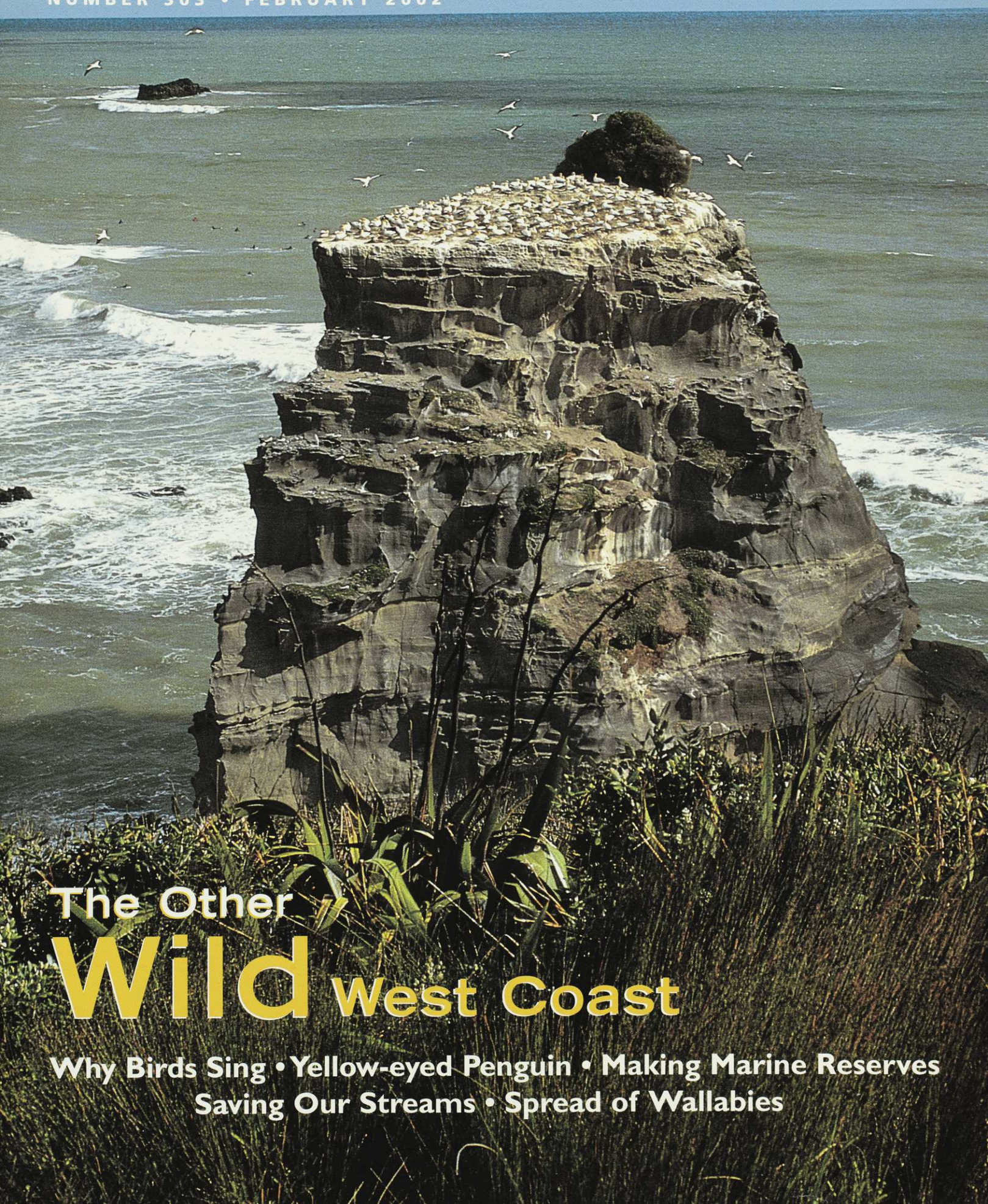
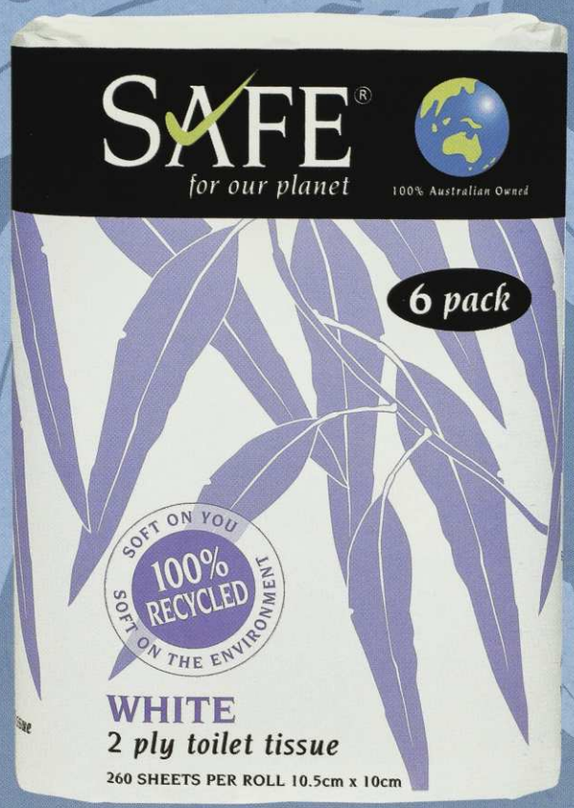
FOREST & BIRD

NUMBER 303 • FEBRUARY 2002



The Other Wild West Coast

Why Birds Sing • Yellow-eyed Penguin • Making Marine Reserves
Saving Our Streams • Spread of Wallabies



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Forest and Bird, New Zealand's largest environmental organisation, is involved in a wide range of conservation work. We are a registered charity which works to preserve and protect the indigenous flora and fauna and natural features of New Zealand for the benefit of the public including future generations. Current Forest and Bird membership is 40,000, and the Kiwi Conservation Club, for young people, has an additional membership of 6,000.

Forest and Bird is helping to:

- Protect natural areas including forests, tussocklands, wetlands and rivers.
- Preserve threatened species such as kakapo, kiwi and the yellow-eyed penguin.
- Save dolphins, seals and seabirds by ending damaging fishing practices.
- Promote a safe environment, free from pollution.

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

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Lyn Bates, General Manager

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

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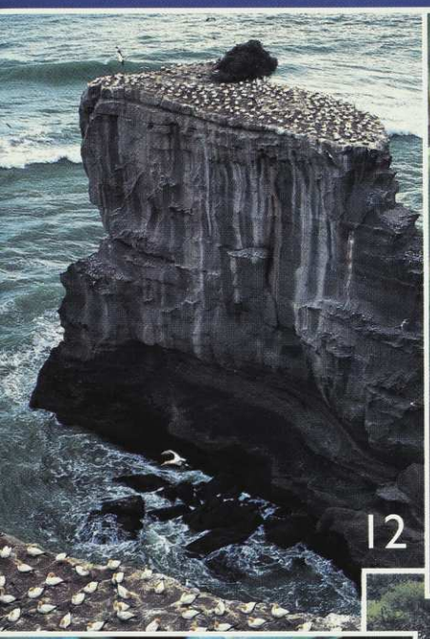

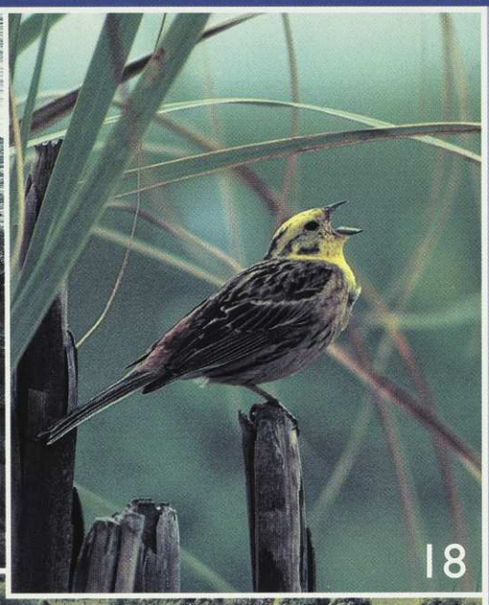

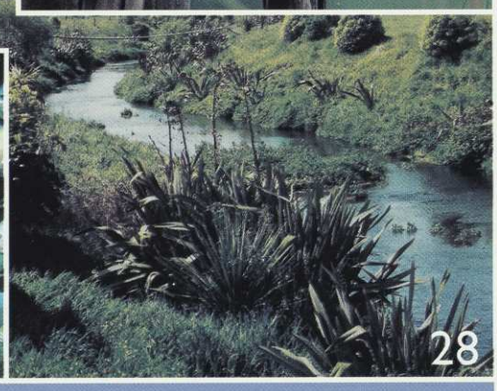

Features

Regulars

Cover: Gannet Rock at Muriwai on Auckland's wild west coast. PHOTOGRAPH: GORDON ELL, BUSH FILMS.

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FOREST & BIRD

Comment

Forest and Bird accepts the challenges

Saving Our Seas, Restoring Our Forests

A quiet revolution is sweeping through New Zealand, helping to bring fish and marine life back to our coastlines, and birds and regeneration to our native forests.

Forest and Bird wants at least 20 percent of New Zealand's coastline set aside as no-take marine reserves. Because these areas will be breeding areas and nurseries, there will be enormous practical benefits for marine life in all our oceans. Marine reserves will also help all New Zealanders to re-discover waters filled with fish, paua and rock lobster, something only older people remember from their childhood.

Our nation is surrounded by ocean. We have the fifth largest exclusive economic zone in the world. This is 14 times New Zealand's land area. Yet for many of us our delight in discovering the wonders of the ocean and its sea creatures has been sacrificed to allow unrestricted access for a fishing industry whose fish stocks are mostly in decline.

In 2002, Forest and Bird is leading a campaign to create a network of no-take marine reserves throughout the country. Politicians are scheduled to pass laws this year to make the task of marine reserve creation much easier.

Our mission is to give support to the creation of new marine reserves. Many of these reserves have already received overwhelming support in public submissions. They simply await political decision. Examples include marine reserves at Kaikoura, Island Bay in Wellington, in Nelson near Cable Bay, and at Te Matuku, Waiheke Island.

Forest and Bird wants at least 20 percent of New Zealand's coastline set aside as no-take marine reserves.

A network of new marine reserves would also be a fitting tribute to Sir Peter Blake. As an ocean adventurer he witnessed first-hand the plight of world fisheries and pollution of the ocean. His resolve to campaign for the environment grew from that awareness. Our challenge is to make our 2002 Marine Reserve Campaign a stunning success.

The second revolution sweeping New Zealand is just as important — the elimination of such pests as possums, goats, deer, stoats, rats and feral cats from our forests. We want to restore these forests to their former glory, filled with mistletoe, fuchsia, five-finger, rata and kohekohe, and ultimately we want to be deafened by the dawn chorus of birds.

Twenty years ago it was accepted that once rats invaded an island they could not be removed. Talon (Brodifacoum) changed all that. This anti-coagulant poison applied in a systematic programme has been shown to eliminate every mouse and rat from offshore islands. First it was used successfully on small islands in the Bay of Plenty, then on progressively larger islands. Each success has led to a more ambitious target. During the winter of 2001, rats and mice on the 11,300 hectares of Campbell Island in the subantarctic were poisoned, and there are signs this has been successful too. Ultimately it is not unrealistic to see such a programme on Great Barrier, an island of 28,000 hectares in the Hauraki Gulf. Already free of stoats, weasels and possums, the removal of rats and mice from Great Barrier and an accord amongst all residents to make the island cat-free could create one of the world's greatest wildlife sanctuaries.

Further, the establishment of 'mainland island' sanctuaries shows that it is also possible to eliminate pests and restore wildlife to their former glory throughout New Zealand. Unfortunately maintenance of these sanctuaries is very expensive and they cover only a fraction of our mainland conservation lands.

Much more extensive areas of conservation land are the focus of pest control through ongoing poison operations, primarily using sodium fluoracetate, 1080. Of the eight million hectares of New Zealand managed by DoC, possum control programmes are currently sustained over one million hectares of the most susceptible ecosystems. About 70 percent of this control is through aerial 1080-poison operations, used because of its effectiveness and safety. During 2000-2001, DoC spent $25.5 million on pest control on the land it manages. It is essential that we maintain these programmes.

The results can be striking. Recently I visited the Leonard Cockayne Nature Walk in Arthur's Pass National Park. This area was heavily poisoned with 1080 in March 2001. Every rata tree now has shoots emerging from its base (normally eaten by possums) and giant fuchsia trees were healthy and in full flower. Flocks of New Zealand pigeon, tui, bellbird, tomtit, brown creeper and fantail filled every tree. A New Zealand falcon landed two metres above our heads and sat fearlessly for photos while the chatter of yellow-crowned parakeets and a lone kaka could be heard high overhead.

We live in an extraordinary natural land. Our challenge now is to work together to retain and restore the best of New Zealand's marine and forest environments.

DR GERRY MCSWEENEY
NATIONAL PRESIDENT

Mailbag

Forest & Bird welcomes brief comments or criticisms about items or issues in the magazine. We reserve the right to edit letters for length. The deadline for our May issue is February 28, 2002.

No Thar, Thanks

John Dyer is wrong to suggest that eradication of thar from New Zealand would contravene the Convention on Biological Diversity (*Forest & Bird,* November 2001). The Convention requires New Zealand to 'control or eradicate those alien species which threaten ecosystems, habitats or species'. Thar threaten alpine ecosystems.

If thar in New Zealand were needed for re-establishment in the Himalayas, then these animals should be managed beyond New Zealand's conservation lands, rather than compromising New Zealand's internationally recognised alpine plants.

Forest and Bird shares Mr Dyer's concerns about the impact of sheep grazing. In the ongoing review of land tenures in the high country, Forest and Bird is actively seeking the retirement of such lands and their transfer as protected areas under the Department of Conservation.

GEOFF KEEY
Forest and Bird researcher, Christchurch

Restoring Nature

Your last magazine cheered me up no end. There are so many good things happening. No doubt stories like those in *Forest & Bird,* will stimulate more people to get up and going on mainland-island type projects or even planting projects.

People must also be starting to realise that anyone can do their bit by setting a few traps around the garden or farm or beach section.

STUART CHAMBERS
Waiuku

10 Years of the RMA

Many small-scale everyday activities generate the 'cumulative effects' of the Resource Management Act, particularly in urban areas. ('Ten Years of the R.M.A', *Forest & Bird* November 2001).Water-related matters, particularly discharges, are critical environmental issues, but water-related impacts are given poor scrutiny. This is because water is still seen as something to take, make and waste with virtual impunity. But clean water comes from somewhere and dirty water must go somewhere.

One important part of the RM Act which receives very little attention is section 17. This states that 'every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity....' This applies to all New Zealanders but how many know this and carry out their duty to the country and their community?

Another serious culprit is the Building Act 1991. In many ways the Building Act is contrary to the RMA. The Building Act does not have proper regard for other legislation, sustainable principles, waste minimisation, water efficiency, pollution prevention, long-term contamination of surface water and streams, rivers etc. Impacts on neighbours are not well handled in the Building Act either. Perhaps these issues may be covered somewhere by words, but what translates into practice is a different matter.

PETER NAGELS
North Shore

Stoats: Renewed Efforts to Control Tiny But Master Predators

If you think the possum is the perfect pest and predator, take a moment to consider the stoat. Recent research has confirmed suspicions that stoats have contributed critically to the decline of native wildlife including kiwi, kaka, kokako, kereru, parakeets, black stilts, yellowheads and giant weta.

'There has been a growing concern about the plight of native species like the kiwi,' says the manager of the national stoat research programme, Elaine Murphy of the Department of Conservation.

'Forest and Bird highlighted these concerns. In the past the scientific community didn't realise the impact of predation on native species, but in the 1990s it became clear that controlling stoats did make a difference to breeding success.'

First introduced and protected under Government policy to control rabbits in 1884, it was not until 1936 that the importation of stoats was finally banned. By then stoats had colonised the North and South Islands from sea level to alpine areas.

Over the years the main control for stoats has been labour-intensive trapping, but in 1999 the Department of Conservation was given an extra $6.6 million to run a five-year integrated research programme.

After a review of knowledge and assessment of research directions, some four dozen projects have been funded to investigate more effective baits, lures and traps, and improving understanding of stoat reproduction and interaction with other pests.

Research is revealing more about the interactions between stoats and their prey in different habitats.

'In a Mackenzie Basin braided-river valley where rabbits and birds are the main prey, it was a surprise to find that stoats and ferrets use common den sites, though not at the same time,' says Dr Murphy. 'However it was depressing to find large numbers of preyed-on riverbed birds in the dens, including quite a number of adult wrybill, as well as their eggs and chicks.'

Researchers are still trying to unravel the complex relationships between stoats, rats, mice and birds in major beech-seeding years (called mast years). The high numbers of stoats in the year following mast years can decimate a native bird population, while after a rat-poisoning operation it was found that stoats switched their diet to birds.

Dr Murphy says some of the more 'biotech' control options being investigated will need longer than five years to test, but will help towards a better foundation for sustainable and effective stoat control.

'We can control possums and rats, but we don't seem to have the same armoury against stoats. We're seeing some promising results for lighter, inexpensive traps, and more effective species-specific baits and lures, but we need to do risk analysis for each option. We've looked at how stoats are controlled on game estates in the UK and we're also working with research centres in Australia, but as stoats are only a conservation pest in New Zealand, we are largely on our own.'

LANDCARE RESEARCH

A stoat emerges from its den.

DEPARTMENT OF CONSERVATION

Radio transmitter affixed to a stoat. In this way, a pregnant female was tracked over 64 kilometres, crossing three mountain ranges in Fiordland, in just four weeks.

DEPARTMENT OF CONSERVATION

The tiny, 250-gram stoat is a serious predator of native wildlife. A five-year research programme costing $6 million is aimed at controlling the introduced pest. Four dozen projects have been funded to investigate more effective baits, lures and traps, and improving understanding of stoat reproduction and interaction with other pests.

So far researchers have tried lures with odours and freeze-dried rats, ultrasonic repellents, and hen eggs stuffed with 1080 poison. They are looking for weak links in the stoats' defences, and whether diseases like canine distemper can reduce populations.

While stoats can proliferate in the wild, it was not until November 2001 that the first litter of stoats was born in captivity, at Landcare Research's special research facility.

'With huge population fluctuations from year to year in natural populations you can't just go out and get stoats for research anytime you need them,' says stoat researcher Cheryl O'Connor of Landcare Research.

'It's important to fully understand the mechanism of stoat reproductive biology before it can be manipulated,' she says. 'One of the fascinating things about stoats is that the females after mating delay implantation of the embryos for eight to nine months.'

Not only do females carry latent embryos, but they also travel and invade large tracts of land. A radio-tracked pregnant female has been found 64 kilometres away after four weeks in Fiordland. Stoats can swim more than 1.6 kilometres to islands. The solitary creatures hunt by day or night using acute senses to detect a wide range of prey on the ground or in trees, from invertebrates to rabbits and possums. They are ferocious, killing more than they need and then storing the food, researchers find.

'We want to make a difference,' says Dr Murphy of the research programme. 'Otherwise we are going to lose yet more species.'

— **KEITH LYONS**

Growing Interest in Pet-free Housing Subdivisions

DEPARTMENT OF CONSERVATION

Fantails are an easy prey for domestic cats. Their populations benefit in wildlife-friendly areas where cats and ferrets are not allowed.

Forest and Bird's initiative to encourage wildlife-friendly conditions near ecologically sensitive areas is catching on with local councils, landowners and developers.

Early wildlife-friendly areas were advanced by Forest and Bird's Upper Coromandel Branch through their conservation officer of the time, Basil Graeme. They succeeded in banning introduced animals and pest plants from the Mahakirau Forest Estate, a subdivision of large, forested lifestyle blocks, home to kiwi and Hochstetter's frogs. In the Far North, Michael Winch and Linda Conning promoted dog-free subdivisions which protected kiwi from the family dog.

Wildlife-friendly subdivisions now occur in Northland, Hauraki Islands, the Coromandel peninsula, Kapiti and Wellington. Now the idea has reached our cities — in September last year a new wildlife-friendly area was announced within a kilometre of the Wellington central business district.

The goal of wildlife-friendly areas is to reduce the impacts of domestic pets on native wildlife. More and more, houses are being built beside vulnerable ecosystems like native forests and sand dunes where shore birds nest. In these circumstances, abstaining from pet ownership acknowledges the value and pleasure of living alongside nature.

Five years ago, Ann and Basil Graeme wrote about the new wildlife-friendly concept in *Forest & Bird* magazine ('Eco-subdivisions: living without cats and dogs', February 1997). Now Forest and Bird, as pioneer of the process, is being approached by landowners and developers asking for assistance in protecting the wildlife and habitat on their land.

Wildlife-friendly subdivisions can be established when landowners or developers protect natural values by placing a covenant on the land title. Usually, this prohibits cats, dogs and ferrets from the land. Some covenants also prevent the introduction of certain invasive plants, and require pest and weed control or prevent the clearing of native vegetation.

Wildlife-friendly covenants also give developers the opportunity to attract conservation-minded buyers. The developers of Opara Estate in Northland advertised by highlighting its conservation covenants, the regenerating habitat and the native wildlife of the estate.

In a recent development at Kaiwharawhara in Wellington City, developers have recognised benefits in protecting wildlife. The subdivision is in a zoned 'bird corridor' near to the Karori Sanctuary, where native birds including kiwi, bellbirds and whiteheads are being reintroduced. Forest and Bird's Wellington branch approached the developers and suggested making the subdivisions wildlife-friendly. The developers investigated the idea themselves and agreed to place covenants on the titles prohibiting cats and mustelids.

The wildlife-friendly concept has come a long way in the last five years, and new challenges lie ahead.

'The wildlife-friendly concept should not be seen as a threat by cat and dog lovers,' according to Forest and Bird's biosecurity specialist, Karli Thomas. 'Only special wildlife areas warrant this status and it offers a choice for people who wish to live with native wildlife, undisturbed by cats and dogs.

'To this end it would be helpful if provision were made for wildlife-friendly standards in District Council plans,' Karli Thomas says. 'As acceptance grows, Forest and Bird would like to see existing communities next to important wildlife habitats become wildlife-friendly.' — **STAFF**

How you can help

There are many areas where wildlife has been protected by special provisions relating to the land. If you know of a wildlife-friendly area please contact Forest and Bird. Collecting this information will provide a resource for landowners who want to develop new wildlife-friendly areas.

If you are interested in protecting the wildlife on your property please contact Forest and Bird for information on how this can be done. We can provide examples of covenants, and put you in contact with people who have already developed wildlife-friendly areas and can offer advice.

— **KARLI THOMAS**

Killer Fungus Attacks Rare New Zealand Frogs

A killer fungus responsible for decimating amphibians around the world has struck one of New Zealand's 'archaic' endangered native frogs.

In September, researchers in the Coromandel Range of the North Island found a dead Archey's frog with skin lesions suggesting that it died from a Chytrid fungus infection. More recently, four dead Archey's frogs were found in the King Country at Whereorino Forest, and it is understood that tests could show some, if not all, were infected by the fungus.

In recent years, amphibians in Africa, the continental Americas, Europe, Australia, and Oceania have been reported as infected by the same fungus. Globally, 93 species of amphibians have been diagnosed as infected. Australia, where the fungus arrived in 1978, has been the hardest hit, with 46 species affected, including eight listed as endangered and five as vulnerable.

The fungus was first found in New Zealand in two introduced Australian species, the green frog and the golden bell frog, in 1999. Reports from Australia indicate a virus may also be implicated.

Archey's frog is one of New Zealand's four *Leiopelma* frogs, 'species of huge scientific interest internationally as they are the most ancient left on the planet, and survivors of the Jurassic period some 200 million years ago,' according to Andrew Harrison of the Department of Conservation. Before the fungus was found to affect Archey's frog, the species was already in serious decline.

SHAUN BARNETT

The endangered-native Archey's frog is being attacked by a Chytrid fungus which has affected frog populations worldwide. New Zealand's ancient frog species are notable for having evolved in the Jurassic period 200 million years ago.

It is found only in the Moehau and Colville Ranges on the Coromandel Peninsula and at Whareorino forest west of Te Kuiti.

'Chytrid fungus has the potential to decimate New Zealand frogs if it spreads,' according to Andrew Harrison, who is a member of a technical group set up recently by the Ministry of Agriculture to work on the problem. 'Frog populations have been decreasing world-wide since the 1980s and New Zealand is unfortunately following the global trend.'

The technical advisory group set up in response wants to find out more about the fungus, particularly how it transfers from introduced frogs to native species. But the effort is hampered by a lack of knowledge.

'We don't know much about how it moves around,' Andrew Harrison says. Other research is centred on detecting the fungus in water and on vegetation.

'The next step is to survey the extent of population decline and to find out if the survivors have been infected,' says a researcher at Victoria University of Wellington, Dr. Ben Bell, who is also on the advisory group. 'The group is anxious to stop the fungus spreading to New Zealand's other three native species, particularly Hochstetter's frog which shares native forest habitat with Archey's frog.'

Dr. Bell said the group was also considering removing some frogs to a safe facility where they may be bred in captivity.

Department of Conservation workers are taking strict precautions when visiting frog habitats to try to minimise the spread of the fungus. Andrew Harrison says an infected frog would appear emaciated and lethargic, often with abnormalities of the skin or eyes.

'The fungus infects the skin of frogs. We're not yet sure whether it suffocates them or kills them as they absorb the released toxins,' he says.

Other factors have been blamed for some frog die-offs, such as uncontrolled chemical use. But nearly half the dead frogs handed in to a three-year Australian survey were diagnosed with Chytridiomycosis, showing no other disease, and no evidence of depressed immunity.

Researchers question if the Chytrid fungus has always been present and, if so, whether it has only recently become 'active'. There is the suggestion environmental conditions such as increased ultraviolet light levels or pollution have made it suddenly deadly.

Certainly, climate change has been put up as a possible explanation. Some workers say drier conditions are causing amphibians to crowd at water sources, helping the fungus to spread.

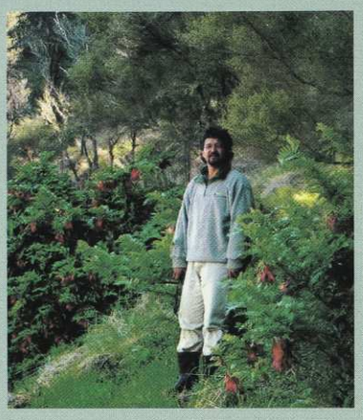
— DAVE HANSFORD

Kaka Beak Recovery on the East Coast

Ranger Graeme Atkins wants to plant the endangered kaka beak on roadsides from Wainui to Ruatoria on the East Coast, a distance of nearly 100 kilometres, and make that part of State Highway 35 a 'crimson highway'. The scarlet-flowering plant is practically extinct in the wild though it is grown in some gardens as a springtime ornamental.

A biodiversity ranger with the Department of Conservation in Ruatoria, Graeme Atkins located one of the last plants on the Waipare/Nuhiti block, north of Anaura Bay, and raised many plants from its seeds and cuttings. That original plant subsequently died in 1997, nibbled by cows and finally dying in the drought.

The trial planting and care programmes have involved



MEG COLLINS

DoC ranger, Graham Atkins, with roadside planting of kaka beak along SH35, East Coast.

seven schools along the highway. Each school has been helping in the preparation of the land, which is mainly steep roadside cuttings, belonging to either local farmers or Transit New Zealand.

Three years ago the children planted out 80 kaka beak plants, and 56 survived the rugged conditions. Some are now three metres high and four metres across. The plants have had to suffer the assaults of snails, slugs, hares, rabbits, goats and straying stock. Their weed enemies include smothering weeds such as Mexican daisy, Japanese honeysuckle, briar rose, and fennel.

Graeme Atkins takes the children to their own sites, once a term, to weed the kaka beak, layering the long branches into the ground using a wire hook. This technique creates large, spread-out plants. He then places 'Treepel', a product developed from eggs, which is used in pine plantations, to keep the animal pests at bay.

'Now the kaka beak have grown into quite substantial bushes, the weeds are less of a problem,' says Graeme Atkins.

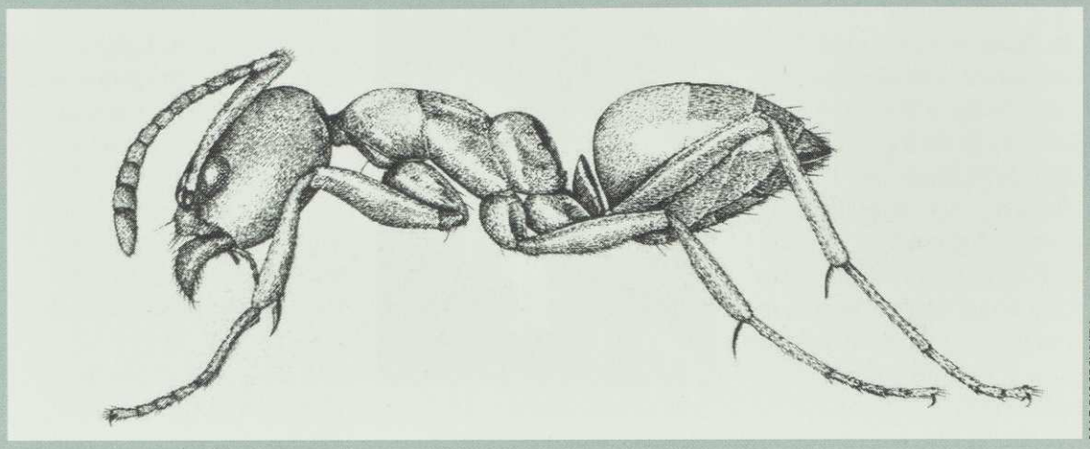
'The beauty of this project is that the kids own it,' he says. 'They now understand the importance of our native flora, and that some plants, such as the kaka beak, are endangered. They are all feeling proud of the fact they have been responsible for reviving this endangered species.'

In Conservation Week, 2002, Graeme hopes to plant up to 2000 more kaka beak along the coast. — **MEG COLLINS**

MEG COLLINS

The scarlet flowers of kaka beak which is practically extinct in the wild.

National Eradication of Argentine Ants Desirable



MAF BIOSECURITY

Argentine ants displace and wipe out other insect populations such as native ants. Although they do not fly, they will climb trees, swarm bird nests and devour fledglings. Preferring sweet foods, they also consume flower nectar that would otherwise be a food source for native birds, geckos and insects.

Forest and Bird is seeking a national eradication programme against the Argentine ant which arrived here 12 years ago and is considered the second most-serious ant pest in the world. (The worst ant pest, the fire ant, arrived also in New Zealand last year — see 'Dangerous Insects...' opposite page.)

Argentine ants are a serious pest of households, conservation, horticulture and forestry. The Ministry of Agriculture and Fisheries says the ants will 'eat virtually anything'. By habit, the ants protect aphids and other insect pests so they can feed on the honeydew these creatures produce. This behaviour could have serious implications for the horticulture industry, and especially for organic farmers who rely on predatory insects to keep pests such as aphids under control.

Argentine ants displace and wipe out other insect populations such as native ants. Although they do not fly, they will climb trees, swarm bird nests and devour fledglings. Preferring sweet foods, they also consume flower nectar that would otherwise be a food source for native birds, geckos and insects. They are light to dark honey-brown, two to three millimetres long and bite — but are not poisonous.

In New Zealand the ants are still spreading, with new populations recently being found in Kaitaia and Hamilton. Since 1990, Argentine ants have been found in Christchurch, Dargaville, Hastings, Morrinsville, Mt Maunganui, Nelson, Warkworth, Wellington, Whangaparoa and Whangarei. The ants were also found on Tiritiri Matangi Island, a wild-life sanctuary in the Hauraki Gulf, where they probably arrived during construction of a new wharf in 1998.

Forest and Bird's biosecurity officer, Karli Thomas, says the insects are considered one of the world's worst pest ant species because they are aggressive and highly organised.

Cooperation between separate colonies of the ants allows them to build up to phenomenal numbers — up to six nests per square metre have been found in Auckland.

'The pressure from such a huge ant population — and its huge appetite — has impacts on households, primary industry and conservation,' she says. 'The ants are a huge headache for households, as they can get into microwaves, fridges and even screw-top jars.'

There are currently no commercially available chemicals known to control the ants, but various baits are being trialled and MAF says it is still investigating the viability of completely eradicating Argentine ants. Early indications of the effectiveness of eradication trials on Tiritiri and in Nelson and Mt Maunganui are promising, but no clear results will be available until the end of this summer.

Argentine ants were first found in New Zealand at the Mt Smart stadium in Auckland, site of the Commonwealth Games in 1990. It is thought the ants arrived there via transported goods from an industrial area in nearby Onehunga.

The then Ministry of Agriculture and Fisheries surveyed the area and found that the ants had already become well established in several Auckland suburbs. MAF says it was decided at that time that the ants would not be eradicated because there were no known control methods and the ants were not then considered a threat to agriculture.

Since then Argentine ants have been spread from infested areas mainly through the collection of rubbish and movement of goods from car dealerships and plant nurseries. Most infestations have been in small areas, confined to less than two hectares, but Karli Thomas says action must be taken urgently to destroy the 'satellite' infestations outside Auckland and to prevent any further spread of the ant.

With infestations in ports at Tauranga and Nelson there is a real risk of transporting the ants to other New Zealand ports, or even to trading partners overseas, Karli Thomas says.

— SIAN ROBINSON

JACK KELLY CLARK, COURTESY OF UNIVERSITY OF CALIFORNIA STATEWIDE IPM PROJECT

Argentine ants are a serious pest of households, conservation, horticulture and forestry. They are light to dark honey-brown, two to three millimetres long and bite – but are not poisonous.

Dangerous Insects, Spiders, Invading New Zealand in Import Cargoes

Repeated border incursions by insect pests, including disease-carrying mosquitoes and venomous spiders, have highlighted the need for tougher biosecurity controls.

'At present the hole in our border control is so big that a bus can get through it,' says Forest and Bird's biosecurity awareness officer Karli Thomas. (She means this literally — last year a dirty bus slipped through border inspections completely.)

Among the unwanted invaders in 2001 were:

- venomous live black widow spiders found on Californian table grapes four times in three months.
- Fire ants, the 'worst ant pest in the world', discovered at Auckland International Airport.
- Larvae and pupae cases of the disease-carrying Asian tiger mosquito found at wharves in Auckland and Wellington.
- A yellow fever mosquito found in a container of used vehicles, also at an Auckland wharf.

Since the discovery of the fourth black widow spider on Californian table grapes in November 2001, a six-month importation ban has been imposed on the grapes. Forest and Bird welcomed the ban but believes it should have been imposed sooner. With imported used vehicles being the source of numerous border breaches last year, Karli Thomas says it is essential that offshore inspections be required.

The Asian tiger mosquitoes were found in an imported used tyre and in a Japanese cargo ship. Fortunately, no mosquitoes were caught in traps set up in the area of either incident. The Asian tiger mosquito is a carrier of dengue fever, Japanese encephalitis and yellow fever.

Figures from the Ministry of Agriculture and Fisheries show that the rate of gypsy moth interceptions on used imported vehicles tripled from 1998 to 1999. Gypsy moths are a serious pest that 'could have catastrophic consequences for our native and plantation forests,' Karli Thomas says. Forest and Bird is asking the Government to immediately review MAF's Import Health Standard (IHS) for used vehicles. MAF proposed an improved standard in 2000, requiring the offshore inspection of all used vehicles, but later abandoned it. Latest figures show that less than half of imported vehicles are inspected before being shipped here.

GENE BROWNE/MAF BIOSECURITY

The Asian tiger mosquito is a carrier of dengue fever, Japanese encephalitis and yellow fever. Larvae and pupae cases have been found at wharves in Auckland and Wellington.

Insect invaders also seem to be hitching plane rides. A single colony of ferocious fire ants that could have been up to two years old was found at Auckland's International Airport. These aggressive ants have a sting similar to that of a bee or wasp, and if they took hold in New Zealand could make being outdoors extremely unpleasant. With an infestation of the ants now in Brisbane, incursions here have become more likely.

Meanwhile, a $6 million nationwide programme has begun to contain the southern saltmarsh mosquito, first discovered in Napier in 1998. An 'aggressive biter', this mosquito is a carrier of the Ross River virus and represents a significant danger to the health of a range of animals, including humans. The southern saltmarsh mosquito has been found on the East Coast and in Hawkes Bay, but the largest infestation is in the Kaipara region, northwest of Auckland. Government policy is to eradicate the mosquito from the eastern sites, and to contain it in Kaipara until the feasibility of eradication there has been investigated. Forest and Bird has asked for all of the infestations to be eradicated.

Then, of course, there is the insect pest that has hit the headlines the most in recent times, the painted apple moth. An Australian native, the moth was first identified by a Forest and Bird executive member and entomologist, Dr Peter Maddison, in Glendene, a suburb of Auckland, in 1999. It has since spread to other Auckland suburbs.

The painted apple moth poses a serious threat to our forests, horticulture and environment, although it spreads slowly as the female moth does not fly. This moth particularly likes to feed on wattle and acacia trees, but has also been found on ribbonwood and kowhai. The spraying of affected Auckland suburbs is expected to cost $11 million. The case of the painted apple moth emphasises the need for stronger biosecurity measures to prevent pest incursions happening in the first place, rather than having to resort to controversial and expensive measures after infestations occur.

— SIAN ROBINSON

MAF BIOSECURITY

The caterpillar of the painted apple moth which has been spreading in western Auckland since 1999. Eradication is budgeted to cost $11 million.

National Education Programme Based on Society's Nature Reserve at Bushy Park

Hundreds of New Zealand school students have this past year been part of a hands-on, Learning Experiences Outside the Classroom (LEOTC) programme, at the Society's Bushy Park Forest Reserve near Wanganui. The aim is to assist students at all primary, intermediate and secondary levels to develop 'environmental and scientific' skills and attitudes.

In 2001, the first of a three-year contract with the Ministry of Education, 1896 pupils have participated in the one-day LEOTC programme — 79 classes from 26 schools. An even greater number is expected in 2002.

The programme is no 'day junket' — every student who visits is tested on their knowledge of the history and fate of New Zealand's flora and fauna. Conservation is presented as a viable way to preserve our flora and fauna for future generations.

An interpretation centre details the plants, birds, insects and other animals to be found in this unique piece of rain-forest and adjoining wetland. A nature trail contains informative plaques.

A trained secondary school teacher from Wanganui College, Terry O'Connor, is funded four days a week by the Ministry of Education to run the programme. On the fifth day, the Bushy Park Homestead and Forest Trust employs him on predator control, managing the property as if it were a 'mainland island'.

Trust board member Stan Butcher of Lower Hutt says this 'forest ranger' role has helped toward the virtual elimination of predators (possum, ship rat, mustelids, cats and magpies) from Bushy Park and, as a consequence, in August the Department of Conservation allowed the release of 28 North Island robin from the Waimarino Forest. Most appropriately, the first robin released has been named 'Stan'.

A distinguished life member of the Society and chair of Lower Hutt Forest and Bird, Stan Butcher first saw Bushy Park in 1981 and was 'captured by the place'. He ran a campaign to have it preserved and since 1994, the homestead of Bushy Park has been administered by a dedicated Trust.

Originally Bushy Park was the home of G Frank Moore who gifted the bush to the Royal Forest and Bird Protection Society in 1960, then the house in 1962, believing the Society would be best able to ensure the future preservation of his beloved bush. The Society has retained ownership of the actual bush, its 'core business', and the historically registered Edwardian homestead on the property is now a licensed restaurant and offers commercial accommodation.

— YVONNE AIREY

Bushy Park Forest Reserve

Bushy Park Forest Reserve is an 87-hectare lowland forest remnant next to the Rangitatau East Road, eight kilometres from Kai Iwi on the Wanganui to New Plymouth highway (SH 3).

Gazetted Protected Private Land in 1963, it is surrounded by farms, each with residual areas of degraded bush.

The landform is an eroded marine terrace surface, 270-305 metres above mean sea level and consists of ridges, hill slopes, gully sides, gully floors, alluvial flats and wetland.

The forest type is relict podocarp-broadleaf with regenerating tawa and pukatea on gully sides and floors. Rimu, hinau and miro are found throughout on ridges and hillslopes.

Northern rata is found throughout the forest, including one listed notable tree 'Ratanui', estimated to be somewhere between 500 and 1000 years old. At 3.67 metres in diameter, 11.6 metres in girth and standing 43.1 metres high, it is the largest known rata tree in New Zealand.

There is also an area of manuka, bracken, and grassland where a wetlands pond was developed in 1980.

— YVONNE AIREY

This northern rata tree in Bushy Park forest is believed to be the largest in New Zealand.

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FOREST & BIRD

ROYAL & SUNALLIANCE

GORDON ELL visits the rugged Tasman coast of the Auckland isthmus where Forest and Bird seeks a marine park.

The Other Wild West

It's as rugged as anywhere along the wild west coast of New Zealand. Huge breaking surfs pile in, driving a mist of salt spray which dims the distances as it lashes the hardy remnants of coastal rainforest. On land, remnants of an ancient undersea volcano break out of the bush in black cliffs and dangerous coves. From the sea it's a wild shore, reef ridden, where the shapes of surfers and seals can easily be confused in the roiling waters.

GEOFF MOON

Surf sweeps over fishermen at Muriwai.

GORDON ELL, BUSH FILMS

GEOFF MOON

The ocean waters off the Waitakere Ranges are the home of an isolated subspecies of Hector's dolphin, the fishing grounds of vast flocks of seabirds, and the northernmost haunt of seals. As city pressures push down into these once-distant coves and exploitation threatens the marine environment, Waitakere Forest and Bird has mounted a campaign to see the coast preserved as a marine protected area.

Coast

From the cliffs at Muriwai, black sand beaches run 50 kilometres north to the Kaipara Harbour. Forest and Bird seeks protection for the habitat of beach-nesting birds. The regional park receives more than a million visitors a year.

Red coastline shows extent of the protection proposal.

Recreational fishing has long been a feature of these shores. Anglers pitch baits into the surf, constantly on the lookout for those unpredictable waves which break as spectacular walls of salt water against the reefs. (Every year, the coast claims several lives among the fishermen and swimmers.) It is not the intention of the conservationists to stop this fishing: indeed they have joined forces with recreational fishing groups to identify areas which should should be protected to help rebuild fish stocks with places to enjoy their sport nearby.

There is more concern about the continuing impact of unsustainable fishing practices: suspected trawling by night, very close inshore near the surf zone, and the 'powerhauling' of nets of minimum mesh size, using a winch from the beach, wasting the so-called by-catch, potentially food for the native mammals and birds feeding offshore.

The recent ban on netting could be just in time to save the 100-odd surviving Hector's dolphin which frequent this coast (though this ban has been challenged by the fishing industry in the Environment Court). Proponents of the marine park also want to protect the ocean habitat, by having a marine mammal sanctuary declared over the prime habitat of dolphin, from the mouth of the Waikato River to the South Head of Kaipara Harbour, a distance of some 100 kilometres along the coast and four nautical miles out to sea.

Another local impetus for protection relates to the marine life of the shoreline, the rock-pool creatures and the native inhabitants of the reefs and sea guts. Save Piha Shellfish encapsulates the concerns of local citizens who see their shores being picked clean of anything edible. Theirs is not the traditional argument over protecting kaimoana, though mussels, pipi and tuatua are examples of shellfish which are being stripped from rocks and beaches. (The managed toheroa harvest on Muriwai beach has been closed for 20 years because the shellfish beds have still not recovered their previous bounty.)

The rapid growth of immigrant communities in Auckland has created a whole new range of hungers, for creatures such as sea anemones, crabs, starfish, marine snails, and sea slugs. Till now there has been little protection for the marine creatures which live in this intertidal zone because traditionally New Zealanders don't take them: while the Department of Conservation now attempts to outline local values to immigrant communities in Auckland, residents at Piha have introduced their own voluntary ban against taking shellfish and other creatures. It's an educational process but not as effective as a marine reserve or specific regulation in saving the shoreline creatures. What it does reflect is community concern to protect the traditional attractions of the coast, and a measure of general support for better protection over all.

The background scenery is vaguely familiar to many visitors: this is the physical location of movies such as *The Piano,* and the television series *Hercules* and *Xena, Warrior Princess.* Landward, many of the remnants of kauri and coastal forest have been protected since the celebrations for the centennial of New Zealand in 1940, and are now incorporated in Auckland's regional park system. But, as in much of coastal New Zealand, human uses are

GORDON ELL, BUSH FILMS

North Shore Forest and Bird helped fence clifftops for the Muriwai gannet colony. The Auckland Regional Council soon built walkways and platforms to protect the birds from hundreds of thousands of visitors.

GORDON ELL, BUSH FILMS

Whatipu, at the north head of the Manukau Harbour where kauri-timber ships once loaded.

changing rapidly which can impact drastically on the environment. The coastal baches, looking through the nikau groves to pohutukawa clifftops and black-sand beaches, have recently acquired a cachet that is pushing some real-estate prices past the million-dollar mark: this in a neighbourhood previously pockmarked mainly by corrugated iron and fibro cottages.

Getting to the West Coast can be confusing, even for Aucklanders. There are five coastal settlements each accessed by its own winding road (watch out for speeding youngsters and the inexperienced on those narrow, blind corners). The access roads wind up into the rainforests of the Waitakere Ranges on the western rim of the city, then twist down often-tight shingle curves to the black-sand beaches, with their protective dunes and tidal creeks. Along the coast itself, there are no connecting roads between the settlements. The Auckland

GORDON ELL, BUSH FILMS

west coast is a place for walking; up steep ridges from the beach ends and along the clifftops through the salt-sprayed coastal vegetation.

The coastal shrubland is shorn so close by the sea winds that its canopy often knits into a velvety skin over the landscape. Closely interlocking manuka and kanuka blend with northern coastal plants, flaxes, the shiny-leved kawakawa, broader-leaved whau, five-fingers, and coprosmas, with an overtopping of loose-spreading pohutukawa. Rainforest trees, including kauri, tanekaha, puriri and taraire, are clambering back up from sheltered gullies to reclaim the hills.

Once you're down at the coast, you're part of a separate world of ocean rollers and crashing surf. It's easy to see what makes these places the hideaways of middle-aged hippies, surfers, artists, potters, architects and writers, and of professional commuters in various stages of dropping out. Casual visitors tend to come and marvel at the state of wildernesss adjacent to metropolitan suburbia, then return to the softer shores of the Hauraki Gulf.

Yet this is no undisturbed paradise. The Waitakere Ranges, and these very shores, were once a focus for the hugely extractive kauri timber industry. The line of bush tramways and old wharves can still be traced from this phase of pioneering. Proximity to Auckland also brings pressure for development.

Muriwai is a surfer's paradise, protected by an Auckland regional park which attracts more than a million people a year. At the back of nearby Maori Bay geologists point to what they call pillow lavas, vast circular cross sections of lava flows from an ancient undersea volcano, its remnants now lifted many metres above the sea. On an adjacent headland hang-gliders share the updrafts with terns and gannets which nest here on the mainland. The Muriwai gannet colony, where hundreds of birds steadily swirl in from the coastal seas, was simply developed a generation ago by fencing off two headlands, using funds organised by North Shore Forest and Bird. Now tour buses have to visit on a timetable so as to avoid overcrowding . Tens of thousands of visitors, many from overseas, come to see the gannets which gather, nest and breed on the clifftops, only metres away from the viewing platform, through August to March.

The cliffs run south from here for 25 kilometres, interrupted in only a handful of places by a prograding shoreline of black ironsand, or the entry of a tidal creek. The wetlands behind these beaches are notable refuges for rare and threatened birds, as various as crakes and rails, fernbird and bittern. Forest and Bird owns the most significant, Matuku Reserve behind Te Henga or Bethells Beach; it dates from when Auckland branches clubbed together in a fund-raising effort in the 1970s to save a stretch of the vegetation-clogged creek from development. Subsequent purchases and land exchanges have extended to protect not only the wetlands but gullies and ridges of coastal rainforest which has helped retain the natural appearance of the valley from floor to skyline.

Suggestions that the proposed protection along the coast could extend inland to include private protected areas and public reserves have been set aside, however. With so much of the Waitakere Ranges already in public hands, as parks or water catchments, protection of the forests is not the issue it might be elsewhere. The Auckland Regional Council has developed a respectable record for pest control in its forests, and the various public parks have been treated with possum control to the extent that bird populations are burgeoning. There are other pest problems in the forests, however, with escaping garden plants, particularly wild ginger, being a long-term concern. Again, Forest and Bird, through the advocacy (and practical action) of Waitakere Forest and Bird has helped tackle the problem.

Groups such as Ark in the Park have been talking about treating the whole region as a giant pest-free forest which, at more than 29,000 hectares, is potentially the size of a small national park. (Ark in the Park is beginning with 1600 hectares of the ranges.)

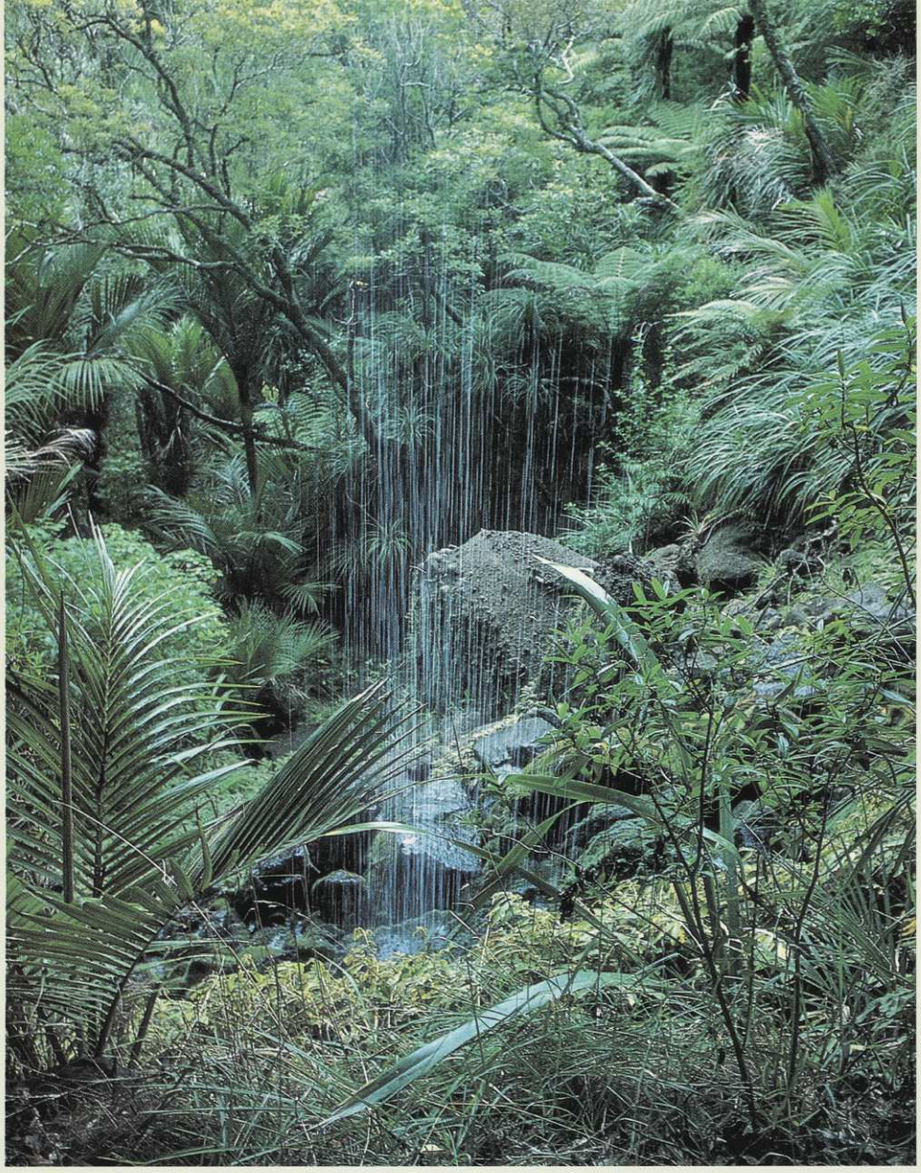
GEOFF MOON

Wild surfs from the Tasman sweep against cliffs of the Waitakere Ranges. Bethells/ Te Henga is typical of the Auckland west coast.

The enemies are not just invasive plants. (Mexican daisy attaches to the highest, barest volcanic plugs, grown from seeds blown up from city gardens below and lodging in the harsh environments usually favoured by subalpine natives.) In the native forests of the Waitakere Ranges, cats, ferrets, stoats and rats, particularly, do the extensive damage they do everywhere.

Dogs, wild, or loosed into the exhilirating environment of the sands, disturb nesting pairs and flocks of birds. They injure young seals resting on the beach, and kill penguins. Part of the lobbying for the park asks residents whether they would consider keeping their dogs on a lead, and neutering their cats.

Present campaigning though is focused on the beaches, the intertidal zone and the offshore fishery. Finding a mechanism that accommodates the sometimes differing concerns of conservation and recreation, the role of local government, Maori and residents, has led to some creative thinking. The initial idea of taking protection from the



GORDON ELL, BUSH FILMS

A Feeling for the Forest

Forest and Bird's Matuku Reserve at Te Henga protects the largest surviving wetland in the Auckland region, and also offers superb transects through coastal rainforest up to the ridges of the Waitakere Ranges. Since the first purchase in the 1970s, Matuku has been progressively expanded to 100 hectares. The forest is notable for its broad representation of northern plants. The swamp, rich in flax and cabbage trees, is the haunt of native fish and many wetland birds including crake, rail and bittern. Jetties into the swamp assist with bird watching. A circular track, which winds down to the swamp, returns to the carpark just off Jonkers Road, Waitakere. There is no access from Te Henga Road which runs down the other side of the swamp to Bethells Beach.

sea up to the crest of the seaward ridges, to create a coastal sea and land park, has now been set aside in favour of saving the shoreline. This means identifying areas of high habitat value and including them in coastal protection zones. This could be through legislation or as part of council coastal plans.

Present intentions are to create some form of marine park along the coast from the mouth of the Waikato River, north to South Kaipara Head. Such a sanctuary would protect the main feeding range of Hector's dolphin which particularly frequent the waters between the Waikato mouth and the Kaipara Harbour. With three known deaths in late 2001, suspected to be through set netting, this subspecies is very close to extinction.

A working group convened by Ken Catt of Waitakere Forest and Bird (and a distinguished life member of the Society) has consulted with some 60 groups and key individuals, and won the support of some Maori. Currently, the groups driving the concept include, besides Forest and Bird, a number of residents' groups, the New Zealand Underwater Association, Ark in the Park, the University of Auckland (which is compiling research reports), the long-established Waitakere Ranges Protection Society, Waitakere City and Rodney District councils, and the recreational fishermen who make so much use of the coast.

While the comments of several of the groups consulted have yet to be drawn up, the local Member of Parliament, David Cunliffe, has offered to sponsor the necessary legislation either as a Government or a private member's bill. The co-sponsor is the Mayor of Waitakere (and veteran surfer) Bob Harvey who is also the author of two recent books on parts of the Waitakere coast. DoC and Forest and Bird are currently sponsoring more scientific research into the values of the coastal waters. In addition, with the help of ASB Bank Trust, Forest and Bird has produced a detailed brochure on the values of the coasts and the risks faced. [Pamphlets are available for publicity purposes from Ken Catt, tel: 09 834-6214 or by email to kiwicatt@xtra.co.nz].

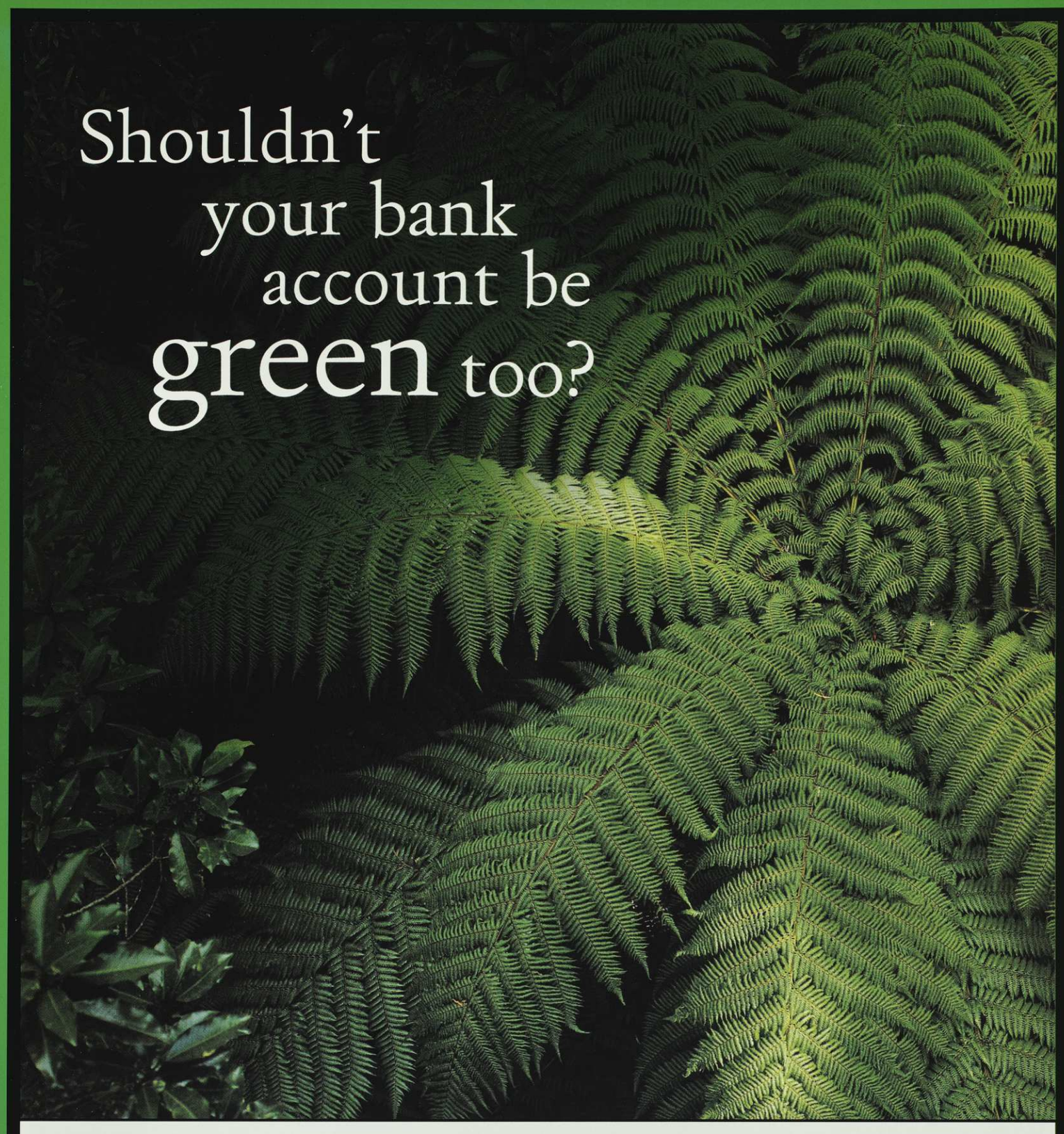
'We see that a number of protective measures may be required to achieve a safe environment for fish and animals along the coast,' says Ken Catt. 'Initially we need a coastal sanctuary to protect the endangered species such as Hector's dolphin. At a later stage within this area it would be good to add some small marine reserves. These give fish a place to multiply but also create enriched fisheries around their margins.

'Unfortunately, declarations under the Marine Reserves Act are cumbersome; they can also be expensive and are always slow,' Ken Catt says. 'We can't wait for them if we're to protect the feeding grounds of the dolphins before it's too late.

'In time we could consider some small absolutely no-take marine reserves, perhaps supported by Maori mechanisms,' he says. These include the possibilities of rahui (local bans on fishing or taking shellfish), mataitai (local guardianship controls) or taiapure (traditional food-gathering reserves).

'Residents, ratepayer groups, recreational fishers and conservation organisations need to work together to develop ways to protect the region's special habitats and wildlife,' says Ken Catt. 'Action is more likely if interest and involvement is community wide.'

GORDON ELL *is director of The Bush Press of New Zealand, and editor of* Forest & Bird.



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CRAIG BARNETT finds that bigger is better when it comes to singing.

Why Birds Sing at Dawn

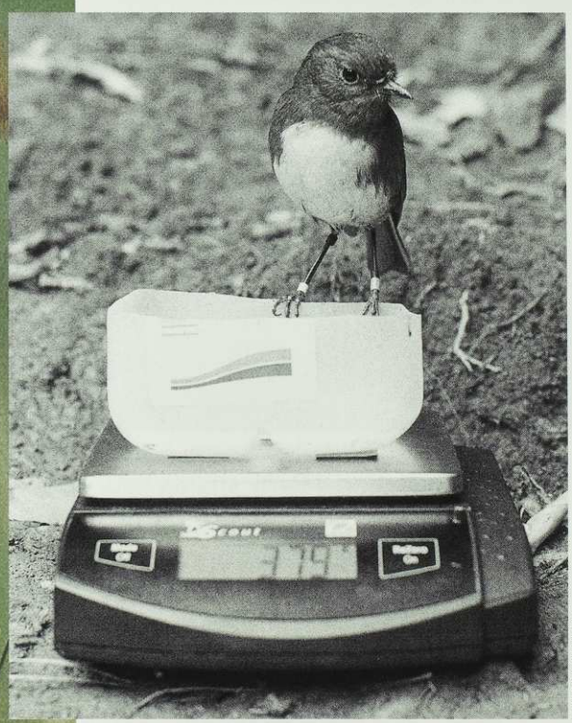
The peak of songbirds singing around sunrise signifies what is termed the dawn chorus. Often starting before sunrise, a bird may sing non-stop for up to an hour.

Birdsong has aroused human interest for millennia. Our Palaeolithic ancestors made bone whistles with which they imitated the songs of birds. Popular folk wisdom saw birds as singing because they were in love, or because of their love of spring. These romantic notions surrounding birdsong are evident in the works of poets such as Keats and persist to this day.

Despite centuries of human fascination with the dawn chorus, the reasons why birds sing at dawn remain mysterious, however. Why should birds sing more at dawn rather than later in the day? It is the human equivalent of waking at first light, and singing an aria over and over at the top of one's lungs before even a cup of coffee!

Left: An introduced yellowhammer in full song. Introduced birds, such as blackbirds and thrushes, are now a major component of the dawn chorus in New Zealand.

GEOFF MOON



CRAIG BARNETT

A New Zealand robin, one subject of an experiment by the author to establish whether supplementary feeding improved the capability of birds to sing at dawn. Birds were weighed to measure their daily body fat, and the duration of their dawn song recorded for comparison.

GEOFF MOON

Tui sometimes appear to be singing silently when, in fact, their song is simply pitched too high for the human ear to hear.

The question of why birds sing at dawn is not the same as asking why birds sing at all. This has been extensively studied and there is clear evidence that birds sing for two reasons: to attract a mate and to protect resources, such as territories. The real question is what benefit a male gets by singing at dawn rather than later in the day. Although the matter is still the subject of debate, there are a number of possible explanations for why males sing at dawn.

Firstly, dawn may be a particularly suitable time for sound transmission. It has been estimated that singing at dawn may be 20 times more effective than singing at midday. This is because there is less wind at dawn and so less interfering wind noise.

Another reason males may sing at dawn is in response to overnight mortality of rival males, and so dawn is the time that vacancies in a neighbour's territory are first noticed. By singing, males are able to assess which of their neighbours are not present and so invade their territories.

Also, female birds are at their most fertile at dawn, and so copulation at this time is more likely to be successful in fertilising an egg. By singing at dawn, a male may encourage his mate to copulate with him, or prevent rivals from entering his territory and courting his mate.

Again, the conditions at dawn may be particularly unsuitable for other activities such as foraging, making singing the best alternative. Singing requires energy and dawn is the time when a bird's energy levels are at their daily lowest. Perhaps by singing at this time, it tells a listener something about the worth of the singer.

Finally, recent models of foraging behaviour suggest birds aim to gain a certain amount of fat by the end of the day, which is sufficient to guarantee their survival, even on the coldest nights. Because birds rarely experience the worst conditions, on most mornings they will have surplus energy, which is used to sing at dawn and throughout the rest of the day. This theory is supported by the fact that birds sing more when they receive supplementary food. However, there have been no studies showing that birds increase their fat reserves along with song output when they receive supplementary food.

To test this theory, I measured the daily weight gain (as fat reserves increase with weight) and song output of two native bird species (silvereyes and New Zealand robins) over three days. On one of these days, I provided the birds with supplementary food and found that an individual's weight increased by several grams after feeding. The birds also sang more when they were fed.

Both New Zealand robins and silvereyes had higher fat reserves when they were fed and were able to sing more at dawn chorus and throughout the day, compared with when they received no supplementary food. These results suggest that the dawn chorus and singing in general, is dependent on the bird's energy levels. This has important implications for our understanding of the meaning of song.

Singing to convey information about the singer has an an energy cost. Males that sing at higher rates under natural conditions may be demonstrating their ability to reach higher fat reserves by the end of the day.

Birds obtain larger reserves by being on better territories or through excluding rivals from food. Through this mechanism, birdsong could be conveying information on the competitive quality of the singer. This means that males may be singing at dawn to demonstrate their high quality to mates and rivals.

This adds a new dimension to understanding the dawn chorus. Although the conventional explanations probably play some role in explaining why birds sing at dawn, my research shows that a bird's energy levels are also important in determining the amount of time a bird can sing. This supports the theory that a bird's song is dependent on its fat reserves.

So it seems, the night isn't over until the fat bird sings!

The haunting song of the kokako may still be heard in a few remote forests at dawn, but no longer in the South Island. The dawn chorus of native birds, described by Joseph Banks in 1770, can never be restored for several such species are now extinct.

GEOFF MOON

CRAIG BARNETT,
has recently completed an M.Sc. in zoology at the University of Canterbury.

Yellow-eyed Penguin, Plodding, Plucky, Persistent.

More than 10 years of intensive effort has kept the yellow-eyed penguin on the New Zealand mainland, NEVILLE PEAT reports.

DENIS PATERSON

NEVILLE PEAT

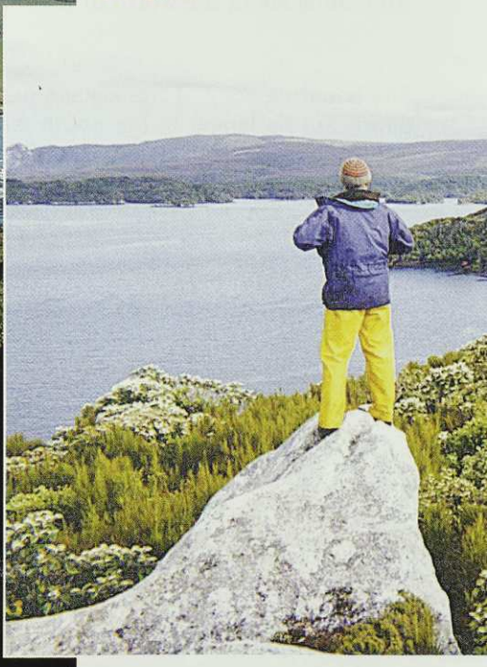
At the remote kakapo stronghold of Whenua Hou/Codfish Island off the northwest coast of Stewart Island, a Department of Conservation ranger happened upon a yellow-eyed penguin at its nest last spring.

These hoiho are known to inhabit Whenua Hou so there was nothing unusual about this encounter — except for the nest's location. It was about a kilometre from the sea and 130 metres above it.

Yellow-eyed penguins habitually nest in coastal forest or shrubland, sometimes a good distance from the sea. They will go to extraordinary lengths to find a site that is physically suitable (usually with something solid like a fallen tree behind it) and private from other nesting

Left top: Two adults and a juvenile which has lost its downy coat.

Left below: Typical coastal habitat of yellow-eyed penguin.



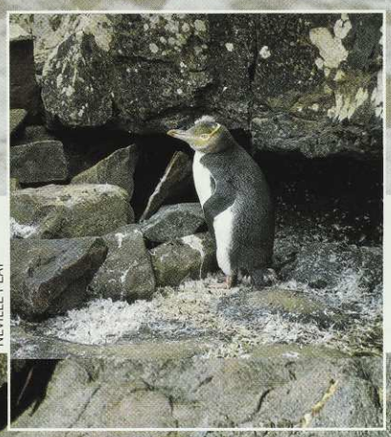
MALCOLM RUTHERFORD

Yellow-eyed penguin brave the surf and rocky shore to reach their nest sites in coastal shrubland or forest.

'yellow-eyeds'. A kilometre inland appears to be about their limit.

Fair enough. A kilometre is a long way for a seabird to walk. Just think of the cost in time lost fishing at sea and energy expended getting to and from the nest. In the case of the Whenua Hou pair, they were assisted by tracks cut for kakapo management.

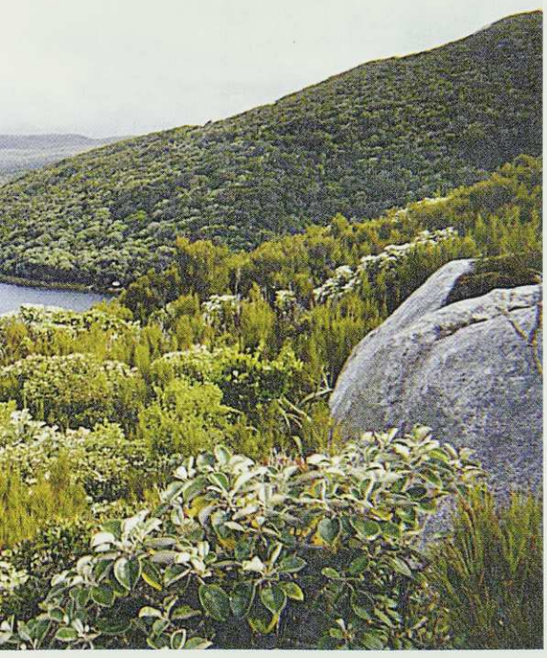
More than anything, this example of inland nesting helps illustrate the pluck and plodding persistence of the species.



NEVILLE PEAT

JENNY & TONY ENDERBY

Below, David Blair, project officer of the Yellow-eyed Penguin Trust, during a survey of penguin habitat on Stewart Island.



GRAHAM THURLOW

penguins to justify a genus to itself. There are six penguin genera altogether, found from the Galapagos Islands to Antarctica. Hoiho is the largest temperate-zone penguin —70 centimetres tall and up to about seven kilograms in weight. Scientists have dubbed it the 'most generalised' of the penguins — meaning that is, the most closely related to ancestral members of the family.

Unique to New Zealand, the yellow-eyed penguin breeds from Banks Peninsula to subantarctic Campbell Island. The species comprises only a couple of thousand breeding pairs, making it one of the world's rarest penguins.

A revised 'hoiho recovery plan', newly published by the Department of Conservation, paints a picture of cautious hope and sleeves-rolled-up determination. Certainly the yellow-eyeds are doing all they can to help themselves. The plan describes this penguin as 'intrinsically robust . . . with a high reproductive rate compared to other sea birds and substantial longevity.'

Other indicators of fortitude include: an ability to scale forbidding cliffs, penetrate dense undergrowth or cope with degraded habitat, while raising two chicks a year in the face of — for most mainland birds anyway — a gauntlet of predators, including dogs, feral cats, ferrets and stoats. Not to mention occasional upheavals in the food supply.

On the mainland we have thrown at them a whopping range of impediments and still they survive, mostly along the coast of Otago Peninsula at Dunedin and the Catlins in southeast Otago.

The yellow-eyed penguin (or *Megadyptes antipodes*, meaning big southern diver) is hardy to say the least.

Behaviourally and biologically, hoiho is sufficiently distinct from all other

The revised plan has dropped the former population target of 500 breeding pairs for the Otago Peninsula and Catlins populations. Instead, it now aims to 'protect areas of habitat to allow for an increase in population'. The nine objectives are all couched in general terms, although under an objective to protect hoiho chicks from predators, the actions include a target of protecting 50 percent of all South Island nests from predators.

The plan's principal author, Bruce McKinlay, who is based at DoC's Otago Conservancy office in Dunedin, says the old '500 target' was based on the theory that to be self-sustaining and genetically healthy a population required 500 pairs. The 1997 population estimate for the

South Island — the latest quoted in the plan — is 300-320 pairs.

Bruce McKinlay says people are getting used to the fact yellow-eyed penguin populations will tend to fluctuate naturally, as documented by studies of the mainland populations over the past 20 years.

Big crashes, however, can appear very scary if not catastrophic. In 1990, adult hoiho died in droves from something mysterious. A biotoxin in the food chain was suspected but never identified. Avian malaria was also postulated but never confirmed. By the time the epidemic was over, the mainland population had been halved. Just 130 breeding pairs were left on the Otago coast. Researchers in the subantarctic reported similar losses there.

Hoiho's 'robust' reputation relies on birds reaching their potential of a long breeding life and a good age. To date the longevity record is 21 years, set by an Otago Peninsula bird. Many of the larger seabirds are content to raise one chick a year whereas yellow-eyed penguins try to fledge two chicks (see box).

'The best safeguard for the species is for the good breeders to survive to the next season,' says McKinlay.

DoC considers the species threatened. The international conservation body, the IUCN, recently reclassified the yellow-eyed as 'endangered' (formerly 'vulnerable') a more at risk classification. Endangered is defined as 'facing a very high risk of extinction in the wild in the near future'.

That may seem too alarmist a view given the 'robust' tag and the populations quoted in the recovery plan, with over 1000 pairs estimated for Campbell Island and the Auckland Islands.

Stewart Island is an important base for these penguins, lying as it does between between the subantarctic islands and the mainland. But the recovery plan's 'sceptical' estimate of 470 to 600 pairs on Stewart Island is too optimistic.

Surveys conducted in 1999 and 2000 on the main island by the Yellow-eyed Penguin Trust with DoC support counted 126 nests. Another survey last November on Whenua Hou/Codfish came up with 65 nests, giving a total for 'Stewart Island' of just on 200. Even if such a tally has to be considered a minimum figure, and excludes the Titi (Muttonbird) Islands, it is still a long way short of the recovery plan's stab at an estimate.

The count for Whenua Hou compared to the much larger main island is telling. It suggests the predator-free and Nature

One Egg Good, Two Eggs Bad?

In 1991, following the disastrous crash in yellow-eyed penguin populations on the mainland, a radical decision was made to remove one of the two eggs from each of the nests at designated study areas.

In the event of repeat problems in the food chain, breeding pairs were thought to be much more likely to rear and fledge one chick than two — and still end up in good condition themselves.

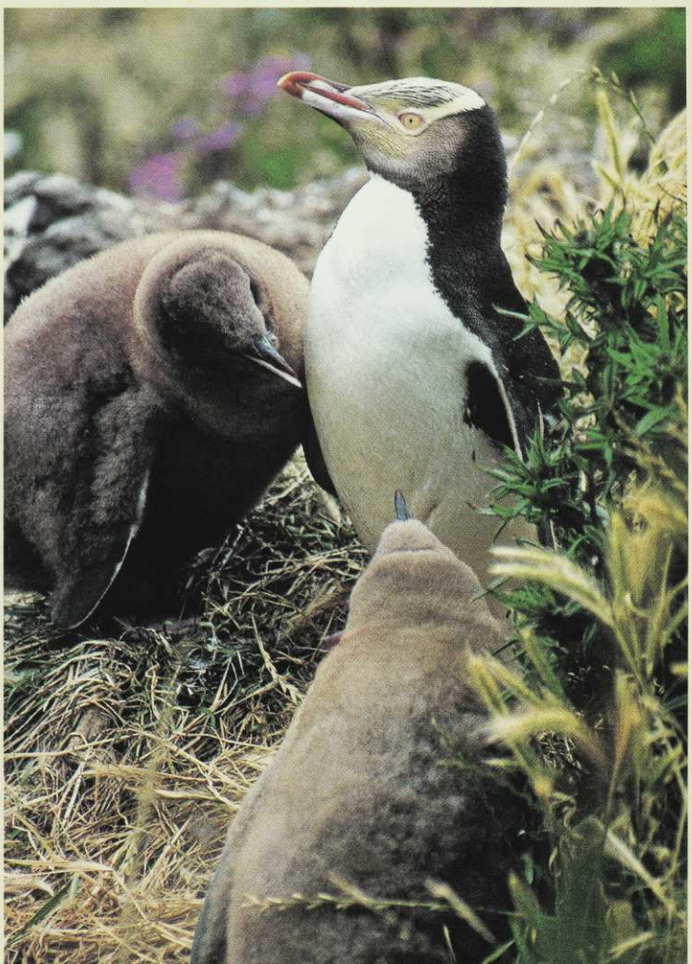
It was a controversial experiment, but in this particular season it appeared to work. Every adult survived to breed the following year. In the 20 years John Darby has studied the species, it is the only time he has recorded a 100 percent survival rate among breeding adults. And for the next five seasons, the population climbed towards a record high.

Now, 10 years on, two PhD students at the University of Otago, Melanie Massaro and Alvin Setiawan, are looking at an allied issue — comparing the breeding strategy of yellow-eyed penguin to that of the Fiordland crested penguin, which invariably raises only one chick, although there are two eggs in a clutch.

Whether they sacrifice the smaller first egg or starve the ensuing chick, Fiordland crested penguins deliberately set out to raise only one chick. Yellow-eyed penguins do it differently, with two same-size eggs producing two chicks more or less on the same day — a strategy that aims to despatch two healthy chicks to sea come February.

In a poor food year, though, this is problematic. Two chicks may be one too many for the parents, and both chicks are put at risk. The PhD studies, due for completion at the end of next year, will compare the different reproductive pathways and why these species are stuck with them. Perhaps, too, the studies will shed light on the advantages and disadvantages of such a breeding regime.

Yellow-eyed penguin usually raise two chicks.



NEVILLE PEAT

A Highly Politicised Species

When it comes to threatened species, few attract more active attention and support than the yellow-eyed penguin, hoiho.

Starting with the establishment of the Yellow-eyed Penguin Trust in Dunedin in 1987, hoiho has become New Zealand's most politicised and publicised bird.

The trust spearheads public advocacy for the penguins, organises habitat enhancement, protection and acquisition where necessary, conducts surveys, funds research and provides educational material. Sponsorship by the Mainland company over the years has greatly benefited the trust and its work.

Annual symposiums on the species regularly attract 40 people, representing conservation, scientific, landowner, corporate and tourism interests. The Department of Conservation co-ordinates a consultative group that explores issues facing the penguins.

Highlighting the importance and profile of yellow-eyed penguins is their appearance currently on New Zealand stamps ($2 denomination) and on the $5 note.

Reserve status of Whenua Hou benefits the penguins. On Stewart Island itself, feral cats are thought to be devastating for chicks. The survey last spring also reported an impressive number of young birds coming ashore at Whenua Hou.

Modern surveys of Stewart Island began in 1984 when an Otago Museum zoologist, John Darby, counted some 130 pairs and concluded that cat predation was a major problem for the yellow-eyed penguins there.

When he started systematic research of the yellow-eyed populations on the mainland in 1980, John Darby tramped the Otago Peninsula and Catlins coasts to the south. He recalls an almost total absence of areas managed or protected for hoiho. He was appalled at their plight.

'There was really only one reserve covering penguin habitat — Sandfly Bay on Otago Peninsula — and that had stock from neighbouring farmland through it,' he says. 'People were still shooting penguins, and cats and ferrets were taking a big toll.'

Today the picture is vastly different. Incremental habitat loss has been halted. All major breeding areas have been protected and some have been revegetated. Predator control work has improved chick survival in a number of areas. Monitoring is intensive.

'There are more penguins now than when I started studying them 20 years ago,' says John Darby, 'but they remain at risk and we're always going to have to manage the mainland populations.'

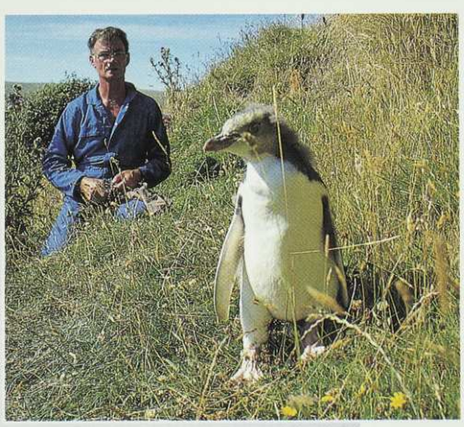
Early on, he investigated whether the mainland colonies were supplemented by migrants from the subantarctic strongholds. DNA studies showed the populations did not overlap, however. The mainlanders were on their own.

In an earlier generation, Lance Richdale put the yellow-eyed penguin on the scientific map with his pioneering studies, which spanned 18 years, starting in 1936. He did not name his study areas in his published work and for many years modern comparisons were impossible. Then in 1987 an unpublished work of Richdale's was discovered in Dunedin's Hocken Library — possibly the draft of a PhD thesis but no one knows for sure — and suddenly the 1930-40s counts could be compared to those at the same beaches in the 1980s and 1990s.

This has enabled John Darby, who has now studied yellow-eyed penguins longer than the legendary Richdale, to declare the species better off than for decades — but some way from being secure.

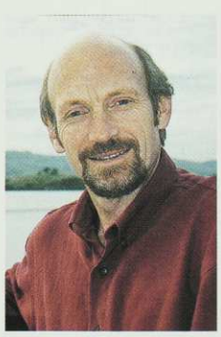
Both he and Bruce McKinlay acknowledge that efforts by DoC, the Yellow-eyed Penguin Trust, Forest and Bird, and others, to protect the penguins, have benefited coastal conservation at large. Predator control for the penguins also helps safeguard species such as blue penguin and jewelled gecko, while habitat enhancement is a bonus for everything, including human enjoyment.

Right: Penguin researcher John Darby in the field.
Below: Leaving the beach. Adult penguins spend the day at sea.



NEVILLE PEAT

SUE MURRAY



NEVILLE PEAT *of Dunedin has written* The World of Penguins, *and* Coasting — The Sea Lion and the Lark *among numerous other books of New Zealand natural history. He chairs the biodiversity committee of the Otago Regional Council.*

The Government's plan to protect 10 percent of our marine environment by 2010 faces considerable challenges, according to JENNY AND TONY ENDERBY.

Looking for More Marine

JENNY & TONY ENDERBY

Above: more than 250,000 people visit the Cape Rodney to Okakari Point Marine Reserve in lower Northland each year.

Since the Government made a commitment to protect 10 percent of New Zealand's marine environment by 2010, two years have passed. Although there has been renewed activity on new and existing marine reserve applications, no new marine reserves have been created since Te Tapuwae O Rongokako Marine Reserve (by a previous Government) in November 1999.

In the 30 years since the Marine Reserves Act became law, only 15 marine reserves have been created, encompassing point one of a percent, or just one thousandth of mainland New Zealand's coastal sea. With the addition of the Kermadec Islands Marine Reserve, 1000 kilometres north of New Zealand, that figure climbs to near four percent. Add marine parks that have some protection and proposed marine reserves, and the figure is still nowhere near 10 percent. Yet we protect around 30 percent of mainland New Zealand in national parks and reserves.

To achieve the target of 10 percent, an easy 'way out' is to establish 'marine protected areas', now the term used in the official Biodiversity Strategy. The Hauraki Gulf Marine Park has been described as such, similar to Australia's Great Barrier Reef, but it's not the same as full protection. Although described as a 'marine protected area', much of the Great Barrier Reef is protected only from oil drilling and mining. The small totally-protected areas are (unlike New Zealand's public marine reserves) restricted to scientists for study. In Australia, visitors who want to see and photograph unspoiled reefs have instead to share degraded reef systems with fishermen and prawn trawlers.

Within the Hauraki Gulf Marine Park's boundaries, only the existing small marine reserves and Tawharanui Marine Park (a regional council initiative) have total protection. From the perspective of protecting marine life, perhaps the time and effort put into the creation of the greater Hauraki Gulf Marine Park could have been better spent adding to its marine reserves.

Although the Gulf has more marine reserves than other areas, it is also the most heavily fished by recreational fishermen and shellfish gatherers. Shipping and cable lanes, where anchoring and fishing are prohibited, run through the Hauraki Gulf, and are clearly marked on marine charts. Have these areas benefited from this 'pseudo-reserve status' and has any work been done to see whether they are in any way different to areas outside the shipping lanes?

New marine reserve proposals come under attack, often from recreational fishermen, yet they benefit from them in the long term. Opposition to Wellington's proposed south coast marine reserve is similar to arguments voiced by opponents to the Cape Rodney to Okakari Point Marine Reserve, better known as Goat Island or Leigh, 30 years ago. Most of those opponents now support what they consider to be 'their' reserve.

The Marine Reserves Act still allows fishing 'at the Minister's discretion' within a marine reserve. Limited amateur fishing was permitted in the Poor Knights Islands Marine Reserve between 1981 and 1998, apart from two small totally

Changing the Laws on Marine Reserves

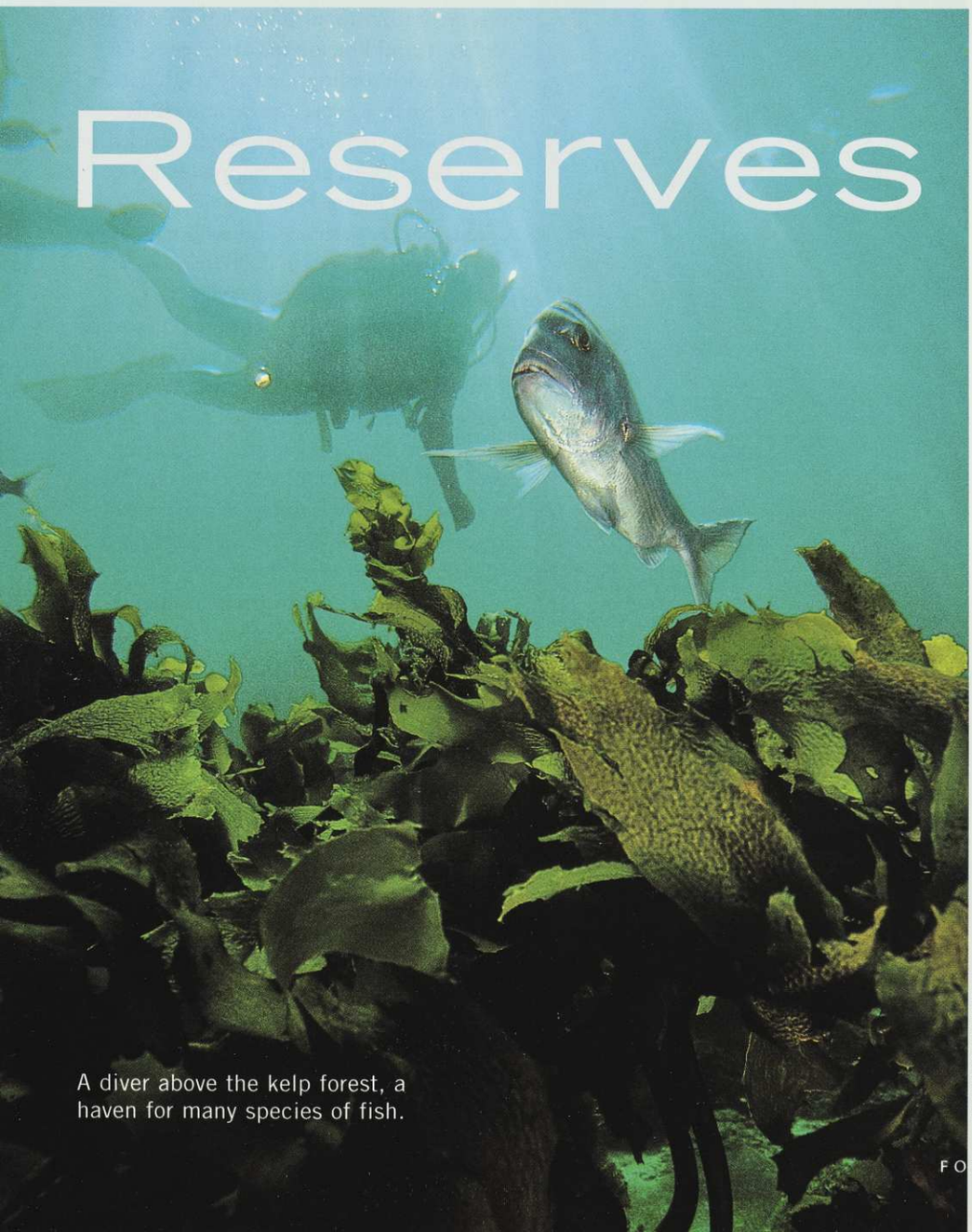
The Government's original intention to create more marine reserves faces immediate challenges in deciding what a marine reserve actually is. Presently marine reserves are created for scientific purposes only. Marine reserve advocates look for a broader definition, to protect representative areas of our differing marine environments, as if they were national parks or reserves.

The Government intends to introduce new legislation early this year to widen substantially the definition under which reserves can be created.

Issues likely to be canvassed for the revision of the Act were examined by *Forest & Bird* in August 2000, (see 'New Hope for Marine Reserves' by Jo Mackay).

Since the Government's announcement of policy, some have tried to change the language of protection: the official Biodiversity Strategy talks not of creating more marine reserves but of undefined 'marine protected areas' which could have a much-lesser protective status.

Also the intended areas under protection might not be measured around our coasts – the 10 percent of our coastline scenario – but placed anywhere in New Zealand's huge Exclusive Economic Zone. Internationally, marine scientists are calling for 20 percent of the oceans to be protected as marine reserves by 2020. For fisheries and biodiversity reasons, some scientists have estimated an even larger area than this may be required. — **EDITOR**



A diver above the kelp forest, a haven for many species of fish.

JENNY & TONY ENDERBY

protected areas. The changes since full protection are astounding with an increase in fish life beyond what was expected.

Snapper numbers at the Poor Knights tripled within the first year after the fishing ban and terakihi and pink maomao populations also increased. The research was carried out by Leigh-based Dr Trevor Willis using a baited underwater-video unit capable of filming down to 50 metres. His findings are backed up by scuba divers who rarely saw snapper at the Poor Knights, but now see them on every dive.

The massive schools of trevally that could cover a hectare or more around the Poor Knights in the 1970s almost vanished just prior to the original reserve's establishment. Today, more than 20 years later, trevally schools are beginning to return. Sadly, not all species re-establish as quickly as the snapper did at the Poor Knights.

The changes within a totally protected marine reserve are complex and ongoing. In the Cape Rodney to Okakari Point Marine Reserve these changes are still happening. Many of the subtidal reefs around Goat Island were shown on the original maps of the reserve, drawn up in 1976-77, as 'kina barrens.' These areas were just bare rock where the kina or sea urchins had eaten all the algae. With the return of good numbers of snapper and crayfish, both of which feed on the kina, these 'barrens' have diminished in size or disappeared.

Dr Russell Babcock of the Leigh Marine Laboratory, in a report published in *Dive New Zealand*, showed snapper nearly twice as large, and in densities 23 times greater in the reserve than outside. Crayfish were four times more abundant and 20 percent longer. Similar increases were recorded for other species such as red moki and blue cod.

The ecklonia kelp is now far more dense — up to 50 percent more than outside the marine reserve. These kelp forests are important as food and refuge for many fish species and juveniles. Red moki, banded wrasse, kelpfish, marblefish, butterfish and sweep, all use the kelp as cover. Many of these species, along with silver drummer and parore, were not common in the reserve around the time of its creation.

The inclusion of the Treaty of

A small red moki moving through the weed.

A small john dory uses the kelp as camouflage as it hunts small fish.

Lizardfish hunt on the sandy floor of the channels and bays at the Poor Knights.

Ecklonia kelp creates a habitat for many species of fish when kina numbers are naturally controlled in a marine reserve.

JENNY & TONY ENDERBY

Waitangi in marine reserve discussions has involved iwi in coastal protection. Te Tapuwae O Rongokako Marine Reserve near Gisborne was established in a joint effort between the Department of Conservation and Ngati Konohi. However, there are other mechanisms of limited protection available to Maori under the Fisheries Act.

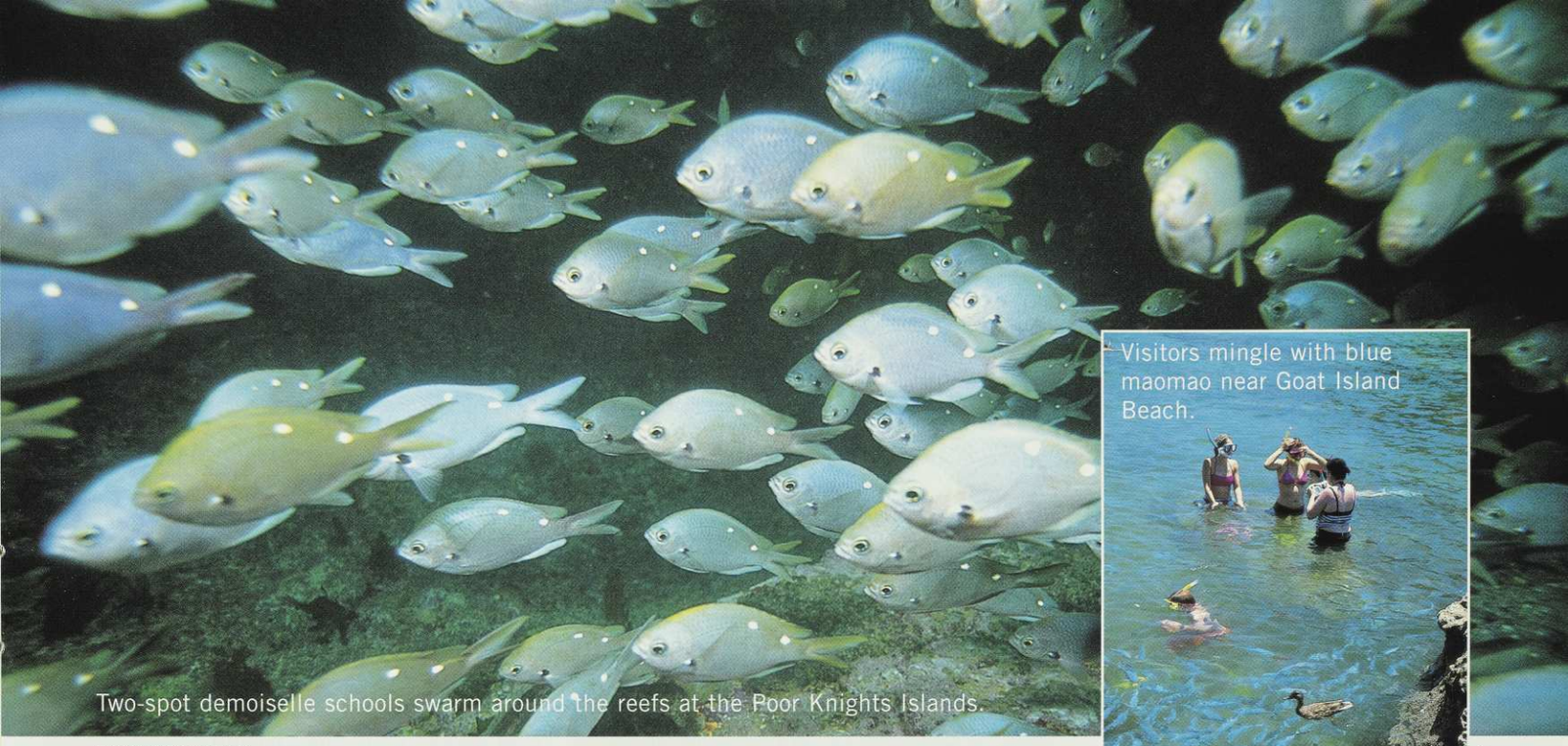
There is some confusion over these protective mechanisms – mataitai and taiapure reserves – which allow iwi customary caretakership. These reserves are different to marine reserves in that they are a fisheries tool under the Fisheries Act. There is a similarity, however, in that few have been created and the process required to set them up is complex.

There are possibilities, however, that these customary tools could be used in conjunction with marine reserves. Why not border a marine reserve with a mataitai or taiapure – there would be a chance to monitor both areas?

In the case of an iwi-sponsored marine reserve, rather than the loss of customary rights it could be looked at in terms of the iwi withholding their rights to gather food over that area. The benefits long-term to the surrounding waters would soon be evident, as has happened at Te Tapuwae O Rongokako.

The marine reserves discussion document (released in 2000 to background proposals to review the Marine Reserves Act) mentioned places of geological or historical importance that could become marine reserves. Advocates for marine protection argue that if this means protecting a feature of a marine area but not the complete ecosystem then it should not be classified as a marine reserve. Other protection mechanisms are there for that kind of thing.

Marine reserves can provide special and unexpected protection for sealife, however. There has been a recent flurry of activity to protect the North Island pod of Hector's dolphins. Set nets and trawling within four nautical miles of the shore between Hokianga and New Plymouth has been banned by the Minister of Fisheries, Pete Hodgson. (This decision is being appealed by the fishing industry.) There is an opportunity here to establish marine reserves, representative of the habitats in the dolphin's range, in addition to the fisheries protection. (See 'The Other Wild West Coast' this issue.) A marine mammal sanctuary could also be established.



Two-spot demoiselle schools swarm around the reefs at the Poor Knights Islands.

JENNY & TONY ENDERBY

Visitors mingle with blue maomao near Goat Island Beach.

JENNY & TONY ENDERBY

The Pohatu Marine Reserve at Flea Bay, Banks Peninsula has protected the penguins as well as the marine life. The local white-flippered variant of the little blue penguin and the yellow-eyed penguin are thriving there. The combination of a marine reserve providing food and the predator-free area surrounding the bay, created by local farmers, has been successful. (See 'Helping the Penguins', *Forest & Bird*, February 1999)

Marine birds and mammals can benefit from the protection of marine reserves, as well as their food source. Large numbers of sea birds feed on small fish in unprotected coastal waters. The proposed addition of several species of baitfish to the fisheries Quota Management System can only put more pressure on the birds, marine mammals and fish that rely on those baitfish schools for food.

Other habitats, such as the 800 seamounts in New Zealand's Exclusive Economic Zone (EEZ) also need protection. (See 'Exploring our Underwater Mountains', Jo Mackay, *Forest and Bird* May 2000.) Many of these seamounts have already been devastated to exploit the fish stocks that surround them. Little is known about the non-target species that shared the seamount habitats – some of which may have vanished before they were even named. Destroying the habitat is hardly sound practice for sustained management of the fish stocks.

The Tasmanian Seamount Marine Reserve was created to protect 20 percent of the seamounts south of Tasmania. The reserve, an area of 370 square kilometres, protects a region that has not been trawled and is in pristine condition. The protection is from 500 metres depth to the seabed. A large number of species new to science covering eight genera have been discovered on the seamounts around southern Australia. (For more information on Tasmanian seamounts see www.ea.gov.au)

New Zealand must follow that lead and protect more of the undamaged seamounts in its EEZ. (The first recognition of our seamounts occurred late last year, when 19 seamounts covering 2.5 percent of the EEZ were protected.) Failure to protect more seamounts can only result in the loss of irreplaceable ecosystems.

A look at a map of New Zealand's marine reserves shows some massive gaps with no protection. Some schools visit marine reserves or cover them as part of Seaweek or Conservation Week, but often it is up to teachers whether marine reserves are studied. There must be funding to show the benefits of protecting representative parts of marine ecosystems. Children are the future owners of our marine heritage and those who visit Goat Island go away asking why there aren't more marine reserves.

The target of 10 percent protection of New Zealand's waters must be the goal of everyone with an interest in the marine world and should not be compromised to achieve political targets. New Zealand's marine reserves currently protect everything within their boundaries and any change to that philosophy would be a step backwards.

Forest and Bird's Shopping List of Marine Reserves

Forest and Bird has been actively involved in promoting marine reserves, largely at branch level and in many communities. Presently it has four applications with the Minister of Conservation – Te Matuku at Waiheke Island in the Hauraki Gulf, Wellington south coast, north Nelson, and Kaikoura.

Discouragingly, the process of obtaining protection can extend beyond a decade, even when advocacy is in the hands of the Department of Conservation. Hopefully, changes to the Marine Reserves Act due shortly will speed up the process.

Work is proceeding in conjunction with local branches in compiling a list of marine areas deserving complete protection. As part of this exercise, branch councillors at the Wanganui council meeting last November were invited to identify their favoured areas for protection.

Marine reserves are now a major concern of the Society nationally, with such projects as a Fiordland marine park likely to be priority campaigns in the coming year. (See 'Preserving Fiordland Underwater', *Forest & Bird*, August 1999.) — **EDITOR**

Saving Our

FISH AND GAME NEW ZEALAND

Feeding stock on riverbeds pollutes water and destroys native wildlife habitats.

The cow clambers down the bank, her hooves dislodging a shower of earth. Dirt falls into the stream. She stands in the cool water, drinking. Then she lifts her tail. Faeces, urine and dirt swirl down the stream together. There goes a cocktail of eroded soil — precious topsoil — along with digested grass, pathogenic bacteria, protozoans such as giardia and cryptosporidium, nitrogen and minerals.

Every moment, every day, this scene is repeated throughout rural New Zealand. It has been so since farming began, but now it is happening more than ever before. For dairy farming is booming. Where a few sheep and cattle once grazed, now hundreds of dairy cows eat

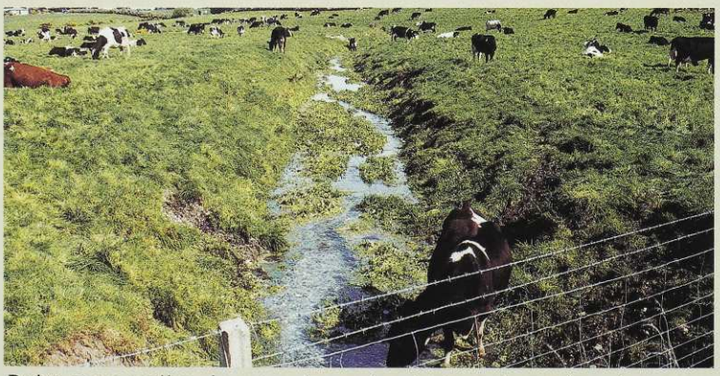
From Fish and Game's Filthy Farming File

Fish and Game New Zealand has been gathering photographic evidence of river damage nationally, particularly recording bad farming practice to support the campaign to keep our rivers pure. Here are examples from North and South Islands.

FISH AND GAME NEW ZEALAND

Mob-stocking sheep, on flat land beside stream during winter, damages the streambanks, removes riverside vegetation, and leads to pollution with sediment, nutrients and bacteria.

A winter feed pad on a beach of the lower Mataura River in Southland. Effluent enters the river through its gravels, and by running across the surface, or by floodwaters washing it in.



Dairy cows wallow in an unfenced waterway, damaging stream bed and banks with their feet and depositing wastes directly into the stream.

Aerial view of a leaking feedlot on the edge of the Mataura River, an internationally famous trout fishery which is supposed to be protected by a National Water Conservation Order.

ANN GRAEME finds fencing riverbanks is good for farming and wildlife.

Streams

and eat, processing grass into milk as well as meat and creating the effluent equivalent to millions of people. And without buffers around the streams, some of that effluent gets into the streams and so does some of the fertiliser, liberally spread to increase meat and milk production.

Erosion and run-off are natural phenomena. Indeed, they are part of the natural food chain that stream life is adapted to deal with. In the cool, oxygen-rich water of a shady bush stream, bacteria take in the organic waste and algae growing on the rocks use the minerals. On the algae and decaying matter feed mayfly and caddis larvae and a host of other invertebrates. They, in turn, are eaten by fish and birds.

But gross enrichment overloads this cycle, creating choking pollution. Too much erosion smothers the stream bed with silt which is carried downstream to degrade the harbour.

This is our topsoil and our fertiliser, washing out to sea.

Too much organic matter like faeces needs too many bacteria to ingest it and the bacteria use so much oxygen that the water becomes depleted. It becomes cloudy and smelly and anaerobic bacteria thrive. Deprived of oxygen, the mayfly and caddis larvae die, and so do the fish. And as the streams through the paddocks have no shade, the water warms and this hastens the depletion of oxygen.

This runaway pollution has many serious consequences. It threatens the health of the people and the stock who drink it. It wastes topsoil and fertiliser. Significantly, it destroys the stream habitat and natural river life. For all these reasons, we should be concerned to protect our streams.

Forest and Bird Concerned With Impacts of Dairying

With the recent expansion and intensification of dairying, New Zealand's streams are under increasing threat. Forest and Bird is particularly concerned about the impacts of dairying on native fish communities. Dairying is now expanding into formerly dairy-free areas like Canterbury. Without careful management, streams in these areas could end up looking like a typical Waikato Stream — muddy and of low ecological value. From the 1970s onwards the dairy industry has spent a lot of effort treating dairy-shed effluent to reduce stream pollution. Intensification and the spread of dairying now threatens to undo some of this good work. The dairy industry is recognising this problem and is encouraging farmers to fence streams. But more needs to be done. Currently, on 80 percent of dairy farms, stock have direct access to waterways.

— **ERIC PYLE,** *Conservation Manager.*

Banded kokopu live in small, rocky streams. Shy fish, they hide under banks and logs, coming out at night to feed.

The forgotten fish

The native fish in New Zealand's streams and rivers are as special as the rimu in the forest, but unlike the rimu tree, they are hard to see. Yet New Zealand still has at least 27 species of native freshwater fish, of which 23 are found only here, while more are being discovered.

Of these freshwater fish, only the long-finned and short-finned eels reach any great size, although the giant kokopu is known to have reached three kilograms and the now-extinct grayling perhaps two kilograms. The other freshwater fish are much smaller and often overlooked. These fish are secretive, hiding beneath rocks, amongst piles of logs and under overhanging banks. Camouflage patterns help them merge with their background. Often they are only glimpsed as they dart out of sight.

FISH PHOTOGRAPHS BY G.A. ELDON

Inanga lay their eggs in estuarine vegetation when it is flooded at high Spring tides, so streamside protection is essential to their survival. Their young are by far the largest species in the whitebait catch.

Koara are smartly speckled. They use their large pectoral and pelvic fins to climb waterfalls so they can be found far inland and high in the mountains.

Common but rarely seen, the handsome redfin bully is found in the lowland as, like the inanga, it cannot climb. It prefers the pools in rocky streams where the spawning males guard their eggs.

Rick Burke, a Bay of Plenty farmer, has fenced and restored his streamsides.

ANN GRAEME

Protecting streams

To protect streams and native wildlife from the excesses of agriculture, the first prerequisite is to fence the stream edges so stock cannot get into the water.

Once fenced, even weed-infested riparian margins go a long way to control erosion and run-off from the paddock. Better still are tree-planted margins which shade and cool the stream water and provide habitat for birds and insects.

Admittedly, fencing is expensive, both in manpower and in money, yet many regional councils now offer subsidies for riparian fencing, and for streamside planting of native trees, and for piping water to troughs. There are also encouraging signs that some farmers are conscious of the dangers farming poses to unprotected streams and are doing something about it. As these case studies show, the result is creating improved habitat for nature and better farm management.

ANN GRAEME
is the organiser of Forest and Bird's Kiwi Conservation Club.

On the flanks of the Kaimai ranges near Katikati in the Bay of Plenty, Rick Burke farms sheep and cattle on his property and on the adjacent farm of his father-in-law, Derry Seddon. Through their land runs the Manaia Stream, flowing from its source in the Kaimai Conservation Park down to the Tauranga harbour. Bit by bit, over 10 years, Rick and Derry have fenced and planted nine kilometres of stream bank. Environment Bay of Plenty, which has provided funds towards the fencing and planting, has taken a keen interest in the stream's restoration, monitoring the water quality and the life in the stream. The number of native fish has increased, with now five times as many banded kokopu as previously.

The farm has benefited too.

'Fencing the stream has been the key to better land management,' says Rick. 'It has given us a fixed boundary to fence off and smaller paddocks. Smaller paddocks give better stock management and land use.'

'But what about the weeds that will surely invade the fenced stream banks?' 'We're fencing the weeds in,' says Rick. 'With the tighter grazing the riparian fence allows, the weeds don't establish in the pasture. They're no problem and the trees and rank grass eventually get on top of them.'

Stock in streams isn't just bad for the streams; it's bad for the stock too. They have accidents. Rick had lost stock over bluffs and in the stream. And stream water can carry diseases like liver flukes. Cattle and sheep like clean water. When a water trough is provided, they drink from it in preference to the muddy creek. In remote hill country where fencing is impractical, clean water in carefully placed troughs will help lure stock away and reduce the pollution of unfenced streams.

Rick sees riparian fencing as the farmer's tool. Beyond these practical considerations, however, he also enjoys the clear waters of the Manaia stream. Framed by trees and meandering through the paddocks, the stream makes his farm a beautiful place.

The Benefits of Fencing Streams

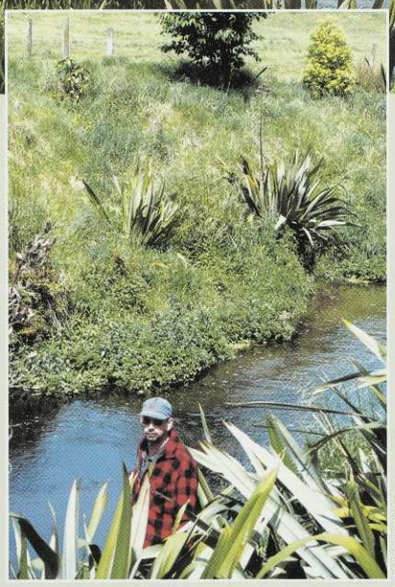
To the farmer:

- higher production
- better paddock utilisation from 'break' feeding
- healthier stock
- easier management
- fewer stock accidents.

To the stream and nature:

- less sediment and nutrients
- clean water
- more diverse stream biota
- safe spawning places for fish.

ANN GRAEME



ANN GRAEME

Stream restoration in the southern Waikato. Riverbank fences once removed have now been restored and the riparian strip expanded to give maximum benefit to the water and improve farming practices. Jos Van Loon (at right) planted the banks of the Little Waipa with native trees and flaxes but left long grass to catch nutrient run-off from the paddocks, and to filter silt deposited by flooding.

Twelve years ago, Jos Van Loon came from Holland to farm dairy cows at Waotu in the South Waikato. An innovative and thoughtful farmer, Jos runs a high quality and highly productive farm milking 450 cows. The Little Waipa stream runs across his farm and the previous owner had fenced it. When a flood damaged the fences, Jos pulled them out. He saw no need to waste that grassy stream margin which the cows could eat.

But a few years later Jos fenced the stream again, and this time he made the riparian margin much wider, up on the banks beyond flood level. Inside the fence he planted native trees and flaxes, not too densely so borders of long grass remain which capture soil, nitrogen and phosphates washing from the paddocks.

This is helping to lessen the sediment which the Waipa River carries, an annual load which equates to between 30 and 90 tonnes for every square kilometre of its catchment. That's a lot of lost soil, but it's not coming from Jos's farm.

Now Jos runs the local stream-care group, helping other farmers protect their waterways. And what caused this change of heart? Says Jos, his English still tinged with a Dutch accent, 'Sustainability is more important than the last dollar. We boogered up Holland. We mustn't boogger up New Zealand!'

Culverts Kill Fish Too

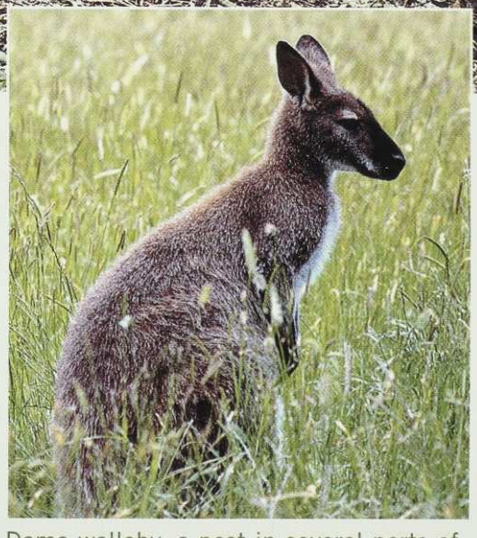
Because native fish migrate during their lifecycles, the innocuous looking culvert, channelling the stream under the track or ford, can spell death to native fish. While many fish species can slither over spray-covered rocks or climb steep, wet waterfalls, a culvert can be an insurmountable barrier because fish cannot leap straight up. Because native fish must migrate up and down stream to breed, a culvert downstream may destroy all the fish life upstream. But once recognised, this problem can be solved. There are various simple engineering solutions to suit the farmer and the fish.

The damage possums do to our forests is well known but BASIL GRAEME finds another Australian marsupial is also threatening forests and tussocklands.

Who Wants

BASIL GRAEME

This fence at Okataina excludes both deer and wallaby, a 'desert' outside and a flourishing and diverse regeneration inside. Two browsers are worse than one.



DEPARTMENT OF CONSERVATION

Dama wallaby, a pest in several parts of the North Island.

There are so many introduced animals munching their way through our forests that we are inclined to forget wallabies. Yet wallabies are another browsing animal which, combined with deer and goat browsing, can totally suppress the regeneration and replacement of canopy trees and so threaten the very existence of our native forests.

While possums destroy foliage and can kill mature trees, it is the seedlings that hold the hope of forest regeneration. So wallabies, deer and goats which all eat these seedlings are ultimately a greater threat to native forest than possums.

Wallabies?

ANN GRAEME

Left: This low fence at Okataina excludes wallabies but not deer. Together both browsers have 'vacuumed up' all seedlings in the foreground. Over the fence some unpalatable plants survive despite browsing from deer.

It is 10 years since *Forest & Bird* last profiled the threat of wallabies to our forests and tussocklands, and since then there have been changes — bringing both good and bad news.

Because wallabies behave differently to deer and goats, their effects can be even more severe. Wallabies are sociable animals. They camp in a site. Around their camp they feed, not travelling too far, until their concentrated browsing has reduced the forest floor to bare earth and browsed moss. Even then they will stay around when food is so scarce that the falling leaves from the canopy become a large part of their diet. Experimental exclosure plots (fenced areas which keep the wallabies out) show a dramatic contrast between such 'scorched earth' outside and luxuriant forest within.

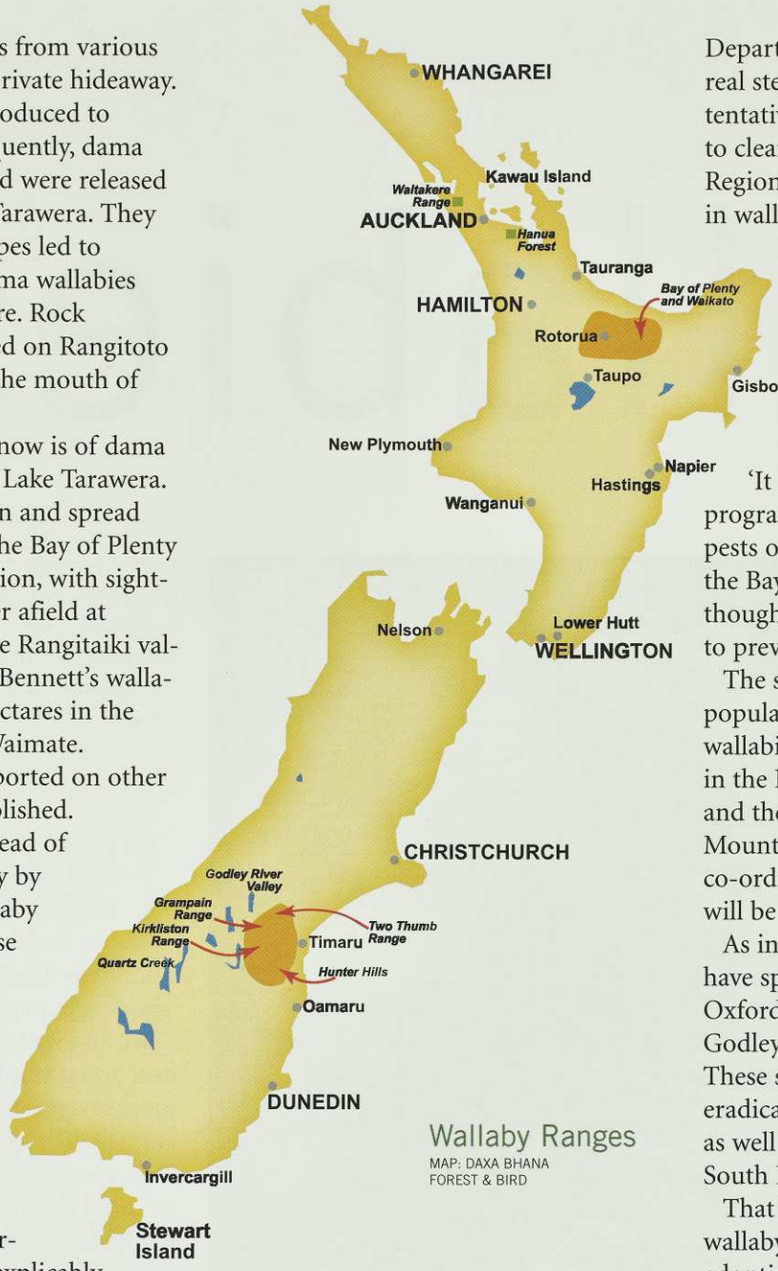
Wallabies are remarkably fecund. A mother wallaby always has a spare embryo awaiting the departure of the joey from her pouch. Shift such a female wallaby and you shift three wallabies as a potential nucleus for a new population. Yet hunters have been known to use this method to establish new populations, to the extent that Landcare Research has drawn public attention to what has become a growing problem.

Wallabies were deliberately released about 1870. Governor Sir George Grey introduced five wallaby species to Kawau Island in the Hauraki Gulf as part of his

efforts to establish animals from various parts of the world in his private hideaway. Bennett's wallaby was introduced to South Canterbury. Subsequently, dama wallaby from Kawau Island were released in the forest beside Lake Tarawera. They thrived. Releases and escapes led to further populations of dama wallabies near Auckland at Waitakere. Rock wallabies were also released on Rangitoto and Motutapu Islands at the mouth of Auckland Harbour.

The biggest population now is of dama wallabies, centred around Lake Tarawera. This population has grown and spread over 170,000 hectares of the Bay of Plenty and adjacent Waikato Region, with sightings peppered even further afield at Tokoroa, Tauranga and the Rangitaiki valley. In South Canterbury, Bennett's wallaby occurs over 300,000 hectares in the hills and ranges around Waimate. Landcare Research has reported on other populations recently established.

In New Zealand, the spread of wallabies is not principally by hopping. People shift wallaby faster than wallaby disperse themselves. Although it is illegal to shift wallaby without a permit, hunters, keen to have a handy new target, are known to deliberately release wallabies into their local patch.



Wallaby Ranges
MAP: DAXA BHANA
FOREST & BIRD

Another source of dispersion is wildlife traders. Inexplicably, there are people who are licensed by the Director-General of Conservation to catch, move and hold wallaby for export. Several new wallaby populations have been established as a result of escapes in transit to or from a trader's holding pen.

So where is the good news in all this? The good news is that the Auckland Conservancy of the Department of Conservation, sponsored by the Auckland Rotary Club, has eradicated rock wallaby from Rangitoto and Motutapu Islands in recent years. Otago DoC has exterminated a small population of Bennett's wallaby which became established at Quartz Creek, between Lakes Wanaka and Hawea. Environment Bay of Plenty has eliminated a wallaby population near Ngongataha and is working on another, thereby reducing the threat of wallaby spreading to the Mamaku forests.

These successes demonstrate how feasible it is to eradicate small, isolated groups of wallabies.

Unfortunately most wallaby populations don't fit this convenient model. The large, dispersed Bay of Plenty and Canterbury populations are a different kettle of fish. The spread of Bay of Plenty dama wallaby is a burden to Environment Waikato. Wallabies shifted by hunters are popping up as far afield as Tokoroa. To the south, only the imperfect barrier of the Rangitaiki River prevents the wallabies sighted there from bounding into Te Urewera National Park. A small population has crossed the Kaituna River, threatening the forests behind Tauranga.

To manage the wallaby problem, the animal-pest manager of Environment Bay of Plenty, Dave Moore, is about to co-ordinate a joint strategy between his council, Environment Waikato and the Department of Conservation. This is a real step forward. One objective, tentatively identified by Mr Moore, is to clear the boundary with the Waikato Regional Council to make its investment in wallaby control and eradication more effective.

'We need to walk the wallabies back to the centre, but how do we deal with the sparse numbers of wallaby spread over extensive areas?' he asks and, answering himself, muses, 'It looks as if we have to invest in a programme that will clean out all the pests over some 170 000 hectares.' So, in the Bay of Plenty and Waikato, serious thought is being given to a regional plan to prevent wallaby spread.

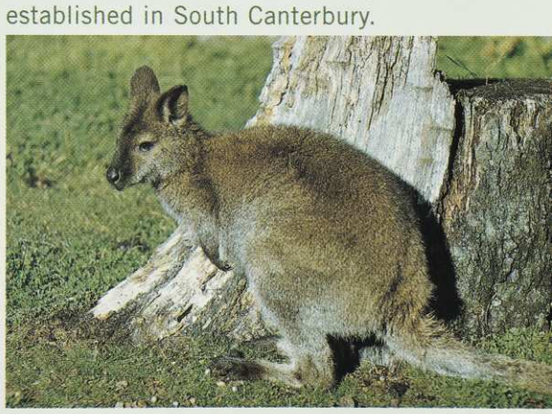
The same problems apply with the population of Bennett's wallaby. These wallabies are spread over 300,000 hectares in the Hunter Hills, Two Thumb Range, and the Kirkliston and Grampian Mountains. Just as for the Bay of Plenty, a co-ordinated and substantial investment will be required to clear such a large area.

As in the Bay of Plenty too, shooters have spread them further afield, to Mt Oxford in North Canterbury, and the Godley Valley at the head of Lake Tekapo. These small populations need to be eradicated quickly. We don't need wallaby as well as thar, chamois and deer in the South Island high-country.

That Waimate District has adopted this wallaby as their local logo – as bizarre as adopting a ferret or a possum – suggests that a lot of education about wallaby is needed in the South Island.

Fortunately, there is another discrete population which can be readily tackled. Kawau Island is one of the most under-recognised wildlife habitats in the country. This island, in the Hauraki Gulf off Warkworth, is already forested and

Red-necked or Bennett's wallaby is well-established in South Canterbury.



ROD MORRIS, DEPARTMENT OF CONSERVATION

free of ferrets, stoats, weasels and hedgehogs. As a consequence the island still manages to sustain a tiny population of kiwi, brown teal and 80 percent of the remaining gene pool of critically threatened North Island weka.

The forests are dominated by kanuka, with a coastal fringe of pohutukawa, some pine trees and a few native canopy trees. Yet so severe is wallaby browsing that all the palatable native seedlings are eaten, leaving arum lilies, monkey apple and silver tree fern to colonise the sparse understorey. The soil is thin and there is scarcely any of the duff and humus needed by the soil invertebrates on which the weka depend. Weka have already died out on Kawau Island once before, probably because of drought-induced starvation.

Getting rid of the wallabies is critical to the enhancement of Kawau Island's wildlife. There is now a strong groundswell of support from Kawau residents who want their island to become wallaby-free and a haven for threatened species.

Local attitudes have changed over the last 10 years, due largely to the advocacy of land owner, Ray Weaver. Ray drives the Pohutukawa Trust, whose mission is to protect and restore the island's pohutakawa trees. The Trust now has the eradication of wallabies in its sights. In Ray's words: 'The Trust has "beavered away" for the past 10 years and voted with their wallets ($43,000) and their actions for real conservation on Kawau.'

A constant wildcard, played whenever wallaby eradication is sought, is the threatened status of some of the island's wallaby species back home in Australia. Parma wallaby were once thought to be extinct in Australia and Kawau Island stock were captured and exported to create new populations. The parma wallaby is now much more secure as a result of these exports and from subsequent discoveries of surviving populations in their native realm. For years rock wallabies were also exported from Kawau Island to zoos worldwide, and now an Australian academic is calling for more to be collected for captive breeding to supplement a gene pool bred in the Blue Mountains.

This is no excuse to delay the eradication of wallaby from Kawau Island, however. As Ray Weaver says: 'We are no longer prepared to see our island turned into a desert just because the Australians are tardy at taking what they want.'

The stage is now set for a co-operative effort between the Department of Conservation, the Auckland Regional Council's animal-pest team and the local Trust. A critical role for the Department is to clear its own reserve land first, and to ensure that it holds a population of the Kawau weka in secure pens for re-release after wallabies have been poisoned on the rest of the island.

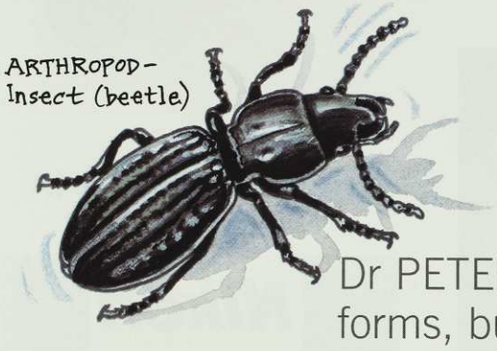
SARAH GIBBS

Ray Weaver, a landowner on Kawau Island in the Hauraki Gulf, has been leading the drive to eradicate its wallabies.

The key players in tackling the wallaby problem are the Minister of Conservation and the Department of Conservation. Wallaby are a noxious animal under the Wild Animal Control Act which they administer. The good news is that we have a real Minister of Conservation in the Hon. Sandra Lee, a former member of Forest and Bird's executive with a track record of active conservation in the Auckland region. For 2002 she is promoting, as a key output from her department, halting the spread of wallabies and the elimination of discrete populations. At last the wallabies are going to be recognised and treated as the threat that they are to our biodiversity.

BASIL GRAEME *was formerly a field officer with Forest and Bird in the central North Island, and is now a member of the national executive.*

Life in earth



Dr PETER MADDISON finds the soil teeming with life forms, but has concerns about genetic engineering.

Life in the soil is complex and abundant. It's not something we generally think about, but what goes on underground has been a particular interest of mine during the debate on genetic engineering. It's one of the reasons I've been advocating a precautionary approach to genetically modifying organisms, in case we disturb this web of life.

There are some surprising facts about the soil ecosystem, unseen as it generally is. Underground ecosystems are extensive and include more biodiversity than the more-obvious systems above ground.

The web of life in these environments includes complex associations between the roots of plants, fungi, and bacteria in legume roots. In fact there is an extensive network of fungal mycelia underground, part of a large inter-related food web relating to the breakdown of organic matter, all crucial to the carbon, nitrogen and oxygen cycles. Amongst the other organisms involved in these processes are earthworms, insects, mites, nematodes, protozoa and bacteria.

The network of cavities and holes left by animals moving below ground is very important too, as general habitat for many animals, from earthworms to insects and lizards. There is also an aquatic network which, as a thin film of water on the soil particles, allows for the existence of another large assembly of fauna, such as protozoa, nematodes, rotifers and tardigrades.

It is evident that this vast web of life is crucial to the growth of plants. It is also inherently part of the basic elemental cycles which circulate and renew physical life — the carbon, nitrogen, sulphur, phosphorus and oxygen cycles.

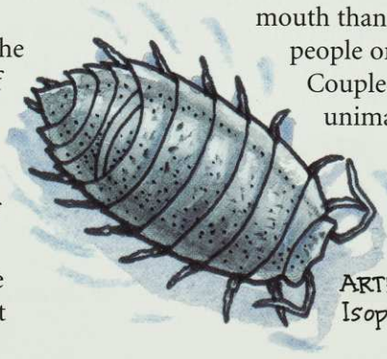
Coupled with the understanding of these soil networks is the need to know about of some of the component players — the life forms which exist underground. They include:

BACTERIA AND ARCHAEA

These two groups are so significant they are now both classified as kingdoms (giving them equivalent biological status to the kingdoms of Plantae and Animalia — plants and animals). They are comprised of many diverse 'simple' organisms.

Bacteria cells, for example, lack nuclei and their DNA exists in a single chromosome. Because of this 'simplicity', bacteria have been much used in genetic engineering — *Escherichia coli* (the *E. coli* of many gut-rot episodes!) in particular.

The numbers of bacteria are truly staggering. Perhaps the most graphic example is to note that there are more bacteria in one human mouth than there are people on this Earth. Coupled with these unimaginably vast numbers is the fact that bacteria are very small — less than one micron in length — and are therefore not directly observable without a powerful microscope.

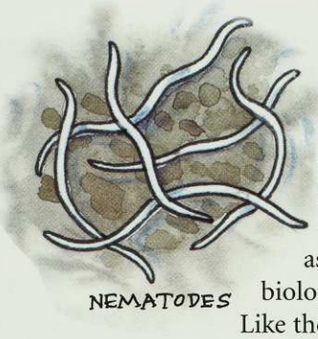


Bacteria reproduce by binary fission (cells which simply divide) and can rapidly reproduce colonies of millions. Perhaps the most well-known examples of bacterial reproduction are those associated with disease — the quick colonisation of a cut by septicaemia, or the speed with which a 'strep throat' develops.

Bacteria are also highly adaptable. They shuffle DNA between their cells by processes such as conjugation, transduction and transformation. In conjugation, fragments of plasmid DNA are transferred between donor and recipient bacteria. In transduction, DNA fragments are transferred between bacteria by a bacteriophage (a virus that infects bacteria). In transformation, living bacteria can take up DNA fragments from decomposing bacteria, released into water or soil.

Consequently there exists the possibility for bacteria to change and incorporate new DNA, a form of natural genetic engineering.

They can be hard to kill too. Bacteria can form resistant cysts that are able to survive a variety of extreme environmental conditions. Such cysts may remain dormant in the soil (or elsewhere) for years.

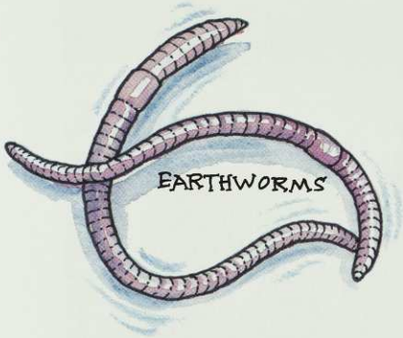


PROTOZOA

These single-celled organisms or Protista are also now classified as a separate biological kingdom. Like the bacteria, protozoa are a very diverse group of small organisms, many of which live in the soil. Protozoa also have the ability to multiply rapidly and to survive (encyst) through periods of unfavourable conditions.

EARTHWORMS

Earthworms are key components of the soil fauna. They are important in incorporating organic material into the soil and thereby improving soil fertility and soil structure. New Zealand has a large endemic fauna of worms, some reaching over a metre in length.

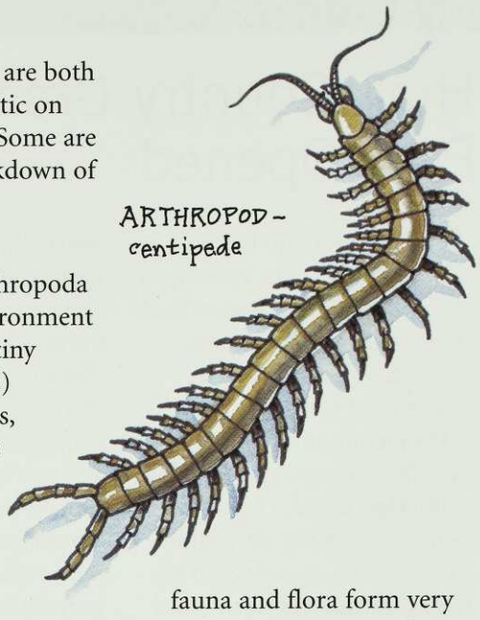


NEMATODES

These small worms are both free-living and parasitic on plant roots or fungi. Some are involved in the breakdown of organic matter.

ARTHROPODS

A vast range of Arthropoda occur in the soil environment — from Copepoda (tiny shrimp-like creatures) through insects, mites, millipedes to isopods (slaters or woodlice) and centipedes. The importance of these animals in the breaking down of organic matter cannot be over-stressed. Along with the other fauna in the soil they can be part of the process of breaking down the dead bodies of animals and plants, and their waste products, into simple elements which are thereby made available for recycling.



FUNGI

Fungi grow underground, forming large threads through the soil. These penetrate decaying material and are important in decomposition. They also make links with the roots of plants. The associations so formed are crucial to the growth of many plants, particularly trees and orchids, to which the fungi attach themselves.

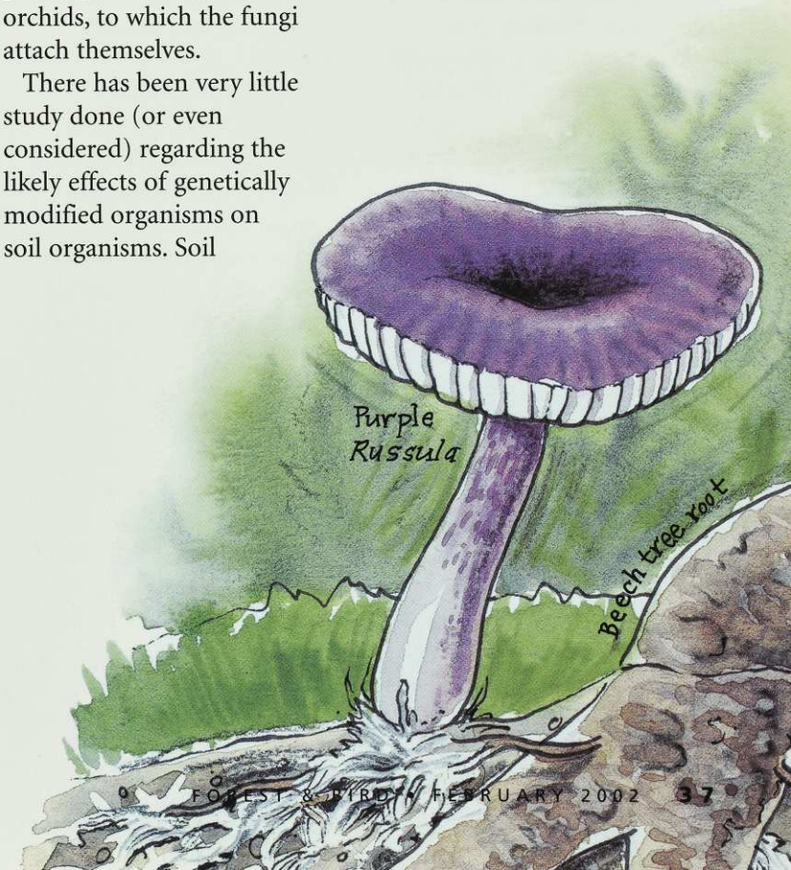
There has been very little study done (or even considered) regarding the likely effects of genetically modified organisms on soil organisms. Soil fauna and flora form very complex associations and communities. They are vital to the survival of all terrestrial plants and animals, and to human activities such as agriculture and horticulture. Guarding the soil against the possibilities of contamination is fundamental to conservation.

DR PETER MADDISON *is an ecological consultant, and a member of Forest and Bird's national executive. His Ph.D dissertation was on the effects of pesticides on the interactions of soil fauna.*

Concerns about the soil from genetic engineering

Not enough is known about the effects of genetic engineering on the health of the animals and plants which live in the soil. Genetic modification of any organism can have a number of effects, such as:

- An upset in the natural balance between the organisms.
- Possible transfer of the genetically modified trait to other organisms, particularly given the prevalence of bacteria in the soil environment.
- Further changes in agricultural practice may affect organisms other than the target ones; e.g. if more herbicide is applied to herbicide-resistant crops, then this could have food-chain consequences.
- Should genetically modified traits be transferred to soil bacteria, then the ongoing fate of this trait would be difficult to predict. The possibility of the material being encapsulated in long-surviving cyst-forms would be an even greater problem.
- Effects of toxins such as Bt in genetically modified plants, when they are released in the soil as the plant or animal decays. These toxins could be incorporated into the soil through leaf materials or through dead animals; they can bind to clay and humic acids in soil particles, while maintaining toxic activities.



High Country Grasslands Park Opened

Forest and Bird has been celebrating the opening of New Zealand's first tussocklands conservation park, Korowai/Torlesse, in the mountains inland from Christchurch.

The picture at right includes the official party at the opening with Hugh Logan, Director-General of the Department of Conservation, speaking. To his right is former Forest and Bird executive member Di Lucas, (chair of the Nature Heritage Committee which arranged purchase, on behalf of the Crown, of some of the run country comprising the Park); Dr Gerry McSweeney (representing Forest and Bird which initiated the conservation park proposal more than 10 years ago); the Minister of Conservation, Hon.Sandra Lee, also a former Forest and Bird executive member; and James Guild, a high-country farmer and previous chair of the Canterbury/Aoraki Conservation Board, which promoted and endorsed the proposed park. (Values of the park were outlined in *Forest & Bird*, August 2001.) — **ALAN MARK**

Opening the new Korowai/Torlesse Tussocklands Conservation Park by Lake Lyndon, on the main Christchurch-West Coast highway.

ALAN MARK

International Ornithological Expert Studying Migration

Dr Theunis Piersma, a leading ecologist from the Netherlands, shared his knowledge of international migratory wading birds during a recent public lecture co-ordinated by Forest and Bird on the Kaipara Harbour.. The meeting was held in conjunction with the New Zealand Wader Study Group, Miranda Naturalist Trust, and the Ornithological Society 'in the field' at Tapora, a popular bird-watching site on the Kaipara Harbour, north of Auckland.

According to Dr Piersma, New Zealand is one of three places in the world that has inter-tidal mudflats and sand-flats with high bivalve populations. This is one of the key reasons why birds with very specialised feeding habits, such as godwits and knots, migrate to New Zealand annually from the northern hemisphere.

Tapora, which has long been regarded by New Zealand ornithologists as 'the Miranda of the north', is another roosting place considered to be internationally significant. Among other things it is listed by the president of the Ornithological Society, David Medway, as the most important post-breeding flock site for endangered New Zealand dotterels.

Despite a front hitting Northland, many attendees braved the weather and headed down to the beach with Dr Piersma and other ornithologists to view godwits and knots that had migrated to New Zealand from Siberia and Alaska for the southern hemisphere summer.

Dr Piersma visited New Zealand to help set up a research programme to investigate whether some birds that visit New Zealand make a direct, non-stop flight from Alaska, rather than migrating along the Asian coast. His visit to New Zealand was sponsored by the New Zealand Wader Study Group with support from Forest and Bird.

— **SARAH GIBBS**

Invasion of the Pied Fantails

Beth and Ron Richards of Upper Moutere in rural Nelson, had an invasion of pied fantails last winter. During the coldest months of June and July, the birds huddled together on a small length of clothesline in a garage. The colder it got, the more fantails came, mainly males but the occasional female too. Any number from five to 17 birds spent the night in the garage, the greater number on the coldest night in July when it was minus five degrees. 'As it warmed up they disappeared,' write Beth and Ron Richards.

— **DIANA REEVES**

Roosting fantails in winter.

BETH RICHARDS

Forest and Bird Council Meets at Wanganui

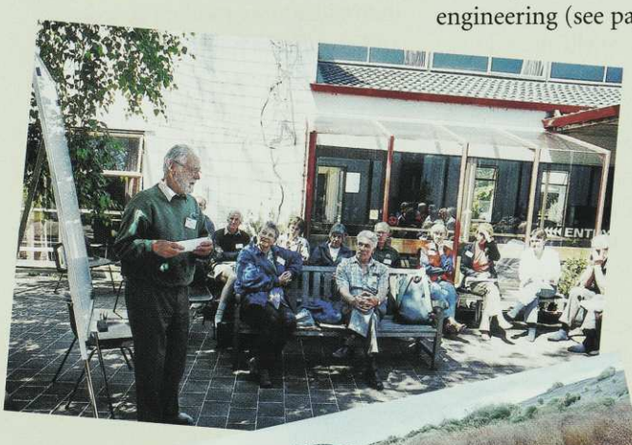
Society councillors at the Friends Centre, Wanganui.

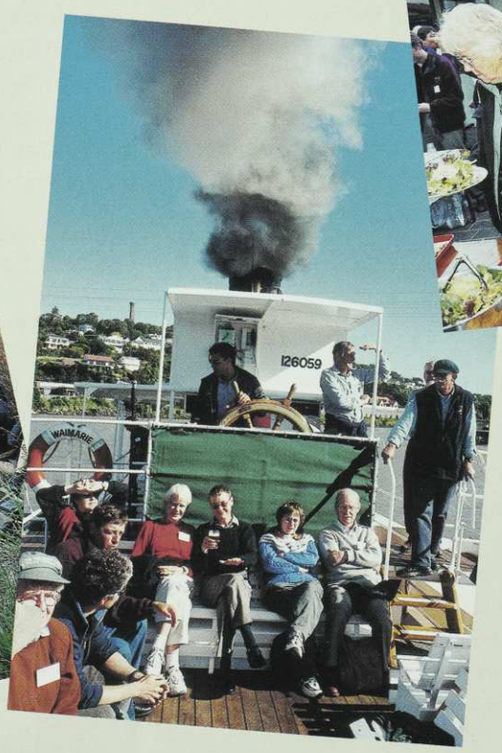
Councillors representing the branches of Forest and Bird throughout New Zealand gathered at Wanganui in November to advise on the running of the Society and to observe conservation issues in the region. The meeting (panorama above) was based at the Friends Centre at the Quaker Settlement.

Sessions included a report on efforts by the Department of Conservation to 'restore the dawn chorus' through pest control, outlined by the Director-General of Conservation, Hugh Logan, and 'mainland islands' expert Alan Saunders. Working sessions included: raising the Society's profile and building membership; conservation on private land; protecting high-country values and the need for more parks there; the crisis with marine farming and other coastal protection issues; genetic engineering (see page 40), environmental eduation, and ideas to inspire communities to restore nature. (Distinguished life member Gordon Stephenson, talked about inspiring rural communities, outdoors, left below).

Supplementary field trips involved a choice between visiting the Society's forest reserve at Bushy Park (see Conservation Briefs, page 10), or to Whitiau Scientific Reserve to see rare duneland plants with botanist Colin Ogle. (Lunching in the reed beds at Whitiau, bottom left).

Social occasions — an opportunity to exchange views on the Society and conservation work informally — included a short trip up the Whanganui River aboard the restored paddle-steamer *Waimarie*, (centre below) and a barbecue hosted by the Wanganui branch of Forest and Bird (their members can be seen serving guests below).





Far left: Gordon Stephenson leads a discussion on rural conservation; left below, lunching in the reed beds at Whitiau Scientific Reserve; a social occasion aboard the river steamer *Waimarie*; and Wanganui branch hosts a barbecue.

ALL PHOTOGRAPHS: GORDON ELL

Society's Evolving Policy on Genetic Engineering

Forest and Bird's precautionary approach to genetic engineering has been further refined by branch councillors attending the November Council meeting at Wanganui.

A paper on genetic engineering was presented to the Council by Dr Peter Maddison of the national executive, reiterating 'that the Society should take a precautionary approach to genetic engineering and oppose the release of genetically modified organisms "beyond the laboratory door". (This implies that the Society is not opposed to the use of this technology in medicine or in the laboratory in containment). However, the protection of native flora and fauna is of paramount importance to Forest and Bird, and the potential for modified DNA to escape into the "wild" causes concerns.'

After debate and amendment, the Society's policy was revised and unanimously resolved as follows:

That the Society reaffirms its belief that a precautionary approach should be taken to the release of genetically modified organisms into the environment.

That a sub-committee of the Council be established to consult with research agencies engaged in genetic modification, to ascertain:

- The nature of current and future projects likely to have an impact upon the conservation of New Zealand's natural environment.
- The potential benefits and negative impacts of these projects.
- The nature and extent of testing proposed prior to environmental release.
- The monitoring process that will be implemented post-environmental release and the precautions that will be taken to restrict unnecessary environmental spread.

Regulatory agencies will be asked to ascertain:

- The process by which the environmental effects of the testing and/or release of genetically modified organisms will be assessed, monitored and evaluated as part of the regulatory procedure.
- What efforts are being made to expand the knowledge base regarding the complexities of natural ecosystems and the effects that genetically modified organisms may have on these.

The sub-committee, comprised of three members of the Council and the Conservation Manager, will report to the June 2002 Council meeting and recommend actions on the following:

- Whether the Society should support or oppose research, testing and use of genetically modified organisms that are likely to have an impact upon the conservation of New Zealand's natural environment.
- Whether the Society should support the New Zealand GE Free Coalition.
- Whether the Society should promote to the Government that the New Zealand Conservation Estate be declared 'GM Free'.

It was agreed that Andrew Cutler and Peter Maddison be appointed to the sub-committee, along with the Conservation Manager, Eric Pyle, and another person. It is intended that conservation organisations and other groups be consulted.

RMA Objection To Protect Seascapes From Marine Farming

As the marine farming 'gold rush' gathers momentum, there is debate about how far the farms should spread. In the Marlborough Sounds, for example, mussel farming is an established industry. But in places not yet invaded by marine farms, people now question whether marine farming should be allowed at all.

Consider Jackson Bay on the West Coast south of Haast, where the tarseal ends. Drive to the end of this road, and the only signs of human presence are a cluster of cribs, a wharf and fishing boats at anchor. Stand on the wharf and look north up the sweep of wild coastline which is backed by the mountains and forests of Te Wahi Pounamu, the South West World Heritage Area. This is the essence of natural New Zealand. It is what the tourists come across the world to see.

When Sealord Shellfish and its associates sought resource consents from the West Coast Regional Council to establish four marine farms covering 112 hectares, more than a third of Jackson Bay, Forest and Bird and the Society's West Coast branch were amongst the many objectors. They raised two major issues:

- About 80 Hector's dolphins live along the Haast coast. There was concern that the marine farms would displace them, and, in the absence of scientific information about the farm's impacts, a precautionary approach was sought.
- From the human perspective, the proposed marine farms threatened to compromise a wild and pristine landscape. Should the outstanding landscape of Jackson Bay be degraded by rows of large plastic buoys?

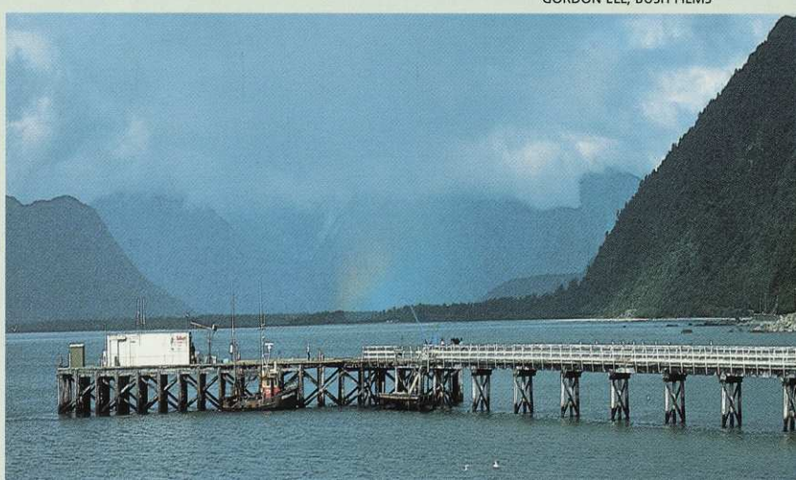
The Regional Council accepted these concerns and declined the applications. They recognised that under the Resource Management Act, section 6, 'Matters of National Importance', they were required to protect the natural character of the coast, outstanding natural features and landscapes and significant habitats of indigenous fauna.

The decision has been appealed to the Environment Court and its ultimate outcome may provide a lead for others seeking to protect their seascapes.

— ANN GRAEME

Scenic Jackson Bay, south of Haast in Westland, has been subject of a marine farming application which would take over a third of its waters. Forest and Bird joined other objectors in opposing resource consents, though Sealord Shellfish is now appealing the decision.

GORDON ELL, BUSH FILMS



Growing Demand for Native Plants in South Otago

South Otago Forest and Bird raises 'valuable dollars for conservation projects' with its annual sale of native plants. The sale, held in a car showroom in Balclutha, has gained in popularity over the past 20 years.

Such is the demand for healthy, compost-grown plants, continuing throughout the year, that members are having difficulty in keeping up supplies.

Seedling plants are gathered in late winter and early spring from roadsides in exotic forests, potted up and grown on for at least a year.

By supplying native plants at very reasonable prices members are gradually helping to educate the public about the landscape value of native flora, with some of the biggest customers being farmers using native species for shelter.

Members also enjoy the picnic-like atmosphere of plant gathering, while working together for the benefit of conservation.

— **MARYLYN MCCLINTOCK**, *South Otago Branch.*

MARYLYN McCLINTOCK

And in Hastings/Havelock North Too

The growing demand for native plants has prompted Hastings/Havelock North Forest and Bird to give trees away. A nursery established by the branch has already garnered a Civic Award, four years after it was set up on the property of branch member Joan Burn.

'Four volunteers turn up at least once a week without fail,' says branch chairman Raewyn Ricketts who, with her husband Don, is also involved in the project.

'The aim of our branch is to encourage and promote the growing of native trees in Hawkes Bay and to this end we raise approximately 5000 seedlings annually. This past year we have distributed more than 3000 plants — the others will carry over to next season.

'These plants go to reserves, schools, private individuals and marae.

'In our latest initiative we have arranged to supply a "plant-growing unit" from Trees for Survival to Hastings Intermediate School. The pupils there will grow 1500 native trees a year, with encouragement, practical help and seedlings provided by our nursery volunteers.'

RAEWYN RICKETTS

Membership Drive at Ellerslie Flower Show

Forest and Bird's Carol Knutson (pictured) reports a promotional success with 150 new members signed up at the Ellerslie Flower Show in Auckland. 'We had a wonderful group of volunteers at the show for the week,' she reports, 'and together we signed up 59 new Forest and Bird members (some of them were past members) and 91 new members in Forest and Bird's Kiwi Conservation Club for children. Since then we have had several new members join through the post using forms from the show.' Forest and Bird also received a merit award for its display.

Carol Knutson, recently appointed promotions officer for Forest and Bird, enrolled 150 new members at the Ellerslie Flower Show. The stand (pictured in part) was awarded a merit award for its display.

SARAH GIBBS

J.S. Watson Trust Funds Benefit Conservation Initiatives

Congratulations to the eight applicants who have had funding for their projects approved by the selection committee of the J.S. Watson Conservation Trust, administered by Forest and Bird. Since its establishment in 1986, the Trust has played an important part in facilitating conservation projects beneficial to New Zealand's endangered plants and wildlife.
The funded projects for 2001-2002 are:

- **Rod Brown,** *Shade House Project, Kerikeri.* Local volunteers intend to produce native trees and shrubs for habitat restoration on public conservation land, support community planting initiatives, provide pohutukawa for Project Crimson and propagate threatened or locally rare species.

- **David Clark,** *The effect of restoration plantings on the development of invertebrate communities on Tiritiri Matangi Island.* This project aims to look at the success of Tiritiri Matangi in terms of increases in invertebrate diversity and abundance. The success of restoration on Tiritiri Matangi regarding birds is well known, but success in terms of invertebrates needs to be better understood, particularly given invertebrates' key importance for ecosystem processes and as a food source for some birds. Lessons learned are likely to be applicable to other island restoration projects and possibly mainland restoration projects too.

- **Judy Gilbert,** *Little Windy Hill, Great Barrier Island.* The establishment of an ecological monitoring programme to support the pest-eradication programme at Little Windy Hill.

- **Peter Speck,** *Benthorn Farm pest management project, Great Barrier Island.* The objective is to eradicate as far as practical all pest species on Benthorn Farm, Great Barrier Island, to create a 'mainland island' sanctuary for native species.

- **Craig Carson, Forest and Bird Southland Branch.** *Purchase native-plant labels for tracks on covenanted properties which are open to the public (six sites).* This project aims to increase awareness and knowledge of Southland's native plants, by enhancing the educational and conservation experience of people, by labelling trees in six native forest areas in Southland to which the public has access.

- **Charlotte Hardy,** *The study of the 'edge effect' on arthropod communities in Rodney District forest fragment.* Fragmentation of native habitats, and resulting increases in the lineal edges of forests, is a real issue in many parts of New Zealand. This study will look at the impacts of edge effects on invertebrates, focusing on arthropod groups (beetles, moths, plant herbivores).

- **Delia Small,** *Survival and productivity of the North Island robin translocated from Kapiti Island into the Karori Wildlife Sanctuary.* Delia aims to determine the success or otherwise of translocating North Island robins from offshore islands to mainland islands by monitoring their dispersal, settlement, productivity and survival.

- **Forest and Bird, Wellington Branch.** *Natural Wellington — 'Restoring the cloak of Tane'.* This project aims to restore the diversity of plant and tree species to sites around Wellington city. Seeds will be sourced from existing local native remnants.

— ERIC PYLE,
Conservation Manager

More Changes in the Society's National Executive

There have been three more changes in the composition of the Society's executive following resignations since the annual general meeting of the Council. Jocelyn Watkin from Auckland has resigned to avoid a conflict of interest with her new professional role as director of the National Parks and Conservation Foundation. Her place on the executive has been taken by the next-highest -polling candidate from the annual election, Basil Graeme of Tauranga. He is a former field officer for the Society in the central North Island.

Peter White from Waiheke Island, who had previously taken the place of Dr Diane Menzies when she was appointed as a commissioner in the Environment Court, has also resigned. He is replaced by the next-highest candidate from the AGM, Anne Fenn, of Central Auckland branch and a member of the Auckland Conservation Board.

The long-serving national treasurer of the Society, David Underwood of Wellington, also resigned at the November meeting of the Council. A distinguished life member of the Society, David Underwood had served the Society as national treasurer since 1980.

WANTED

Committed members with the skills to lead Forest and Bird

The Society needs a strong and able Executive with a mix of backgrounds and skills in e.g., conservation science, education, activism, management, membership promotion and marketing. Important campaigns have been launched to Restore the Dawn Chorus, raise the profile for marine reserves, and protect important high country areas. Executive members are sought to bring a broad range of skills into the governance of the organisation. As well as the Executive positions, we seek a person to fill the position of Treasurer which is currently vacant — a conservation minded person with suitable qualifications and experience in finance or accounting is sought to oversee the work of paid staff. Would you like to know what is involved in being on the governing body of the Society? The General Manager, Lyn Bates, or the National President, Gerry McSweeney, are happy to talk through the responsibilities and issues in confidence, with interested people.
The Executive comprises the President, Deputy President, Treasurer and seven Executive Councillors. They are elected by representatives of the branches at the Annual Council Meeting. Nominations for the Society's Executive close with the General Manager on April 19, 2002.

For further information contact the General Manager, Royal Forest and Bird Protection Society of New Zealand Inc, P O Box 631, Wellington. Phone (04) 385 7374 or Fax (04) 385 7373 or email: l.bates@wn.forest-bird.org.nz
or the President Gerry McSweeney Phone (03) 318 9246.

Coastal Forest Reserves on Waiheke Island

PETER WHITE visits the home of Hauraki Islands branch

Forest and Bird's three reserves on Waiheke, near Auckland, are preserving a little of the original coastal forest which once coverd much of this offshore island. While Waiheke has a growing suburban population, the island is still free of possums and therefore has an environment where trees can flourish without being eaten.

The old forests of Waiheke Island were largely cleared in the 1800s making these reserves an important reminder of what the coastal forests were like before settlement. The giant kauri which once grew down to the water's edge were milled for shipbuilding, and later housing. Lighter forest and regenerating patches long supplied Auckland with firewood.

Today, Hauraki Islands Forest and Bird manages two reserves that protect significant remnants of the old coastal forest and is also revegetating another 17 hectares of erosion-scarred pasture on hillside land. (See Atawhai Whenua Reserve featured in *Forest & Bird* August 2000.)

The **Onetangi Reserve** stands at the back of Onetangi bay and village, with a Forest and Bird lodge just across the road. The 50-hectare Onetangi Reserve was purchased in 1962 to save it from the effects of overgrazing and threatened logging. It consists of taraire-pohutukawa forest with puriri, rewarewa, kohekohe, matai, tawa, kauri, kanuka, nikau, kahikatea and a hybrid of pohutukawa-northern rata. Onetangi Reserve is one of the largest areas of intact forest on the northern coast of the island.

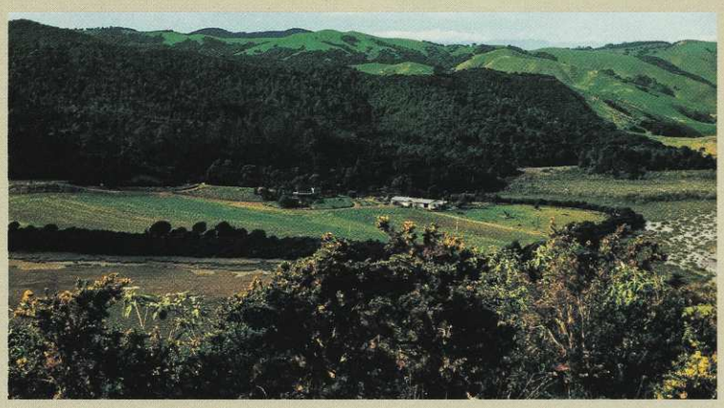
An internal loop-track system takes a leisurely two hours to traverse the major vegetation types in the reserve and can be accessed from five entrances. At various points the track crosses streams containing native fish.

On the southern ridge Forest and Bird has constructed a platform from which to view a surviving grove of large kauri. Pohutukawa Ridge, named for its impressive stand of pohutukawa, runs east-west into the centre of the reserve and provides extensive views over the reserve and Onetangi Bay to Auckland's North Shore.

For years the Hauraki Islands Forest and Bird branch has battled a host of introduced plant pests here, mainly woolly nightshade, Japanese honeysuckle, wandering jew and climbing asparagus. Now revegetation is being undertaken in parts of the reserve, particularly Pohutukawa Ridge.

The 35-hectare **Te Haahi-Goodwin Reserve,** overlooking Te Matuku Bay in the eastern end of the island, has high natural character and species diversity and adjoins the Society's proposed Matuku Bay marine reserve.

Harold Goodwin gifted the largest part of the reserve in 1979 and sold the much smaller 'School Block' – the site of the early settlers' school – to the Society in 1988. The Te Haahi (Church) Block, previously owned by the Anglican Church, was purchased as an addition to the reserve in 1983.



PETER WHITE

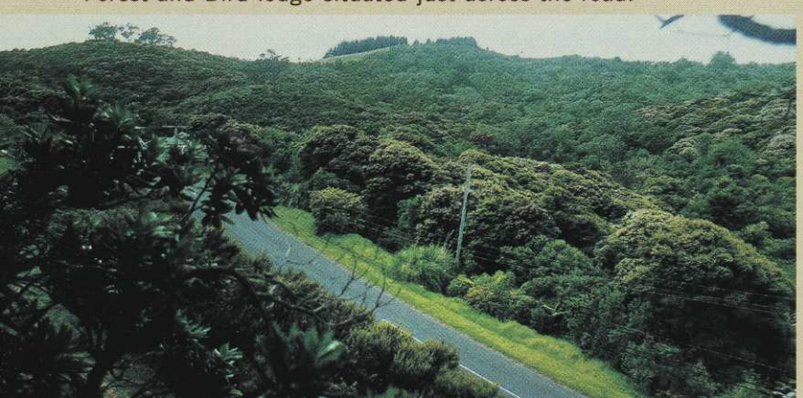
The 35-hectare Te Haahi-Goodwin Reserve, owned by Forest and Bird, and overlooking Te Matuku Bay in the eastern end of Waiheke Island. The forest adjoins the Society's proposed Matuku Bay marine reserve.

The ridges and upper slopes are dominated by forests of kauri, tanekaha, manuka, kanuka, mapou, *Leucopogon fasciculatus* and *Olearia furfuracea.* This surrounds gullies containing a forest of kohekohe, taraire, nikau and ponga with occasional puriri and emergent kauri. There are some very large kauri and kohekohe in the upper parts of the reserve. The species list includes a large number of mosses, orchids, fungi, ferns and fern allies. These forests are part of a nationally significant 'ecotone sequence' extending from hillside forests through freshwater and saline wetlands to the mudflats of Te Matuku Bay.

The Te Haahi-Goodwin Reserve has no tracks but the Forest and Bird ranger is always willing to take people on a guided tour.

— PETER WHITE, *is reporting to the national executive on the Society's reserves and their management.*

The 50-hectare Onetangi Reserve was purchased in 1962 to save it from the effects of overgrazing and threatened clearance. The Reserve stands at the back of Onetangi Bay and village, with a Forest and Bird lodge situated just across the road.



PETER WHITE

Base for Exploring Waiheke

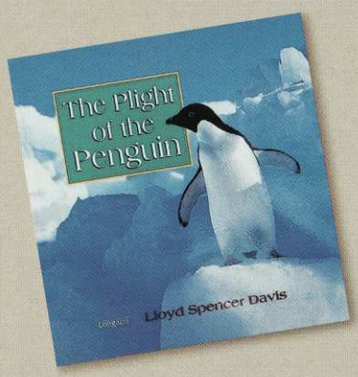
Forest and Bird's Onetangi Lodge is situated in Scotts Terrace opposite one of the entrances to Onetangi Reserve. Accommodating up to eight people, the lodge is one of the cheapest places to rent on Waiheke Island. Income from the property pays for the rates on the cottage and all three reserves managed by the Hauraki Islands branch. Any surplus is used to fund needed work in the reserves.

The lodge is in easy walking distance of Onetangi Beach, shops and buses. Buses provide ready access from the wharf to the lodge, and to various coastal and forest walks in the western part of the island. To visit eastern Waiheke it is better to take a tour or hire a car.

To book Onetangi Lodge see 'Lodges' on page 49 of this magazine for details.

The Plight of the Penguin

By Lloyd Spencer Davis, 112pp limpbound, Longacre Press, Dunedin 2001, RRP$39.95.



Lloyd Spencer Davis is an academic with an interest in popularising nature. A world authority on penguins, he's also director of the world's first university course in natural history film-making, at Otago. His book takes a graphic approach to the plight of penguins, with striking colour photographs, and some witty sketches, along with chatty panels under populist headings like 'Daddy's Milk', 'Loony or Goony' (evolutionary ancestors) and 'Convergent Evolution: putting the auk into awkward'. The various species are displayed as a 'Penguin Family Album'. Sexual selection is introduced with an anecdote of the author's first discoveries in human biology in *Confessions of a Window Cleaner.* The jazzy text is set off by lines from popular musicians such as Split Enz and Pink Floyd.

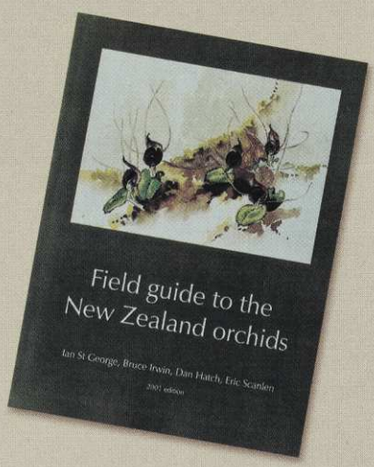
There's a suprising amount of interesting and modern science disguised in this lively presentation.

Field Guide to the New Zealand Orchids

By Ian St George, Bruce Orwin, Dan Hatch, Eric Scanlen, 135pp limpbound, The New Zealand Native Orchid Group, Wellington 2001, RRP$34.95.

First published in 1996, this is a second edition of line drawings and field notes. It recognises that in the ensuing four years new genera and species have been described and new taxa recognised, and more renaming has taken place.

With its monochromatic approach, this book is quite a contrast with Ian St George's beautifully illustrated colour guide to orchids, *The Nature Guide to Native Orchids* (Godwit, 1999). Instead of colour photographs this book is illustrated with line drawings —



actually a more useful guide in the field when trying to distinguish one similar species from another. There are useful notes, often in botanical short-hand, on characteristics, habitat, flowering seasons, distribution and conservation status. If you are interested in orchids buy both books.

Shifting Nature

Photographs by Wayne Barrar, with an essay by Geoff Park, 120pp limpbound, University of Otago Press, Dunedin 2001, RRP$49.95.

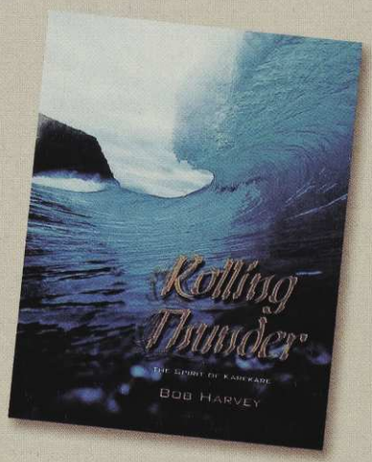
Art photography of the environment often removes the element of nature, transmuting scenery into symbols. Wayne Barrar has a more interesting approach, presenting here nine portfolios,

each with a short essay which outlines an environmental concern. The subjects vary from isolated Mason Bay on Rakiura (where introduced marram has taken over much of the sand dunes), to the sculpted ruins of Nauru from which phosphate miners have stripped the very earth. His subjects also include the impact of salt mining, hydro schemes on the Waikato, the collision of nature with people's attempts to control it, 'restoring ground', and manipulation of nature in the laboratory. His interesting visions are satisfyingly complemented by one of Geoff Park's multi-layered essays on places through time — reflections on the concept of scenery, and Wayne Barrar's alternative vision, evoked while kayaking on Rotoaira on the volcanic plateau.

Rolling Thunder, The Spirit of Karekare

by Bob Harvey, 240pp, limpbound, Exisle Publishing, Auckland 2001, RRP $39.95.

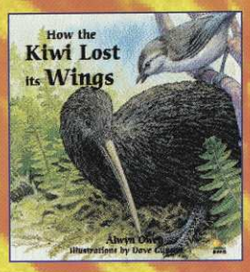
There can't be many little beaches in the world to be celebrated on such as scale as Bob Harvey has Karekare. The veteran surfer, and Mayor of Waitakere City, has gone out to the wild west coast of the Auckland isthmus to record his love for one of the black-sand beaches where he has been in the surf club for 45 seasons. That is not to diminish his relationship with the place, just to explain how he comes to love it like a local. The *Rolling Thunder* of the surf, echoing off the valley walls, is just one of the affecting sounds and sights which help to define 'the Spirit of Karekare' so gloriously delineated in this book. Imagine please, 240 A4 pages of full colour about your own favourite place enriched by the poems, memories, photographs, prints and paintings of some of New Zealand's leading artists over more than a century. Here is an unusually rich cultural heritage for any New Zealand place, shared internationally in recent years through such movies as *The Piano.* Not that this book broods in wilderness. The pages are packed with graphic marginalia, of people and the artefacts of everyday life — a richly peopled landscape from Maori times to the present. This is local history, and sense of place, evoked on a



visual scale to the level where it encompasses more universal themes of pioneering and love for our land. Quite coincidentally, it stands with Bob Harvey's other recent book *Untamed Coast, the Waitakere Ranges and West Coast Beaches* as a persuasive argument for the better preservation of this comparatively little-known corner of wild New Zealand (see our feature from page 12 of this issue).

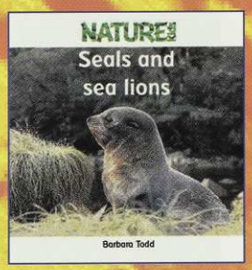
New titles from Reed Publishing

HOW THE KIWI LOST ITS WINGS



Alwyn Owen, illustrated by Dave Gunson - $12.95
Available in both English and Maori editions
Long ago a plague of insects threatened to destroy the forest, so mighty Tane called upon the birds to save the precious trees. Who of all the birds answered Tane's plea and what sacrifices were made? This classic story, originally broadcast on radio, is now available for the first time in book form.

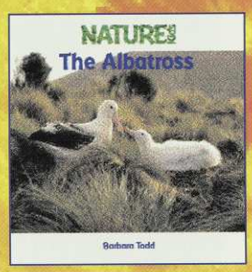
THE NATURE KIDS SERIES



The books in this series, which is published for 5–8-year-olds, are designed to provide information about New Zealand's unique natural world and its inhabitants. They are particular to New Zealand whatever subject they cover; the authors are experts in their fields and all photographs are taken in New Zealand.
Other titles in the series are: **The Kea, Penguins, The Kiwi, The Orca, The Weta**

SEALS AND SEA LIONS

Barbara Todd - $12.95
Discover the difference between 'eared' and 'true' seals, where they live in New Zealand, what they eat, and more.

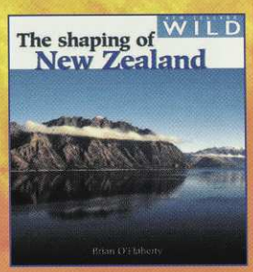


THE ALBATROSS

Barbara Todd - $12.95
Did you know that albatross run across water to take off and that two albatross found in New Zealand are the largest sea birds in the world?

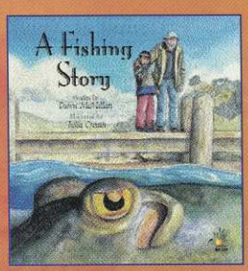
THE NEW ZEALAND WILD SERIES

The New Zealand Wild Series is aimed at 8–14-year-old readers.
Other titles in the series are: **Bats, Penguins, Rocky Shore, The Tuatara, Whales and Dolphins**



THE SHAPING OF NEW ZEALAND New Zealand Wild

Brian O'Flaherty - $14.95
Learn how our planet was formed and what's inside it, and how New Zealand arrived at its location on the earth's surface. Discover the forces that constantly remodel the country and create its spectacular landscapes. The book is packed with diagrams and colour photographs of interesting and important landforms in New Zealand. There is also an index and a glossary.



A FISHING STORY

Dawn MacMillan and Julia Crouth - $12.95
Available in both English and Maori editions
When Jasie and Koro go fishing, they catch enough kahawai to take home for dinner. But when faced with a difficult challange, Jasie has the courage to stand up for what he believes is right, in this heart-warming story.

A TRAMPER'S GUIDE TO NEW ZEALAND'S NATIONAL PARKS:

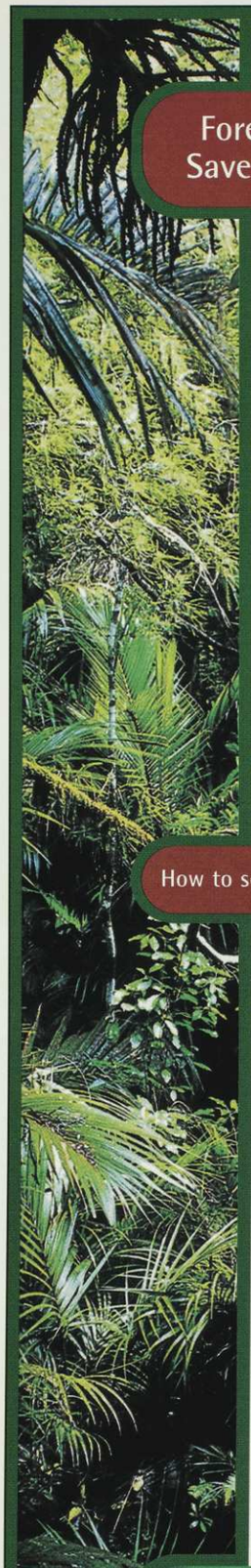
NEW EDITION
Robbie Burton and Maggie Atkinson - $29.95
A new edition is now available of this leading guide book which has been in print for almost 20 years. All the information has been updated and checked with local DOC offices to ensure accuracy. The new Stewart Island Park has not been included as the boundaries have not yet been finalised; information will be made available on the Reed website – www.reed.co.nz – as it comes to hand.

THE REED DICTIONARY OF NEW ZEALAND PLACE NAMES

A.W. Reed - $49.95
This comprehensive book tells the stories of the naming of New Zealand. From Mt Horrible to Wekaweka, over 7000 entries cover all the major Maori and European place names and their fascinating histories. Originally written by the legendary A.W. Reed, and out of print for many years, this much sought-after book is now available in an extensively revised new edition.

Availabe from leading booksellers nationwide
Visit our website: www.reed.co.nz

REED



Forest and Bird Members – Save Dollars for Conservation

DIRECT **DEBIT** YOUR **MEMBERSHIP** FEE AND HELP **SAVE** THE SOCIETY THOUSANDS OF **DOLLARS** FOR **CONSERVATION** WORK

Help us save time, money and paper by arranging a Direct Debit for your Membership and Donations to *Forest and Bird*. That way we'll save much of the costs of processing some 25,000 subscriptions annually – and so have more money to spend on conservation.

Direct Debit is a very simple, cheap and safe method of payment, and one that's becoming increasingly popular for all household bills.

How to set up a direct debit for *Forest and Bird*

All you need do is phone us on **0800 200 064** or Wellington (04) 385-7374 and we'll send you a copy of Forest and Bird's Direct Debit brochure. This outlines the Direct Debit process and includes an Authorisation Form which you can fill in: send it back and we'll do the rest.

PHONE *FOREST AND BIRD* DIRECT DEBITS ON 0800 200 064 AND WE'LL DO THE REST.

Remember, Direct Debits save dollars for conservation not paperwork.

PLEASE ACT NOW!

Using Rainwater Saves Money While Going Easy on the Earth

It rains a lot up north — often as much as it does on the infamous We't Coast. The problems of flash flooding and stormwater are much the greater in northern cities, however, with rains running across sealed streets and hard-standing, straight into the sea.

North Shore City, which has already given a lead to engineers with alternative ways to handle stormwater, is now encouraging home-owners (and businesses) to save some of the rainwater in holding tanks and use it later.

The argument goes that even a small rainwater tank can help prevent the the localised flooding and erosion that results from a small storm. Collecting rainwater can also significantly reduce demand on the city water supply. In the case of North Shore City, where the suburbs drain quickly to the sea, arresting stormwater also helps improve water quality at the beach.

Approximately 65 percent of household water demand could be met by rainwater collected from the roof, according to the city council. It could be used in the laundry, for flushing the toilet and for watering the garden. The share of the kitchen, which is only 10 percent of useage, and the bathroom (25 percent) would still come from mains water.

If every household could install a 5000-litre rainwater tank, the city could halve water demand while significantly reducing beach-water pollution. The council also advocates using smaller tanks, such as rain barrels which hold 240 litres, to gather rainwater from smaller roofs (30 square metres).

The installation of a 4500-litre tank, collecting rainwater from a typical-sized roof, can reduce peak stormwater run-off by 20-35 percent.

Outside its main library, in Takapuna, the council has a demonstration of what can be done, relatively cheaply. A 5000-litre tank takes rainwater run-off from the library complex and provides a source for gardeners maintaining the gardens in the city centre. The system cost $900 for the tank and $300 to install.

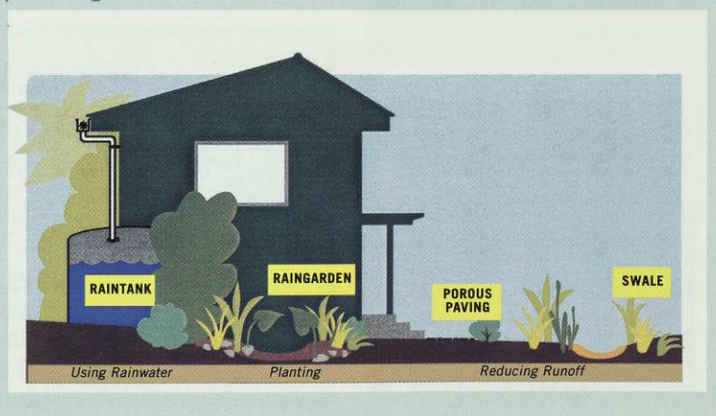
The council has been offering help and grants for people prepared to introduce ways of using stormwater in the city. These include installing rainwater tanks, the planting of 'rain gardens' where stormwater may disperse, forming grassy swales and berms, and replacing impervious surfaces with permeable alternatives.

PETER NAGELS

A rainwater tank holding 5000 litres has been installed alongside the Takapuna Library as a demonstration of what can be done with rainwater. North Shore City Council uses the water to maintain adjacent gardens at the city centre. The conservation manager of Forest and Bird, Eric Pyle, (on right) recently presented an award to the Mayor of North Shore, George Wood, recognising the council's initiatives in encouraging rainwater conservation.

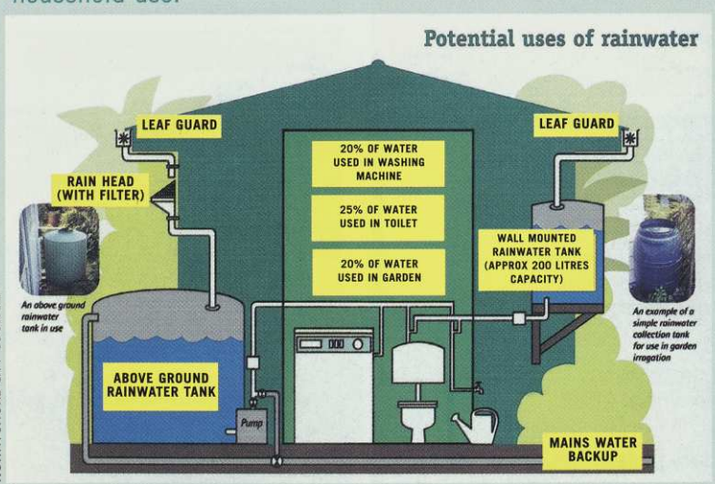
NORTH SHORE CITY COUNCIL

North Shore City Council favours rainwater collection and porous surfaces to prevent stormwater erosion, and run-off polluting streams and beaches.



NORTH SHORE CITY COUNCIL

Plumbing arrangements show uses rainwater can be put to in the average house. Water savings total 65 percent of total household use.



NORTH SHORE CITY COUNCIL

join Forest and Bird

working together
we CAN make a difference

As a member of Forest and Bird you can:

- Gain satisfaction from the knowledge that you are contributing to the conservation and protection of New Zealand's natural heritage.
- Receive the Forest & Bird magazine - four full-colour issues a year, delivered to your mailbox.
- Receive regular issues of Conservation News containing the latest in environmental news.
- Participate to the level you desire in a large, successful, grassroots conservation group.
- Be informed by your local branch of trips, walks and conservation projects in your area.
- Stay at Forest and Bird's reasonably priced lodges around the country.

Kiwi Conservation Club

a special club for children

Kids love learning about the natural world and how to protect and enjoy it. The Kiwi Conservation Club is for young people aged 5 to 12 years. It encourages an appreciation of nature, and promotes fun, conservation-based activities. Membership is available to individuals, families and schools.

KCC members receive:

- Five copies annually of the KCC magazine, packed with interesting stories, games, jokes and projects.
- A personalised KCC membership certificate containing the Kiwi Conservation Code.
- KCC member's stickers.
- Notification of activities and trips held in most areas by local KCC groups.

Use the attached form to give a donation or join as a member (donations over $5 are tax deductible)

It is your support and generosity that enables Forest and Bird to continue working for the environment

FOREST & BIRD

Membership and/or donation form

Name (Mr/Mrs/Ms) _____

Address _____

_____

_____ Telephone _____

Email: _____

This is a ☐ new membership
☐ renewal membership (membership no.) _____

GIFT MEMBERSHIP
Join a friend by filling in their name above and your name below. Gift membership will be sent with a special gift card in your name. If you would like to be billed for renewal of this gift membership next year please tick here ☐

Gift from (Mr/Mrs/Ms) _____

Address _____

_____

Forest and Bird membership category *(all prices include GST)*

☐ single ☐ family ☐ non-profit group	$52.00		
☐ senior citizen ☐ senior family	$39.00		
☐ student/schools	$35.00	☐ libraries	$52.00
☐ business	$120.00	☐ life (single only)	$780.00
☐ overseas	NZ$75.00	☐ corporate	$275.00

Kiwi Conservation Club membership category *(all prices include GST)*

☐ single	$12.00	☐ family (no. of children _____)	$20.00
☐ mini set (4 magazines)	$22.00	☐ class set (30 magazines)	$55.00
☐ overseas	NZ$22.00		

DONATION *(Donations over $5 are tax deductible)* $_____

☐ Enclosed cheque to Forest and Bird

or charge my ☐ Visa ☐ Mastercard ☐ Amex ☐ Diners

Expiry date _____ Cardholders signature _____

By mail FREEPOST No. 669, Forest and Bird, PO Box 631, Wellington.
By phone (04) 385-7374 **or fax** (04) 385-7373 with credit card details.
By internet www.forest-bird.org.nz

2002

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By phone (04) 385-7374 **or fax** (04) 385-7373 with credit card details.
By internet www.forest-bird.org.nz

2002

We invite new and existing members to pay membership and donations by direct debit

Every year we process in excess of 25,000 cheques. As you can imagine, this is a time consuming and labour intensive process. You can greatly assist the work that we do by making your membership payments and donations by Direct Debit.

Pay your membership/donations by direct debit

If you are an exisiting member this authority will operate from the next date your membership becomes due for renewal

Name (Mr/Mrs/Ms) _____

Address _____

_____

Phone (work) _____ (home) _____

Email: _____

We may need to contact you if problems are encountered setting this up.

This is a ☐ new membership
☐ renewal membership (membership no.) _____

GIFT MEMBERSHIP
Join a friend by filling in their name above and your name below. Gift membership will be sent with a special gift card in your name.

Gift from (Mr/Mrs/Ms) _____

Address _____

_____

Forest and Bird membership category *(all prices include GST)*

☐ single ☐ family ☐ non-profit group			$52.00
☐ senior citizen ☐ senior family			$39.00
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☐ mini set (4 magazines)	$22.00	☐ class set (30 magazines)	$55.00
☐ overseas	NZ$22.00		

Please debit my bank account on a continuous basis as selected below:

☐ 28th each month (may only be used where donation is included with subscription)
☐ 5 instalments, on the last day of January, February, March, April and May in any year.
☐ 6 monthly on 28 January and 28 July
☐ annually on 15 January

If you join part way through the year, a partial payment by direct debit maybe required.

Should the membership fee be increased Forest and Bird are authorised to automatically increase this amount.

For the relevant portion of the following:

☐ Current annual subscription
☐ Gift subscription for: member number
member name
☐ Donation as outlined below (list annual amount here)
☐ Total annual amount

I wish to make a regular donation to Forest and Bird of $ _____ per annum.

☐ To be deducted from my bank account together with my subscription as outlined above **or:**
☐ To be deducted on the day closest to the 15 January every year.

Please make my annual donation: _____

Complete the bank authority form overleaf and post together with your completed direct debit form to: Forest and Bird, Freepost no. 669, P O Box 631, Wellington

BANK AUTHORITY FORM

Direct Debit

BANK INSTRUCTIONS

NAME:
(of Bank Account)

AUTHORITY TO ACCEPT DIRECT DEBITS
(Not to operate as an assignment or agreement)

AUTHORISATION CODE
0 6 1 0 3 5 3

Bank account from which payments to be made:

BANK | BRANCH | ACCOUNT NUMBER | SUFFIX

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

To: The Bank Manager

BANK:

BRANCH:

TOWN/CITY

I/We authorise you until further notice, to debit my/our account with all amounts which ROYAL FOREST AND BIRD PROTECTION SOCIETY OF NEW ZEALAND INC.
(hereinafter referred to as the Initiator)
the registered Initiator of the above Authorisation Code, may initiate by Direct Debit.
I/We acknowledge and accept that the bank accepts this authority only upon the conditions listed below.

Information to appear on my/our bank statement:

PAYER PARTICULARS:	PAYER CODE:	PAYER REFERENCE:
FOREST&BIRD	SUBSCRIPTION	THANK YOU

YOUR SIGNATURE(S) _____ DATE / /

Approved
1035
02 1999

For Bank Use only

Original - Retain at Branch

Date Received:	Recorded by:	Checked by:

BANK STAMP

CONDITIONS OF THIS AUTHORITY

The Initiator

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

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

The Customer may:-

(a) At any time, terminate this Authority as to future payments by giving written notice of termination to the Bank and to the Initiator.

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

The Customer acknowledges that:-

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

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

(c) Any dispute as to the correctness or validity of an amount debited to my/our account shall not be the concern of the Bank except in so far as the direct debit has not been paid in accordance with this authority. Any other disputes lie between me/us and the Initiator.

(d) Where the bank has used reasonable care and skill in acting in accordance with this authority, the Bank accepts no responsibility or liability in respect of:-
- the accuracy of information about Direct Debits on bank statements.
- Any variations between notices given by the Initiator and the amounts of Direct Debits

(e) The Bank is not responsible for, or under any liability in respect of the Initiator's failure to give written notice correctly nor for the non-receipt or late receipt of notice by me/us for any reason whatsoever. In any such situation the dispute lies between me/us and the Initiator.

The Bank may:-

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

(b) At any time terminate this authority as to future payments by notice in writing to me/us.

(c) Charge its current fees for this service in force from time-to-time.

lodge *accommodation*

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

Tai Haruru Lodge, Piha, West Auckland
A seaside haven set in a large sheltered garden on the rugged West Coast, 38km on sealed roads from central Auckland. Close to store, bush reserves and tracks in the beautiful Waitakere Ranges. Double bedroom and 3 singles, plus large lounge with open fireplace, dining area and kitchen. The self-contained unit has 4 single beds. Bring food, linen and fuel for fire and BBQ. For details and rates send stamped addressed envelope to Myriam Schreuder, PO Box 91, Piha, Waitakere City. Tel: (09) 812-8541.

Waiheke Island Cottage
Located next to our 49ha Wildlife Reserve,10 minutes walk to Onetangi Beach, general stores etc. Sleeps up to 8 in two bedrooms. Lounge, well-equipped kitchen, separate toilet, bathroom, shower, laundry. Pillows, blankets provided. No pets. Ferries 35 minutes from Auckland. Enquiries with stamped addressed envelope to: Maya Spence, 16 Hobson Tce, Waiheke Island, Tel/fax: (09) 372 9333, e-mail: andyspence@xtra.co.nz

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, hot showers. Supply your own linen, sleeping bags etc. For information and bookings please send a stamped addressed envelope to Pam and John Wuts, 15 Durham Ave, Tamatea, Napier. (06) 844-4751, email: wutsie@xtra.co.nz

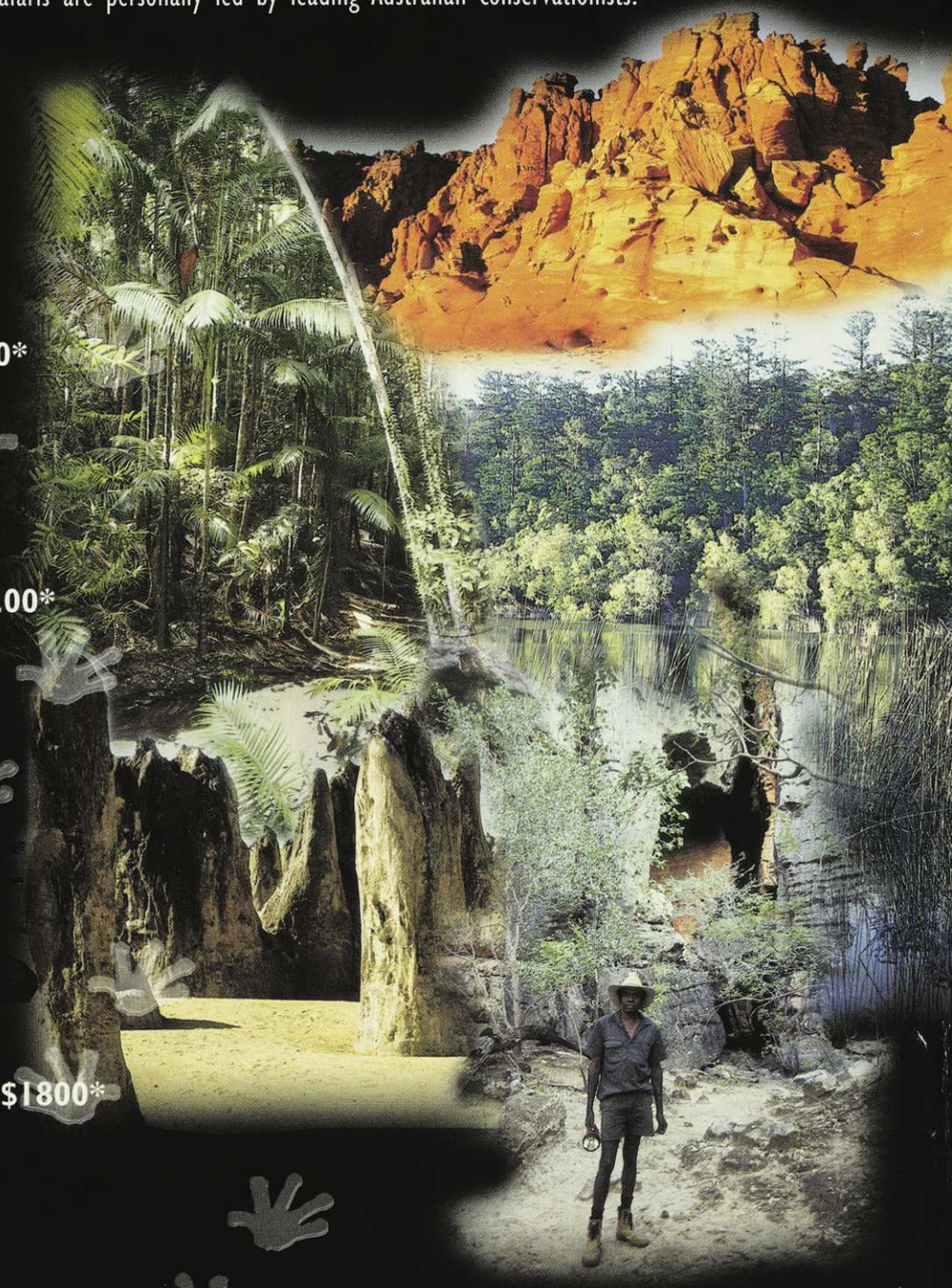
Matiu/Somes Island, Wellington Harbour
Joint venture accommodation by Lower Hutt Forest and Bird with DoC. A modern family home with kitchen, 3 bedrooms, large lounge and dining room, just 20 mins sailing by ferry from the centre of Wellington or 10 mins from Days Bay. Ideal place to relax in beautiful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

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

Go Bush in Australia 2002 - 2003

Go Bush Safaris are Australia's World Heritage Area Specialists & annually visit most of Australia's World Heritage areas.

All safaris are personally led by leading Australian conservationists.



Tropical Rainforest and Reef **$2000***

12 days (includes all accommodation)

Leaves Cairns: Saturday, 20 July, 2002
Returns Cairns: Wednesday, 31 July, 2002

Fraser Island - Whale Watching **$1500***

9 days (camping)

Leaves Brisbane: Wednesday, 21 August, 2002
Returns Brisbane: Thursday, 29 August, 2002

Shark Bay & Western Wildflowers **$2200***

11 days (includes all accommodation)

Leaves Perth: Saturday, 14 September, 2002
Returns Perth: Friday, 27 September, 2002

Mungo Mutawintji and More **$2400***

17 days (includes all accommodation)

Leaves Sydney: Tuesday, 29 October, 2002
Returns Sydney: Friday, 15 November, 2002

Bush Christmas in the Blue Mountains **$1800***

12 days (includes all accommodation)

Leaves Sydney: Saturday, 21 December, 2002
Returns Sydney: Wednesday, 1 January, 2003

15th year of operation.

Projected program for 2003 includes most of the above destinations plus:

- Kakadu in the Wet (February),
- Discovering Tasmania (March),
- Lord Howe Island (May),
- Kimberly Adventure (June),
- Top of Australia Cruise (November).

Full details and itineraries are available from:

GO BUSH SAFARIS

PO Box 71 Gladesville NSW 1675
Email: john@gobush.com.au
Phone: +61 2 9817 4660 Fax: +61 2 9816 1642
Web: www.gobush.com.au

* All prices are in $ Aus and include GST plus all transport, meals, accommodation, and access fees from start to finish. Australian GST will not apply to air travel within Australia if included with your international flight. A few places remain on our popular safaris during the first part of 2002.