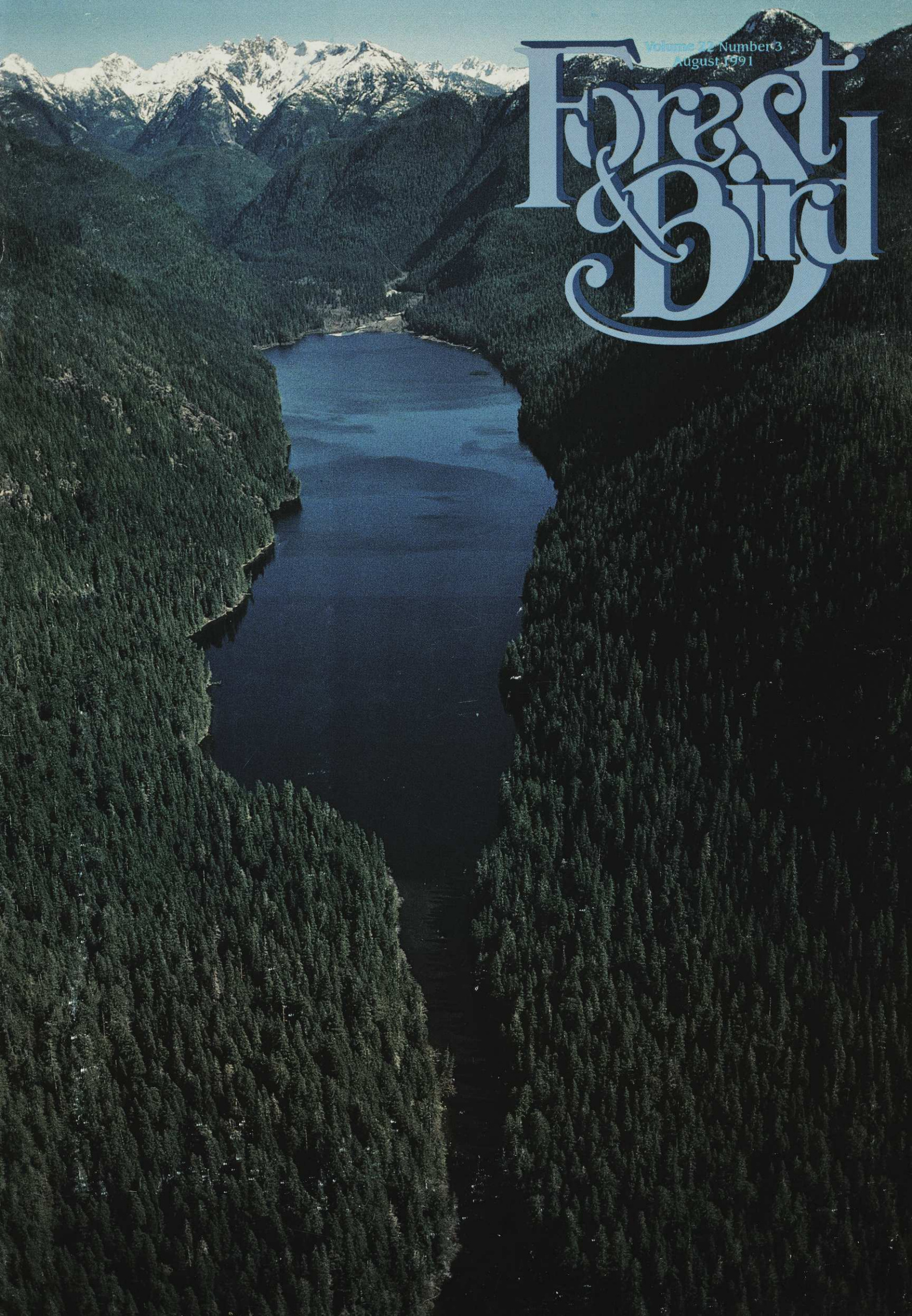
Volume 22 Number 3
August 1991

Forest & Bird



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Front cover: *One of the largest remaining intact watersheds on Vancouver Island, British Columbia, is centred on the 24,000 ha Megin Lake area. An article on the rundown of the island's rainforests and the involvement of New Zealand company Fletcher Challenge Ltd. appears on page 12.* Photo: Gerard Hutching

Cultural harvest

FOREST AND BIRD is occasionally drawn into the debate about the taking of protected species by some Maori people through our historical commitment to preservation through the law. Since 1923 Forest and Bird has been instrumental in pressing for the successive statutes which at present protect many native species. Recent suggestions that some of these species should be harvested have been opposed by the Society.

This discussion comes at a time when in all areas of the environment there are arguments made for "sustainable management." This seductive theory allows for the taking of trees and other resources at a level which nature can restore. The problem with many of our birds is that the "resource" is so depleted that it cannot be regarded as "renewable." Harvest of such species cannot be sustained. The bottom line too often is protection or possible extinction.

It would be unwise to overlook the fact that different people have different perceptions of conservation. The Society has always taken the view that it has a duty to protect native species of plants and animals, even if only for their intrinsic value. That is why the Society exists and why many of its early battles were about obtaining legal protection for New Zealand birds.

There is another view of conservation which allows for the harvest of everything in moderation. Conservation then is about managing stocks of birds (and plants) so there will be more to use tomorrow. That is how we manage our freshwater fisheries and gamebirds, the muttonbird harvest, and how presumably those who wish to eat godwits would manage that resource. The difficulty arises when birds such as kereru in Northland no longer exist in sufficient numbers to harvest. Then, the Society has always argued, harvest is no longer appropriate.

It is worth remembering that present laws make provision for the taking of Maori cultural materials from nature. In this way totara and kauri have been taken from Department of Conservation land to build canoes. Plant materials and feathers from protected birds can be available for the repair of tribal treasures. Problems arise, however, with how this process is managed. The Society is concerned about this burgeoning harvest.

There is considerable argument in Maoridom about this too, with concerns expressed about the volume of material being taken, the degree of tribal consultation, and the taking of materials by one tribe from the traditional area of another. In the interests of protecting nature, while being fair to those legally entitled to take, the Society has pressed the Department of Conservation and the Conservation Authority to develop national guidelines for such harvest, in consultation with tribal and conservation interests.

A potent aspect of the present debate is the Treaty of Waitangi. This document asserts the right of Maori chieftainship over certain natural resources which some take to include native birds. From this point it can be argued that Maori authorities should govern the use of them, just as some have argued for control of fisheries. To argue the Crown's right to manage native birds can be seen as an opposition to Maori political aspirations. While the wounds of Waitangi remain open, those questions unresolved, such feelings will continue to trouble the individual conscience and divide people.

Forest and Bird has a long standing commitment to absolute protection for native species, arising from its successful efforts to enshrine these principles in law. To zero-rate this effort and debate the whole structure of our commitment to conservation and use would be unacceptable to most of our members. Further, any weakening of our advocacy would also be in contradiction of our aims and objects. Now the Society's June council meeting has asked for your executive to develop a policy with regard to the harvesting of indigenous flora and fauna.

Debating the possibility may fit with fashionable economics and social interests. It may also be that everyone will benefit from reviewing their commitment to conservation and by discussing it with those most affected. Personally, however, I am doubtful that wavering in our resolve will benefit that absolute protection of native species that this Society has sought for nearly 70 years.

Gordon Ell
President

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Forest & Bird

C·O·N·T·E·N·T·S

Articles

Departments

Forest & Bird is published quarterly by the Royal Forest & Bird Protection Society of New Zealand Inc.

Society's aims: to protect New Zealand's native species, natural ecosystems and landscapes and promote an appreciation of these.

The Royal Forest & Bird Protection Society is a member of the International Union for the Protection of Nature and Natural Resources (IUCN) and the International Council for Bird Preservation (ICBP).

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Set net ban to save penguins

THE BELEAGUERED YELLOW-EYED PENGUIN will be assisted in its struggle for survival by the imposition of a set net ban around the southern half of the Moeraki Peninsula in Otago. This is the country's first set net ban imposed specifically to protect a bird.

The ban, to apply year round, will also protect the recreational salmon fishery in the area.

At least eight yellow-eyed penguins have drowned near the peninsula in recent years; six of them died within three days. No doubt many others have drowned in set nets but were not reported.

With a mainland population of only 130 pairs, the impact of set nets on the species is devastating. Over the total mainland range of the penguin, at least 50 are known to have died in set nets. Yet Otago Museum penguin expert John Darby believes this is only a small proportion of those killed.

As more knowledge comes to light, it is apparent that many of our inshore diving birds are seriously threatened by set nets. The frequent drownings of pied shags in Panmure Basin, Auckland, is a well documented case. Other anecdotal reports about birds caught in set nets are building up a clear picture of how widespread the problem is. In two separate incidents a gill netter killed a total of 600 shearwaters in Southland's Te Wae Wae Bay. Other birds frequently drowned are Hutton's and fluttering shearwaters, spotted shags and little blue penguins.

There is now a compelling case for a total ban on all set netting in New Zealand. Our marine ecosystems and our recreational and commercial fisheries would be better off without them.

If you have any detailed information about birds drowning in set nets, please send it to Alan Tennyson, Royal Forest and Bird Protection Society, PO Box 631, Wellington.

Alan Tennyson

Moeraki lighthouse keeper and honorary ranger Janice Jones is a longtime campaigner against set netting. This 1986 photo shows her feeding a yellow-eyed penguin chick while an adult looks at two less fortunate penguins killed in set nets.
Photo: Otago Daily Times.

Kokako to benefit from book

IF ALL 2000 COPIES of a new rare birds book are sold, the kokako recovery programme will receive a financial injection of $180,000.

The book, *The Fifty Rarest Birds of the World*, comprises paintings by Auckland artist Blake Twigden, and was launched recently by Conservation Minister Denis Marshall.

Two of the species featured are New Zealand ones – the kokako and the kakapo.

The text was written by the deputy director of the International Council for Bird Protection, Dr Nigel Collar and one of his colleagues, Mark Cocker.

The book is limited to 2000 copies and costs $2700 plus GST. Publishers are Osborne Editions International of Auckland.

The kakapo, as depicted by Blake Twigden in his new book.

Editor Vanuatu bound

AFTER SEVEN YEARS as *Forest & Bird* editor and publications manager, Gerard Hutching is departing for Vanuatu where his partner Adele Bryant has been posted with the Ministry of External Relations and Trade.

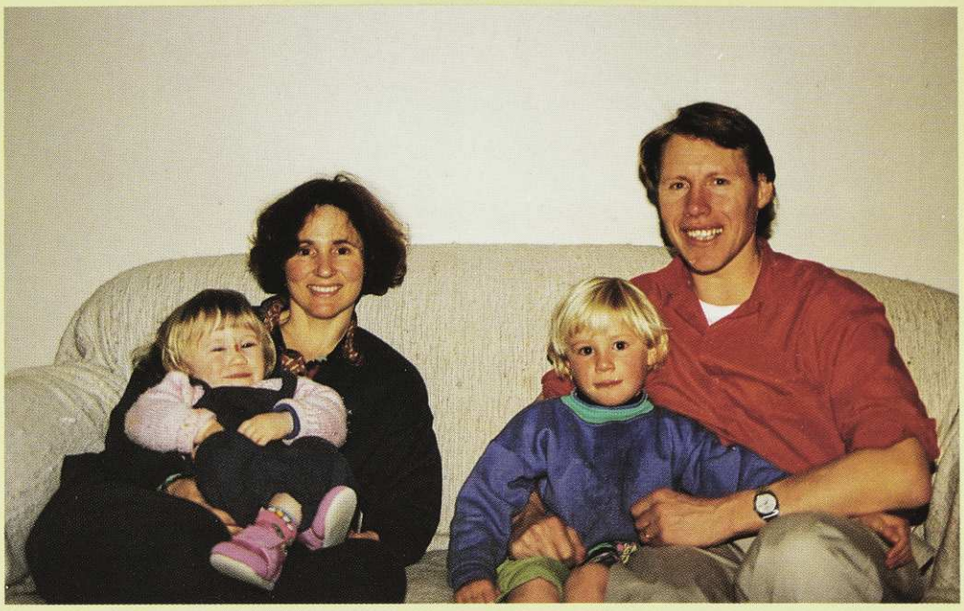
Gerard's arrival at Forest and Bird coincided with a growing professionalism in the Society's publicity: not only in *Forest & Bird* but also calendars, diaries, posters and media releases. As well as overseeing the production of Forest and Bird publications, Gerard also wrote articles for the journal and a number of outside media.

"It's been a tremendously stimulating seven years and a great privilege to have been a part of some major conservation advances," says Gerard. Particular highlights were the stopping of state-sponsored destruction through subsidies, the creation of the Department of Conservation and Ministry for the Environment, the land allocation debate and the creation of a South-west NZ World Heritage area.

He says it has been encouraging to see the way in which Forest and Bird has evolved as an organisation, taking on different issues and different challenges.

A large part of the enjoyment of the job has been dealing with the talented magazine designers, photographers and writers who have helped make *Forest & Bird* the successful magazine it is.

"I'll be sorry to say goodbye to the friends I've made over the years. However they are assured of a warm welcome if they ever make it to Vanuatu."



Left to right: Elinor, Adele Bryant, Sam, Gerard Hutching.

Kiwi recovery project launched

Sir David Attenborough Photo: Woolf

A FIVE-YEAR RECOVERY plan to save the kiwi from extinction was launched this month by the Threatened Species Trust programme with the blessing of one of the world's best known conservationists, Sir David Attenborough.

"I am delighted that a recovery plan is in place for the kiwi. In the minds of many people around the world, the kiwi is a symbol of New Zealand itself. The project deserves all the support it can get and shows, once again, that New Zealand is leading the way in its conservation of native birds," said Sir David.

The plan has also won the backing of the Bank of New Zealand, which has committed itself to a five-year support programme enabling the recovery project to begin immediately.

Bill Mansfield, director-general of the Department of Conservation, says the plight of New Zealand's national emblem is not widely appreciated.

"All kiwi species are considered threatened with extinction unless the causes of declines are addressed," Mr Mansfield said.

Recent research shows the three species of kiwi still present in New Zealand have been declining in number and geographical spread, to the extent that the little spotted kiwi is thought now to exist only on offshore islands. The great spotted kiwi is found only in large forest areas in the South Island and although they are still the most widespread, brown kiwi populations are becoming increasingly isolated.

In the first year the recovery plan will research and quantify the extent of the problem. The next stage will seek to improve the position by increasing, where possible, the current abundance and distribution of all species of kiwi.

The Threatened Species Trust programme, a partnership between the Department of Conservation and the Royal Forest and Bird Protection Society, will co-ordinate the project over the next five years.

Mr Mansfield said the Bank of New Zealand was working alongside the Trust to tackle the problem quickly, and across a wide range of fronts.

"Time is critical and considerable resources are required throughout the country to implement the plan. The Bank's partnership will contribute greatly to the success of the whole project," he said.

The managing director of the Bank of New Zealand, Lindsay Pyne, said the Bank had enthusiastically taken up the challenge to assist in the preservation of the kiwi.

"We are developing a number of initiatives and using our nationwide presence to provide a strong impetus and high awareness level for this project.

"The Bank is honoured to play a role in preserving what is a key element of New Zealand's natural heritage," Mr Pyne said.

KIWI RECOVERY PROGRAMME
BANK OF NEW ZEALAND

Getting the green light

NOT ALL "energy efficient" light bulbs are created equal, according to a report carried out by independent energy consultants. Tests have shown that some use more current (amps) than others.

It appears the fluorescent light bulbs promoted by David Bellamy on behalf of Electricorp Marketing are in the "less than totally green" category.

Chalkline Energy Consultants, a UK-based company, have singled out bulbs with electro-magnetic ballasts as the worst culprits – the type that David Bellamy is touting. These bulbs have lower power consumption than incandescents but their power factors are between 0.23 and 0.5. Ideally an appliance should have a power factor of 1, meaning that it is 100 percent efficient at converting mains power to light.

On the other hand, suppliers have advised that bulbs recently advertised through *Forest & Bird* have a higher power factor of 0.95 because they convert the mains current using an electronic circuit rather than an electro-magnetic ballast.

Source: New Scientist

The bulb in David Bellamy's left hand might be greener than the incandescent, but it still can't beat the latest in energy efficient bulbs sold in Forest and Bird's shop (inset).

Upping the insect image

A WINGLESS FLY that rides around on bats, a giant centipede as long as a human foot and a solar-powered fly are some of the rare and endangered New Zealand insects portrayed in a new book called *Forgotten Fauna*.

Author and scientist Mike Meads of DSIR Land Resources says many of New Zealand's insects are as rare and endangered as the more well known birdlife such as the black robin and the kakapo.

He calls in the book for a new conservation effort to be launched for invertebrates to ensure the future survival of "these incredible forgotton fauna".

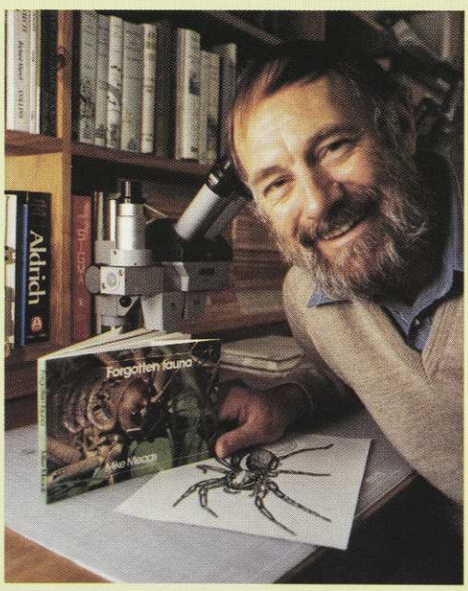
Invertebrates make up more than 80 per cent of living organisms on earth. Life could not exist without them. They carry out the recycling task of shredding, composting and returning to the soil as nutrients the leaves from all the world's plants.

"Humans need invertebrates though they don't need us," Mr Meads says.

Insects suffer from a bad press, because of the anti-social activities of a few of their number, he says.

For example the endangered and docile giant wetas are tarnished by the common tree weta's reputation for biting and kicking.

The public perceives insects to be agricultural pests or stinging, biting nuisances which can spread disease. But most invertebrates are harmless, he says.



Mike Meads

Among the many rarities in the book is a fly without wings. It has no close relative in the world. This blind bat fly lives in a very specialised habitat – the guano of the roosts of short-tailed bats.

The wingless fly rides on the bat only when seeking new roosts. The fly can make a noise like a dentist's drill to prevent it being eaten by bats.

The book also contains the only known photo of what is thought to be the world's rarest fly – the batwinged cannibal fly. It is found in the cool Fiordland mountains.

The batwinged fly holds its big black wings open in the sun to raise its body temperature before flying down to seize other flying insects.

Another of this country's strange creatures is the giant centipede which can grow up to 25 cm long. This efficient predator can poison and kill small lizards.

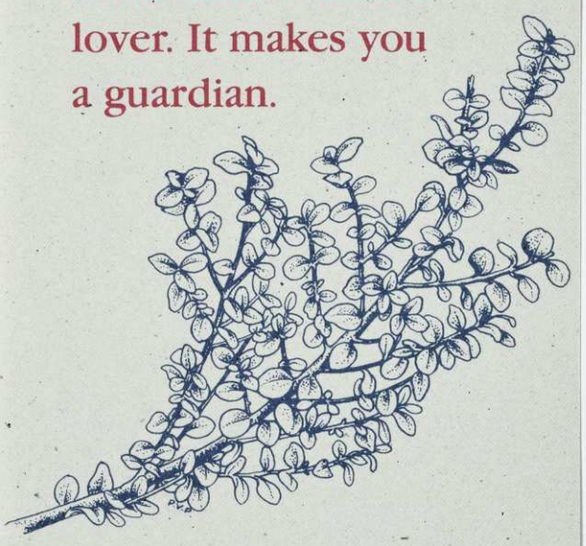
New Zealand has one of the richest land snail faunas in the world, Mr Meads says. They occupy most niches from sea level to the mountaintops – anywhere there is a trace of vegetation.

Forgotten Fauna ($19.95) contains colour photos and descriptions of 45 rare, endangered and protected invertebrates. More than half of the insects in the book have never had photographs of them published before.

JOIN US!

As a Forest and Bird member you help to protect scores of rare and endangered species.

That makes you more than a nature lover. It makes you a guardian.



FOREST & BIRD

the luscious rain forest
the endless beaches
the searing deserts
the bustling cities
the silent mountains
the romantic islands

but where can I stay?

Goldman Environmental Prize

UN Secretary-General Javier Perez de Cuellar (centre) meets with Goldman Environmental Foundation prize winners. From left, Roland Tiensuu (Sweden), Duane Silverstein (executive director, Goldman Environment Foundation), Wangari Muta Maathai (Kenya), Yoichi Kuroda (Japan), Eha Kern (Sweden), Evaristo Nugkuag (Peru), Rhoda Goldman, Sam LaBudde (USA), Cath Wallace (NZ), Richard Goldman (President, Goldman Environmental Foundation).

NEW ZEALAND conservationist Cath Wallace was honoured earlier in the year with one of the second annual awards of the $US60,000 Goldman Environmental Prize. Cath won the prize for the Australasian/World At Large region.

The prize is given to grassroots campaigners. Cath is well known and respected for her unceasing activism on behalf of a number of issues, although her work to protect Antarctica has given her the highest profile. She is co-founder and present convenor of the New Zealand arm of the Antarctic and Southern Ocean Coalition, co-chairperson of ECO and founder and editor of the now-defunct *Mining Monitor*. At present she is the Australasian councillor for the International Union for the Conservation of Nature.

As a lecturer in resource economics at Victoria University, Cath Wallace has been able successfully to combine activism and professionalism. There is a strong family tradition of involvement in conservation: her mother Charlotte is on Forest and Bird's Waikato branch committee.

Two other Goldman award winners, Yoichi Kuroda and Sam LaBudde, share links with Forest and Bird. Yoichi is the coordinator of the Japan Tropical Forest Network (JATAN), which in 1990 became a member of the New Zealand Rainforests Coalition.

Yoichi is best known internationally for his report *Timber from the South Seas: An Analysis of Japan's Tropical Timber Trade and its Environmental Impact*. An indictment of the Japanese contribution to rainforest destruction, the report has had an enormous influence. His accomplishments are particularly impressive coming from a country where activism is frowned upon. Thanks in part to his efforts, forest conservation has become part of a rigorous national debate.

Sam LaBudde of the Earth Island Institute put his life on the line to film dolphins being slaughtered in the tuna fishery off the west coast of the United States. It has been estimated that since 1960 about six million dolphins have been killed in the fishery.

As a result of the publicity, the major tuna canning companies announced in 1990 they would stop buying tuna caught in association with dolphin slaughter.

LaBudde came to New Zealand at the end of 1988 to warn New Zealanders about the effects of driftnetting. An article he wrote on the issue appeared in the May 1989 *Forest & Bird*.

A new shearwater on the Chathams

IN JANUARY 1990, Department of Conservation workers, Ron Nilsson and Jill West, were mystified by an unusual looking seabird which they caught at night on South East Island in the Chatham group. The bird was similar to a muttonbird or sooty shearwater, but instead of being dark below like a normal muttonbird, it was white underneath. On closer examination they noted other differences – its tail was longer and it was much lighter in weight.

Not wanting to harm the emaciated bird, they released it, after taking measurements and recording plumage details. They concluded that it was either a very peculiar and partly albinistic sooty shearwater or a species previously unknown to science. Unfortunately, it was later found dead.

The bird was sent to the National Museum in Wellington, where its skin and skeleton were preserved. Various seabird authorities examined the specimen and after debate decided that the bird was almost certainly a new species of shearwater. Not only were its plumage and measurements unique, but its skeleton was also quite distinct.

These days it is very unusual to discover a new species of bird. However, scientists are fairly confident the Chatham bird is distinct because amongst shearwaters, there are no records of different species hybridising and there is little variation amongst individuals in populations.

I was a member of a DoC expedition studying petrels on South East Island this January. We searched for more of the unusual shearwaters but did not see any. If further birds are found, the species' identity will be more certain and a conservation strategy can be formed.

National Museum biologist, Phil Millener, compares the apparently new shearwater species from the Chatham Islands (left), with the common sooty shearwater. Photo: Evening Post.

The story of the new shearwater may parallel that of the endangered Chatham Island taiko, which was rediscovered by David Crockett and his team in 1973. The taiko survived, unseen by researchers, for more than 100 years after being first scientifically described in 1867. Petrels and shearwaters come ashore only at night and breed in long burrows. Therefore they can easily go unnoticed. It appears that the new shearwater has been overlooked until now.

The discovery highlights again the unique nature of the animals and plants that have evolved on the Chatham Islands. Only time will tell what the future holds for the new shearwater, but let's hope that some more are found soon.

Alan Tennyson

Pingao – the Golden Sand Sedge

by Averil Herbert and Jenny Oliphant (Nga Puna Waihanga)

THIS EXCELLENT 32-page booklet brings together the art, weaving traditions, legends and natural history of pingao. Authors Averil Herbert and Jenny Oliphant have also documented the efforts of weavers, Maori groups and conservationists to replant dunelands in pingao. Their booklet outlines replanting projects throughout New Zealand and gives clear instructions on how to propagate and plant out pingao.

Produced by Nga Puna Waihanga (the Maori artists and writers' runanga), and launched at their national council meeting in May, the booklet is available direct from the Forest and Bird mail order for $9.95 (see catalogue).

North West Nelson Tramping Guide

by Derek Shaw ($19.95, Nikau Press).

OVER THE YEARS Nikau Press have quietly been building up a track record as a publisher of quality guide books to the natural areas of the northern South Island.

This latest addition to their publication list will be welcomed both by those who already know that North West Nelson is a tramper's paradise and those who so far have heard of it only by reputation. More ambitious than the other guides (there is much more territory to cover) the 100-page book is more than simply a guide. It also contains sections on the diverse flora and fauna, the complex geology, and the human history of the areas a tramper would pass through.

Few know the North West Nelson wilderness as intimately as Derek Shaw. Those planning their next tramping holiday to the region would be wise to invest in the book before they set out.

The book can be bought for $19.95 direct from Nikau Press, PO Box 602, Nelson.

99 New Zealand Birds

by Don Hadden ($29.95, The Caxton Press).

THE AIM of this attractive book is to introduce readers to the birds they are most likely to see, although some rarities such as the takahe and black stilt have been included.

A member of the Ornithological Society, Don Hadden has some striking images, particularly of bush birds such as the rifleman, tomtit and yellowhead.

W·O·R·L·D W·A·T·C·H

Bison reprieve

THE WORLD'S LARGEST bison herd will not be eradicated after all. The Canadian Government has rejected the advice of its own environmental assessment panel, which had recommended killing the bison in Woods Buffalo National Park, Alberta, because some were infected with brucellosis and tuberculosis, supposedly endangering neighbouring cattle.

The announcement came days after an internal memorandum drafted by employees of Parks Canada, the responsibility federal agency within the Department of Environment, was leaked to the press.

The memo pointed out that killing all the bison would be impossible, that it was poorly reasoned and that it would harm the integrity of Canada's national park system.

Source: Oryx

Teak wars

THAILAND'S BAN on logging within its own borders has had unfortunate consequences in neighbouring Myanmar (formerly Burma) where their forests are still largely intact.

Since the 1989 ban, Thai logging companies have received concessions to cut more than 350,000 Myanmar trees a year. As a result, an area that had known only small-scale logging using elephants and rivers for transport was penetrated by a network of roads that allows easy access to heavy logging machinery.

The target in the forests is teak, prized by boatbuilders, carpenters and furniture makers who appreciate the attractiveness of the hardwood. Rainforest Action Groups around the world are calling for a boycott of all tropical timber products imported from non-sustainably managed forests, a policy also promoted by Forest and Bird.

Source: Sierra

Falcons take cover

THE US AIR FORCE has plans to study the impact of low-flying jet noise on wildlife by flying F-16 and F-111 fighter jets over the nests of endangered peregrine falcons in Alaska's Yukon River Valley.

The University of Alaska-Fairbanks has accepted $800,000 to run a three-year study to videotape the falcons' reactions as jets scream by 30 metres above their nests. If the birds survive the test the Air Force will argue for a change in existing US Fish and Wildlife Service rules that prohibit strafing and evasive manoeuvre training over hundreds of environmentally sensitive areas around the country.

Source: Earth Island Journal

B·I·R·D·S I·N·T·E·R·N·A·T·I·O·N·A·L

Two-thirds of birds declining

AT THE 20TH World Conference of ICBP meeting in New Zealand last year it was reported that two-thirds of the world's 9000 bird species are in decline and more than 1000 are threatened with extinction.

Sierra Leone – the Gola rainforest

RAINFOREST DESTRUCTION in Sierra Leone has been more thorough than in most other West African countries. Only about 4 percent of the land is now under forest compared to 60 percent originally.

Between them, ICBP and the UK Royal Society for the Protection of Birds (RSPB), with the agreement of the Sierra Leone Government, are attempting to conserve the 750 km² Gola Forest Reserves in the country's south-east.

The lowland forest is a critical region for at least nine of the world's most endangered species, including the white-necked picathartes, an extraordinary bird with a strange name and looks to match.

Conservation of the forest will not be easy; local people depend on it for their livelihood. A first step will be to decide on those areas where some logging can be allowed, against areas which are to be strictly protected as nature reserves, and where neither hunting nor logging can be permitted.

Saving the magpie robin

IN 1981 staff from the New Zealand Wildlife Service went to the Seychelles to eradicate cats and give the rare magpie robin a chance of survival.

At that point the robin's population was just 20. Despite the successful battle against predators, however, in the decade since the bird's numbers have risen to only 22.

The magpie robin's problems bear echoes of those experienced by New Zealand birds. Over thousands of years the species became a confiding ground feeder in a land with no rats and no cats. It lays just one egg, like many New Zealand birds.

Today the magpie robin is restricted to just one island in the Seychelles group, Fregate. ICBP have prepared a report showing why the magpie robin is not succeeding, and the Royal Society for the Protection of Birds is funding the rescue programme.

This will involve increasing territory quality, providing additional nesting sites and establishing a second population on another island.

Solomons Survey

LOGGING CONCESSIONS have been granted on most of the forest in the Solomon Islands, placing many of the Solomons' 72 endemic bird species at risk.

An International Council for Bird Preservation expedition was recently mounted to survey the bird populations on some of the islands. Its report is sobering: the islands of Kolombangara and Ghizo have had their forest cover drastically reduced and as a result a number of bird species are threatened such as the Kolombangara warbler, Heinroth's shearwater, the Solomons sea eagle and Nicobar pigeon.

On the 3000 km² island of San Christobal (Makira), all the endemics were recorded in reasonable to high numbers except for the San Christobal mountain rail which appears to be not only rare but also elusive. San Christobal is still largely primary forest but action is urgently needed to head off logging.

Argentine rainforest protected

ICBP is to help manage 5000 ha of rainforest in north-east Argentina, which is being bought as a result of an appeal by the environmental charity, The Earth.

The rainforest, which featured in the film *The Mission*, is located in Misiones Province, biologically the richest area of Argentina, and supports at least three species of birds currently threatened with extinction. Large areas of the forest are poorly known, and it is believed that further survey will turn up more threatened bird species.

ICBP and the leading Argentine conservation group Fundacion Vida Silvestre Argentina (FVSA) are already actively involved in other conservation projects in the region. It is hoped this initiative will be the first in a series that will secure the protection of critically threatened areas of rainforest in Misiones.

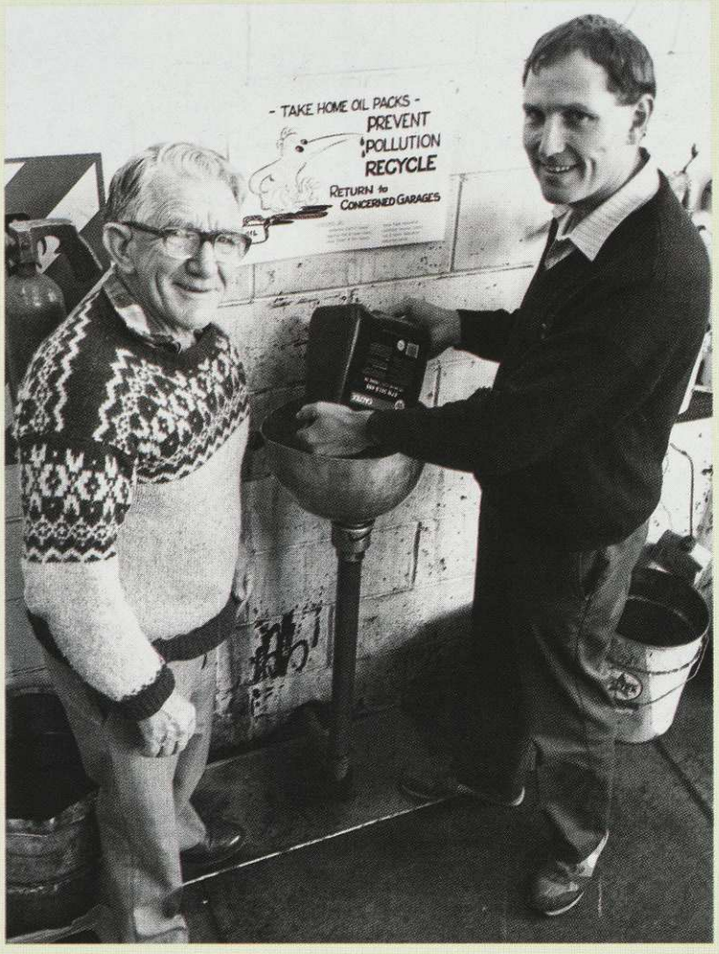
BRANCHING OUT.....

The good oil

THANKS to Ashburton branch member Jim Ackerley the Mid-Canterbury area is leading the country in oil recycling efforts.

Concerned at the dumping of oil into the drains or soak holes, Jim approached the local Motor Trade Association for their co-operation in allowing the public to bring in used oil to garages for recycling.

Their reponse was positive; the next move was the production of a poster by the Ashburton District Council advertising the service. Jim took the poster around every garage in Mid-Canterbury and the local branch set up a display in Ashburton. The public has responded well to the scheme; it is hoped to extend it to the rest of the country with the support of the MTA and other councils.



Jim Ackerley (left) and president of the Ashburton branch of the MTA Bryan Donaldson show oil recycling made easy.

Okataina activist weekend

THIRTY PEOPLE from around the North Island gathered at the Okataina Outdoor Centre recently to polish up their activist skills.

Led by conservation director Kevin Smith and regional field officer Basil Graeme, the workshop covered such topics as how to mount a campaign, the media skills required and the need for letters to editors and MPs. On Sunday the group investigated the wallaby exclosures at the end of Lake Okataina to see the forest damage caused by wallabies for themselves.

Where they have been held before the weekends have been hailed as a success. If your branch would like to host one, please contact Chris Wratt at head office. Thanks go to the Rotorua branch for the work they did in organising the venue and supplying food.

Project Weka

JUST AS Forest and Bird's Project Weka gathers momentum, the North Island weka has been officially declared a "threatened species". So far a weka survey has been completed on Kawau Island and a major survey is underway in the Gisborne district - the weka's stronghold.

Led by Dick McMurray of Forest and Bird's Gisborne branch, the Gisborne survey is a joint effort by the Department of Conservation and Forest and Bird. Using a postal questionnaire to cover far-flung rural areas, the results from 320 returns have recorded a mere 400 birds. Though this would be an underestimate, it indicates a remarkable decline from the 1970s when weka were abundant and readily seen. The strongest populations appear to be in the Matawai/Whakarau hinterland, where droughts have been less severe and the habitat is less disturbed.

Survey respondents suggest the droughts of 1982-83, followed by floods, led to food loss and subsequent starvation among weka. Other factors suggested leading to weka decline include increased numbers of ferrets, and loss of habitat from intensive horticulture. An encouraging response was that 90 percent of replies said they were sorry to learn of the weka's plight and would welcome the bird's return (though not in the garden!).

On Kawau Island the weka survey was organised by Richard Chambers of the Hibiscus Coast branch, assisted by John Kendrick, Forest and Bird, Ornithological Society members and islanders. They surveyed the western side of the island on foot, playing taped weka calls and recorded all the responses. A total of 123 weka were recorded.

The weka seem concentrated on the sheltered western side of the island, where the islanders live. Local people say that weka numbers have fallen by half or even three-quarters in the last three years.

Forest and Bird members and Department of Conservation staff prepare to set out in the dark to survey weka at Matawai. Photo: Roger Allen

Roost boxes boost

Form 4JM woodwork class at Wellington College made 14 roosting boxes for the saddleback. The pupils are (from left) front row, Daniel Kalderimis, Andrew Douglas, Benjamin Atkin, Chris Gilman; back row, Rohan Biggs, Timothy Catchpole, Geoffrey Clare, Scott Clemmett and Charles Gillespie. Photo: Evening Post

ON KAPITI ISLAND the rare saddleback's attempts to survive are hampered by their habit of roosting on low branches, making them easy prey for rats.

Scientist Tim Lovegrove has been working on a project to provide roosting boxes for the birds to protect them from the rats. The Wellington branch, along with the Wellington Trust Bank, Wellington Central Rotary Club and the Department of Conservation, recently sponsored a competition to assist Tim's efforts.

Schools were asked to build roosting boxes; the prize was membership of Forest and Bird for the winning school and a chance for three individual winners to spend the night on the island.

The schools responded by building 510 roosting boxes which are now being used on the island.

Hibiscus Coast branch protects forest

The Hibiscus Coast fencing gang at Dunn's Bush. Photo: Eric Parker

JUST NORTH of Auckland at Puhoi stands a testament to the enthusiasm and commitment of our newest branch, Hibiscus Coast.

Owners of a 100-ha block of forest called Dunn's Bush wanted it to be covenanted with the QEII National Trust. This involved erecting a 1.7-km fence on moderate to steep hill country with limited tractor access. Therefore the local branch organised a fencing gang which carried in 450 posts and 2000 battens, as well doing the actual battening work.

The grateful owners now have a fine area of native bush protected under a covenant and fenced against stock invasion.

Do it yourself

UNHAPPY about the lack of plants around the Cape Kidnappers gannet colony, Hastings/Havelock North branch student member Tim Hay has initiated a project to make the area more attractive.

Earlier this year he organised a fun run along the coast to raise money to revegetate the area. He obtained sponsorship from Watties, The Hub and Arataki Honey, and enlisted helpers from the branch to service the checkpoints and drink stations along the run.

On a beautifully fine February morning nearly 60 people from 18 to 60 ran the 25-km trip from Clifton Beach to the gannet colony and back to the beach.

Tim's effort raised $550, and the branch has made the total up to $1000. They are now working closely with the Department of Conservation on a planting plan for the Cape. Well done Tim.

The start of the run to raise money for tree planting at Cape Kidnappers.

Earth Day for the children

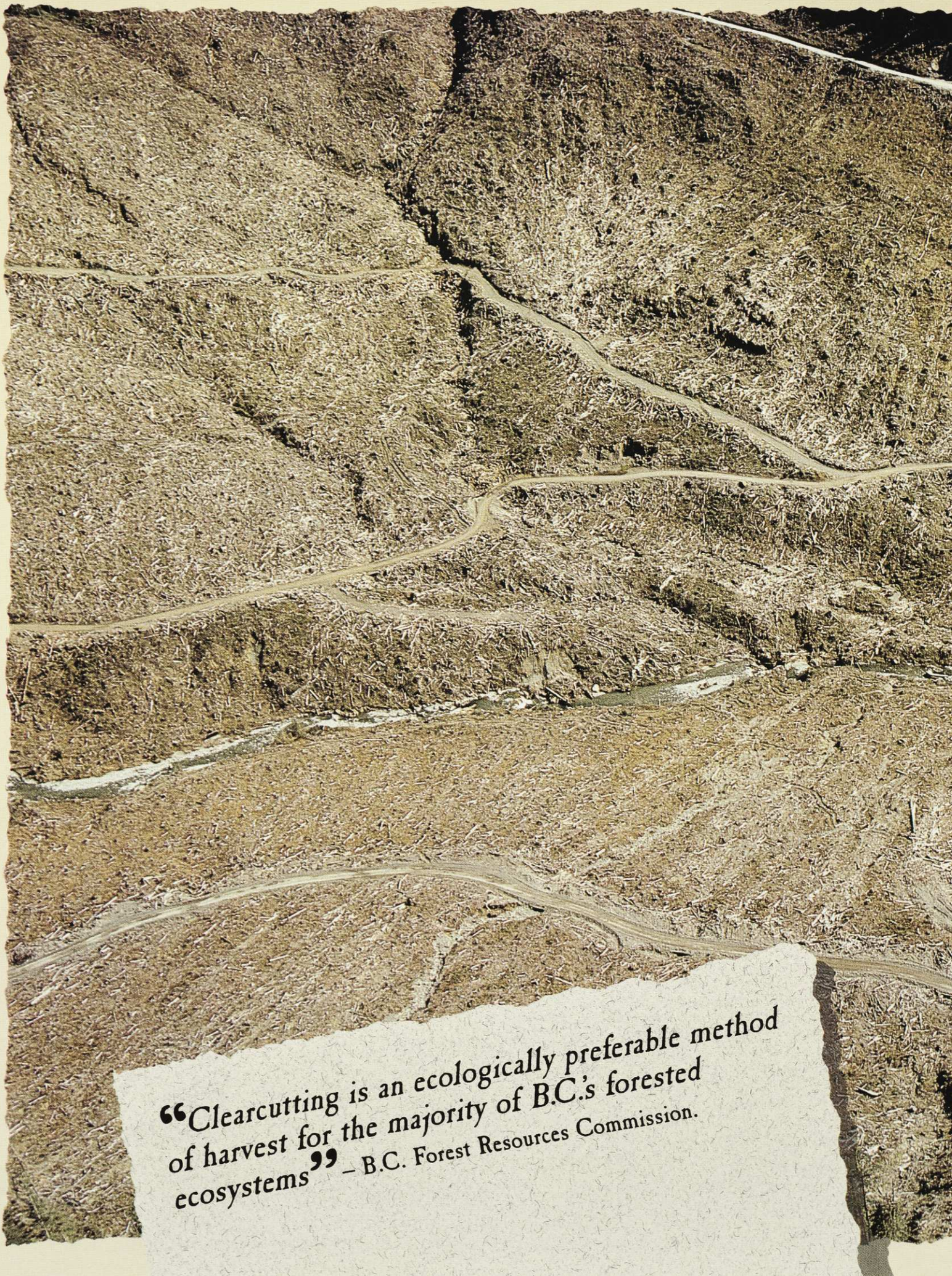
EARTH DAY celebrations swept the globe at the end of April. In New Zealand, where Forest and Bird organised events, many of our branches took the opportunity to invite the public along to walks, beach clean ups, field trips and tree planting, while others organised special Earth Day events.

Great Barrier Island members weeded out wild ginger, and Otago and Waitaki branches together cleared wilding pines from a proposed reserve near Mt Stalker. In Wellington the branch organised a festival at the zoo, while Auckland branches were involved with festivities which saw Queen St renamed Green St.

Many of the branches took on board the theme for the year and approached their local schools with environmental information and various competitions.

A Wellington KCC member paints a poster at the Wellington Zoo Earth Day celebrations.

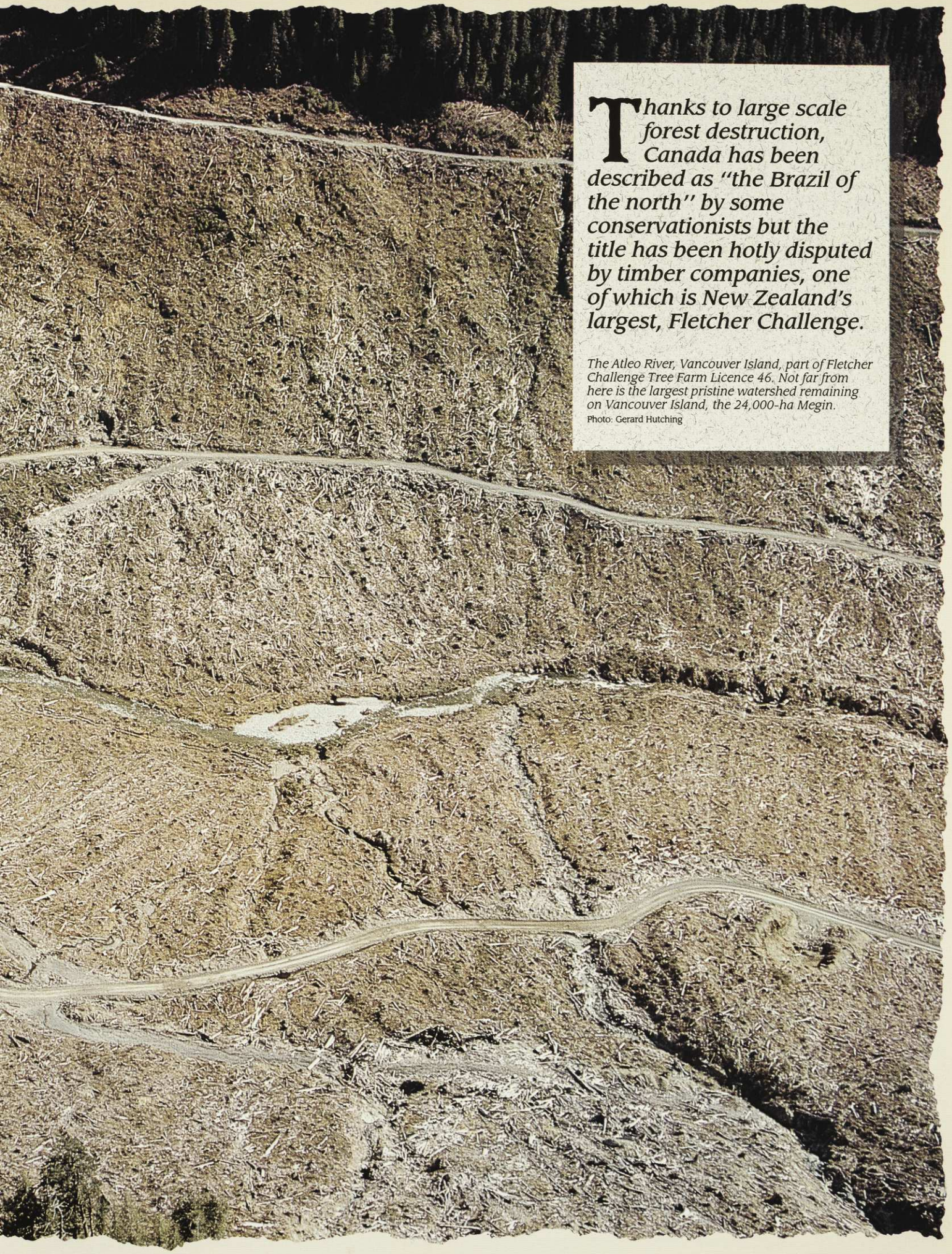
FLETCHER'S CHALLENGE



"Clearcutting is an ecologically preferable method of harvest for the majority of B.C.'s forested ecosystems" – B.C. Forest Resources Commission.

by Gerard Hutching

SPARING CANADA'S OLD GROWTH FORESTS



Thanks to large scale forest destruction, Canada has been described as "the Brazil of the north" by some conservationists but the title has been hotly disputed by timber companies, one of which is New Zealand's largest, Fletcher Challenge.

The Atleo River, Vancouver Island, part of Fletcher Challenge Tree Farm Licence 46. Not far from here is the largest pristine watershed remaining on Vancouver Island, the 24,000-ha Megin.
Photo: Gerard Hutching

"THERE'S A LOT of mud slinging on both sides but the conservationists' mud is a lot cleaner."

This comment from veteran British Columbian journalist Tony Eberts aptly reflects the level of tension between the antagonists in the battle for British Columbia's 500-year-old forests. But, coming from a relatively impartial observer, it also indicates that public support to conserve the forests outweighs plans to log most of Canada's westernmost province's big old trees in the next few decades.

New Zealand's largest company, Fletcher Challenge Limited, today finds itself embroiled in a bitter argument over the future of Canada's forests as a result of having bought a majority interest in Columbia Forest Products in 1987. As reflected in Fletcher Challenge's annual accounts, timber is big business in Canada. In 1988 Fletcher Challenge Canada (FCC) made a net profit of $C290 million; in 1989 $C188 million; and in 1990 $C82 million. In 1989 the total value of forest exports to the country was $C40.2 million.

Huge country

Canada is a huge country. British Columbia - not the largest Canadian province - is 95 million ha in size (four times larger than New Zealand). Of that, 46 million ha supports forest, but 20 million ha is considered unharvestable. That leaves 26 million ha of "working forest" as the logging industry describes some of the world's finest temperate forest. Around 60 percent of that is "old growth" (virgin or primary) forest, but the percentage varies according to latitude. In the north, where logging is marginal, there are still large areas intact. In the warmer south, between 60 and 70 percent of the old growth forest has been cut.

Despite the staggering quantities of available timber, almost all of which is owned by the provincial government, the day of reckoning for the industry could be relatively close at hand. At British Columbia's current cut of 260,000 ha a year (more than is cut in *all* US national forests combined), its coastal old growth forests will be exhausted in 15 years, say environmentalists. Industry officials contest this, estimating up to 30 years. In New Zealand the native forest woodchip industry cleared 16,557 ha between 1971 and 1989.

It is little wonder that the coastal forests, especially of 386-km-long Vancouver Island, are so sought after by loggers, or revered by tree huggers. The rainforests are dominated by four majestic tree species: Sitka spruce, Douglas fir, western red cedar and western hemlock. On immensely fertile sites, Sitka spruces tower up to 95m above the forest canopy, higher than anywhere else in the world. In the 6,700 ha Carmanah Valley there are an estimated 5 million cubic metres of timber. Compare that to the more northerly Kitlope watershed on the mainland whose 317,000 ha can only muster 4 million cubic metres of timber.

The work of centuries, the giant western red cedar can grow to a prodigious size, surpassing every other British Columbian tree species for size and mass. On Vancouver Island the largest existing recorded tree has a six metre diameter. Photo: Adrian Dorst

Bald eagles rule over the forest world, their massive nests located at the summits of tall trees. Until relatively recently the eagle trees were felled along with all the other trees, but now they are left. But are those trees sufficient when the remainder of the forest is destroyed around these magnificent birds of prey? Photo: Adrian Dorst

Of the 89 largest watersheds on Vancouver Island, only six have been left untouched by logging. All six are on the island's west coast and five of them have been slated for logging. There are two major centres of controversy: the Kyoquot/Brooks region and Clayoquot Sound.

In 1988 Clayoquot Sound sprang to the nation's attention when protesters blockaded road construction at Sulphur Pass. The road would have provided access to the trees around Sulphur Pass and Shelter Inlet, and opened up the pristine 24,000 ha Megin River. Local group Friends of Clayoquot Sound (FOCS) asked Fletcher Challenge Canada to stop the road construction until a sustainable management plan could be prepared for all of Clayoquot Sound.

Deaf ears

The plea fell on deaf ears, the company continuing with the road construction. Fletcher Challenge Canada forestry head Don McMullan says the local conservationists "don't have a stake in the industry," and that 200 people would have been affected if they had declared a moratorium.

The company then took a court injunction out against the protesters, making anyone interfering with the road construction in contempt of court. Over the next two months protesters defied the court order and thirty five were arrested. A Fletcher's contractor shot at a tree sitter with a pellet gun; his sentence was 20 hours of community work. Loggers started to fell a tree occupied by a protester lying in a hammock, stopping only when they became aware that they were being filmed. The protester spent 15 days in a maximum security prison; no action was taken against the loggers.

Bonny Glambeck, a director of FOCS, was one of six women who refused to pay their fines. As a consequence they were sent to a maximum security prison where they were incarcerated with two women charged with manslaughter. If it was the State's intention to terrify the protesters into submission, it has partly succeeded. The women had nightmares for months afterwards and no blockades have occurred since.

Glambeck views the sustainable management committee set up for Clayoquot Sound as achieving little except "drawing off a lot of energy."

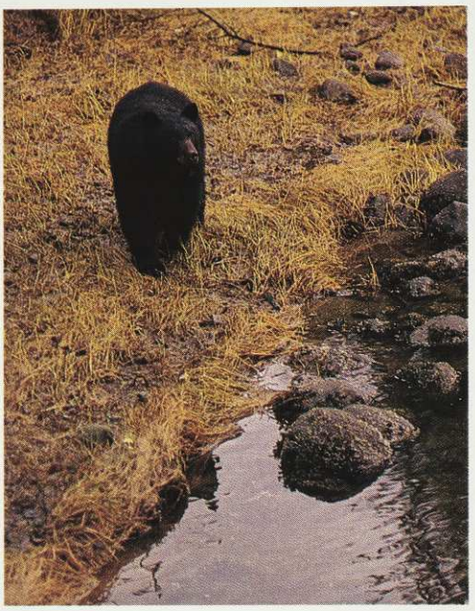
Her view of Fletcher Challenge is one that is echoed by a number of Tofino residents: "FCC are exploiting our lack of government enforcement and treating us like a third world country."

Tourism entrepreneur Dorothy Baert is typical of a number of Tofino townspeople: from an early age she fell in love with the coastal town on visits and today she has chosen to make a living there running a sea kayak business. From her office she has an uninterrupted gaze across the sea to Meares Island and Vancouver Island's distant mountains. No environmental radical, she belongs to the local Chamber of Commerce and is the townspeople's representative on the Sustainable Development Steering Committee. She is no more complimentary in her estimation of Fletcher Challenge Canada.

"The company has no ties to the community. Our trees are simply cash flow and their objective is to liquidate the resource."

She says the message the people of Tofino are trying to impart to the logging industry and government is that there should be enough forest left "to maintain the legacy of wilderness in all its complexity."

After two years on the committee Dorothy Baert has become sceptical about the industry's or government's desire to compromise. Instead of hammering out an overall strategy for the future, the committee spends most of its time arguing over where the loggers can go next.



About 10,000 black bears live on Vancouver Island, flourishing in the rich habitat provided by the varied vegetation of the rainforest. The key to their survival is found in the diversity of the old growth forests. Photo: Adrian Dorst

Natural history photographer Adrian Dorst is another Tofino resident who has made a career in a non-exploitive industry. When he arrived in what was predominantly a fishing village in 1972, he scratched out a living as a bird spotter and wood carver, meantime learning the art of photography. Today a burgeoning interest in natural history books and magazines has created a demand for his striking images.

A founding member and director of FOCS, Dorst has seen little change in the logging companies' approach during the 1980s.

"Clearcutting is clearcutting. It's just total destruction of the forest environment. FOCS would prefer to see single log extraction. They should shut the mills down if they are at the expense of the environment," he says.

However FCC say a recently-issued independent B.C. Forest Resources Commission report strongly endorsed clearcutting as an ecologically preferable method of harvest for the majority of B.C.'s forested ecosystems.

Such sentiments tend to play into the companies' hands as they use the spectre of environmentalist demands to drive a wedge between workers and environmentalists. But the truth is that timber workers have increasingly lost their jobs as a result of automation, and not because forests have been protected.

The timber industry argues that, without automation, far more jobs would have been lost through bankruptcies due to the industry's inability to compete in global markets.

Employment cost

Forestry writer Cameron Young has pointed out the cost, in employment terms, of B.C.'s forest industrial strategy. The emphasis is on high volume automated production of timber and pulp, rather than value-added processing.

"Back in 1960, a work force of 68,500 cut and milled an estimated 34 million cubic metres of wood - a ratio of two workers for every 1000 cubic metres cut. By 1990 the work force was estimated to be around 90,000, and the volume of timber logged had risen to more than 90 million cubic metres. That meant the ratio had dropped to approximately one worker for every 1000 cubic metres logged. In other words, the rate of logging in B.C. has nearly tripled in the past 30 years while the rate of employment per volume logged has declined by half."

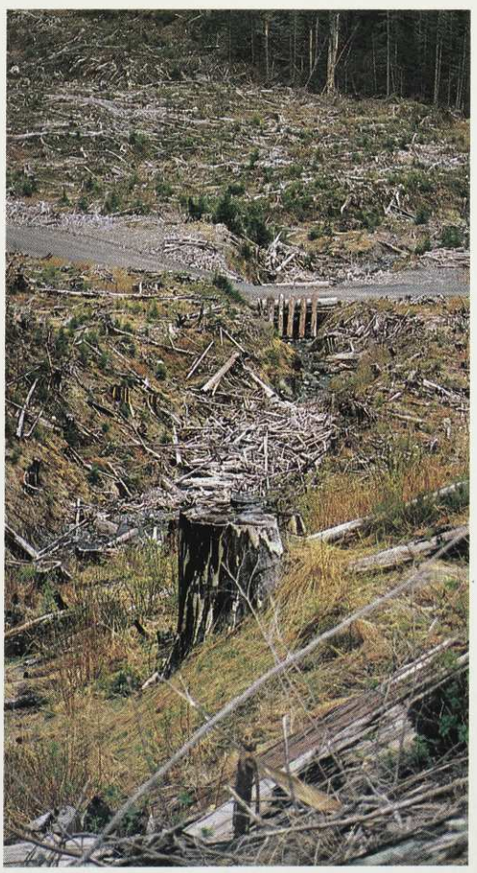
According to the industry, the figures are proof that it has become more productive and efficient.

The situation is bound to worsen as the old growth forest is cut out and replaced by second growth trees destined to be fodder for pulp mills within 60-80 years. Already around 60 percent of the trees logged on Vancouver Island by FCC are turned into pulp for paper.

A male wolf strides across the Arakun mudflats of Meares Island in search of prey. Efficient hunters, even of cougar kittens and bear cubs, the coastal wolves of Vancouver Island are smaller than the bigger silver timber wolves of the north.
Photo: Adrian Dorst

EARLY SPRING, and a meeting is called in Tofino by the Friends of Clayoquot Sound (FOCS) to discuss what action, if any, should be taken in the summer to stop further logging in the area. Most of those attending are young, alternative lifestylers; some make a living from tourism; there is one native American. Dress tends to be uniform: artificial fibre gear is definitely *de rigeuer*.

Because the meeting has been advertised as public, four burly loggers from the "Share the Clayoquot Sound" group arrive with their wives. Conventionally dressed men and women, the loggers and their partners stand out like a clearcut in the midst of an old growth forest. "Share" groups are a North American phenomenon: started in the United States by disenchanted Sierra Club member Ron Arnold, the share groups spring up to counteract environmentalist demands. United States share groups' links to the right wing Centre for the Defense of Free Enterprise, the American Freedom Coalition and the Reverend Sun Myung Moon's Unification Church are well documented. Fletcher Challenge Canada deny such links exist for the Canadian share groups.



The ecological consequences of logging such as this by Fletchers in the Atleo River, Vancouver Island, are hotly debated. Locals have charged that such logging wreaks havoc on streams, causing salmon populations to plummet. Photos: Gerard Hutching, DAC Communicate (salmon)

People power

The meeting starts with an impassioned plea from a FOCS spokesperson who asks whether the group is prepared to stand by while the forests are "butchered and raped." In 1984 and 1988 "people power" had stopped logging in two areas near Tofino, he reminds the audience.

In response a unionist warns against any blockades. He claims the union wants to change the companies' logging practices. After a five minute address he rises to leave; shortly after, the other loggers and their wives depart, leaving behind a disappointed and disillusioned meeting. This attempt to create a dialogue between the two camps appears to have failed.

Still remaining, though, is a writer who works for logging company MacMillan Bloedel. He is prepared to discuss the environmentalists' concerns with management. He also warns against any blockades: "It feels potentially explosive at Kennedy Lake," he says (Kennedy Lake is a nearby logging site).

The meeting ends divided between those who want to take direct action and those who see the negative effects it brings. It is felt that, while blockades are newsworthy, they bring only a sensational few minutes on TV and fail to portray the full complexities of the issue.

And there is one other reason why civil disobedience is not wholeheartedly supported: anyone who has been incarcerated with criminals charged with manslaughter is probably not willing to repeat the experience.

WHAT IS IT about British Columbia that makes sensible decision making apparently impossible? Why do people feel they have no recourse but to participate in civil disobedience to save forests? And why is a company like Fletcher Challenge with a good environment record in New Zealand regarded by some as a pariah on the other side of the Pacific?

As good a place to start looking for the answers to these questions might be the state of British Columbia politics and the way in which B.C.'s resources are parcelled out. For 100 years British Columbian politicians have regarded the province's forests as an inexhaustible resource. As people have become aware that the forests will not go on forever, the provincial government's response has been to allow the rate of logging to increase.

Tree farm licences

Logging rights have been handed out in the form of Tree Farm Licences (TFLs), huge areas which are leased for 25 years and are almost automatically renewed. Critics charge that the timber companies have been granted the licences gratis, while small timber businesses which want to fell small areas for downstream processing have to pay.

FCC's Don McMullan takes issue with the criticism. He responds that the large companies pay a stumpage when they fell a tree, and they have to pay for roads and reforestation. In 1990 Fletcher Challenge Canada planted 14 million seedlings in B.C.

What does anger environmentalists is the fact that TFLs, having been virtually given away, suddenly become worth millions of dollars when an area is protected. Under state law, only 5 percent of a tree farm can be withdrawn from cutting. Anything more and compensation has to be paid to the company involved. In the case of the creation of South Moresby National Park in the Queen Charlotte Islands, companies were promised $31 million Canadian ($NZ49 million).

Because of the high stakes involved with the granting of TFLs, the temptation for some

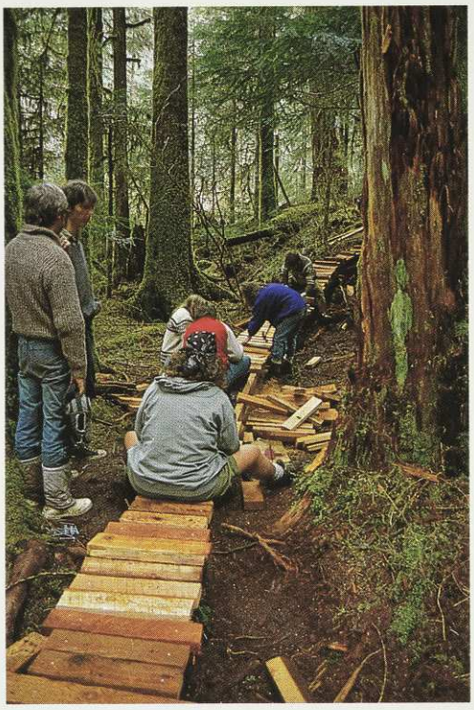
politicians to abuse the system has been difficult to resist. In one celebrated case, British Columbia Forests Products ended up owning a tree farm licence by bypassing the chief forester and taking its case directly to the Forests Minister. In 1958 the Minister was imprisoned for received "considerations", but the licence was not revoked - the judge ruled the company had obtained its TFL in an honest fashion. Today the licence has been amalgamated with another to make up an area of 181,000 ha, called TFL 46. It is now owned by Fletcher Challenge.

But it is not only the way in which logging licences are given out that has come under fire; logging practices themselves are a bone of contention. Logging companies are plainly embarrassed about clearfelling - but not so much what it might be doing for the biodiversity of the forests. No, clearfelling *looks* bad, and the practice has become a public relations problem.

Bonny Glambeck: imprisoned for refusing to pay her fine following anti-logging road protests. Photo: Gerard Hutching

In many logging areas riparian strips do not exist. Before logging, all streams are rated for their natural values, with an emphasis on their value as salmon spawning grounds. In some cases riparian strips are left downstream. However, little attention is paid to the effect of silt from totally denuded upstream areas, on the areas downstream.

FCC counters that the Department of Fisheries and Oceans and the Ministry for the Environment (Wildlife Branch) together review and approve all company logging plans and monitor operations to ensure compliance. Furthermore, the company raises five species of salmon and releases millions of fry into waterways each year. Salmon are under a four-fold pressure: habitat destruction, overfishing (particularly driftnetting), ocean warming (believed to be making the sea increasingly uninhabitable for them), and pulp mill pollution. It has been estimated that salmon numbers are a half of what they were at the turn of the century. Yet even now no detailed studies have been carried out.



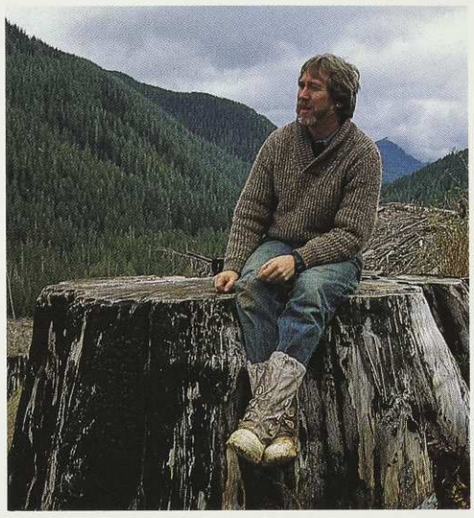
Project Phoenix in the Carmanah Valley underway with volunteers restoring the boardwalk earlier destroyed by vandals. Photo: Gerard Hutching

Laments FOCS director Bonny Glambeck: "Virtually no wildlife studies have been done. We don't know what we are destroying."

And with the salmon in decline, what future for the grizzly bears (found only on the mainland) or for the orcas that depend on a continuing supply of the fish? Each summer around 270 orcas ply the waters around Vancouver Island, feeding on salmon. In winter they disappear out to sea.

One of the most intriguing Canadian wildlife stories is that of the seabird the marbled murrelet, and its dependence on old growth forests. The secretive murrelet makes its nest atop the huge branches of the old trees. By 1990 only 11 tree nests of this fascinating bird had been recorded; no-one knows just how many birds may have been affected by logging, but it is believed that they may seek out the same tree for nesting year after year, in the same way other seabirds return to the same burrows. The loss of the forests is diminishing the chances of the bird's survival. In 1990 it was added to the list of Canada's threatened species.

According to Fletcher Challenge Canada, there is no evidence to show the marbled murrelet returns to the same tree. It says that the bird's population is an estimated 45,000 in B.C., and numbers are stable.



Joe Foy of the Western Canada Wilderness Committee: "I want to know we will have ancient forests forever." Photo: Gerard Hutching

Don McMullan is unrepentant about FCC's logging methods. He says that in the past the company left some riparian strips in upstream areas but high winds blew the trees down. But, bowing to concern over salmon decline, forestry practices are changing to reinstate riparian strips alongside all rivers.

He is also annoyed about the "Brazil of the north" epithet applied to B.C. Certainly the scale of clearance is less: the 260,000 ha logged a year in B.C. compares with the 1987 clearance of 2.1 million ha of Brazilian rainforest, much of it by fire. Since then the rate of clearance in Brazil has dropped.

According to McMullan, forestry practices in Canada are equal to the best elsewhere in the world. After all, the companies now replant logged areas, he says.

It is on this point that conservationists and foresters part company. Conservationists say that tearing down 500-year-old forests and replacing them with two or more species which will be logged in 60-80 year's time is not the way to manage them. They say logging should mimic natural processes, biodiversity reserves need to be created and there should be multi-species natural regeneration.

Supposedly overseeing the way in which forests are managed is the B.C. Forest Service, but the grossly understaffed department has

Saving the Stein

IN 1989 native Indian chiefs Ruby Dunstan and Leonard Andrew travelled to New Zealand to plead with Fletcher Challenge Ltd directors and shareholders that they should not log their band's spiritual homeland, the Stein River valley.

A source of controversy since the early 1970s, the Stein Valley is, at 106,000 ha, the largest intact major catchment left in south-western British Columbia.

Bowing to pressure to protect the valley, the provincial government designated two wilderness areas within the watershed - one protects the glacier-covered Coast Range peaks and alpine tundra at the headwaters of the river. The other safeguards the lower Stein as it descends eastward into the arid rainshadow of the Fraser River canyon. But lush forests at the heart of the valley, which Fletcher Challenge want to log, have been left unprotected.

At present the government has placed a moratorium over the logging; meanwhile says Ruby Dunstan: "The spiritual and physical footprints of our ancestors are evident for all to see throughout the Stein Valley which is like the pages of a book upon which thousands of years of our history are written....Fletcher Challenge must accept the lion's share of responsibility for a just resolution of this conflict."

The waters around Vancouver Island were once thick with cetaceans. Today the most numerous are orcas which feed on salmon in the coastal waters. Photo: Adrian Dorst. Inset: *By 1900 sea otters had been virtually wiped out, victims of human greed for their luxuriant pelts. In the early 1970s, 89 were reintroduced to Vancouver Island, their numbers growing to 500 by 1990.* Photo: Adrian Dorst

turned monitoring over to the forest companies themselves. While studies may be required to determine logging will not threaten downstream values, those studies are conducted by the companies. FCC describes these as "joint" studies with government agencies.

Several hours drive from Tofino along a dirt road lies the Carmanah Valley. As recently as four years ago the valley was just part of an enormous tree farm licence of 453,000 ha owned by MacMillan Bloedel. It was the discovery of the Carmanah Giant - the Sitka spruce 95 metres tall and 9.6 metres around - that galvanised conservation group the Western Canada Wilderness Committee and others into action to spare the 6,700 ha valley from the chainsaw.

WCWC campaigner Joe Foy's passion for the Carmanah is belied by his easygoing exterior. Strolling through a clearcut at the head of the valley, he explains WCWC's strategy for saving the forest.

Word came out

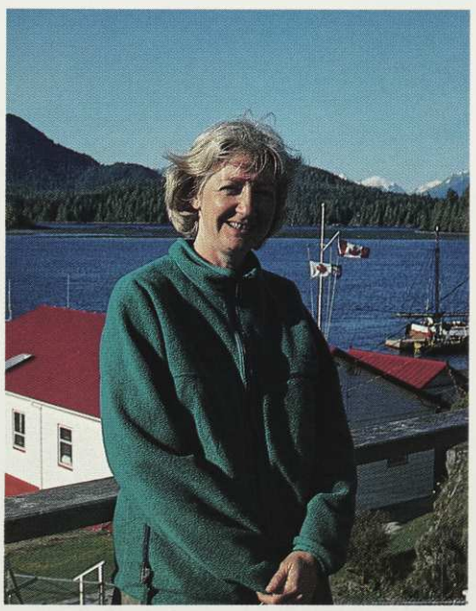
He says that as soon as word came out about the size and extent of the big trees in the valley, a photograph was taken and made into the most popular poster the group had ever printed. Volunteers and staff then created a boardwalk into the forest, and a research station was set up high in the canopy - the first research carried out at that height on the rainforests of British Columbia.

In 1989 a number of artists were invited into the valley to interpret it as they wished. The resulting book - *Carmanah: Artistic Visions of an Ancient Rainforest* - was a bestseller and award winner. In two short years the valley had emerged from obscurity into the spotlight of national concern.

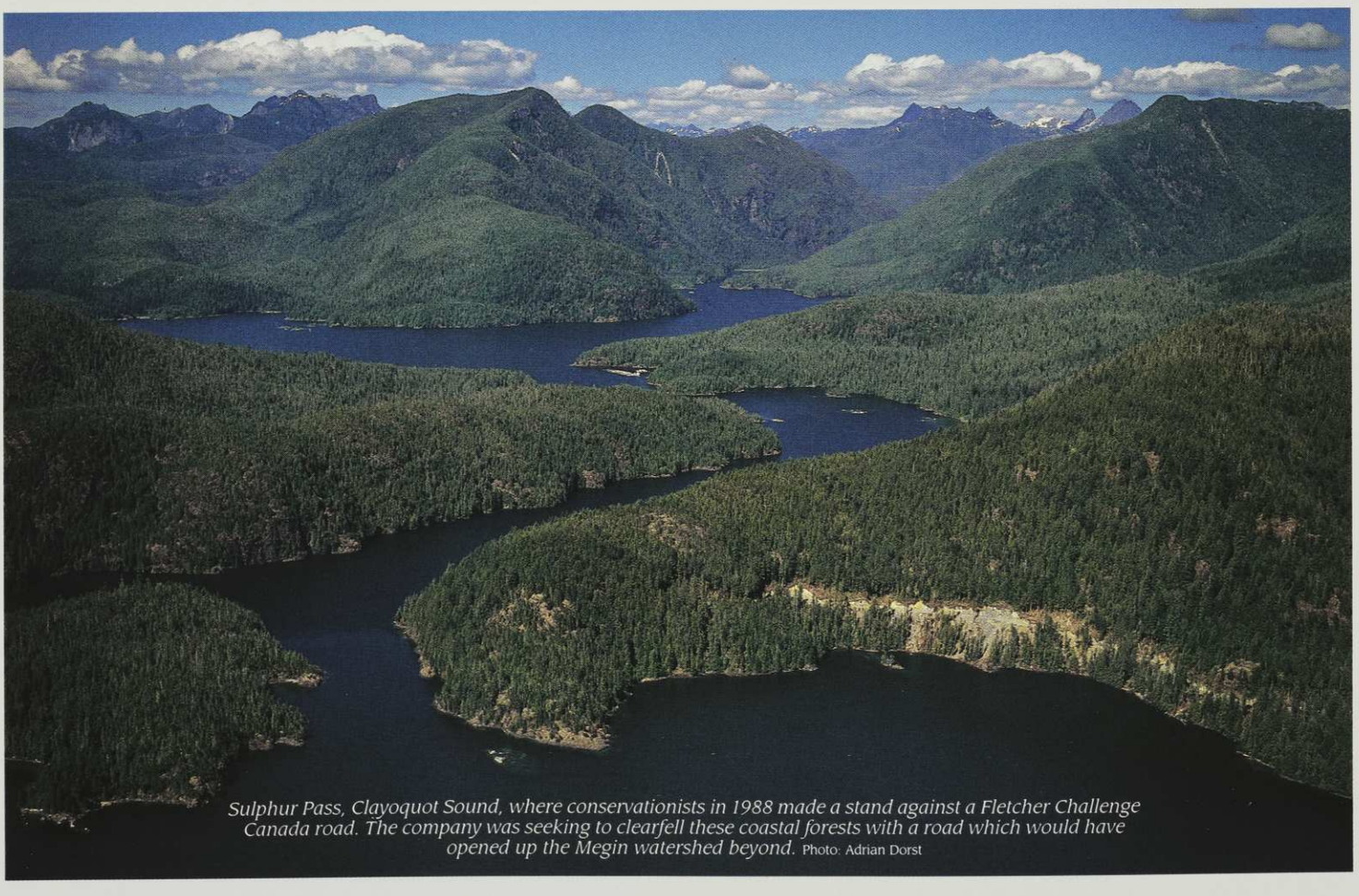
By 1990 a pressured Government acceded to environmental demands, creating the Carmanah Pacific Provincial Park to protect 3,600 ha in the lower half of the watershed. But it was a compromise that satisifed no-one, and the stand-off remains over the remaining unprotected forest.

This weekend Joe Foy and the score of volunteers he has organised are in the second phase of the Phoenix Project. The first phase started several weeks beforehand with repair work to damage caused by vandals in October 1990 when they destroyed a large section of the boardwalk and burned the research camp during a loggers' blockade of the main road. In spring 1991 WCWC rebuilt the camp and now they are working on repairing the boardwalk. "They can come in and destroy the place 15 times; we'll rebuild it a 16th time," says Foy.

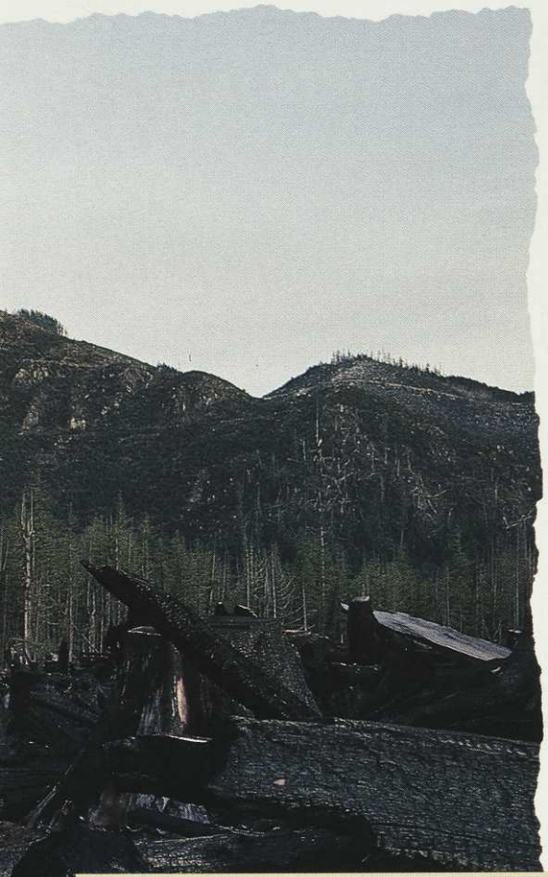
In the argument over the Carmanah Valley the heat is off Fletcher Challenge, for this is in competing company MacMillan Bloedel's tree farm; nevertheless FCC are bracing themselves for an impending clash over a neighbouring valley, the Walbran, where they do have a TFL. There the trees are every bit as grand as in the more celebrated Carmanah. Foy shows me the area where a marbled murrelet nest was recently sighted. WCWC, he says, intends to build a research site here as well.



Dorothy Baert, Tofino tourism entrepreneur and Chamber of Commerce member: "Our trees are simply cash flow." Photo: Gerard Hutching



Sulphur Pass, Clayoquot Sound, where conservationists in 1988 made a stand against a Fletcher Challenge Canada road. The company was seeking to clearfell these coastal forests with a road which would have opened up the Megin watershed beyond. Photo: Adrian Dorst



"Clearcutting mimics natural forest processes", according to logging companies. It would be difficult to find any natural coastal forest in British Columbia that renews itself in quite the same way as a human-induced clearcut. Photo: Adrian Dorst.

So what do conservation groups want for B.C.'s forests, I ask.

"Adding more value to what we cut, choosing to be more than simple hewers of wood, holds the key to creating meaningful jobs. And by cutting fewer trees, we open the way to retaining natural expanses of forests for the benefit of all," answers Foy.

Instead of retaining the great forests, the response of the B.C. Parks and Forest Ministries has been to give conservationists rocks and ice. About 5.5 percent of the province is fully protected in parks, and another 1 percent is protected in recreation or wilderness areas, where roads, mining and in some cases logging are permissible. Few of these protected areas include lowland forest.

Foy's message to Fletcher Challenge is that they should translate their excellent environmental record from New Zealand into the way in which they manage old growth forests in Canada.

"From what we hear Fletcher Challenge is a responsive company in New Zealand. I hope they'll come to their senses in Canada before it's too late. British Columbia is my home. I have children and I want to know that we will have ancient forests forever. Can the people who run Fletchers understand that?" he asks.

In the 1990s that will be the test of Fletchers' commitment to the environment - not whether they are upgrading their pulp mills (which they are) or whether they are replanting the areas they are clearfelling (which they also are). The more difficult question the company has to answer is whether they are prepared to leave some of the centuries old forests - which they have every legal right to cut - alone. That test of Fletchers' commitment to the environment is something that not only Canadians and New Zealanders have a stake in; what happens to ancient forests today is of vital interest and concern to the global community.

Response from Ian Donald, President and Chief Executive Officer, Fletcher Challenge Canada:

FLETCHER CHALLENGE is a decentralised organisation. Our Canadian company of course shares the Group's values and commitment to environmental sensitivity in all operations. But decisions regarding British Columbia forest management issues are made in B.C. by managers who have full knowledge of the relevant facts and concerns. It would be unwise for New Zealand to interfere in Canadian political and environmental affairs.

It serves the purpose of the extreme elements of the environmental movement - some of whom are quoted in Mr Hutching's article - to present a misleading, inaccurate and unfair view of Fletcher Challenge Canada's forest management philosophy and practices.

Fletcher Challenge Canada is in fact an organisation of over 9,000 people, most of whom live quite close to the forest - in communities that depend largely on the forest for their livelihoods. All of us have a very real concern for and stake in the long-term sustainability and intelligent management of British Columbia's forest resources.

Far from being a "cut and run" enterprise, our company is investing immense amounts of capital and effort to consolidate the ongoing strength and stability of our activities in B.C. and the communities they support. For example, we have spent or committed more than C$2 billion to capital projects since 1983 - with some C$450 million dedicated exclusively to environmental projects.

There is no doubt that - when judged in the light of society's new environmental awareness - many forest management practices of the past can be justly criticised. Certainly, examples of poor forestry can be found in many parts of B.C. However, the industry has been learning and changing and forest management practices are continually evolving and improving.

Mr Hutching's article would lead one to believe that the industry operates virtually unfettered by environmental rules or standards. In fact, because 95 percent of the land in B.C. is publicly owned, the provincial government controls - and strictly regulates - the way the forest resource is managed and harvested.

Before one tree is cut, our plans must be approved by a host of government agencies, including the provincial Environment Ministry's Fish and Wildlife Branch, the federal Department of Fisheries and Oceans and finally the B.C. Ministry of Forests. These agencies will withhold approval until they are satisfied our plans provide proper protection for the non-timber values in the forest, including fish and wildlife as well as unique ecological and recreational features.

The law also requires that we make our plans available for review and comment by the public. For example, in a number of operating areas we have established local advisory groups through which various community interests - such as municipal councils, Native bands, unions and environmental organisations - have an opportunity to provide input at an early stage of planning. And our plans often are changed as a result of public consultation.

Our company is participating in the provincial government's Old Growth Strategy Project to find appropriate levels and methods of preservation. It is important to understand that of the 95 million hectares of land in B.C., approximately six million hectares have already been set aside for parks and ecological reserves (more than in any other Canadian province). More than one-third of the preserved area is old growth forest - or 1½ acres of old growth for every man woman and child in B.C. As well, over 50 percent of the publicly owned land base is *de facto* wilderness - unsuitable for development.

Only 26 million hectares (30 percent) is considered to be the "working forest" - suitable for timber harvesting - and less than one percent of this area is harvested each year. This harvest is vital to B.C.'s economy. In 1990, the forest industry provided employment for 17 per cent of the province's labour force and contributed $2.6 billion in taxes to all levels of government - supporting a wide range of services such as education and health care. Obviously, these benefits must be considered in any decision to remove additional old growth from the potential harvest.

The future of British Columbia and its residents will clearly be affected by the quality of solutions developed for the complex and often highly emotional issues surrounding forest resource management. Numerous task forces, committees and community groups are working hard to find the appropriate balance between a sound forest economy and the environment. Fletcher Challenge Canada, as a leader in the B.C. forest industry, is participating fully in this co-operative process.

Margaret Peace, Conservationist

By Jim Kidson

PICTURE A PARADISE of treed tranquillity, bounty, birdsong and butterflies, harmony and handsome plants - the dramatic diversity of nature neatly parcelled into less than a hectare.

On that small holding of the "best soil in New Zealand, if not the world", Forest and Bird Marlborough chairperson Margaret Peace has turned a paddock overrun with docks and thistles nearly two metres high into one of the most bountiful pesticide and herbicide-free zones in New Zealand - a place which has fed her pure, organic produce in astonishing quantities and provided a regular income.

What Margaret achieved in the physical sense lies for all to see along a country road at Tuamarina, near Blenheim. Where other people with smallholdings manage a garden, she has achieved a self-sustaining lifestyle based on the best principles of conservation and environmental care.

Growing thousands of annual and perennial plants from seed helped her establish a dried-flower business which could have been expanded many times over had Margaret decided to specialise.

Margaret Peace the teacher: passing on her skills to future generations at her home in Marlborough.

Diversity the key

But, as in the natural ecosystems, she points out, the key to a successful permaculture venture is diversity, to ensure long-term sustainable production. Other income came from selling organic produce from the garden, as well as high quality hay.

A vegetarian for "politico-economic" as well as health reasons, Margaret from the outset kept a small flock of hens, and one dairy goat. Home-produced eggs, milk, cheese, yoghurt, fruits, nuts and vegetables supplied most of her food requirements.

Three years after starting her venture in Marlborough, she built up a small herd of eight pedigree Saanens, which averaged five litres of milk per head per day for most of the year. The goats' milk fetched high prices.

A couple of Romney sheep acquired as orphans were kept primarily to tidy up the paddocks, though the fleeces were often used in garments Margaret wove and sold.

And three beehives ensured good pollination for twenty species of fruits, as well as honey for sale.

Margaret says a key role in the whole system was played by planting a wide diversity of trees, shrubs and perennial herbs, supplying a succession of flowers, fruits and seeds year round. This provided for the steady build-up of a permanent habitat and food resources for a vast range of insects and 18 species of birds which formed an efficient network of biological controls.

Margaret Peace's friends value her firstly for her tremendous courage and determination. Almost as much, they value her greatly for her knowledge as a teacher of many skills, her vision, her tireless commitment to the welfare of this besieged planet and her expertise over a range of activities. Yet in some quarters in Marlborough she has been slow to accrue the recognition of the people she shares a province with.

One unfortunate local body politician referred to her as a "rabid greenie who did more damage than anyone else in Marlborough." He didn't realise he was speaking to Margaret's daughter.

But the tributes flow from others, such as many of the 100 Workers on Organic Farms (or Woofers) who have visited Margaret's home over 13 years.

- "Thank you from the bottom of my heart for this enriching stay in your Garden of Eden..."
- "Thank you for sharing your home and garden, you are so knowledgable. Your garden reminds me of a fairy tale..."
- "I admire your knowledge and experience. I will always remember you and there will always be a place in my heart for you..."
- "I was demoralised for a long while, but now feel the strength for the long struggle ahead. I will no longer apologise to people for my idealism..."

These statements flow from their brief experience of Margaret Peace at home amidst the magic she created on the Wairau Plains.

Encapsulating the very essence of her philosophy, this land was the base for her forays into the contentious and chilly waters of environmental campaigning. From Marlborough, the renewed battle for the nature of New Zealand was launched...

Early life

Margaret was born in Leominster, a little town in Hertfordshire, in 1923, to John and Margaret Stokes. The family moved to New Zealand in 1924.

In the 1930s Depression, the axe fell on his job and they bought a little farm in Henderson (now under concrete).

"It was a quite idyllic time for me," Margaret says.

"There were so many places to walk and ride around. I was an amateur ornithologist when I was five years old. My brothers John and Robin were both much older than me so, as an only child, I spent all my time by myself learning about nature.

"My father was very interested in nature study. He grew up on a beautiful estate where he photographed birds. I learnt the songs of the introduced birds. I think all very young children have a natural empathy with nature but it gets pushed out of their minds by socialisation."

The young Margaret was learning about the New Zealand she would make such a huge contribution to. She joined Forest and Bird at the age of 12.

She did very well at Epsom Grammar, where she was to teach in later years and at Hamilton High, where she received a scholarship. Ironically, for Margaret graduated M.Sc. in 1975, girls weren't allowed to study science at school. She did cooking instead.

Some of the determination and confidence which allows Margaret to tackle anything and everything with vigour and a conviction that she can do as well as anyone was shining through already.

Having graduated B.Sc. Auckland in 1945, she was asked by the principal of Takapuna Grammar to teach science and botany to the fifth and sixth forms.

Forest and Bird journals

Margaret had no training college experience but accepted the job anyway. She was then approached by the principal of Tauranga College to set up a biology curriculum for the school. At that stage, she was teaching the subject from three books and Forest and Bird journals.

Margaret wrote the curriculum for the third, fourth, fifth and sixth forms before setting off for a year of teaching at Mossvale, west of Sydney. It was a Church of England school for the daughters of foreign diplomats.

Miss Margaret Stokes returned to New Zealand at the end of 1949 and

married in 1950.

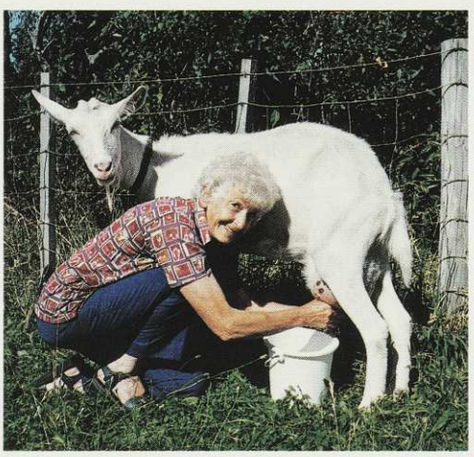
Margaret's son Warwick was two and daughters Kerry and Robyn nine and eight when she left her husband.

She held several teaching positions before in 1975 completing her Masterate thesis on the plant ecology of the dune system of Kaitorete Spit outside Christchurch.

Then 53, she decided she was becoming a bit impatient with the young, as teaching was very stressful, and retired from formal teaching.

After 25 years of teaching and raising a family on her own - enough to send most people scuttling for an easy-care seaside cottage - Margaret Peace began a new life which would produce new stresses, illness and recovery, victories, defeats, encounters with crazed dogs and grizzly bears, backpacks and, at every turn, battles on behalf of the environment.

She decided to settle in Marlborough because it lay at the centre of Aotearoa and it cost just $10 to get to Wellington by ferry. It was a place of few people, had a mountains-to-the-sea environment and was a good place to be outdoors.



The good life: Margaret Peace's smallholding of less than one hectare has provided most of her needs over the last 15 years.

Rachel Carson in mind

She arrived at Tuamarina with Rachael Carson packed in her mind. The writer had galvanised Margaret and many others into consciousness about the dangers of pesticides many years before then.

Margaret was teaching science in 1963 when Carson was releasing her grim predictions. The science teacher suggested the dangers of pesticides should enter the curriculum. The suggestion was greeted with gales of laughter from her colleagues. So was Carson.

In 1977, Margaret and May Foley, whose entire family suffered the effects of 2,4,5,-T spraying, established the Agricultural Chemicals Action Group.

For three years the pioneering group campaigned to raise awareness about the dangers of products like 2,4,5,-T. Two national seminars were held and thousands of pamphlets were distributed on the subject.

Hundreds of letters poured in - details of spina bifida babies, dying dogs and aborting cows.

The United States Environmental Protection Agency, locked in battle with Dow Chemical Co Ltd, sent lawyers around the world to collect evidence, including from Margaret.

Economic factors, Margaret says, have curtailed spraying to some extent, but the group helped raise consciousness about the dangers of the chemicals and their application. However, "mindless" roadside spraying still occurs.

A long serving member and Minister for the Environment's nominee on the Pesticides Board, Margaret points out there are over 900 pesticides on the market in New Zealand today. Phenoxy herbicides are still being sold.

Margaret scoffs at Marlborough's adopted title of "Gourmet Paradise". It is, she says, a paradise where food and wine can be laced with pesticides.

She notes how pesticides have accumulated under cherry and apple orchards for 40 years in places, how orchards can be sprayed 15 times a year and how stock are left to graze in those orchards.

"The whole system of using sprays is unsustainable. It makes the problems worse and worse. We will never get biological control if this continues. There are strains of fungus becoming more and more immune to spraying. DDT-resistant mosquitoes are now responsible for a great resurgence of malaria. There are now hundred of insects resistant to sprays.

"Quick-fix solutions don't work. They are not going to allow the sustainable production of anything. It's in everybody's interest to get back to natural farming.

Smarter than nature

"The chemical companies are now trying to find bio-tech fixes. Again, they're going the wrong way. They're trying to do something smarter than nature."

Margaret, who lobbied members of the former Labour Government intensively about the dangers of pesticides, says a resource management review of toxic and hazardous substances made comprehensive proposals after 18 months of paper and meetings.

Tramping in her beloved Marlborough.

"It was a good review, but it ended up in the too-hard basket. So for the moment we're stuck with the Pesticides and Toxic Substances Boards. Hopefully we will eventually get a Hazards Control Commission."

The only woman ever to hold a seat on the Pesticides Board, Margaret maintains she is the only member other than the beekeeper's representative to have a concern for the environment.

"All I have done is insisted that things get debated. It's almost impossible to get things done. I moved the formal withdrawal of organo-chlorines, but they can still be used. There's a 10-year supply out there. I tried to insist they be recalled but the answer was it would be more dangerous to have them stored in any concentration."

Margaret has waged a tireless war against the dumping of chemical residues into Marlborough tips, warning that they would pollute the underground water supplies as they contaminated the aquifer.

One day, armed with a toxic cargo of chemicals left to her by the former property owner, she drove to a local tip and asked where she should unload the cargo for proper disposal.

"Just throw them in the tip, lady," said a somewhat bemused attendant.

She did not follow this injunction but it armed Margaret with the evidence of neglect she needed to tackle the bureaucrats once again about their negligence.

The particular tip has been moved and linings installed to mitigate against the probable consequences of allowing toxic dumping. But, as Margaret has pointed out all too frequently, the only solution is to rid the country of potentially toxic chemicals.

She envisages a pesticide-free Marlborough, a concept so bold it takes the breath out of even her supporters. Still, Margaret has been doing that all her life. She is usually right.

Chairperson of the Marlborough branch of Forest and Bird from 1977/85 and a member of the Forest and Bird executive 1981/84, Margaret has recently returned to co-chair the Marlborough branch again. At 68, she is brimming with vitality.

One fire too many

Only once since 1975 has that not been the case. That was in 1984, when one fire too many destroyed a magnificent scenic reserve. It was the result of negligence of a local authority unable to control tip fires.

Margaret, somewhat alone after several friends had abandoned Marlborough, decided she had endured enough. She left for Dunedin in the hope it would be too wet there for fires to destroy the land.

A major knee operation destroyed her mobility. Six months later, she returned to Marlborough. It was a shock to see her shaky and frail. But she reaffirmed her commitment to life and the environment and the illness left her body and spirit.

In 1988, Margaret travelled to Costa Rica, Nicaragua and Guatemala with her son Warwick.

She has strong views about the way you travel : "Talk with them, don't gawk at them. Use the environment as a learning experience. Travel should not just be indulgence in food, drink and sunshine..."

Margaret uses the *Lonely Planet Guide* and does a lot of research before she heads off overseas. She travels with backpack and tent, or uses small accommodation places where the profit goes directly to the people.

"Justify your expenditure. It's not just a holiday. I don't distinguish between work and recreation. I think we should be doing something constructive.

"You should use minimum impact travel systems and local accommodation. Let the people profit from you. Learn about their environmental and social problems."

Life threatened

It was in Nicaragua, while she was following these principles, that her life was threatened. She was walking with Warwick alongside a main highway in the dark when a vehicle hit a dog. There was terrible screaming and "half a dog" crawled off the road and "bit the nearest thing". That happened to be Margaret.

Rabies was endemic in this country and stray dogs were shot all the time. United States destabilisation was cutting into the last years of the Sandinista Government and the country had no vaccine. The only way was to fly quickly to Guatamela, a land with an oppressive political regime.

Margaret survived the ordeal with no long-lasting ill effects and - the following year - was back in Nicaragua picking coffee with an international brigade.

Other travels have included the United States and Canada. Margaret's USA travels were characteristic - pack, tent and public transport, with some illegal hitch-hiking in national parks.

"Travelling with white hair is a great advantage. People stop to find out who you are and why you're doing it."

It was during that trip in the south-west corner of Yukon that Margaret shared the early morning with a bear who was digging for roots just metres from her tent flap. She had been told by a filling station attendant it would be safe to pitch a tent as his dogs would drive off any bears. The next morning, there were no dogs in sight - but there was a black bear.

In 1982, Margaret was on the road again - this time backpacking through the highlands of Papua New Guinea. She has further travels planned - but they will not be to her country of birth or Europe.

"I don't want to see any more degraded environments - there are enough in New Zealand," she says.

"It is so important for me to go to places where there is some semblance of the original flora and fauna. If we are going to replenish the earth's resources, we have to go to where there is some baseline of what it was like.

"What I am concerned about is that we have destroyed this paradise in 100 years. Each generation accepts a more degraded environment."

Major role

In the Marlborough years, Margaret has played a major role in the planting of thousands of trees, she fought to save the province's rare broom plants from destruction, she lobbied against the pine tree invasion of the Marlborough Sounds and she wielded shovel and crowbar to establish a mini-native forest along the Taylor River in Blenheim.

She has served on both the Marlborough Catchment Board and the Marlborough Sounds Maritime Parks Board. She was the first woman to challenge for election to the former Marlborough County Council.

The National Organisation of Women in Marlborough nominated her for a Zonta award, which resulted in the Marlborough area recognising her promotion of environmental issues. She is one of a world-wide network of Women in the Environment.

She has been an active member of all the main conservation organisations in New Zealand, written numerous articles for newspapers and magazines about caring for the environment, lectured to national and local audiences and given many radio talks.

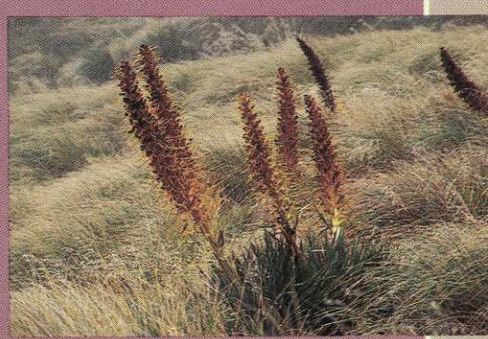
In the future she will not be waiting for things to come her way. In inimitable fashion, she is devoting time to the teaching of permaculture skills. Her work was recognised at the fourth international permaculture conference in Katmandu earlier this year. There, she was nominated as one of a dozen foundation members of an International Guild of Permaculture Practitioners.

The skills of this hardy and devoted environmentalist are a precious asset in today's world. Each time she passes them on, the world seems a little brighter.

Footnote: we are pleased to announce that the winner of our competition for a holiday in Rarotonga is Margaret Peace.

SUPPLEMENT TO *FOREST & BIRD*, AUGUST 1991, VOL 22 NO 3.

HIGH COUNTRY HIGH HOPES



In 1984 Forest and Bird launched its High Country Campaign, seeking greater protection for the landscapes, and unique plants and animals of this much celebrated region. Regional field officer Mike Harding reports on the campaign's progress to date.

Above: *The first runholders encountered tall, thick tussock grasslands with a variety of uncomfortable plants. Widespread burning eliminated spectacular 'spaniards' (*Aciphylla *spp.) from all but the most inaccessible or alpine sites.* Photo: Mike Harding.

Dansey's Pass, north Otago. Photo: Andris Apse

STRETCHING FROM the broken greywacke ranges of Marlborough and Canterbury to the rounded schist summits of Otago, the South Island high country is a special part of the natural and cultural heritage of New Zealand. The legendary names of Molesworth, Mesopotamia, Mackenzie, and Mavora evoke images of dramatic open landscapes, tawny tussock grasslands, and a rugged back country life. But a century of pastoralism has taken its toll on this unique and fragile land, and now the survival of these native tussock grasslands, and the fine wool industry based upon them, is seriously threatened.

The South Island high country spans over 3 million hectares of the South Island's eastern flank - 10 percent of New Zealand's land area. Spreading between the low country of the hills and plains and the broken snow-capped ranges of the Southern Alps, this spectacular landscape has been sculptured by glaciers and cut by great rivers. Its distinctive vegetation is conditioned by the extremes of a harsh inland climate.

Windswept snow tussock grasslands, fragile cushion bogs and other wetlands, rich native shrublands, and beech and totara forests are its characteristic images. But today stark bright squares of green pasture stand out where there was once an unbroken sward of tussock. On the barren flats of the dry inland basins, native wildlife has been displaced by sheep and rabbits.

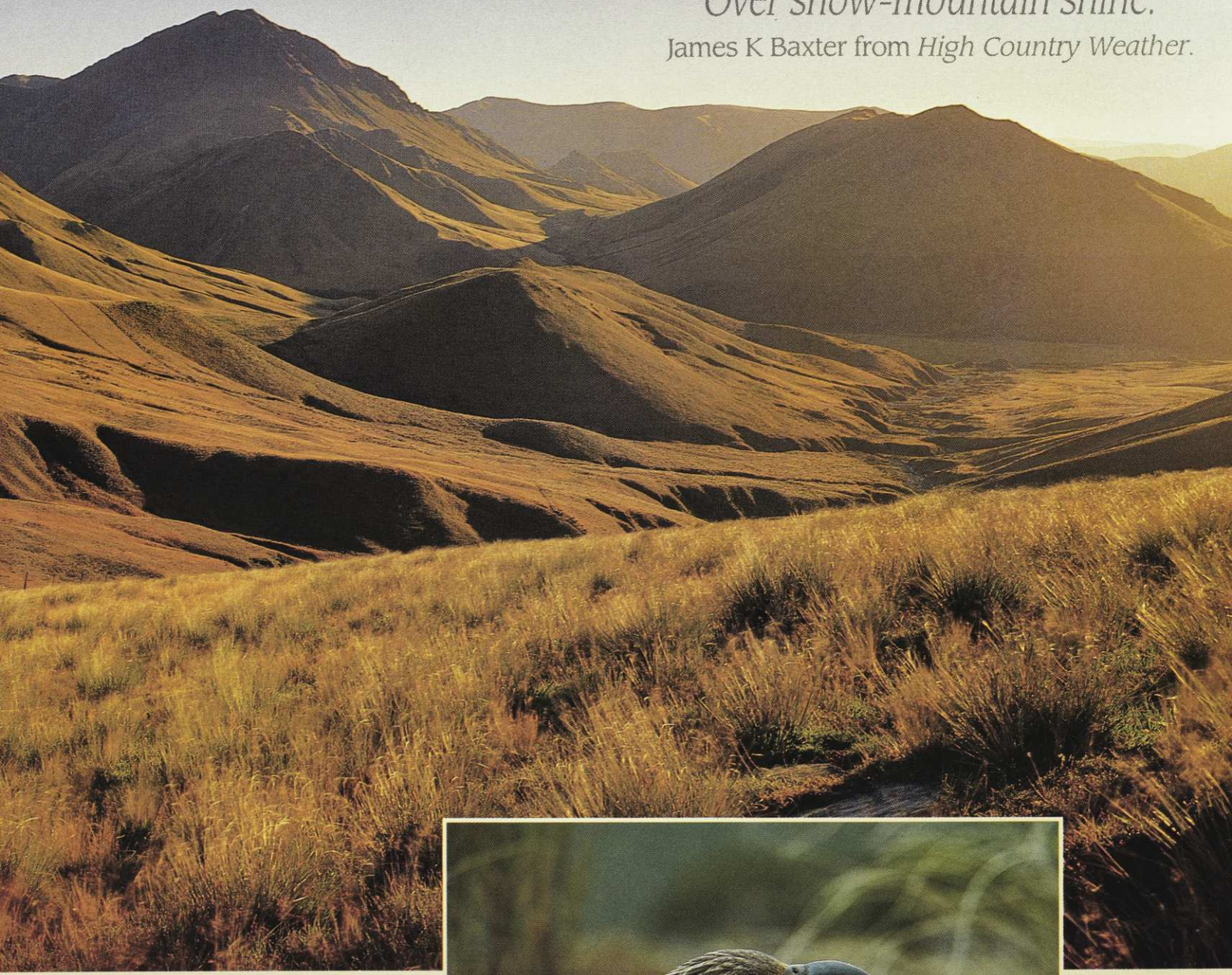
Country in crisis

There is a crisis in the high country. The main problem areas are the grasslands of the dry basins of Central Otago, the Mackenzie and Molesworth. Dramatic changes in management, attitudes, and expectations are required to prevent these areas turning into permanent wastelands, to protect their natural features, and to ensure a long term future for pastoralism.

Native tussock grasslands once covered millions of hectares, predominantly in the eastern South Island high country, the alpine tops of the main divide, and on the volcanic plateau and axial ranges of the North Island. Thousands of years of evolution has adapted the tussock grasses to the harsh conditions of the high country climate. The long-lived bunched tussock grasses can cope with strong winds, snow, periodic drought, fire and extremes of temperature. They are as characteristic of the New Zealand flora as the cabbage tree or the kauri.

Tussocks flourished in the eastern South Island high country, dominating the main grassland communities. Their natural distribution was determined by rainfall, temperature, soil fertility, and past disturbance, reflecting the phases of vegetation change dating from the last glaciation. Metre-high snow tussocks formed extensive grass-

Alone we are born
And die alone;
Yet see the red-gold cirrus
Over snow-mountain shine.
James K Baxter from *High Country Weather.*



lands on moist alpine or montane sites.

Now narrow-leaved snow tussock *(Chionochloa rigida)* is mainly found south of the Rakaia river; slim snow tussock *(Chionochloa macra)* is dominant north of the Rakaia, and at higher altitudes on the South Canterbury and flat-topped Central Otago mountains. Broad-leaved snow tussock *(Chionochloa flavescens)* is widespread on rubbly slopes of the Canterbury mountains. Further west, on the wet Main Divide mountains, mid-ribbed snow tussock *(Chionochloa pallens)* and curled snow tussock *(Chionochloa crassiuscula)* dominate above the treeline. More widespread is red tussock *(Chionochloa rubra)* which favours damp valley floors or poorly drained rolling country and old moraines. Once covering most of the Southland Plains, it has now been all but eliminated from lowland sites. Short (fescue) tussock grasslands, dominated by *Festuca,* but often with *Rytidosperma* and *Poa* species, are present on low altitude or well drained sites such as basins, riverbeds and plains.

The distribution of tussock grasslands today results from a complex history of succession following the retreat of the glaciers, widespread fire, and then accelerated change through the development of pastoralism. Botanist Colin Burrows' analyses of pollen and macro fossils from deposits near Cass in Canterbury show that tussock grass-

The high country is home to the world's only alpine parrot, the inquisitive kea. In the last 140 years sheep have invaded the kea's habitat, causing tensions to rise between environmentalists and runholders when the birds are shot for harrassing sheep. This adult bird yawns after feeding on flax nectar.
Photo: Mike Harding.

Restoration in action: monitoring of the 220-ha Black Rock Scientific Reserve over 18 years has revealed the dramatic recovery of narrow-leaved snow tussock and the demise of mouse-ear hawkweed once the sheep had been removed. Photo: Alan Mark.

Introduced plants such as sweet brier and self-sown pine trees are spreading rapidly through the high country, overwhelming native plants, displacing grazing, and marring the famous high country scenery. Photo: Mike Harding.

Land Act review

CRITICISM OF the Land Act has not gone unanswered. A review of the Act has been drafted by Government officials and is awaiting the green light from the Minister of Lands. It proposes that pastoral lease land be reassessed and placed in one of three categories:
Conservation Land: areas with predominant conservation or recreation values;
Restricted Use Land: areas available for grazing but with significant natural values that must be conserved;
Farmland: modified areas of productive farmland with no conservation values.

This categorisation process would be based on an exchange of interests between the lessee and the Crown. The lessee would gain the right to freehold the significantly modified, and generally most productive, areas in exchange for relinquishing the grazing rights to important conservation areas. A revised lease for the restricted use land would allow continued grazing but within strict limitations, so that other values were protected, including the sustainability of resource use.

Categorisation would encourage rationalisation of the land held within pastoral leases, and ensure that land inappropriate for grazing passed to the public conservation estate. It would also provide an opportunity to include clear performance standards and environmental monitoring in a revised lease.

The high country is the only large area of Crown land remaining in New Zealand that has not been separated into production or conservation land. The task will not become any easier. With the lack of protected areas in the high country, and the sustainability of pastoral farming under scrutiny, now is the obvious time to determine the appropriate tenure for this vast resource.

land was the main vegetation type for 4000 years after the retreat of the ice age glaciers. These grasslands were gradually colonised by bog pine, celery pine, and hardy *Coprosma* shrubs. As the climate warmed, larger podocarps such as miro, matai and Hall's totara became established and eventually, about 7000 years ago, beech became the dominant forest type. Native grassland, however, persisted on recent river terraces and flats, and in the cold dry basins.

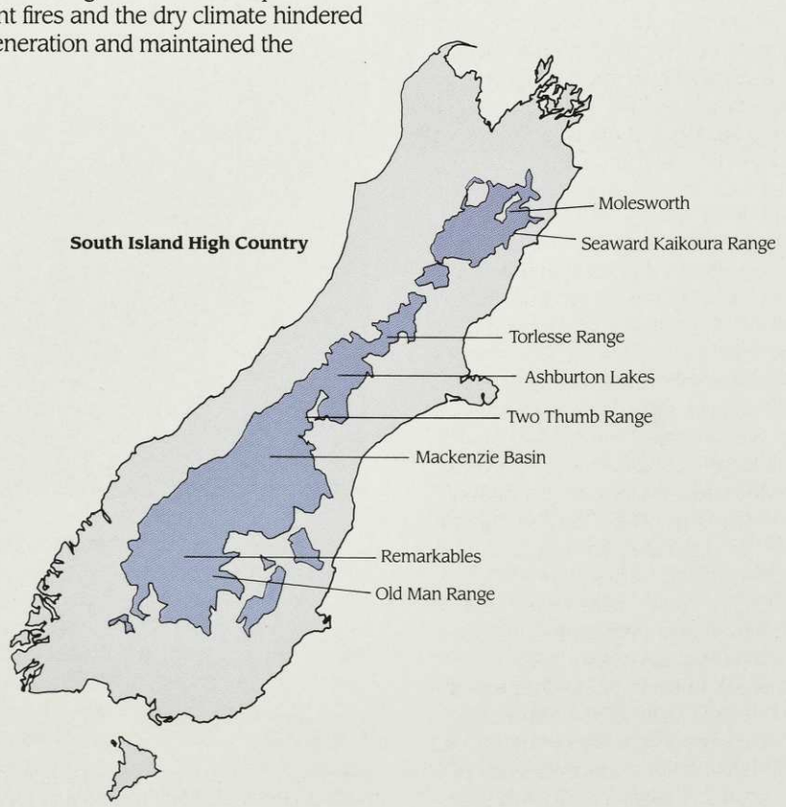
In the last 1000 years fire has disrupted the natural vegetation pattern. There were certainly early fires, triggered by lightning during warmer and drier periods, over at least parts of the high country. These would have eliminated areas of forest and shrubland and favoured the development of tussock grassland. We have a better record of fires over the last thousand years, from oral histories, and from buried wood and charcoal.

Devastating fires

About 600 years ago devastating fires, associated with Maori settlement of the east coast, burnt from south Otago to north Canterbury. Vast areas of forest were destroyed and replaced by tussock grassland. Subsequent intermittent fires and the dry climate hindered forest regeneration and maintained the tussock dominance.

Over the last 150 years, European farming practices have devastated the natural grassland ecosystems. The present remnants of the magnificent tussock grasslands are a sorry reminder of their former extent. The vast red tussock grasslands of the Southland Plains have been reduced to a few small patches. Snow tussocks have steadily retreated from montane slopes, to be replaced by short tussock, and much short tussock grassland has been lost to cultivation, particularly in the lowlands.

Over three-quarters of the pre-European area of tussock grassland has been destroyed. In addition to the direct loss of native grassland, the health of the remaining tussocklands has suffered from extensive grazing, the invasion of introduced plants and declining soil fertility. These dramatic changes have not been given the attention they warrant because of the conventional beliefs that pastoralism can co-exist with tussock grasslands. But it is not surprising that the slow-growing perennial native grasses, whose most significant natural herbivores were grasshoppers, have been unable



"The exceeding joy of burning", as Lady Barker described firing tussock in the 1860s, continues to have its attractions for some present day runholders. Fire has now been implicated as one of the major causes of degradation in the high country. While tall tussock can withstand occasional fire, the combined effects of burning and grazing will eventually kill the tussock plants.

Much tall tussock grassland has been reduced to short, fescue tussock through repeated burning and grazing. Now the native short tussock, such as this on Molesworth Station, is threatened by continued pastoralism and introduced weeds and pests. Photo: Mike Harding.

to tolerate the combined effects of grazing mammals and repeated burning.

Complex Ecosystems

Individual tussocks can be decades old. The grassland communities they form can have a complex structure and support a rich diversity of species. They have often been compared with forest. The late DSIR botanist Lucy Moore said of tussock grassland in 1956: "Because its dominants are perennials with very long lives, it has many of the characteristics of a forest and few of those of a short rotation pasture. Like a forest, it is the product of long slow development, and like a forest it is much easier to destroy than rebuild."

Yet when early European graziers entered the high country, little value was placed on intact tussock grasslands. The first act was often to set fire to the dense waist-high grasslands to remove awkward plants like the spiny 'wild irishman' (matagouri) and the sharp pointed 'spaniard' *(Aciphylla* spp.). Standing at their homesteads many miles away, runholders measured workers' progress in exploring new sheep country by the dense plumes of smoke. The "exceeding joy of burning" was described by Lady Barker in her book *Station Life in New Zealand*. "It is a very exciting amusement ...and the effect is beautiful, especially as it grows dusk and the fires are racing up the hills all around us. The immediate results of our expeditions are vast tracts of perfectly black and barren country, looking hideous and desolate to a degree hardly to be imagined."

Because the nutritional value of tall tussock grasses is low, it was common in the early days of high country farming to burn the grasslands regularly. Burning removed the accumulated dead leaves and litter, promoting a flush of fresh growth that was highly palatable to sheep. Professor Kevin O'Connor of Lincoln University estimates that stock units in Central Otago increased by 247 percent between 1861 and 1871, reaching a high of 11.3 million sheep in 1878. These very high stock levels were achieved by effectively mining the native tussock grasslands. O'Connor estimates that by 1950 "unimproved" rangelands of Central Otago supported only 10 percent of the stock carried in 1880.

While tussock burning is less frequent today (about 20,000 ha is burnt annually), visitors to the high country in spring are still greeted by dense palls of smoke as whole hillsides burn from valley floor to snowline, under Department of Conservation and regional council-approved permits. Scientists have now shown that repeated burning and grazing of unimproved snow tussock grassland depletes nutrient reserves, reduces the height of the tussocks, opens up the tussock sward to invasion by introduced weeds, and can eventually lead to its replacement by short tussock. Tussocks will slowly recover from burning, but repeated burning or burning followed by grazing can be lethal.

It is now acknowledged that there are several advantages in retaining tall tussock on pastoral lands. Tall snow tussock grasslands on the eastern and Central Otago block mountains yield more water, through reduced evaporation and interception from fog, than grazed tussock, or even bare soil. Tussock grasses can act as heat conductors: melting and breaking up snow, thereby freeing the shorter intertussock plants from the cover of winter snow. Tussocks are adapted to exploit seasonal surges in mineral nitrogen, released by the freezing and thawing of the subsoil layers, capturing valuable nitrogen into the grassland system. On many runs snow tussock still provides useful shelter and emergency forage for stock.

Fire, grazing and introduced weeds and pests have taken their toll. Burgeoning rabbit numbers have forced land out of production in the driest parts of Central Otago and the Mackenzie Basin. Bait shyness is causing major headaches for landholders and regional councils (see box). To complicate the problem, invasive introduced hawkweeds *(Hieracium* spp.) are spreading at an alarming rate through the dry tussock grasslands (see box). Both rabbits and *Hieracium* are having a serious impact on the viability of pastoral farming and the survival of native species.

Rabbit plague

Large areas of the high country are badly degraded with a loss of soil organic matter, fertility, soil moisture, and soil structure. Degradation has been obvious in the dry tussock grasslands for over 100 years, with earlier crisis periods in the 1890s and 1940s coinciding with periods of high rabbit numbers. Many still remember the rabbit plagues and scabweed of the 1940s and are familiar with the rescue of Molesworth Station by the Government.

A recent review by the Parliamentary Commissioner for the Environment, Helen Hughes, concludes that traditional pastoral-

Otago skinks bask on the open schist of Central Otago. The unique lizard fauna of Central Otago has been decimated by habitat loss and predation. Photo: Ian Southey.

Gone to rabbits and ruin

The now-barren flats of the Mackenzie Basin are a sorry reminder of what were once spectacular short tussock grasslands. They have now succumbed to the combined effects of grazing, rabbits and Hieracium. Photo: Mike Harding.

OPINIONS VARY over the causes of the recent explosion in rabbit numbers. The most commonly cited reason is that efforts to control rabbits were reduced following the removal of taxpayer subsidies during the 1980s.

Rabbits now thrive in the drier basins and valleys where conditions are particularly favourable, resulting in uncontrolled overgrazing of grasslands. About 280,000 hectares of high country land is regarded as 'rabbit prone' and 100,000 hectares of this is considered to be severely infested.

Calls for the introduction of myxomatosis led the Parliamentary Commissioner for the Environment to recommend, in 1987, that a five-year integrated programme of rabbit control and land management be established. The Rabbit and Land Management Programme has targeted rabbit-prone properties, establishing integrated land management methods through property plans. It is too early to judge its success but it has arrested and reduced rabbit numbers in some areas and sown the seed of future sustainable land use. Most importantly, it has changed attitudes towards pest control and land management.

It is now clearly acknowledged that rabbits are a symptom, rather than the cause, of a much wider problem of land degradation. Any response to high pest numbers must also address the decisions that led to the high population in the first place.

The cost of rabbit control, and the development of bait shyness in some areas, has led to renewed calls for the introduction of myxomatosis. But, as Morgan Williams, Director of the MAF Rabbit and Land Management Programme, puts it, "The real debate is not about the kindest way to kill a rabbit. It is about how we prevent the death of a fragile piece of New Zealand. We will leave future generations the corpse of an entire region if we continue to argue about which painkiller to use on a near terminal patient when what is needed is some swift medical surgery followed by a change of lifestyle."

Regional councils and high country farmers have teamed together to apply for the introduction of myxomatosis, a process which will involve feasibility studies and an Environmental Impact Report. There is no guarantee that it will be effective, and its introduction would be about three years away at the earliest. Myxomatosis is only another control method, not the solution to the problem. In the end land management techniques will have to be adopted that do not favour rabbits. We may as well start now.

Rabbits are a major pest in the drier areas of the high country. Mismanagement of the land through stock overgrazing has created the ideal rabbit habitat. Photo: Andris Apse (MAF Technology)

ism may no longer be feasible in many areas. Anyone visiting the Mackenzie Basin today could not help but agree that we are now witnessing land degradation on a scale not seen before in this country.

Burning and grazing have not been the only causes of change in the high country. Many of the more fertile productive flats and terraces have been cultivated for pasture or cropping, often accompanied by irrigation and shelter belts. Grasslands on montane slopes have been oversown with introduced grasses and legumes, and topdressed with fertiliser, promoting a green flush across the golden tussock slopes. Wetlands have been drained or damaged by unrestricted stock access, leading to enrichment of water bodies and the loss of habitat for fish and water birds. Exotic trees have been planted for shelter or commercial forestry; large areas of tussockland are now threatened by uncontrolled wilding tree spread.

Gigantic hydro-electricity schemes have transformed the Mackenzie Basin and Clutha Valley, and there is increasing pressure for tourist development at key scenic and recreation sites. These changes have been at great cost to the native vegetation and to the distinctive high country landscapes.

Native grasslands, forest remnants and shrublands have been destroyed and populations of rare and endangered plants and animals threatened. Central Otago lizards have been decimated by modification of their habitat and predation by introduced cats and ferrets. Bog pine shrublands and rare plants found within them, such as *Hebe armstrongii,* are now confined to very small areas. Specialised plants of limestone substrates, such as the Castle Hill buttercup, a variety of *Ranunculus crithmifolius,* and delicate turf plants have, in many places, been browsed or trampled to death.

The whole tussockland ecosystem has been, and continues to be, altered by the introduction of plants and animals. No longer is there the proliferation of ground birds that the Maori and early runholders spoke of, or the extensive wetlands supporting an abundance of eels and other fish. Continued landscape modification by thoughtless design and insensitive development is creating a clashing patchwork of contrast, and gradually consuming a scenic landscape unique to New Zealand.

Sadly neglected

Protection of the great tussock grasslands of the high country has been sadly neglected. The sweeping high country scenery, so frequently painted and photographed, is gradually disappearing in many areas.

The problems of sustaining pastoralism and yet protecting the natural values of the high country have been with us since the first runs were taken up about 140 years ago. Most high country land is Crown land, owned by the people of New Zealand, and leased for grazing under the Land Act 1948. In 1990 this totalled 2.85 million ha, contained in 349 pastoral leases and 29 pastoral occupation licences.

Pastoral lease tenure gives the lessee the exclusive right of pasturage within prescribed stock limits, exclusive rights of occupation, and perpetual rights of lease renewal. The leases are administered by Landcorp, on con-

Above: *Droplets of water collect on this slim snow tussock* (Chionochloa macra) *in a dense cool fog. Research carried out on the Otago Block mountains has shown just how important intact tussock grasslands are for collecting water in this way.* Photo: Mike Harding.

Left: *This magnificent wetland and the surrounding slim snow tussock grassland on the southern Old Man Range are now protected as the 4500-ha Bain Block reserve, based on PNA survey recommendations.* Photo: Alan Mark.

tract to the Department of Survey and Land Information, with the Department of Conservation retaining oversight for conservation and recreation values.

Under the Land Act, consents are required for developments such as roading, cultivation, tree planting, burning, wetland drainage or commercial recreation. These activities are privileges, and are not allowed as of right. But over time, these restraints have been increasingly ignored or challenged by runholders. The Act also requires land to be "properly farmed" in a "diligent and husbandlike manner" (s.99). Contemporary concepts of species diversity, representativeness, and ecological sustainability are not contained in the 1948 Land Act - a major constraint in tackling the current land degradation crisis.

Crown revenue from the leases, about $670,000 in 1990, is less than the cost of administration. The Land Act and its administration has become increasingly ineffective and a review of the Act is long overdue.

Some attempts have been made to rationalise pastoral lease land. Widespread concern for soil erosion and water quality in the 1940s led to the Soil Conservation and Rivers Control Act 1941, and later a government policy of retiring steep, erosion-prone land from grazing. Under this Act many lessees negotiated Conservation Run Plans which subsidised the development of lower altitude parts of the run in exchange for the retirement of the upper slopes from grazing.

Millions of taxpayers' dollars poured into these 'conservation' plans which, in many instances, were little more than subsidised development programmes. Land unsuitable for grazing, such as high open tops, steep scree and rock slopes, and sensitive alpine cushion bogs and herbfields, was retired from grazing, while lower altitude land, some of which also had high conservation values, was 'improved' with subdivision fencing, shelterbelts, irrigation, cultivation, oversowing and topdressing. Moreover, in a number of cases the retired land was not surrendered back to the Crown as required and the runholder retained occupation rights.

The major nature conservation underway at present is the Protected Natural Areas (PNA) Programme. This programme identifies priority areas for protection covering the full range of plant and animal communities in each ecological district. A number of ecological districts in the high country have been surveyed and the formal protection of the identified areas is receiving greater attention. But, despite the Department of Conservation's hard work, progress is frustratingly slow, and few worthwhile representative reserves have been protected.

DoC recently protected two large areas in Central Otago. One is the Bain Block of 4,500 ha on the southern Old Man Range with a representative altitudinal sequence from 1600m to 760m. The other is 1,400 ha of high altitude *Chionochloa macra* grassland with associated wetlands on the northern Dunstan Mountains. But many negotiations are on the basis of continued grazing, despite increasing evidence of the detrimental effects of current land management practices on natural values.

The major constraint on the PNA Programme is the difficulty in negotiating valuable conservation land out of pastoral leases, even if the land has negligible grazing value. Individual lessees have shown goodwill and come to valuable agreements, but the implementation process has been effectively stalled by the reluctance of most lessees to relinquish land from their leases. The focus of the programme has been also too narrow to protect the full range of conservation values in the high country. Its original emphasis on the very best areas has ignored the wider ecological, landscape, historic and recreation values.

Recent responses to the loss of natural values and the doubtful sustainability of grazing in the South Island high country have made the need for change very convincing. The need to protect the high country's natural values and and to maintain agricultural productivity are issues of national significance.

Land degradation critical

Land degradation is now so critical in the dry intermontane basins that there will soon be little left for either nature conservation or farming. There is a pressing need to define sustainable land use and implement it in a practical and equitable way. It is also vital that representative areas of tussock grasslands are protected.

The lack of secure tenure and ignorance have been blamed for the early land degradation. Yet the security of tenure provided by the renewable leases and legal restraints of the 1948 Land Act has not prevented the continued degradation we are witnessing today. The call for secure tenure is still being used to downplay the important effects of economics, speculation and unsustainable farming practices. Wholesale freeholding of these fragile public lands is unacceptable to most people and will not solve any problems. The suitability of much of the high country land for freeholding has always been questioned and the arguments against freeholding are even stronger today, when the sustainability of pastoralism itself is in doubt.

Performance standards are required for high country pastoral lands management. Enforcement of lease and licence conditions is essential, but this will only be effective if comprehensive ecological monitoring is undertaken. Research and advisory bodies must change their emphasis from the promotion of increased production to the encouragment of sustainable land use.

Accompanying the greater control and accountability must be rationalisation of all land contained within pastoral leases and licences. Mountain peaks over 2000m, sensitive alpine cushion fields, snowbanks and herbfields, extensive rock screes, wetlands, forest and spectacular tussock grasslands are contained within grazing leases.

Changes in land tenure, to protect these areas as conservation land and rationalisation of run boundaries, is required. This could be achieved under a new modified Land Act through the proposed process of categorisation (see box) or through a similar exchange of rights between lessees and the Crown.

It must also be accepted that there are magnificent natural high country areas outside pastoral lease land, including the University of Canterbury's 77,000 ha of endowment lands. The objectives of sustainable land use, the protection of conservation and landscape values, and the provision of public access should apply to these lands as well.

The grand high country scenery so eloquently described by generations of poets and writers, and the diversity of special plants and animals which make up such this unique part of our natural heritage, are seriously threatened.

The devastation of the tall North American prairie, the desertification of Australia's semi-arid lands prompt our criticism. Yet our own unique tussock grasslands are being destroyed before our eyes. We have a national and international obligation to protect this important part of our heritage, for the sake of the species that live there, the joy and inspiration we derive from its magnificent landscapes, and for future generations of New Zealanders.

References

Sustainable Land Use for the Dry Tussock Grasslands in the South Island, *Report of the Parliamentary Commissioner for the Environment, March 1991.*

P.J. McKendry and K.F. O'Connor, The Ecology of Tussock Grasslands for Production and Protection, *Unpublished Report for the Department of Conservation, June 1990.*

Hieracium – goodbye tussock

The "creeping grey hand" of ground-hugging hawkweed (Hieracium pilosella) *forms an unbroken sward at the expense of all other plants.* Photo: Mike Harding.

IN THE 1940s it was scabweed that invaded the high country grasslands. In the 1990s it is the introduced *Hieracium*. Landholders now talk of the "creeping grey hand of *Hieracium*", and despair over how to respond.

Large areas of grassland have been eliminated and replaced with this ground-hugging mat plant of little value for grazing, and disastrous for landscape or nature conservation. First recorded in the country over 100 years ago, it has only become prevalent in the high country in recent years. It now forms more than 50 percent of the plant cover over at least 500,000 ha, in places forming an even sward at the expense of all other plants.

Of the four main species, mouse-ear hawkweed *(Hieracium pilosella)* is the most dominant on pastoral lands, particularly in the 400-600mm rainfall zone. Its spread is clearly influenced by grazing, though there is debate over which factors are most important. It is well adapted to arid and infertile areas and has thrived in areas of modified or short tussock grassland. Spreading predominantly by stolons and efficiently exploiting soil moisture, *Hieracium* has out-competed, and perhaps displaced, other grassland plants including native tussock seedlings.

The spread of *Hieracium* has alarmed runholders and conservationists alike. No land in the dry zones appears exempt from its invasion, particularly in the presence of uncontrolled grazing by rabbits. Mouse-ear hawkweed's cousin, the aptly-named king devil *(Hieracium praealtum),* has become a major species on disturbed infertile sites in the wetter western mountains.

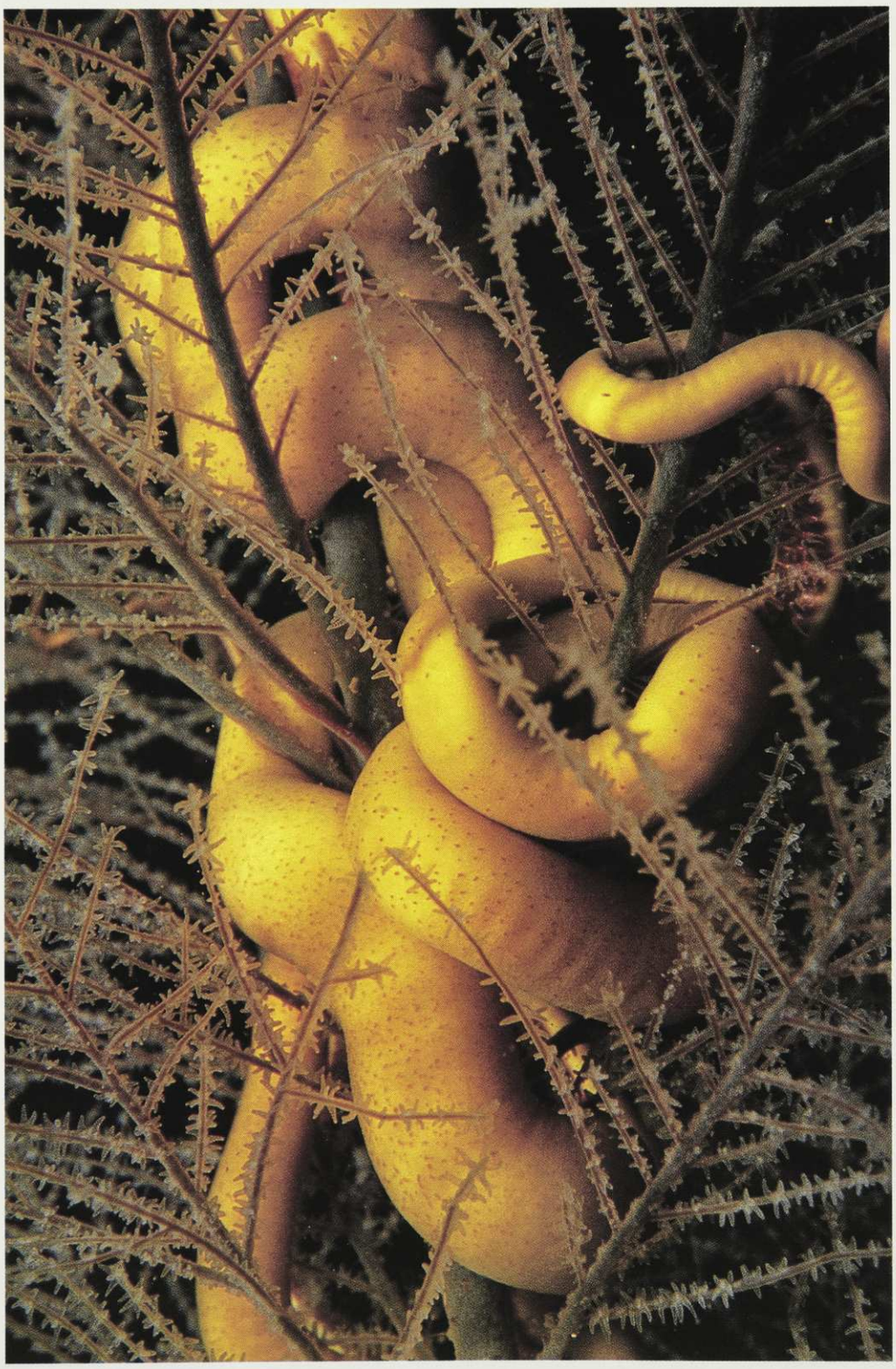
Both species have been recorded in Arthur's Pass, Mt Cook, and Mt Aspiring National Parks, and the presence of *Hieracium* has significantly downgraded important areas identified for protection by the PNA Programme.

Ready solutions are not apparent. In moister areas the application of fertiliser allows other species, such as oversown legumes, to outgrow *Hieracium.* This is often uneconomic or unsympathetic to nature conservation values. The search for a biological control agent is underway but initial results do not look promising. Rusts and fungi being investigated are likely to only reduce the vigour of *Hieracium* slightly and are probably five years away.

Concern has been expressed that *Hieracium* is all that remains to hold the soil in place in some areas, and that its removal would be disastrous for soil conservation. As with rabbits, we cannot simply blame *Hieracium.* The plant is clearly a successful opportunist, colonising country that has been bled of its nutrients by animals and fire.

PROTECTING THE UNDERSEA WORLD

The waters around Fiordland National Park currently have no protection. They continue to be exploited for crayfish, blue cod, sea cucumbers and, potentially, kina. Department of Conservation marine scientist Anita Pillai explains why the fiords are a unique and vulnerable marine environment deserving of protection.



TO MOST PEOPLE Fiordland appears a vast, remote and unspoilt area.

At more than 12,500 square kilometres, Fiordland National Park is the country's largest national park.

Near a park this size, you would think it would be easy to catch a fish, especially a blue cod. Yet during Easter last year, 42 keen fishermen, using 12 boats, took part in a three-day fishing competition in Doubtful Sound. They caught only two blue cod.

Yet photos and archives held at the Deep Cove Hostel show that in the past school children regularly caught cod.

This puzzled Dr Ken Grange, a DSIR scientist, and author of a recent report "Unique Marine Habitats in the New Zealand Fiords".

He recognised that strong flows of fresh water down the fiords limited the entry of ocean water and blue cod larvae, but doubted this was enough to cause the collapse of the fishery.

It was not until Dr Grange started calculating the amount of habitat available to most marine life in the fiords that the reasons for the poor catch became evident.

Mountain wall

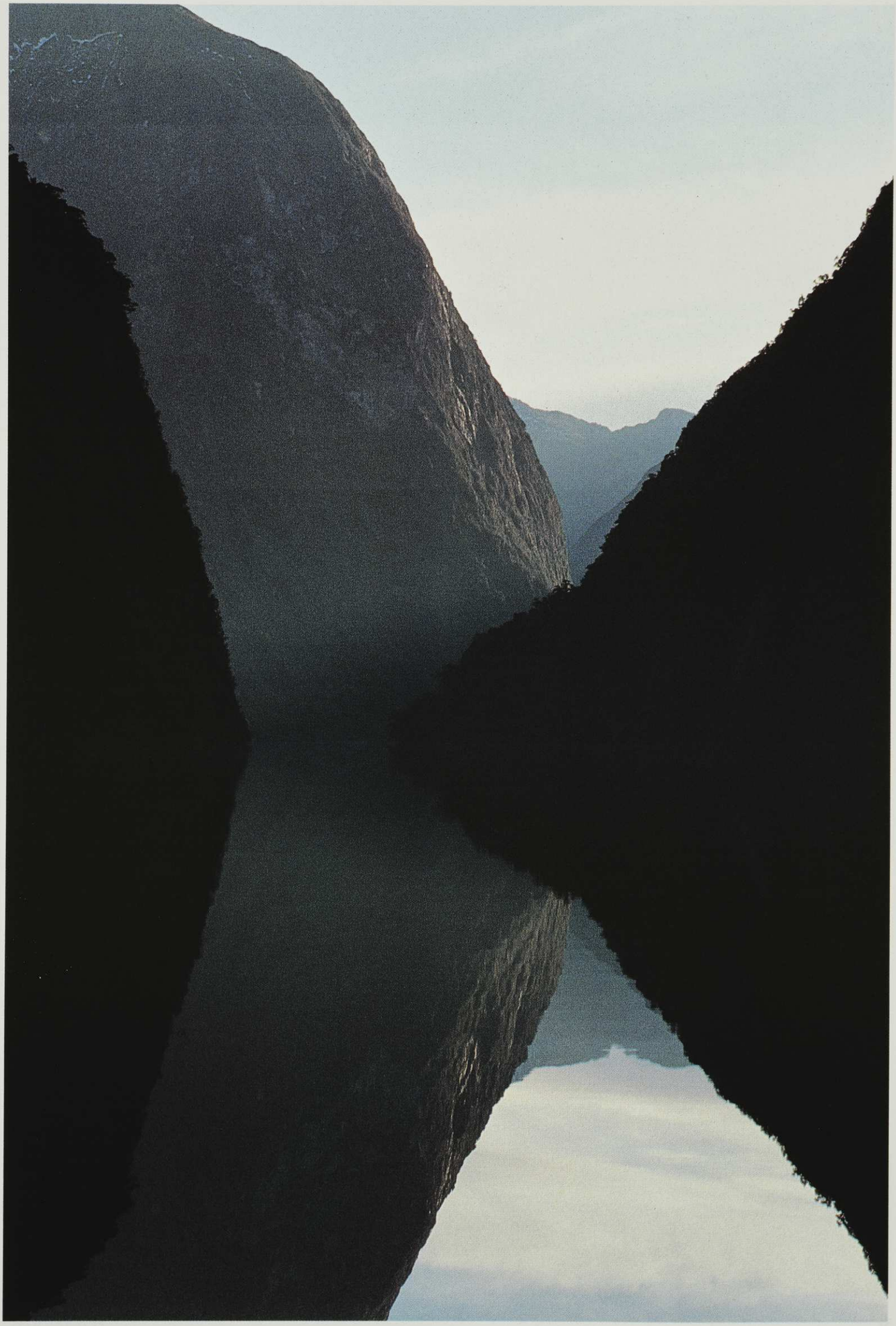
In Fiordland the mountains form a wall which forces the warm wet westerly air to rise up into cold alpine air. It then condenses to form rain. Up to seven metres is fed into the fiords every year by thousands of creeks and rivers.

As the rain filters down through the forest, it picks up tannic acid from decaying vegetation and turns the colour of strong tea or beer.

This stained freshwater layer floats on top of the seawater in a permanent three-to-four-metre deep layer, and like a blanket spread

Opposite: *The mirror world of Hall Arm, Doubtful Sound. The tremendous diversity of the underwater Fiordland is concentrated in a narrow band of 46 square kilometres - less than the area of each of our main centre harbours.*
Photo: Simon Hayes

Left: *The world's largest population of black coral occurs in Fiordland where it provides habitats for other animals such as brittle stars which in this photo are wrapped around the coral's branches. Corals may be as old as 300 years.*
Photo: Simon Hayes



This hard red coral with featherstars is usually found outside the fiords at depths in excess of 150m, but the peat-stained waters encourage the beautiful coral to grow just 15m below the surface. Photo: Warren Farrelly

A sea cucumber Stichopus mollis. *Little is known about this animal, but as an efficient cleaner it is believed it plays an important role in the delicate ecology of the fiords. Last year the Ministry of Agriculture and Fisheries gave permission for 73 tonnes of the cucumbers to be harvested for export to the Asian market where they are regarded as a delicacy.* Photo: Lance Shaw

Below: *Captain Helmut Just and the vessel* Mata Whao Rua, *which recently targeted sea cucumbers in the fiords. Fortunately the cooked cucumbers proved too tough for the intended customers, but once the processing process has been refined the operation could be restarted. The same boat has recently experimentally fished for the giant southern spider crab in subantarctic waters.* Photo: Southland Times

across the fiord it soaks up the sunlight.

As light cannot penetrate very deep, many species usually found at much greater depths live within the first 40m. Below 40m, light levels drop quickly and life thins out.

Dr Grange proposed that if the top 40m band contained the majority of life on the fiord rock walls, then a habitat area for the fiords could be calculated. Since the coastline of the fiords covers 948 kilometres and the gradient of these walls averages 45 degrees (it is often between 60 and 80 degrees), then, using simple maths, the habitat of the area is about 46 square kilometres. This is smaller than Wellington Harbour (87 km^2) or Manukau Harbour (145 km^2).

Many rare, unknown and protected species - about which little is known - live in this small area.

The largest black coral population in the world occurs in Fiordland (7.5 million colonies) and is accessible to scuba divers studying these fascinating organisms.

Red corals, gorgonian fans, brachiopods, feather stars and sea pens can also be seen in this 40m band.

Species-rich area

The area supports more than 60 fish species and contains representatives from warm water, cold water and deep water habitats.

However, apart from their existence and basic biology, little is known about these creatures, their ecological relationship with other animals and their role in the marine environment.

Some species have been studied elsewhere but, because the fiord environment is unique, comparisons with populations of different areas is very difficult.

One species which has been extensively studied is black coral (*Antipathes fiordensis*). Dr Grange, who has studied the animal over many years, found that limited water exchange with the open coast and weak currents caused low levels of food supply and growth rates. An average growth rate of 2.5cm a year suggests some black coral trees could be older than 200 years.

It is not unreasonable to assume that limited food supply will similarly affect other organisms of the fiord rock wall community.

Considering the habitat size, it is easy to see that fiords are extremely vulnerable to fishing pressure and why in Easter last year only two blue cod were caught in Doubtful Sound.

While the effects of single species extraction are obvious, there are also indirect effects on the environment caused by the removal of one species from the food chain and the complex web of species interactions.

Fishermen working the open coast of Fiordland are noticing changes which may have been caused by the crayfishing boom of the 1970s. Some scientists believe the depletion of crayfish stocks caused a massive increase in kina, which are predated by crayfish.

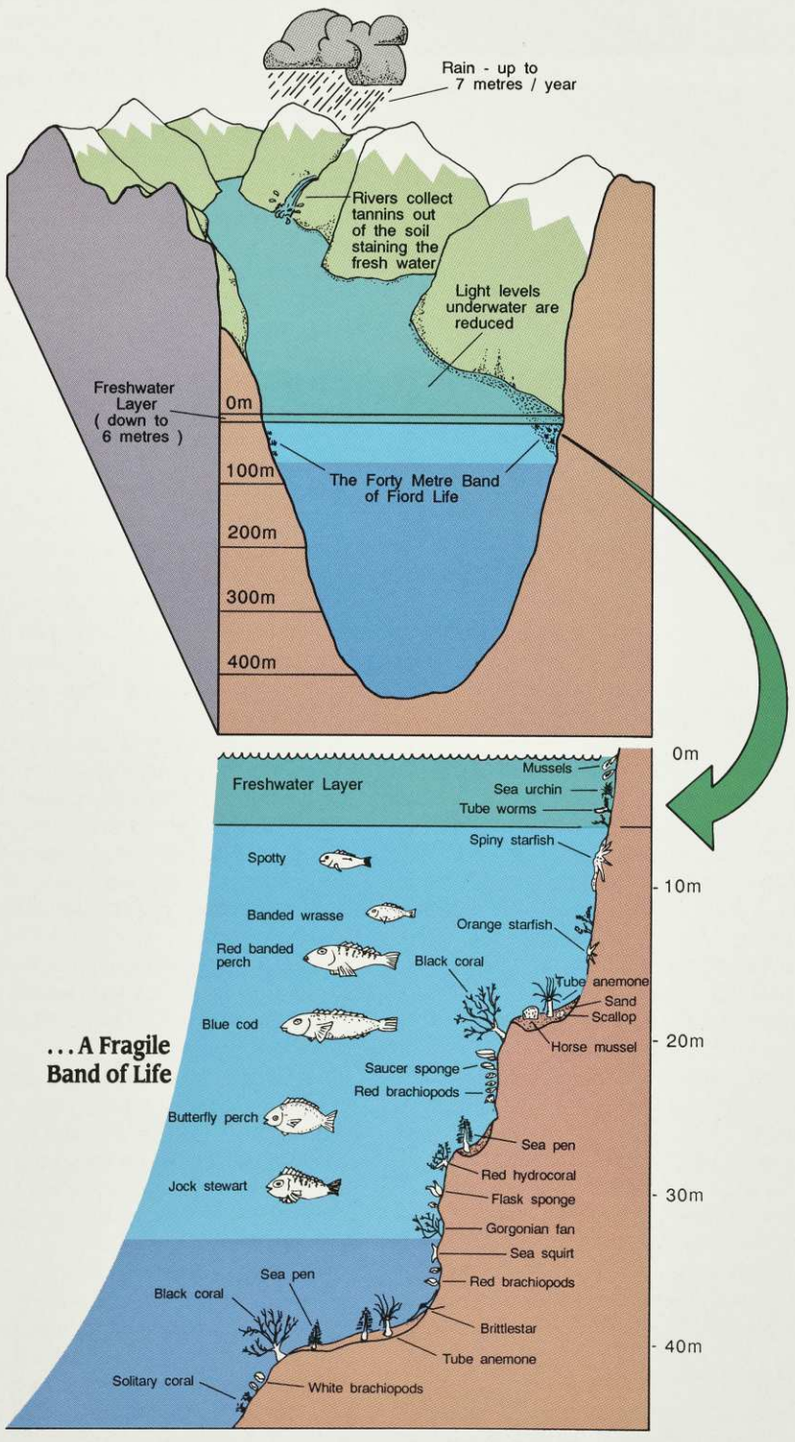
The large numbers of kina have munched their way through long-established seaweed beds, destroying the habitat for small fishes. Small fishes feed big fishes, so the effect of the extraction of one species may have had a dramatic effect on the whole coastal ecosystem.

The latest commercial venture in the fiords - the extraction of sea cucumbers - has begun in the absence of knowledge about the animals' lifestyle and role in the ecosystem. Fortunately last summer's operation ceased a quarter of the way through its permit to extract 73 tonnes of sea cucumbers.

Some small fish - apparently immune to the effect of the stinging tentacles - use jellyfish as protection from predators. This jellyfish measured around 1900mm in width. Photo: Warren Farrelly

Bright yellow zoanthids look similar to anemones except they have only one ring of 24 or more tentacles and a long stalk. In some areas these striking organisms occur in extensive beds. Photo: Kathy Walls

Fiordland's Underwater world . . .



These slug-like creatures, known to scientists as *Stichopus mollis*, are widespread throughout Fiordland, lying both on the mud and sandy sediments at the head of the fiords and clinging to the sheer rock walls.

Their similarity to cucumbers is in their shape; in colour they range from greyish brown to black, providing excellent camouflage from potential predators.

The cucumber's mouth is surrounded by special sticky tentacles, which collect sediment lying on the rock walls and sea floor, and pass it into the mouth.

As in our society, the cleaners - while often underrated - play an extremely important role. Many organisms which inhabit the fiords rely on a clean environment, with low levels of sedimentation.

Long-lasting effect

The extraction of this seemingly insignificant animal could have an important and long-lasting effect on other animals of the fiords.

While the cucumber's shape suggests that it remains lying in one place all day, closer observations have revealed that these creatures can often be found partially raised off the surface gently swaying back and forth in the current. The reason for such behaviour is unknown.

Divers have also observed sea cucumbers practise a defence mechanism, known as auto-evisceration. This involves the organism "throwing up" its entire stomach, complete with sticky threads, in an attempt to put off any would-be attacker.

Large sea cucumbers are common in many places but it is difficult to find many animals which are 8cm or less. Whether they are hiding in rock crevices or perhaps spend part of their lifecycle in another marine habitat, is also unknown.

Sea cucumbers occur around the New Zealand coast, so given the special conditions of Fiordland, it needs to be asked whether this is an appropriate location for extraction. Kina appears to be the next species to be targetted in the sheltered waters of the fiords.

The importance of the fiords' 40m band goes beyond commercial extraction. This is an internationally recognised area which over the years has attracted many notable visitors, including Jacques Cousteau, National Geographic and Television New Zealand's *Wild South*.

*Sea pens (*Sarcopyhllum bollonsi*) can only be seen by divers around the New Zealand coast in Fiordland where they inhabit sandy slopes around 20m and below.* Photo: Kathy Walls

Precisely because they are so accessible, sea pens are at risk from unthinking collectors.

Above: *True to its name, a sea perch sits atop a well adorned horse mussel.* Photo: Warren Farrelly

Opposite: *The well disguised stargazer lies half buried in sediment, eyes swivelling in search of prey. When finally a small fish swims past, the stargazer's large mouth opens wide, devouring both its intended meal and a large quantity of water!* Photo: Warren Farrelly

Opposite top: *Most attacks on divers in the fiords come from the harmless looking girdled wrasse, rather than sharks. Divers are often bitten on the lip by the fearless wrasse, which here swims in front of a large black coral colony.* Photo: Kathy Walls

Although the unique features and beauty of Fiordland's underwater world are not as visible to tourists as Mitre Peak and Sutherland Falls, they are no less worthy of protection. TVNZ's *Wild South* fittingly called the fiords a "mirror world" of the region's forests, mountains and wildlife.

The National Cancer Institute plans to research the potential of anti-cancer compounds contained in the marine organisms. As with rainforests, many of the organisms within the fiords may contain as-yet-undiscovered substances of use to medicine.

The Department of Conservation believes that, like the land of Fiordland, the marine environment of the region is also worthy of protection. Fiordland is a great natural asset and one of the world's special places. It deserves the greatest respect and protection.

Permissive conduct

THE FIORDLAND SEA CUCUMBER case raises important questions about the role of special fishing permits.

The Fisheries Act and the Marine Farming Act both have provisions for special permits.Originally special permits were designed to allow an applicant to carry out research into fishing or farming specified species of fish or marine vegetation.

Among the large number of permits issued to date have been some for paua harvesting at the Bounties and Antipodes Islands, seaweed cultivation in Northland, on the West Coast and at Kaikoura, and salmon farming in Big Glory Bay, Stewart Island and Akaroa Harbour.

The latest to cause concern is a proposal to harvest the giant southern spider crab on the Pukaki Rise in subantarctic waters. The crustacean, with a span of about 2m, was fished by the Japanese 20 years ago but has not been touched since. Fisheries scientists are concerned that it would be very easy to overfish this species in a short period of time.

So what are the concerns about special permits?

- There is no requirement for an environmental impact assessment before the activity starts or approval is given.
- There is no opportunity for the public to have a say, in the same way they are invited to comment on ordinary marine farm licences, for example.
- The permit can be issued in an area where certain fishing practices are banned under regulations or fisheries management plans.

The Royal Forest and Bird Protection Society believes MAF are taking an irresponsible approach to the question of special permits. This is illustrated by the sea cucumber example.

Any assessment of the sea cucumber fishery is likely to be highly speculative. A figure based simply on counting and measuring cucumbers from randomly selected sites at one time of the year will not take into account growth rate, breeding potential or seasonality. It certainly will not take into account the effect of the removal of this species on the rest of the fiord ecology.

Another danger with special permits is that an entrepreneur may invest large sums in a venture, even though it may be environmentally unsound. It then becomes extremely difficult to prevent the practice when the proponent applies for a full licence.

This area of fisheries is likely to come under intense debate in the coming review of the Fisheries Act. The fishing industry will want to widen the provisions for exploratory fishing or marine farming without public debate.

Barry Weeber, Forest and Bird researcher

Let them eat steel

by Mark Bellingham

Being shot at by hunters is not the only hazard facing waterfowl; they also have to contend with the wasted lead shot fired into our lakes and waterways, as field director Mark Bellingham reports.

SPARE A THOUGHT for the ducks – not so much perhaps for those that were shot during the hunting season, but for the hundreds which will die from lead poisoning in the next few months.

Lead poisoning does not occur as a result of being shot by a hunter. In fact lead pellets in duck flesh are more of a problem to hunters who break their fillings on them or ruin the microwave oven.

No, ducks contract lead poisoning from eating lead shot pellets. Hunters are notorious for missing their targets, and the wasted shot invariably ends up in our wetlands. Waterfowl eat the lead shot, which they mistake for grit, seeds, molluscs and insects. They actively seek it out with their sensitive tongues amongst the finer sediments of lakes, swamps and estuaries. A mute swan in Denmark was found with 3,335 shot in its gizzard, the equivalent of about 15 shotgun cartridges. European and North American studies have shown that diving ducks are most likely to eat lead shot, followed by dabbling ducks and finally herbivorous and grazing species.

NZ's diving duck

In New Zealand our only wetland diving duck – the totally protected New Zealand scaup or black teal – may be similarly affected along with an array of other water birds. One scaup has been recorded with bone lead levels more than 20 times higher than those considered to be "abnormally high" by European wildlife experts. Swan deaths from lead pellet poisoning have been recorded on Lake Ellesmere since the 1950s. Mute swans, which overseas studies show are most susceptible to lead poisoning, have markedly declined on the lake.

When waterfowl eat lead shot, it goes down into their gizzard. Here it is ground down and dissolved by the stomach acids. The resulting toxic lead compounds are absorbed into the bloodstream and deposited in

Pukeko and the secretive banded rail are two species shown to be affected by lead poisoning.
Photos: Brian Chudleigh and Peter Reese

In the United States top predators such as eagles have picked up lead shot secondhand – by eating ducks. Research in New Zealand indicates that the same may be happening to harriers.
Photo: Brian Chudleigh

the liver, kidney and bones. Acute poisoning usually occurs when more than 10 shot are eaten and birds die within a few days, often with no obvious signs of poisoning or weight loss. More often, sub-acute poisoning occurs when birds eat far fewer shot and die 2-3 weeks later. Birds weakened by low levels of lead poisoning are more susceptible to predation, sickness and being shot.

If the effects of lead poisoning on humans are ghastly, they are no less so on waterfowl. The lead paralyses the gut muscles, effectively starving the bird. The nervous system degenerates, capillaries rupture, haemoglobin levels drop and anaemia sets in. The functioning of the liver, heart and other organs is disrupted. Bile builds up in the gut and stains the faeces green.

It is rare to see a mass die-off of lead-poisoned birds. Lead poisoning depends on the feeding habits and site conditions of different species and individual birds. Poisoned birds quietly seek cover, their wings droop and they have an unsteady gait. They usually die a solitary death and overseas studies show that they are quickly removed by predators.

Lead, however, is a very persistent poison. In North America predators have been dying from secondary poisoning. Since the 1960s this has accounted for about 500 of the endangered bald eagle, whose population numbers only 3000.

None of this is news to wildlife managers. In fact, way back in 1874 the news broke that ducks swallowed lead shot. A health officer in Galveston, Texas, seized two batches of ducks because it was feared the ducks had ingested too many lead pellets, making it a health hazard for humans to eat them. The subject has been intensively studied there in the United States and elsewhere for the past 30-40 years. US Fish and Wildlife Service scientists estimated in 1976 that up to 2.4 million wildfowl die each year as a direct result of eating lead shot.

Shot densities

Similar studies have gone on in Europe and New Zealand. In 1974 Wildlife Service scientist Tom Caithness documented lead poisoning in ducks on Manawatu's Lake Pukepuke. He found male mallards and swans were particularly affected. Some birds were found with over 200 shot pellets in their gizzard. At Pukepuke, shot densities were between 23,000-50,000 per hectare per season. With a long history of hunting this could represent an accumulation of 8 million shot per hectare.

A 1985 survey by the Wellington Acclimatisation Society on Lake Wairarapa and its adjacent wetlands showed that 450 hunters used the wetlands on 4800 hunter days per year. These hunters shot 6.8-8.5 tonnes of lead shot per year into the lake and wetlands.

In November-December last year, Dr Deborah Pain (a British expert on lead poisoning in wildfowl) held seminars at the ICBP and IOC bird conferences on the lead poisoning problem. Her advocacy has encouraged the New Zealand Fish and Game Council to investigate more fully the incidence of lead poisoning in New Zealand wildfowl.

The preliminary work by Tom Caithness and Bill Locke (Wallaceville Research Centre) indicated that scaup, mallard, Canada goose, pukeko and black swan were most susceptible. However it also suggested that rails and stilts are affected, and that harriers may be contracting secondary poisoning from eating lead-poisoned wildlife.

Skeet shooting also causes lead poisoning. Clay pigeon ranges often affect adjacent areas: in Scotland lead shot from skeet shooters poisoned vegetation on an adjacent moorland bog, and in Denmark, dairy cows have been poisoned by shot from a nearby skeet site. In Europe these have had lead shot densities of 20,000 per square metre!

The tragedy of lead poisoning of waterfowl is that it need not occur. Just as lead-free petrol, paints and waterpipes have been developed, so has lead-free shot. Steel and tungsten polymer shot has been used for almost two decades. Steel shot hunting areas were first introduced in some states in the United States in 1976 and this year a US-wide ban on lead shot comes into force. There are partial bans on lead shot in Canada and Denmark and many European hunting organisations have instituted voluntary lead shot bans.

Why not in New Zealand? Do we need to use lead shot? Obviously non-toxic alternatives to lead shot are available and with most of the North American hunting fraternity going over to steel shot, there is no shortage of supply. The wider use of steel shot has brought its price down to that of lead shot.

For some hunters the change over to steel shot may require them to spend $500-$1000 on a new gun barrel or they could continue using their existing shotguns with dearer tungsten polymer shot. However, in the overall budget of the average hunter, shotguns are not major expenses compared to clothing, maimai and consumables.

In 1979 the NZ Wildlife Service surveyed hunters in the Waikato's Whangamarino wetland. This survey shows that over the years the average hunter pursues his or her pastime, more than 80 percent of expenditure is on consumables (dog food, transport, food and ammunition), and only 4-5 percent is spent on a shotgun. For those hunters having to change guns or barrels, this one-off cost is not much more than their consumables for one season. For new hunters entering the sport, there would be no extra costs involved at all.

The solution to the problem lies with hunters and the Fish and Game Councils and their acceptance of the need to stop pouring lead into our wetland ecosystems, where it can be eaten by waterfowl. We took lead out of petrol to save ourselves; surely we can do the same for the birds.

New Zealand's only diving duck – the scaup – may be particularly susceptible to lead poisoning.
Photo: Peter Reese

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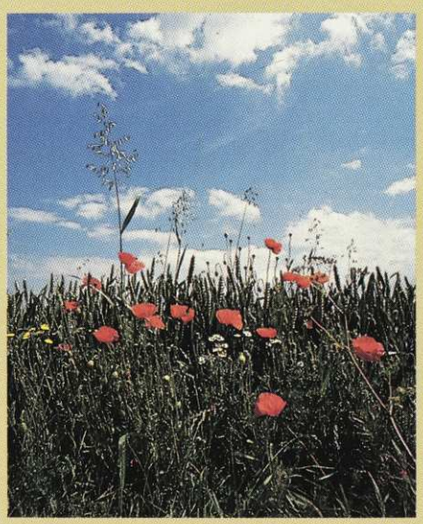

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When is dryland wetland?

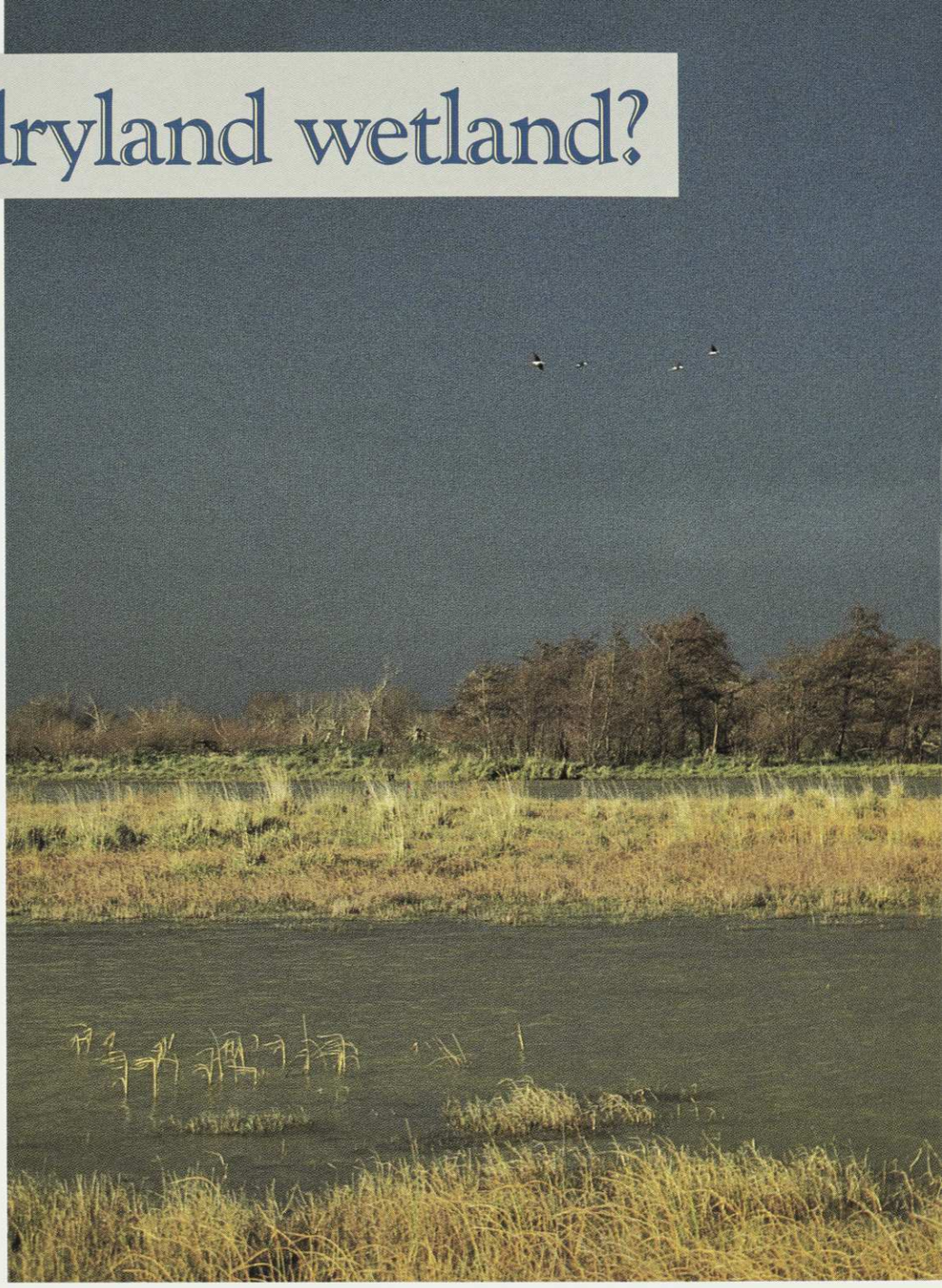
by Colin Ogle

IT IS NOT COMMONLY KNOWN that New Zealand has naturally occurring ephemeral (or temporary) wetlands, yet when wetlands appear from time to time in central Australia's dry basins, the event usually makes the news. For example, severe floods in eastern New South Wales and Queensland over the past two summers created rivers which drained to the west to form vast inland wetlands. Desert depressions, named as "lakes" on the maps of Australia (the largest being Lake Eyre) suddenly conformed to their map identities. Resident plants and animals flourished, after surviving in a dormant state sometimes for years. Mobile water fowl and waders soon made use of the ephemeral habitats, especially for massed breeding on islands and margins of "new" lakes.

In New Zealand we are all used to seeing birds in temporarily flooded pastures and sportsfields, but these habitats, the result of human activities, are mostly used by adaptable species like mallard duck, gulls, white-faced heron, and pied stilt, while *natural* ephemeral wetlands, the main subject of this article, are used by highly specialised plants and animals.

Ephemeral wetlands are often the habitat (and sometimes the only habitat) of highly specialised indigenous plants and animals. Like their often more extensive Australian counterparts, our natural ephemeral wetlands can be alternately wet and dry every year, or may remain either wet or dry for several years in succession. Some are places which lacked trees even when the surrounding land was clothed in forest, and they remain to this day as island refuges for non-forest species, often encircled now by a sea of developed land. For biogeography (the study of species' distribution patterns, leading to an understanding of past geological events and climates), they can be of immense value.

A Sebaea ovata *plant about 12cm tall in a dune hollow near Wanganui. This plant is close to extinction.*



Although I use the term 'ephemeral' to describe such wetlands, other authors have used terms such as temporary or seasonal.

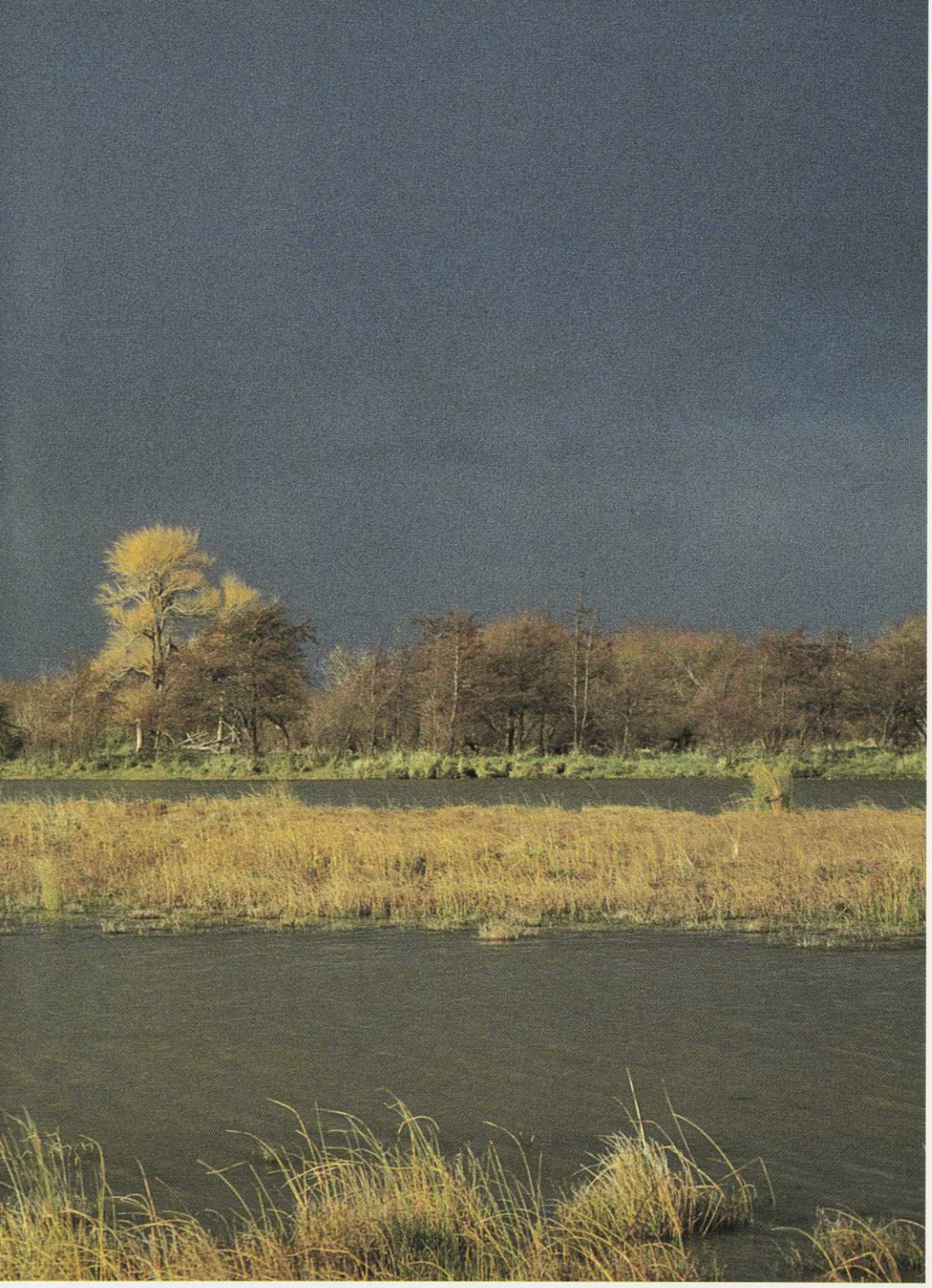
There are many types of ephemeral wetlands because they are geographically widespread and occur on a wide range of landforms, and in various climatic zones. Many are small in area, and hence are subject to heavy pressure and modification from surrounding land uses. Domestic stock, wild animals, weeds and vehicles are a few of the modifying agents. The following wetlands are chosen to illustrate their diversity, their special features, and some of the problems for their conservation.

Ephemeral dune wetlands

In January 1989 I was one of a group of botanists who discovered a native gentian relative, *Sebaea ovata*, in a dry dune hollow at the Whangaehu River mouth, near Wanganui. The species had not been reported in New Zealand for 17 years. Why did it remain here after disappearing from a string of locations between Hokianga and Lake Ellesmere over the past 150 years? I believe the answer lies in the annual cycle of wet and dry conditions of the dune hollow.

Between July and December in 1989 sheets of shallow water lay over the low, flat surfaces, or in channels on uneven ground. Black-fronted dotterel and spur-winged plover waded and dabbled in the shallow waters. From January to June the parallel dune hollows (dune slacks) were surface-dry, though they support many indigenous plants that indicate a continuing high water table: the shrub *Coprosma propinqua*, cabbage tree, toetoe, sand gunnera, a minute sedge *Isolepis basilaris*, jointed wire rush (*Leptocarpus similis*), two small milfoil species (*Myriophyllum pedunculatum* and *M. votschii*), New Zealand flax, lady's tress orchid (*Spiranthes sinensis*), two tiny herbs of the foxglove family, *Limosella lineata*, and an unnamed *Mazus* sp, and others.

Thus, for half the year the Whangaehu dune hollows are undoubted wetlands; for the other half of the year most observers would describe them as dryland. In all sea-



The eastern shore of Lake Wairarapa in mid-winter. The areas of water are seasonally dry and provide extensive habitat for wading birds and wetland turf plants. All photos Colin Ogle

sons, however, the hollows have a high water table and this determines the ecological character of the community.

Periodic flooding not only provides for wetland plants and fauna, it also suppresses weeds. Relatively few adventive species seem to cope with the alternate wet/dry nature of the habitat. *Sebaea ovata* is an annual plant which needs damp, bare ground for seed establishment every year, but dry ground for growth and flowering. The periodically wet and dry hollows near the Whangaehu River mouth happen to provide these needs. Threatened plants scientist David Given of DSIR Land Resources, rates the plant as a nationally endangered species.

DSIR botanist Alan Esler described similar plant communities near Himatangi on the Manawatu coast in 1969. I saw these dune hollows with him in the same year, but the area is now almost unrecognisable through the spread of pampas grass, Yorkshire fog, strawberry clover and other weeds. The natural character may have deteriorated because the water table has dropped, so that the periodically wet areas are no longer inundated as deeply or for as long. In the same period, however, there was also oversowing of pasture plants, and fertiliser was applied. About six years ago the dune hollows were mown and "hay"-bales were made of jointed wire rush!

Further south, between stabilised dunes in Queen Elizabeth Park near Paekakariki, there are ephemeral wetlands surrounded by pasture. They contain regional rarities like tall spike-rush *(Eleocharis sphacelata)* in its closest occurrence to Wellington, tumble grass (*Lachnagrostis filiformis*) and *Gratiola sexdentata*, a small creeping herb with 12mm tubular flowers. When wet, the area is used by waterfowl, including New Zealand shoveler and black swan, and also by dabchick, pukeko, white-faced heron, and shags. After the area was fenced off from grazing in 1982, the native grass *Amphibromus fluitans* was found. David Given lists this species as having a nationally 'vulnerable' status. Although *Amphibromus* exists in only a few places, nearly all are ephemeral wetlands such as those, discussed below, in the Kaimanawa Mountains and at Lake Wairarapa.

Recent problems in protecting wetlands in Queen Elizabeth Park have arisen mostly from peoples' different perceptions of ephemeral wetlands. These wetlands had been identified for protection from grazing in the 1982 Management Plan for the Park but after the Queen Elizabeth Park Board came under the control of Kapiti Borough Council in 1984, the fence was used to keep cattle and sheep in the wetland, and horse trialling and cross-country motor cycle racing were permitted when the wetland was dry. Appeals to the Board over five years by members of conservation groups and, more recently, by staff of the Department of Conservation and Botany Division DSIR, obtained a respite from horses and motor cycles, but not from grazing.

Progressive drying out of the wetlands seems to have coincided with the laying of Wellington's natural gas pipeline along the eastern edge of the wetlands in 1984. Clearing drains in other parts of the Park and nearby land may have had effects on the water table but these are unknown. The impact of a well which was installed close to the wetland in 1976 is hotly disputed. The Park's Management Plan specified that the wetland's natural values should be protected, but the means of achieving this were not addressed. Weed invasion is so severe now that restoration of the wetland's natural character may be very difficult.

Ephemeral wetlands of mountainlands

Many of our most important ephemeral wetlands are in mountain country. Perhaps this is because such areas have been less modified than lowlands by human activities, or because trees tend to occupy non-forested, low altitude wetlands quite rapidly. In the second case, long-term habitats for species needing ephemeral wetlands would arise only under peculiar conditions, such as on saline soils or where new open sites such as dune hollows are being created over time.

Karst (limestone) country in mountain areas has some very significant ephemeral wetlands, created by a combination of gentle slopes, good drainage and high rainfall. Such temporary wetlands usually have hard, sandy or silty substrates with little or no organic soil or peat, because peat accumulation leads to permanent wetlands (usually bogs and tarns). In a sea of red tussock in the north-west Ruahine Range is a mosaic of temporarily wet hollows and also permanent peaty pools, the Makirikiri Tarns, which overlie limestone. The hollows support mats of short stature 'turf' plants, and almost every hollow is floristically different; a 10cm tufted sedge, *Carex rubicunda* dominating one, and creeping herbs such as *Tetrachondra hamiltonii* or *Hypsela rivalis* dominating others.

During rain, all the hollows fill with water. Some dry out quite quickly as water drains into the subterranean streams, but others take days or weeks, and some pools remain as permanent water. Vegetation differences probably relate closely to water regimes, but may also result from small differences in substrate, or even from competition between the first plants to arrive and later arrivals which cannot establish in the dense turf. Drier hollows have been invaded recently by mouse-

ear hawkweed (*Hieracium pilosella*) which could be a serious competitor with native species. Dr Geoff Rogers, of Forest Research Institute (FRI) at Rotorua, reports that *Acaena rorida*, a bidibidi species of these hollows which is endemic to the north-west Ruahines, is seriously threatened by hawkweed. This bidibidi is rated as 'rare' by David Given.

After many years without livestock, land around Makirikiri has been recently grazed by cattle. Physical damage by cattle hooves opening the turf also assists the entry of weeds, such as hawkweeds and pasture grasses. Dr Gillian Rapson of Massey University describes (pers. comm.) similar impacts of cattle in string bogs and associated ephemeral wetlands of the Lammerlaw Range in Otago.

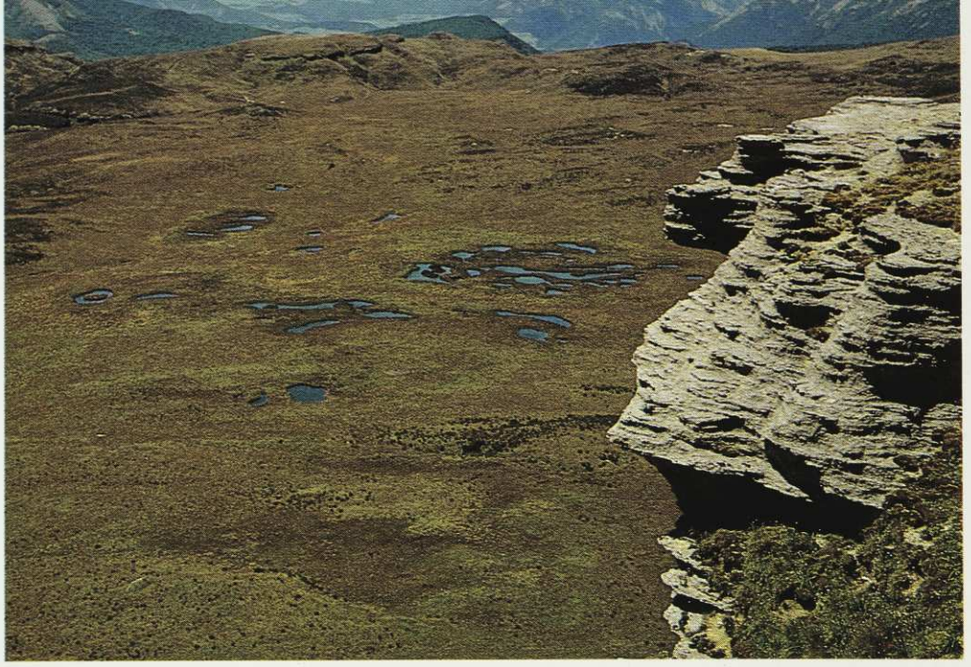
A very similar situation occurs around the highest parts of the Maungaharuru and Te Waka Ranges in inland Hawkes Bay. Turf mats on hard substrates resist the trampling of cattle, sheep and goats which graze the surrounding pasture (at over 1,800m altitude). Soft-bottomed, seasonally wet areas are badly trampled and adventive plants (for example jointed rush, *Isolepis setacea*, and *Carex ovalis*) have invaded them. Searches in 1989 and 1990 failed to re-find a New Zealand endemic asphodel, *Iphigenia novae-zelandiae*, on Te Waka Range, the site of its only North Island record.

Wild animals can also have considerable impacts on wetlands. For example, in periodically wet areas of the Moawhango River, southern Kaimanawa Ranges, wild horses are modifying the habitat of nationally threatened plants. On-going research by Geoff Rogers has already shown that the present high numbers of horses are incompatible with the conservation of the diverse native flora of these wetlands. One remarkable site on the shoulder of a ridge above Awapatu Stream can be empty or full of water at any time of the year because its water comes from the overflowing of an adjoining creek. Plants at risk there include *Gnaphalium ensifer* in its only North Island site, and *Amphibromus fluitans*. Ironically, the horses are protected under the Wildlife Act but the threatened native plants have no formal protection.

The majority of the southern Kaimanawa wetlands are "flushes" in tussockland – permanently damp areas which have trickling surface water during wet weather. *Carex berggrenii* occurs only here in the North Island. Both the buttercup *Ranunculus recens* (brown hairy form) and a fine-leaved, small sedge, *Carex uncifolia* are here and in only one other North Island site each. The original population of the latter plant was wiped out during road construction by the army. Fortunately, it had been taken into cultivation by botanist Tony Druce, from whom Geoff Rogers obtained material to replant it recently in several places with similar habitat nearby.

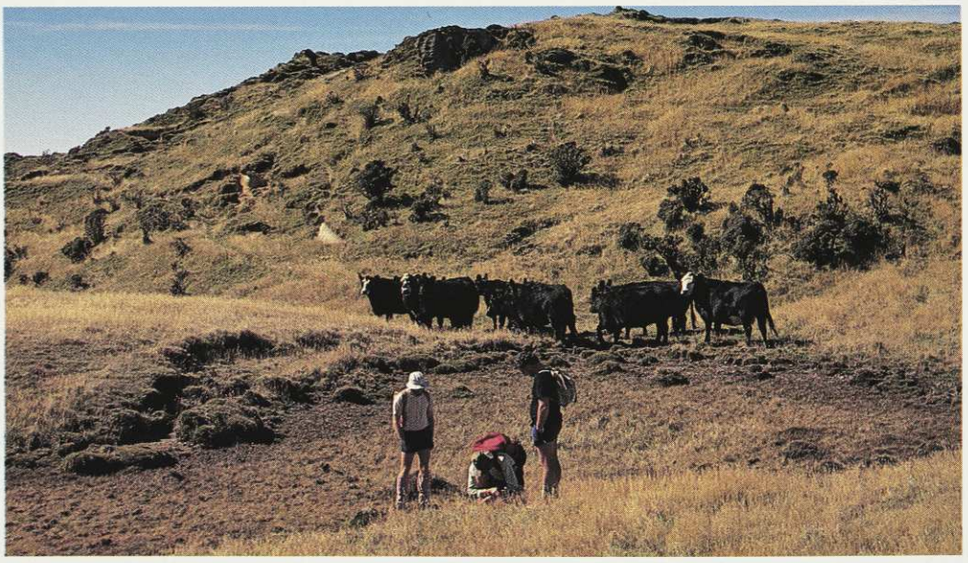
Ephemeral saline wetlands

The Protected Natural Areas (PNA) programme was set up to identify and protect the best remaining examples of all types of natural area in each ecological district. However, PNA surveys have sometimes failed to recognise that ephemeral wetlands exist as, for example, ephemeral saline wetlands in Old Man Ecological District.



Makirikiri Tarns from Te Rakaunuiokura, north-west Ruahine Range. Surrounded by red tussock, some of these pools have permanent water, but others dry out for different lengths of time, creating habitats for a wide range of native plants.

Inland saline areas of Central Otago were comprehensively surveyed and described by Department of Conservation (DoC) scientist Brian Patrick in 1989. A subsequent article in *Forest & Bird* (February 1990) gave some of the highlights. Although these areas have some similarities in flora and fauna to coastal salt marshes, long periods of isolation from the coast have produced unique ecosystems with endemic biota. Agriculture has eliminated many sites, and adventive plants are invading those that remain. Brian Patrick makes a strong plea for the conservation of remaining saline areas, but he stresses the need for management to retain or restore their natural character. One area of 125 hectares, including Sutton Salt Lake, has been purchased recently as a reserve by DoC.



Cattle in an ephemeral wetland on the crest of the Maungaharuru Range, inland Hawkes Bay. Iphigenia novae-zelandiae, *in its only North Island location, was in a similar site in the adjoining Te Waka Range some years ago but could not be found in two recent surveys. Some other uncommon species remain, despite cattle trampling.*

Ephemeral wetlands of lake shores

Other types of ephemeral wetlands can be found on lake shores, such as DoC scientists Peter Moore, Kevin Moynihan and I described for Lake Wairarapa in 1984. On the eastern shore of Lake Wairarapa, sand dune formation has isolated parts of the lake bed, and produced quite different habitats from the lake shore itself. One example is Boggy Pond Reserve, a wetland isolated by stopbanks. The Reserve comprises a large pond and several shallow basins which become discrete ephemeral wetlands when water levels drop. One of these basins we dubbed "Wader Pond" in 1983 because, as water levels dropped in January, Peter Moore found it was used regularly by pied stilt, banded dotterel, white-faced heron, sharp-tailed sandpiper, pectoral sandpiper, and, less often, wrybill and lesser yellowlegs.

By March, Wader Pond was dry and the native turf plant community was found to contain an aquatic fern called pillwort (*Pilularia novae-zelandiae*), and again that characteristic grass of ephemeral wetlands, *Amphibromus fluitans*.

Shortly after, gamebird managers cut through the stopbank to allow water from an adjoining reserve, Matthews Lagoon, to "top-up" Boggy Pond. Matthews Lagoon received

water pumped from nearby farmland at that time, and its water level fluctuated less than in Boggy Pond. Its water would also have been more nutrient-rich, and certainly the raupo and willows of Boggy Pond are now more similar in size and vigour to those of Matthews Lagoon. Sedges which thrive in high nutrient waters, such as the tall summer-green *Bolboschoneus fluviatilis*, soft grassy *Carex maorica* and tall spike rush were in Matthews Lagoon only, but in March 1989 I found a bed of *B. fluviatilis* on the edge of Wader Pond nearest the cut in the stopbank. Introduced Mercer grass now appears to be spreading in the habitat of the native *Amphibromus*, and pillwort has not been seen for several years. A range of wading birds such as seen in 1983 has not been seen since.

The end result of this attempt to enhance Boggy Pond for waterfowl shooting was a loss of wetland diversity; Boggy Pond became more like Matthews Lagoon in both its water regime and water quality and, as a result, in its flora and vegetation.

The shores of some inland lakes of Canterbury and Otago are similar to those at Lake Wairarapa. The only South Island record of *Amphibromus fluitans* was on the shore of Lake Tekapo in 1935, before the lake was raised for electricity generation.

Ephemeral wetlands on glacial debris

Moraines and outwash gravel surfaces resulting from glaciation contain yet other types of ephemeral wetlands. These deserve more specific survey and recognition than they have received in the parts of the PNA programme. The 1984 PNA survey report on Mackenzie Ecological Region called these "kettlehole tarns", or simply "tarns" and identified them almost entirely as waterbird habitat, especially for black stilts. Where their ephemeral character was mentioned at all, the seasonal absence of water was, by implication, a blemish on their biological importance. However, native turf communities on the tarn beds are distinctive enough to warrant protection, with or without bird usage.

Ephemeral wetlands on pumice

Central North Island "frost flats" can contain ephemeral wetlands, but they show why it can be difficult to classify communities as "wetland" or "dryland". The few frost flats that have native vegetation remaining after extensive exotic pine plantings and pastoral farming are characteristically covered by low heath scrub or short tussocks. Native forest species are absent, or are very slow to occupy the sites for a number of reasons.

The micro-climate of the broad flats or basin-shaped surfaces is frosty because of cold air ponding, the areas are drought-prone and have a history of fires, and the soils are often of low fertility. Although Taupo pumice in the soil is excessively free-draining, other less permeable tephra deposits and buried soils can impede drainage for shorter or longer periods. Areas with hard tussock and monoao (*Dracophyllum subulatum*), which are wet underfoot only during heavy rain, seem to be undoubted drylands, but these grade into progressively wetter areas with wetland species such as the sedges *Schoenus pauciflorus* and *Baumea* spp., tanglefern (*Gleichenia dicarpa*), a shrub daisy *Olearia virgata*, and bog pine. Between these extremes of dry and wet sites are those which are wet for some weeks or months – the truly ephemeral wetlands.

Mark Smale of FRI has recently pointed out that the natural character of frost flats is threatened by the spread of lodgepole pine (*Pinus contorta*) and mouse-ear hawkweed. In similar habitats in Tongariro Forest, heather (*Calluna vulgaris*) is another invader.

An ephemeral wetland on a terrace above Awapatu River, a tributary of the upper Moawhango River. Amphibromus fluitans *occurs here, and it is also the only North Island site for* Gnaphalium ensifer.

Conservation needs

Identification: People do not generally appreciate the ecological importance and distinctiveness of ephemeral wetlands, their national rarity, their great range of types, their dynamic nature and their vulnerability to disturbance. Even PNA survey has sometimes failed to identify them or at least to distinguish their special qualities.

Nature conservation tends to fare badly in competing interests for use of wetlands, and especially of those that are not permanently wet. The important first step in the conservation of ephemeral wetlands is to recognise their existence. This should be followed by recording their flora and fauna, in all seasons, and mapping to achieve an understanding of what changes are happening. Their dynamics can be better appreciated by study of earlier maps and aerial photographs, and talking with landowners and others with long-term local knowledge.

Management: In the past, formal reservation of ephemeral wetlands has not always led to their protection. No attempt should be made to "improve" an ephemeral wetland which has natural values until the possible consequences of change have been considered. Biologists from a range of disciplines should be consulted, as well as people with local knowledge. A primary aim of wetland management should be to retain and, where necessary, enhance, natural diversity. This applies as much to ephemeral wetlands as other types.

It must be understood that there are risks in deliberately modifying a wetland. As an example, disturbance of the native vegetation and substrate by livestock or vehicles allows the entry of weeds. Once weeds are established it can be very difficult to eradicate them, and restoration of the natural condition is likely to require much more than merely fencing to exclude animals or vehicles. In certain circumstances, controlled grazing may be necessary to suppress weed growth. Carefully designed experiments and monitoring should be part of every attempt to manage disturbed wetlands, and the results made widely known to wetland managers.

*Ephemeral pond, Boggy Pond Reserve, Lake Wairarapa. The area is the habitat of the regionally uncommon plants such as the pillwort (*Pilularia novae-zealandiae*) and* Pratia perpusilla*; and temporary habitat for wading birds when water is shallow, including rare migratory species such as lesser yellowlegs and pectoral sandpiper, and the endemic wrybill.*

Acknowledgements

My special thanks to Tony Druce and Geoff Rogers for field discussions in many of the sites discussed above, and for their valuable comments on a draft of this script. My thanks also to others who commented on the script, including Department of Conservation staff Brian Patrick, Susan Timmins, Don Ravine, Hugh Robertson and Jan Heine.

Colin Ogle is a botanist and conservancy advisory scientist with the Department of Conservation in Wanganui.

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With these shower heads it is possible to attain flow rates of less than two litres per minute. Most people will however find that a minimum flow rate of between two and three litres per minute is necessary for pleasant showering.

In the staff member's case, the actual flow rate when installed was found to be less than the quoted flow rate.

Because these shower heads reduce flow rates, back pressure problems may occur when they are fitted to unequal pressure plumbing systems. This problem can be corrected by modifying the plumbing system to ensure equal hot and cold pressures at the showerhead, or using an appropriate shower head.

*Assumes: 16 degrees Celsius inlet, 60 degrees hot water, 1:1 mix ratio for 38 degree shower, one shower per person per day per year, 8.54 cents kWh.

For further information please contact:

Christopher Turbott
Energy Management
Ministry of Commerce
PO Box 4218, Auckland

or Telephone (09) 775 328

Energy Management

Forest and Bird AGM and Council Meeting

Forest and Bird's 68th AGM and council meeting were held in Wellington on June 22.

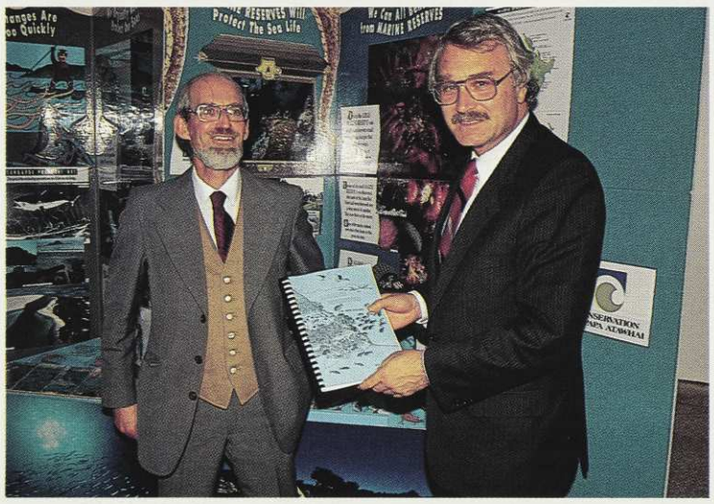
Three new executive members were elected. They were Bill Gilbertson (West Coast), Sandra Te Hakamatua Lee (Waiheke Island) and Craig Potton (Nelson).

Old Blue awards were presented to Ken and Nina Spencer, and Ruth Mander, from Tauranga, Eric Geddes from North Shore, Ken Mason from Otago and Theo Simeonidis from the NZ Federation of Freshwater Anglers.

Former President Dr Alan Mark was created a distinguished life member of the Society.

President Gordon Ell farewelled editor Gerard Hutching, congratulating him on his efforts in maintaining the standard of the Society's publications over the years.

Marine biologist Dr Bill Ballantine delivered the Sanderson Memorial Address, using the opportunity to launch his new book *Marine Reserves for New Zealand*, which has been sponsored by the Royal Forest and Bird Protection Society.



Dr Bill Ballantine presenting a copy of his new book Marine Reserves for New Zealand, *which the Society co-sponsored, to President Gordon Ell.*

Subscription rates – no change

Some of the best news to come out of the Society's Council meeting was that there will be no increase in the Society's subscription rate.

Considering that your subscription helps employ around 20 staff, funds a host of conservation campaigns and provides you with four of these beautiful magazines a year – in that light the subscription price is an excellent investment.

Waikato Branch conservation grant 1991/92

Applications are invited for a $3,500 grant to support a conservation project during the summer of 1991/92. There is no restriction on the type of project as long as it helps protect NZ's plants and animals, though relevance to the Waikato/Coromandel area would be an advantage. Acceptable proposals would include fencing bush, acting as a wildlife warden, research on a conservation topic, an education or journalistic project.

Each applicant should set out the aim of the proposal, an outline of how it will be carried out, estimated cost, other sources of revenue, evidence of ability and two referees.

Applications should be sent to Forest and Bird, Waikato Branch, PO Box 11-092, Hamiton.

Canterbury Branch Stocker Scholarship Grants

APPLICATIONS are invited from individuals or groups for a grant for a conservation project over the 1992 year.

The research or project undertaken must have special reference to the needs of South Island and further to objects of the Royal Forest and Bird Protection Society, as stated in the Society's constitution.

The results of the research or project shall be communicated widely and as relevantly as possible.

A total of $3,500 is available and at the sole discretion of the trustees, this may be awarded in whole or part to one or more applicants, or held over for a subsequent year.

Applications should be sent to: Forest and Bird, Canterbury Branch, PO Box 2389, Christchurch.

Errata

ON PAGE 40 of the May *Forest & Bird* (Protecting an Icon), the captions for the bottom two photos were transposed.

An article on bird re-locations in the August 1990 issue (page 28) stated that Antipodes Island kakariki had been predated by tuatara. In fact, the kakariki preyed on the tuatara.

Peter Hooper 1925-1991

AFTER ALMOST 25 YEARS of visiting the Coast I have great difficulty in separating the man, Peter Hooper, from the place, the West Coast.

The deep philosophical calm of Peter and the dramatic beauty of the region he deliberately chose as his seem in perfect harmony. To arrive at his dwelling, be it at one of the Paroa properties he was to occupy or up the Grey Valley at Ahaura, was to be admitted into the life of one who lived the solitude of books and writing and thought, and yet loved people deeply too.

In so many ways he was a contrast to what the Coaster is popularly seen as – a man of deliberation rather than action, a peacemaker rather than a confrontationist, a man of gentleness, intuition and originality and a great lover of nature. He was not without considerable courage and independence and pursued his own beliefs, particularly about conservation, long before it was fashionable. Because of his style, his example, he won over far more converts both as a teacher and exemplar, than perhaps he realised.

He was a man of great lyrical gift. In his quietly appreciated but never fully acknowledged forest trilogy, *Song of the Forest, People of the Long Water* and *Time and the Forest*, he created the wonderful world of the boy who became a spiritual leader.

In his most political work, *Our Forests, Ourselves*, he spoke of how so often all we see of the forest is what we view from a car – and how different it all is once we enter it on foot. That in some ways sums him up – he never took something at face value but always chose the most deliberate route, achieving wisdom on the way.

I have a sense that somewhere out in the Westland bush right now, a great rata is in untimely full florescence. Peter, it was a privilege to know you and I thank you for the opportunity.

David Young

I walk out into the winter night
to find again, if only for some moments,
a broader margin to my thoughts.
And suddenly the weather of my mind
veers sou'sou'west, I inhale a sharp delight.

Fierce air and a few glittering stars –
an old memory wakes of such a night
moving to love, the earth alive
and singing in me, pure and clear
my thought as your philosopher's pond.
New-found companion of my lonely walks
interpreter of my unproved ideals,
how readily it seemed you might direct
as honestly and plainly as your axe
hewed timbers for your hut, my 'prentice dreams.
The gold moon slipped her moorings on the hill
the air divided to the morepork's call.
In a boy's mind held
gold disk and bird had power
to cherish the innocent world.
In thirty years,
the moon long drowned in blood, the morepork calls
only the names of the lost from the wounded hill.

From *Homage to Thoreau*, by Peter Hooper

JOIN FOREST AND BIRD

We need your support and the support of your friends to fight for New Zealand's natural heritage.

Being a member of the society means being a part of New Zealand's most effective conservation lobby.

You can be active in conservation campaigns . . . join others in national or local trips and walks . . . or simply take pleasure in knowing you are playing an important role in helping to preserve our priceless natural heritage.

And of course, you receive 4 copies a year of *Forest & Bird,* the Society's superb natural history magazine.

JOIN A FRIEND

We need your friends and relatives to join Forest & Bird.
Show them through *Forest & Bird* magazine the wonder of our natural heritage and why it should be protected.

Our key campaigns for the future are:
• Private forest clearance • A network of marine reserves • High country tussocklands • South Pacific rainforests • Ozone layer • Antarctica • Climate change • Fisheries • Pollution

FOREST & BIRD –
working together for our natural heritage

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☐ Yes,I want to join! Please enter a membership in the category checked below.

Name: _____

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GIFT MEMBERSHIP: If you are giving this membership as a gift, please enter *your* name and address *below:*

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Address: _____

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GIFT MEMBERSHIPS will be sent with a special gift card in your name.

☐ Please tick if you would like to be billed for renewal of this gift membership next year.

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	1991/92
☐ Family ☐ Single ☐ Group	$40.00
☐ Senior (single) ☐ Senior (family)	$30.00
☐ Student, Schools and libraries	$25.00
☐ Corporate	$275.00
☐ Life	$475.00

Send your cheque to: THE SECRETARY
ROYAL FOREST AND BIRD PROTECTION
SOCIETY, P.O.BOX 631 WELLINGTON

Kiwi Conservation Club (separate newsletter)	1991/92
☐ Single	$10.00
☐ Family, Schools and Groups	$20.00

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☐ Senior (single) ☐ Senior (family)	$30.00
☐ Student, Schools and libraries	$25.00
☐ Corporate	$275.00
☐ Life	$475.00

Send your cheque to: THE SECRETARY
ROYAL FOREST AND BIRD PROTECTION
SOCIETY, P.O.BOX 631 WELLINGTON

Kiwi Conservation Club (separate newsletter)	1991/92
☐ Single	$10.00
☐ Family, Schools and Groups	$20.00

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The membership manager
Youth Hostels Association
P.O. Box 436
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Set in magnificent parklike surroundings offers unique and idyllic facilities for your holiday camp or group conference.
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Enquiries welcome.

Ph Carolyn McLellan (Chairperson Board of Trustees) (0525) 48-132, Geoff Scrimgeour (Acting Principal) (0524) 48-209 evenings; Ross Allan (Treasurer Board of Trustees (0524) 48-274 evenings.

Coromandel Cottage

Accommodation on 100 acre farm, idyllic location, bush and river, shorter or longer walks. 15 bunks. $12 per night. Just bring bedding and food. Honey and eggs available. Write to 309 Honey, RD1, Whitianga or ph (0843) 65151.

Energy Efficient Lamps

Help the environment – and your power bill!
Buy ultra longlife lamps imported direct from Europe.
11 watt (equivalent to 60 watt incandescent)
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$45 each + $4.50 postage and packaging
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Make cheque out to Energy Management Services, PO Box 3195, Wellington. Ph (04) 757-356.
Send SAE for information brochure or see November issue.

RUAPEHU COTTAGE AND HOMESTAY

Skiing and Family Holidays

Comfortable cottage for 6-8 with excellent facilities, or homestay in the house, in beautiful, peaceful surroundings at Horopito, 2km off S.H.4, half way between Auckland and Wellington, 16 km both Ohakune and Raetihi. The 3.2 hectares on the boundary of Tongariro National Park includes bush, streams, pond and magnificent view of Mt Ruapehu. Perfect location for family, tramping and adventure holidays, skiing or just relaxing. For leaflet and bookings contact Conon and Jackie Fraser, Matapuna Rd, Horopito, RD6 Raetihi. Tel: (0658) 54495.

Kermadecs

Your chance to visit the Kermadec Group – NZ's latest marine reserve.
The 70' M.V. Valkyrie will be departing Auckland late October '91 for a 10-day guided visit to this unique island group 400 miles NE of NZ.
For further information contact Blue Water Charters Ltd RD 4 Kaitaia or Ph Andries (09) 408 0622

Firth of Thames

29 December 1991 – 6 January 1992

SPEND CHRISTMAS with your family in the North and New Year with Forest and Bird at Waharau.

Field trips (to be confirmed) include:
- Waikato wetlands
- Auckland's west coast
- An island in the Gulf
- Bush walks and Miranda waders

Plus – evening activities (guest speakers, hot pool, night walk).

Venue: Waharau Educational Camp (near Miranda)

Families Welcome

Organised by Central Auckland Branch

Enquiries: send 3 x 45c stamps and address to: Summer Camp, PO Box 1118, Auckland, or phone Jan or Peter Riddick (09) 524-2229

ALPINE WALKING
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Alpine Recreation Canterbury Ltd
P.O. Box 75, Lake Tekapo
Phone: (05056) 736, Fax: (05056) 765
From 3 Aug '91: Ph: (03) 680-6736, Fax: (03) 680-6765

Catlins Wildlife Trackers

The Catlins is off the usual track, rich in wildlife, scenery and history. Two day small group tours from Dunedin are run by conservationists Fergus and Mary Sutherland. See rare wildlife including penguins and seals. Experience genuine southern hospitality at a home with a magnificent view. Equipment for snorkelling, wildlife observation and boating provided. For information and bookings: Catlins Wildlife Trackers, PO Box 2192, Dunedin. Ph (03) 4552 681

Vacancy Wilderness Couple

Lake Moeraki Wilderness Lodge near Haast has a vacancy for an energetic couple who love the outdoors, meeting people, have experience in tourism and a knowledge of NZ natural history.

We require a receptionist with word processing skills who can also assist in our restaurant, accommodation and guiding work. We also require a handyperson/guide also able to help in our restaurant/hotel. The work is well paid and includes cottage accommodation. The job commences early October for a minimum of 8 months and would ideally suit a couple with no dependents who want experience in nature tourism and don't mind remote living.

For further details contact Dr Gerry McSweeney, Lake Moeraki Wilderness Lodge, Private Bag, Hokitika, Fax (0288) 32-882; (0288) 32-881.

Tui Chorus

You are invited to take a comfortable one hour hill walk to discover Wairarapa's Hidden Lakes, to enjoy the flowering kowhai trees and to experience the tui chorus. The Lakes farm is open to the public on September 21, 22, 28, 29 and October 5 and 6, and is found 14 kms north of Masterton at Kopuaranga.
Adults $2, children 50c.
Phone: (059) 25-829

FOUR DAY GUIDED WALK

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Close to beach – Kina Peninsula, Tasman Bay, Nelson. Elevated sunny peaceful farmlet with view to inlet and mountains. Environment friendly.
Tel: (03) 526-6846, or R Taylor, Private Bag, Tasman Bay, Nelson.

FOR SALE BUSH BLOCK 63 ACRES

Near Raglan, adjoins Pakoka Scenic Reserve and Pakoka River. Easy access (vehicle or boat), sunny building sites, views of Mt Karioi and Aotea Harbour. Majority of block covered by QEII Open Space covenant. $42,000.

Contact Ian Crilby, RD 5 Hamilton, Ph (07) 825-9914.

CHRISTMAS IN NEPAL

YOU ARE INVITED FOR CHRISTMAS DINNER AT THE BEAUTIFUL FISH TAIL LODGE IN POKHARA:

...VIEW DAWN OVER THE HIMALAYA
...PHOTOGRAPH RHINO FROM YOUR ELEPHANT
...TREK THE TRAILS OF NEPAL
...VISIT LOVELY VILLAGES BENEATH ANNAPURNA
...AND MUCH, MUCH MORE, INCLUDING 3 DAYS IN HONG KONG.

Join a small group for this unique Christmas experience, personally constructed by Diane McKinnon.

Suitable for most age-groups, and accompanied by Diane, whose intimate knowledge of Nepal will ensure cultural insights and experiences not available to the independent traveller.

26 DAYS, FROM 14 DECEMBER TO 8 JANUARY.

Diane McKinnon Footprints
39 Iwa Road, Nelson.
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Fax: 0-3-548 9668

Details of personally accompanied treks in the Everest, Annapurna and Manaslu regions in 1991-92 also available.

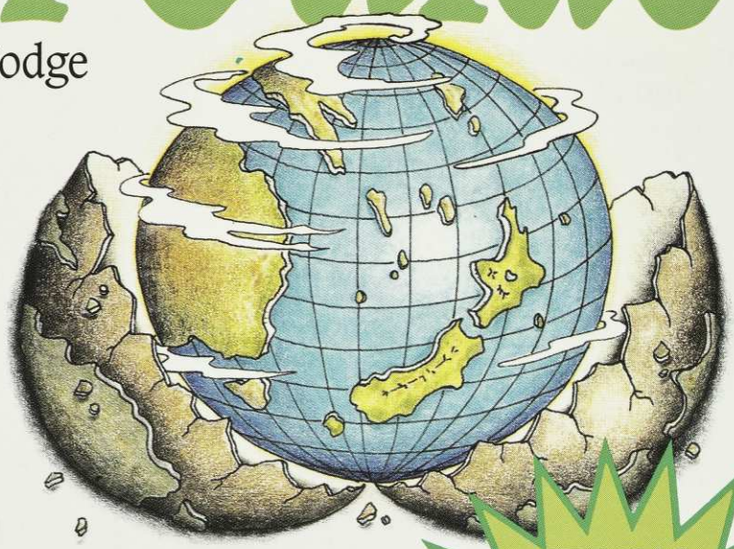
FOOTPRINTS
QUALITY TOURS ARRANGED BY DIANE MCKINNON

SPECIAL OFFER

TO FOREST AND BIRD MEMBERS!

The New Zealand Green Guide

by Peter Davis and Judith Hodge



This long awaited publication provides you with the most up-to-date information on how to lead an environmentally friendly lifestyle. Topics covered include:

- Personal Health
- Good Food
- Making More of Your Garden
- Sustainable Farming
- Stopping the Greenhouse Effect - Energy and Transport
- Health Before Wealth - Business and the Environment
- Environmentally Friendly Leisure
- Shopping
- Self Empowering

Author Peter Davis is an environmental consultant with Eco-logic with a background in organic gardening, naturopathy and green politics. Judith Hodge is a journalist specialising in health.

SPECIAL OFFER TO MEMBERS $19.95 (retail price is $24.95)

ENDORSED BY FOREST AND BIRD

The New Zealand Green Guide

Please send me _____ copies of *The New Zealand Green Guide* @ $19.95 each, plus postage and packaging $2.00 each.

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My cheque enclosed $_____ or

☐ Visa ☐ Bankcard

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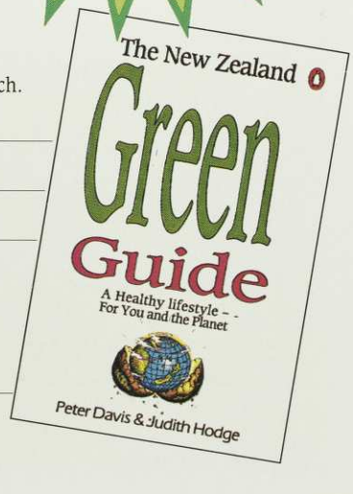
Please send orders to Forest and Bird Mail Order, PO Box 631, Wellington.



The Kiwi Conservation Club
A Growing Movement

What gift can you give to a child that's fun, educational, doesn't need batteries or doesn't break after the first week?

There aren't many today, but a gift membership to the Kiwi Conservation Club is one. The KCC is a Forest and Bird initiative for children from 5 years and older that encourages them to take part in practical, positive conservation activities.

• Positive •

With problems such as driftnet fishing, global warming and the hole in the ozone layer, it's easy for children to become worried about the future of their planet. Through the KCC they learn that by taking personal action they can make a difference.

• Active •

All over New Zealand KCC members meet regularly to take part in walks to the coast and bush, replanting projects, raising money for endangered species and taking part in conservation activity days.

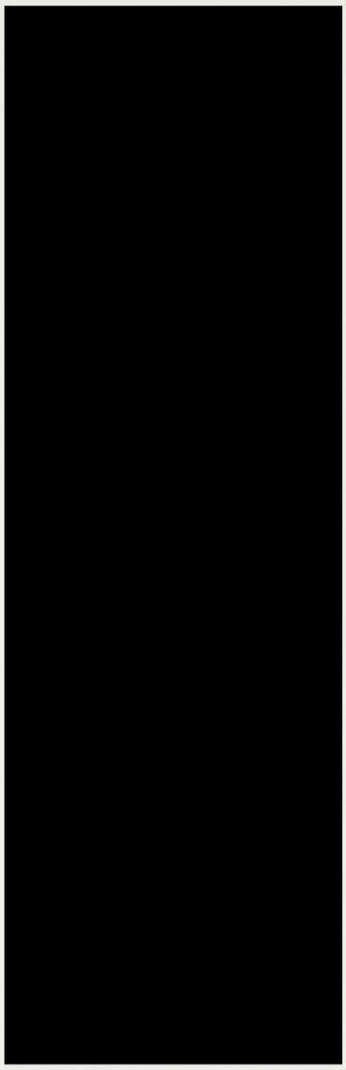
• Informative •

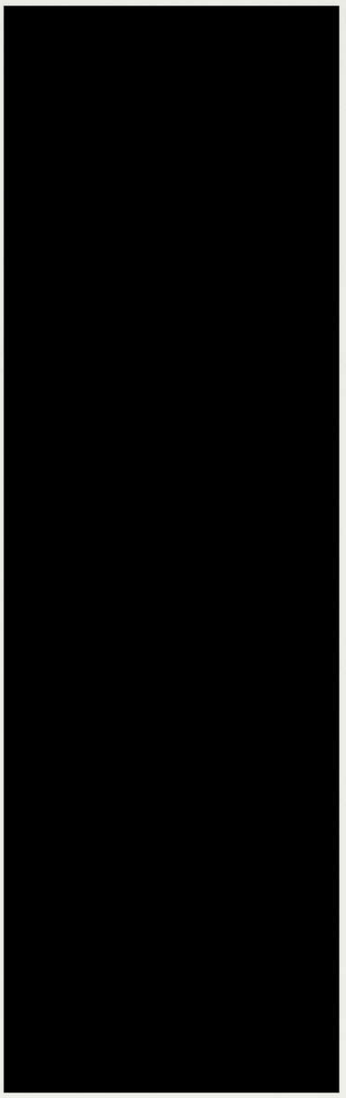
Every KCC member receives a stimulating newsletter full of news, information and their own poems, pictures and letters about conservation.
Many classes, libraries and groups are also members and receive multiple copies of the KCC newsletter – a valuable research resource.
Give a gift membership to the Kiwi Conservation Club and encourage today's young Kiwis to become tomorrow's conservationists.

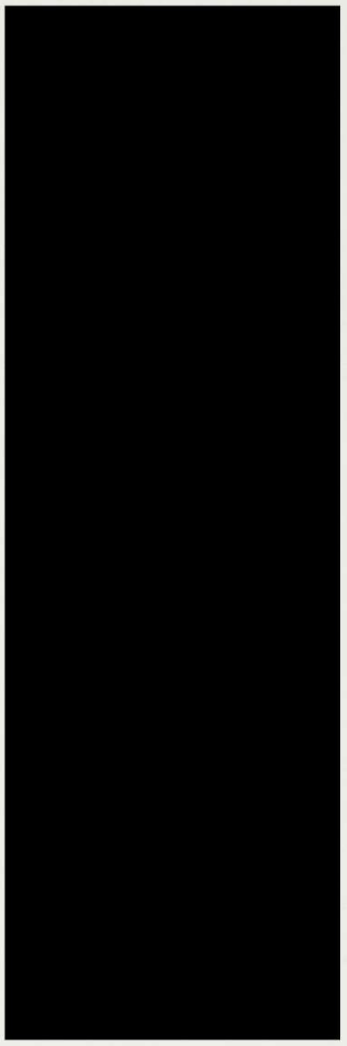
Complete the membership form in this journal and return it to Freepost 669, PO Box 631, Wellington. Only $10!

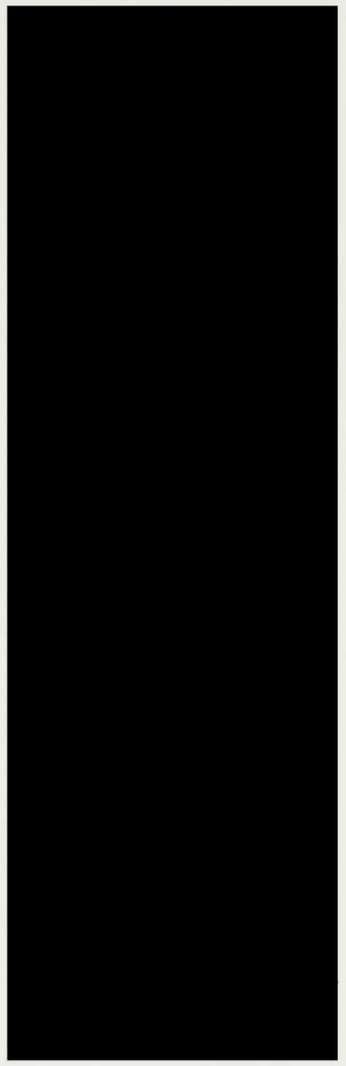
Forest & Bird's Kiwi Conservation Club
Taking nature to heart

Today's Young Kiwis – Tomorrow's Conservationists.









SOCIETY'S LODGES AND HOUSES

Ruapehu Lodge, Whakapapa Village, Tongariro National Park

Set in a privileged position within the National Park this lodge is available for MEMBERS ONLY, and is an ideal location for tramping, skiing, botanising and exploring.

The comfortable lodge holds 32 people in four bunk rooms, and provides all facilities. You need bring only food and bedding. Private parties are restricted to 10 members.

Bookings and enquiries should be made from P O Box 631, Wellington (04) 728-154. The lodge is very popular, and bookings may be made six months in advance, if secured with a 20% deposit. The rates are reasonable, and fluctuate seasonally.

Full payment is required four weeks prior to occupation, after which time there is no refund for cancellation.

Turner Cottage, Stewart Island

Turner Cottage, is on Stewart Island and is a three-roomed dwelling with sleeping arrangements for six people. For details write, enclosing a stamped, addressed envelope, to: "Turner Cottage", C/- Mrs M. Tait, P.O. Box 48, Stewart Island, Telephone (021) 391-396.

William Hartree Memorial Lodge, Hawke's Bay

The lodge is situated 48km from Napier on the Puketitiri Road and 8 km past Patoka, amid the 14ha William Hartree Memorial Scenic Reserve.

The Lodge accommodates 10 people. Extra mattresses and pillows are available to sleep up to 20. The lodge has a fully equipped kitchen, including refrigerator.

Visitors supply their own linen and cutlery. The nearest store is 8km away. No animals are permitted.

For rates send a stamped addressed envelope to the Booking Officer, Mrs Colleen MacKay, 3 Plunket Street, Tamatea, Napier, Telephone (070) 444-219.

Tautuku Lodge

Tautuku State Highway 92, South East Otago. Situated on the Royal Forest and Bird Protection Society's 550 ha Lenz Reserve 32 km south of Owaka. In a bush setting, and many lovely beaches nearby providing a wonderful base for exploring the Catlins. 3 well appointed buildings, the Lodge, the Coutts cabin and an A-frame sleep 10, 5 and 2 respectively.

Information and rates on application to the caretaker: Miss M. Roy, Papatowai, Owaka, R.D.2. Phone (03) 415-8024. Stamped addressed envelope with inquiries please.

Tai Haruru Lodge, Piha, West Auckand

A seaside home situated in Garden Road, Piha, 38km from central Auckland. Eight minutes' walk from the Piha store, with right-of-way access to the surfbeach and close to bush reserves and walking tracks in the Waitakere Ranges.

The lodge is fully equipped and sleeps six to eight persons. It has a large lounge with open fire, dining area, and modern kitchen.

You will need food supplies, bed linen, towels, and tea-towels.

Different rates apply for winter and summer, for rates send a stamped, addressed envelope to the Booking Officer, Mrs B. Marshall, 160 Valley Road, Henderson, Auckland. Telephone 838-5859.

Waiheke Island Cottage, Onetangi, Waiheke Island

The cottage has comfortable bunk accommodation for eight people and has a stove, refrigerator, and hot water. Adjacent to a 49ha wildlife reserve, belonging to the Society it is in easy walking distance from shops and beach. It is reached by ferry from Auckland City (two or three returns daily) and by bus or taxi from the island ferry wharf. Everything is supplied except linen and food. No animals are permitted.

Different rates apply for winter and summer. For rates send an addressed envelope to the Booking Officer, Mr D. McLean, 55a Queens Drive, Oneroa, Waiheke Island. Telephone Waiheke 6494.

Bushy Park Lodge

Kai Iwi, 24km northwest of Wanganui on sealed road off S.H.3.

Historic homestead, fine grounds and view. 89 ha of virgin bush with tracks and trees identified.

Accommodation: for 16 in six bedrooms, single and double beds, electric blankets, heaters and vanity units. Six extra folding beds. Bedding, linen and towels supplied. Showers, drying cupboard, kitchen with electric stoves, microwave, refrigerator, deep freeze, cutlery and crockery. Bring own rations. Milk may be ordered.

Reduced adult rates Sunday to Thursday nights except long weekends and school holidays (GST included). Open 7 days a week.

A bunkhouse for 12 is available for group bookings. It has kitchen facilities, mattresses and pillows. Toilets and showers are in the adjacent stables building.

Bookings and Information leaflets: Manager, Bushy Park Lodge, Kai Iwi, RD8 Wanganui. Telephone Kai Iwi 879. STD (06) 3429-879.

(Hector's Dolphin. Endangered species "Cephalorynchus hectori")

OUR COMMITMENT IS TO HELP PROTECT THE HECTOR'S DOLPHIN.

The dolphin species you see here is found only in New Zealand coastal waters.

It's one of the world's smallest, reaching just 1.4 metres in length. The total population is similarly small: 3,000 to 4,000. As you might expect, such limited numbers are vulnerable to man's activities.* Research has shown that they are prone to the pollution flushed into the ocean from nearby rivers.

But there are other hazards. In recent years many Hector's Dolphins have perished from entanglement in fishing nets. The result is their mortality rate is higher than their birth rate.

If this continues they will eventually become extinct.

But thankfully their plight is not being ignored. Dr Stephen Dawson and Dr Elizabeth Slooten of Otago University are researching ways to protect and save the Hector's Dolphin.

Reckitt & Colman, makers of Down To Earth, are sponsoring this project. Our commitment is to help preserve this endangered species, and you'll be supporting us in this whenever you use Down To Earth products.

Together we can take action to help save the Hector's Dolphin for future generations. If you would like to know more about Hector's Dolphins, contact 'Save the Hector's Dolphin Project', Private Bag, Symonds Street, Auckland. Telephone (09) 358 3022.

DOWN TO EARTH ...a cleaner home and a cleaner world.

*PCB/DDT

Chiat/Day/Mojo R&C532

Forest and Bird's 1992 Calendar

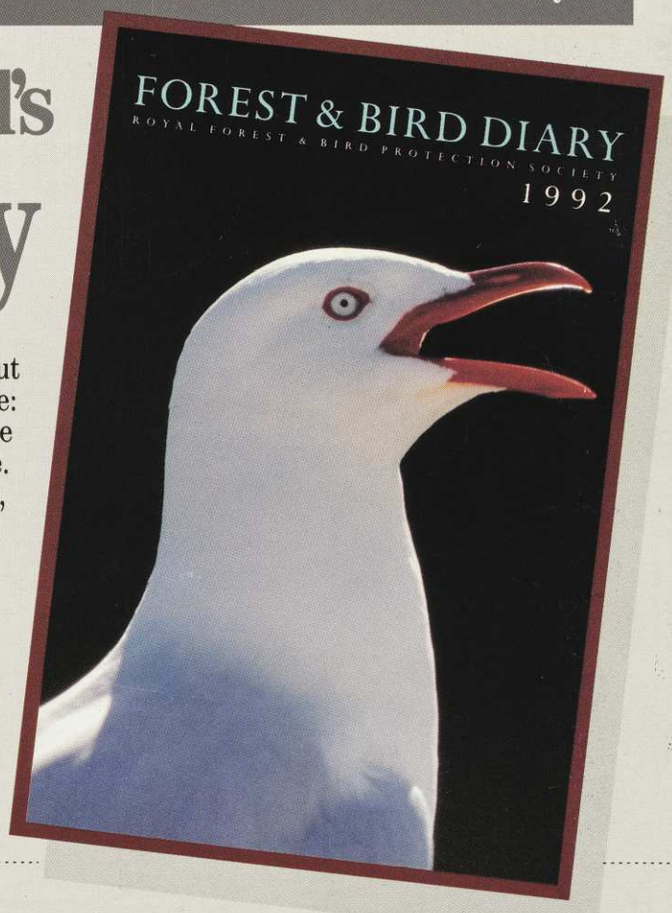
Note: Due to popular demand the weight of the calendar plus the specially supplied envelope will be less than 200 gms and thus qualify for the cheaper overseas postal rate.

New Zealand's Natural Heritage

FOREST AND BIRD'S 1992 CALENDAR continues the outstanding quality of previous years, featuring landscapes, plants and animals.
Buy now for friends and relatives overseas.
Calendar will be available August 1.
Order now and don't be disappointed.

Retail price $14.95. Special price to members **$12** *(includes postage and packaging).*

Forest and Bird's 1992 Diary



Forest and Bird's 1992 Desk Diary

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