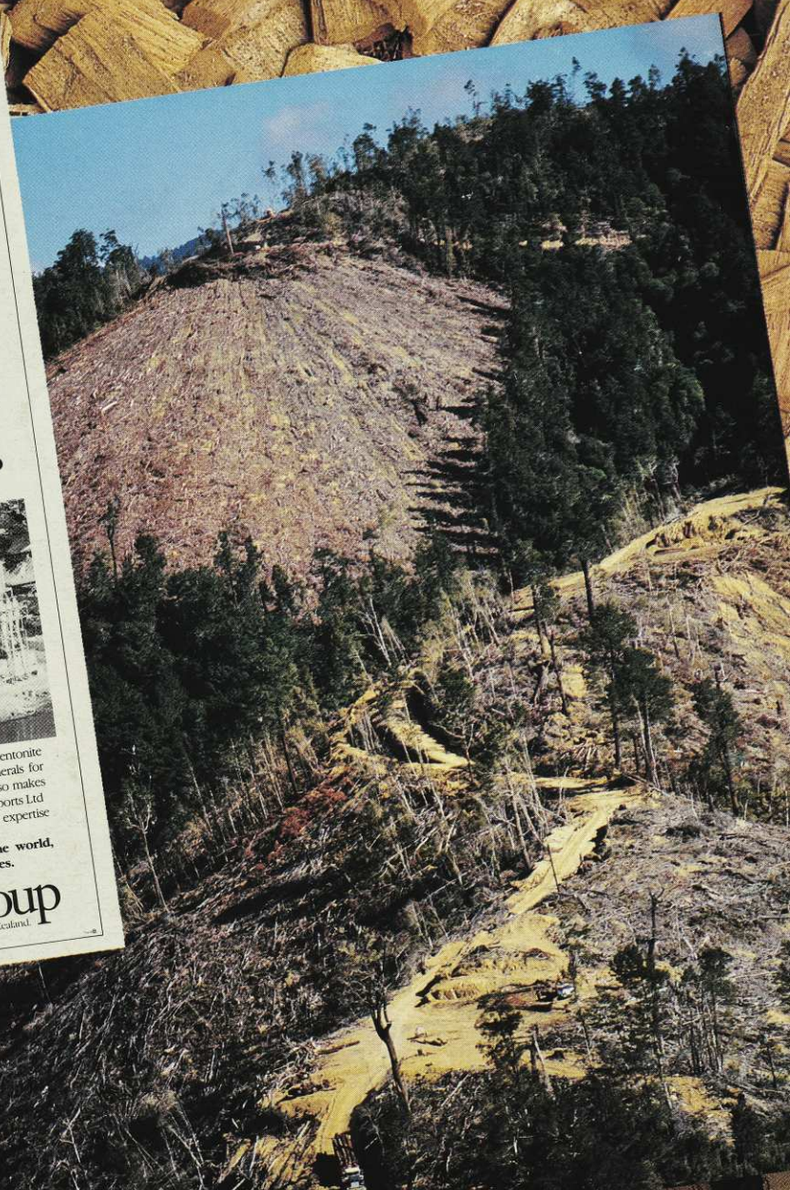
November 1988

Forest & Bird



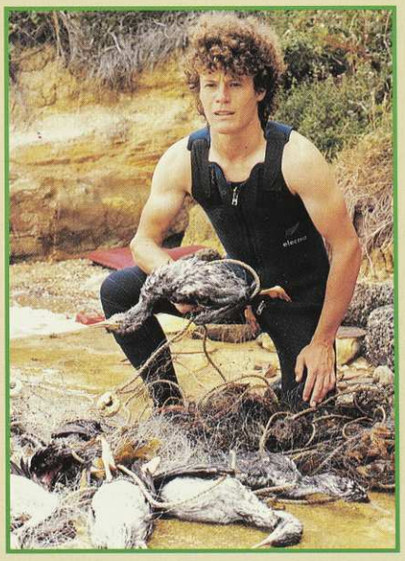
BAN NATIVE WOODCHIP EXPORTS

Your help is needed...

...in the forests

...in the high country

...on the coast



...for our threatened wildlife

It's not always easy keeping tabs on the environment, but with your help we are doing our best. Our campaigns depend on the extraordinary support of our ordinary members.

These are just some of the issues Forest & Bird has been working on over the past year: TBT pollution, South Westland forests, marine reserves, threatened wildlife, Kauri national park, deer "enrichment", clearfelling of kokako forest.

Did you know that on a per capita basis New Zealand has one of the best records of any country for its support of voluntary conservation organisations?

But . . . we think there must be many more people out there who would like to help save our plants and wildlife, stay at Forest and Bird lodges, go on informative walks with friends and have the opportunity to buy special conservation products at reduced prices. And of course receive Forest & Bird magazine 4 times a year!

That's why we are setting ourselves — and our members — a membership target for 1990, the year we observe 150 years of nationhood. Can you help boost our membership from 50,000 to 60,000 in that time? You can start by filling in the order form on the card in the magazine, or by passing a form on to a friend.Forest & Bird — protecting the natural environment.

Target 60,000 members

Front Cover:
Forest & Bird and the Maruia Society are launching a major campaign to ban the export of native woodchips, a move which should see an end to destruction such as this in Marlborough private forests.

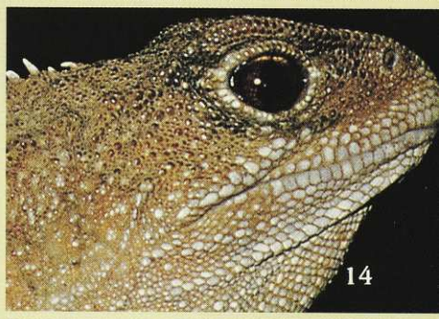
Issue Number 250
November 1988

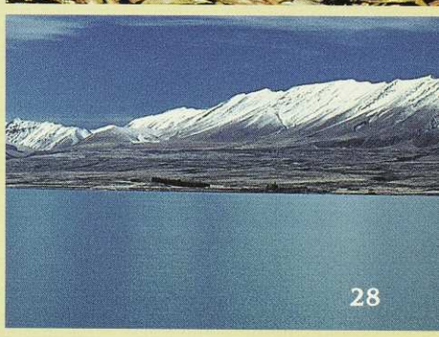
Forest & Bird

C·O·N·T·E·N·T·S

Articles

Departments





A Ministry Against The Environment?

In 1986 with high hopes we welcomed the Ministry for the Environment (MfE) but cautioned that to be effective it needed a legal mandate to protect the environment.

Sadly it has become the master of the talkfest. Its slavish adherence to neutrality is laughable in a world beset by pollution, species and rainforest destruction, erosion, ozone depletion and accelerating resource exploitation. The MfE will this year spend $58.2 million – two-thirds the Conservation Department budget – to achieve a fraction of the environmental outcome primarily because it lacks both commitment and decisiveness. Ironically the Ministry's many committed environmentalists are frustrated by their minister's and the Environment Secretary's obsession with neutrality.

It made a promising start by bringing groups together to hammer out the West Coast Accord and sort out the misallocation of Crown land. Ominously however, it soon also abolished the Environmental Council, the National Water and Soil Conservation Authority and the Environmental Council grants scheme. Worse was soon to follow:

- The deluge of rhetoric from the Minister and the Ministry on ozone depletion has not matched Tasmania's and the USA's rapid action to outlaw ozone destroying chlorofluorocarbons (CFCs). CFC aerosols and CFC manufactured polystyrene trays still cram our supermarket shelves.
- Tributyl tin – a mutagenic boat antifoulant has already been banned or controlled in many western countries. Our MfE convened a working party and a year later we still await a ministerial decision.
- Use of non-biodegradable plastics and deposits on all glass and even plastic bottles is a feature of Canada and many Northern European countries. For more than 18 months our MfE has convened a working party on packaging. Meanwhile there is spiraling and virtually uncontrolled use of wasteful and unnecessary packaging. Recycling of cars, bottles and paper has largely ceased, plastics clog our beaches and waterways and milk cartons clutter our dumps.

These are all examples of the Ministry's inaction.

Its resource management law reform (RMLR) is more sinister and seems designed to strip away sensible environmental controls and hand responsibility for public assets including air, water, the sea coast, minerals and native forests to regional governments whose abuse of the environment is legendary. For example, their championing of sewage outfalls, coastal subdivisions, reclamations and marinas is well known.

A pretence of public consultation and free phones has masked the gravy train of high priced consultants and apparent sweetheart deals with regional government. At the Ministry's meetings around the country we were told that devolution of power to regional government was "non-negotiable", despite widespread public opposition. In late September the MfE coralled DoC's coastal planning review into its RMLR with no prior public warning and a week after public submissions on the RMLR had closed. Cyclone Bola and the tragedy of woodchipping highlighted in this journal show the dangers of letting the market reign supreme. The Ministry is ignoring that lesson.

Its basic problem is its captivation with the wonders of the market place ahead of basic ecological principles, its naive reliance on voluntarism as opposed to compulsion and its apparent dislike of democratically elected and hence accountable central government. Ironically at the very time New Zealand proposes devolving resource management powers to regional government, both the USA and Australia are trying to reverse that process because of a growing recognition that environment planning must have a national and in fact global dimension. The USA gave its Environment Protection Agency resources and legal teeth to do just that.

The lesson to our Environment Ministers Geoffrey Palmer and Philip Woollaston is a simple one. Rather than weakening you should strengthen your controls over resource use and environmental management to ensure a sustainable future for all of us.

Dr Gerry McSweeney

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WOODCHIPPING : A SCOURGE ON

In recent years significant progress has been made in New Zealand forest conservation. Yet, the whine of the chainsaw and the menacing growl of heavily laden logging trucks are still common sounds in our rainforests. With awesome efficiency, the woodchip industry is rapidly eliminating large tracts of South Island beech forest and Central North Island tawa forest.

New Zealand is a willing party in an international trade in rainforest destruction. We are contributing to the greatest ecological disaster since the last Ice Age. Worldwide, rainforest destruction poses a threat to civilisation ranking alongside nuclear war and destruction of the ozone layer. It is also a major contributory cause to global warming. This will result in environmental disruption that may make a considerable portion of our planet uninhabitable to all but the simplest of life forms.

Rainforests are one of the world's most complex ecosystems. They support an incredible array of life forms. The impact on the world's biota from their destruction is almost beyond comprehension. Thirty hectares of rainforest are destroyed every minute and as a consequence several species of plants and animals become extinct each day. This rate of species extinction has not occurred since the mass extinctions that marked the end of the Dinosaur's reign on earth.

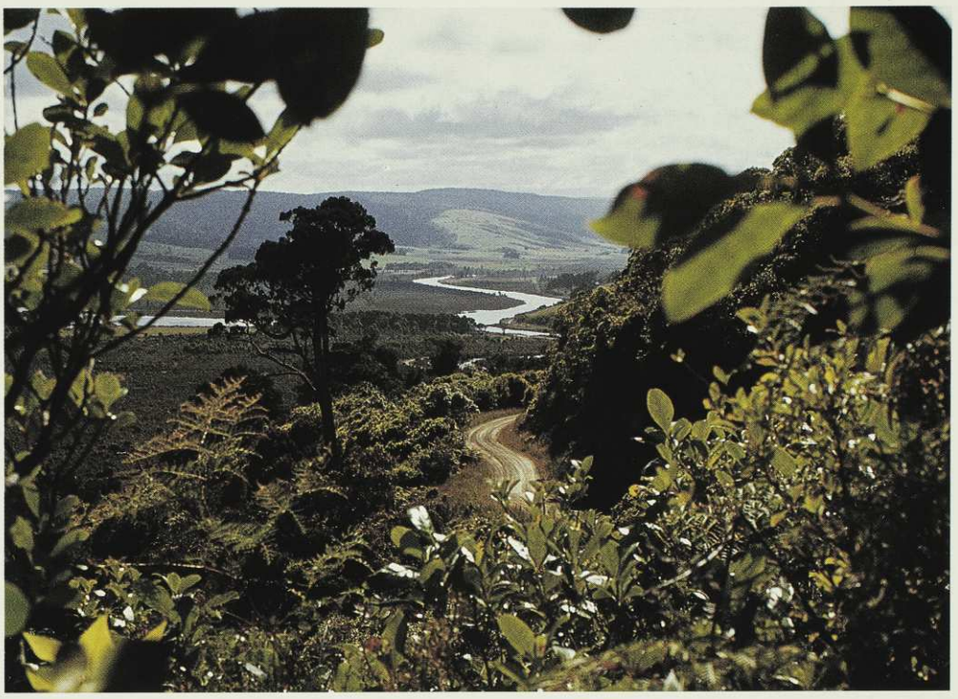
The companies couldn't give a hoot for sustained yield management and logged areas are not replanted to regenerate the forest.

Rainforests Under Siege

Rainforest destruction is most extensive in the tropical rainforests of indebted, third world countries. Woodchipping and log exporting are truly international scourges. However, the temperate rainforests of relatively affluent countries such as Australia and New Zealand are also under siege. In both rich and poor countries, logging companies annihilate whole forests as they strive to feed the insatiable appetites of the Japanese and Korean pulp and paper industry.

Throughout the world, conservationists and public environmental agencies have raged impotently against the industry. Governments have generally avoided their environmental responsibilities and have allowed the development of a one-way traffic from the world's rainforests to the pulpmills of the East. International agreements exist to stop the trade in endangered species; but the international woodchip industry, which endangers more species than any other activity, operates with impunity.

The horrendous consequences of woodchipping have been well documented. The Royal Forest and Bird Protection Society believes that bold initiatives now need to be taken to end this international scourge. We will be asking the Government to take a stand, just like it did in declaring New Zealand nuclear-free, and ban the export of indigenous woodchips and unprocessed indigenous timbers. This could be achieved through a simple amendment to the Customs Act. Forest and Bird and the Maruia Society have embarked on a nationwide campaign to achieve this ban. Unless the Government acts quickly, the cancer of woodchipping will continue to spread through New Zealand's remaining unprotected native forests.



The lovely Tahakopa Valley has been a significant source of wood for the chipmill. Since this photo was taken in 1977 most of the distant hills have been cleared. Photo: Fergus Sutherland.

Taxpayer Subsidies

Woodchipping is the major threat to New Zealand's rainforests. The industry did not arrive here until the late 1960s and since then it has been plagued with financial difficulties. It only managed to gain a foothold here through generous direct and indirect taxpayer subsidies, including cheap supplies of State Forest logs.

Indigenous woodchip exports have increased dramatically in recent times. Export tonnages have risen sharply since 1984. Most of the increase comes from the clearfelling of native forest on private land.

Chipmills using indigenous wood operate at Richmond near Nelson, Awarua near Invercargill, and at Kinleith in the Central North Island. The Nelson mill is the biggest and has mainly drawn on beech forest from private land near Nelson. From time to time it has been kept going with cheap supplies of beech timber from West Coast State forests. It also scavenges far afield for private forests from Marlborough, Murchison and from the Maruia, Inangahua and Grey Valleys of the West Coast.

The Southland mill has been a blot on the Southland landscape since 1981. It takes kamahi, rata and beech from forests in the Catlins, Hokonuis and throughout Western Southland.

These two mills operate in conjunction with large Japanese corporations that take all the chips. Elders-NZ Forest Products operate the third mill as part of their Kinleith complex. It consumes tawa logs from the clearfelling of native forests on the Mamaku Plateau and from forest remnants on farmland in the Bay of Plenty and King Country. The chip is processed on-site and used in producing certain types of paper. Forest and Bird is currently holding talks with the company to explore ways of accelerating the changeover from tawa to plantation-grown eucalypts as a hardwood pulp source.

Minister of Customs Margaret Shields: a giant step for conservation if she amends the Customs Act to ban woodchip exports.

Both the South Island woodchip export mills suffered setbacks recently. The Labour Government's decision to protect a network of reserves and wildlife corridors in North Westland and their decision earlier this year to protect the virgin forests of Western Southland's Dean and Rowallan forests have reduced the potential woodchip resources. Sustained-yield requirements for the remaining State forest indigenous production forests in both areas have further

THE LANDSCAPE

By Kevin Smith, Society West Coast Conservation Officer, who argues for a native woodchip export ban.

reduced the opportunities for wholesale woodchipping

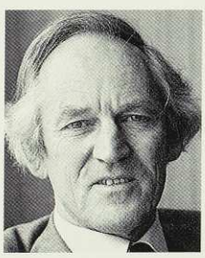
A further setback for the Nelson chipmill occurred when Waimea County, formerly its major source of logs, introduced controls on forest clearance on private land in response to an initiative of the Maruia Society. The chipmill owners, Nelson Pine Forests Ltd, challenged these controls at the Planning Tribunal and in the High Court but fortunately lost both times.

Opportunistic Industry

Woodchipping is an opportunistic industry however. Nelson Pine Forests' logging trucks now roar over into Marlborough and down to the West Coast's Inangahua valley. NPF has also made a bid for the sole rights to the Forestry Corporation's West Coast beech forest estate. They are waiting ominously in the wings, if proposals to use these forests for high quality sawn timber production founder.

The Southland mill is owned by Wood Export Tokanui Ltd, a combination of New Zealand and Japanese interests. Having been denied further State resources, it continues to plunder native forests on Maori and private land in Southland and South-East Otago.

The export of whole indigenous logs made a brief, financially disastrous appearance on the local scene in 1987. Log exporter, Tai Swiss Ltd, used a big helicopter to remove logs off back country steeplands



M.K. Hunt of the Hunt Foundation, part owner of the Southland chipmill: an economically wasteful industry, with horrendous consequences for wildlife.

in Hawkes Bay and also cleared forest in Marlborough. Heavy losses on a 15,000-tonne log shipment to Taiwan forced the company out of business. Elsewhere in the Pacific, log exporting has been big business, stripping tropical islands bare of their lush forest cover.

Woodchipping is also a highly unstable industry as the world price for woodchip fluctuates wildly. The Nelson chipmill's operation has been marginal from the start. In 1979, the company threatened to close its entire operation but was bailed out by the Government with a supply of virtually free logs from State forests in the Maruia Valley. Earlier this year it slashed its staff of 28 by a third to boost its profitability.

Indigenous woodchipping is one of the worst types of industry. It is highly mechanised and creates few jobs. As the industry is marginally economic, the taxpayer has received little back for the huge sums of taxpayers' dollars shelled out to keep the industry afloat. Woodchipping earns export dollars but these are largely cancelled out by its reliance on expensive imported heavy machinery.

To the Japanese the destruction of New Zealand's rainforests is a lucrative business. They supply the logging machinery, logging trucks, the cargo ship and do all the downstream processing in Japan.

The woodchip export industry fails New Zealand in its ability to create jobs or wealth. It also fails as a sustainable land use. Much of the land from which the forest is cleared is marginal for forestry or agriculture because of its poor fertility or steepness. After logging, large tracts are abandoned in a seriously degraded condition. The companies couldn't give a hoot for sustained yield management and logged areas are not replanted to regenerate the forest. Some sites are burnt off and planted in pines. On others, farmers struggle to grow grass amidst the remains of the wrecked forest but are often defeated by the soil's high fertility requirements and rapid reversion. Increased farm productivity is not the incentive for these farmers; it's the ability to convert native forest into a one-off cash crop.

John Elliott of Elders-NZ Forest Products: his company recently flattened kokako forest.

Incredibly Wasteful Use

Woodchipping is also an incredibly wasteful use of a limited timber resource. When a forest is felled, some of the better quality logs are put aside for sawmilling, but between 80 to 90 percent is simply pulverised into 5 centimetre woodchips. Undoubtedly, a much greater proportion of the logs could be sawn for their timber. In this way, woodchipping destroys sustainable jobs. The pell-mell destruction of the beech resource eliminates options for a sustainable beech timber industry using a highly selective, small-scale harvesting approach.

(Newman's) directors and shareholders seem oblivious to the permanent damage their chipmill is wrecking on the scenic landscapes tourists come to see.

Today, travellers on the highways and country roads within a wide radius around the chipmills are confronted by the large-scale devastation of this country's natural heritage. Across the Mamaku Plateau, around the Catlins and throughout the Nelson hinterland, it's as if some mysterious holocaust has blasted away the original forests. Ironically many tourists travelling these routes will be transported by Newmans buses or campervans. Nelson Pine Forests Ltd is part-owned by Newmans. The company directors and shareholders seem oblivious to the permanent damage their chipmill is wrecking on the scenic landscapes tourists come to see.

Nelson conservationists are not so blind. Maruia Society and Forest and Bird members recently attempted to prevent a woodchip vessel from entering Nelson harbour. A blockade of small craft stretched across the harbour entrance, similar to those used elsewhere in the country against that other international floating obscenity, nuclear warships. The Nelson blockade didn't succeed in stopping the ship, but successfully focussed national attention on the woodchip trade.

An export ban (of native woodchips) is the single most important step the Government could take to end the destruction of this country's rainforests.

Vigorous protests have also been mounted by many Southlanders against their chipmill. Not since the days of the Manapouri campaign has Southland witnessed as much public controversy on an environmental issue. The Southland mill menaces remnant native forests throughout the province and threatens the chances of establishing the proposed Catlins Coastal Park. The Catlins is the only place on the whole eastern coast of the South Island where unspoilt rainforests still meet the sea-coast.

Catchment authorities have invariably been either unwilling or lacking in statutory powers to curb the excesses of woodchipping. Steepland forests that have conserved soil and water resources for millenia have been stripped away overnight. The downstream impacts of this clearance will continue well into the future.

Horrendous for Wildlife

The consequences for wildlife conservation from all this woodchipping are horrendous. Many of the lowland forests being destroyed harbour an abundance of native wildlife. In the South Island, the beech forests may be home to threatened birds such as the yellowhead, kakariki and kaka. More common forest birds such as rifleman, robin, brown creeper and bellbird may be especially numerous.

On the Mamaku Plateau over the last ten years, 1000 hectares of prime native forest containing New Zealand's largest surviving population of kokako has been woodchipped, burnt and converted to pines.

Earlier this year the forest corridor linking the 100-strong East Mamaku kokako population with the 200-strong West Mamaku population was flattened by Elders-NZ Forest Products to supply tawa to the Kinleith pulp mill. Forest and Bird want to see the corridor replanted and the remaining forest protected.

Since 1979, both kaka and kakariki have become locally extinct on the Mamaku Plateau — victims of continued woodchipping.

Research in Southland beech forests has shown that woodchipping eliminates more sensitive species such as the threatened yellowhead, kaka and kakariki. Even decades old regenerated beech forest is of no value to these birds which are confined to unlogged native forest. Populations of most other native birds declined drastically after logging; only introduced birds like sparrows, redpolls and finches increased. Logging transformed the diverse forest ecosystem into just another commonplace modified landscape devoid of any special wildlife.

New Zealand can no longer ignore the woodchipping crisis and the sell-out of our natural heritage. For woodchipping, Rogernomics has been a two-edged sword. The industry has lost many of the direct subsidies that have propped it up over the years. On the other hand, the scene is set for a surge in native log and woodchip exports. Hard-pressed landowners are being forced to liquidate their forest assets for an immediate, short-lived, cash injection. At the same time, the profitability of native woodchipping is improving with the lowering of inflation and interest rates and the falling value of the kiwi dollar.

Woodchipping is an area of market economy failure. An uncontrolled trade in native woodchips benefits a few individuals and companies but incurs massive environmental costs on the wider community. Moreover, as Cyclone Bola powerfully demonstrated, widespread forest clearance can result in frighteningly high economic costs not previously imagined.

Virtually No Controls

The Government must move quickly to end the scourge of woodchipping in New Zealand's native forests. At present there are virtually no controls on the industry's operations on private land. While Elders-NZ Forest Products are talking with Forest and Bird about ways to end the chipping of tawa, the owners of the Nelson and Invercargill mills remain committed to large-scale woodchipping of native forests.

In its 1984 election manifesto, Labour promised to develop effective mechanisms for the protection of native forest on private land. Little has been achieved to date and the Government is left standing on the sideline while the woodchippers rampage through the private forest estate.

Conservationists will continue to battle woodchipping through district planning schemes, and we will press for planning reforms that make better provision for environmental protection. But progress in these areas is slow and uncertain. This approach is unlikely to result in any significant challenge to the supremacy of the native woodchip industry in the forseeable future.

Yet, society must be able to control an industry that causes such extensive and permanent environmental degradation. The most effective measure to control the industry would be a ban on the export of indigenous woodchips and unprocessed indigenous timber. The simplicity and transparency of an export ban, and its immediate effectiveness and ready enforceability make it clearly superior to other forms of control.

It is not the only answer, and other avenues need to be explored to end the chipping of tawa as the tawa chips are processed locally. The ban would bring to an end the current woodchipping of South Island forests. This may result in the loss of a relatively small number of unsustainable jobs in Nelson and Southland. In both areas rapidly expanding exotic wood resources offer a sound prospect for future forestry employment.

Native forest woodchipping has a deplorable record of environmental destruction in New Zealand and elsewhere in the world. The costs of allowing it to continue on its destructive path are too high. An export ban is the single most important step the Government could take to end the destruction of this country's rainforests.

THE CHIPPING OF SOUTHLAND'S NATIVE FORESTS

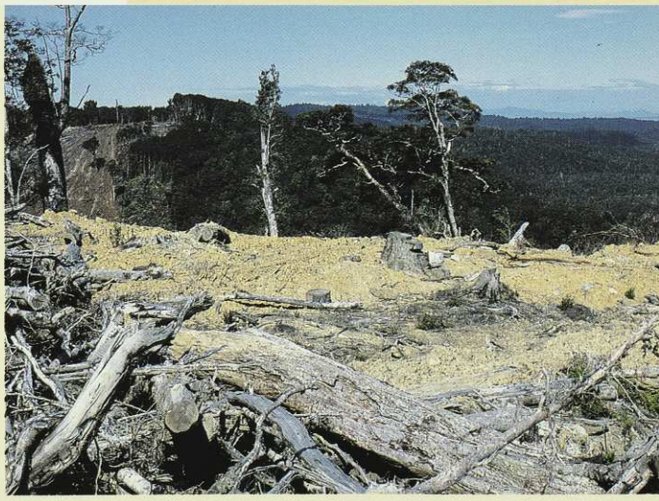
by Executive Member and Southland branch chairperson Fergus Sutherland

The pile of dark wood chips at the Bluff wharves in Southland represents the destruction of many hectares of native forest. More native forest clearance occurs in Southland than in any other part of the country, although the recent allocation of publicly-owned forests in Western Southland has slowed the pace of destruction.

Every day more than 30 truckloads of logs, clearfelled from hectares of beech or kamahi forest, rumble through Invercargill on their way to the chipmill at Awarua. There some are stockpiled while others, still festooned with garlands of dying orchids and ferns, are fed into debarking and chipping machines. Reduced to shreds, these forest remains are trucked 20 kilometres to the Bluff stockpile to await shipping to the paper mills of Japan. This chipmill stands as a monument to the last and most frenetic era of native forest destruction in New Zealand.

The mill was the longtime idea of a local man, Murray Crosbie. He succeeded in getting it underway in 1980, having enlisted the services of consultants T.J. Sprott and Associates as well as finance from the M.K. Hunt Foundation of Rotorua and C. Itoh Ltd of Japan. Planning approval for the establishment of the mill was sought from Southland County. This brought forth several objections. The objections put forward

Nelson conservationists recently drew public attention to the disastrous woodchip trade when they attempted to blockade this ship coming into Nelson Harbour.
Photo: Nelson Evening Mail.



Alton Valley, Rowallan Forest. Thanks to conservationist pressure, the remaining virgin forest has been saved from the chipmill.
Photo: Dean Schneider

by the Royal Forest and Bird Protection Society were based on the widespread destruction of forest that would result from the establishment of the mill. The County blindfolded itself to this obvious effect and chose only to deal with problems related to the site of the mill itself. The rest of Southland's planners and people were content with the mill company's assurances that it was to consume "waste wood" only.

Nearly 1,000 Hectares a Year

How wrong these assurances were! This can be judged at any time by observing the great trees riding the trucks on the way to the mill, and seeing the results of clearing in the forests of the Catlins and Western Southland. Ancient trees, many straight, some twisted and rotten cored, are condemned to the paper making machine. None of this was "waste wood". It was home to rare kaka, yellowhead and parakeet populations as well as myriads of other "protected" wildlife. It was holding soil in place on steep land, was helping to keep rivers pure and even in their flow, was also a potentially valuable craft timber resource, which carefully harvested, could have remained forever for future generations.

In the eight years since it started, the Awarua chipmill has caused the clearing of over 7,000 hectares of rich native forest on privately-owned land in eastern Southland, South Otago and in Western Southland. A further large area of publicly-owned Western Southland beech forest at Rowallan — now in the control of the Conservation Department — has been exploited as part of a chipwood and sawlog extraction scheme.

Era of Destruction

In the east and west of Southland the chipmill initiated and sustained a massive resurgence of native forest clearance at a time when the milling era was at last winding down. The milling had already stopped in the Catlins district of eastern Southland, leaving a landscape in the process of stabilising to an attractive combination of farmed valley floors dotted with islands of native forest and lapped by rich forested hills. There were also accessible valleys where regenerating forest promised in time to re-establish the primeval forests of the past. Although it was too late to save the rarer birds, this forest was a lowland one full of mystery and rich in life. The chipmill has cut ugly scars into this scene and presently scavenges the forest back up the valley sides to the skylines. The picturesque Tahakopa valley in the heart of the Catlins is being hardest hit, with clearing underway on many of its farms. On the valley's south side, forests once renowned for their brilliant southern rata displays are now almost half gone, on the northern edge, ever steeper slopes are being cut into.

Particularly hard hit has been the yellow-eyed penguin. Significant areas of coastal forest near its breeding habitat have been woodchipped. Fortunately, there is now a much greater awareness in the farming community about the value of coastal bush for penguins.

In Western Southland the native timber was still being exploited prior to the coming of the chipmill. Two mills at Tuatapere took predominantly beech and rimu from Maori land sections at Rowallan and the state-owned forests at Rowallan, Dean and Longwood. These operations selected the best trees for sawlogs and left a broken forest, but at least it retained most of the nutrients and seed sources in the slash and the non-sawlog trees. Now the chipmill removes most of the timber of any size, leaving a grey desert of broken branches and exposed soil. On the Maori-owned sections this is mainly left to regenerate as best it can, or occasionally it has been planted in exotics. On the publicly-owned land it was to lead to another generation of native beech forest, but this time a managed mono-culture without the age and species range of trees necessary as a habitat for kaka, yellowhead, parakeet or pigeon. All this was at a cost to the taxpayers of New Zealand before the Government allocated the land to DoC in July. The "beech management" scheme in western Southland was consistently a money loser.

Public Silence – Private Shame

Although Southlanders accept the chipmill, few show great enthusiasm for it, unless, like the Southland Harbour Board, they directly benefit from it. Many deplore its destructiveness in private but are unprepared to speak out publicly.

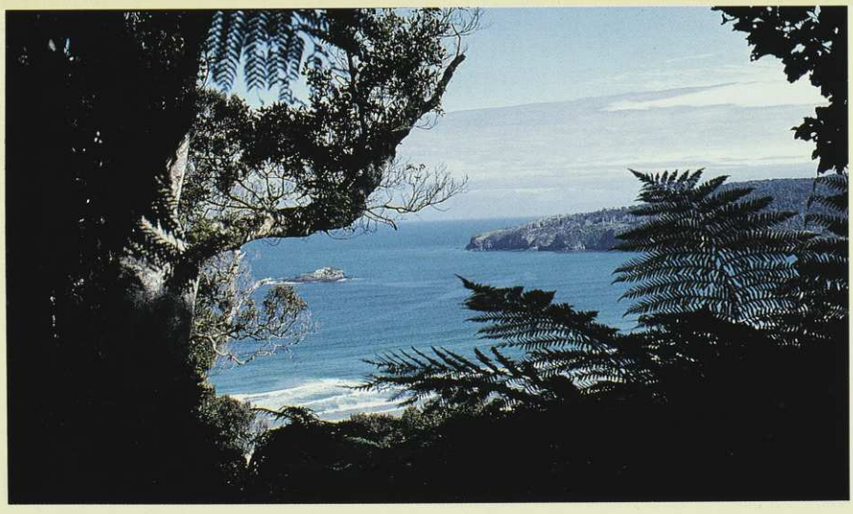
Numbers directly employed are not great, this being an absolute minimum "value added" industry. Those employed fulltime at felling, trucking and at the chipping plant probably do not exceed 30. Another 30 may provide labour or services part of the time. The regional economy gains little apart from these few jobs. Roads get extra use and wear, the cost of which is barely balanced by road tax income. The Harbour Board undoubtedly receives the largest single rake off — from wharfage for the 150,000 tonnes of chips and the dues from eight or nine chip ships annually. Nationally there is a little foreign exchange earned, the company pays little tax, and it has received $200,000 of taxpayers' money in regional development assistance. **Sadly, the Southland United Council (SUC) recently joined forces with the Southland Harbour Board in arguing for the woodchipping to keep going. The SUC says claims that regenerating forest may be suitable for "snails and birds", "must be balanced against the livelihood of thousands of people reliant on the resource". Like regional government elsewhere in New Zealand, the SUC shows little environmental concern, preferring to kow-tow to the almighty dollar – yet another example of the problems in Deputy Prime Minister Geoffrey Palmer's plans to hand environmental regulation to regional government.**

Is An End In Sight?

When will the chipping end? The present rate of exploitation cannot continue as there will be no available timber outside of state-owned land in a few years. At present the mill operators are aggressively seeking to obtain rights to the remaining timber in private ownership. They have recently negotiated the purchase of two major forest blocks in the Tokonui District in eastern Southland and they are also trying to obtain rights to cut the largest block of Maori land in the Catlins. These Catlins coastal forests are scenic gems presently under an important short term conservation lease agreement between the owners and the Department of Conservation, due to expire this year.

As for the western Southland public forests, now that they are in Conservation Department control, the chipmill is attempting to find more supplies from adjacent Maori lands. But thanks to the pressure applied by the conservation movement, coupled with an excellent case put up by DoC, the future of a number of our threatened species in the publicly-ownd forests is at least assured.

Careful assessment of bird habitat in Fiordland National Park by ornithologist Kim Morrison found that only 2.6 percent of the Park – a mere one fortieth of its huge area — was the tall valley floor and footslope forest, vital for kaka, parakeet, yellowhead, robin and other species. The protected area of this important forest has been almost doubled now that the western Southland state native forests are protected.



Waipati Beach, well known by the many who have visited Cathedral Caves, lies in the heart of the beautiful Catlins coast. The Southland chipmill has been tempting the Maori owners of this land to allow them to chip the forests.
Photo: Fergus Sutherland.

Whanganui • Waters of Life

by Keith Chapple

The Whanganui* River starts its long journey to the sea high up in the mountains of Tongariro National Park.

Rushing torrents of pure mountain water cascade on down past tussock and beech forest; to the Maori, the river was alway sacred, renewing; to whio, the blue duck, the headwaters of the Whanganui are life-giving, for this part of the river contains the precious food for this specialised torrent duck, one of only four such ducks in the world.

Not far along its course, the Whanganui disappears, and in defiance of all natural laws, heads north rather than west, its clear waters becoming part of the Tongariro power project.

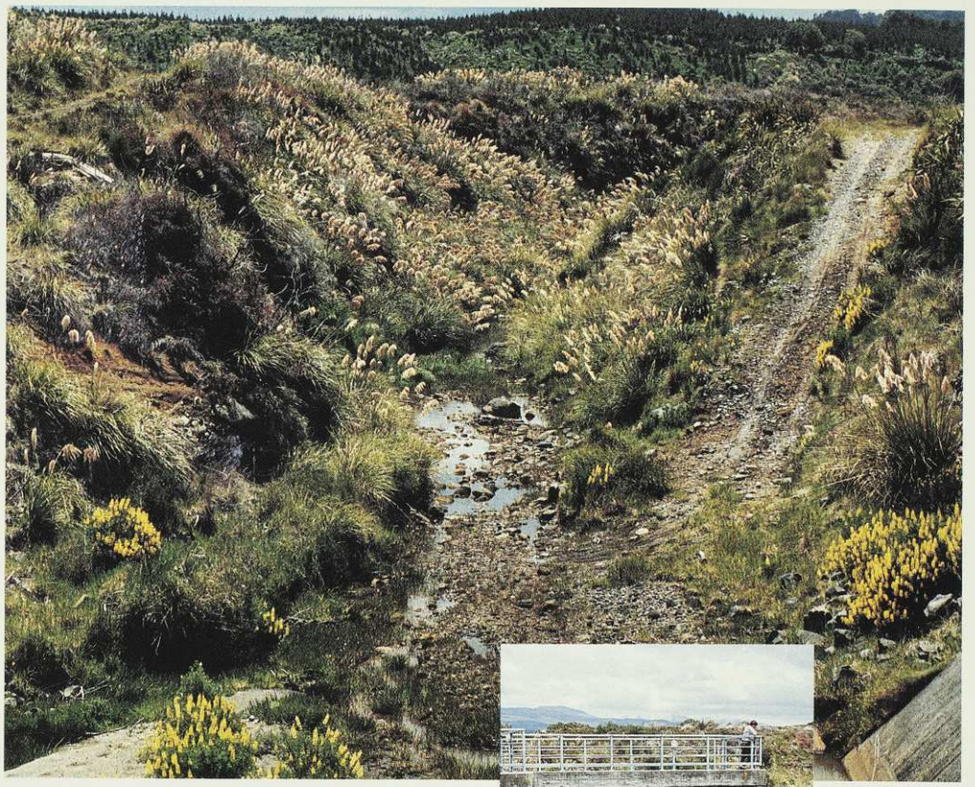
The Whanganui slowly picks up momentum again downstream from the alien diversion structure, but today it is ailing, deprived of its vitality. Why?

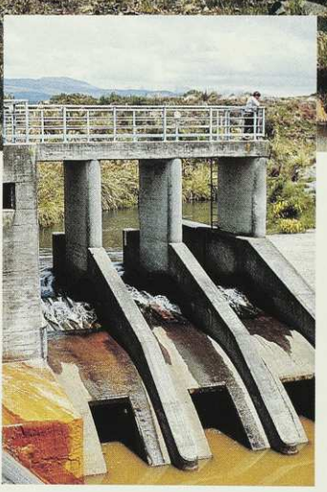
The answer has its origins in the early 1950s. The pioneering spirit was in full cry. Forests were still being destroyed at a ferocious rate, wild rivers were being tamed and an industrial/manufacturing base was swiftly being built. Electricity capacity was an important factor. Indeed, the requirement for electricity generation tended to outweigh all other considerations.

Little wonder then, that when a bright-eyed developer proposed exploiting all the rivers of the Central Plateau, the idea was eagerly seized upon. The sheer audacity, the grandeur, the ability to dominate nature, the enormous engineering difficulties of what was to become the Tongariro Power Scheme, electrified the imagination of politicians, engineers and planners. Europe had its monastries and cathedrals – New Zealand would have its dams.

Investigation and planning proceeded immediately and as befitting such a grandiose concept, it was jealously guarded. No interference was tolerated and none was offered – in the beginning. The word "environment" was not in common usage. The age of questioning and probing Government decisions had not yet arrived.

But as the enormity of what was to happen leaked out, major controversies erupted – in 1964 (when Peter McIntyre made the scheme public knowledge, even though final approval to build had been given six years earlier), in 1967 and 1972. However, these brave attempts to control the ambitious plans of the autocratic Ministry of Works and the Electricity Department had no real effect. The ideas of 1953 commenced operation in 1974. What happened?





The intake structure at the headwaters of the Whanganui River, where 100 percent of the mountain water is taken for the Tongariro power project. The result just downstream (above) is an ecological and a scenic shambles.

Waterway Beheaded

Virtually every waterway flowing from Tongariro National Park was beheaded, their waters being led through a series of tunnels, lakes and canals to Tokaanu Power Station on Lake Taupo. From Taupo, they pass through the Huka Falls and a further nine power stations on the Waikato River. Sixty-six pure cold mountain rivers and streams were sacrificed for hydro generation. Just two survived – the Manganui-a-te-Ao which was too far away, and the Upper Whangaehu because of its toxicity.

Ninety-seven percent of the Whanganui headwaters were diverted, leaving a miserable 0.6 cumec residual flow in the Whakapapa tributary. (A cumec is a cubic metre of water passing a given point per second).

Fish stocks were depleted by 75 percent above the dam sites; 90 percent below the dam sites; and 60 percent 30 kilometres downstream. Algae blooms flourished where none had been known before. Weeds swiftly colonised exposed riverbanks. Further downstream, temperatures of 37 degrees celsius were recorded in isolated pools of papa shelving – whole ecosystems were boiled alive!

Anglers lost the best dry-fly fishing river in New Zealand when the Whakapapa was decapitated – at the same time, recreationalists lost one of the finest white water rivers in the North Island.

The whio (blue duck) population was decimated – it lost about 75 percent of its central North Island habitat.

The Maori people of the Whanganui River, already stripped of their traditional self-sufficiency, suffered the final indignity. They lost the source of their Mana.

** The name of the Wanganui as spoken by the tangata whenua.*

STOP PRESS STOP PRESS STOP PRESS

In a landmark decision, the Wanganui Rangitikei Catchment Board decided on October 18 that 100 percent of the headwaters of the Whanganui River should be returned, and a substantial proportion of the flow of the Whakapapa River should be restored – good news for blue ducks, river users and the Whanganui.

Highly Polluted River

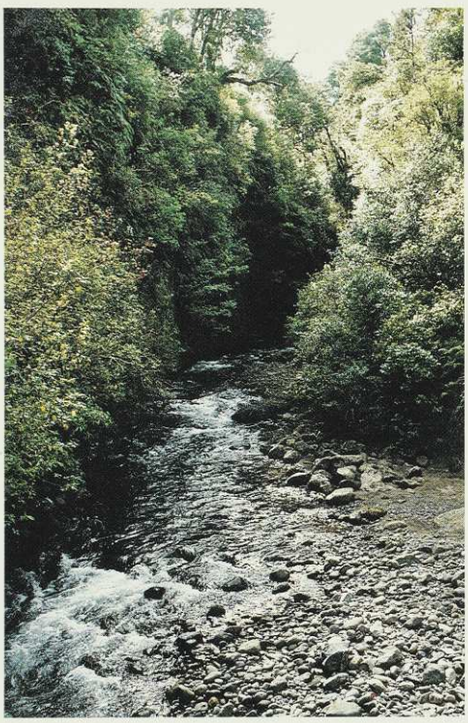
In a mere 150 years, the mighty Whanganui of Maori mythology had been reduced from a magnificent waterway displaying all the classic signs of ecological diversity from snow to sea, hosting a remarkable array of plant life, aquatic species, bird and wildlife, including the short-winged bat; and sustaining a Maori population of about 30,000 – to a dirty, silt-laden, highly polluted river.

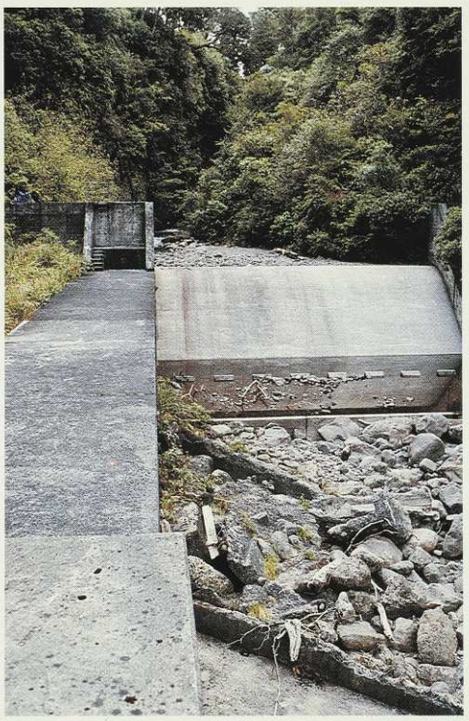
Such was the situation confronting King Country Forest and Bird when research began for submissions to the Whanganui National Park draft Management Plan in early 1987. Gazettal of the park presented an ideal catalyst to return the Whanganui to a normal and healthy state – for if the national park was to be managed according to accepted conservation principles, surely its *raison d'être*, the mighty Whanganui, should be accorded equal status? If the status quo prevailed, (viz the land managed for maximum protection and the river for maximum exploitation), New Zealand's national parks were clearly under the gravest of threats. Such a precedent could easily be transferred.

The branch worked out a general strategy – the principle objective being to return the Whanganui to a normal and healthy state with compatible management structures. The review of the so-called "minimum flow regime" set down for May 1988, was identified as the suitable means to institute fundamental change.

The regime was set in place in 1983 following an application for more water by the NZ Canoeing Association in 1977. It was not ideal and was implemented to satisfy recreational demand rather than the general ecology. It allowed a 22 cumec minimum flow at Te Maire for 10 summer weeks and Easter, and a 16 cumec minimum for the rest of the year. As a reference yardstick, this is about 50 percent below normal low flow conditions. Artificial and unsuitable though the regime was, it held one enormous advantage. It provided a legal base to mount a determined challenge to recover a biologically acceptable quantity of water. Research indicated that 70 percent of the natural flow was required.

Basic themes were decided, some of these being canvassed in submissions to DoC. The branch would propose no solutions, suggesting instead that an authoritative forum should be constituted with wide terms of reference, whereby solutions would be arrived at following examination of scientific and social evidence. The minimum flow regime was judged a mistake, for it visited upon the river an alien environment. If water had to be diverted, then it should be on a proportional basis, (i.e. a fixed percentage to the Electricity Corporation, the rest to the river.) We rejected any notion of ownership of the river. The concept of sharing would be vigorously promoted.





The Mangetepopo Stream is an attractive tributary of the Whanganui. Descending down off the Central Plateau, it tumbles down through dense native forest until, within only 50 metres of the Outdoor Pursuits Centre, it disappears north. Here thousands of young people each year learn about the outdoors.

These strategies and themes were then discussed with Forest & Bird staff during the 1987 AGM. Over one matter we held no doubts – the stakes were high! Electricity Corp stood to lose up to $30 million per year — a figure which has since risen to $300 million plus!

Taking it to the Public

We decided, therefore, to take the matter to the public.

On 20 October 1987, the King Country Branch hosted a public meeting in Taumarunui with two aims in mind. Firstly, to explain the basic workings of the scheme and some of its history. Secondly, to form a community-based coalition of organisations to lobby for fundamental change.

The meeting was a huge success. The Whanganui River Flows Coalition eventually came to represent over 35 organisations as diverse as: King Country Federated Farmers, Whanganui Chamber of Commerce, Friends of the Shoreline, Forest & Bird, Tramping Clubs, Owhango Electrical.

The campaign message was simple — the Coalition rejected outright a review of minimum flows as merely tinkering with the problems, and said Electricorp's right to the water itself ought to be reviewed. This was later upgraded for Electricorp to apply for a water right to take and use the headwaters of the Whanganui. This was a fundamental distinction, in that a water right applicant must prove the requirement for water.

However, the Government planned to sell all of the electricity generation and transmission assets to Electricorp – including water rights. The public were excluded from the negotiations. In retaliation the Coalition began a round of public meetings, TV appearances, press statements and radio interviews. The Minister of Conservation was seen as a natural ally, and her advice was sought. Six Ministers were informed that very serious mistakes were being made. The Parliamentary Commissioner for the Environment was asked to intervene on the grounds that a national resource was being allocated in advance of public participation and little investigation. It was made known that a legal case was being investigated to take the Government to court on the grounds they were acting against the principles of the Treaty of Waitangi. (The State-Owned Enterprises Act binds Electricorp to the principles of the Treaty). Forest & Bird were briefed on the issue during the National Council Meeting at Mt Ruapehu in November 1987.

Simple Message

Once again the message was kept simple – ". . . the Government planned to sell New Zealand's rivers . . . customary rights of access were in jeopardy." The NZ Maori Council held similar fears, and the sale of water rights was abandoned in mid-December 1987.

By Christmas 1987, advice had been received that the National Water and Soil Conservation Authority was to be axed with functions devolving to Catchment Boards and the Ministry for the Environment. This meant the Ministry's policies, particularly the legal status of intrinsic values and sustainability, would/should preside over any allocation decisions. Good news indeed. All efforts were now directed down two avenues.

The first was to persuade the Government that Electricorp must apply for a water right. This was achieved remarkably quickly. A nationwide petition was launched on 28 January 1988 calling on the Government to take whatever action was required to have Electricorp apply for a water right. Six weeks later and six weeks in advance of the petition deadline, Electricorp announced they would apply for such a right . . . in five years. Despite the tag, Electricorp were publicly congratulated for a sensible and courageous decision. An important principle had been established; for the first time in New Zealand history, Electricorp would have to stand in the market place and prove its case. 5,500 people from just about every

place name in New Zealand signed the "Speak up for the Whanganui River" petition in the first five weeks, thanks to the help of *Conservation News* and distribution by environmental/conservation organisations. Electricorp's dramatic cave-in however, caused the 2nd and 3rd phase to be called off.

The second avenue concerned the "review of minimum flows", still set down for May 1988, but later postponed to early July. The constant publicity had had its effect. The Rangitikei Wanganui Catchment Board announced the review would not be the singular affair it had been in 1982/3, but broadened to encompass any matters the public wished to discuss. And, in February, the Ministry for the Environment announced radical changes; namely, Catchment Boards would in future deal with all water rights as if they had issued them; privilege was a thing of the past — Crown Water Rights no longer applied. Put together, these factors meant the Coalition had achieved what it set out to do. Under these acceptable circumstances, it was agreed to present submissions to the minimum flow hearing which, to all intents and purposes, now took the form of an interim water right application. Others were urged to participate and 70 "submission advice kits" were distributed. Over 1300 submissions were received. As a safety net, the Commissioner for the Environment was asked to monitor the proceedings, which she agreed to do.

With the "pressure politics" stage of the campaign over, it was decided to disband the Coalition, leaving a watchdog committee in place to draft submissions and present evidence at the hearing. The Catchment Board had appointed a four-member tribunal to conduct the hearing and report back their findings and recommendations. As such, a legalistic and scholarly approach was called for — tribunal hearings being no place for pressure politics.

Enormous Workload

It is perhaps an understatement to say the workload became enormous, particularly that of Branch Secretary, Brenda Chapple. Not only did we have to draw up the submissions and compile evidence for the branch, but had the responsibility of conducting a like case on behalf of the Coalition Watchdog Committee and the huge family of 1100 individual submissions collected by the Taumarunui Promotion Association. Dark clouds, though, have silver linings and in this case, the size of the task allowed us to present evidence on just about every subject available.

The Whanganui River and its whio population in the upper reaches was considered of national importance. Accordingly, Forest & Bird would present its evidence at national level, (a factor which carried considerable influence during the hearing), including the three local branches who made submissions, Manawatu, Wanganui and King Country.

A top environmental lawyer was appointed by Head Office to act for Forest & Bird and the Coalition – an absolute requirement in view of the complex legal and technical evidence which tended to dominate.

The hearing was both tiring and exhilarating. Held in the Taumarunui Courthouse, it became the best show in town and played to packed audiences every day. The very strong Maori presence brought tremendous dignity to the proceedings. The star of the first six days was undoubtedly the Department of Conservation. From scratch the Wanganui office team had produced in six short months a highly professional, scientific statement, supported by acknowledged experts in all the social, aesthetic and tourism fields – and it was easy to understand!

The submission set of three documents, presented by counsel, Jim Guthrie, is a telling indictment of present and past water management practices. DoC called for a return of ALL the diverted waters — only thus could the aspects of the law governing the hearing be acknowledged; only thus could the Whanganui be returned to a normal and healthy state. This was qualified by the statement that if this were not acceptable, then a proportional flow of 70 percent of the natural flow was the absolute minimum required.

Curiously, despite the many different sector groups represented and the various means whereby they reached their recommendations, this is what they all asked for – a fair share – including Forest & Bird.

Wanted the Lot

Except Electricorp! They wanted the lot for five more years when they would apply for a water right! As expected, Electricorp put forward a voluminous, highly polished, technical case. Speaking on behalf of the Coalition, Forest & Bird member Tom Wells likened Electricorp to the White Witch of Narnia. His evidence and presentation was brilliant and intellectually devastating.

The last day of the hearing was held on the Ngapuwaiwaha Marae in Taumarunui – appropriately, this means ". . . the meeting place of the waters Te Taurawhiri a Hinengakau . . . the twisted strand of rope that binds people together . . ."

Kaumatua travelled from Pipiriki, Whanganui, Raetihi and Ohakune to join their Taumarunui relations – all 15 sub-tribes were represented. The kaumatua pleaded for the return of the headwaters and hence a return of mana. They said:

". . . The interference with the flow conjures up an image of a body without a head or, in a Maori sense, of the Whanganui tribes without the source of their mana. The water which moves in the river and its tributaries is not just water but also the blood of the ancestors; the water's murmur is the voice of our tipuna . . . all things are connected."

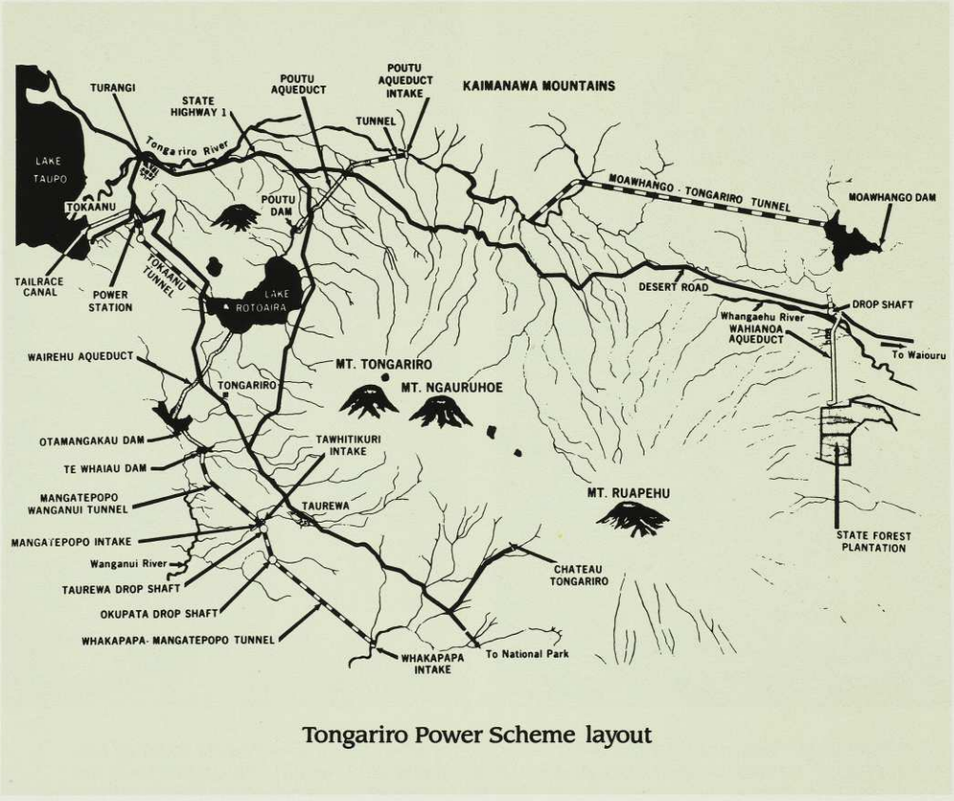
At time of writing, the "jury is out" and no decisions have been reached.

The campaign, however, has had other beneficial effects, the most notable being that it has forced local authorities to carefully inspect their impact on the river. The Taumarunui Borough Council, for example, have announced they will investigate a land-based sewage outlet to stop the river outfall. The Whanganui City Council are also moving to stop sewage pollution.

All the evidence and all the submissions point to the Whanganui retrieving a substantial portion of its water; and there is no doubt within King Country Forest & Bird that the water will be returned. The question is . . . how much?

For the whio . . . the answer is critical to their survival.

Keith Chapple is chairman of the King Country branch of Forest & Bird. He and his wife Brenda have been active in seeking protection for rivers surrounding Tongariro National Park since the early 1980s. They and the Tongariro Forest Park Promotion Committee campaigned successfully between 1984-86 for a forest park.



Tongariro Power Scheme layout

Untapped Potential in Natives

The country could earn more money and the Sunday drive become more scenic if we planted selected strains of native trees with the same zeal as we have the pine, according to Dr David Bellamy.

Dr Bellamy called for more research to be carried out into New Zealand native trees to identify the best trees for timber production and unlock their genetic potential.

"As yet no one has bothered to come into this forest and find out which individual rimu, miro or totara grows fastest, so consequently we find the surrounding areas planted out in pines. When you look at these trees in Whirinaki, some of the oldest plants still living on earth, their ancestors dating back to the age of the dinosaurs, one can only guess at the wealth of untapped genetic material contained here in this forest."

As an example Dr Bellamy pointed out that the giant podocarps of Whirinaki may well hold genetic information to solve every fungal disease there is.

"These trees are unique in never having been affected by fungus diseases. Certainly when we consider the age of these trees we can't say that they have never come into contact with fungal spores."

Dr Bellamy said unsolved questions such as these highlighted the need to keep untouched heartlands of native forest reserves.

"It's no good saying everything is alright because we have one kahikatea, or one rimu tree preserved in a botanic garden or reserve. Just as people are different, so every tree is different."

Pureora Forest — The Treaty and Forest Protection.

In 1980 the Government paid out $7 million to get logging companies out of Pureora forest. It was made a Forest Park to protect the nation's finest dense podocarp rainforest habitat for kokako, kaka and parakeet.

Sadly the loggers have since returned.
In the last 18 months there have been six different incidents where Conservation Department staff allege the Titiraupenga Maori Trust, who are logging their B9B block which adjoins the Forest Park, have crossed the Park boundary and poached 150 giant rimu and matai trees from within the Park. This photo on the park boundary shows one of those giant rimu which had been hauled from a kilometre inside the park.
The alleged log poaching finally stopped when DoC staff seized the Trust's bulldozer and impounded it at the Forest Park Headquarters.

Court action is proceeding.
Complicating the debate is a Waitangi Tribunal claim for Pureora. The merits of the claim will be assessed by the Tribunal and their recommendation considered by Government. Land ownership is a matter between the Crown and the claimants on which it would be inappropriate for Forest and Bird to comment. We can however comment on land use and make the strongest possible plea that Pureora's forests and wildlife remain protected forever. Pureora Forest is a national treasure. Pureora, Fiordland and Mt Aspiring National Parks and the South Westland state forests are all under Waitangi Tribunal claims. Regardless of the outcome of those claims Forest and Bird believes these areas must all remain fully protected. The Ngati Tuwharetoa gift of Tongariro as a National Park and the leasing of Lake Waikaremoana by Maori owners to form the core of the Urewera National Park symbolise their commitment to protect New Zealand's nature heritage.

We would welcome your comments on this important issue.

Basil Graeme.

J. S. Watson Trust Awards

The threatened kaka and black petrel will be assisted with the aid of grant money given by the J.S Watson Trust, administered by the Society. As well, money goes to scientists studying red-billed gulls, and a pamphlet celebrating the late Lucy Moore is being financed by the Trust.

Jacqueline Beggs, whose article on kaka breeding appears in this issue, has been awarded $1100 to continue her vital work. Paul Scofield, an Auckland University M.Sc student, has been given $1000 to study the distribution of black petrel on Great Barrier Island and to investigate methods of predator control for these burrowing birds.

The Mid-North branch of Forest & Bird has been granted $500 to produce a pamphlet entitled "Scenic Reserves of Warkworth", as a memorial to one of New Zealand's best known botanists, Dr Lucy Moore.

Finally, Dr Jim Mills of the Conservation Department received $1600 for a continuing study of the breeding dynamics of the red-billed gull.

Ashley Riverbed Reserve Created

New Zealand's first riverbed reserve has been officially gazetted, safeguarding a 10-km stretch of North Canterbury's Ashley River for the threatened wrybill plover. The population of the wrybill is estimated at between 3000 and 4000.

In the August 1987 *Forest & Bird* we carried an article highlighting the work done by staff and pupils of Rangiora High School to create this reserve in the birds' northernmost breeding ground. The pupils have since won a conservation award for their efforts.

Books Received

Vanishing Ice: An Introduction to Glaciers, *by Graham Bishop and Jane Forsyth (McIndoes, $12.95).* This focusses on the Dart Glacier in Mt Aspiring National Park. It is a marvellous book for teachers and anyone interested in how New Zealand's glaciers work and reasons for their retreat in the last 50 yars. It is accompanied by many colour photos, diagrams and a clear and simple text.

Whale Nation *by Heathcote Williams (Jonathan Cape, $24.95).* Praised by poet laureate Ted Hughes for its emotional power, Whale Nation is an eloquent paean to cetaceans. Part poem, part prose, the book should be enforced reading for those who would want to continue hunting these marvels of the deep.

Wild South: the story of New Zealand's Endangered Birds, *by Rod Morris and Hal Smith (BCNZ, $49.95).* While many articles and scientific papers have been written about our endangered species, a more relaxed, anecdotal approach has been lacking. This excellent publication makes up for that, providing the reader with fascinating insights into the behaviour of the kakapo, black stilt, kea, saddleback, takahe. black robin and others. Photographs by Rod Morris are outstanding.

Pandas in Peril

Since October, Auckland Zoo has been playing host to two giant pandas whose visit is proving enormously popular. Doubts, however, have been raised about both the risks such exhibitions pose to conservation of this famous rare species, and the morality of parading the animals for commercial gain. In this article, reproduced from the Australian Conservation Foundation magazine **Habitat**, *World Wildlife Fund In Australia conservation officer Ray Nias argues against further exhibitions.*

The world's largest private conservation organisation, World Wildlife Fund, has called upon international zoos and Chinese authorities to put an end to exhibition loans of giant pandas, after completion of the latest programme now underway in Canada, Sydney, Melbourne and Auckland.

Today the giant panda *(Ailuropoda melanoleuca)* is restricted to the bamboo forests of south-western China where fewer than 1000 animals remain. Unless the small remaining patches of suitable habitat are conserved, the giant panda faces extinction within the next 100 years, perhaps even sooner. Analysis of satellite images from the mid-1970s to the mid-1980s shows a clear pattern of human encroachment taking place within the panda's habitat and a continued reduction of forest cover both within and outside the twelve established reserves.

Today, the panda is in its last remaining stronghold. It has nowhere else to go. Westward lies only the rock and ice of the Tibetan plateau where pandas have never lived. The panda literally has its back against the wall.

Declining Numbers

Since the first Chinese survey in the mid-1970s, China's panda population has decreased by 150 to 200 individuals. The total panda population, estimated at 1000 to 1100 ten years ago, is now between 800 and 1000.

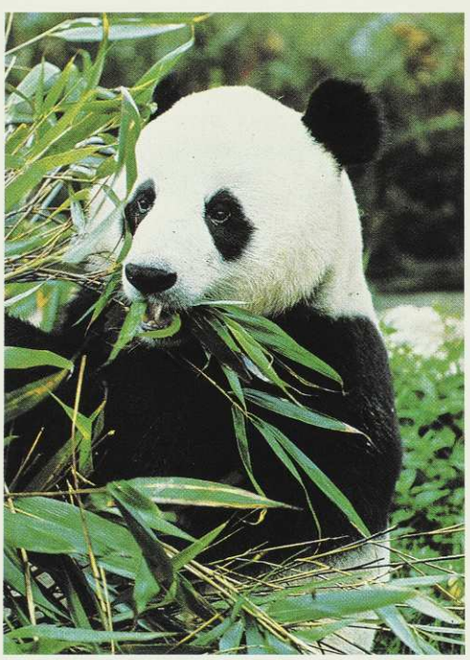
The analysis, part of a joint project conducted by World Wildlife Fund and the Chinese Ministry of Forestry, included a ground survey of the giant panda's habitat as well as a study of satellite images.

Information from the ground survey on distribution and density shows that the population is increasingly divided into small sub-groups separated by insurmountable barriers such as roads, settlements and agricultural areas.

Most of these sub-populations number fewer than 50 individuals with many being as few as 10. Any sub-population with fewer than 20 individuals cannot be expected to survive for more than a very few generations because of lack of suitable breeding partners. Studies on captive pandas show that only 15 percent of the population is in the right age class to breed at any given time. Thus each time a population reaches 20 individuals, only two or three may be breeders, and all may be of the same sex. Additionally, as with all species, the smaller the group of animals, the greater the danger of in-breeding.

The giant panda has the digestive system of a carnivore, but long ago adapted to a vegetarian diet. They feed almost exclusively on the stems and leaves of bamboo. Hidden in the dense foliage of the forest, the panda feeds almost continuously on the nutrient-poor bamboo, consuming 12-14kg in a 24-hour period.

One of the main threats to the panda comes when the bamboo flowers. This happens over large areas at regular intervals (from ten to over 100 years, depending on the species), after which the plants die. Although it takes the bamboo about one year to regenerate from seed it can take up to ten years before it can support a panda population. During this time the pandas have to move to other areas where the bamboo has not flowered. In the past, this has not posed a problem but, with expanding human populations, large areas of the forest have been cut down for agriculture and the pandas' movements have been restricted.



Giant panda numbers are fewer than 1000, and have been showing a steady decrease. Unless remaining patches of habitat are conserved, the panda could be extinct within 100 years. Photo courtesy of World Wildlife Fund.

Unlike other bears, the panda does not hibernate. The animal lives a solitary existence, meeting only occasionally with other pandas, apart from during the very brief mating season (2-3 days) when several males may come together and compete for a female.

Breeding in Captivity Difficult

Breeding of the giant panda is very difficult in captivity, making its protection in the wild all the more important. Panda cubs weigh only 90-130 grams at birth, and have little fur, whereas an adult can weigh over 100 kilograms. Maturation is slow — weaning occurs after six months. The average life span is only 10-15 years. There are reported to be more than 80 pandas in captivity within China and a further 18 are held in international zoos. Captive breeding, however, whether through natural breeding or artificial insemination, does present difficulties and the population held in zoos is not self-sustaining.

In addition to being actively involved with the conservation of wild pandas and their habitat, the World Wildlife Fund has also participated in joint research programmes aimed at producing a viable captive-bred population as a further measure of security for the species.

In recent years there have been an increasing number of exhibition loans of pandas to zoos outside China. World Wildlife Fund recognises that these loans attract considerable public interest and the funds generated may benefit panda conservation in China.

Arguments Against Loan Exhibits

However, the World Wildlife Fund has become increasingly concerned that since these loans subtract potential breeding animals from the captive populations, they do not form a useful part of an integrated breeding programme. WWF has raised this issue with the relevant organisations in China on several occasions. It has been suggested that the loans should be restricted to only those animals which are either too old or too young to breed. However, it is difficult to specify an age above which pandas are too old for breeding, and it would appear unwise to subject young animals, which might reproduce in the future, to the risks of international travel.

Therefore, WWF urges the world's zoos, and the Chinese authorities, to cease their involvement in exhibition loans of giant pandas, once the loans in Calgary, Sydney, Melbourne and Auckland are completed. WWF will not associate itself with any further loans in the future. WWF also urges the Chinese authorities to halt the use of giant pandas in circuses.

Experience in other countries has shown that commercial activities related to endangered species tend to put pressure on the wild population. In this context, WWF shares the concern of Professor Hu Jinchu, one of China's leading panda experts, who has stated that it is necessary to stop the capture of pandas for zoos to save the species from extinction. *(China Daily, Beijing,* 15 July 1987).

The Royal Forest & Bird Protection Society has joined WWF in protesting about the exhibition, although it realises that there are some positive aspects to it. It is important that money made during the four-month visit goes directly to panda conservation. At the last meeting of the IUCN, New Zealand and China both supported a resolution that there be no more exhibitions; it thus appears that this will be the first and last in New Zealand.

Auckland member Glen O'Keefe adds the following updated information on the plight of the giant pandas.

Reproduction

Giant pandas are dependent upon and thus remain with the adult female for the first 18 months of life. Because of this and due to a gestation period of 3-5 months, at best the female can only produce offspring each two years. At the present time they are not managing this. A female which gives birth to a cub (which subsequently lives to independence) each three years is a rarity.

Where two cubs are born, one will be abandoned as the female must carry the other for the first 16 weeks following the birth. The remaining cub is by all accounts given constant care but despite this there is high mortality in the wild.

I have been unable to establish the age at which giant pandas mate but there are records of one captive female being on heat at the age of four years. Of the pandas being lent to New Zealand, the male will be around five and a quarter and the female almost four years old by the time they return to China. China has around 80 captive pandas, yet the total number of offspring born in captivity per year is 3, and these via artificial insemination.

Status

Since the last survey 12 years ago when it was found there were around 1000 pandas left in the wild, habitat loss has increased, there has been bamboo die-off (1983) and poachers seem to be as numerous as ever despite the fact that they may receive life imprisonment or the death penalty. In the past 12 years, one in four pandas died through poaching. Giant panda hides sell for about $15,000 in Japan or Hongkong. As an example of the extremely precarious situation the panda is now in, one need look no further than Wolong Reserve at Sichuan province.

With 770 sq miles, Wolong is the largest of 12 panda reserves. It is staffed with biologists led by China's panda expert, Professor Hu Jinchu and America's panda expert George Schaller. At Wolong is the $US 1.6 million research and conservation centre which is specifically for giant pandas. In short, Wolong reserve appears well managed. Despite this, the number of pandas there has decreased to 72, 50 percent of those at Wolong 12 years ago.

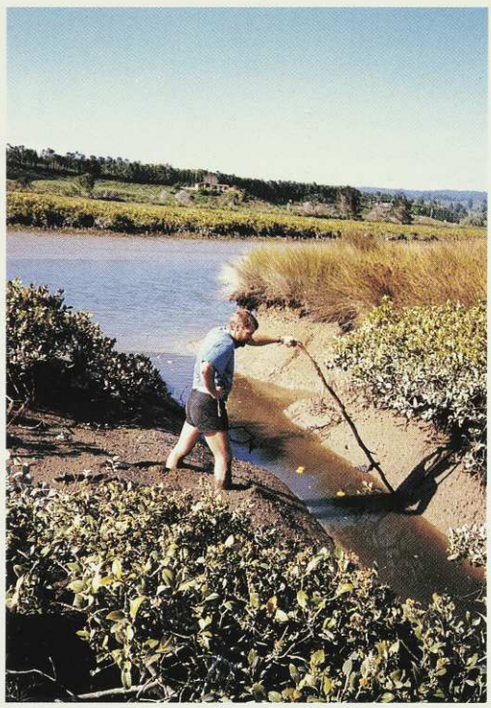
It should be remembered too, that giant pandas have been ruthlessly exploited during the 50 years that the western world has known them. Expeditions for hides in the 1930s generally resulted in the deaths of cubs, lactating females and old pandas. Of those captured live, many died before they could be shipped from China, and the majority of those which did live long enough to reach foreign zoos died within 1-12 months. Because pandas did not run from gun-fire, early hunters described them as "stupid".

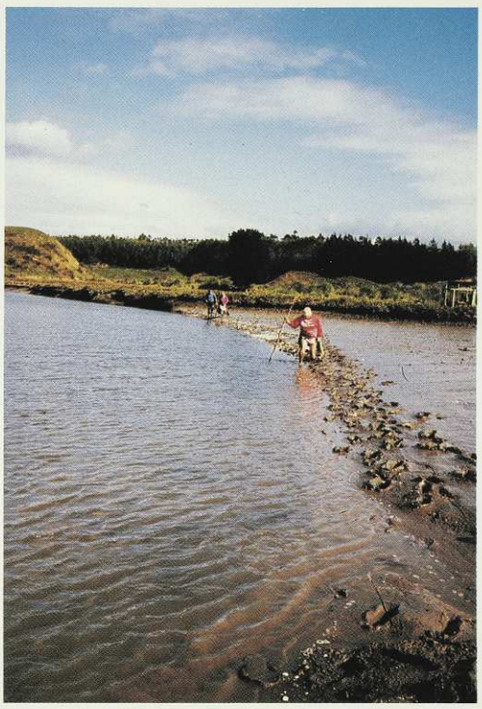
I believe pandas are probably incapable of any activity which demands sustained high level expenditure of energy. Bamboo shoots are 90 percent water and 80 percent of the food is not digested. Also, the evolution of giant pandas has proceeded alongside that of bamboo, thus the body is modified for ambling through bamboo thickets and for sitting upright to peel and eat shoots. Pandas spend 50-75 percent of their time doing just this. They may climb trees and can stand upright but they have never achieved the bi-pedalism most bear species are capable of nor have they achieved speed on all fours.

The Scheme's

A Lemon

On the face of it citrus fruit would not appear to be a powerful weapon in the battle to save our estuaries and wetlands from pollution. However, as our Bay of Plenty field officer Ann Graeme demonstrates in this article, the Tauranga branch of Forest and Bird recently discovered that the humble grapefruit proved an important point in wetland protection.





The grapefruit bobbed off down the drain to the river and the watchers plodded after them. Because the tide was low the river was restricted to its narrow banks and the grapefruit whirled along at a fine pace. Only the boats and the lightweights of the party could keep up with them and we envied the pukeko their big splayed feet as we stumbled and sank in the mud.

As the river became wider and shallower and firmer, we waded through beds of Pacific oysters and were glad of our sneakers to protect our feet from the sharp shells. Pacific oysters, new to Tauranga Harbour, are flourishing. They are keenly sought for food, and the ones we opened were large and succulent. Flounder were also abundant. Then we passed a group of rare wrybill plovers as they fossicked in the mud.

The grapefruit travelled about two kilometres to the mouth of the estuary before the rising tide stopped them and pushed them back up the river. As the tide rose still further the river spilt over the mudflats, and the grapefruit dispersed over the estuary. The experiment was finished. We had proved our point.

Effluent from a piggery is discharged out of this flap valve (top left) at low tide into the middle of Tauranga Harbour. When our Tauranga branch heard of plans to increase the discharge rate to 126,000 litres daily, they conducted a novel experiment with grapefruit to see how far the effluent would travel. The grapefruit begins its three-hour journey at the valve (top left) before drifting out into the Wainui River (top centre). The grapefruit prove difficult to keep up with in the mud (top right), but a good number of Forest and Birders manage to follow the trail to the end (above). They proved that the effluent would pollute shellfish beds and have forced the pig farm owners to look at land-based treatment.

Human History

To understand the significance of the experiment, we have to retrace our steps through the history of Tauranga Harbour to a time when humans first came to New Zealand. The shores of the harbour have always been a popular place to live; large Maori settlements flourished on the peninsula fingers and people fished and gathered kai moana in the rich, shallow waters. Today about 55,000 people live around the harbour, using it for food gathering and recreation, and enjoying its beauty.

Our population puts great pressure on the harbour. The peninsulas are narrow, fringed with sandy beaches, salt marshes or mangroves. Around Tauranga City, decades of reclamation have provided land for industry and the port. In the country, stop banking has replaced salt marshes and wetlands with pasture. Much of the fertile wetland fringes, the larder and nursery of the harbour, have been destroyed.

In 1985 the Tauranga City Council sought to protect the city salt-marshes with an Estuarine Protection Zone. However, this tentative step towards environmental protection was shortlived when owners threatened the council with compensation demands should their plans to reclaim and develop their salt marshes be thwarted. The Estuarine Protection Zone was quickly revoked.

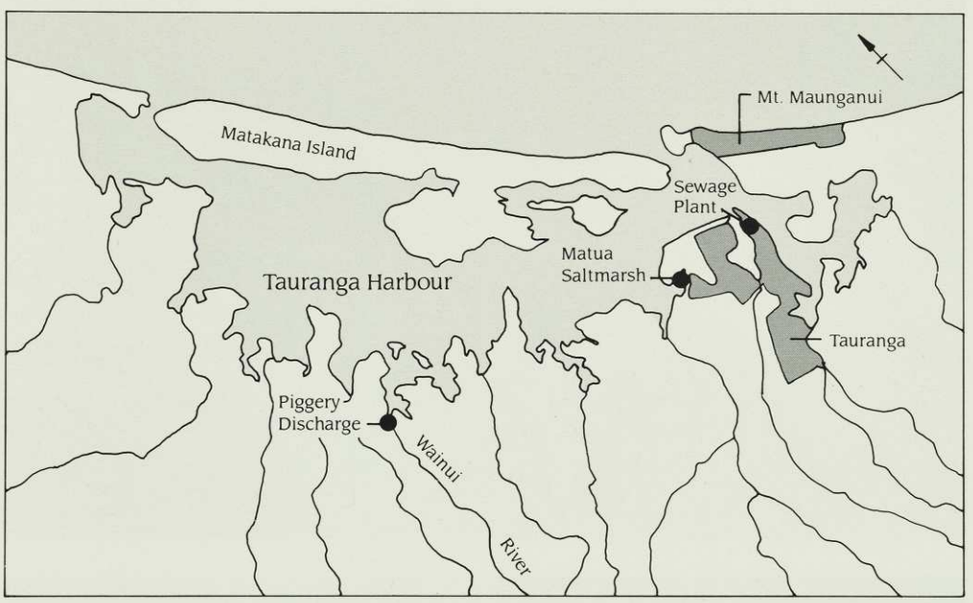
In 1986 Tauranga Forest and Bird and Kaimai Native Forests Action Council engaged the Environmental Defence Society to dispute the City Council's action before the Planning Tribunal. The case rested upon the Town and Country Planning Act, section 3c, which requires "preservation of the natural character of the coastal environment and the margins of lakes and rivers and protection of them from unnecessary subdivision and development."

In a landmark decision, Judge Moore decided that the Estuarine Protection Zone should be reinstated and strengthened, and such zoning would not involve compensation to the owners.This is a major triumph for local conservationists, and has set a precedent for saltmarsh protection elsewhere. At present the 25-ha Matua saltmarsh, the largest in the city, is under negotiation for purchase as a wetland reserve. This will be a joint effort involving the Tauranga City Council, the Department of Conservation and the QE II National Trust.

Besides reclamation, Tauranga Harbour is entirely surrounded by housing, orchards and farms. From the orchards and farms comes run-off containing spray residues, fertilisers and effluent. From the urban areas comes storm water, contaminated by petrol and chemicals from factories, enrichment from septic tanks and treated sewage from Tauranga city. The city sewage discharge, opposite the harbour entrance, was designed to operate on the outgoing tide, taking the effluent out to sea. Now overburdened, the treated sewage is discharged continuously, so much of the enriching effluent is dispersed up the harbour.

126,000 Litres of Pig Effluent

It was against this background that Tauranga Forest and Bird learnt of a proposal to seek planning permission and water rights to discharge 126,000 litres daily of pig effluent into the Wainui River estuary, roughly in the middle of Tauranga Harbour.



The piggery has an existing right to discharge 22,700 litres of scantily treated effluent, and wishes to increase the discharge to 126,000 litres daily to provide for up to 10,000 pigs.

Tauranga Forest and Bird objected to both the planning application and the water right on the grounds that the discharge would enrich and pollute the harbour waters, to the detriment of the ecosystem and the people who used that estuary for recreation and shellfish gathering.

To provide factual material to support our objections, a group of members and local residents went out to monitor the discharge. The Wainui estuary is very shallow and muddy, fringed with dense mangroves. Except at high tide the mudflats are entirely exposed, with only the Wainui River snaking across them.

The piggery discharge takes place into a drain leading to the river, and is controlled by a flap valve. As the tide falls, the reduced water pressure allows the valve to open. Effluent than flows out the valve for about three hours over the low tide period, until the rising water recloses the valve.

To track the effluent we put grapefruit in the still water in front of the discharge valve, before it opened. Citrus are excellent for tracing discharges because they float nearly submerged, offer little resistance to the wind, they can easily be spotted by observers and are cheap and biodegradable when lost!

As low tide approached we watched the discharge valve slowly open, allowing an inky stream to first trickle, then pour out. There was a strong smell of sulphur. The grapefruit and the effluent then moved off as described earlier until, after two kilometres, they dispersed further over beds of cockles and pipis.

Alarming Coliform Levels

Tests on the effluent initiated by local residents and the Conservation Department revealed alarmingly high coliform bacteria levels, and very low B.O.D. (oxygen) levels, showing that the effluent was practically raw sewage – bad news for shellfish beds.

And the result of all this activity? The pig farm company has withdrawn its application for an increased water right. It is now investigating a new management regime involving housing the pigs on a deep layer of sawdust to absorb most of the effluent, and treating the remaining effluent through ponding and a created wetland.

Small victories like this give us hope that the ecology of our harbour can be protected and eventually enhanced. The Catchment Board, never in the vanguard of conservation, has been embarrassed at the revelations of how their lack of policing allowed the pig farm to flaunt the conditions of the original water right. They have now initiated a major water quality survey of the harbour which will provide standards against which further discharges can be evaluated.

The local Forest & Bird branch has shown that, not only can we lead public opinion in environmental issues, but we can actively investigate and document cases to promote the wellbeing of our communities.

Secret Sell-Off Of Our Coastlines?

The Minister of Transport Bill Jeffries appears to have shut out public comment on land being sold to Port Companies. The land assets of Harbour Boards that could be sold to the companies include: *nationally important mangroves and saltmarshes in Auckland's Waitemata Harbour; * the extensive Aramoana saltmarsh in Otago Harbour; *an island in Rangaunu Harbour, Northland, which is a roost for 8000 wading birds and breeding site for the endangered NZ dotterel; * parts of Napier's well known Ahuriri estuary; * The Sugarloaf Islands marine park in New Plymouth.

We have appealed to Associate Environment Minister Philip Woollaston to intervene and ensure the Government's land allocation criteria are applied through a public process – this way we feel the areas will be allocated to the Conservation Department.

Unravelling the Mysteries of Tuatara Reproduction

Stephens Island is home to one of the world's most fascinating reptiles, the tuatara. Situated at the northwestern entrance to Cook Strait, this remote and inaccessible wildlife sanctuary provides a refuge for a number of rare and endemic New Zealand animals, including giant weta, the Stephens Island gecko, and Hamilton's frog. But without a doubt, the tuatara is the most famous of its inhabitants. Scientists Alison Cree and Michael Thompson here describe the research they have been carrying out on tuatara reproduction.

For the last three years, scientists from Victoria University of Wellington's Tuatara Research Programme have been studying the tuatara on Stephens Island. While we have been focussing on reproductive biology, other scientists from New Zealand, Australia and the United States have joined the programme to participate in studies of genetic variation, water balance, thermoregulation, parasitism and juvenile ecology.

International Attention

Why should this cold reptile attract such international attention? One reason why biologists study the tuatara lies in its unique evolutionary position. The sole survivor of an order with equal ranking to the other three groups of living reptiles (turtles, crocodilians and squamates – the lizards and snakes), the tuatara retains distinct similarities to fossil reptiles from the Age of the Dinosaurs. For example, the tuatara's skeleton is remarkably similar to that of a reptile called *Homeosaurus*, which lived in Europe approximately 140 million years ago. Tuatara also have distinct differences from modern lizards, which they otherwise superficially resemble. Male tuatara are unique, for instance, in lacking a copulatory (intromittent) organ.

A second and equally important reason for current research on the tuatara is to assist with conservation. The tuatara was apparently present on the New Zealand mainland until last century, and despite having had legal protection for the past 100 years, island populations continue to become extinct. Although the population on Stephens is remarkably large, numbering many thousands, populations on the remaining 30-odd tuatara islands are smaller and several, which comprise predominantly older animals, are unlikely to survive without assistance. Predation (especially by rats) and habitat changes are likely causes of at least some population declines.

Stephens Island is a cliff-bound and isolated wildlife sanctuary in Cook Strait. Grants from WWF-NZ and the Department of Conservation have been instrumental in funding transportation costs of current research. Photo: M Simons

Tuatara are abundant on Stephens Island in both grazed sheep paddocks and in remnant native forest (inset). Recent observations indicate that sheep paddocks provide favoured areas for nesting because the soil there is several degrees warmer than in the forest. Photos: A. Cree

A female tuatara – an animal which has until recently managed to keep many details of its reproduction a secret. Photo: A Cree

In order to devise an informed management programme for any species, it is vital that we have a detailed understanding of the species' requirements for reproduction. Until recently, information on tuatara reproduction was meagre and largely anecdotal, and in many respects this reflected particular features of the animal itself: its restriction to isolated and inaccessible habitats, its highly protected status, and its tendency to cease activity when disturbed. However, using a combination of field and laboratory techniques, current research is providing new and exciting answers to many questions about the reproductive biology of the tuatara. These results will help direct future research and management not only on Stephens, but also on other tuatara islands and in captivity.

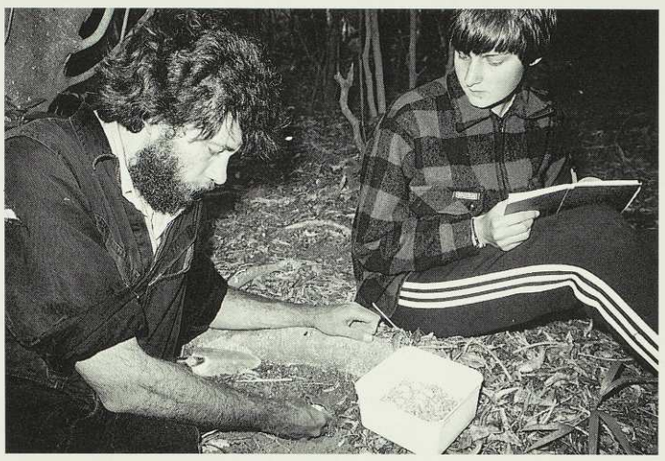
The programme for a typical field trip to Stephens Island illustrates the variety of studies involved. Over the last two years, we and our colleagues have made two-week-long trips to Stephens Island at monthly intervals, catching marked adult tuatara at night, weighing and measuring them to determine growth rates, collecting blood samples to analyse for sex hormones and other substances reflecting reproductive activity, and monitoring soil temperature and moisture conditions in tuatara nests around the clock. Once a year, the Department of Conservation carries out an x-raying study which identifies the proportion of female tuatara carrying shelled eggs each year. When we return to the mainland, blood samples are analysed, data on nest conditions are examined by computer, the development of eggs incubated in the laboratory is monitored, and the next month's field trip is planned.

Reproductive Cycle

These studies have helped clarify many aspects of the tuatara's reproductive cycle. Like most reptiles, tuatara are seasonal breeders. Mating occurs in late summer. Between January and March, male tuatara spend much of their night-time activity "displaying" in highly visible locations. They erect the spines and crest down the head and back, and adopt an alert, "head-erect" posture which is probably important in attracting females. During mating, the male lies over the female and entwines his tail around hers, serving to bring their cloacae into close apposition so that sperm can be transferred. Copulation is an extended process, having been observed in one instance to last 58 minutes. Following mating, the female fertilises her eggs by April and has at least partly shelled them by July, but does not lay them until the following November or December. The embryos are poorly developed when nesting occurs, and just why a female holds shelled eggs for so long without extensive embryonic development is unknown.

Courtship and mating have rarely been observed in the tuatara. During courtship, the male (left) circles the female (right) with his crest erect and throat skin extended. Receptive females are mounted by the male until sperm transfer is complete (right). Photos: A Cree

Strictly speaking, the reproductive cycle of female tuatara begins well in advance of mating. In fact, some females begin yolking a new clutch of eggs soon after nesting. Individuals do not nest every year, however, and it is likely that egg yolking takes place over many months, even years, prior to mating. The minimum known period between nestings of the same female is two years, and the nutritional status and perhaps age of the female may affect how frequently she reproduces.



Mike Thompson and assistant Jennie Hay burying tuatara eggs in an artificially constructed nest chamber. No natural nests have been found under the forest canopy on Stephens Island. Eggs are therefore being incubated in man-made nests, in an attempt to determine whether the success of development varies between forest and paddock habitats. Photo: A Cree.

One of the most interesting discoveries of recent research is that nesting is concentrated in particular areas, or "rookeries", on Stephens Island. To date, such rookeries have only been found in open areas, predominantly grazed sheep paddocks. This raises the question of why females favour such open, modified areas for nesting in preference to the original forested habitat. Monitoring of the nest conditions reveals that during summer, when embryonic development occurs, soil temperatures are often higher in the paddock than in the forest. In fact, soil temperatures in the forest rarely exceed 15°C, a temperature shown by laboratory studies to be too cold for successful development.

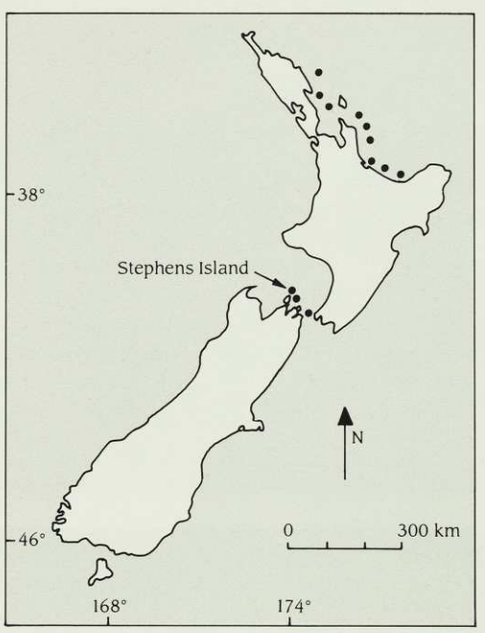
Disastrous Consequences

In the paddocks, eggs in the warmest nests hatch first. Since some eggs appear to be eaten (probably by beetle larvae) during incubation, faster development may be advantageous in minimising exposure to predators. However, in some reptiles, the incubation temperature can affect the sex of the resulting hatchlings. Such a phenomenon could have disastrous consequences for the tuatara if only one sex was produced. This possibility is currently under investigation.

A further discovery with important management implications is that females spend several nights digging a nest chamber, and then several more nights covering the eggs with soil and grass before the nest is complete. Since the nest may remain partially open for a period of days, this makes the eggs potentially very vulnerable to predation by rats. Fortunately, no rats are present on Stephens Island. However, the dwindling status of tuatara populations on several other islands has been linked with the presence of kiore, the Polynesian rat, and the tuatara are never found on islands with Norway or ship rats.

In many respects, our results support the popular idea that "Everything the tuatara does, it does slowly". Along with an extended period of egg yolking and processing prior to nesting, the tuatara has an extraordinarily long period of egg incubation (about one year), a long life-span (perhaps sixty years or more), and takes a decade or longer to reach sexual maturity. Many of these features may reflect the fact that tuatara are adapted to life at much cooler temperatures than are most other reptiles. With such an extended life-cycle, subtle changes in a population's health could take many years to appear and it is therefore critical that we begin to address important issues of tuatara biology now, before it is too late. The presence of a large and viable population on Stephens Island is invaluable in allowing us to tackle such questions, without risking the health of smaller and more vulnerable populations.

Once the current studies on Stephens Island have been completed, the results will be used to formulate comparative studies on other island populations. For instance, our results raise such important questions as: where do tuatara nest on islands that are fully forested?, Do kiore prey on tuatara eggs and is that one of the reasons for the drastic reduction in reproductive success of tuatara on islands with kiore? Do the important reproductive events (mating, ovulation and nesting) occur at the same time on northern and southern islands?



The tuatara is now restricted to just 12 island groups (about 30 islands), shown by black dots. The population on Stephens Island numbers many thousands and may be as large as all other populations combined.

Are the hormone cycles of either sex affected by low population density or reduced social interactions? And, do tuatara nest more frequently in warmer conditions or where food is more abundant? Only when these and other questions related to geographic variation are answered will it be possible to formulate a New Zealand-wide management plan for the conservation of this unique species.

Alison Cree and Mike Thompson are scientists who have been working for Victoria University's School of Biological Sciences. *Throughout their studies, a major principle has been that their research on tuatara should not only be good science but also have readily identifiable management values. They extend their warmest thanks to the many colleagues, assistants and sponsors who have made these tuatara studies possible.*

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KAKA

A Threatened Species?

by Jacqueline Beggs and Peter Wilson

Kaka in an aviary were fed the larvae of kanuka longhorn beetles so we could measure how much energy they gained from them. Although the larvae are rich in fats, the effort required by kaka to dig them out means that the net gain of energy is negligible. Photo: Peter Wilson.

An inordinate amount of energy goes into digging out larvae. A male kaka (right) digs kanuka longhorn beetle larvae out of mountain beech trees, taking it on average 81 minutes of hard work peeling off strips of wood (left).
Photos: Ian Southey, Peter Wilson

Scientists are worried that South Island kaka are not breeding successfully. An intensive four-year study on kaka in the Nelson Lakes region found only three nests, and the eggs in all three failed to hatch. A separate study on birds in South Westland also found that the kaka there were not breeding.

The kaka is a forest-dwelling parrot. It is closely related to the alpine kea, although it is not seen as often as the kea because it spends most of its time in the tops of trees. There are two subspecies, the North Island kaka and the larger, more brightly coloured, South Island kaka. At the time of the arrival of European settlers in New Zealand there were accounts of large flocks of kaka throughout much of the country. Indeed, Buller in 1888 reported that the kaka was one of New Zealand's ". . . characteristic forms and is met with, more or less, in every part of the country."

Today, kaka live only in the larger remaining forests, and in most of these areas they survive only in low numbers. Why did the number of kaka decline so dramatically, and how secure is their future? To try and find the answers, our DSIR Ecology Division research team studied the kaka in beech forests of the Nelson Lakes region.

The destruction of forest habitat is one obvious reason for the reduced distribution of kaka, but we wanted to find out how well kaka were surviving in the areas where the forest is still intact. It would be a great shame if kaka were to become yet another species restricted to a few offshore islands or remote forests most New Zealanders will never see.

Difficult to Study

Kaka are difficult to study, as they live in the tops of trees and often move large distances. It was obvious that we would need a fairly sophisticated technique to locate and follow these birds, so with help from Brian Karl of Ecology Division we developed a method for attaching a miniature radio transmitter that would withstand the powerful "bolt cutters" the kaka has for a beak. The transmitters were held on by a harness system, like a small daypack, and a weak link was built in so that the transmitters would eventually fall off.

Kaka spend a lot of time collecting insects, from both dead and live trees. Male kaka can spend up to two hours digging into the live wood of a mountain beech to capture one larva of the kanuka longhorn beetle. This larva looks very similar to the huhu grub, and is rich in fats and protein. However, the kaka uses so much energy to dig the larva out that not enough energy is gained from eating it to meet the bird's daily requirements. For energy, the kaka must supplement the insects with a richer, more easily accessible food.

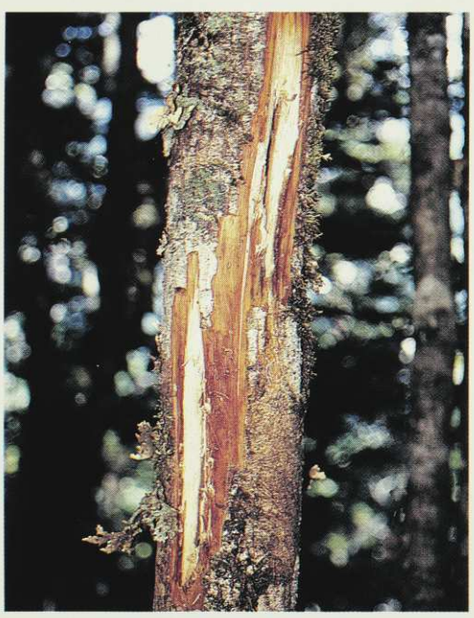
There are many anecdotal accounts of kaka feeding on fruits and nectar, but both these food sources are scarce in northern South Island beech forests. Instead, the kaka we studied fed on drops of honeydew. This is a sugary substance produced by a small scale insect which lives in the bark of some beech trees. The honeydew drops have a high energy content but a low protein content, so by themselves they are not a balanced diet. However, when the energy from honeydew is combined with the protein and minerals from insects, kaka have a diet that allows them to survive in beech forests.

Kaka feed on honeydew mainly in the late afternoon and early morning. This helps them to survive through the night, and to gain energy quickly in the morning before they head off to start digging out insects. Kaka collect most of their honeydew from branches in the tree canopy. Experiments have shown that the sugar concentration in droplets from the canopy level is higher than in droplets lower down the tree.

We needed to find the answers to three questions before we could calculate how much energy the kaka would get from feeding on honeydew:

- How fast can kaka collect drops of honeydew?
- What is the average energy value of a drop of honeydew?
- How much energy does a kaka use up in collecting honeydew?

We found that kaka could collect about three drops of honeydew every second. Each droplet had an energy value of about 11 joules. From this we estimated a kaka would only need to feed on honeydew for about three hours to get enough energy to



last it through a summer day. It should need to feed for longer in winter because of the colder temperatures, but honeydew would still be a good source of energy.

Competition from Wasps

There are two main species of introduced social wasp in New Zealand: the German wasp and the common wasp. These wasps build up to very high numbers in beech forests with honeydew trees, and hundreds of wasps can be seen crawling over each honeydew tree in late summer and autumn. The wasps take so much of the honeydew at this time of the year that there is not enough left for the kaka. Kaka are rarely seen in the honeydew areas when wasps become numerous. In its natural state, a beech forest contains very few flowering or fruiting plants. The introduction of possums and deer has reduced the variety even further.

Possums, for instance, have killed many of the mistletoes you would normally expect to find in beech forests, yet kaka feed on the fruit and flowers of these plants in areas that possums have not yet reached. Now, when wasps drive the kaka away from the honeydew, there are few alternative foods for them to turn to as a source of energy.

The sap of trees is one option, and kaka do feed on sap, but it is harder to get and probably not as rewarding as honeydew. It seems likely that kaka have to scratch a living from a combination of insects, sap, and seeds when they are available. Unfortunately, the worst time comes in autumn when the birds need to build up their reserves of fat. If kaka are short of energy reserves in winter, then by spring they may not have the extra energy they need in order to breed.

Lack of Breeding

It is of great concern to us that in four years of fieldwork we have not found a single successful kaka nest. One pair we were observing attempted to breed three times, but the eggs never got any further than the incubation stage. They were all eaten by rats, but we think this happened only after the kaka had abandoned the nest. The birds stayed on the nest until well after the eggs should have hatched, but without any success.

The female does all the incubating, and has food brought to her by the male, with at least one other kaka helping him. It is possible that these "helpers" at the nest are part of a family group, but information on the social organisation of kaka would take many years to collect — especially since they breed so infrequently.

Colin O'Donnell and Peter Dilks of the Department of Conservation have been assessing the birdlife of forests in South Westland since 1983. They have not found any kaka breeding in their study areas. Combine this with the lack of successful nesting we have found, and the future of South Island kaka looks bleak.

Nobody knows how long kaka live for, but parrots in general have a long life span. Kaka can probably live for longer than 20 years, so if a kaka population was not producing any young then it would be many years before a decline in the number of birds was noticeable. In other words, the kaka populations in some or all of our forests could be made up solely of elderly birds, and if we were only to count the number of kaka present, then we would probably not notice the problem until it was too late.

The solution for kaka may lie with active management of the beech forests of North Westland, Nelson and Marlborough. The introduction of a wasp parasite may be one answer, and is currently being looked at by DSIR under contract to the Department of Conservation. It may also be necessary to provide extra food for kaka at certain times of the year — perhaps by planting a food source that is not attractive to wasps.

What is needed now is more research, aimed at finding out whether our theories about the lack of breeding are correct, and determining how widespread the problem is. It is easier to help save the kaka now, before their numbers have become critically low and we are faced with yet another endemic species requiring "emergency treatment". Preventative medicine is always the better option.

Jacqueline Beggs and Peter Wilson are scientists working for DSIR Ecology Division in Nelson. *The author's work has been part funded by recent grants from the J.S. Watson Trust and The Native Forest Restoration Trust.*

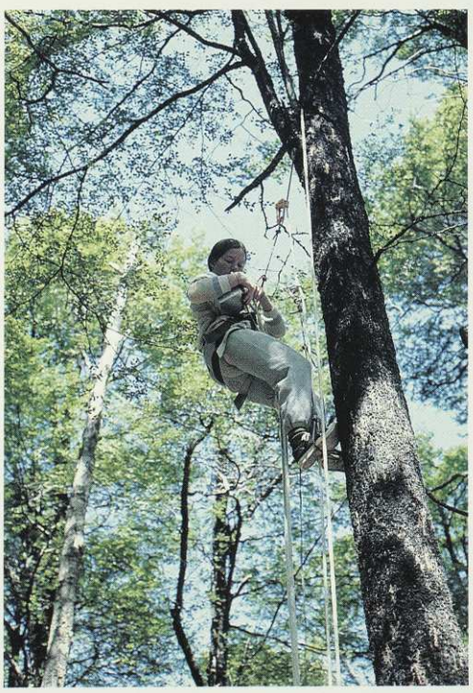
No Forests — No Kaka

Forest logging and clearance pose the greatest threat to the kaka. Scientific work by Colin O'Donnell and Peter Dilks shows that selective extraction of rimu and beech trees and a long-term logging rotation cycle in South Westland would be devastating for rare birds like the kaka. Despite the evidence, the logging option is favoured by the majority of the Working Party on South Westland including DSIR, Forestry Corporation, Ministry of Forestry, West Coast United Council and the Maori representatives.

The loss of primary forest and the decline of kaka is best illustrated in the North Island. Here viable kaka populations, probably survive only on the larger Hauraki Gulf islands, Kapiti and a few large mainland forest blocks (Urewera-Whirinaki, Pureora, North Taranaki and beech forests of the axial ranges) which continue to be reduced in area by logging of private forest.

The survival of South Island kaka will be ensured if the World Heritage forests of South Westland are protected and woodchipping in Southland, Marlborough, Nelson and North Westland ceases.

But the North Island kaka may become an island exile, if forestry companies like Carter Holt Harvey continue to log away the last kaka strongholds in North Taranaki and NZ Forest Products woodchip more tawa forests of the central North Island.



Above: *We climbed beech trees so we could compare the energy value of honeydew at the top and bottom of the tree. Kaka collect most drops from the canopy level, as the drops there contain more energy.* Photo: Peter Wilson

Right: *Big Bush State Forest (foreground) adjoins the Nelson Lakes National Park to form a large area of forest habitat suitable for kaka. Unfortunately, the edges of these forests — in private ownership — are still being clear-felled, so the lower-altitude forest containing the large trees suitable for nesting are being lost, as well as the red and hard beech trees that are the source of honeydew.* Photo: Tim Fitgerald

THE RED HILLS :

Miners have always dreamed of possible fortunes to be made from the fabled Red Hills, though the fortunes are no more tangible than the dreams. Mike Harding here describes some more lasting values found in the Red Hills than minerals.

In West Otago, south of Haast, further than roads have been pushed, is a place called the Red Hills: a mysterious sounding place that many people talk about but where few have been; a place where the mountains are in fact red, and devoid of vegetation; a place where miners and prospectors have delved and dreamed of indescribable wealth; and a place so remote, so rugged and so battered by cold, wet westerly storms that successful trips to it are legendary.

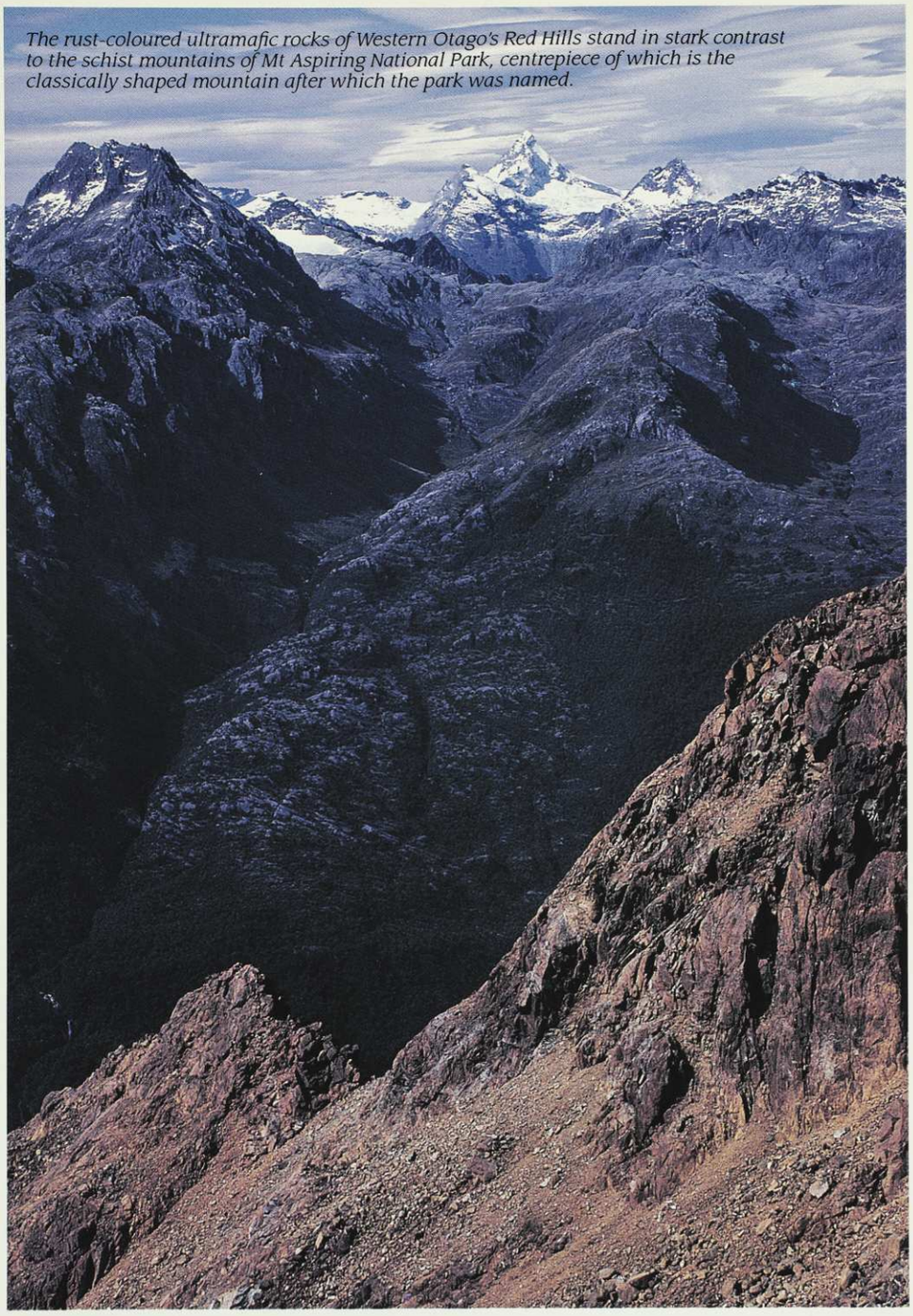
Gradually, I accumulated information: an account of A.J. Barrington's epic journey in 1864; tramping club trip reports; DSIR botanical surveys; and a resources report produced in the last year of the Lands and Survey Department's existence, as part of the long-running debate over the future of the area. But, perhaps not surprisingly, general information on the plants and animals, access, routes and travelling times was lacking.

The Red Hills became even more fascinating. Here was a place that seemed to be largely undiscovered or unexplored. My thoughts turned into a personal challenge: to tramp through this country and discover for myself the mysteries of this bizarre, barren landscape. It would be a journey of several day's duration through broken mountain ranges, untracked forest and involve crossing large, swift rivers. There would be no facilities: no tracks or even described routes.

Red Mountain sunset.

PRECIOUS WILDERNESS

Far left: *Trampers can easily get lost in the Red Hills as mist and fog obscure landmarks and compasses fall victim to the capricious whims of geology.*
Middle: *Near Barrington Saddle, a jumble of crushed boulders and no green in sight.*
Right: *Ultramafics detail.*
All photos: Mike Harding



The rust-coloured ultramafic rocks of Western Otago's Red Hills stand in stark contrast to the schist mountains of Mt Aspiring National Park, centrepiece of which is the classically shaped mountain after which the park was named.

Finally, in April our small party of three, laden with 12 day's food, ventured up the Cascade Valley. Filled with a mixture of excitement and apprehension, and with only a map and compass to guide us, we picked our way through the fertile lowland forest of the Cascade. We forded the deep, cold river when forced to and gradually gained the upper valley. Only faint traces of a 100-year-old prospecting track reminded us that people had come before us.

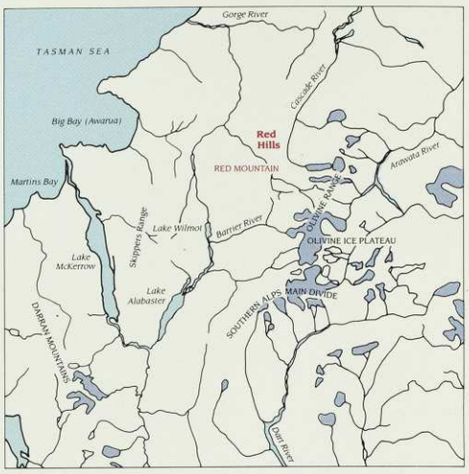
Watching the weather carefully, we gained the open tussock tops of the northern Red Hills Range. To the east the gnarled beech timberline of the Cascade straggled against the basins and plateaux of the range, and to the west a band of weather-beaten subalpine shrubs clung to the abrupt scarp of the Alpine Fault. The ochre glow of the Red Mountain massif tempted us onward south along the range.

An overwhelming feeling of solitude overcame us, at the same time as one of freedom – to wander at will across this striking landscape, with no tracks or footprints to distract us from our selected route.

The Red Hills . . . a landscape virtually devoid of vegetation. This Dracophyllum uniflorum *struggles to survive on the iron and magnesium-rich rocks of the region.*

By moonlight we gazed from the shattered rock across valleys and ranges, east to Mt Aspiring baring a flank seen only by those who journey this far; and closer the sheer ramparts of the Barrier Range and Olivine Ice Plateau, glaciated peaks unknown and unnamed, resisting the invasion of civilisation.

My thoughts turned to Barrington and his companions retreating tired, cold, hungry and disillusioned, from the lower Cascade, after months of fruitless prospecting from their starting point in Queenstown. Separated crossing Red Mountain and trapped by early winter snows, they were lucky to survive and reach the relative comfort of their base camp at Lake Alabaster. Then this wilderness took weeks to cross, not days, and help was too far away to be useful.



As we descended to the Pyke River and the broad sweep of Big Bay, I thought of the naturalist Dick Jackson, lost here last summer, and what the solitude of that last camp would have meant to one so fascinated by nature and its mysteries. And together we wondered as we scrambled over the bouldery beaches on the long days back up the coast how the bulldozer driver felt when he scarred this pristine beach with his machine a few years ago. Nature would mostly recover from this temporary intrusion, the Tasman Sea battering the sculpted rocks on the one side and windswept forest carpeting the flank of the Malcolm Range on the other.

And I still wonder, as I reflect from the tracked and travelled mountains of Arthur's Pass, what the future of the Red Hills will be. Will others after us have the opportunity to experience the power and grandeur of nature free from the trappings of modern society? Will others have the opportunity to experience the challenge that is provided only by those very few areas that remain as wilderness?

The future of the Red Hills as wilderness is in our hands. The challenge is ours to counter the arguments for mining, logging, roading or other tourist development. For myself, I may never return there, but it will always be important to me that it is there as wilderness, just as it is to many others who may never travel there. It is important that there are places where ecological processes continue free from the direct influence of humans, and it is important to future generations that there are still places like the Red Hills when it is their turn to live on this beautiful planet.

We cannot recreate wilderness, so let us be sure to save what we have.

The National Parks and Reserves Authority has recommended that the Red Hills be added to Mt Aspiring National Park. The Minister of Conservation, Helen Clark, must now decide whether to formally accept that recommendation.

Mike Harding is a ranger at Arthur's Pass National Park.

SIGNPOSTS TO THE PAST

by Conservation Department senior conservation officer Isobel Gabites

What was it like for the first Polynesian settlers living along the east coast of the South Island? How easy, or difficult, was it, to make a living in a new land . . . a new land with unfamiliar cycles. Some birds became scarce, but that was just what happened. Weren't there always other animals? This was a land of plenty.

The first settlers lived on the coast, feeding on seals, dolphins and fish. Nearby, streams ran sluggishly through lowland swamps forests breeding fish and eels. To the north and south of the Waitaki River limestone caves provided shelter within a day's walk for hunters gathering birds to supplement coastal diets. It is thought that the lowlands of Canterbury were particularly abundant in moa. Strong winds and fire had already turned the forest into a mosaic of vegetation types suitable for browsers, and the limestone bluffs of South Canterbury and North Otago provided sheltered nesting sites.

After 300-400 years of human settlement, the combination of introduced rats, hunting, and fires wrought considerable changes on the big game species. They were rapidly becoming extinct. Their memory is captured in drawings on rock faces done by Maori hunters and travellers, probably during the 1300s and 1400s. Moa, eagle, goose, swan, pelican . . . the drawings remain like a cold shiver along the spine of South Canterbury and Otago; memories of an amazing diversity of animals now gone.

Moa and seagulls were becoming severely depleted after three centuries of human settlement. By the 1500s moa were probably gone from South Canterbury, along with swans, geese and eagles. Burning of forest, for bracken, by accident, for route clearing, eventually reduced wildlife diversity and volume to the point where it no longer supported growing settlements. Once-sluggish creeks winding through swamp forest became free flowing streams and lagoons. People no longer went on hunting expeditions for moa to the big limestone bluffs. They turned to fish for food. As the big game moa and seal colonies were depleted, they moved on, rather than developing new technologies to exploit the less productive lands.

The southern South Island climate denied people the opportunity to garden, so they remained a hunter-gathering community apart from deliberate bracken regeneration and minimal kumara planting. The entire South Island population was probably not more than 5000. It may be that, within their technological restraints, the land had reached its 'carrying capacity.' A new sort of society was emerging: one which took resource rights far more seriously and defended infringements with violence. And in the 1500s new people were arriving in the area.

In the limestone rock shelter, figures drawn in red ochre are probably from this period. In some places they have been deliberately drawn over the top of earlier figures. They are more abstract, and include some motifs reminiscent of later Maori sculptural art. Red is the colour of tapu; perhaps the newer figures were drawn by new settlers to protect themselves from ancestors, and to establish their own rights to the land? More recent still, are 'European contact' drawings of sailing ships and horses.

Bones are not the only traces left of extinct species, such as the great eagles. Drawings in limestone caves of South Canterbury and Otago hint of lifestyles and species now lost forever. Photo: Isobel Gabites

Figures like these are best preserved by recreating the environment they are drawn in. By replanting the vegetation around cave entrances, moisture and dust levels are minimised. Photo: Isobel Gabites

Whereas many of the charcoal and grease drawings obviously represent the wildlife and activities familiar to the artists (birds, dogs, fish, dolphins, lizards, hunting, and fishing), there are other figures which are ambiguous. There are human-like motifs, symmetrical designs and taniwha forms. Do they hold spiritual connotations? Does, for example, the positioning of animal forms beside 'hollow' human forms suggest recognition of a spirit shared by all creatures?

Speculation runs rife amongst anyone who sees the cave drawings, of which there are hundreds. The Opihi 'taniwha' has been a focus for interpretation for decades. Detailed, large, precisely crafted, this drawing appears to contain several interlocking skeletal, but stylised forms. Those that trace its origins to lizards may wonder if it is symbolically linked with death. Those who suggest that it represents the fossilised, or even decaying remains of the presumed extinct marine dinosaur, *Plesiosaurus*, can easily understand people being so amazed by this rare, unfamiliar monster that they'd want to capture its memory in art form.

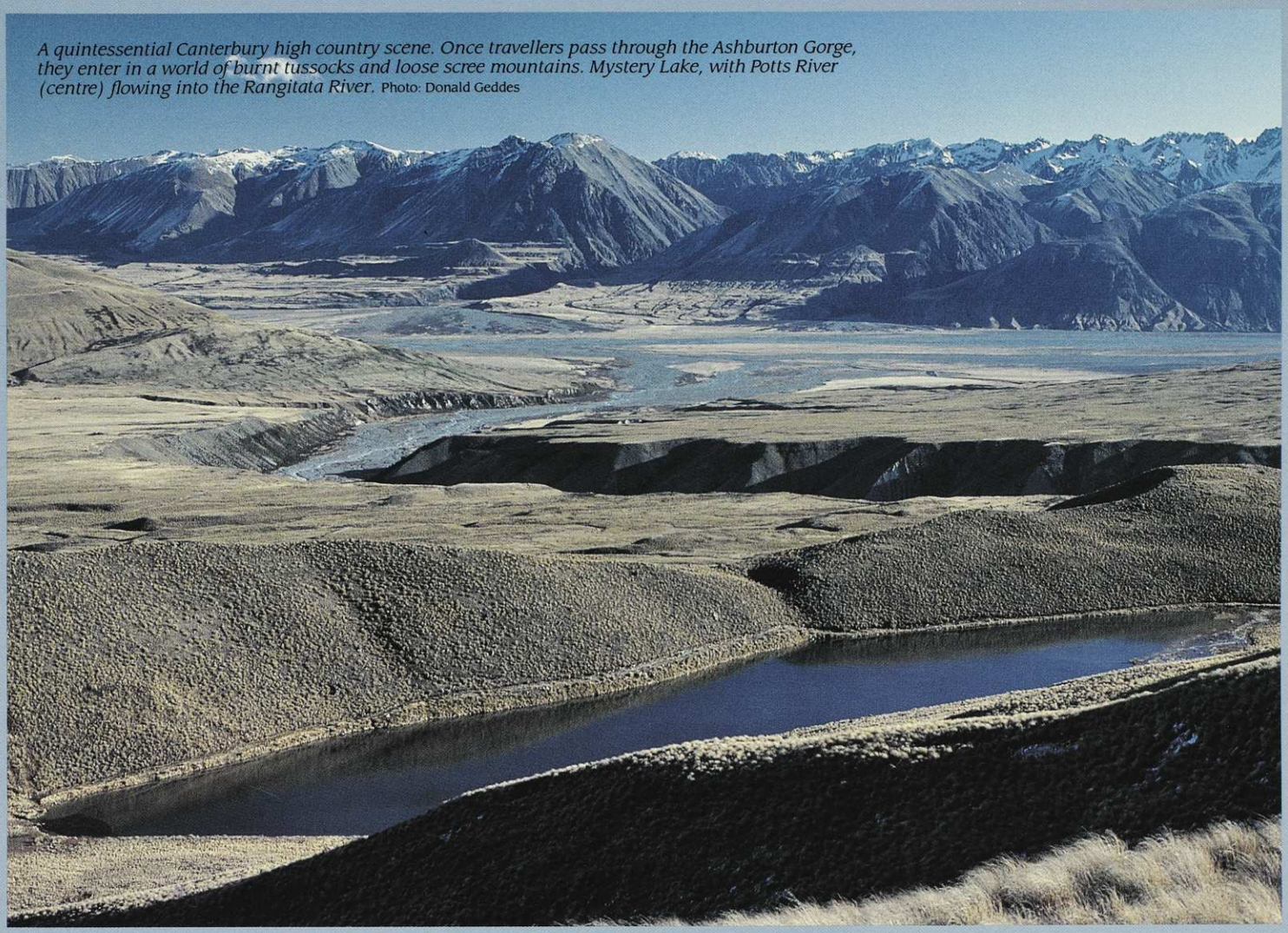
An obstacle to a better understanding of the drawings is the absence of a comprehensive catalogue that shows, in colour, all the drawings as they appear on shelter walls. So little dating has been possible, that perhaps distribution maps of similar drawings will provide a useful chronology of what group travelled where, and when. It's a task worthy of proper funding before sheep, vandals, exposure to dust and rain, decay the drawings beyond recovery.

The rate of loss has been slowed by some landowners who are prepared to fence stock out of the shelters, and replant protective vegetation around them, but more protection is needed. Both the Historic Places Trust and the Department of Conservation are able to assist farmers with protection work, as Historic Places Trust and Lands and Survey have done successfully in the past in South Canterbury. DoC, HPT and museums are building up a record of the drawings, using photography and tracings, before they fade altogether.

To stimulate interest in the drawings, an exhibition of life-size photos and real samples of 21 drawings is moving through the country this year. DoC has produced four high quality posters which include rock drawing illustrations of extinct wildlife, partly as a reminder that settlers everywhere cause rips in the ecological fabric of new and strange lands, and partly to share an insight into the artistry and expression of the earliest settlers. Proceeds from sales will fund fencing, planting and recording activities in Canterbury and North Otago (the posters can be bought or ordered from DoC, Central Office, PO Box 10-420, Wellington).

The earliest drawings, deceptive in their simplicity, have been handed down from ancestors for us to treasure. Some of the ancestors may not, in fact, be long dead! The extraordinary continuity of Maori art (and recent graffiti) found within the shelters signpost some of the most momentous moments in New Zealand's Polynesian settlement history; deforestation, extinctions, cultural change, European settlement, farming and urbanisation.

Information about protected sites open to the public, with the kind permission of the landowners, can be obtained from Historic Places Trust (PO Box 2629, Wellington), DoC offices in Timaru and Dunedin, or Canterbury and Otago Museums.



A quintessential Canterbury high country scene. Once travellers pass through the Ashburton Gorge, they enter in a world of burnt tussocks and loose scree mountains. Mystery Lake, with Potts River (centre) flowing into the Rangitata River. Photo: Donald Geddes

A scaup on the nest. These clownish waterfowl are prodigious divers, staying under for half a minute and more in their search for insects and small fish. Photo: Donald Geddes.

Ashburton Lakes

by Dr Andy Bray, Ashburton branch councillor

The lakes and braided rivers of mid-Canterbury's high country are the home of an impressive number of birds belonging to twenty species of waterfowl, wetland and braided river specialists. In addition to the endangered southern crested grebe there are other notables such as the wrybill plover of which only about one thousand remain, and the self-introduced Australian coot.

Probably the best known of the lakes is Lake Heron. Although the other lakes are familiar to few outsiders they are well used by anglers, yachties, power boaters and, to an increasing extent, by windsurfers. The lakes lie in a basin between the headwaters of the Rakaia and Rangitata rivers, two hours west of Christchurch by car.

Since they lie in the bottom of a wide glaciated basin the lakes are shallow and have extensive wetlands on their margins. Distinctive *Carex* communities, bog rush and red tussock wetlands cover hundreds of hectares around the lake edges and along inlet and outlet streams. They are the home of marsh crake and bitterns and provide shelter from strong northwest winds for the waterfowl. One of the waterfowl that is not appreciated by farmers of the surrounding land is the Canada goose. These large game birds congregate in flocks of several hundred on the lakes and fly out to graze on pastures intended for sheep and cattle. Recreational hunters are unable to control their numbers so the local Acclimatisation Society undertakes culling operations to limit farm damage.

Formal Protection

Currently only Lake Heron and Maori Lakes have formal protection. Both are Nature Reserves and Wildlife Refuges. Ashburton people have been working for many years to get protection for the other lakes. Their efforts have been given impetus recently by the release of a Protected Natural Area survey of the region, and by inspections by the Nature Conservation Council and Aoraki National Parks and Reserves Board. Investigations by local Catchment Boards into the use of the lakes to store water for irrigation of the Canterbury plains has lent urgency to the matter.

The Nature Conservation Council has long held an interest in the lakes and their wetlands, from the time of Sir Robert Falla who held their special values in high regard. The Parks and Reserve Board noted the "high wildlife, geological and scenic values and botanical associations that require protection." It has recommended to the Department of Conservation that most of the lakes and wetlands be designated Scenic Reserves, with provision for farming, access for recreationalists and management of fisheries, game birds and weeds.

These recommendations are an important step forward. The ball is now clearly in the court of the Department of Conservation. Given the Department's public commitment that protection of the lakes will be given high priority, the first concrete steps after nearly twenty years of discussions, meetings, inspections, submissions and recommendations can be expected soon.

Increased Threats

The need for speedy action arises from increased agricultural and recreational threats.

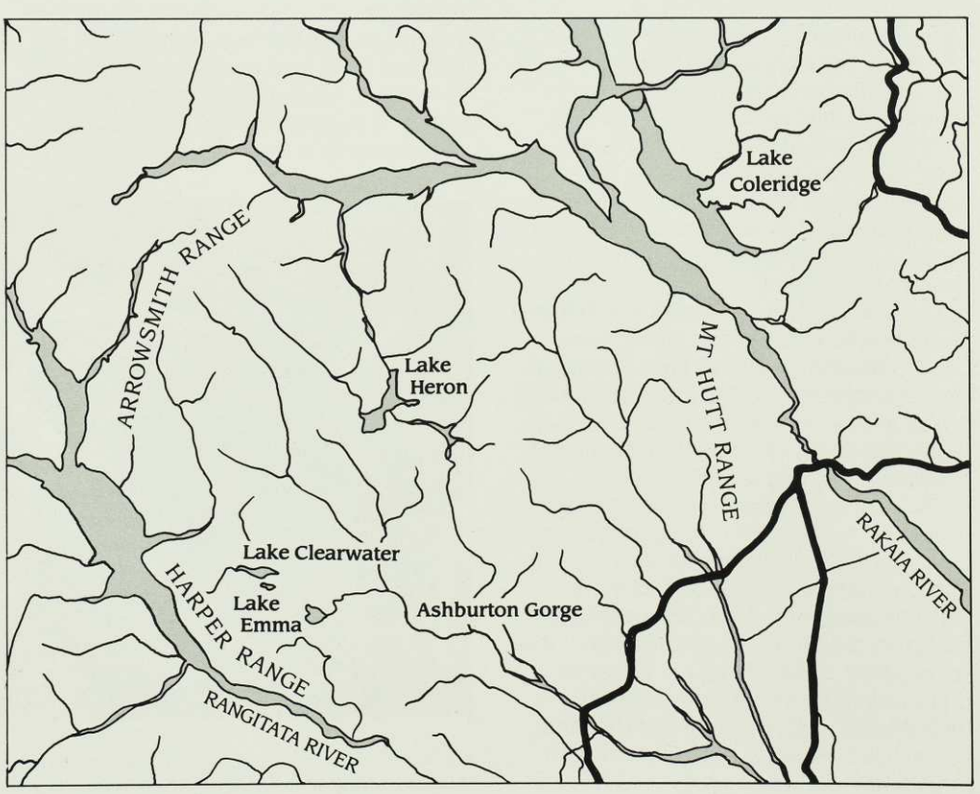
Although the immediate threat of water storage for irrigation has receded, that posed by the development of the tussock grasslands and wetlands into pastures remains. Most of the lake's catchments are at low altitudes so they have been cultivated or oversown with pasture grasses and clovers. Fertiliser application and increased numbers of sheep and cattle mean that more nutrients are now flowing into the lakes. The loss of tussock cover and destruction of wetlands by cultivation, drainage and heavy grazing will result in more rapid run off of surface water and fewer nutrients will be trapped before reaching the lakes. Eutrophication will be favoured by the shallow nature of the lakes.

Jim Ackerley, Lynn Adams and Neville Adams were awarded Conservation Citations by the Nature Conservation Council for their outstanding work in protecting Ashburton's high country lakes from harmful development. Jim Ackerley has long been involved in bird conservation work, while Lynn Adams has got off to a flying start in conservation with her efforts on the lakes. A 7th former at Ashburton College, Lynn has been a guardian of the scaup and crested grebe on Lake Clearwater, ensuring that predators do not take eggs or chicks.

Large scale pastoral development has taken place on Barossa station but the Grigg family have taken steps that will limit the impact on the lakes on their property. They have developed pastures all round the Maori Lakes but have fenced livestock out. Previously sheep and particularly cattle had grazed through the wetlands, right to the lake edge but now vegetation is regenerating in a substantial buffer zone. Mrs Phillipa Grigg expresses concern at the vigour with which introduced grasses and weeds are invading it and believes that light grazing might be better than none.

Lake Emily is on the same property. Pastures around it have not been improved, nor have they been subjected to heavy grazing. In consequence the vegetation has been less modified than around other Ashburton lakes. Again the Griggs consider that continued light grazing may be the best way to maintain the site in its present condition.

The condition of the lakes on Barossa and their wetlands can be contrasted with that of some others. In some instances land has been cultivated to the lake edge leaving no buffer strip, cattle have destroyed wetland margins and broken down stream and lake edges, and wetlands have been drained. It is hoped that not only will the Department of Conservation act to stop future actions of this type but they will also act on the recommendations of the Aoraki National Parks and Reserve Board for formal protection of the lakes.



Numerous birds are found on Maori Lakes, (left) including scaup, paradise duck, bittern, pied stilt, marsh crake (pictured above) and pukeko. The threat of an irrigation scheme hung over the lakes but has since receded. They are now Wildlife Refuges. Photo: Donald Geddes.

Recreational uses also pose a threat to the natural values of the area. There is a shortage of water for power boating and windsurfing. Currently power boating is restricted to Lake Camp but it is overcrowded at peak times. Windsurfing has a rapidly growing following and windsurfers are looking beyond Lake Clearwater that they share with yachts. It has had a marked effect on bird numbers on Lake Clearwater. One of the reasons why Lynn and Neville

The Southern Crested Grebe - A Bird of Value

by Jim Ackerley

The southern crested grebe was once found throughout New Zealand but is now confined to lakes from Canterbury southwards. It is an endangered species with an estimated total population of a mere 250 birds, which are losing the struggle to survive in what has become a hostile environment. Their numbers are decreasing because of the destruction of their high country lake habitat.

The first European to record the southern crested grebe *(Podiceps cristatus)* was Charles Heaphy in 1846 at Lake Rotoroa in the Nelson province. This was confirmed by others such as Governor George Grey and Julius Van Haast who added to the limited knowledge of these unusual birds.

The Ashburton lakes at present provide habitat for the greatest number of grebes in the country but the lake with the largest individual population is Lake Alexandria which is adjacent to Lake Tekapo. My own studies of the birds have been at Lake Clearwater, about 60 kms from Ashburton in mid-Canterbury. I have been fascinated by their unique mode of living and their individual habits which are so different from other birds.

Mate for life

The grebe is about the size of a mallard duck, darkly coloured on the back with a white breast, a long slender neck with two dark crests on their head and a chestnut coloured ruff that can be extended as a fan either in courtship or when facing an intruder. The male bird is stockier in build and is more dominant. They have a strong bond between them and they mate for life. Completely aquatic, they have legs which emerge at the extreme rear of their body, explained in the latin "Podiceps" (Podicis — rump, pes — foot). Their feet are not webbed like most other water birds but have three broad lobes which assist in diving and underwater swimming. Because of their physical build they cannot stand on land and must feed, mate, nest and live on the water. Grebes dive for their food of mainly nymphs and small fish, remaining underwater for a long time as they have an amazing ability to navigate while they are submerged. Though reluctant fliers they move from lake to lake for food or in search of a new habitat. In flight they resemble a black shag but show their white breast and throat and have a rapid wing beat.

Their nesting requirements are most specific and suitable sites are not plentiful. At Lake Clearwater we have had a pair of grebes nesting close to the holiday village for several years. They have an ideal site in a large willow which has extended over the water with its lower branches semi-submerged to a depth of about 60 cm. The grebes build their nest in a fork of these branches using weed plucked from the lake bed and lock the structure with twigs from the tree.

Strongly Territorial

They establish strong territorial claims and rigidly enforce their rights against all other

The rare crested grebe with a youngster on its back. The Ashburton Lakes are a stronghold for this fascinating bird, whose New Zealand population stands at only 250. Photo: Donald Geddes

Ferrets (pictured above), along with wild cats, are a menace to the waterfowl of the lakes, particularly the endangered species such as the crested grebe. Photo: Donald Geddes

Left: *The Australian coot is a member of the rail family which was first confirmed as breeding in New Zealand in 1958.* Photo: Donald Geddes

Adams and Jim Ackerley were awarded Conservation Citations was for their efforts to politely educate windsurfers and yachties as to the needs of the lake birds and the special charms of the crested grebe. They have found a ready acceptance of their views but their effectiveness depends on them being present and continued goodwill. They look forward to the formal protection of the lakes — their water, their wetlands and their wildlife.

birds including other grebes. There is a definite boundary to their territory and all trespassers are attacked and driven away. I saw a black-backed gull alight on the water intent on eating some garbage it had scavenged. The male grebe immediately submerged, swam underwater and came up under the unsuspecting gull. Its reaction was swift: the startled bird shot into the air, dropped its food in the panic and rapidly disappeared while the victorious grebe quietly paddled back to its nest.

The grebe's courtship is complex. The birds come together with their ruffs extended, heads held high and beaks touching. They will hold this position for some time; then vary the procedure by solemnly presenting each other with a beakful of weed — a reminder to start nest building perhaps. At times they lift themselves up in the water, breast to breast, feet beating the water to a foam as they move back and forward. It is an intimate and touching scene. Nesting, which usually starts in December, is a serious and busy time. Both birds work very hard diving and carrying weed into the tree to build their nest, which is a large, dome-shaped structure raised above the water and securely anchored in place. They usually lay four chalky white-coloured eggs, which quickly become discoloured as the grebes always cover them with weed when they leave the nest. Incubation is shared by both birds and takes between three and four weeks. At change over at the nest, the grebe will approach below the surface and rise with enough force to slide onto the nest. To do this they must have a depth of water at the approach.

It is a vulnerable time for the grebes. They are at the mercy of stoats and ferrets, and other grebes may raid their nest when they are absent.

Young at Home in Water

The young grebes, coloured white with black markings, are at once at home in the water and start diving very quickly. They spend long rest periods on one parent's back, tucked under the feathers with only their heads protruding. While one parent is taking care of the family in this way, the other is working very hard diving for food which it feeds to the hungry infants on its mate's back. At times they change roles: the carrying bird gently shrugs the chicks off while the other lowers its body well down into the water and the youngsters scramble aboard. It is hard, relentless work for both adults until the chicks are big enough to fend for themselves. The family stays together until the young are fully grown. How often they breed is unknown.

I find it incredible that this bird which is so anti-social allows families of scaup or black teal to share the tree with them and raise their young in company of the young grebes. The grebes lead a quiet life but the scaup maintain large noisy groups of up to 20 adults and plenty of young that they are perpetually producing. They are the clowns of the waterfowl world and play as no other birds seem to do. The grebes tolerate their behaviour up to a point but if the scaup transgress beyond this they are punished for their sins and retreat, complaining loudly. I have not seen any pattern of behaviour approaching this in any other lake or even anywhere else on Clearwater.

The grebes most probably tolerate scaup because of the security offered by the extra number of birds present at any one time. Small grebes are very tempting targets for predatory gulls and hawks who are constantly on the lookout for an opportunity to seize one. In close proximity to the tree will be a good number of young scaup together with the young grebes, the parents of both in close attendance. If a predator flies over, an alarm is given and the young ones scurry into the shelter of the tree until it is safe to emerge. Sometimes a hawk or gull is too fast and dives and takes a chick. Usually the large number of adults provides a warning system as they are constantly looking for danger in the sky. I have seen two adult scaup lure a hawk away from the area by simulating distress until they were well away from the others.

A Wet and Wiser Hawk

One hawk that dived on a solitary chick badly timed its flight and plunged into the lake. Unable to take off, it drifted helplessly, supported by its outstretched wings until it reached the bank some distance away. It crawled out and spent a long time drying out before it flew away — a wiser hawk no doubt.

The key to the grebes survival lies in its habitat. The availability of suitable nesting sites is crucial to their existence. The nest must be in water and securely anchored, it must be protected from strong winds and have good and safe access. Fluctuating water levels are fatal to their future as the nest is either drowned or too high to reach. Suitable nesting sites in Lake Clearwater are few but we have managed to create a suitable place which was used last year — with no breeding success yet. Lake Emma and Lake Heron have good nesting sites in willows and raupo beds and there has been some successful rearing in the last three years.

The number of grebes in any one lake varies from time to time as the birds move around the whole lake system. On a recent count we had a total of 75 grebes identified. Hopefully we can maintain these numbers and improve on them in the future before they join the growing list of creatures that have been sacrificed in the name of development and progress.

SALE OF THE CENTURY

NEW ZEALAND CROWN LAND CARVE-UP

By Gerry McSweeney Conservation Director

The Government's 16 September 1985 decision to restructure environmental administration in New Zealand caused momentous changes in the management of our public lands.

Those lands and forests principally used for commercial farming or forestry were to be vested in a Forestry Corporation and a Land Corporation. Parks and reserves and the Crown's natural and culturally important lands were to be administered by the Department of Conservation (DoC). DoC was also given responsibilities for marine and freshwater ecosystems.

The ink was hardly dry on the Cabinet decision before the scramble for public lands began. Apparently there was standing room only in the annex where the press release was prepared announcing the Cabinet decision. Prospective heads of the new corporations jostled to ensure the wording favoured land allocations to the corporations.

Allocation Process Hindered

Confusion between Cabinet decisions and subsequent re-interpretation of those decisions by officials in press statements, departmental memos and even in papers to the Cabinet Policy Committee on issues as diverse as West Coast forests, high country pastoral lease and riverside reserves hindered the land allocation process for the next two and a half years.

"Some might say it is conservation gone mad . . . More and more areas of a productive nature had been demanded (for conservation) and usually agreed to . . . The allocation criteria had been totally one-sided."
– George McMillan, Chief Executive, Landcorp.
(Christchurch Press 19/5/1988)

Significantly, Deputy Prime Minister Geoffrey Palmer found it necessary at the height of the public debate over land allocation in May 1987 to resurrect the original wording from the 16 September 1985 decision when advising Government MPs how to respond to mounting public concern over land allocation.

Landcorp, for example, was supposed only to get "lands primarily used for farming purposes". However, shadow land allocations drawn up within the Lands and Survey Department interpreted this very loosely to include any land used for farming, with farming potential or even without any farming value but acquired as part of a broader package of farmland. Hence huge blocks of unfarmable mountains in Molesworth, the Eyre Mountains of Southland, shrublands in Golden Bay and Taranaki and the Far North were allocated for sale to Landcorp.

The two greatest problems with the initial carve-up of the Crown estate were the absence of allocation criteria and of any public participation. In late 1985 the Government made the decision to exclude the public from the land allocation process. Soon after this it scrapped its proposed Crown Estates Commission designed to oversee the process – before the Commission had even met. A further problem compounding both the other two was the lack of time and Treasury.

Ministers and their officials were insistent that the carve-up could be done quickly. Associate Finance Minister Richard Prebble went so far as to claim he could sit down with Lands Minister Koro Wetere and sort out any land carve-up problems in an evening!

Public Excluded

From September 1985 onwards staff in the Lands and Survey Department and the Forest Service prepared shadow land allocations. Belatedly in July 1986, staff of the DoC Establishment Unit were invited to object to those shadow allocations. They were expressly forbidden by Ministers to consult the public in this review process and were given a ludicrously short time – particularly at the regional level – to assess the allocations and lodge objections.

For the rest of 1986 and in early 1987, DoC staff negotiated with Corporation staff over contested allocations in a process mediated by a Ministerial Committee chaired by Geoffrey Palmer. Finally, on the 17th March 1987, DoC and Corporation officials signed schedules confirming the final allocation of Crown lands. Soon after, in mid-April 1987, Palmer announced that land allocation schedules and explanatory maps were available for public scrutiny and comment by the end of April.

Public Relations Disaster

His announcement was followed by howls of public protest from throughout the country when people discovered many of the maps and schedules were either incomplete or unavailable. For example, not until 26 May 1987 were the allocation maps of much of Northland publicly available.

The lack of maps as well as the absurdly short time for comment incensed conservation and recreation groups. Worse still was the discovery that many of the maps contained mistakes. Parts of the Wanganui and Tongariro National Parks were found to be allocated to the Corporations, as were riverbeds, lakes, pastoral lease mountain land and even private farmland (including a portion of freehold land owned by our Waikato Forest and Bird Chairperson!). The entire Arawata Valley, in the heart of our proposed South West NZ World Heritage area, was scheduled for sale to Landcorp as was the 25,000 hectare Walter Peak station — a special lease identical to pastoral lands which the Government had resolved would stay in Crown ownership.

Early on, conservation and recreation groups had realised the process was going awry. During 1986 we had been embroiled in a debate over the future allocation of the 2.4 million hectares of pastoral leasehold high country and of the native production forests of North Westland. Both of these issues were resolved by a special procedure.

In August 1986 I was appointed on a part-time basis as a consultant to the DoC Establishment Unit and much of my time was occupied with land allocation issues. Nevertheless, like all other staff in the unit, I had been sworn to secrecy on land allocation issues.

Molesworth a Test Case

Word did however leak out. A Federated Mountain Clubs-Forest and Bird group that met the Establishment Unit in October 1987 chanced during a tea break upon an allocation map of the 182,000 hectare Molesworth Station in Marlborough. The entire station – 82 per cent of which is high mountainland unsuitable for grazing – was scheduled for sale to Landcorp.

"It is not a question of whether we trust Land Corporation or not. But it is a question of whether certain lands are retained in Crown ownership or whether they go into Corporation ownership, which means they effectively become private land. A certificate of title could be issued and they could be sold on the open market."
– Philip Woollaston, Associate Minister for the Environment –
(NZ Farmer 11/5/1988)

Dr Hugh Barr, vice-president of FMC, pushed the panic button and for the next three months a debate raged over Molesworth's future. In many ways it symbolised the principles involved in the Crown land carve-up.

Acquired by the Crown in the 1930s after it was wrecked by overgrazing and rabbit infestations, Molesworth had been restored through careful conservation management by the Crown. By the 1980s however there was increasing recognition of its ecological importance and recreational value.

Soil and water protection, scenery, historical sites, nature conservation and recreation were all tentatively recognised in a 1986 Molesworth strategy plan as having equal if not more importance than cattle

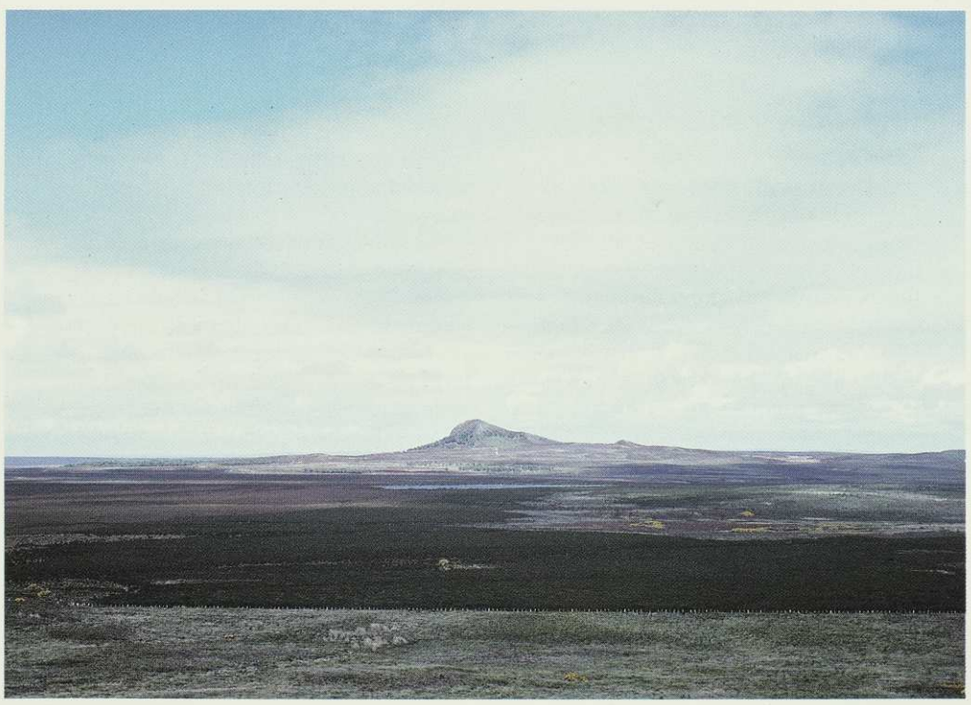
Mailbox Inlet, Lake Tekapo. The wetlands on the margins of the lake were allocated for sale to Electricorp, a move which could have had major repercussions for the endangered black stilt which breeds here. Photo: Gerry McSweeney

farming. Hence the public outrage at its privatisation for purely commercial farming. "Molesworth – Hocking off the Crown Jewels" headlined a *Dominion* newspaper feature at the height of the debate.

If the Crown could sell its largest single property with undisputed conservation value it seemed nothing was sacred. We argued that although Landcorp should continue the cattle farming, there was no case for privatising Molesworth and losing control over all its important non-commercial values. Recognising the explosive potential of the issue, particularly for a Government under pressure from the Labour left over the sale of public assets, Geoffrey Palmer personally intervened. He visited the property with DoC and Landcorp officials in late January 1987 and late during a candlelit evening in the historic Tarndale homestead a compromise was sorted out. Molesworth would remain as Crown land. Landcorp would manage the farming venture and jointly with DoC develop a management plan to recognise and protect Molesworth's many other values.

Unparalleled Voluntary Effort

Flushed with success from the Molesworth debate, Forest and Bird, Federated Mountain Clubs and the Acclimatisation Societies anticipated a big battle ahead when the carve-up schedules were finally made public from



The Wharekauri block on Chatham Island has important peatlands and lakes, and its coastline has many nesting pairs of the endangered Chatham Islands oystercatcher. Photos: Mark Bellingham and Harro Muller (oystercatcher)

April 1987 onwards. We formed the Public Lands Coalition and challenged all our branches to quickly review the land allocations in their areas. Our members' response was fantastic. People took time off work to pore over plans at Government offices in their districts. We received hundreds of phone calls detailing misallocations.

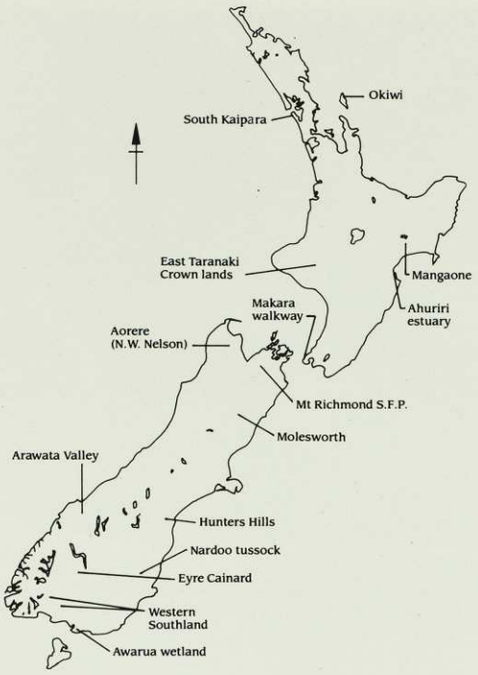
Bruce Mason, researcher for our High Country Coalition, shelved his high country work to review allocations throughout New Zealand. He was joined by all the staff of Forest and Bird, some Acclimatisation Society staff and volunteers from all three organisations. For two months we worked almost continuously. Forest and Bird's Wellington office was overwhelmed by maps and schedules as our team worked up to 16 hours a day, 7 days a week. Cadastral maps for the whole country were traced onto topographical maps. Based on extensive field knowledge of New Zealand, hurried checks with local members, and intuition based on landscape and map interpretations, we prepared our own schedules

Despite forewarnings, we were not prepared for the scale of land misallocation. We discovered:

- Tens of thousands of hectares of high mountains under recreation permit had been mistakenly mapped for allocation to Landcorp contrary to Cabinet decision.
- National park land had been mapped for sale to the Corporations.
- Vast areas of native forest and shrublands in Wanganui, Taranaki and Nelson were scheduled for sale to Landcorp and Forestry Corp.
- Nationally important wetlands at Kaimaumau, near Kaitaia, at Okiwi, Great Barrier Island, around the Piako-Kopuatai peatdome, on the Chatham Islands, in Westland, and around Lake Ellesmere were scheduled for sale.
- Proposed tussock land reserves in the mountains of Otago and Southland were zoned for sale to both Landcorp and Forestcorp.
- Historic sites throughout the country and even a marae in Northland were scheduled for sale.
- Agreed boundaries defined in the West Coast Accord had been altered so that at least an additional 30,000 hectares of protected virgin beech and rimu forest was mapped for sale to Forestry Corp.

On 12 June 1987 our Crown land catalogue – a 300 page, 2 volume book which listed about 3,000 misallocations totalling 600,000 hectares was presented to Geoffrey Palmer. He also received 260 public objections from throughout the country. Palmer described our book as a "thorough, comprehensive and brilliantly researched case" and in a subsequent *Checkpoint* radio interview, commented that it just proved the value of public input – you could get the public to do your job for you! To his credit, he immediately set up a public review process.

The Public Lands Coalition, Federated Farmers and the Maori people were invited to join Government and Corporation officials on a technical advisory committee which developed land allocation criteria over June and July.



Breakthrough in Allocation Criteria

Ably chaired by Denise Church of the Environment Ministry, this committee achieved a breakthrough in land use in New Zealand. In addition to criteria acknowledging conservation, cultural, scenic and recreation values, the criteria required that the corporations also satisfy commercial criteria for allocation. Corporations claiming Crown land were required to demonstrate the likelihood of a commercial return from the land. This could then be assessed against the non-commercial values.

For the first time the shoe was on the other foot. Commercial use of land was not to prevail automatically over non-commercial use. Rather it would have to prove its viability. Subsequently this criterion proved vital in determining the conservation allocation shrublands full of fernbird and kiwi throughout the country — previously allocated to Landcorp as "potentially productive farmland". Equally the miserly $31 per hectare Forestry Corp was prepared to offer for the virgin forests of Rowallan in Western Southland could be weighed against their outstanding conservation value. For the previous decade we had argued against Lands and Survey and Forest Service uneconomic bush clearance schemes. At last such schemes were to be subject to economic assessment. Under such judgement, the proposals were shown to be pointless.

In August and September 1987, officials applied the allocation criteria to the 3,000 cases identified by the PLC.

450,000 Hectares Reallocated to Crown

In October, their recommendations were made public. The majority of the contested cases were allocated to DoC. However, in about 40 percent of the individual cases we considered officials had still erred in applying the criteria. We immediately undertook a further intensive review. In the Crown Land Catalogue Stage 2, we detailed and mapped a further 300 cases totalling 150,000 hectares which remained misallocated. Most prominent amongst these were the 33,000 hectare Western Southland Beech forests, the 30,000 hectare Eyre Creek-Cainard mountainlands in Southland, wetlands of Okiwi station on Great Barrier, shrublands in Taranaki, Golden Bay and the Gisborne region and many riverbeds.

From December 1987 to February 1988 we worked with DoC and Corporation staff to try to resolve these outstanding issues. Final decisions were made by the Ministerial Committee on Land Allocation chaired by Philip Woollaston with Fran Wilde MP (Conservation), Peter Tapsell MP (Lands, Forests) and Peter Neilsen MP (Finance). During this period as well as the comprehensive cases from the Public Lands Coalition the Conservation Department and the corporations (17 separate cases were prepared for Eyre-Cainard, 14 for Western Southland), Ministers received thousands of public submissions on land allocation. The Prime Minister received well over 1,000 letters supporting protection for the Western Southland forests alone.

Decisions finally reached by Ministers recognised both the Conservation and Corporation values of the lands and a number of compromises were reached. The majority however favoured the Conservation Department – primarily because most of the lands

High Country Pastoral Leases

The 2.4 million hectares of South Island High Country (10% of New Zealand) under pastoral lease includes high mountains, glaciers, vast natural tussocklands and many rare plants and animals. In February 1986, the Prime Minister assured high country farmers that Landcorp would be sold these leases. We ran a major campaign against this decision over the next 6 months. Finally, in September 1986, the Government decided to retain the leases land in Crown ownership. Landcorp was to manage the leases as the Crowns agent. The Conservation Department was to safeguard conservation and recreation values on the leases.

Government is now pushing for a split of the leases between the conservation and production lands. There are many parts of the leases such as mountain tops which are unsuited for grazing and areas which contain high conservation values that should be allocated to DoC. Equally there are parts which are best suited to intensive farming and could be freeholded. A residue remains of multiple use tussocklands which both Forest and Bird and recreation groups (our High Country Coalition) and High Country Federated Farmers believe should be retained in Crown ownership and managed for conservation, recreation and pastoral farming. Treasury disagrees and wants to sell off the lot! The debate continues.

were marginal for production but of undisputed conservation value;

- Wetlands on Okiwi came to DoC because of their value for brown teal.
- Eyre-Cainard was split with DoC getting 20,000 hectares of the mountainlands containing rare plants and the soil and water protection zone while Landcorp got the 10,000 hectares predominantly used for farming.
- Wild duneland on South Kaipara head (near Muriwai beach, Auckland) came to DoC in acknowledgement of their wetlands, wading bird habitat and outstanding landforms.
- Most of the West Coast Accord boundaries were reinstated to ensure that DoC got most of the virgin forest areas.
- Natural areas on the Wharekauri Crown land block on the Chatham Islands were either allocated to DoC or protected by legal covenant.
- The 3,000 hectare Mangaone shrublands and forest adjoining the Urewera National Park were reallocated to DoC and shrubland and forest on the nearby Ohuka and Waihi North blocks protected by covenant.
- Boundary readjustments were made in the Nelson region with approximately 30,000 hectares of beech forest reallocated from Forestry Corp to the North West Nelson and Mt Richmond Forest Parks while shrublands in Golden Bay also come to DoC.

The last major contentious land allocation decision was made on 9 June 1988. Cabinet ended more than two years bitter debate by allocating 23,000 hectares of the Dean, Rowallan and Longwood forests in Western Southland to DoC. This included all the virgin forest areas. 10,000 hectares of heavily cutover forest is to be offered for sale to Forestry Corporation who have tentatively indicated they are not interested in it.

The great Crown land carve-up is still incomplete but the bulk of the division of New Zealand's former 13.5 million hectares of Crown land – a staggering 52 per cent of the country – is over. The Department of Conservation will now be the guardian of about 30 per cent of New Zealand's land area. Should the Waitangi Tribunal find in favour of a claimant over land sold to the corporations, the Crown will implement the Tribunal's recommendation. That came about as a consequence of the Maori Council's High Court injunction and the subsequent Court of Appeal ruling. This legal review was a quite separate process from the administrative review we initiated.

Our debate with Forestry Corporation and Land Corporation was often bitter and intense. Property rights issues will always be so. Nevertheless all the members of the Public Lands Coalition acknowledge the enormous contribution of staff of the Conservation Department – spearheaded by Alan Ross, John Halkett and John Holloway; Landcorp staff, particularly Graham Grant, and Forestry Corporation staff led by Peter Berg as well as Survey and Land Information staff and Environment Ministry staff who chaired the negotiations.

We also appreciate the Government's belated recognition of the interest and role of the public. The process initiated by Geoffrey Palmer found a champion in his Associate Minister Philip Woollaston, appointed in mid-1987 after the election. He insisted throughout on sticking to allocation criteria and on involving public interest groups in direct negotiations to resolve issues. His fair-handed approach resulted in resolution of the debate.

In June 1987 Deputy Prime Minister Geoffrey Palmer (left) accepted the voluminous report from the Public Lands Coalition which turned around the course of land allocation in favour of conservation and recreation. Representing their respective organisations were, from second to left, Gerry McSweeney (Forest and Bird), Bryce Johnson (Acclimatisation Societies) and Hugh Barr (Federated Mountain Clubs).

Challenges Ahead

Negotiations are still continuing on safeguarding public access rights across lands scheduled for sale to the corporations. A formula has also been developed which guarantees access reserves called marginal strips alongside rivers, lakes and the sea coast on corporation land. Further areas of Crown land have been identified which have yet to be allocated. We are now making submissions on those areas which total several hundred thousand hectares.

The Government has also ruled that asset allocations to other State Corporations should be subject to the allocation criteria developed by the Technical Advisory Committee. Both Telecom and Electricorp have co-operated with this ruling. Important Telecom conservation land in the Awarua wetlands near Invercargill, the Makara coastline near Wellington and at Warkworth in Northland will be protected. Riverbeds, river margins and wetlands formerly controlled by NZ Electricity Division will also be protected and not sold to Electricorp. Another major challenge ahead is the Government ruling that the land assets of the Railways Corporation should also be sieved to identify conservation lands deserving protection. Many wetlands, estuaries and native forest remnants come into this category. This exercise will yet again test the skill and enthusiasm of our members throughout the country.

The other allocation issue still unresolved is the future of 311,000 hectares of former state forest south of the Cook river in South Westland. The Government would do well to learn the lesson of the Crown land carve-up debate. The New Zealand public will not accept the privatisation of public lands with high natural value.

The most important lesson is the need for continuing vigilance by non-government conservation and recreation groups.

While conservationists welcome the Department of Conservation, this issue well illustrates the limitations of a Government agency. A ministerial ruling requiring secrecy can severely inhibit the activities of a Government agency but not those of public interest groups. A partnership between DoC and non-government groups can be a formidable combination.

Looking to the future, the same partnership which secured protection for New Zealand's publicly-owned natural lands will now be needed to ensure that DoC is adequately financed in order to safeguard the lands it oversees. Our support for DoC is vital for its survival.

I wish to pay tribute to all the members of the groups that make up the Public Lands Coalition. In particular outstanding efforts were made by Mark Bellingham, Bruce Mason, Kevin Smith, Alison Davis, Sue Maturin, Hugh Barr and David Henson.

Russell State Forest (foreground), the largest remaining area of regenerating kauri forest, was first allocated to Forestcorp, then Department of Lands and finally the Conservation Department.
Photo: Mark Bellingham

West Coast Forest Accord

In November 1986 this accord was signed between Government, the Conservation Movement and the timber industry. It finalised the production protection split of North and Central Westland native forests and largely ended twenty years of intense public debate.

Two-thirds of the lowland forests were given protection and a third zoned for sale to the Forestry Corporation to enable it to meet legal sawlog commitments and to provide the basis for a small scale sustained yield beech scheme. Although minor debates continue on some boundary definition, the Accord remains intact today.

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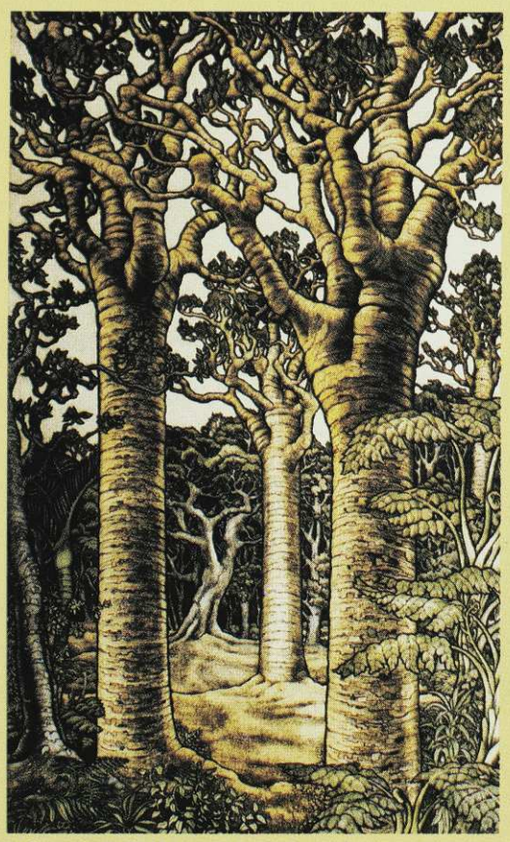

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NEW ZEALAND PACIFIC AID FORESTRY PROJECTS – GOOD FOR CONSERVATION?

by Tim Thorpe

One of my more vivid, and somewhat humbling experiences when I worked as a volunteer forester in Vanuatu, occurred the first time I walked across Erromango, the island where I was working, with an Erromangan guide. As we ambled along through the forest, me loaded down with pack, food and possessions, my guide carrying nothing more than a bushknife, he began to explain something of the forest that we were passing through, and its inhabitants.

"Snake-rope" he said, "good for drinking", and proved it by cutting off a section and holding it up so that the water could drain out. "Wild fowl", he exclaimed as he turfed a piece of wood skyward, missing the intended target. As we walked he cut off small saplings and sharpening them, hurtled them into the bush as spears, practising for the time when he would go hunting. Rounding a corner he cut a leaf off a fern, and fashioning a drinking vessel, dipped it under a small watercourse and offered me a drink. It was discarded afterwards. I thought to myself, can we in New Zealand ever know the forest as this man does? Who am I to come here and tell these people about forestry?

The author reviewing a New Zealand-sponsored forestry project on Erromango Island, Vanuatu, with senior forest guard Daniel Laeyang.

Forestry Vastly Different

It is a thought that I still ponder from time to time as a consultant adviser to some of the New Zealand-funded projects in the Pacific. Forestry in New Zealand is vastly different to forestry in the Pacific, as you would expect. Not only are the physical components of forestry, such as species, climate and soils, different but also the social, economic and political components. Forestry is only one component in the development of the Pacific Island states, and many more factors affect the outcomes of a project than might be the case in New Zealand.

New Zealand has been involved in forestry in the Pacific through its Official Development Programme, for at least 30 years. During that time it has built up a considerable body of knowledge of forestry issues, wider development issues, and knowledge of the partner countries in which it works. Forestry has been among the more "successful" of the development projects that New Zealand has been involved in, a fact not often recognised in New Zealand and only now being recognised internationally.

There are close parallels with the development of forest administration here in New Zealand. New Zealand forestry has developed from a philosophy of mining the (native) forest to the concept of sustainable resources. Many developing countries are still in the throes of the mining philosophy. In earlier years much of the aid programme was spent analysing forestry needs as part of overall development needs, a process that is still continuing today. Much effort was also put into experimental forestry to determine the species that would grow best, how to grow them, and how best to utilise the existing resource. Training was an important part of the programme, as it still is today, so that skills would no longer have to be imported. Systems and administrations had to be assisted to develop within the context of overall government structures.

As the so-called developing countries have developed so to has the type of assistance that New Zealand has been prepared to offer. Much of the forestry that has been carried out has been in the form of large scale plantations with the ultimate aim of timber production. Some of these projects are beginning to mature, such as the Fiji Pine Commission, and now New Zealand is offering assistance to utilise the resource. This project is also an example of where New Zealand management and long term adviser assistance has been reduced considerably as positions have been localised.

New Aid Approach

Since the mid-1970s an approach to developmental forestry called community or social forestry has received much attention in the forestry world. This approach is small scale by nature, and tries to involve communities in forestry projects, identifying their needs and attempting to meet them. In this way much more attention is placed on fuelwood, agro-forestry, amenity, extension and cultural plantings. New Zealand has contributed to a number of projects of this nature, although it could be argued that most forestry projects in the Pacific are examples of community forestry due to the commercial nature of land ownership here.

A good example of a community project assisted by New Zealand is the Malaita Reafforestation Project in the Solomon Islands. This project is the first planting on custom-owned land in the Solomon Islands, and involves close co-operation between the Solomon Islands Government as managers, the community as landowners and workers, and New Zealand as aid donor. The project has been going since 1985, and a decision has been taken this year to carry out planting on custom land elsewhere in the Solomon Islands with New Zealand assistance.

Community forestry partly arose as a result of a growing recognition that tropical forests were being destroyed around the world at an alarming rate. The same factors have also led to the strong voice of the conservation movement worldwide. Replanting through the traditional large scale plantation forestry approach was not enough to keep up with forest destruction. Social factors or land issues meant that plantation forestry projects were not always acceptable culturally or could be implemented with confidence in their long term future. Community forestry sought to identify ways in which people would want to become involved in forestry so that planting rates could be increased and pressure on the remaining tropical forest relieved.

Relieving the Pressure

Through its support for community and plantation forestry projects the New Zealand aid programme has been involved in conservation in the Pacific. Plantation forests when logged will relieve the pressure on native forest for timber. Community forestry enables planting for conservation purposes according to community needs. Both plantation and community forestry projects have assisted with the rehabilitation of degraded areas, eg erosion prone sites, or restocking of logged over forests. New Zealand has also assisted in the development of the profession of forestry in several countries. Often foresters have been the only scientifically trained professionals able to give advice to governments and administer programmes of a conservation nature.

New Zealand forestry advisors with Tongan counterparts on 'Eua Island, inspecting a Pinus caribaea *nursery.*

In fact both plantation and community forestry can assist with the rehabilitation of degraded areas, for example erosion-prone sites, or restocking of logged over forests. New Zealand has also assisted in the development of the profession of forestry in several countries. Often foresters have been the only scientific-trained professionals able to give advice to governments and administer programmes of a conservation nature.

There are two examples of where New Zealand has tried to have some direct involvement in conservation in the Pacific through its aid programme. Since 1970 New Zealand foresters have recommended that a National Park be set up on the island of 'Eua in Tonga, as this is one of the last areas of untouched native forest in Tonga. A formal request was received by New Zealand to fund the project in 1986, but it has been stalled while land issues are resolved. In 1986 New Zealand agreed to fund a kauri reserve in Fiji. Since that time the two coups have caused some disarray in Fiji and the gazetting of the reserve has been delayed.

As our Pacific neighbours have developed, and as developmental philosophies have evolved, it has been possible for New Zealand to adapt its aid programme. But New Zealand responds only to requests from its partner countries and must balance priorities within its aid programme. The forestry programmer has to compete with other sectors of the aid vote including health, education, and water supplies. Conservation issues are being addressed within the programme and deserve wider attention from the New Zealand public.

However, there are some concerns for the future. New Zealand's official aid vote as a percentage of national income is very low, and decreasing due to the current economic situation. This will undoubtedly influence the number and type of aid projects that New Zealand will be able to contribute to. Perhaps its time we all thought about just how generous New Zealanders really are with their aid money, and just where we want that money spent.

An example of agro-forestry in Tonga. Small trees are planted between bananas, taro, and coconut. Haniteli Fa'anunu is the man behind it all.

Tim Thorpe is a senior forester with the Overseas Forestry Assistance Group of the Ministry of Forestry. He has a special interest in development forestry, particularly in the South Pacific and has worked in the Solomon Islands, Vanuatu, Tonga, Fiji and Nepal.

FIJI'S MOIST AND MYSTIC LANDSCAPE

by Sean Weaver

The Fijian group of islands are set in the tropical South Pacific, lying at the same latitude as Townsville (Queensland) to the west and Tahiti in the east. Fiji has an extremely rich fauna and flora, much of which is still unstudied or unknown to science. It also lies on the eastern fringe of a tropical zone that is said to include the highest biotic density on earth, and this extends to Java in the west.

Few people who visit Fiji get a true perspective of its size and the extent of the wilderness that exists beyond the fringe of white sand beaches and coral reefs. The remoteness of the mountains and forests prevents easy access, but the explorer is amply rewarded.

During the summer of 1986/87 my friend Ian MacDonald and I carried out a three-month field trip to Fiji for our BSc Honours projects in forest ecology (Victoria University). The Royal Forest and Bird Protection Society assisted us with a QEII Scholarship.

My study was on the regeneration of Fijian kauri (*Agathis macrophylla*), known to Fijians as dukua makadre (pronounced ndakua makandre) and notable for being the largest and most widely known native Fijian tree. The dakua resembles our own kauri, but it usually does not grow as tall; however, it may reach diameters of close to 3 metres. It is patchily distributed on the large islands of the Fiji group, with few virgin stands remaining.

Stately Giant

The timber of this magnificent tree has been sought after for centuries by Fijian and more recently European sawyers. As a result, few of the old forests remain intact, and one has to travel considerable distances to see this stately giant and its allies in undisturbed surroundings.

I was interested to know whether dakua would be able to regenerate on sites following logging. I suspected that it would be unable to compete with the lush tangle of vegetation which usually occupies such sites, unlike New Zealand kauri which forms even-aged stands after logging. What I found, however, contradicted my hypothesis: dukua appears capable of forming even-aged stands.

Ian MacDonald studied the way in which dakua regenerated within mature forest, and was working on an old growth stand not far from my study area on Mt Lomalagi. He found dakua to be a long lived tree that could benefit from small scale disturbances in these mature forests. The high frequency of hurricanes and storms is an environmental feature that enables dakua to regenerate within gaps formed in the forest canopy by windthrown trees. The tree evidently maintains a permanent position in Fijian forests and appears to be a successful competitor in both secondary and mature forests.

One noteworthy feature of these higher altitude forests is their similarity to many New Zealand conifer/broadleaf forests. The forest in which we spent most of our time could easily have been in Northland: we came across mahoe, ake ake, and mamaku. There is a relative of the kahikatea (*Dacrycarpus impricatus var patulus*), and other podocarps including *Podocarpus nerifolius var degeneri, Decussocarpus vitiensis* and *Dacrydium nidulum var nidulum*. Kohekohe has a relative *Dysoxylum richii,* as has pigeonwood (*Hedycarya dorstenioides*) and titoki (*Arytera brackenridgeii*).

Although we entered these forests primarily as botanists, it was impossible to ignore the richness of the bird life, endowing the scene with the ambience of a tropical rainforest.

In the past the bright colours of the parrots and lorikeets made them prime targets for feather hunters, their plumage used for traditional adornments and in ceremonies. Red feathers in particular were a sought after commodity in pre-colonial days, becoming one of Fiji's earliest exports to other Pacific islands. Fiji has two parrots, the yellow- breasted musk parrot and the red-breasted musk parrot. Related to this colourful pair are the lorikeets which include the collared lory and the red-throated lorikeet. Of these four, the yellow-breasted musk parrot and the red-throated lorikeet are generally found only in mature rainforest.

Then there are the two native frogs, the

tree frog, which is somewhat smaller than the ground frog. The tree frog is still found on Viti Levu in damp forests near streams but the ground frog has declined dramatically since the introduction of the mongoose. A lesser known creature is Fiji's "bolo", or burrowing snake. It is a member of the cobra family, and though quite timid is nevertheless poisonous. It lives in areas of loose soil and leaf litter and grows to only 40cm. Very little is known about Fiji's only endemic snake.

Fiji also possesses a variety of very ancient plants. It is the home of *Degeneria vitiensis* (masiratu), which is the only member of the family Degeneriaceae. Authorities place it second on the list of the most primitive flowering plants known.

Conservation in Fiji

The conservation of representative (or any) natural areas in Fiji is sadly lacking. There is only minimal sensitivity to habitat protection although a wide range of areas call out for preservation.

Athough relatively large areas of rainforest remain, much of it has been logged at some stage. There still remain, however, extensive areas of untouched forest that adorn the jagged peaks and steep valleys of the misty interior of the two largest islands, Viti Levu and Vanua Levu, not to mention the large forests of the Garden Island, Taveuni.

Of Fiji's land surface (18,376 km²), only 6266 ha is legally protected. Fiji has no national parks, but does have a few nature reserves and sanctuaries. Legislation exists to protect wildlife and habitats, but as yet it has not been greatly effective in landscape preservation, although it lies latent as a potential vehicle for conservation in the future.

A strong argument for conservation can be based on the needs of the country's native animals, such as most of the land birds which are unable to survive in logged areas. Remaining areas of virgin rainforest have escaped exploitation thanks to their inaccessibility. One such area of virgin dakua forest is an isolated valley adjacent to Fiji's highest peak Mt Tomanivi, but local landowners want to log it.

One success story has been the granting of funds to protect 120 ha of dakua forest on Vanua Levu. New Zealand aid money was made available early in 1987 for the establishment of the proposed Waisali Reserve. The milling company has agreed to surrender its claim to this area provided the landowners are compensated.

Attitudes towards logging of native forests are somewhat ambivalent: people of the coastal areas and towns appeared to have little affinity for their forests, perhaps because they simply have never set foot into the interior and therefore remain unaware of its natural beauty.

I spoke to one forester who was working for the Fiji Pine Commission. He seemed quite sure that most of the native forests would eventually disappear, taking the wildlife with them. He expressed a sadness about this, but accepted it as a fait accompli. I asked him about the steepest country, and he said: "They will be in there with the cable haulers."

The forests are a source of income for the people of the interior (kai colo pronounced kai tholo) and the value of the land is often measured in its anticipated royalties from logging. It is important to recognise that this potential income is a major asset to the village or clan (mataqali — pronounced matanggali), and attempts to preserve these forests must also take into account the monetary needs of the people who are dependent on this land.

Indigenous Fijians own 83 percent of the total land area, the remainder is either crown land or leasehold land. The Native Lands Trust Board is an organisation that has in the past helped counteract the most destructive aspects of development on native-owned land, but still in many cases has failed to be effective in preventing a great deal of habitat destruction.

Conservation programmes require high degrees of sensitivity in observing the needs of local peoples as their interests in the land are first and foremost. There is certainly room however, for common ground to be reached in the conservation issues of these South Pacific landscapes.

Depite the recent Fiji coup, we should not turn our backs on our Pacific neighbours and their forests. Conservation is above politics; Fiji's moist and mystic forestscape has an intrinsic beauty and innocence that should not be ignored.

Born in Fiji, Sean Weaver lived there during his early childhood, and although now a New Zealand resident, regards Fiji as his second home. He is now studying towards a PhD on forest dynamics and conservation biology.

The Fijian kauri is a stately tree not unlike our own giant kauri — a little lower in stature although equally as broad. It is an emergent tree standing over a mixed canopy of podocarps and broadleafed trees. As a mature tree it develops massive crown branches, often the size of entire tree trunks of other canopy trees. Photo: Sean Weaver.

Map of Fiji compared to the North Island

At the top of Fiji. Left to right Ian MacDonald, Aleki, Manoa Waqa and Maika Savukikadavu in the foreground. We climbed Mt Tomanivi (Victoria) this particular day with this photo taken just below the summit. Mt Tomanivi is the highest mountain in Fiji. Photo: Sean Weaver.

Subject and Author Index

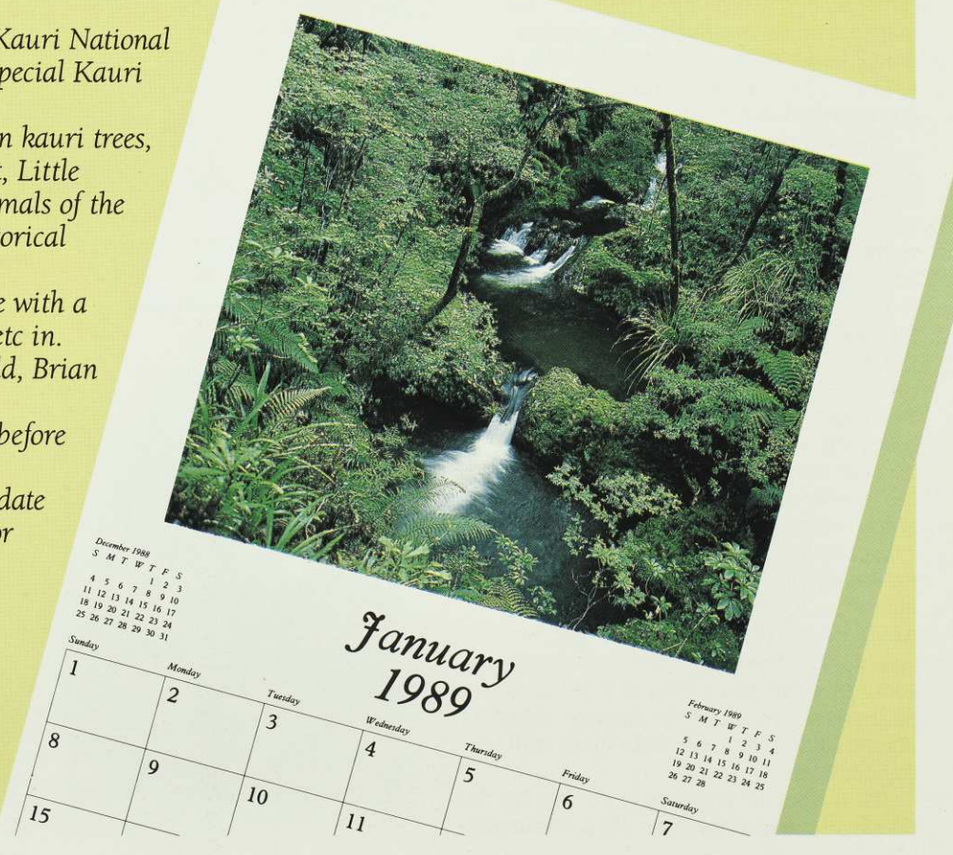
New Zealand's Kauri Heritage

As part of our campaign to promote a Kauri National Park, Forest & Bird is publishing a special Kauri Heritage calendar for 1989.
Scenes will include some of the well known kauri trees, the lush understory of typical kauri forest, Little Barrier Island and special plants and animals of the kauri forest. In addition there will be historical photographs never before published.

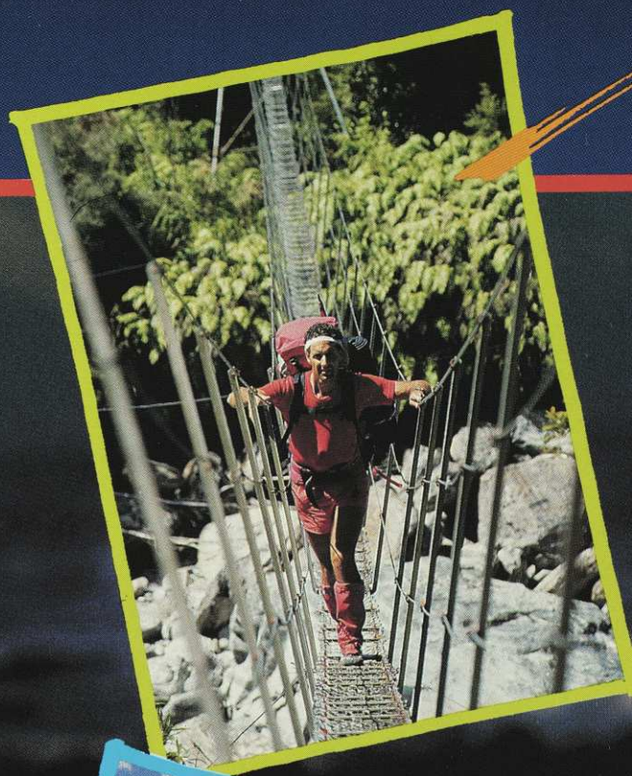
- *The 1989 calendar will be extra large with a grid to write plenty of appointments etc in.*
- *Photographers include Ian MacDonald, Brian Enting, Hugh Best.*
- *Each month will include the months before and after.*

Order your 1989 calendar now. Delivery date will be August 1988. Send your cheque for $12 to Forest & Bird Mail Order, PO Box 631, Wellington.

(Forest & Bird will post your calendar overseas on your behalf with your personal message in it. Postage cost: extra $3).



COMBINING EXPERIENCE WITH THE TECHNOLOGY AND COLOURS OF TODAY...



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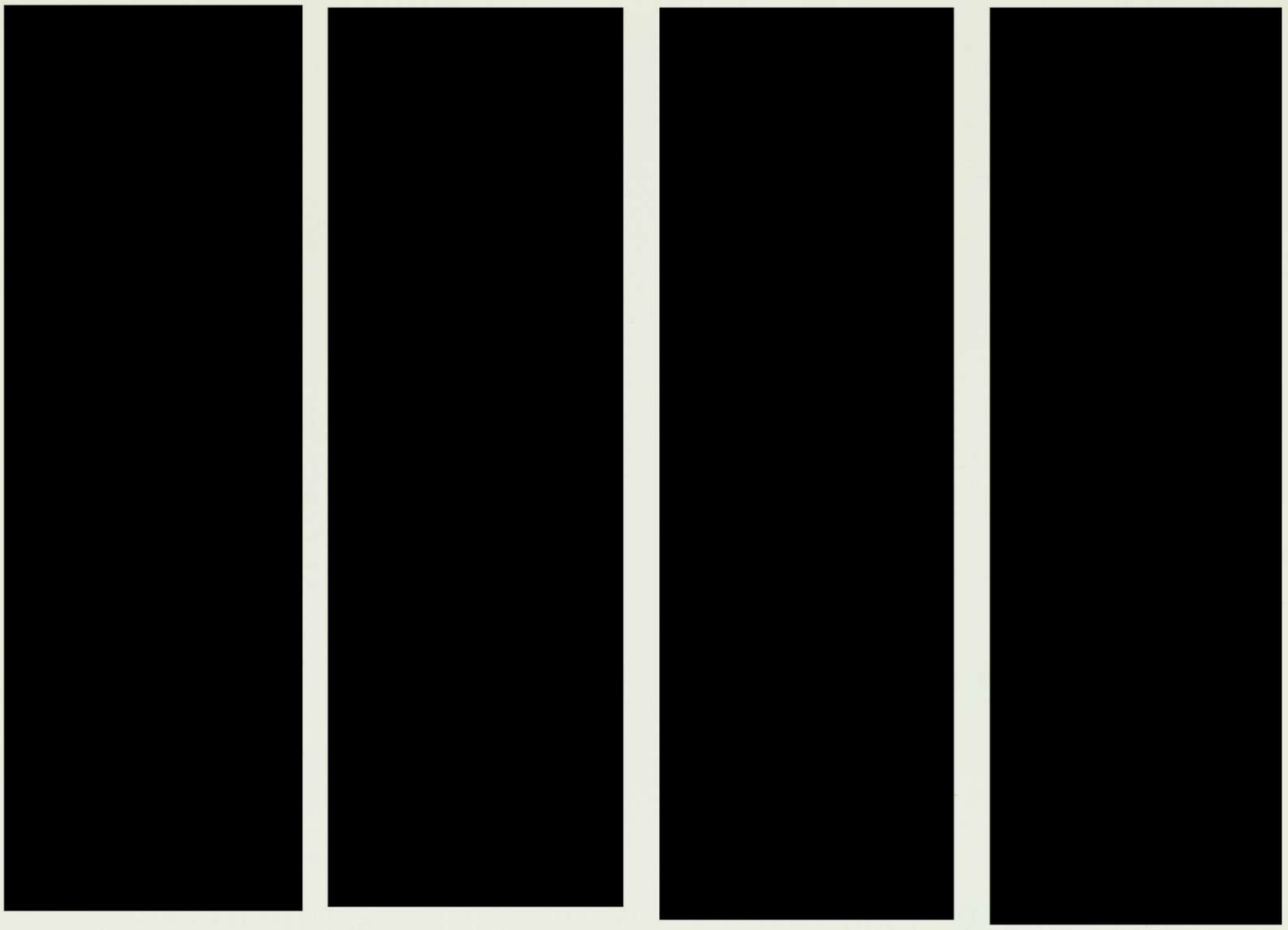


SOCIETY'S LODGES AND HOUSES

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: Custodian, Bushy Park Lodge, Kai Iwi, RD8 Wanganui. Telephone Kai Iwi 879. STD (064) 29–879.

Okarito Beach NFAC Cottage

Sleeps 4–6 in basic but comfortable facilities, water, wood stove, 2 rooms. Sited in historic township, coastal and bush walks, Okarito lagoon, Westland National Park and glaciers. $3 per person per night. Bookings: Bill Minehan, Private Bag, Hokitika, Whataroa 34-082.

William Hartree Memorial Lodge, Hawke's Bay

The lodge is situated 48km from Napier on the Puketitiri Road and 8km 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 full equipped kitchen, including

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.

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.

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

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 (0299) 58–024. Stamped addressed envelope with inquiries please.

Tai Haruru Lodge, Piha, West Auckland

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 836-5859.

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, Mrs R. Foley, 23 Stoddard Street, Mt Roskill, Auckland. Telephone Auckland 696-769 (evenings).

Turner Cottage, Stewart Island

Turner Cottage, is on Stewart Island and is a four-roomed dwelling furnished for six people. For details write, enclosing a stamped, addressed envelope, to: "Turner Cottage", C/o Mr W. Fisher, P.O. Box 44, Halfmoon Bay, Stewart Island.

Obituary

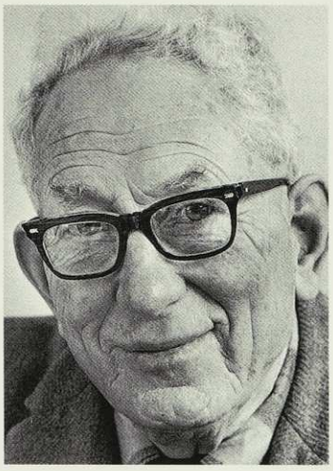
Royal Cullen Nelson, President of the Society from 1955 to 1974, was a person of imposing physical stature and even greater standing as a man of integrity and wisdom.

Born at Petone in 1897, one of a family of eight, though completing his formal education at the primary level he never ceased to learn and grow in his lifetime.

Returning from war service in France in 1919 he worked on farms and in the bush before beginning a final career as Warehouse Manager for R.L. Button.

He was one of the first Boy Scouts in New Zealand, continuing this association throughout his lifetime. He was awarded the "Silver Tui" for his services. Roy Nelson ("Maire" was his Scout name) was a significant person in the lives of hundreds of scouts.

An Executive Member of the Society for many years, he was elected President in 1955. During his term the "Save Manapouri Campaign" initiated by the Society produced the largest petition then seen in New Zealand. Other campaigns included the West Coast beech forests, Maud and Mangere Island to preserve the kakapo and black robin, Waipoua Kauri Forest, deer and opossum control, National and Forest Parks, mining and water soil conservation. During his presidency the Society was granted Royal patronage.



Roy Nelson's personal integrity, and his devotion to its objectives, encouraged people to gift land and money to the Society. His deep knowledge, speaking and writing skills, respect and regard for people, made him an unequalled advocate for the Society. Ministers of the Crown and departmental heads consulted him on conservation matters. He continued his interest in people and environmental issues until his death.

Roy Nelson was a traditionalist who jealously guarded the high ideals for the Society set in 1923 by its founder – the late Capt. Sanderson of Paekakariki.

Mr Nelson died on September 5, 1988 at the age of 91. His many friends and representatives of Scouting, Royal Forest and Bird Society and other organisations attended the funeral. Former President Mr Justice Ellis, was one of three distinguished mourners speaking of Roy Nelson's great contribution to New Zealand society.

Roy Lynch

New Hut Fees

From December, many of the public huts on Conservation land will have a charge for staying overnight. These have been streamlined into a nationwide system of charges that reflect the costs associated with each hut's facilities.

Fully serviced huts (with fuel, cookers, lighting, mattresses, wardens etc) will be $12/night for adults. Intermediate huts $8/night; basic huts $4/night. Quite a few small huts, shelters and bivouacs will be free. Camping beside Fully Serviced and Intermediate huts costs $4/night. School children will be half price.

You'll be required to buy tickets in advance, from DOC offices or visitor centres, selected tramping clubs or retailers with extended hours. Details of classification of huts are also available from these outlets.

"Wanted Alive" Conservation Officer

Forest & Bird is seeking a conservation officer to coordinate our Vanishing Heritage — Threatened Species campaign.

The successful applicant would be responsible for assessing the effectiveness of threatened species programmes underway in New Zealand and identifying opportunities for Forest & Bird to protect certain species and their habitats. They would also be required to publicise the campaign, seek financial support from the business community and the public and seek effective laws on plant and animal protection. Qualifications required include a good working knowledge of NZ plants and animals, and experience in their conservation, research, fundraising and publicity skills, and an ability to critically review policies and conservation programmes. Above all we are seeking an enthusiastic candidate to motivate and support our members.

This is a one-year appointment with a longer term dependent on the applicant's fund raising skills. For salary, conditions and a job description, contact: The Conservation Director, RF&BPS, Box 631, Wellington.

A lot of New Zealand Children Are Taking Nature to Heart

They're members of Forest and Bird's

KIWI CONSERVATION CLUB

The Kiwi Conservation Club is about nurturing our children's interest in conservation. It's also about having fun!

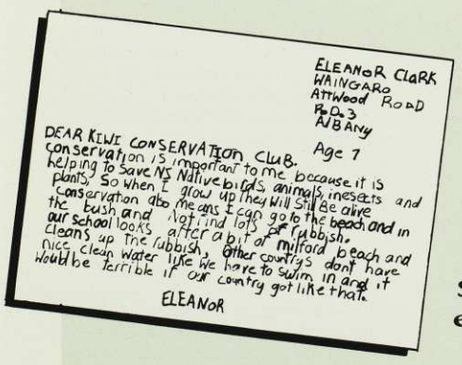
Kiwi Conservation Club members receive:

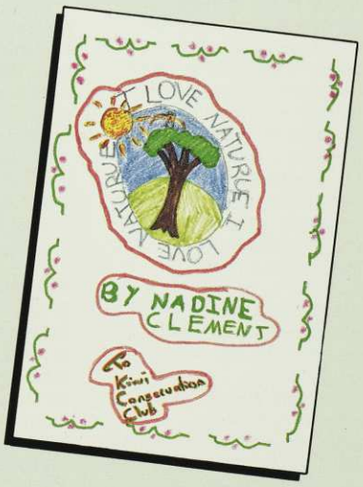
- their own quarterly newsletter full of news, information and ideas for projects and activities
- a Club badge, certificate and sticker

Activities – walks, talks, environmental games and projects are regularly organised for club members in many parts of New Zealand.

Parents, Grandparents, Aunts, Uncles and Teachers

–The Kiwi Conservation Club needs you to enrol your child, grandchild, niece, nephew or class as a member.





Support the Kiwi Conservation Club and encourage today's young Kiwis to become tomorrow's conservationists.

To join the Kiwi Conservation Club complete the membership card within the journal and return it with $10.00 to: Kiwi Conservation Club, P O Box 631, Wellington.

BOOKS

NZ Wildlife BOOKS

DISCOUNTED Prices

Immigrant Killers by Carolyn King. OUP 1984. 224pgs Paperbk. was ~~$33.00~~ NOW **$4.95** to RFBPS Members with every order over $35 received before 31 Dec'88. Subtitled: Introduced predators and the conservation of birds in NZ,this book carries the seal of recommendation of both the World Wildlife Fund & the International Council for Bird Preservation.

•

Little Barrier Island by Ronald Cometti. H&S 1986. 144pgs Pbk was ~~$32.95~~ NOW **$18.75** NZ's foremost wildlife sanctuary is described & illustrated along with all its rare native animals and plants.

•

The World of the Kauri by John Halkett & E.V.Sale. RM 1986. 256pgs Hardback. was ~~$35.00~~ NOW **$25.75** The story of NZ's most important and revered tree is told in detail.

•

Ferns of New Zealand by S,M.&E.Firth. H&S 1986. 80p Pbk was ~~$32.95~~ NOW **$22.95** The most stunning pictorial celebration of ferns to be published since the passing of the Victorian Fern Craze.

•

ALSO NOW AVAILABLE:

NZ in the Wild	**$22.95**
NZ Medicinal Plants	**$34.95**
Native Edible Plants	**$21.95**

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*** * FREE DELIVERY * ***

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.....***World of Kauri***	$.....
.....***Ferns of NZ***	$.....
.....***NZ in the Wild***	$.....
.....***Medicinal Plants***	$.....
.....***Edible Plants***	$.....
TOTAL :	$.....

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Please send order & cheque to Freepost Sys 35, Natural History Publications,Box56386,Auckland 3.

MACANZ TOURS (in conjunction with "River City Tours" Wanganui)

1. Matemateonga Track
This traverses west to east from Taranaki to the Wanganui River. Rich in birdlife, beautiful trees and ferns, 40 km of sheer tranquility. Three well appointed huts. All food, equipment and transport provided. Cost $400 including GST. Your guide, Bob Macnab, is the only licensed operator for this four-day walk.

2. Pioneer Tour (beyond Back of Nowhere) — Whangamomona — Tangarakau.
Five day historic encounters, bush walks, jet boat rides. The beauty and grandeur of the Tangarakau Gorge, Joshua Morgan's grave. Stay on a farm (Wi-Tois) on the Tangarakau River, enjoy farm activities, BBQ meal farm-style, Maori fighting pa site, pioneer village. Five days for $495.00 GST included.

For futher information and bookings write:
Macanz Tours.
P O Box 36.
Wanganui
Phone (064) 44194

FOREST AND BIRD
SOUTH WESTLAND ADVENTURE TOURS

Take your summer holiday in beautiful south Westland with our West Coast Officer, Kevin Smith.

Two tours are being offered: 3-8 February and 3-8 March.

These non-profit tours have been immensely popular and are organised by Forest and Bird to show members the heart of the proposed South-West World Heritage area. You will visit the great glaciers of Westland National Park, walk through kahikatea and rimu rainforests, discover South Westland's abundant wildlife.

All inclusive costs for transport, quality food, accommodation, guide, natural history handbook.

For further details, contact Kevin Smith, Private Box 57, Harihari, South Westland or phone (0288) 33090 (Harihari).

TO SEE THE BIRDS OF SOUTH EASTERN AUSTRALIA

Stay at
GIPSY POINT LODGE

. . . from where guided birding and nature outings are conducted by launch and 4WD into remote areas of the
CROAJINGALONG NATIONAL PARK
Over 280 bird species have been sighted here.
Accommodation at the Lodge is First Class and all inclusive; with all meals home cooked traditional Australian fare.
6 or 3 night 'Package Tours' are offered or if preferred, tours can be arranged to suit.
For further particiluras contact—
MARG OR JOHN MULLIGAN
Gipsy Point, Vic. 3891. Ph. (051) 58 8205

Project Conservation
MURIHIKU

Come and work on a volunteer conservation project in sunny Southland. Summer 1988-89.

Send S.A.E for programme to:

Project Conservation
Department of Conservation
Murihiku District
P O Box 743
Invercargill.

Centre for Continuing Education
University of Auckland
STUDY TOUR TO KAKADU NATIONAL PARK
MAY 1989.

The Centre has organised a 13-day study tour to this World Heritage park in the tropical north of Australia. It is an area of diverse habitats, rainforest, heathlands, extensive flood plains and mangrove-covered tidal flats, with a remarkable abundance of plant and animal life.

It also contains a wealth of aboriginal rock art.

The tour will be led by Joan Robb, formerly Assoc. Professor of Zoology at Auckland University.

Other tours to Australian National Parks are also planned.

For further details contact:
The Centre for Continuing Education
University of Auckland
Private Bag
Auckland
Telephone: 737-999 ext. 7831 and 7832.

Hikurangi House

25 km or half an hour from Mangaweka, in the foothills of the Ruahine Ranges, roomy old farmhouse, sleeps 8, cot and high chair available. Marked tramping route through farm to Conservation Park. Comfortable beds with bedding and cutlery supplied. Bring your own food.

$10 per night per person. $100 per week per family or group.

Contact Kristin Gorringe, Kawhatau Valley, Mangaweka RD. Ph (0658) 25721

MONTROSE LODGE
WESTERN BAY OF PLENTY

Comfortable seaside unit for adult members. Suit 2–4 persons. Everything supplied. Interesting birdlife, excellent bush walks. Mild climate.
Telephone 491–175 Tauranga, or write c/- M. MacDiarmid, R.D.1 KATIKATI

RUAPEHU COTTAGE

Comfortable cottage in peaceful, beautiful surroundings at Horopito, 2 km off the A4, half way between Auckland and Wellington, 16km Ohakune. The 3.2 hectares on the boundary of Tongariro National Park includes bush, streams and superb view Mt Ruapehu. Perfect location for family, tramping and adventure holidays, skiing or relaxing. HOME-STAY ACCOMMODATION will also be available at main house in the New Year. For details and bookings contact Conon and Jackie Fraser, Matapuna Road, Horopito, RD 6 Raethihi. Tel: (0658) 54495.

Correction

Herpetologists have alerted us to two recent errors in captions relating to lizards. (1) The labelling of the robust skink and the Great Barrier skink on page 17 of the August 1988 issue of Forest & Bird were reversed. (2) The lizard in our Wildlife Diary referred to as a harlequin gecko is in fact the North Canterbury green gecko.

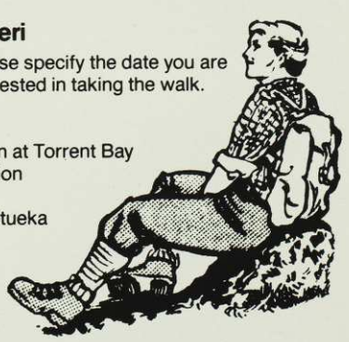
TRAMPERS
ABEL TASMAN NATIONAL PARK
GUIDED WALKS AND LAUNCH SERVICE
4-Day Guided Walk $485 (adult); $465 (child).

Ex-Kaiteriteri

Please specify the date you are interested in taking the walk.

Includes:
- We carry your pack
- Meals provided
- Our own private accommodation at Torrent Bay
- We arrange motel accommodation before and after the walk
- Courtesy coach to and from Motueka

Freedom trampers — we service Totaranui



For further details and colour brochure contact
John Wilson
Greentree Rd,
Motueka, RD3, Nelson

Ph 87-801 Motueka

Does the South Island kokako still exist? A Conservation Department team heads for Stewart Island this month to find the answer to that question in an intensive three-week search. In 1986 intrepid ornithologist Rhys Buckingham believed he spotted the elusive bird and later a feather of the orange wattled crow was discovered near the site. Forest and Bird has donated $4700 towards the cost of the expedition, funded out of our threatened species appeal. The illustration is from Buller's Birds of New Zealand, which depicts the blue wattled North Island kokako as well, itself under severe threat.