wild. Not a single released bird weighing over a kilogram has been preyed upon by a stoat or cat. Once kiwi have been put back into the wild, however, that population must still be managed in terms of advocacy and pest control: this is particulary important where kiwi populations are near human settlements. – *ROGAN COLBOURNE, Science and Research Unit, Department of Conservation, Wellington.*

The progress of young kiwi through the stages of Operation Nest Egg. From top: a dummy egg and monitor to find out more about kiwi incubation; egg hatching after 75 days artificial incubation; day-old kiwi chick; sub-adult, North Island brown kiwi ready for release; artificially raised bird after six months in the wild.

ROGAN COLBOURNE

patch over a two-month period and two other nearby birds were killed about the same time — this ferret was trapped and the mayhem ceased. Serial killing has also been recorded at Te Urewera National Park.

Although the odd kiwi is killed by possum, their main impact is indirect, when kiwi are accidentally killed by possum traps or poison. Many injured kiwi have been handed to veterinarians or bird rescue centres with damaged legs or bill as a result of an accidental encounter with a trap, and many others are killed outright or escape minus toes or a foot. During the peak of possum-trapping in the late 1970s and early 1980s, 35 percent of kiwi in some sites had signs of gin-trap injuries, and undoubtedly many others died from their injuries. Possum-trapping has lessened as fur prices have dropped yet a steady flow of injured kiwi are still handed in.

The Department of Conservation has taken the lead by using only soft-jaw traps, and by raising them over 70 centimetres off the ground in parts of the country where there are ground-dwelling birds. The traps are set on branches or treeforks, on sloping boards, or on small platforms attached to the tree trunk. Kiwi sometimes eat cyanide baits on the ground and so bait stations should be raised well off the ground. Less than five percent of little spotted kiwi on Kapiti Island were accidentally poisoned during the aerial application of brodifacoum to eradicate rats. (The surviving birds bred well and quickly made up their losses as most of the competing weka were temporarily removed from the island). Other recent research has shown that adult kiwi have not been affected by similar aerial operations using 1080 poison, or when brodifacoum baits are repeatedly placed in bait stations for several years. In these studies, chick survival in the poisoned areas was far better than in untreated blocks nearby, because predator numbers were reduced, allowing the kiwi populations to start to recover.

All kiwi face natural hazards such as disease, getting tangled in tree roots, being hit by falling branches, drowning, falling into holes, or being 'beaten-up' by another kiwi. They also face a number of man-made hazards such as falling into cattle stops, swimming pools or cowshed effluent ponds. Others are hit by cars, shot in mistake for possum, or killed by bulldozers or roller-crushers.

Now that the various threats are better understood, the recovery programme has moved towards experimental management to recover the most endangered populations, and to restore depleted kiwi populations. One experimental technique used to overcome the vulnerability of eggs and young chicks is the programme called Operation Nest Egg. Eggs and/or young chicks are removed from the wild to the safety of captivity, or a predator-free island, until they are able to cope with stoats and cats. (See box opposite.) Successful management of predators, through intensive trapping or poisoning, has greatly increased chick survival, and allowed selected populations to start to recover in Northland and at Lake Waikare-moana. This work has been on a small scale, protecting birds in areas ranging from 40 hectares to 700 hectares, but the next step is to try to improve the cost-effectiveness of management, to develop better pest control techniques, and to increase the scale of operations.

Kiwi are good indicators of environmental health, and management to benefit kiwi also helps many less charismatic species of native wildlife. Forest and Bird's Kiwis for Kiwis campaign, based on developing eleven management sites of 10-20,000 hectares for kiwi throughout New Zealand, is ambitious with current technology but would certainly go a long way towards ensuring that the birds were prospering in the natural ecosytems on the mainland where they have been for tens of millions of years.

Many kiwi still survive on private land or close to people; so changing the attitudes and behaviour of people is important for the survival of these birds. The recovery programme has targeted such areas to raise awareness about the threats kiwi face and the actions people can take to maintain kiwi populations. Some communities, such as in the Bay of Islands and Coromandel, have 'adopted' their local kiwi populations and are dealing with many of their threats. Changes in legislation and public attitudes which could better protect kiwi and their habitats will underpin a sustainable recovery. If kiwis continue to get behind the recovery programme, the battle to save kiwi can be won!

– HUGH ROBERTSON *is a scientist with the Department of Conservation where he is head of the Kiwi Recovery Programme.*

Carving up the

Housing development is surrounding Tairua Harbour on the Coromandel.

coastline

Increasing coastal subdivision threatens wildlife, plants, and scenery, according to JO MACKAY

Subdivision is fast eroding the scenic values of our northern coastline — forever.

A simple bach by the sea is a common New Zealand dream. Yet, in the north particularly, population pressure and rising affluence (amongst some) is leading to subdivision of every spot of coastline with a view.

Professor Terry Healy, of Waikato University's Coastal Marine Group, worries that there is very little 'coastline of nature left — where the artefacts of construction are not evident'. His concern is that coastal subdivision is knee-capping our potential future income from tourism.

'Many tourists come here because of our so-called "clean green" image, and the coastline is a big part of that,' he says.

Under sections 5 to 7 of the Resource Management Act, local authorities are supposed to take consideration of the 'preservation of natural character'. However, Professor Healy believes it will take an Environment Court case to set a precedent before councils pay attention to landscape values.

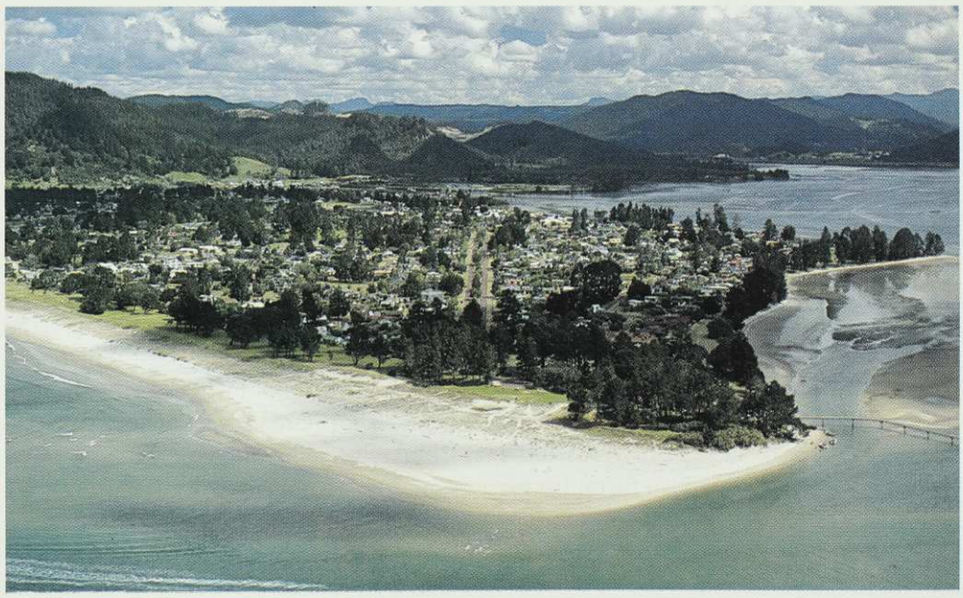
Rodney District, just north of Auckland, is expecting a 40 percent increase in population over the next two decades, and subdivision is rampant along its eastern coast. This will be encouraged by a planned motorway extension to Puhoi. Further north, the coastline is also filling up.

In the Coromandel, an Aucklanders' playground, there is scarcely a patch of 'buildable' beach that is not covered in houses. Developers are currently seeking consents for a large marina at Coromandel, which will involve dredging a canal into the harbour. At Whitianga another developer is seeking to dredge a channel up a harbour arm, to turn 220 hectares of farmland into an extensive canal suburb, providing water frontage to several hundred sections. In the upper part of Tairua harbour, a developer has gained consent to create an 'international golfcourse' along a stream just back from the coast, comprising about 150 sections.

As Warren Stace, senior planner for Environment Waikato, lists these pro-

A & J ENDERBY

Coastal subdivision drastically modifies natural values. Omaha (above) is built on a sandspit of the Rodney coast near Warkworth. A rock wall, pointing seaward, is part of the protection works for this fragile environment. Forest and Bird has successfully sought protection for sand dunes and coastal kahikatea forest on the Whangateau Harbour side of Omaha (pictured). Pauanui (below), on the Coromandel east coast has its own airstrip for visitors. An international golf course with 150 sections is part of further development planned around the Tairua Harbour (below and left).



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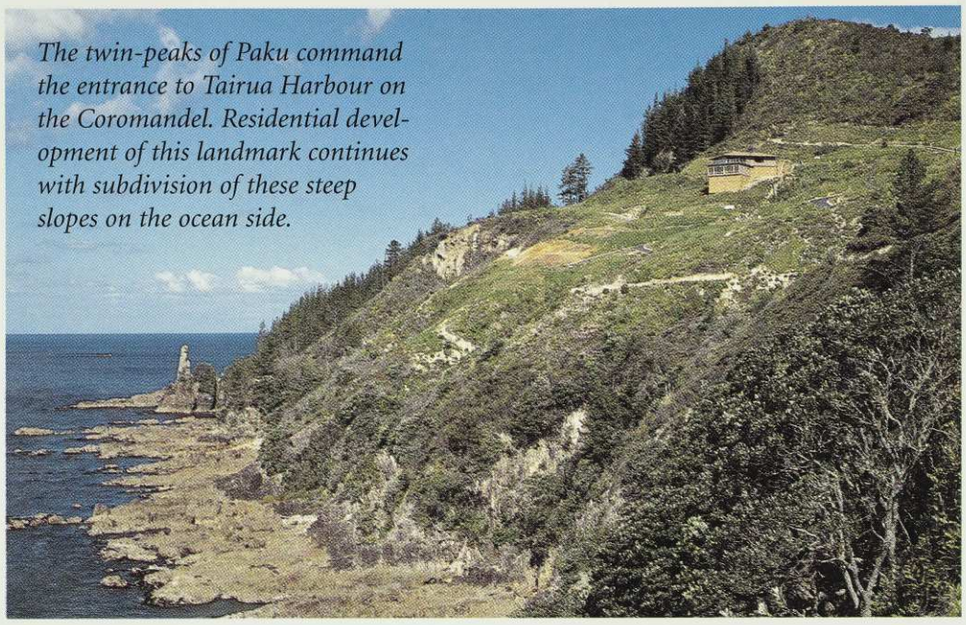


The twin-peaks of Paku command the entrance to Tairua Harbour on the Coromandel. Residential development of this landmark continues with subdivision of these steep slopes on the ocean side.

GORDON ELL BUSH FILMS

posed developments, he comments: 'Natural character is supposed to be taken into account, but once development is underway it's very hard to do so.'

Quiet Ohiwa harbour, a very shallow, tidal estuarine environment, is tucked away behind Ohope in the eastern Bay of Plenty. In 1996, Forest and Bird members mounted a fierce campaign to protest against, and finally throw out, developers' plans to build a canal housing development in Ohiwa's western arm.

'It would have meant dozens of sections and jetties in the upper reaches of the harbour; bright lights, boats,' says then-resident and local Forest and Bird chairperson, Helen Harrison. The area is largely tranquil mudflats, two-thirds of it less than two metres above the high water mark, with one mound sacred to Maori. The site would have required extensive alteration.

'We decided it was totally inappropriate.' she says.

The campaign raised a record 507 submissions opposing the applications for development, brought in expert witnesses to the application hearings, and with the support of the local iwi, Te Whakatohea, succeeded in having the application thrown out.

It was a victory Helen Harrison and the others were proud of. But early this year, the council gave approval for a conventional subdivision to be built in the same place. The harbour won't be as affected, there won't be dredging nor a canal dug through a reserve as in the original application, but the quiet is gone forever.

At best, environmental impacts can be mitigated by careful planning. The coastal marine group at Waikato University did a lot of early work to establish formulae for determining 'setback zones' for subdivisions, to protect fragile dunes, especially around the Bay of Plenty.

As a result, some coastal subdivisions such as at Waihi Beach, Papamoa, and Pukahina beach, avoided the mistake of building upon unstable sand. Setback zones are calculated on known erosion rates, short-term episodic-erosion rates, potential sea-level rise, and the topographic factors of dunes.

Ann Graeme, Kiwi Conservation Club coordinator for the Bay of Plenty, has witnessed ever-increasing habitat threats in coastal areas because of subdivision.

'New Zealand wildlife used to get by because there weren't very many people, and there were a whole lot of unused places,' she says. 'But now people go to the secret places, which aren't secret anymore.'

Beach-breeding birds are particularly at risk. Ann and Basil Graeme have recorded a steady decline in New Zealand dotterel numbers around the Bay of Plenty and Coromandel since they began monitoring them in the early 1980s. Variable oystercatchers are also beseiged.

Reserves are no great protection for these birds. The tip of the subdivided spit at Matarangi on the eastern Coromandel has been set aside as a bird refuge — but that doesn't stop 4WDs driving along the sand, nor people surfcasting along the beach.

'When you get people close to a place, their effects spill over,' says Ann.

Basil Graeme also points out that low-profile, remnant, lowland fish populations, which have managed to survive in farm drains after their habitat was drained, are now being wiped out when drains are covered over for residential development.

It takes ongoing and committed actions from locals to help wildlife survive. At Omaha, on the Rodney coast near Warkworth, Laura and Jim McKinlay have started an intensive predator control programme which in 1997 enabled their small local population of New Zealand dotterel to fledge chicks for the first time in eight years. They have also succeeded in enthusing other locals to look out for the birds: now people rarely walk their dogs along the beach in breeding season, for example.

The story of Omaha, a beautiful sandspit just south of Leigh, is typical of many other subdivision developments. It has its share of past planning catastrophes. The most spectacular was a huge, expensive, infilled seawall, almost half a kilometre long and about five metres high which was built to protect houses built right along the water's edge. Large storms ripped out the sand and swept away all signs of the wall — and the front row of houses had to go.

With consultation required under the Resource Managment Act, the latest plans for subdivision of the southern part of the spit are far more environmentally friendly, says Jim McKinlay.

The consultant for this, Boffa Miskell, has accepted several Forest and Bird proposals. The company has left a wider coastal protection zone, and proposes to build wooden walkways and fence the dunes to protect the muehlenbeckia. It also proposes to create a buffer zone, of a strip of manuka, as a windbreak to a small kahikatea swamp forest (the last of its type in Rodney District), and to fence the remnant forest. It is recording the swamp's watertable, and has measures in place to feed in water if the level drops. Omaha is covered in archaeological sites and Boffa Miskell has allowed for a Ngati Wai representative to be present at excavations in case sensitive material is unearthed.

Local councils can be the 'piggies in the middle' of some environmental messes caused by past developments. The Western Bay of Plenty District Council is under pressure to rectify the mistakes of the past at Waihi Beach. Planner Philip Martelli says coastal erosion has been exacerbated by creek realignment from the 1930s, and properties are now at risk as a result — and there's debate about how to protect them.

'The pressure comes where you have dynamic or unstable coastlines and it's subdivided right up to the beach — it changes the character of the beach. In some areas sea walls have gone in and changed the nature of the beaches.'

Philip Martelli says the issue of coastal subdivision is two-fold: firstly, should more subdivision be allowed, and secondly, what are the environmental effects of further development on already subdivided areas? His council is not zoning any more coastal areas residential, 'which puts quite a lot of pressure on existing zoned areas.' And

simple little baches are now being replaced by spacious resource-hungry holiday homes.

'A major issue is that the more substantial the dwellings are, the more pressure there is from ratepayers to protect them from erosion,' says Philip Martelli.

Population, mobility, leisure time, money: these things are difficult to fight against, and the weapons in the conservationists' armoury are not strong. As many local Forest and Bird branches know, the ability of conservationists to counter the worst effects of development depends upon the slant of local council district plans.

The popular Kapiti Coast just north of Wellington is regarded as having a 'pro-development' council. The one small patch of coastline not developed is adjacent to a nationally significant scientific reserve at Waikanae River. Local environmental groups, including Forest and Bird, are currently appealing the council's approval of developers' plans, seeking to lessen their negative impact on the reserve.

Issues of equal access to our beaches, when coastal properties are fetching astronomical prices out of the reach of most New Zealanders, have not even been touched on in this article, but are also a concern. It is said, for example, that in the outer Bay of Islands, coastal land development is making access to the coast more difficult for locals.

Conservationists around the rest of the country need to be aware that it may only be a matter of time before population pressure moves into other areas. We need to constantly defend the value of natural scenery and protect coastline habitats around the country — before it's a case of protecting the last remnants around the rest of New Zealand's coastline, as in the north.

JO MACKAY *is a freelance writer based in Wellington, with a particular interest in conservation, and botany.*

The curse of the

Cage birds released into the wild are only one of the ways 'Australian birds' take over

NZ HERALD/NEVILLE MARRINER

Tui and rainbow lorikeet meet at a North Shore bird table. The birds compete for nectar and observations suggest that flocks of lorikeets chase tui from their natural food supplies. They also eat fruit, and use nest holes needed by native birds. Fears are growing that, if not eliminated soon, the lorikeets will shortly spread to nearby Tiritiri Matangi Island bird sanctuary where they will also compete with bellbird and stitchbird, both nectar feeders. Nesting space on Tiri is already critical with artificial nest boxes built to house the hole-nesting birds.

They're strong, beautiful, breeding and dangerous. The rainbow lorikeet is yet another example of how foreign bird species are changing New Zealand's ecology, threatening our native birds.

The Australian lorikeet has feeding habits which place it in direct competition with our native species, as the birds form growing flocks and raid flowering trees and fruit, particularly on the North Shore of Auckland. They also compete with some native species for scarce nesting habitats.

Yet the illegal release of rainbow lorikeets in the suburbs of Auckland has been supported by a small body of people who see them as a 'valuable addition' to our range of urban birds. Unfortunately, official action to eradicate this obviously dangerous bird has been slow in coming. Meanwhile lorikeet numbers multiply and the risk of their invading neighbouring bird refuges in the Hauraki Gulf escalates.

The man accused of releasing the lorikeets appears quite unrepentant, defending their place in the wild, and soliciting public support for them. He was also reported by the *North Shore Times Advertiser* as offering $10,000 to the Department of Conservation to help save kakapo if it would drop plans to capture the lorikeets.

The rainbow lorikeet has already spread beyond the North Shore, where flocks approach 50 birds, with more reported across the harbour as far away as Mt Albert, Remuera and Glendowie, and possible sightings further south.

Thanks to campaigning by Forest and Bird activists, the Department of Conservation has taken some initial action with the Auckland Regional Council to capture the lorikeets. Anecdotal evidence against the lorikeets on the North Shore includes their rapid breeding and spread, their natural aggression towards native species, and their competition with native tui for nectar. If the birds reached nearby nature sanctuaries, such as Tiritiri Matangi Island just offshore, they would immediately threaten the nectar sources of bellbird and stitchbird too.

Lorikeets are also fruit eaters thus competing with birds reliant on that food source. The New Zealand Fruitgrowers' Federation has joined in pleas to have the birds declared a pest — its concern is based on the impact of the species on Australian fruitgrowing, particularly in Western Australia where the birds have been introduced.

As hole nesters, lorikeets would also compete for nesting habitat with native red-

DEPARTMENT OF CONSERVATION

The Australian white-backed magpie has a sentimental place in our countryside with its musical call but it is a frequent killer of native and introduced birds. Anecdotal evidence blames it for the loss of field birds such as pipits and skylarks, diminished finch flocks and the death of many native birds, eggs and young. Attention drawn to their aggressive behaviour by Forest and Bird has led to some eradication and a heightened awareness of the damage they do. A recent report from Makarora near Wanaka tells of a pair 'downing' and killing a kaka.

The silvereye or waxeye is a popular native bird in the garden, though a pest in vineyards. While accepted here as a native bird, it was first reported as arriving from Australia in 1832, becoming widespread through New Zealand during 1856. It joined a large number of Australasian species which have become New Zealanders over the millennia.

lorikeet

our countryside. By GORDON ELL

GORDON ELL, BUSHFILMS

Auckland, and the north generally, has several species of wild birds which usually don't occur elsewhere — bred from birds which have 'escaped' from cages into a warmly welcoming environment. The suburbs already contain a small but widespread population of Malay spotted doves and some ring-necked Barbary doves. The shriek of sulphur-crested cockatoo gives a harsh Australian accent to the kauri forest of Centennial Park, Waitakere. An escaped population of Australian galahs is recently reported to have spread from Ponui Island in the inner gulf and into last regional haunt of the kokako on the mainland, in the Hunua Ranges on the southern edge of Auckland.

The eastern rosella of Australia is already widespread, from North Cape through to the eastern Bay of Plenty and Waikato, extending into Taranaki. These birds occur in the vicinity of other New Zealand cities too, particularly in Wellington and Hutt Valley, with wild populations of these former cage birds spreading into the Wairarapa, Hawkes Bay, Horowhenua and Manawatu. There is also a core population about Dunedin.

Wellington also has a population of the closely related crimson rosella, another popular cage bird. Rosellas are often mistaken for native parakeets, which have similar feeding patterns but are now restricted to the remote corners of our forests.

Another valuable cage bird, the sulphur-crested cockatoo has established several wild populations, particularly in Wellington, in the Turakina Valley of Rangitikei, and the coastal hills of Waikato. Many blame cage escapes for these populations, though it is likely some colonies formed after legal introductions in the early 1900s. These large white parrots may occupy much the same breeding and feeding niche as our own kaka and therefore their place as wild birds in New Zealand needs to be carefully watched. Fortunately, their shop value of around $1250 has been a factor in slowing their spread as people catch them for sale.

crowned parakeet, saddleback and other species. Nest holes are difficult to find in most forests, as old-growth trees are lost, and possums, starlings and mynas compete for holes. (On Tiritiri Matangi, which has a comparatively young forest, nest boxes are already needed to sustain the population of hole-nesting native birds).

A co-operative venture between the Ministry of Agriculture and Forestry, the Auckland Regional Council and the Department of Conservation originally aimed to capture the birds, offering some to the zoo. Others would be tested for the range of diseases that lorikeets carry in Australia, including some which may affect native parakeets, and others of public health concern, including salmonella, avian cholera and avian tuberculosis. The rest would be destroyed.

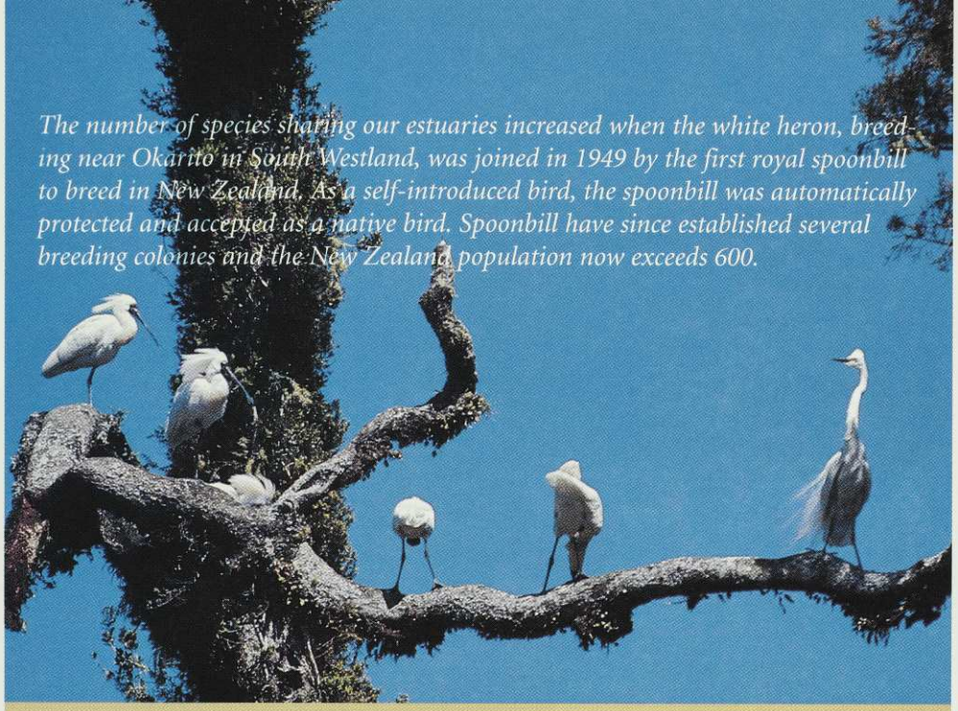
An initial attempt during February resulted in 27 birds being captured, at which time the cage-bird enthusiasts argued the birds should be put back in cages (they're worth from $200-$265 each) rather than put down. Since then work has stopped, for a couple of months at least, while the Department of Conservation prepares a 'capture plan' for the rest of the birds. It seems there are also some legal ambiguities to be worked through, a clear signal that the laws about capturing unwanted birds need an overhaul.

DEPARTMENT OF CONSERVATION

Getting rid of an unwanted population of exotic birds has been done before. In 1952, a number of red-vented bulbul, a popular cage bird from India and south-east Asia, were apparently released from a ship entering Auckland Harbour. Mindful of their impact elsewhere in the Pacific region (the birds may be seen in suburban Sydney and Fiji, for example) the Department of Agriculture determined to exterminate them. It took till mid-1955, to find and kill 52 birds between Takapuna and Mount Eden in central Auckland. This timetable can be set against the lack of progress in eradicating wild populations of the rainbow lorikeet, of which a greater number have already spread through a larger area.

The problem of 'avian pests' — birds which take the place of native species — is a controversial one. Sometimes, as with the rainbow lorikeet, the issues are clear and something can still be done to stop the birds. In other cases, for example the Australian magpies and the Indian myna, the immigrant birds are already so widespread that 'control' is more likely than eradication.

Many people are attracted by the lively calls of these introduced birds, and by their anthropomorphic behaviour. The late Jacqui



The number of species sharing our estuaries increased when the white heron, breeding near Okarito in South Westland, was joined in 1949 by the first royal spoonbill to breed in New Zealand. As a self-introduced bird, the spoonbill was automatically protected and accepted as a native bird. Spoonbill have since established several breeding colonies and the New Zealand population now exceeds 600.

DEPARTMENT OF CONSERVATION

A Spread of Herons

Our newest new native bird is the nankeen night heron, which in 1994 bred here for the first time in the Upper Wanganui valley. It is automatically protected as a native bird, being self-introduced from Australia. The present law makes no provision for asking questions about the impact of such new self-introductions on existing birdlife.

In the case of the nankeen night heron, the birds affected might include New Zealand's other herons; the bittern, white heron, the reef heron, white-faced heron, and cattle egret, which all, to some degree or other, use similar habitat. Interestingly enough, however, these birds were all originally 'immigrants', all self-introduced and not 'endemic' in the sense that they are restricted to these islands. Some are embedded in human experience from Maori times; others are very recent immigrants:

- The bittern or matuku is more correctly called the Australasian bittern and is also found in southern Australia, New Caledonia and the Loyalty Islands. With the draining of our wetlands, its population may have fallen to as low as about 600 birds, making it a rare native in New Zealand.
- The white heron, known in Maori as kotuku, 'the bird of a single flight' (He kotuku rerenga tahi) or the 'bird of the single-alighting,' is in fact a worldwide species, *Egretta alba*. New Zealand shares a sub-species *modesta* which exists from India, China and Japan to Australasia. With a New Zealand population around 100 it is, here, an endangered native species.
- The reef heron, *Egretta sacra*, is a widespread subspecies shared with other countries in eastern Asia and the Pacific too. (The colour of the reef heron is 'dimorphic' and in New Zealand the birds are slate grey. In other countries the birds are often white. New Zealand's population may have descended from grey-phased immigrants but they are still the same bird as the sacred egret of the Pacific.)

Populations of these herons pre-date European settlement and their habits and character have found a place in Maori tradition. Yet their habitation is not unchallenged by other immigrant herons.

Besides the nankeen night heron, New Zealand has been invaded during the past half century or so by a number of other herons — including our most common species, the white-faced heron, which bred here for the first time as recently as 1941. It spread rapidly through New Zealand in the late 1950s and early 1960s, a good example of an immigrant bird which found vacant niches in our new environment of pastureland.

The world-wide spread of cattle egret reached our shores in the 1960s. As many as 3000 birds have been recorded as migrants spending the winter here, though the seasonal population now is nearer 1000.

Other heron visitors include little egret, also spread widely through Europe, Asia, Africa and Australasia. While these birds are on our estuaries, they are protected as natives.

It seems a curious feature that such wading birds could find unused habitat in New Zealand at a time when wetlands have so frequently been drained. The most successful of these immigrants can feed in other places, however, notably the white-faced heron and the cattle egret which are at home in farm paddocks.

Barrington, however, drew attention to the destructive habits of magpies (and mynas), particularly in the *Forest & Bird* journal for August 1996. Their aggressive behaviour towards other birds has been further documented recently by Department of Conservation rangers who have described how two magpies singled out a kaka at Makarora near Wanaka, drove it to the ground, and killed it. Only with frequent reminders that magpies kill other birds will popular attitudes change and their pest status be widely recognised.

Leaving aside unofficial and official acclimatization, the natural migration of foreign birds is also a significant dynamic in their population of New Zealand. The past 50 years have seen the spread of several waves of successful bird immigrants from Australia. In that time white-fronted heron, welcome swallow, Australian coot and spur-winged plover have all spread through the country to become common birds. Their impact has not been fully measured, though there is anecdotal evidence that the highly efficient welcome swallow, outperforms the fantail in its hunt for insects, which may have suppressed local populations of the native bird. The aggressive territorial nature of spur-winged plover is also said to affect other species, though these arguments are contested. While circumstantial evidence against them grows, so does the population which has spread widely in the South Island, and through the North Island during the past decade. Questions which might have settled the matter scientifically don't seem to have been asked in time to make an informed choice. As self-introduced birds they are automatically protected.

Scientists describe New Zealand as having a 'depauperate avifauna' — that is the countryside has comparatively few species with consequent habitat 'gaps' which some new species may readily fill. Further, not only have many of our original birds been radically reduced in number but the habitats they once enjoyed have also changed. Maori settlers burnt up to a third of the forest, for hunting, for gardening, and to encourage the growth of bracken fern, the root of which was a staple food. European settlers followed, burning and clearing a further third for farmland. New Zealand of the year 2000 has only 10 percent of the wetlands it had when the Treaty of Waitangi was signed in 1840; river systems, lakes and coastal habitats have also been extensively modified by development.

As a result of this, and the introductions of mammalian pests, three-quarters of our native bird species are now classed as 'threatened'. At the same time, it has

become easier for some kinds of new immigrants to find a suitable habitat with the expansion of grassland farming.

The foreign bird 'invasion', however, has gone on for a very much longer time than this. Fossil remains indicate some Australasian birds have been here thousands of years; others a million or more. The self-introduction of the familiar white-eye, waxeye or silvereye, however, occurred as recently as 1832, with the birds becoming widespread during 1856. Their comparatively recent arrival is recorded in their Maori name of tauhou or 'stranger'.

A closer look at the pedigree of many of New Zealand's native birds reveals them to be the same species, or at least a closely related sub-species, to those also found in Australia

The spur-winged plover is blamed by many for its attacks on native birds, including nesting New Zealand dotterel. Settled first in Southland, then the Far North, this Australian bird has spread through New Zealand in recent years to become a common bird of open country and the coastal hinterland. Since its arrival in New Zealand the spur-winged plover has been automatically protected as a native bird because it is self-introduced. Such a legal provision might better be supported by some assessment of the dangers new immigrants pose to our environment and wildlife before they spread to problem proportions.

or even the Indo-Pacific region. Examples include the Australasian harrier, the morepork (Australian boobook owl), the pied fantail (Australian grey fantail), the banded rail of the western Pacific and Indonesia-Philippines, pied stilt, and the pukeko (the cosmopolitan purple gallinule). Many of our gulls, terns and shags occur elsewhere.

Some of these self-introduced birds have been here a very long time — the takahe is believed to be a local flightless descendant evolved over millions of years from the ancestral purple gallinule — while the self-introduction of the pukeko and the New Zealand subspecies of the sacred kingfisher may date back only a few hundred years.

Making a value judgement between such historic self-introductions, now our 'native birds,' and those new species which are still arriving is generally too difficult; the law simply finds that a new self-introduction, a natural arrival, should be classed and protected as if it were a native bird. Thus the nankeen night heron from Australia, which bred for the first time by the upper Wanganui river in 1994, is protected as much as the endemic takahe.

The wisdom of automatically accepting such self-introductions could be questioned. For example, there is plenty of anecdotal evidence that spur-winged plover attack other birds but some scientists say this is not conclusive enough. Self-introductions of potential insect pests are not so casually accepted. It could be argued the time has come to review the 'automatic protection' of birds and assess the likely consequences of self-introductions on other species before extending them full protection as a 'native'.

For 'exotic' species, which appear to have no deleterious effect on the environment (or other birds), protection might seem an adequate reward. Yet any formal attempt to introduce a new species of bird would surely lead to a round of environmental impact assessments. There would doubtless be fulsome objection from those who feared a new bird might affect the viability of populations of rare and endangered 'native' birds. Forest and Bird, for example, is adamant that new introductions are totally inappropriate, unnecessary, and a further threat to our native species. Fortunately, the release of cage birds is already illegal but the case of the lorikeets shows such laws may need more rigorous enforcement.

The ambiguity of ancestry among our native birds makes it rather difficult to rank the relative importance of our species, particularly in terms of world rarity. Obviously the endemic birds — those occurring in New Zealand alone — are of special concern. These are the ones often at most risk, if not already extinct. The ancestors of birds like the flightless moa, the adzebill and the kiwi, evolved at a time when New Zealand was still part of the ancient supercontinent of Gondwana. In a New Zealand isolated by ocean, they filled the niches occupied elswhere by mammals which had not evolved when New Zealand became separated from today's southern continents.

When Maori, with dog and rat, settled New Zealand perhaps 1000 years ago, the ecology began to change. When moa were hunted to extinction, the giant eagle which fed on them also vanished. Around 32 species of bird, including various moa and rails, the native goose, a pelican, ducks and swan, were lost during Maori times, unable to sustain harvest or competition from the new mammals.

Since European settlement another 11 species have vanished while more have been driven to the brink of extinction. Loss of habitat has had a major influence on bird numbers, but so has the introduction of new species of mammalian pests and birds which have changed our natural environment, forever.

On the open country European finches, sparrows, starlings and mynas have replaced the New Zealand quail, weka and other scrub species. On the wetlands, introduced mallard ducks are rapidly taking the place of native grey duck, with which they interbreed.

In the lowland forests of New Zealand, European blackbirds rake about the leaf mould for food, in many places more common as a species than the native robin. In higher forest the piping sounds of introduced chaffinch and redpoll are usually more distinct than the chattering of native whitehead, or yellowhead (mohua) and brown creeper.

The introduced common and garden birds of New Zealand may all seem a 'threat' to our native species, but obviously the days of putting this to rights is long gone. Many of the peculiar endemic birds have already been lost. The test that needs to be applied to the many immigrant species already flourishing here is whether their acclimatization should be tolerated further, if they are affecting our remaining native and endemic birds.

With escaped cage birds the choice is a clear and easy 'never'.

Logically, with self-introduced species such the spur-winged plover (and the nankeen night heron), questions need to be asked about their likely environmental impact before they spread too far.

Our native birds don't need more competition; and most of them need more help.

The author acknowledges the distribution records of the Ornithological Society as summarised in the Field Guide to the Birds of New Zealand *by Barrie Heather and Hugh Robertson, (Viking, Auckland 1996).*

JOE CRANDLE

Author GORDON ELL enjoys Australian birdlife when it is in Australia. A cage bird escapee in New Zealand, this crimson rosella was photographed in the wild at Bunya Mountain National Park, in southern Queensland.

Otari's garden of native plants

A major bequest will enhance Wellington's collection of native plants, reports KATHY OMBLER

It is a sunny afternoon at Otari Native Botanic Garden in the Wellington suburb of Wilton. Underfoot, the track is littered with tawa drupes; overhead three playful kereru stall high above the green canopy then swoop from sight into the forest-filled gully. Tui song resounds, and the supervisor, Anita Benbrook, talks animatedly of discovering a nesting kereru in a nearby matipo tree. It is the first she has seen actually breeding here in 11 years of working in the gardens. The forest is now showing healthy recovery signs after intensive possum-poisoning programmes in recent years.

Yet, there's more excitement at Otari: a bequest of $1.3 million dollars has 'kick started' a major redevelopment plan for the 80-hectare reserve. On the plans are a new alpine garden, a revamped visitor centre, enlarged car park and a tree-top walkway through the forest canopy.

Otari is touted as New Zealand's major collection of native plants in a botanic garden — the legacy of an earlier association with the eminent New Zealand botanist, Dr Leonard Cockayne. Otari's five-hectare stand of remnant podocarp/hardwood forest is also regarded as the most significant mature forest remaining on the Wellington peninsula. The reserve's forest walks, gardens and picnic areas, just a few minutes from downtown Wellington, are enjoyed by thousands of visitors each year.

Wellington City Council, which administers Otari, has committed a further $300,000 to the 'windfall' from the Charles Plimmer Bequest, to help fund redevelopment, due for completion in October. Resource consents for the work were granted late last year.

The most spectacular development will be a 75-metre-long, tree-top walkway, which is being built to span a section of Otari's forest-filled gully and link two sections of the gardens. At its highest point the bridge will be 18 metres above ground — creating opportunities for 'bird's-eye' viewing into the canopy tops.

A new and enlarged alpine garden is another major part of Otari's redevelopment. That this reserve — in a shady gully in the middle of Wellington's suburbia — has an area devoted to the hardy little plants normally found growing high above bushline, is testament to the vision of Leonard Cockayne.

In 1927 Cockayne initiated a plan which aimed for the conservation of primeval New Zealand, and for education to encourage the use of native plants in private gardens.

Cockayne's specific aims were to establish a collection of all New Zealand's native plant species, to be arranged as far as possible in their families, and to re-create several ecosystems representative of different areas of New Zealand — hence the development of an alpine garden.

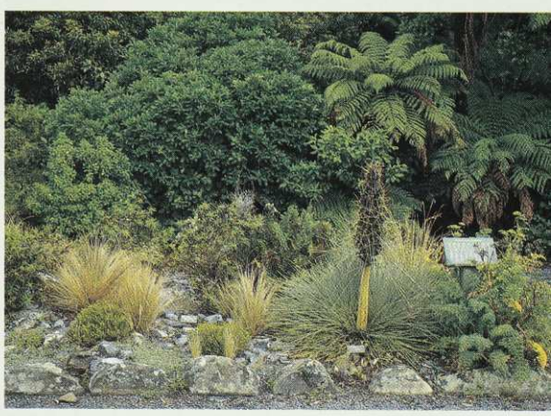
This was initially planted in 1931 and, in 1968, was shifted to its present site beside the Otari's carpark. The new garden will be on the same site, but slightly enlarged to an area of some 1500 square metres.

'We plan to establish 1500 alpine plants, that were all grown here on site from seed and cutting, plus another 1000 subalpine plants that will merge into the alpines. Naturally we will lose some of these but we will keep lots of spares in the nursery,' says Anita Benbrook. 'Everything will all be planted in ecological groupings; there will be tussock grassland, a bog with appropriately associated plants, and a scree area. We are also going to try some subantarctic plants.' (Staff have been south on a collecting trip, with the Department of Conservation.)

Growing alpine plants — and other species from throughout New Zealand — in Wellington conditions, is not a huge issue, according to Anita Benbrook.

'Wellington is well suited for growing temperate plants right through to quite cool plants,' she says. 'By siting the plants well, and manipulating their growing conditions, you can grow a greater range. Alpine plants face south, for example, and the garden is elevated to get good slopes. The more the degree of slope the further "south" you go. The same applies for growing northern plants — by siting them on a north-facing slope you can develop a micro-climate that's really hot.' (In this way, a small kauri grove has become established at Otari from plantings in the 1930s.)

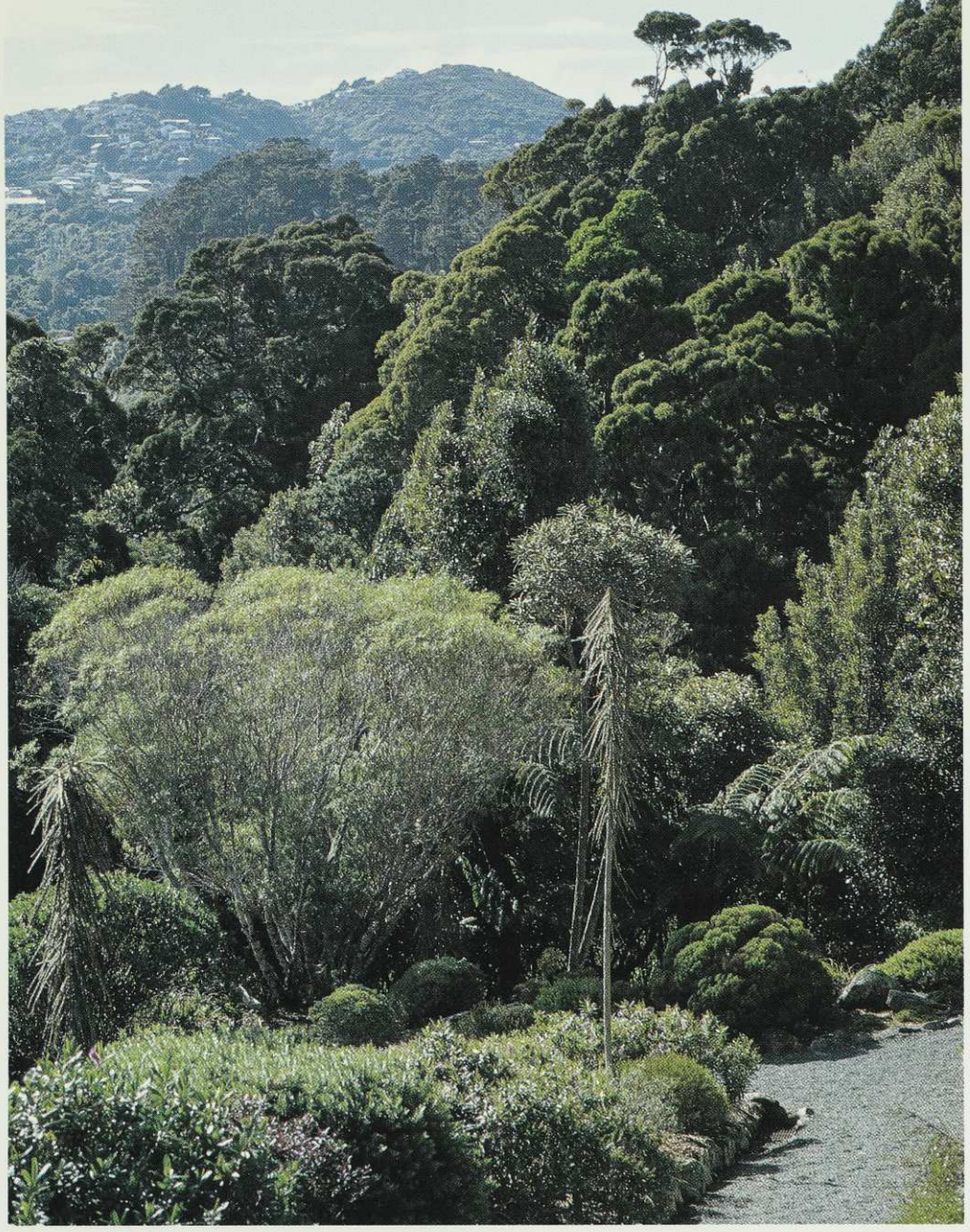
In other developments, Otari's visitor centre will now include a bigger display area, bigger classroom, improved staff facilities and a huge deck leading to the canopy walkway. Major improvements will also be made to the carpark and entranceways and a new irrigation system installed.



A Welcome to Visitors

Although Otari is classified a scenic reserve, its management has been vested in the Wellington City Council since 1918. There is a 10-kilometre network of tracks and paths, offering walks of varying distance and standard. Two picnic areas, include one with coin-operated barbecues.

Otari is located on Wilton Road, in the Wellington suburb of Wilton. The Wilton bus (No. 14) takes less than 20 minutes from the city to the main entrance. Entry is free. Parts of Otari, including the carpark, will be temporarily closed to the public during the period of redevelopment



WELLINGTON CITY CORPORATION

Wellington's Otari native plant garden features representative collections from different climate zones. At top, celmisia is usually found high in the mountains; middle, dracophyllums surrounded by Chatham Island lily; bottom, the spear of a Spaniard Aciphylla squarossa *from Southland rises above a bed of natives. Above, a general view of the gardens looks toward suburban Wilton, beyond the remnant of mature forest where a tree-top walkway is planned.*

The botanic gardens curator for Wellington City, Mike Oates, says there was a need to upgrade Otari. 'This whole concept was finalized in the management plan in 1996. Otari is a unique attraction of national importance and we felt a need to bring it into the 1990s.'

That the council is investing so heavily in Otari is, according to Oates, a political decision.

'The council recently completed a review of its services and determined that the provision of parks and open spaces was deemed to be a core service, because there wasn't any other provider.' The current developments also fit with the council's strategic plan for landscape, ecosystems, natural heritage and recreation.

With these developments underway, further funding is being sought for new interpretative material and signage.

We recognize interpretation is one of the crucial parts of the experience here and our labelling needs improvement,' says Mike Oates, referring in particular to labels on the large number of cultivars growing at Otari. 'These are something of a hangover from plant fashions of the 1960s,' he says. 'The mish-mash of tracks that zig zag throughout Otari are also urgently in need of better signage.'

Michael Harte, spokesperson for Forest and Bird's Wellington branch, is delighted with the Otari developments. 'Anything that gives Otari a higher profile is good. The higher the profile, the easier it will be to resist future funding cuts,' he says.— *Kathy Ombler*

KATHY OMBLER *is a Wellington-based freelance writer with an active interest in conservation and recreation. She has written a number of tramping guidebooks including the regional series of* AA Leisure Walks.

Campaigning to 'Bring Back the Birds'

Otari Native Botanic Garden is a key focus in a new campaign to increase native bird populations in Wellington city. The campaign heralds the developing partnership between Wellington branch of Forest and Bird and the council's botanic garden staff.

'We have always had a great relationship when seeking submissions and feedback but this is the first formal relationship,' reports botanic garden curator Mike Oates.

For the Wellington branch of Forest and Bird, Michael Harte says in the last three years there has been an increase in the numbers of native birds in the city. The campaign aims to build on this.

'For a long time there weren't many native birds in Wellington at all. We think the green belt regeneration is starting to mature, and the regional council has carried out very intensive predator control programmes to the extent that native bird numbers, especially tui and kereru, are really expanding.

In Otari, supervisor Anita Benbrook has noticed a huge difference since pest poisoning began in 1983.

'The bush has really perked up. It doesn't have that trampled, munched look anymore,' she says. 'The fruit in the trees is amazing now. Kohekohe was just one species that showed major improvement flowering and fruiting within one year of control starting. A side effect has been knocking down the rat population.'

Michael Harte says the campaign aims to involve the 'normal Wellingtonian' in a conservation programme.

'We want to encourage people to plant native species in their gardens, the right types that will attract birds to their natural food sources. We will encourage people living near Otari and Karori Sanctuary to have bird feeders with supplementary feeding, such as nectar water, so the birds have a reason to stay in Wellington through the winter, and so they will be in good condition for breeding.

'We want to establish a partnership with the city council and have demonstration points and information for our campaign in Otari and the city's Botanic Gardens. In the long term we would like to have garden shops involved, but that will require more resources.'

Stewart Island/
a national park proposed

The time is right for a national park on Stewart Island, writes GORDON ELL.

Stewart Island and its outliers stand on the subantarctic edge of New Zealand, a place set apart by nature and geography. It is still largely a wilderness: a place of rocky coasts or lonely sand beaches, where forested headlands encompass long sheltering harbours, and winding rivers are often the easiest paths through wetlands to the hills. At its remote heart is a series of granite mountains surrounded by forests that have never been felled. The spectacular views, the natural values, and wilderness, all cry out for recognition as a national park, and recent political initiatives now make this a prime possibility.

The islands are a haven for rare and endangered species, including several subspecies of birds peculiar to the island, and many plants found nowhere else.

About 93 percent of the main Stewart Island is owned by the Crown and the investigation for a national park would have to consider the natural and scenic values of a vast area. The criteria is simple: any park must 'contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique or scientifically important that their preservation is in the national interest.' A national park must also contain an area of at least 10,000 hectares. Crown holdings on Stewart Island total around 164,000 hectares.

Lying south from Invercargill, across stormy Foveaux Strait, Stewart Island/Rakiura has been little developed, though settled early on by Maori and European. Here it is still possible to catch a glimpse of what the pioneers faced in the old forests and wetlands of New Zealand.

Settlement today is focussed around the township of Oban (population 400 or so) while the remainder of the island is in forest. In a few places the original forest has been modified, through failed farming efforts or small-scale milling, but most is too isolated to have suffered axe or firestick. The rugged nature of the landscape, the wet climate and the difficulty of extracting timber, mean Stewart Island is still largely intact as a wilderness.

Unlike the mainland to the north, and contrary to the expectations of a visitor approaching cooler climes, Stewart Island has no 'subantarctic' beech forest. Instead, the fabric of its rainforest is redolent of warmer places. Huge podocarps rise in reserves close to the town. The coastal forest is usually a sheltering belt where windswept manuka mixes with hebes, the whipcords of dracophyllum, flaxes and leathery muttonbird scrub. Everywhere there are panoramas of the southern ocean, exposed beaches, infiltrating harbours.

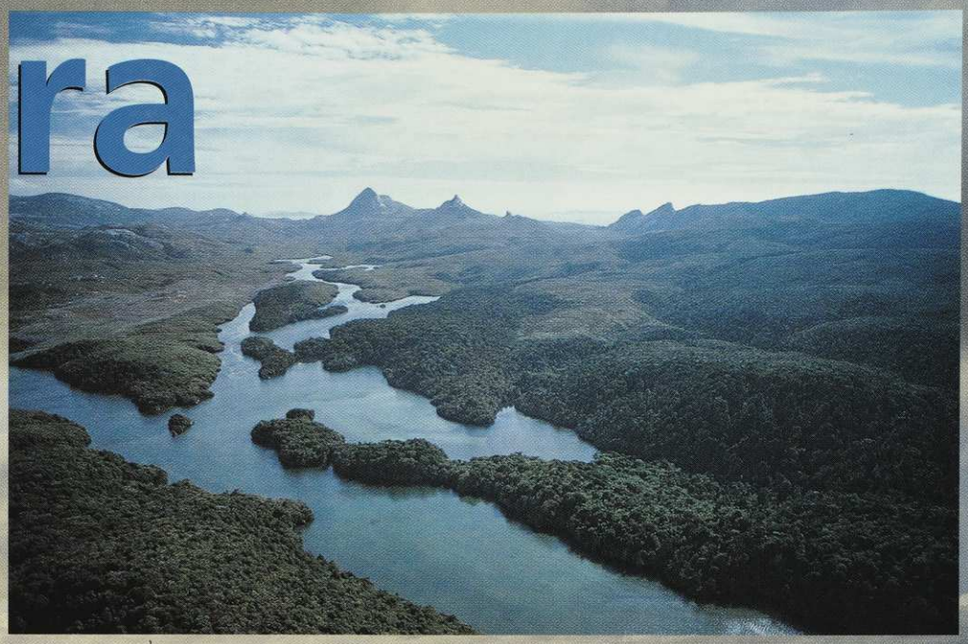
The light is different too, softer than in

National park proposed

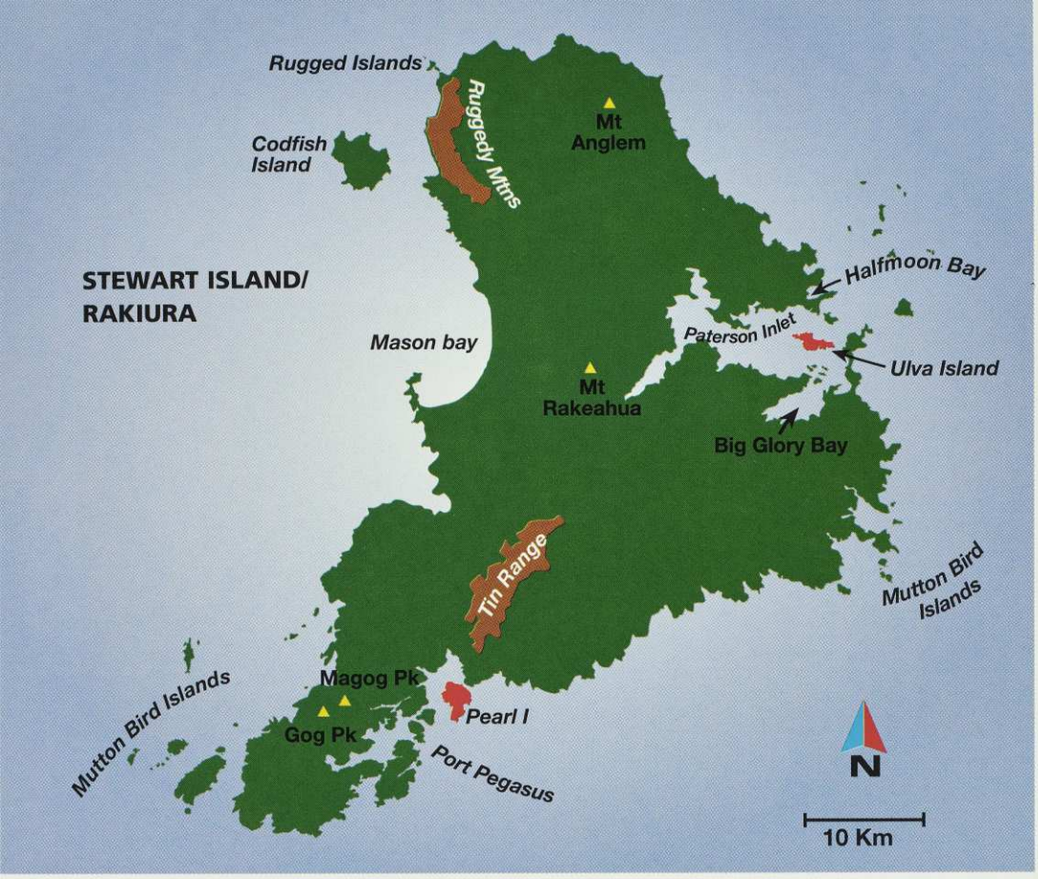
At Easter, the Minister of Conservation, Dr Nick Smith, requested an official investigation of Stewart Island/Rakiura under the National Parks Act, suggesting a deadline of this Christmas so the park could be created for the new millennium. He proposed publication of a formal discussion document in June, inviting public submissions through July and August. 'The New Zealand Conservation Authority could then make its recommendation to Cabinet before Christmas if all the issues have been resolved,' he said.

Rakiura

Photographs by Craig Potton



Aspects of Rakiura captured by photographer Craig Potton include the wilderness of sand behind Mason Bay (above); the inland waterways of Port Pegasus (top insert); typical forest on the northwest coastal track (far left) and the granite domes of Magog and Gog (at left). Such outstanding scenic values are important in establishing national park status.



Rocky coasts, long sheltering harbours and sweeping beaches give contrast to the island's coast. At top, Mason Bay on the remote west coast; below, windswept seas are a reminder that Stewart Island is in the 'Roaring Forties'.

the north, clear but with a touch of the gloaming that accompanies the move into higher latitudes. It gets dark early in winter but the late night sunsets of summer, the red-lit clouds and crackling aurora give memorable meaning to its Maori name — Rakiura, (isle of) glowing skies.

The township of Oban surrounds Halfmoon Bay, its houses and 'cribs' clinging to forested hillsides and spilling over into adjacent bays. The only roads on the island are those that link the settlement together. On the flat land behind the wharf there's a pub, a backpackers lodge, community facilities, a Department of Conservation office, some small stores.

Oban is the starting place for the island's track system, established in the days when the Forest Service ran much of the island as a protected area. The 280 kilometres of track include the Rakiura Track, a circuit of 36 kilometres and one of the Ten Great Walks promoted by the tourist industry and Department of Conservation. It often follows a board walk built to stop trampers getting bogged in the notorious mud, while protecting the forest.

Many tourists take a boat from Oban to Ulva Island which, free of pests, has a huge bird population. Curious kaka come down to examine the visitor; Stewart Island weka pick their way along the tideline looking for marine morsels. Sheltered by the arms of Paterson Inlet the island is forested in mature rimu, kamahi and rata. From their branches, the calls of native birds meld into a chorus, exciting imaginings of how the New Zealand forests must once have sounded.

The plant and animal life of Stewart Island is rich and diverse, with species varying through narrow bands of altitudinal range, and some eight identified ecosystems. They include rare and endangered plants, some not found elsewhere, and threatened birds, including several sub-species peculiar to the island.

The podocarp-hardwood forests dominate, and are home to many birds including the threatened Stewart Island weka, yellow-crowned parakeet, Stewart Island brown kiwi, South Island kaka, Stewart Island robin, banded rail and Cook's petrel.

The coastal shrublands shelter Fiordland crested penguin, weka, kiwi, fernbird, robin, and banded rail.

The alpine and subalpine tussock grasslands of Mount Anglem/Hananui, Mount Rakeahua and the Tin Range have been likened to tundras. Herb bogs and cushionfields lie about water-logged and ponded areas, within the tussock zone. Many of the plants found here occur nowhere else.

The four types of native grassland found on Stewart Island shelter more plants peculiar to the island. Grasslands are not extensive but they contain local forms of alpine speargrass and mountain buttercup, besides the coastal Cook's scurvy grass which Captain Cook fed to his crew to prevent disease. These coasts are also frequented by Stewart Island shag, Fiordland-crested and yellow-eyed penguins, New Zealand sea lion and fur seals.

The freshwater ecosystems are notable too, because whole catchments are still largely intact. The island has 11 species of native freshwater fish and, with the exception of migratory quinnat salmon which are farmed in the sea, there are no introduced freshwater fish. The undisturbed freshwater systems are valued scientifically and intrinsically as features long gone from other parts of New Zealand where introduced fish, such as trout, have modified river catchments.

Besides holidaying 'crib' owners, more than 30,000 tourists visit the island annually. Creation of a national park would swell these numbers as the island joins the 'must-see' list for those who come to New Zealand to see its best places.

Growing tourism has led the Department of Conservation to consider new sites for visitor camps, and it may involve the Southland District Council in regulating camping. Many popular sites are on private land but, within its reserves, the Department of Conservation is looking to provide basic facilities, such as toilets, clean running water and washing facilities. That all costs money.

Growing numbers of kayakers too are using the shores of Stewart Island as campsites. Kayakers' camps may conflict with the night-time territories of Stewart Island kiwi which hunt along the tideline.

The chance of seeing a kiwi in the wild is one of the reasons eco-tourists holiday on Stewart Island. To protect the majority of kiwi populations, spotlighting expeditions are now permitted at only three places.

One of the reasons for the comparatively rich birdlife on Stewart Island is the absence of mustelids; particularly the introduced ferrets and stoats which have put some mainland birds in danger of extinction. There are wild cats though, their depradations prompting the removal of kakapo to offshore islands. Rats are another pest being eradicated from some islands off the shores of Stewart Island, to aid bird recovery programmes.

Possums and deer are problems in the forests. White-tailed deer, in particular, favour sub-canopy hardwood trees, making some plant species increasingly rare. Above them, possums eat the forest canopy, opening the trees below to the salt-laden winds and causing considerable 'die-back', particularly around the coast. This combination of deer and possums arrests regeneration.

The Department of Conservation believes that hunting is removing only some 15 percent of the deer per year, about the same amount as their annual reproduction. An objective of the conservation management strategy is to reduce deer densities to zero. Policies of 'moderate reduction' of deer are not enough to save the island's vegetation from serious damage. To save the forest, deer have to go, regardless of the status of the land.

Wild cats, dogs and goats are also destroyed when possible on conservation land. Around Halfmoon Bay this has created tensions about the future of keeping pets, but such fears are groundless. Oban stands outside the Crown boundaries so pets are quite safe there.

Living with nature

Stewart Islanders have put forward their own 'vision for the future' of the island, under the heading 'Living with Nature'.

- A vibrant community with a relaxed and friendly atmosphere, which is a stimulating and interesting place to live.
- A strong economy and a wide range of sustainable services for a permanent population of up to 1000 residents.
- A progressive community, proud of its pioneering past, willing to encourage growth and development which is compatible with the island's character and the sustainable management of natural and physical resources.
- The unique natural beauty and attractions of the island have been preserved as a recognised example of an area with significant environmental qualities.

This vision is the product of well-attended community meetings held during the preparation of the Southland District Council's 'concept plan' for the island.

From the Ryan's Creek airstrip near Oban it is possible to fly to the remote west of the island at Mason Bay, and land below the high-tide mark of a lonely ocean beach. The flight across the island reveals a fascinating landscape of water-penetrated land, sinuous rivers winding back through extensive wetlands. The forested hills are gradually bared as they approach their granite domes, some rising to 900 metres and more. The alpine herb-fields of the Tin Range in the south are the breeding ground of a southern race of the New Zealand or red-breasted dotterel. The endangered bird numbers only 120 or so. Unlike the northern race which breeds on the coastal sands where it feeds, this dotterel roosts and nests near the mountain tops and 'commutes' down to the beach.

From Mason Bay there is a distant view of Codfish Island/Whenua Hou, a refuge for kakapo. Until these birds were discovered in the Tin Range wilderness and relocated, it was thought that only three of the species survived (in the Sinbad Valley of Milford Sound, Fiordland). Rats are now being removed from Whenua Hou, and the kakapo temporarily placed on Pearl Island where they have recently bred.

Brown kiwi patrol the sandhills of Mason Bay, often feeding in daytime. The giant sandhills roll back for a kilometre or so, their native pingao sand-binders increasing in area as introduced marram is cleared from this isolated coast. Among the dunes are rare plants such as the coastal spurge *Euphorbia glauca*.

Mason Bay was grazed into the 1980s but is now totally protected. The surrounding forest is regenerating but the appeal of the place in scenic terms is already outstanding.

All islands have a special feel about them; their local populations also take a special view of their relationship with mainlanders. On Stewart Island, traditions stretch back a long way. Living on what was once a stronghold of Ngai Tahu Maori, some people have grown up in a very long tradition of harvesting and fishing. Early European sealers and whalers settled here with Maori wives in the very early 1800s. Many later became fishermen or timberworkers.

Not surprisingly, the frontier tradition and outlook still survives. The idea of a national park, with its suggestion of broader perspectives, is likely to raise some hackles if residents are not consulted.

A lot of people on Stewart Island still work in extractive industries, notably fishing, and fish farming and the associated pack houses. Commercial salmon farms have been established in Big Glory Bay near Oban, and a pioneer paua industry produces baby molluscs for fattening in mainland factories. The clean waters around the island are a major resource and interest for these aquaculturists. (By definition, national parks do not include coastal waters.)

The coastal seas of Stewart Island are littered with rock stacks and small islands, about 170 in all. Several are extremely valuable from a wildlife management point of view, some being the last resorts of rare and endangered species, such as kakapo on Whenua Hou, and the South Island saddleback.

Around 60 percent of the offshore islands are less than five hectares, and only 10 percent are more than 40 hectares. The Department of Conservation distinguishes between 'forest islands' such as publicly owned Ulva Island in Paterson Inlet, and 'seabird islands', several of which are significantly free of pests while still the subject to traditional 'muttonbird' harvests. Many of these islands are Maori owned. Any proposal for a national park would be limited to the Crown estate, however, and not include such places.

Maori interests are further entrenched with the recent settlement of the Ngai Tahu claim. Not only was the ownership of the Crown Titi Islands vested in Ngai Tahu; their roles as advisers with special interests in the management of the wider Crown estate is also formally recognised in the agreement, particularly on Whenua Hou, which now has a special advisory committee and is not included in the park proposal. Maori place names, such as Rakiura for Stewart Island, have been restored alongside the English ones. Even where no Maori land is involved, Ngai Tahu interests in the management of their special species and heritage on Stewart Island generally require particular consultation, by law. On the other hand, the land claims have been settled, making investigation of a national park more practical than in other areas of New Zealand, where Crown reserves have been claimed by Maori under the Treaty of Waitangi process.

For the visitor, it is easy to assume the extensive wilderness and its outstanding natural values would automatically qualify the island as a national park. There are, however, other considerations, particularly the views of those who live there. Local fishing industries using the coasts and estuaries could have an interest, though marine areas are generally not affected by national parks. So would hunters, tourist operators and Maori. The Southland District Council has expressed interest in the 'sustainable management' of the island as part of its territorial area. The consultation phase of creating national parks is about considering the varying viewpoints.

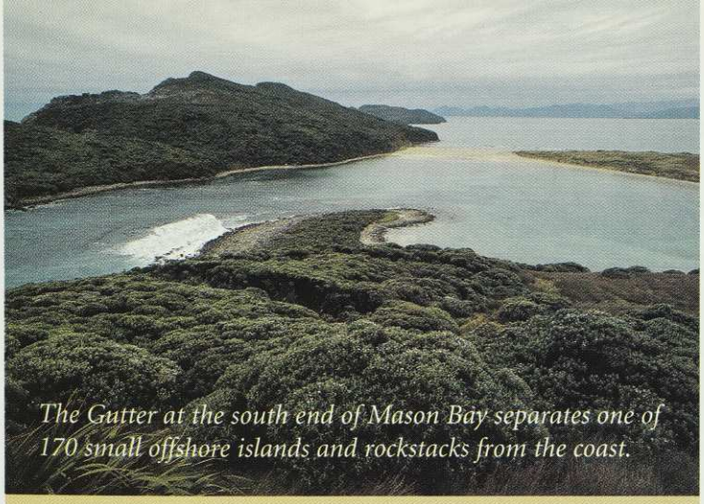
At Easter, the Minister of Conservation, Dr Nick Smith, announced he wanted a recommendation to create a Stewart Island national park, before Christmas. The Southland Conservation Board has advocated such a move, while the New Zealand Conservation Authority — which has statutory responsibility for such investigations — was already gathering information from the Department of Conservation about interested groups which might want to be consulted.

Forest and Bird has embraced the national park proposal for Stewart Island. Its natural values are superb, its scenery outstanding: the island surely must meet national park criteria.

The time is right for a national park on Rakiura.

GORDON ELL *is the Forest and Bird nominee on the New Zealand Conservation Authority.*

Known to locals as Halfmoon Bay, the settlement of Oban spills into nearby coves. Population is round 400. The only roads on the island are those linking this settlement together. Around 93 percent of the island is Crown land.



The Gutter at the south end of Mason Bay separates one of 170 small offshore islands and rockstacks from the coast.

Many Reserves But Only One Park

The present reserve status of Stewart Island is an erratic tapestry of different land classifications, varying from scenic reserves to include nature reserves (more than half the island), considerable unclassified conservation land which nevertheless contains threatened and endangered species, and local purposes landing reserves.

The estate includes 'sites of special wildlife importance' and 'wetlands of ecological and representative importance'. The conservation management strategy notes the island is of 'national importance' to conservation and in many instances its natural features are of 'international importance', further significant argument for national park status.

Much of this land was inherited from the New Zealand Forest Service which ran the island as a largely protected area from 1903 till the establishment of the Department of Conservation in 1987. The Nature Reserves were managed before then by the Department of Lands and Survey. A national park would combine this diversity into a single category of protection.

Deer and Deerstalking

Among the lobbies concerned about national park status on Stewart Island will be deerstalkers. Beyond one mainland herd in the Dart-Rees area, near Glenorchy on Lake Wakatipu, the island is the only place in New Zealand where white-tailed deer are found. Hunting is a popular recreation among islanders while others come over from the mainland, often setting up camps by the shore, complete with deepfreezers and generators.

The Department of Conservation wants hunters to take greater care when camping and to clean up afterward. The 'camps' may be a hut or shanty made from driftwood, tree fern trunks, bits of tin and plastic sheeting, set up by hunters just inside the forest and close to their landing place from boat or airplane. With extended occupation, year after year, they can become rubbish dumps. Boat operators serving the island have recently agreed to a protection charter — among other disciplines, they now ask hunters not to bring dogs, motorcycles, refrigerators, or chainsaws for clearing camp sites, and to carry out their rubbish.

While much hunting takes place on private land on the east coast, many hunters are allocated blocks on Crown land, booking sometimes a year in advance. Nevertheless, recreational hunting is not achieving any effective control over deer numbers. The annual cull of about 15 percent is soon replaced by births.

The conservation management strategy calls for the eradication of deer, regardless of the status of the land.

'Out in the Open' with T.

The contradictory views of 'our first conservationist' reflect the differing values of pioneer

The author of *Out in the Open* had a hand in introducing foreign plants and birds but believed in protecting native species too.

When the Treaty of Waitangi was signed, over half of New Zealand was still covered in native forest. Much of the remainder was wetland or tussock. Fifty years later, nearly half of the country had been transformed into farmland, where introduced stock was largely reared on introduced grasses.

Because so much of our natural heritage was destroyed in the process, European settlers of the nineteenth century are often described as though they lacked all appreciation of New Zealand's environment and had no interest in its conservation. But it wasn't that simple.

We've all been party to actions which have led to pollution and environmental degradation. Few see the paradoxes or realize the consequences until later. Only some never care, and this was no different in the last century.

Thomas Henry Potts, the Canterbury runholder who Philip Temple has called 'New Zealand's first conservationist', was one who cared. In retrospect, his life seems full of contradictions. In 1855, like many new immigrants, he was nurturing gorse and oak, but he also transplanted rata and native clematis. And although he killed weka, he didn't want to exterminate them. The problem was, 'they are so partial to fowl's eggs ... that one is reduced to the alternative of wekas or eggs'. He clearly understood the conflict of interests between native wildlife and invading colonists.

With his 13 children, his cattle and his sheep, Potts was very much an invader. As a source of income, he established a huge runholding at Hakatere on the eastern side of the upper Rangitata River. He was MP for Governors Bay, where he lived, but he was always 'impatient for the session to close in order that he might go camping in the bush during the nesting season'.

For, more than anything else, Potts enjoyed the study of New Zealand's natural history. In 1872 he described the only remaining unclassified species of kiwi, and his papers for the New Zealand Institute included the best accounts of native birds then available. His book *Out in the Open* (1882) was the first substantial work of natural history published in the country. (It was republished in 1976.)

In his last article, about the Chathams, Potts regretted that, 'owing to the grazing of stock, there has disappeared much of the thick covert which afforded the requisite privacy' for native birds, but he wrote this sitting at the table of his son-in-law, whose animals had plundered the island's ecosystems with particular success.

Potts, throughout his life, maintained an interest both in the conservation of native flora and the planting of exotics. Similarly, his support for the native fauna went hand in hand with an early involvement in the acclimatization of European birds and the continuous promotion of cattle and sheep.

This was less problematic for him than it might be for us. Any rigid division between native and exotic, pronouncing one in place and the other out of place, was not for Potts, since either could be useful in the development of New Zealand. He shared this view with William Travers, Thomas Kirk, and other early conservationists who were also active in the acclimatization movement.

Conservation mattered to them since it prevented future loss. By the same token, acclimatization was crucial because it provided a storehouse of exotics with known potential. The Canterbury Acclimatisation Society received big numbers of English birds in the 1860s; some were successfully released and helped to establish by its vice-president, Thomas Potts.

He also planted trees. When he recorded that, of his 21 species of pines, *Pinus radiata* outstripped all else, he inevitably played a role in promoting this particular exotic.

There is no question of Potts's role in the 'ecological invasion' of New Zealand, but he combined this with a spirited defence of the earlier environment. His first public attempt to conserve native trees occurred in 1858, when he approached the Provincial Secretary about the destruction of totara on the Port Hills. It did no good: 'with the utmost urbanity of demeanour, the worthy official showed that he neither knew nor cared a rap about the matter'.

Potts witnessed the burning of the forests on Banks Peninsula from his doorstep. In 1868 he got Parliament to look into the colony's timber resources, 'with a view to their better Conservation'. This provoked national debate, but it wasn't until 1874 that Julius Vogel legislated to support colonial development by a wiser use of such forests.

New Zealand's native birds were also discussed in Parliament, though here again we must be clear about the attitudes of their protectors. Sportsmen like Potts saw no inherent conflict between hunting and conservation. They thought of selective shooting in much the same light as people once felt about the selective logging of trees. The argument then was with 'wholesale slaughter', 'reckless burning', lost opportunities and unnecessary waste.

Potts thought the extinction of kiwi and kakapo would be 'a lasting disgrace'. When a Wild Birds Protection Bill succeeded in Britain in 1872, he asked the English lobbyists to 'help us to save our birds'.

In fact, even with kiwi, protection only came in 1896, eight years after Potts's death, and he often doubted whether legislation would triumph over individual greed. As a governor of the Canterbury Museum, however, he could directly influence its director, Julius Haast, who gathered kiwi and kakapo as trading items. Potts successfully reversed this policy in 1878.

In pioneer New Zealand, the population decline of native birds was obvious, but Potts refused to see this as the inevitable 'displacement' of inferior species. He

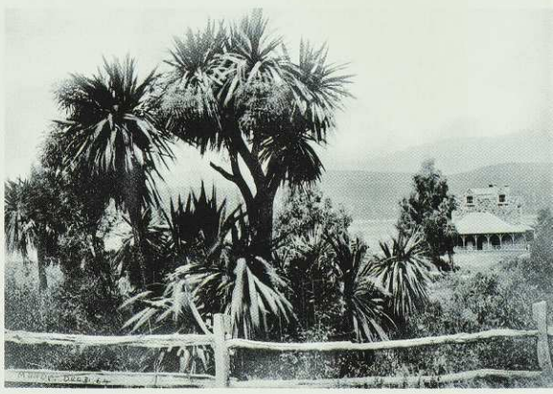


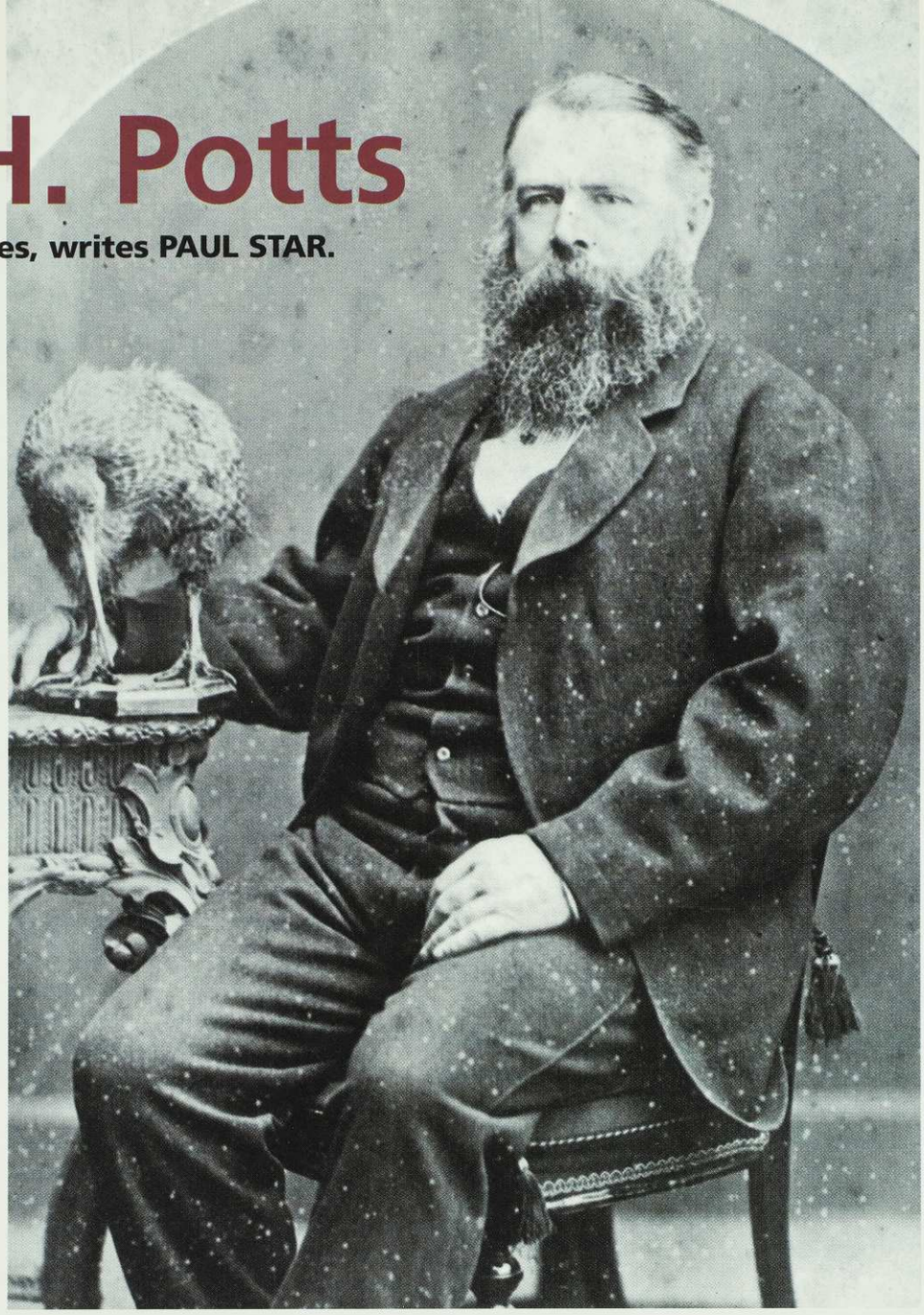
PHOTO CREDIT: MUNDY ALBUM, ALEXANDER TURNBULL LIBRARY F29216

In 1867, native cabbage trees fringed the landscape of Ohinetahi, home of pioneer conservationist T. H. Potts MP, at Governors Bay in Lyttelton Harbour. From its terrace he watched the destruction of totara forests on the Port Hills prompting his first efforts for conservation — an unsuccessful appeal in 1858 to the Provincial Secretary to stop the waste. The house, restored, and occupied by the architect Sir Miles Warren, is now surrounded by a famous garden largely of introduced plants.

Right: Thomas Potts was the first to describe the great spotted kiwi as a separate species, in 1872. He named it Apteryx haasti *after the director of Canterbury Museum, Sir Julius von Haast. As a governor of the museum, Potts was instrumental in stopping von Haast from trading specimens of kakapo and kiwi with overseas scientists. This hand-coloured lithograph is by J.G.Keulemans who also illustrated the pioneer* A History of the Birds of New Zealand *by Walter Buller.*

H. Potts

times, writes PAUL STAR.



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Thomas (T.H.) Potts (1824-88): run-holder, Parliamentarian, nature writer and pioneer conservationist. Like many of his contemporaries, Potts was active in nurturing introduced species such as gorse, oak and pines but believed in protecting native forests and birds.

ALEXANDER TURNBULL LIBRARY

thought 'people themselves can alone determine what shall be allowed to exist'.

In the nineteenth century, the role of Christians as stewards of the earth more often became a mandate for colonization than for conservation, but the Anglican tradition of 'natural theology' caused Potts to treat all nature with reverence. The value of native species was unknown — since they had only recently been identified — but it was not to be denied.

Potts also understood 'nature's economy' and saw the need to conserve habitat as much as species. Victorians didn't have the knowledge of ecology which has made us so aware of the flow-on effects of environmental change, but some had a sense of the web of life.

In the late 1870s, fresh ideas on scenic beauty, tourism and health coincided with worries about timber shortages and climate change. Americans wrote of national parks, and Yellowstone became the world's first in 1872. Potts welded his old arguments for reserves to the new talk of health resorts and national parks, and conceived a plan for 'national domains'.

He identified three kinds of preservation — of health, of trees, and of birds — and proposed three kinds of 'domain'. Some would be sanitariums for the human sick. Others would be native forest reserves, 'nurseries and storehouses ... of the indigenous flora of New Zealand'. Thirdly, and most radically, Potts suggested fauna reserves to protect interesting species for science.

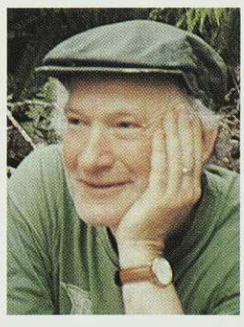
He wanted islands as fauna reserves. Resolution Island, plus some offshore islands in the north, could be parks or domains 'where animals should not be molested under any pretence whatsoever'. In Europe, hunters had fenced in game reserves for centuries. In a new country, Potts turned to the natural barrier presented by the sea.

These ideas had their impact. Scientists successfully lobbied for Resolution Island to be reserved in 1891. Richard Henry's time there, from 1894 to 1908, represents one of the most dramatic attempts at bird preservation in any country's history. Henry transferred kakapo from the mainland to Resolution Island to protect them from stoats and rats. Unfortunately, the attempt eventually failed when stoats swam to the island, but it was a world first in 'ecological restoration' with government support.

The broader notion of national parks or domains was also accepted about this time. In 1883, the Bishop of Nelson hoped for 'Government lands ... which might be our Yellowstone domain'. In the year before Potts's death, Horonuku, on behalf of the Tuwharetoa, donated land which became (in 1894) the core of Tongariro National Park.

National parks have since become the dominant model of environmental protection. Because of that, the history of conservation is often traced back only as far as their creation. But while European settlement before that undoubtedly involved sweeping destruction, this never went on unquestioned or 'without reserve'.

The life of New Zealand's 'first conservationist' includes many examples of concern for the environment, even in this period of its most rapid transformation. Born out of paradox it may be, but evidence of this early concern is undeniable and inspiring.

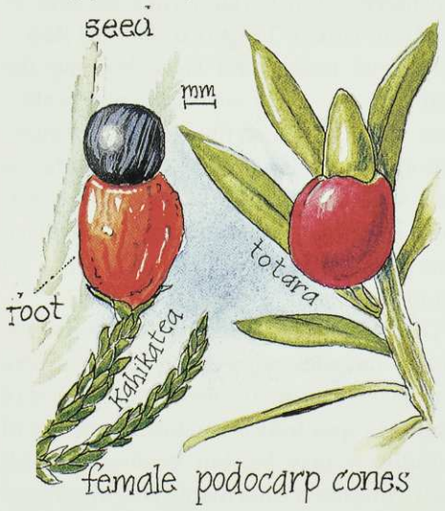


PAUL STAR *is an environmental historian and secretary of Dunedin Forest and Bird. His research into T. H. Potts was assisted by the New Zealand History Research Trust Fund.*

The shaping of seeds

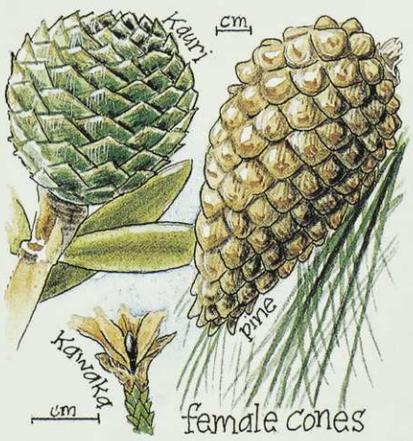
Nearly two thousand years ago, the ancients of Rome and China recorded a time of darkened skies and spectacular sunsets. They did not know it, but these were a side effect of a cataclysm far away in the southern hemisphere, the volcanic eruptions that created Lake Taupo about 186 AD. Roller coasters of ash were spewed out to overwhelm and bury the forests of the central North Island. But in the grey desolation after the ash had settled, some trees and some seeds survived. From them grew the podocarp forests of the present day, the most lofty and species-rich forests in the country, nourished on the ash deposits of the past.

'Podocarp' is a useful word, bandied about by botanists, but scarcely understood by anyone else, which is a shame, as this is a most convenient collective name for those forest giants, rimu, totara, kahikatea, matai, miro and tanekaha. The word 'podocarp' originates from the Greek *podos* — a foot — and *karpos* — a fruit. A podocarp is a plant which bears a naked seed on the end of a swollen, succulent stem — a 'fruity foot' or 'fleshy-footed seed' — which is a useful description of the seeding peculiarity of these trees.

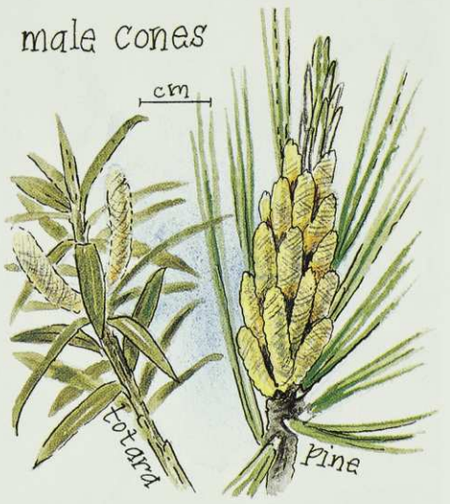


All these podocarps, including the familiar trees above, and other less common or less widespread species, belong to a predominantly southern hemisphere family of plants called the Podocarpaceae, of which 17 species are native to New Zealand. Podocarps don't have flowers, because as a group they belong in another ancient class of trees called Gymnosperms (meaning 'naked seeds') — all cone-bearing trees.

This is confusing for non-botanists because, in common usage, cones are knobbly things that grow on pine trees and make



good fire wood. These woody cones, with overlapping scales laid in a spiral pattern, are the typical fruits of the Gymnosperms of the northern hemisphere, and of one southern hemisphere family, the Araucariaceae, of which we have one species, the kauri. (Other members of the Araucariaceae include the monkey puzzle tree from Chile, the Norfolk Island pine and the Australian Bunya pine). Another predominantly northern hemisphere family in the Gymnosperm Class is the Cupressaceae, which have smaller, woody cones. Our cedars — kawaka and pahautea — belong here.



Compared to these cones, those of the female podocarp seem small and unlikely, because they are only a single seed, and their support structure is fleshy rather than woody. However, male podocarp cones readily show their Gymnosperm relationship. Just as the exotic pine forests around Tokoroa make the streets run yellow with pine pollen, so too our native conifers produce showers of pollen from similar, tiny, male cones, borne in their thousands on the tips of the branches, exposed to any passing breeze.

The Gymnosperms are an ancient class of plants, dependent on the wind for carrying their pollen from male to female cone. The wind is a careless carrier, so Gymnosperms must produce enormous quantities of the male pollen to ensure a few grains reach the female cones. In most podocarp species, individuals are either male trees or female trees. This ensures that cross pollination must take place but it lengthens the odds in a lottery whose prize is the achievement of a fertilized seed, for the male and female trees need to be relatively close to each other..

ILLUSTRATIONS BY TIM GALLOWAY

Even by Gymnosperm standards, the Podocarpaceae are a very ancient family, appearing first in the Jurassic period, about 190 to 135 million years ago. Fossil records show that some species growing today are little changed from their ancestors which grew in the forests of Gondwana, the ancient continent of which our country was once a part. Until recently, New Zealand was a rainforest ark for such ancient species, its isolation sparing them from the challenges of invasive species which so profoundly altered other ecosystems of Gondwanan origin.

So while flowering plants like tawa and taraire, beech and broadleaf mingle with rimu, totara and matai, it is still the ancient podocarps that lord it over the native forests of New Zealand. Podocarps are our icons, and the pillars of the cathedrals that are our native forests.

— *Ann Graeme*

PS Miro and matai fruits don't fit the seed-on-a-foot design. So these species have recently been put into a new genus, Prumnopitys, but still within the family Podocarpaceae.

ANN GRAEME *is national co-ordinator of the Kiwi Conservation Club, the junior arm of Forest and Bird. She lives in Tauranga.*

Flower power

Flowers are a reproductive device exclusive to the flowering plants or Angiosperms. Emerging later than the Gymnosperms, the Angiosperms and their flowers represent a giant stride in evolution, made possible by exploiting the contemporary expansion of insect species in a relationship which is of benefit to them both. Flowers attract insects, offering colourful petals and scent, and edible nectar and pollen. When the insect moves on it may accidentally carry with it grains of pollen which brush off and fertilise the next flower it visits. Insects are much more discriminating than the wind, handsomely repaying the flowering plant for its investment in petals and nectar, and helping make the Angiosperms the dominant plant group in the world today.

Just as cones evolved from a whorl of leaves, so too did the parts of a flower — sepals, petals, the male stamens and female pistils. Angiosperm means 'enclosed seed' and the angiosperms have their seeds enclosed in a leaf, modified and rolled into a tube. This becomes the juicy fruit surrounding the seeds, or the hard shell of the nuts we eat.

Building a riverside forest

Private planting project inspires community action on riverbanks writes MARGARET RICHARDSON

Jaap van Dorsser always dreamed of creating a forest. Several thousand trees, hours of back-breaking labour, and many years later, this dream has become a reality.

Forest and Bird members Jaap and his wife Sue live on a 3.7-hectare lifestyle block north of Rotorua, with the crystal clear Awahou stream on their boundary. It would normally be considered a great asset to have a beautiful stream running past your property, but until recently Jaap and Sue could not even see it for blackberry.

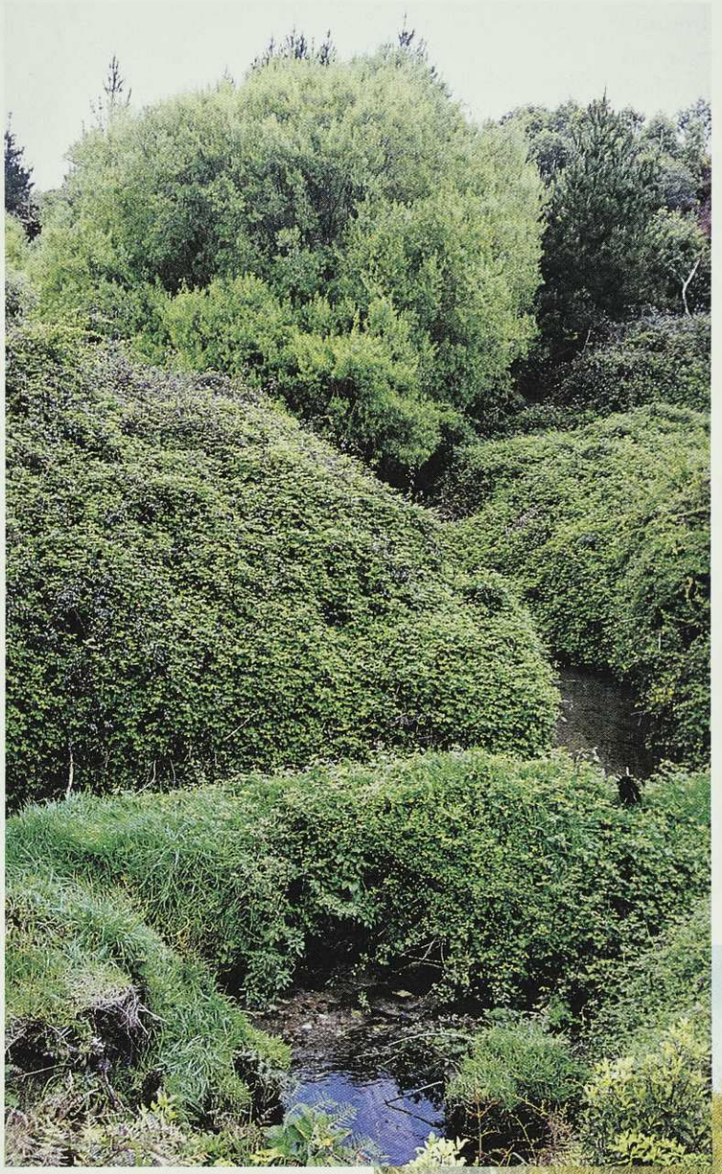
Back in the 1980s, the local catchment commision devised a scheme requiring all major streams feeding Lake Rotorua to be fenced off. This represented an important step toward improving the water quality of the lake. By excluding all grazing animals from riparian strips, streams previously soiled by pasture run-off cleared remarkably. The flip-side was that previously grazed streambanks soon became infested with blackberry.

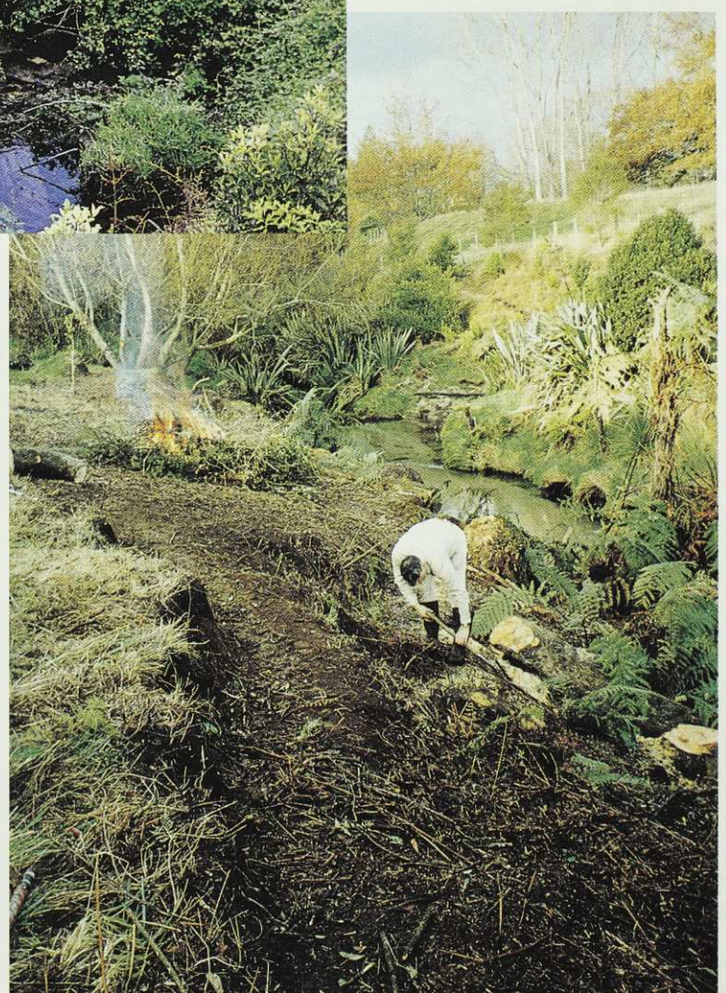
Unless you're a goat, blackberry is very nasty stuff, and little can grow up through a well-established patch. Since every root system throws up a new shoot every year, layer upon layer of blackberry forms a dense barrier to light, and greatly delays natural succession to forest trees.

While most landowners despair at these impossible thickets and turn a blind eye, Jaap, a retired forest nurseryman, saw the perfect site for his forest. Armed with slashers, spades, the odd bonfire and several gallons of spray, the enterprising couple laid siege on the virulent weed. Most people could probably imagine more relaxed ways of spending their retirement, but as Jaap says, 'I don't like golf and I'm very fond of trees.'

Once the blackberry was cleared and the root crowns dug out, they began planting native species. With a long background in forest-tree propagation, Jaap has broad experience in the field as well as 'valuable contacts who are sympathetic to the cause.' Obtaining hundreds of left-over shrubs from nurseries every year, the van Dorssers aimed for a high, initial planting density. As Jaap says, 'If you want to make a forest, you just have to close the canopy as quickly as possible'.

While this is a long-term project — in the extreme — the short-term requirements are clear and demanding. The van Dorssers are more concerned with coverage than artistic placement, and species are planted according to availability. For this reason, the for-





Above: a blackberry infested riparian strip on a neighbouring property gives an indication of the condition of the van Dorsser property before the restoration. Right: work in progress. Opposite page: Jaap van Dorsser – several thousand trees and hours of backbreaking labour have culminated in the completion of stage one of the restoration project.

MARGARET RICHARDSON

est is a bit of a hotch-potch to start with, but they know a more even distribution will result over time.

The older areas of planting, dating back to 1965, are already taking on the variety and balance of a natural forest environment. The van Dorssers have planted a number of totara, beech, rimu and other tree species that grow in the area, but natural seeding has also taken place. They say there is nothing more satisfying than seeing wild kahikatea emerge from the undergrowth.

By establishing a ground cover of 'pioneer species' such as coprosma, pittosporum, flax and other fast-growing varieties, blackberry is eventually prevented from re-invading the riparian area. The initial canopy also provides cover for most frost-tender species to establish.

While strict forward planning is not necessary in creating their forest, the van Dorssers have found it useful to construct clearly defined pathways from the outset, to provide easy access and future enjoyment. After the initial clearing, Jaap and Sue must spend the next three or four years keeping weeds out, so that juvenile plants can get properly underway.

'Once decent shade is established, a natural progression takes over and canopy trees emerge, which would previously have been choked.'

While they do the initial groundwork, nature does the rest. All they have to do is wait, and Jaap, with his affinity for 'long horizons', has the perfect temperament for a project of this kind.

Every year, the retired couple work their way further along the stream, so the forest can be seen at several stages of development.

'The end would be in sight if we didn't have that constant, niggling desire to go round the next bend.'

So impressive are the results of this project that other landowners and local authorities have followed their lead. Jaap has been appointed project leader of an environmental sub-committee formed by the Ngongotaha and Districts Community Association, to continue this work on a larger scale.

What started as a personal vision by this hard-working Dutchman with a love of New Zealand flora has grown into a vigorous community project.

'All we wanted to do was make our stream beautiful,' the van Dorssers say. Nature is rewarding their efforts by ensuring this is the case. As an added bonus, efforts by the community association will now enable other streams in the area to support the same beauty over time.

Pioneer Species for Forest Establishment

A retired forest nurseryman, Jaap van Dorsser lists these species as useful for projects like his streambank restoration near Rotorua.

FOR RIPARIAN STRIPS:

- Karamu, *Coprosma robusta*
- Black mapou, *Pittosporum tenuifolium* var. *colensoi*
- Kohuhu, *Pittosporum tenuifolium*
- Tarata ((lemonwood), *Pittosporum eugenioides*
- Broad leaf, *Griselinia littoralis*
- Flax, *Phormium tenax*
- Makomako (wineberry), *Aristotelia serrata*
- Houhere (lacebark spp.), *Hoheria populnea* and *H. sexstylosa*
- Putaputaweta, *Carpodetus serratus*
- Akeake, *Dodonaea viscosa*
- Mahoe (narrow-leaved), *Melicytus lanceolatus*
- Mahoe (whiteywood), *M. ramiflorus*
- Horopito/peppertree, *Pseudowintera colorata* and *P. axillaris*
- Lancewood, *Pseudopanax crassifolius*
- Mapou, *Myrsine australis*
- Karamu, *Coprosma lucida*
- Koromiko, *Hebe parviflora*
- Fern species

FOR WETLANDS AND SWAMP AREAS:

- Manuka, *Leptospermum scoparium*
- Kanuka, *Leptospermum ericoides*
- Karamu, *Coprosma robusta*
- Kahikatea, *Dacrycarpus dacrydiodes*
- Flax, *Phormium tenax*
- Cabbage tree, *Cordyline australis*
- Mingimingi, *Coprosma propinqua*

Pest control in local forests

South Waikato branch has developed a pest control programme which doesn't need a MAF poison licence.

Do you, your neighbours or friends, have a backyard or area of bush that needs protecting from introduced pests? Gordon Stephenson and the South Waikato branch have produced a simple guide to pest control based on experience at their Waotu project. They emphasise that while their programme has been developed over the last eight years they are still learning from their experiences. Nevertheless, they are achieving good results.

The control programme for possums and rats will also produce some by-kill of other pests such as mice. South Waikato Forest and Bird uses this timetable:

Step 1, June-July: Assume possum density is about 12-15 per hectare, plus mice, rats, mustelids, feral cats. Invite a professional possum hunter to take the 'first cut', which should drop numbers to about five per hectare. This part is the most profitable to a hunter, and the most expensive for a bait station programme.

Step 2, August: While numbers are still low, and before breeding, establish the bait stations. There are then three options:
(a) bait stations at 150-metre intervals (one per 2.2 hectares) gives excellent possum control and gets about 80 percent of rats;
(b) stations at 100-125-metre intervals gives excellent control of possums and rats;
(c) stations set along ridges and tracks at 150-200 metres, gives reasonable possum control if the programme is long-term.
Place stations about 15 centimetres above ground, or in a tree fork to avoid poisoning ground-dwelling pets, etc.

PHIL THOMPSON

At left: possums at raised bait stations. Left, below: bait stations, tunnels and traps available from Philproof Feeders. Tel/fax (07) 829-4712.

To catch mustelids

Use Mark 6 Fenn traps in tunnels 180 millimetres high by 150 millimetres wide by 750 millimetres long. Preferably two traps per tunnel with a bait (a cracked egg, fresh meat etc) between. Place alongside fence, track or a log.

Capturing wild cats

Try Timms traps with entrance enlarged by one centimetre in diameter. Pre-bait with meat scattered around trap for two or three nights, then set trap with meat.

Discouraging rabbits, hares

Rabbits eat leaves, dig up roots. Hares cut off stems with a neat 45° cut. Try soaking natural fibre baling twine (not synthetic) in creosote, and lay in a circle around young trees.

Step 3, August-November: Place brodifacoum (Talon or similar) pellets in stations. Begin with up to one kilogram per station. Recharge once a month (e.g., first weekend of the month). Do not keep filling up stations between times — it is wasteful, with little benefit. By October, 250-500 grams of bait should be ample.

Step 4, December or January: Stop baiting. Clean the stations to stop old bait going mouldy. Do not rebait until making another 'pulse' in April-May. Stop baiting again in June-July.

Our experiences with this programme have produced a number of useful tips:

- The programme, using options (a) or (b), should give good or total control of possums and rats. If conditions are very wet, the 'waxed egg' bait Talon 50 WD is moisture-resistant, but it is twice the price.
- There should be some by-kill of mustelids and wild cats feeding on dying possums and rats.
- The two periods of 'non-baiting' allow some build-up of rat numbers to obtain a by-kill and assists in avoiding 'bait-shyness'. The rest period also helps reduce the total amount of poison used, as concerns exist about the persistence of brodifacoum in the environment..
- With a programme in one portion of a large area of forest, a barrier of a line of stations at 50-metre intervals at the outer edge of the baited area will assist in preventing re-invasion.
- Brodifacoum is an anti-coagulant, and the antidote is Vitamin K. (See a vet., in the unlikely event of poisoning a pet.)

Know the enemy

This programme is designed to deal with several problem pests which are devastating our forests and birds:

Possums - which eat vegetation, berries, grass. They kill some tree species. Also eat birds' eggs, and spread tuberculosis. Will range one to two kilometres, but have bursts in autumn when they move several kilometres.

Rats - eat seeds and fruits, eggs, young birds, invertebrates. Range 50-1000 metres.

Mustelids - the collective name for the 'killing machines' – ferrets, stoats and weasels. These creatures eat rats, mice, young birds, young rabbits. Stoats and weasels can climb trees. Will spread tuberculosis. Will travel considerable distances.

Cats - prefer mice, rats, also eat rabbits and birds. Are somewhat territorial.

The hidden enemy

Getting rid of stoats is a critical step in making the environment safe for birds, writes STEPHEN WESTGATE.

The impact of stoats is not immediately obvious — until suddenly it becomes apparent that birds which were once present are seldom seen or heard. Like all serial killers, stoats operative furtively and unseen.

The extent to which they may be present and wreaking their unseen havoc is aptly demonstrated by the catch rate on the Okaihau (Northland) farm of Forest and Bird members Ian and June Wilson, adjoining the Puketi Forest.

Brown teal were released on Ian and June's property about three-and-a-half years ago. Since then, an intensive predator trapping regime has been maintained, which has resulted in a good survival rate of the brown teal, and some breeding success. Up to 50 tunnel traps are maintained on 80 hectares, along with various traps for feral cats.

The results have been amazing. Prior to starting the trapping programme, the Wilsons had only seen two stoats in 15 years. Since then they have caught 97 stoats, five weasels, one ferret and 36 wild cats. The predator catch rate has been:

Summer 1995-96 (traps only, no baits): 9 stoats, 5 wild cats.

March 1996-97 (traps baited with rabbit): 43 stoats, 2 weasels, 14 wild cats.

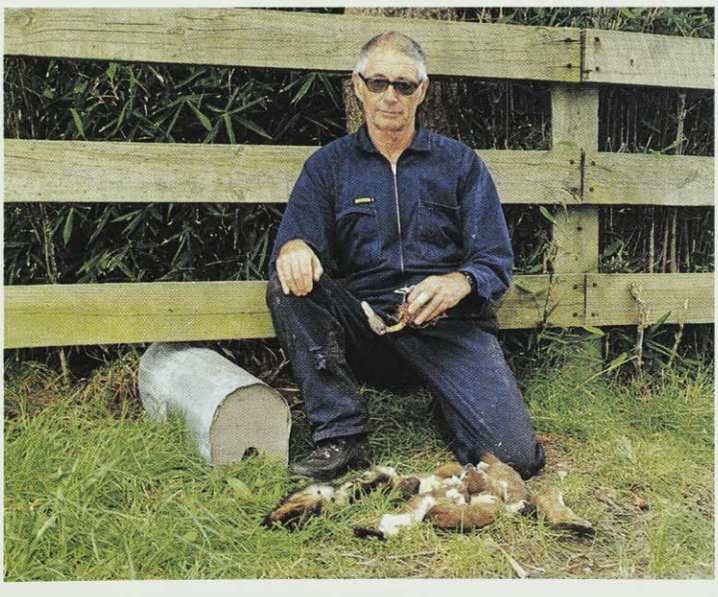
March 1997-8: 35 stoats, 2 weasels, 10 wild cats

March-October 1998: 10 stoats, 1 weasel, 1 ferret, 7 wild cats.

At peak times, three stoats a week have been caught over a two-month period (December 1996-January 1997). Ian Wilson sees this summer period as the time when stoats are spreading out, seeking new territories. Obviously, the reinvasion rate is incredibly high and continuous monitoring of the traps is essential, particularly over this period. The number of feral cats caught is also of great concern.

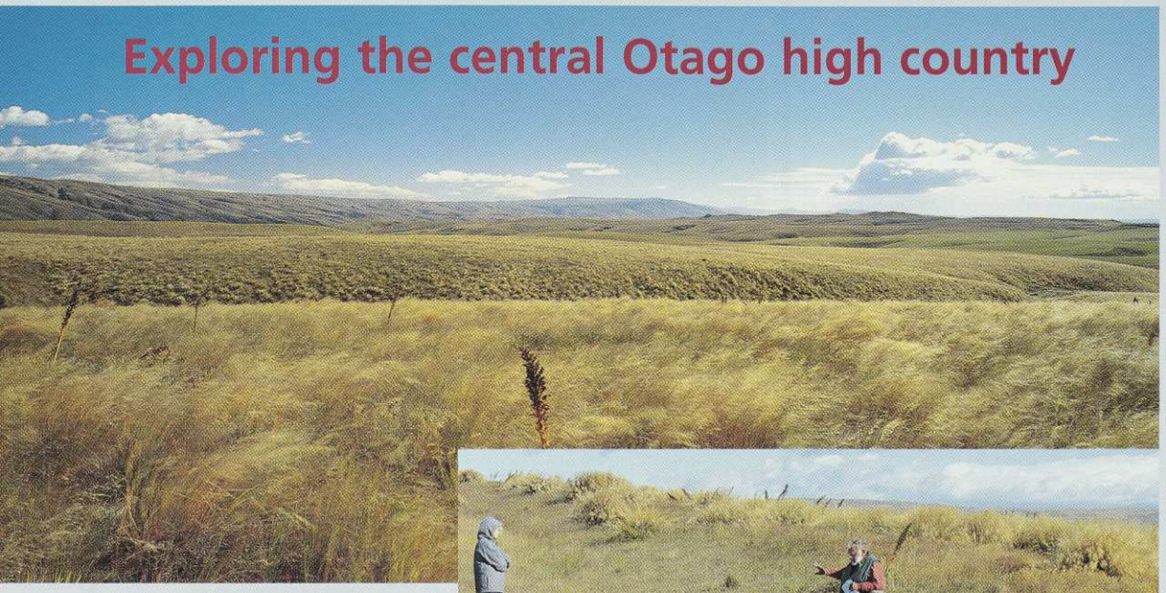
With this number of serious predators caught on just one farm, the survival of some species of native birds on the mainland appears to be dependent on 'mainland island' refuges and on private property, where committed people like Ian and June Wilson are prepared to 'make a difference'. — *Stephen Westgate.*

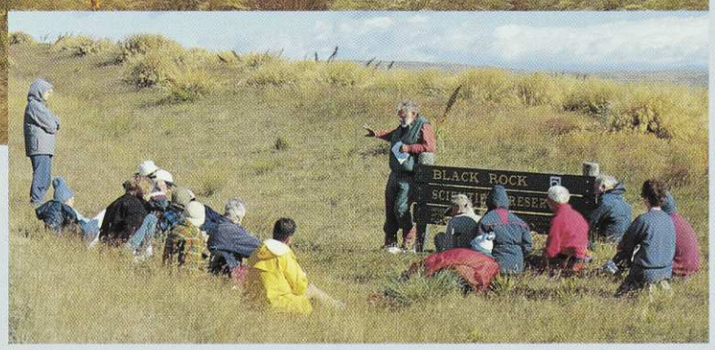
Ron Dobbs of Kerikeri maitains the trap lines that protect brown teal on Ian Wilson's farm.



SANDRA LEE

Exploring the central Otago high country





GILBERT VAN REENEN

The slopes of the Lammerlaw Range in central Otago, typical of the uplands areas explored by a combined party of Forest and Bird members from Upper Clutha and Dunedin branches. This area of the Black Rock Scientific Reserve displays healthy Chionochloa rigida tussock, with the Rock and Pillar Range in the distance. Below, members listen to Prof. Alan Mark, a former president of Forest and Bird, whose special interest is the high country and its conservation.

Following the old Dunstan gold trail, members of Upper Clutha Forest and Bird explored the central Otago uplands and met with Dunedin Forest and Bird members during a weekend trip. Led by former member of the Otago Conservation Board, Mike Floate, the party explored the Lammerlaws and Lammermoors, travelling some 20 kilometres across Rocklands Station. About 12,000 hectares of the Rocklands pastoral lease has been retired as conservation land out of an original 30,000 hectares. The new conservation land includes four special areas: Taeiri Rapids and part of the upper Taieri plain; the Deep Stream gorge; some 3500 hectares of upland snow tussock, the largest unmodified snow tussock grassland in Otago, including finger bogs, bog pools and snowbank communities; and the shrublands in a gorge of the upper Deep Creek which contains remnant totara.

The tour also included the Sinclair wetlands on the Taieri Plain. This area was recently purchased by the Crown from Ducks Unlimited and passed to Ngai Tahu as part of their claims settlement.

A former Forest and Bird president, Emeritus Professor Alan Mark, guided the combined party on Sunday, meeting at Lake Mahinerangi and travelling to the Black Rock Scientific Reserve to see snow tussock, a trial burning plot near Deep Stream reserve, and the Nardoo Scenic Reserve rising to the crest of the Lammermoors overlooking Lake Mahinerangi. *Source: Mike Floate*

REUBEN WILLIAMS

Kauri Coast Forest and Bird has begun a protection programme at Rototuna on the North Kaipara Head, some 50 kilometres south of Dargaville. The nine-hectare lake is to be fenced and its margins replanted with native vegetation, to enhance water quality. Taking a break during the work are Cyril Ranginui from the local Maori community Te Uri o Hau, on left, and Stephen Soole, secretary-treasurer of the Kauri Coast section of Forest and Bird.

Caring for dune lakes

Kauri Coast Forest and Bird is undertaking protection work at Rototuna, one of several dune lakes on the Pouto Peninsula in Northland. The nine-hectare lake is one of several formed behind drifting sand on North Kaipara Head, some 50 kilometres south of Dargaville.

The dune lakes are ranked as 'ecologically outstanding' because of their habitat for rare and threatened fauna. Rototuna is the home of endangered dwarf inanga, eels and a number of threatened bird species.

Funding for the project comes from the Northland Regional Council, following a joint approach from Forest and Bird and the Department of Conservation made with the support of local iwi, Te Uri o Hau.

The project is to fence the lake's margin and plant suitable native species 'to protect and enhance the environmental values of the lake'.

By creating a riparian buffer between agricultural land and the water, it is hoped to filter nutrients and enhance the water quality of Rototuna, significantly reducing eutrophication. Stopping stock access to the lake should reduce presently high coeliform levels.

Water levels in the lake are presently affected by pines planted in the catchment. All pines about the lake margin are to be felled. The restoration of a natural margin to the lake should also enhance its lansdscape value.

It is hoped to use this lake to raise public awareness of this and other dune lakes in Northland, and involve the public in protecting their environmental values.

Revegetation and maintenance of the new plantings on the lake margin will be an ongoing project over a number of years. Rototuna will be used as a conservation programme for various conservation and community groups, including the Dargaville Conservation Corps, local schools and Forest and Bird members. — *Stephen Soole, Kauri Coast Section.*

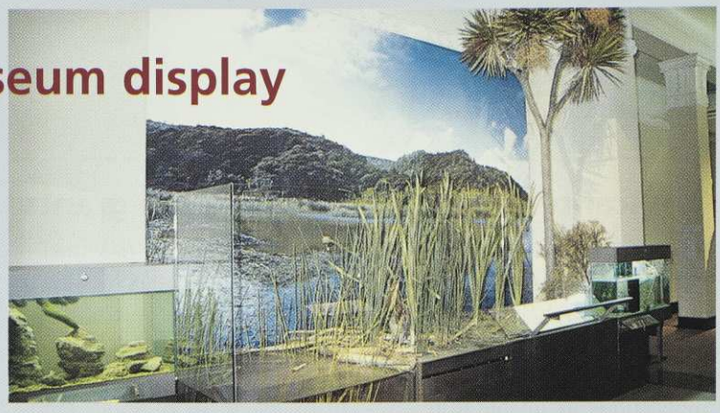
Society reserve featured in museum display

The Society's second largest reserve features prominently in a new display at Auckland War Memorial Museum. The environment of the 101-hectare Matuku Reserve, in the Waitakere Valley near Auckland, is represented in a panorama illustrating the wetland ecosystem.

The display containing typical plants and creatures of the Te Henga wetland is backed by a huge colour photograph of Matuku Reserve, extending from open ponds in the foreground through reed beds, to an alluvial fan with cabbage trees, right up to forested ridges on the skyline.

Lurking in the reeds are Australasian bittern (matuku), fernbird, pukeko and dragonfly, while an underwater section shows a black shag capturing a small eel. Either side of this display are freshwater tanks, one containing live small invertebrates, and the other live inanga and kokopu, which inhabit the Waitakere River and its tributaries.

The Matuku Reserve is made up of several adjacent blocks acquired since 1979 and protects the forested hillside above the best remaining wetland environment in the Auckland region. It began with 45 hectares of forest purchased jointly by Auckland branches and the Society nationally. Further land was acquired by purchase or exchange over the years. Both the Queen Elizabeth II National Trust and most recently the Forest Heritage Fund have assisted expansion. The two eastern blocks adjoin a Rodney District Council esplanade reserve along the Waitakere River which is managed informally as part of the reserve. — *John Staniland, Waitakere Branch.*



JOHN STANILAND

The Society's Matuku Reserve on the Waitakere River on Auckland's west coast is featured in this new display at Auckland War Memorial Museum. Raupo and flax are to be added to this display which is backed by a panorama of the forested reserve covering 101 hectares of the hills beyond. Tanks of live native fish and insects complement the static displays of wetland plants and birds including a bittern, fernbird, and a black shag capturing an eel.

'Native background' planting project

Mid-North Forest and Bird has carried out a project to promote the Society and the branch at Morris and James Pottery works at Matakana, near Warkworth.

An area was designed and planted with 230 native trees and shrubs as the background for photographing weddings and special occasions where a natural outdoor theme is required. Morris and James presented the branch with a pottery plaque recognizing the native area as a 'Mid-North Forest and Bird planting project'.

The plaque will be hung at the entrance of the pottery showroom, with photographs of the planting project placed in a frame, and Forest and Bird membership forms at hand. A small sign will also be placed at the planting site. — *Val Dunn, Mid-North Branch.*

Planting a native garden at Morris and James Pottery, Matakana, near Warkworth. Mid-North branch members with the pottery plaque they received to mark this promotional project are, from left: Laura McKinlay, Les Buckton, Joyce Hawkings, Eleanore Clark, Phyllis Knott, Val Dunn, Anthony Morris, Viv Davie-Martin and Jim McKinlay

Auckland office relocating

The Auckland office of Forest and Bird will be relocating to new premises, and restricting its opening hours to part-time, in May or June 1999. At the time of going to press the new address had not been determined. The telephone number will remain unchanged for a while, however, so please ring (09) 303-3079 to establish the new location and hours of opening before you visit.

NANCY PAYNE

Members of a Central Auckland Forest and Bird trip visited the historic Acheron Accommodation House near Molesworth Station during a South Island tour at New Year. The trip, organised by Nancy Payne, looked at conservation issues en route through Marlborough, Murchison, Maruia, Hanmer Springs, and Kaikoura. For the northerners highlights were 'mistletoe, robins, beech trees and companionship'.

Caretaker for Ruapehu lodge

An unpaid caretaker is required at Forest and Bird's Ruapehu Lodge for the duration of the 1999 ski season. Preference will be given to current Forest and Bird members. Duties include checking accommodation authorities and organising cleaning and maintenance. For more information contact Lyn Bates at Central Office, telephone (04) 385-7374 or email Batesl@wn.forest-bird.org.nz

bulletin

Applicants sought for conservation grants

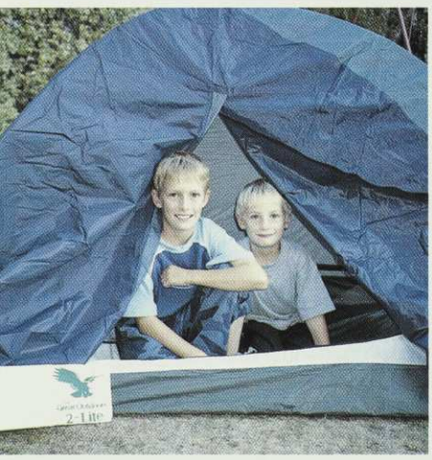
Another $20,000 is available this year, to help conservation projects and research, from the J.S. Watson Conservation Trust administered by Forest and Bird. Applications are invited from individuals or conservation groups for financial assistance for projects in the 1999-2000 year.

The criteria for assistance include projects dealing with:

- the conservation of plants and animals and natural features of New Zealand;
- the advancement of knowledge in these matters by way of research, literary contribution, essay or articles, or other effort;
- general education of the public to give them an understanding and love of the earth.

Grants are given to applicants up to a maximum of $4000 pa.

For further details and applications forms, write now to the Watson Grants, Forest and Bird, PO Box 631, Wellington. Applications close July 31.



PETER VAN ESSEN

Signing up a friend

Two young members of the Kiwi Conservation Club have won the prize in a Forest and Bird promotion 'Sign up a friend and win a tent'. Carl and Jerome Roberts of Ashhurst in the Manawatu went into the draw when they signed up a friend as a KCC member for his birthday. Here Carl (left) and Jerome are erecting their prize, a Great Outdoors 2 Lite tent.

Notice of annual meeting

The annual general meeting of the Royal Forest and Bird Protection Society of New Zealand Inc., will be held at 8.30am on Saturday, June 19, 1999, at the Quality Hotel, 355 (Upper) Willis street in Wellington. The meeting will be followed by the formal sessions of the annual Council meeting where delegates from branches will discuss policies and elect the national executive for 1999-2000.

The Council meeting begins with introductory talks at the Quality Hotel on the evening of Friday June 18 and continues through till Sunday.

After dinner on Saturday night, the annual Sanderson lecture will be given by Professor Peter Barrett of the School of Earth Sciences at Victoria University of Wellington, who has been involved in advocacy about the effects of global warming on the Antarctic ice reservoirs. The lecture commemorates the contribution to conservation made by the Society's founder Captain E.V. (Val) Sanderson, the first secretary (in 1923) and later president.

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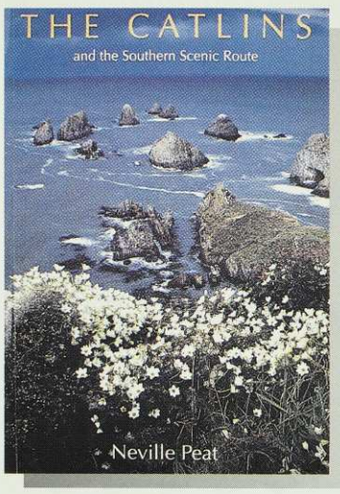
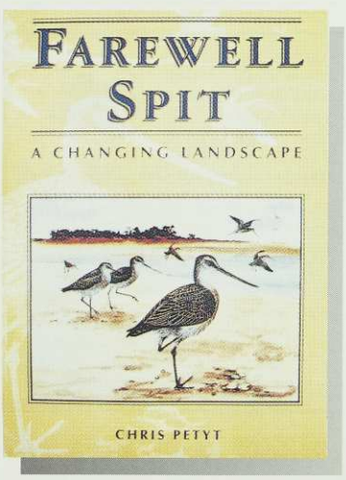


The Catlins and the Southern Scenic Route

by Neville Peat, 64pp, Otago University Press1998, RRP$19.95.

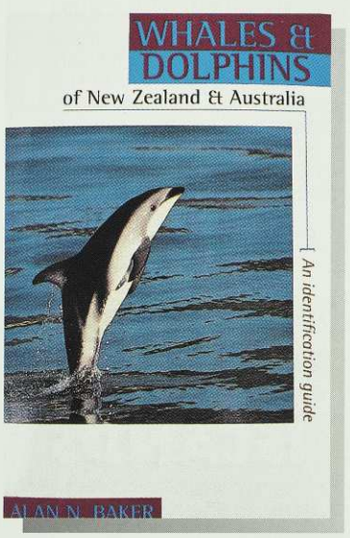
This is New Zealand's farthest south on the mainland, an oft-forgotten corner where continuing land clearance has not quite overcome the wilderness. After introducing the natural and scenic values of this exposed coast, the author follows the scenic route from Dunedin (the coast road turns off at Balclutha) and edges round the Catlins to Invercargill (and also outlines the Southland coast, to Te Anau). With its spectacular coastline, bush walks and lonely beaches, the Catlins still has the feel of pioneering days. Rent the Society's lodge at Lenz Reserve, and take this book along to enjoy.



Farewell Spit: A Changing Landscape

by Chris Petyt, 190pp, Terracottage Books, Tukurua, Takaka RD2, Nelson, RRP$45 post free.

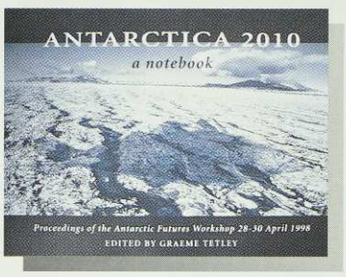
Everything you might ever want to know about that snagged fingernail of sandbank which flares off the northwest South Island. A photocopied A4 book this, with many black and white photographs, and even colour laser prints when needed: the combination works well giving scope for an extensive introduction to this nature reserve with its international bird list and interesting history. That history extends from Maori times, with photographs of artefacts, through European discovery, settlement, shipwrecks, lighthouses, farming and tourism (nearly half the book). The rest covers vegetation, animals and seashore life, whale-strandings, birdwatching, and an annotated birdlist. It is the kind of record which needs to be published but rarely attracts a commercial publisher because of its detailed local focus. It should add great interest to a journey in this remote corner. *Farewell Spit* is published by the author, who also handles sales by mail order from the address above..



Whales and Dolphins of New Zealand and Australia

by Alan N. Baker, 134pp, Victoria University Press, Wellington 1999, RRP$24.95.

The third edition of this identification guide, first published in 1983, is much the same as before, with the addition of up-to-date records. The publishers have not quite matched the typeface so the changes are obvious to anyone considering buying a replacement copy. Regardless of that, this is a model guide, with fine photographs and identification pictures, crammed with information. If you're interested in whales and dolphins and don't already have a copy, buy this edition.



Antarctica 2000, A Notebook

edited by Graeme Tetley, 96pp, Antarctica New Zealand through Craig Potton Publishing 1998, RRP$29.95.

Something new in conference reports, this is a precis of the Proceedings of the Antarctic Futures Workshop 28-30 April 1998 held in Christchurch, dressed up by a film writer and a designer for easy reading. Not only is there a page or more for every speaker: there is a running panel through the book with the lay thoughts and reactions to each paper by the editor as conference observer. The effect of this combination is curious, an attempt perhaps to give colour to the conference 'proceedings', which in themselves appear to be the editor's notes rather than the contributors' abstract. In the right-hand bottom corner a Patagonian toothfish gradually disappears over 90 pages, like an old-fashioned flick-through animation book, while the story of its exploitation by pirate fishers is serially detailed. The Antarctic Futures Workshop, organised by a Government agency, brought together a range of interest groups, including scientists, environmentalists, tourism operators, fishing interests, policy advisers, developers and miners. These were 'an intriguing three days which challenged established paradigms, moved beyond the polarised debate about use and protection and laid a platform of shared values and vision.' For a summary of possibilities in the Antarctic it is an idiosyncratic record.

a raindrop, a flowing river

photographs by Graeme Matthews, haiku by Ernest Berry, unpaginated, Graeme Matthews Photoimage, 193 Rarangi Beach road, Blenheim, 1998, RRP$59.95.

Graeme Matthews now publishes his own books, 10 of them to date since *The Edge of the Land*, about coastal New Zealand, in 1983. This coffee table volume displays a fine selection of his natural landscape pictures with the invitation to 'come to these pages with your own unique imagination'. The photographs 'work best', according to Graeme Matthews, 'when they evoke an emotion.'

The minimalist haiku form of Japanese poetry adds a few syllables of perspective to each image. The intention is 'to take the reader "inside" the photograph, "to understand the rustling of the leaves."'

Many of the pictures are of New Zealand but there are many also from other places, the geography sometimes indicated by the haiku, but often only by the 'reader's' recognition of foreign species. As to the content, there is the customary but evocative selection of landscapes captured at the margins of the day; some of the tree photographs are particularly striking.

For people whose imaginations are not already dulled by the constant bombardment of arresting visual images, there is space here to contemplate one man's vision 'of living on a beautiful planet.'

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Arethusa Cottage
An ideal place from which to explore the Far North. Near Pukenui in wetland reserve. 6 bunks, fully equipped kitchen, separate bathroom outside. For information and bookings send a stamped, addressed envelope to: Pat Platt, Waterfront Road, Pukenui, RD4, Kaitaia. (09) 409-8757.

Tai Haruru Lodge, Piha, West Auckland
A seaside haven set in a large sheltered garden on the rugged West Coast, 38km on sealed roads from central Auckland. Close to store, bush reserves and tracks in the beautiful Waitakere Ranges. Double bedroom and 3 singles, plus large lounge with open fireplace, dining area and kitchen. The self-contained unit has 4 single beds. Bring food, linen and fuel for fire and BBQ. For details and rates send stamped addressed envelope to Ethne Richards, 1/109 Fredrick St, Hillsborough, Auckland. (09) 625-8627.

Waiheke Island Cottage
The cottage at Onetangi has comfortable bunk accommodation for 8 people and has a stove, refrigerator and hot water. Adjacent to a 49ha wildlife reserve, it is in easy walking distance from shops and beach. It is reached by ferry from Auckland City. Everything is supplied except linen and food. No animals. For rates send an addressed envelope to the booking officer, Maya Spence, 16 Hobson Tce, Onetangi, Waiheke Island. (09) 372-9333.

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

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

Matiu/Somes Island, Wellington Harbour
Joint venture accommodation by Lower Hutt Forest and Bird with DoC. A modern family home with kitchen, 3 bedrooms, large lounge and dining room, just 20 mins sailing by ferry from the centre of Wellington or 10 mins from Days Bay. Ideal place to relax in beautiful surroundings, with accommodation for 8. Bring your own food and bedding and a torch. Smoking is banned everywhere on the island, including the house. For information sheet, send stamped addressed envelope to: Accommodation officer, PO Box 41-112, Eastbourne. (04) 562-8257

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

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