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Archey's frog, photographed near Tapu on the Coromandel Peninsula. The Peninsula is the only locality where this frog, one of New Zealand's three natives, is found. Over the last 150 million years these frogs have changed little; one of their unusual characteristics is that they do not live in standing or running water. Archey's frog is one of the subjects of our 1988 New Zealand Nature Heritage calendar. *Photo: Alison Cree*

Front cover: A lahar path, western Ruapehu, high above the Mangaturuturu River, Tongariro National Park. The historic gift of all the land within a 1.6 km radius of all the peaks is celebrated this year by the National Parks Centennial. (Photo: Brian Enting)

National Parks: Our Premier Natural Places

National Parks are special places.

As we enter the National Parks Centennial year, it is timely to be reminded of just why our national parks exist. A recent survey by Conservation Department scientist Kay Booth reveals that most people regard the principal purpose of national parks as being preservation of the natural environment, with recreation placed second. Park staff are seen first and foremost as being guardians of this environment, not there primarily to assist the public.

Such a reminder is timely because of the "Parks for People" motto adopted for the Centennial and the pressures placed upon national parks which increasingly threaten the "parks for preservation" ethic.

The pressures are numerous: understaffing; a possible return to the disastrous deer and possum levels of the 1940s and 50s; insensitive tourism developments; under-funding for park management; and a danger that we will lose public caretakers and watchdogs such as the National Parks and Reserves Authority which ensure that our parks retain their integrity.

The user-pay approach – necessary in the light of Treasury's demands that DoC retrieve 15 percent of its income by 1990 – may be appropriate up to a point. I believe that services such as accommodation, parking and interpretation programmes should be paid for, but entrance fees to national parks must *never* be charged. Importantly, any income gained from these services should be re-invested in the park where it was originally obtained. Surveys have shown that such re-investment minimises consumer resistance.

It is also important to me that we do not accept the philosophy of "who pays, says" – in other words, if you are a national park user, you should have the main say over how the money you spend there is used. In fact the full spectrum of the interested public should have a say, even if some of them never enter a national park. This is what management planning provides for.

At another level parks face an uncertain future. There are those within officialdom who would prefer to play down the special significance of national parks within our protected natural areas system and instead see them merely as part of the spectrum that makes up all our public lands.

This concept is unacceptable. The public trust and respect the concept of national parks. They identify them as being pre-eminent and unique in terms of protection and standards. How often do we hear people refer to the "sacredness of our national parks?"

The Centennial will provide us with an opportunity to reaffirm our commitment to the national park concept. I hope you will support the Centennial Commission in its endeavours to reach non-traditional park users such as the handicapped, the elderly and the less wealthy. The role of our Society in encouraging and assisting these people not only see but also gain a better appreciation of national parks will be vital. I call on each and every one of you to play a part.

Dr Alan Mark, President

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Parks of the People

New Zealand's Natural Heritage

by David Thom, Chairman, National Parks and Reserves Authority

The national park idea had its birth in the United States, with the declaration of the Yellowstone National Park in 1872. Just two years later the idea was imported into New Zealand, to become the basis of an historic action in 1887. Over the century which has followed, New Zealanders have created their own national park ethic, an approach to administration, and a national park system of international standing.

The journey of the national park idea in New Zealand is very much a journey of discovery about the real nature of New Zealand. For the major part of the one hundred years of the journey, the focus has been on scenery; areas where beauty and drama captured the imagination of European settlers, without any need to ponder the reasons for beauty and drama. Another very important factor has been land protection; initially an important influence in the formation of Egmont National Park, and the most important aspect in the formation of Urewera National Park.

Park origins

The origin of Tongariro National Park was a very special and unusual story from the mainstream of our history, and springing from the very different cultural values put on land by Maori and European: the one, protection of sacred heritage; the other, to safeguard the mountains against the sort of exploitation that impelled the Yellowstone decision. New Zealand's second National Park, Egmont, in 1900 followed a more

conventional pattern. The Provincial Government of Taranaki laid the foundations with the reservation of a radius around the mountain in 1875. Much of Taranaki was at that time covered with forest that was swept away in the 1880s and 90s by the rapid development of dairy farming which followed the successful application of refrigeration.

The great scientist Leonard Cockayne was a major influence in the formation of Arthur's Pass National Park. Cockayne understood and pointed to the significance of unique evolution in New Zealand, and regarded Arthur's Pass as an important example of trans-alpine floral transition. Cockayne's classical ecological survey of Tongariro National Park in 1908 with E Philips Turner eventually enlarged Tongariro National Park to something approaching the area it is today.

Initial reservations in Fiordland which followed soon after the early Arthur's Pass reservations were promoted by arguments for tourism values, largely by Thomas Mackenzie, later the foundation president of the Native Bird Protection Society. Science as a justification for national park formation submerged, after Cockayne, although the New Zealand Institute and the later Royal Society were strong advocates for scientific protection, and promoted, year after year, the special circumstances of natural history in New Zealand. It was branches of the New Zealand Institute that in the 1880s pressed successfully for the establishment of Resolution and Little Barrier Islands as



sanctuaries for native birds.

By the 1880s decline in native bird populations was very marked. From the 1840s on, acclimatisation, with very little consideration for consequences, had been pursued with astonishing zeal, with an even more astonishing number of importations of animals and plants. The first rabbit plagues led to the introduction of stoats, weasels, and ferrets, which increased the attack on native birdlife. While burning of forest increased steadily from the 1840s, forest destruction by fire reached a new and terrible level in the 1880s and 1890s, as by this time a railway and road system had greatly extended access inland.

Even at this time, however, a large area of the central North Island was relatively unaffected. Development, European-style, had

A tourist party on the Franz Josef Glacier, 1906. Photo: Canterbury Museum



Above: The mineral rich waters of Emerald Lake on the slopes of Mt Tongariro, Tongariro National Park. Photo: Eric Taylor

Right: Pioneer ecologist Leonard Cockayne was a strong advocate about the turn of the century for the establishment of Arthur's Pass National Park. Later he carried out a classical ecological survey of Tongariro National Park which was a very significant influence on its future shape and extent. Photo: Alexander Turnbull Library



been retarded by the policies of the Maori King movement which had prior to the land wars refused to sell land, and resisted surveying and road construction. In effect the King Movement had applied a land protection policy through the period that the national park idea was generating in the United States, and long enough for some European New Zealanders to gain insights into the desperate need for conservation in New Zealand.

European influence in the Ureweras was retarded right into the 1890s. By this time a few influential New Zealanders, including no less a figure than Julius Vogel, had been pointing to connections between forest destruction, flooding and erosion, for 20 years. Their text had been often 'Man and Nature' by the American, George Perkins Marsh, himself an observer of events on the frontier.

Vast forest destruction

Through the 1880s and 1890s, forest destruction, driven by the expanding transport network on the one hand, and the expanding dairy industry on the other, was on a vast scale. Scenery preservation societies sprang up; the developing perceptions of the first generation of European New Zealanders, coupled with the advent of Harry Ell in Parliament combined to produce the

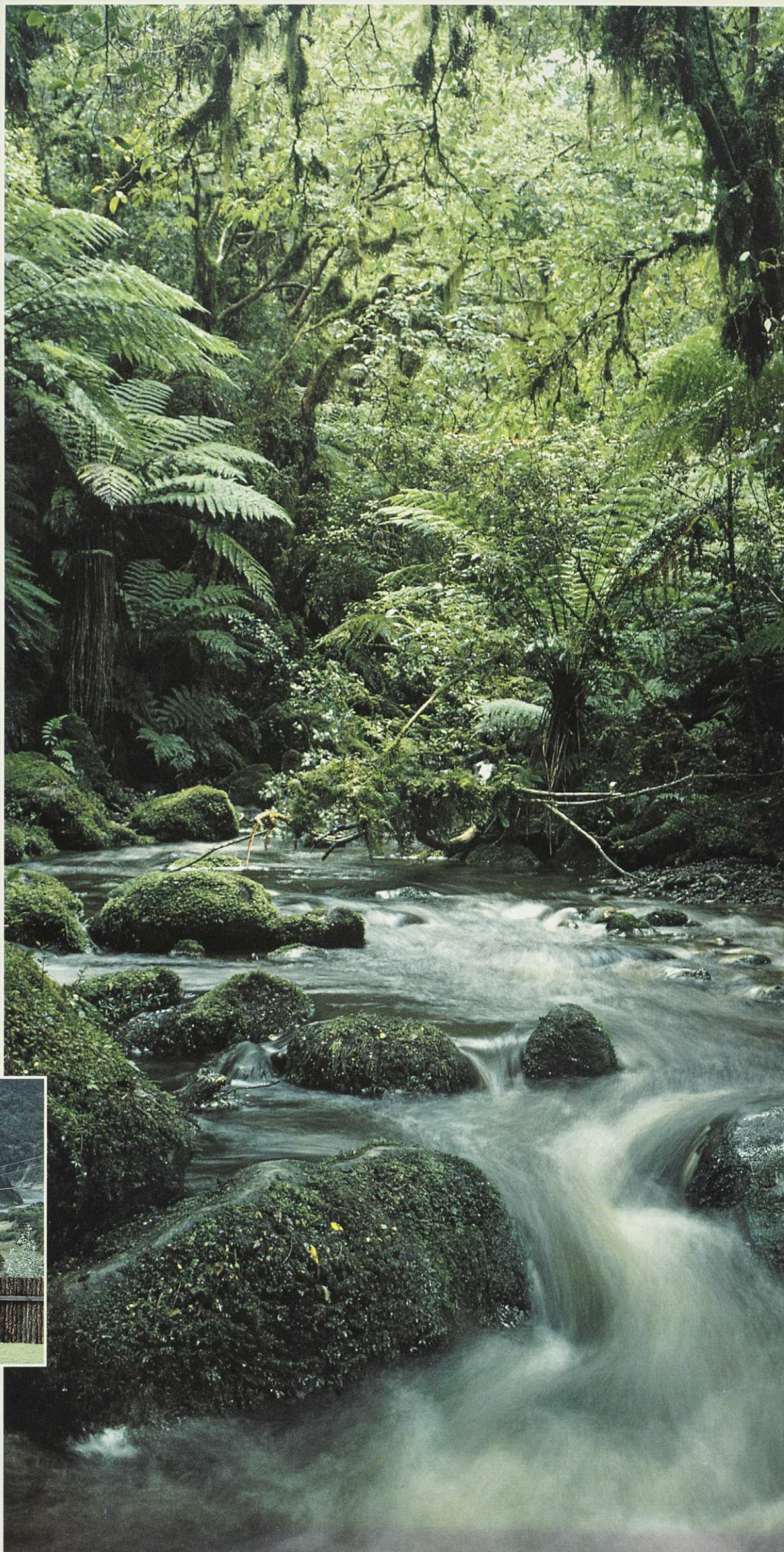
By the 1970s conservationists were demanding lowland forest areas with production potential to become part of the national park system. The best known case is the addition of Waikukupa-South Okarito forests to Westland National Park. At present conservationists are pressing for the lowland forests of Waitutu to be added to Fiordland National Park. Photo: Geoff Spearpoint



Paramount chief Te Heuheu Tukino IV Horonuku's gift of 2600 ha of the central North Island created New Zealand's first and the world's fourth national park. Photo: Burton Bros. by courtesy of the Alexander Turnbull Library



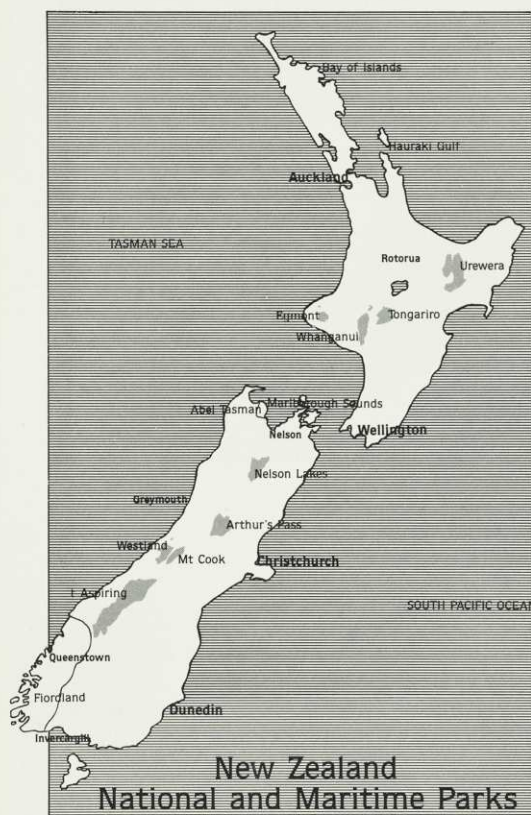
New Zealand's latest national park, the Whanganui, was officially declared open at a ceremony on the Pipiriki marae at the beginning of the year. Photo: Gerry McSweeney.



Scenery Preservation Act. Over the next twenty years, the Scenery Preservation Commission and the Board which followed laid the foundations for the reservation we have today.

It was well into the 1920s before 'national park' began to collect some definition in terms of an ethic or a defined objective. The term has been always understood as a trusted (often the only trusted) level of protection. Many national park proposals have arisen from a general wish to protect land, using the only perceived and secure designation.

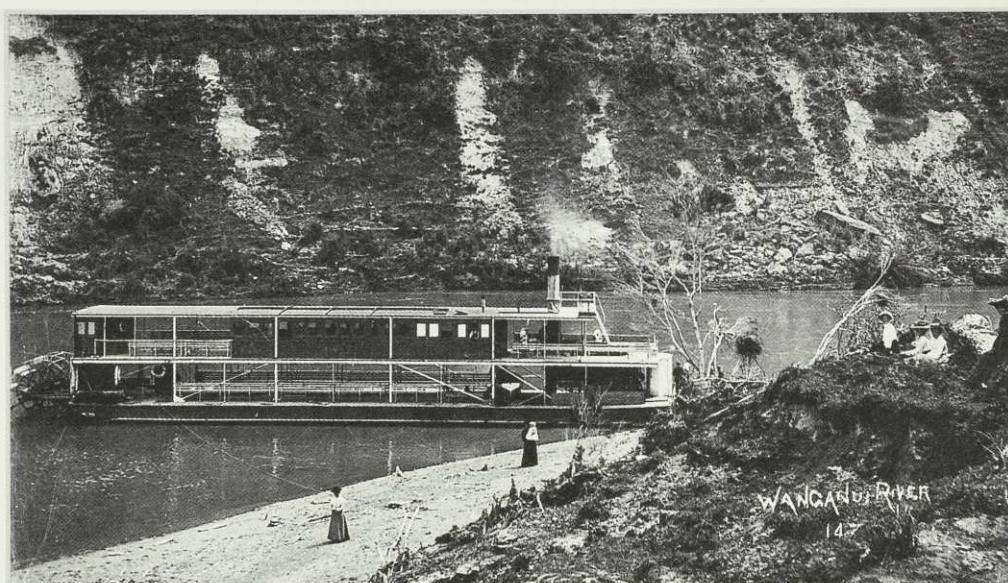
The ethic and objectives of the national park idea in New Zealand were shaped by events of the 1920-40 period. By 1920, the deer importations of the late 1800s, and early 1900s had resulted in populations which could be recognised as a threat and



pest by forest experts. By the 1930s high deer populations and forest destruction were reaping the grim harvests of soil erosion and flooding. Lance McCaskill, and the Royal Forest and Bird Protection Society, took a leading role in the advocacy which resulted in the passage of our first soil conservation legislation. Growing awareness of the importance of land protection influenced the establishment of the reservation which later became Urewera National Park.

It was the deer and goat which shaped the 'extermination' provisions of the eventual national park legislation, just as heather in and near Tongariro National Park shaped the attitude to introduced plants. In the 1900-1920 period 'national park' was clearly public land, but some influential people saw it as 'park' in a European sense. John Cullen, the warden of Tongariro National Park, with the support of William Massey, the Prime Minister, set out to plant a huge grouse moor with Scottish Heather. The debates about this issue helped to clarify the objectives which were stated later.

It is in some respects surprising that Abel Tasman National Park should have been the



Tourism has been a strong influence in the shaping of our national park system even before the 1890s when Thomas Mackenzie was pointing to the importance of the Fiordland area. The Wanganui River was in the early 1900s billed as the 'Rhine of New Zealand' with a fleet of steamers servicing tourist journeys on the river. Photo: Alexander Turnbull Library

fourth. Abel Tasman has quite a curious connection with the Second World War. Like many other campaigns, that by Perrine Moncrieff and Nelson people had land protection as its objective. They saw the significance of 1942 as the tercentenary of Abel Tasman's arrival in Golden Bay, and pointed to the appropriateness of joining with our allies in the War, the Dutch people, in the national park declaration. The Queen of the Netherlands became the Patron of the park.

Creative partnership

The Federated Mountain Clubs took a key role in the 30s and 40s in the shaping of our very fine national park legislation. Conservation works best in New Zealand when government and citizen join in a creative partnership. Such a partnership functioned through the 1940s, A.P. Harper, Lance McCaskill, F.M.C., Forest and Bird, and the Royal Society all being involved on the citizen side. The catalyst proved to be Ron Cooper in the Department of Lands and Survey, supported by his Director-General D.M. Greig, and two reservation conscious ministers, Messrs Skinner and Corbett. Cooper was actually responsible for the wording of some of the important philosophical statements which come down to us today in the 1980 Act.

American ideas influenced New Zealand National Park development from the 1930s onward, initially through McCaskill who visited the United States several times. When the philosophy, which was eventually incorporated into the National Parks Act of 1952, was being hammered out in the 1940s by reformers like McCaskill and A.P. Harper, the Federated Mountain Clubs, and government officials, McCaskill was testing New Zealand ideas against American practice.

The first National Parks Authority carried out an enormous task, bringing the system together, establishing boards, and defining policy; in short, bringing order out of the chaos of different administrations. Some parks had been administered under the Domains Act by the Department of Lands and Survey, and others had been set up at dif-

ferent times by specific legislation which resulted in different board structures.

While the ranger service can be said to have begun with Richard Henry on Resolution Island in the 1890s, it was in the 1950s that it began to develop strength and expertise. The service expanded, training programmes commenced, and *esprit de corps* evolved.

By 1964, there were ten national parks, and an established ranger service. The whole system, was, and remained until 1980, citizen-administered with the Authority responsible for policy and general oversight, and the boards in executive control of their parks. Rangers were employed directly by the boards, but this changed in the late 60s when the rangers became an employment group within the civil service in order to provide a career structure. The Depart-



This 1930s Railways poster has an almost military aspect. Photo: Alexander Turnbull Library



The creation of most of New Zealand's national parks has demanded little economic sacrifice, since by far the majority have been mountainous areas. It has been estimated that only half of one percent of New Zealand's land area has been designated a national park or reserve where the land also had production potential. Mt Cook from the west. Photo: Gerard Hutching

ment of Lands and Survey, through a period of very rapid expansion, established a national parks directorate, and took various other steps to enhance departmental capability. Winston Churchill Fellowships, allowing senior departmental officers and rangers to participate in courses and study tours in the United States, played a major part in developing New Zealand expertise in national park management. During the 1970s New Zealand was exporting its skills in planning and management. Senior rangers and departmental officers, working under aid programmes, contributed to national park development in Nepal, Peru, and Western Samoa.

In the Centennial Year of National Parks in New Zealand we have fifteen superb reserves, if the Maritime Parks are included (and they are well worthy of inclusion) and if we assume the gazettal of Paparoa National Park during the year. New Zealand has an international reputation for its parks system, its management skills, and the citizen/government partnership it has invented.

Future challenge

Coincidentally, the Centennial year is also a year of major administrative change representing an enormous creative opportunity. The establishment of the Department of Conservation has the potential to carry the citizen/government partnership into new

dimensions of progress. A major challenge of the adjustment which must take place will be to ensure that the great achievement in national park and reserve development and administration, the outcome of a hundred years of historical development and effort, is carried forward within new structures.

The Centennial alone would justify profoundly creative thinking about where we are going, but the new Department, at a stage when its style, and its long term objectives are both being shaped, must make a major effort to define long term goals, and the short term objectives within the goals.

A number of the short term goals are very obvious. The Protected Natural Areas Programme represents the vital component of the future landscape. Large areas of the country have already lost their 'signature'; their visual affirmation of distinctive evolution. The P.N.A. programme has been hailed as an initiative which lies at the leading edge of applied biogeography — it must be completed without delay.

Something surely must be done about our sorry performance in the area of marine reservation. The diversity of the New Zealand coastline and its adjacent water mirrors the diversity of the land — there is a potential here for a protected system which will enhance productivity while according to the conservation, scientific and educa-

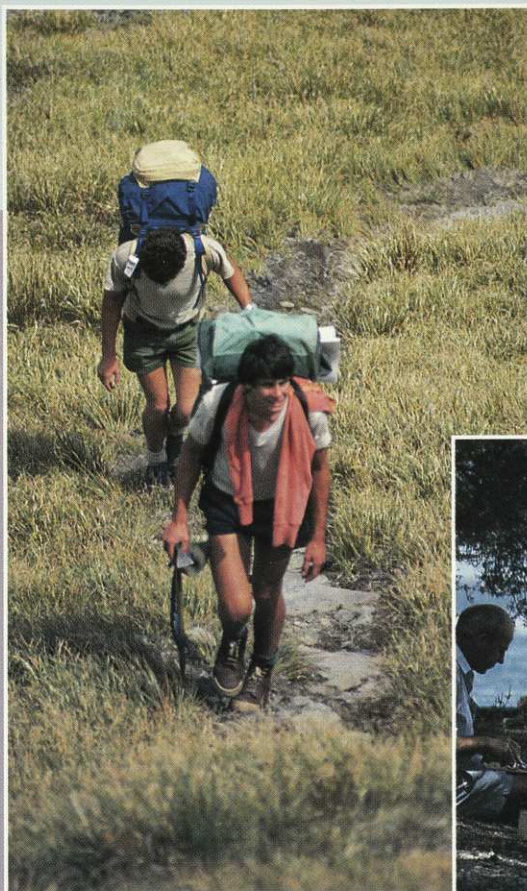
tional values of the coastline the status they must have.

Wilderness and wild rivers both represent programmes which, like protected natural areas, must be carried forward with determination, if balance is to be maintained and further losses avoided.

But to address the long term future, we need on the one hand to re-assess the very great importance of the heritage of unique nature in New Zealand, and on the other to acknowledge the inescapable link between culture and land policy. What is needed is a national inventory and valuing process, region by region, with as wide a participation as can be possibly obtained. Only through such a major effort will we be able to lift our sights and our horizons a level approaching the cultural vision which informed the gifting of Tongariro National Park by Te Heuheu Tukino and his people in 1887. 🦅

*David Thom, NPRA chairman since 1981, was a member of previous National Park Authorities and has served in national parks administrations since 1969. His book **Heritage – the parks of the people** – about the history of national parks in New Zealand, and the people and perceptions that are a part of that history, will be published in September/October.*

National Parks



*What do we
think of them?*

by Kay Booth from the Department of
Conservation who has carried out a survey on
New Zealand's attitudes to and perceptions of
national parks



The myth (left) opposed to the reality (right) of the majority of national park visitors. Most people like to walk, see the scenery or picnic in national parks. Photos: C Rudge and Conservation Department.

While you relax and enjoy reading this latest issue of *Forest & Bird*, here are a few questions to consider:

- should New Zealand have national parks?
- have you visited one recently?
- how many are there and can you name them?

No doubt you answered a firm yes to the first, and probably second question, and a good chance you replied 11 to the last (not forgetting our newest national park on the Wanganui River!). But what do *other* people think?

A recent study in Christchurch¹ put a number of questions, including those above, to over 300 members of the public

and found some interesting results:

- total support for national parks
- most people had visited a national park at some time but only half had visited one recently (in the last two years)
- not everyone knew what a national park was
- people thought national parks were primarily for preservation and secondarily for recreation.

By examining the public's use and attitudes towards parks more closely, a picture of how New Zealanders use and appreciate this resource may be built up. What better place to begin than within the parks themselves . . .

Who uses national parks?

The image of national park visitors as rugged, outdoors, macho-types is a myth! The three most popular activities undertaken in parks are viewing scenery, walking (rather than tramping) and picnicking. Indeed tramping and climbing comprise only about one eighth of all activities pursued in national parks. Furthermore, a high proportion visited a national park just for the day, probably influenced to some extent by the closeness of Arthur's Pass National Park, just two hours drive away from Christchurch.

If a national park user is defined as someone who has visited in the past two years, and a non-user as someone who has not, park visitors are more likely to be:

- 'better' educated
- in professional or skilled occupations
- male
- inclined to undertake active pursuits and visit the countryside
- regular patrons at cultural events.

Surprisingly, there was no difference between users and non-users of parks on the basis of age, marital status or presence of children in the home. These factors have sometimes been used to characterise a 'typical' park user. While such a description appears incorrect, these factors may influence the type of activity undertaken in parks.

The million dollar question: Why doesn't everyone visit a national park?

When the national park system is considered in terms of a national asset, an estate belonging to every New Zealander, the million dollar question is not who visits them, nor what they do there, but why one person visits when another does not. Just under half of the Christchurch respondents indicated they had visited a national park recently — more than half had not! As the city is quite close to Arthur's Pass National Park compared with other urban areas, a reasonable estimate of national usage could be even lower, perhaps one third — a ratio of one park user to every three non-users.

The following reasons were given by non-users to explain why they had not visited a national park recently:

- 77 percent wanted to visit but were unable to do so
- 16 percent did not want to visit a national park
- 7 percent knew nothing about them.

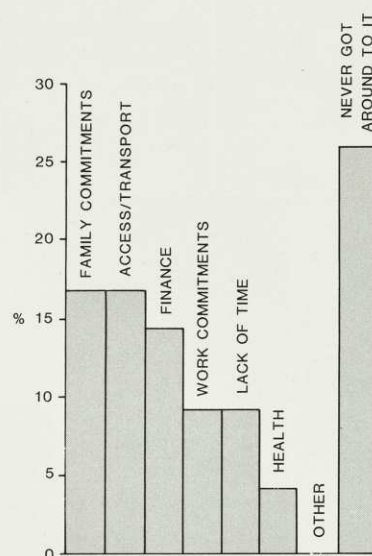
Clearly the majority would like to use national parks but are constrained in some way — yet it appears that they just 'never got around to it'. The oft-quoted physical, social and economic factors such as lack of transport or time, are less important in restricting use of national parks (graph 1). Obviously there are other factors influencing the decision to visit.

Everyone knows about national parks... don't they?

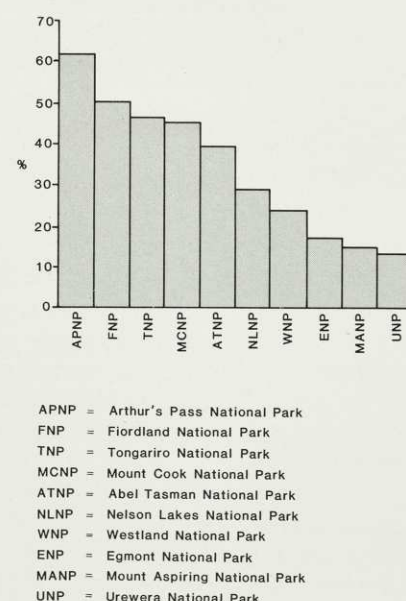
The results above suggest that some people do not know about national parks. When asked to list as many national parks as they could name from memory, one third of all

respondents (both users and non-users) either could not name any or listed an area that was not a national park. For example, Hagley and Spencer Parks (Christchurch urban parks), Lake Taupo, and the Southern Lakes were all called national parks. Out of the 10 parks that existed at the time of the survey, each person named only 3.4 on average.

Graph 2 shows how many people named the different national parks. Predictably, the closest park to Christchurch, Arthur's Pass National Park, was mentioned the most often. However, distant parks were also quite prominent in people's minds (Fiordland and Tongariro). Furthermore, Mount Cook National Park, our highest peak and a renowned tourist focus, was mentioned by less than half of all respondents. Apparently it is not commonly recognised as a national park.



Constraints on use. The bars illustrate the proportion of respondents that gave each reason.



APNP = Arthur's Pass National Park
FNP = Fiordland National Park
TNP = Tongariro National Park
MCNP = Mount Cook National Park
ATNP = Abel Tasman National Park
NLNP = Nelson Lakes National Park
WNP = Westland National Park
ENP = Egmont National Park
MANP = Mount Aspiring National Park
UNP = Urewera National Park

Some national parks are better known than others. This graph shows the proportion of people who named each park from memory.

Use and beyond

Most park visitors probably know when they are within a national park, although it is not necessary for enjoyment of the experience! Interestingly, just over half of park visitors indicated that the area's designation as a

national park was not a major reason for their visit. Hence it is what is contained within park boundaries rather than the status per se that attracts most people.

But one need not visit national parks to appreciate them. New Zealanders place a lot of importance on preservation of the natural environment. The public thought that the principal purpose of national parks was preservation, with recreation placed second. Similarly, park rangers were seen foremost as guardians of the environment. Less than one quarter of respondents suggested that rangers were there to assist the public.

This strong statement about preservation indicates that benefits other than recreational use are derived from our national parks. Some writers² have suggested the following benefits may also flow from protected natural areas:

- simply the knowledge that they exist
- the option to visit in the future
- preservation of the environment for future generations.

Such benefits, however, can only be realised if one is aware that national parks exist!

For the benefit, use and enjoyment

The National Parks Act states that national parks are set aside... *for their intrinsic worth and for the benefit, use, and enjoyment of the public*³. While it has been shown that a relatively small proportion of New Zealanders regularly visit our national parks, enjoyment of these areas is not restricted to use. The knowledge that these lands are being preserved brings benefits itself. Perhaps in the year ahead the celebration of the national parks centennial and the advent of the new Department of Conservation will increase the public's awareness of these lands and nurture a stronger conservation ethic. By doing so, it can only enhance the benefits derived from our national parks, those areas also called 'parks for the people'. 🦜

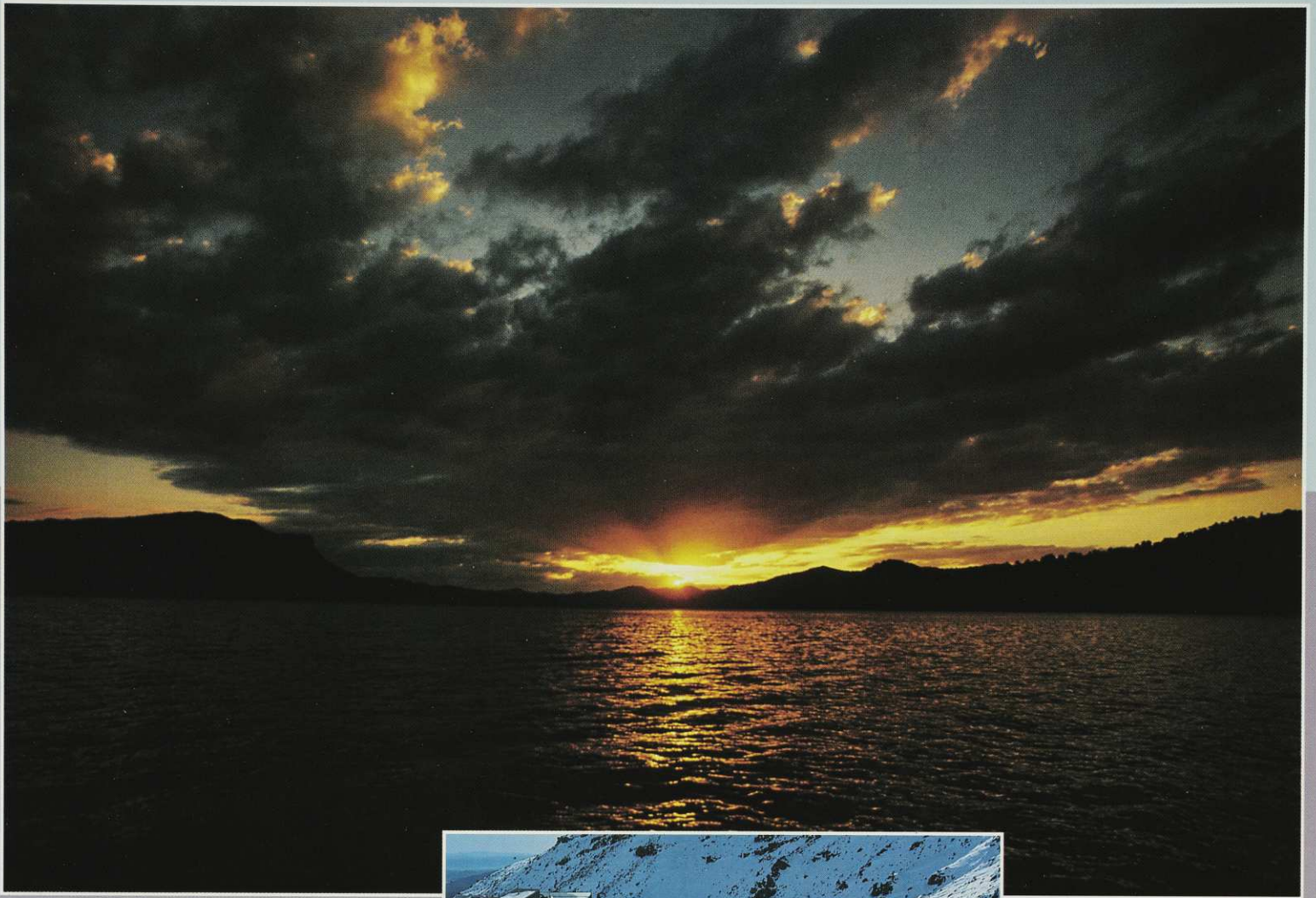
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1. Booth, K.L. 1986 — National Parks and people: An investigation into use, attitudes and awareness of the New Zealand national park system. Unpublished MSc thesis in geography, University of Canterbury.
2. See for example: Kerr, G.N.; Sharp, B.M.H.; Gough, J.D. 1986 — *Economic Benefits of Mt Cook National Park*. Lincoln Papers in Resource Management No. 12, Centre for Resource Management, University of Canterbury and Lincoln College.
3. *National Parks Act 1980*, Section 4(1).

Acknowledgements

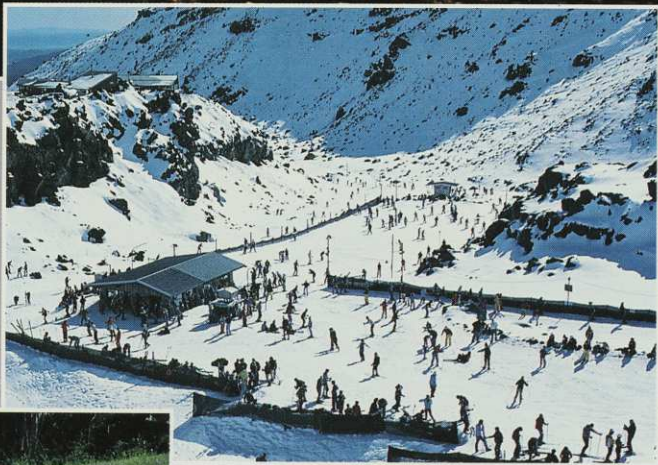
The author would like to thank those people who took part in the survey for their time and thoughts.

Kay Booth carried out this research for her master's thesis in Geography at the University of Canterbury. She is now working for the Department of Conservation as a scientist, specialising in tourism/recreation research in protected natural areas.



The mere fact that national parks exist is sometimes cited as a benefit — making people feel good that areas are being preserved for future generations. Lake Waikaremoana, Urewera National Park.

Photo: Eric Taylor



Above: Most people surveyed regarded preservation as the principal purpose of national parks, with recreation placed second. Some would argue that national park staff spend more time catering to the public than preserving the natural environment. Tongariro National Park skifield. Photo: J Mazey



Above and right: The national park system caters for different types of visitors with facilities that range from interpretative centres to huts and tracks in remote areas. Mangatepopo Hut, Tongariro National Park. Photos: Conservation Department; Gerry McSweeney (right)



FORESTS, FIORDS AND GLACIERS NEW ZEALAND'S WORLD HERITAGE

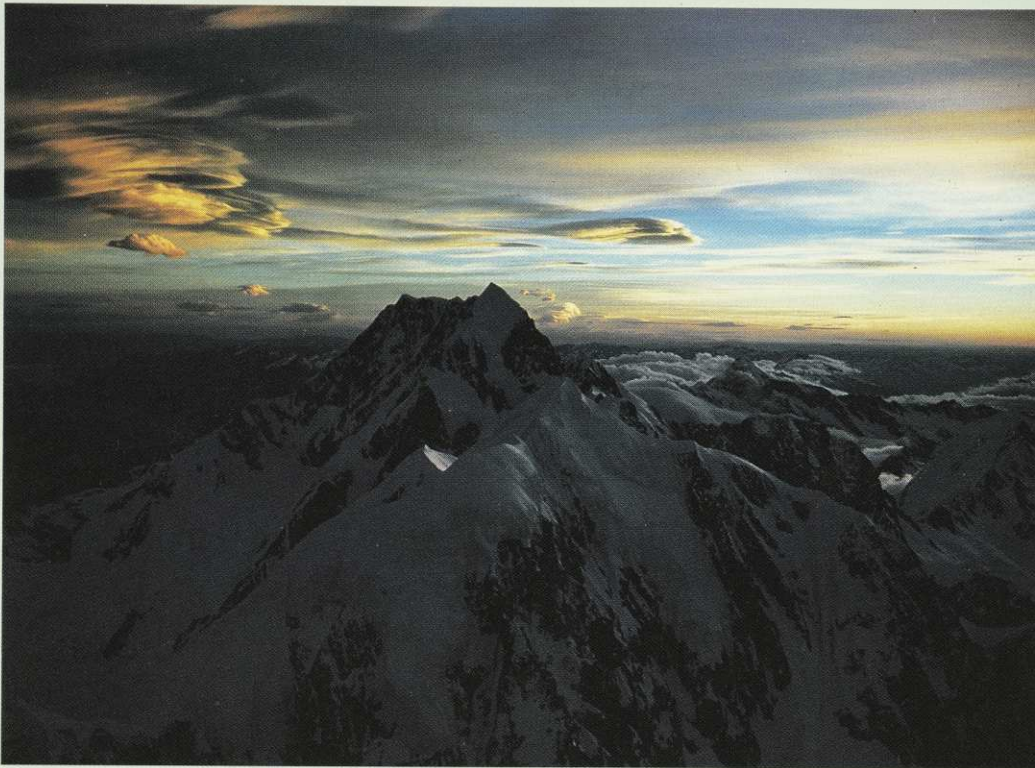


Photo: Mt Cook

Photographer: Brian Brake

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The texts – an introduction to world Heritage with Gerry McSweeney, forests by scientist/conservationist Kevin Smith, European history and geology by Craig Potton, wildlife by Colin O'Donnell, the tangata whenua by Keri Hulme and an appraisal by Guy Salmon.

Please note: political events have forced a change in deadlines for the book. Election announcements by the National Party have now been incorporated, delaying publication until September-October. We apologise for any inconvenience this has caused.

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Ote Makura Reserve

a combined approach

by Mike Clare

"I know a lot of people think this is a strange thing for a farmer to do — I think they have strange ideas about farmers. If I didn't love the land and appreciate the birds and the bush I wouldn't be here."



The Ote Makura Reserve begins as coastal broadleaf and ends with high altitude mountain beech and patches of tussock on the tops. It will be a valuable addition to the few areas of bush protected on the South Island's east coast.

Photo: Annette Dew, Christchurch Press

Kaikoura farmer, Bill Dowle, has no reason to be apologetic about the fact that he has recently reserved 614 ha of bush along the Ote Makura stream, 18 km south of Kaikoura. He is aware that on soil and water conservation grounds alone, the bush is worth saving; in addition, though, as one of a handful of forested areas remaining on the South Island's east coast, Ote Makura is a vital home to bellbirds, tuis, fantails, pigeons, falcons, brown creepers and the South Island bush robin.

Without the help of hundreds of Forest

and Bird members, Ote Makura might never have been protected. When an appeal went out to some Forest and Bird branches earlier this year for \$16,000 to fence part of the area — no money was paid to buy Ote Makura — the donations quickly mounted up. Today Ote Makura's chequered history is behind it and a reserve is the happy outcome.

Hidden gullies

A rugged coast, violent seas, rocky vegetation-clad cliffs and magnificent snowcov-

ered mountains are the impressions of Kaikoura that the passing public gain.

Yet behind this spectacular coastline lie impressive bush-clad gullies hidden from view. While most of the coastal escarpment is scenic reserve, until recently these gullies have not been afforded the same degree of protection.

Now the Ote Makura block, combined with the original Goose Bay — Omihi Scenic Reserve forms one of the largest reserves in southern Marlborough (1043 ha). Moves to acquire this catchment and ad-

jacent lands were initiated in the mid-1970s for soil and water conservation purposes. The Kaikoura coast is noted for its rapid climatic changes and high intensity rain storms, resulting in severe erosion of gullies and hillsides causing disruption to the main road and rail links.

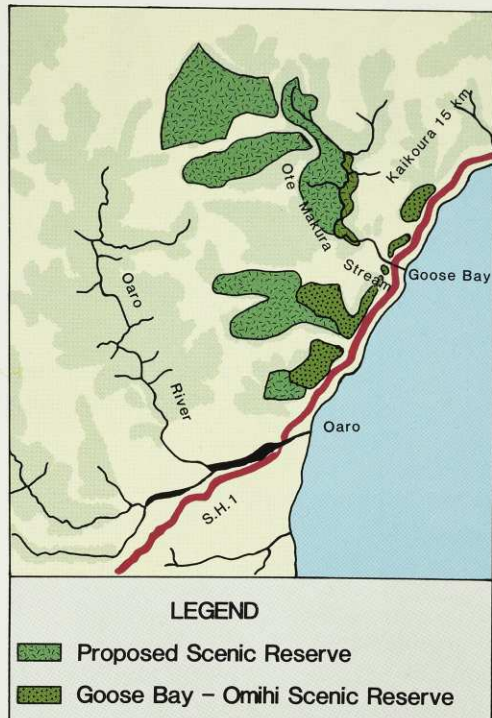
A Marlborough Catchment Board East Coast survey published in 1978 highlighted browsing animals and bush clearance as the two main contributing factors to erosion along the coast. Feral and domestic animals had severely depleted the vegetation under the canopy so that little regeneration was occurring. Running screens under the canopy were evident in the forest, with the long term possibility that the forest would die. Although the upper full slopes were stable, slow insidious clearing into the riparian zone was affecting the stability of stream beds. This was causing problems to rail and road links.

The East Coast Survey also noted that although recreation use was coast-orientated, it was likely to extend inland in the future. This dwindling of the flora and fauna resource was highlighted, and preservation of these was shown to be in the nation's interest.

The report recommended the Ote Makura and Omihi catchments should be reserved with appropriate retirement fencing.

Shortly afterwards in response to a Department of Lands and Survey request Dr Peter Williams, of the Botany Division, DSIR, surveyed all of the reserves in the Kaikoura region. His findings were published in the booklet *Scenic Reserves of Southern Marlborough* 1982. The Goose Bay — Omihi Reserves received a scientific rating of 9 (0-10 scale) because of "the size of this reserve and adjacent bush distinguishes this reserve from many of the others on this coast. It has a variety of habitats, from sunny faces to deep shady gullies and this is reflected in the diversity of species."

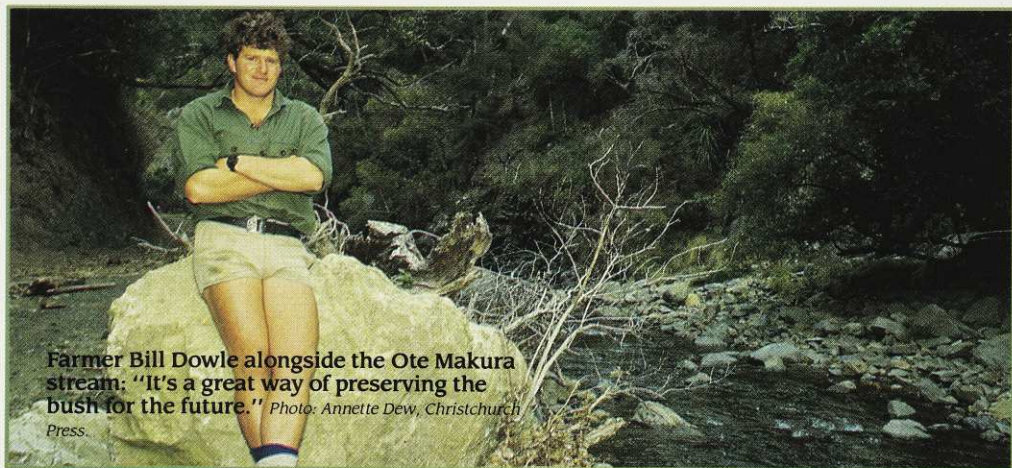
The main reserve area comprises mainly mahoe-titoki-ngaio forest with a mixture of broadleaf, pigeonwood and five finger being the other major canopy trees, while the sub-canopy is mainly mahoe. Dr Williams noted in his conclusions that the current reserve boundaries "do not make biological sense, excluding upper parts of an altitudinal sequence from the coast through to beech forest," and that "the reserve should be extended to the heads of the Ote Makura and Omihi Streams."



Stock in forest

Early in 1985 Bill Dowle, conscious of the importance of the bush on his property, was also becoming concerned that he could not manage his productive land as successfully as he would like. He therefore approached the Catchment Board and asked them to prepare a run plan. The steep Ote Makura bush dissected his property. He has no flat land; most of it is very steep with most of his grazing done on narrow ridge crests. Tighter sub-divisions in recent years had resulted in heavier grazing pressures and stock had been forced deeper into the forest. Bush boundaries were no longer effective and stock control had been lost.

Senior Soil Conservator, Don MacKay, assessed the problem. His solution was to fence the forest — 24 km would be required! It was agreed that fencing the



Farmer Bill Dowle alongside the Ote Makura stream: "It's a great way of preserving the bush for the future." Photo: Annette Dew, Christchurch Press.

Purchase or pressure — options for private forest protection

Is purchase the best way to protect native forest on private land? To judge from the increasing number of requests coming to our Head Office, it seems many people consider it is. Certainly it is a popular approach with many members who want to own bush areas and devote their energies to enhancing and protecting such places. Their work is acknowledged and important.

However the Society's executive do not generally share this enthusiasm for bush purchase and believe a range of incentives is needed to encourage nature protection on private land. These will be more equitable, far more cost-effective and not burden our members with huge fund-raising tasks and on-going management costs.

Without infringing private property rights much more could be done to discourage private land forest destruction:



The rural downturn is causing farmers to look to income from woodchipping. Recent clearfelling in the Pelorus valley, Marlborough.

Photo: Craig Potton

bush and sub-division were the answers to economic survival, and enhancement of the bush. Both men were conscious that with the bush "destocked" a considerable asset was being protected. At this point the Department of Lands and Survey (Department of Conservation) was contacted to assess whether the area was worth reserving and to help explore methods of funding the fencing.

Assessment of the bush revealed an exciting diverse habitat, fulfilling all the criteria that Dr Williams stated was missing from the original Goose Bay reserve. The forest in the Ote Makura rose from sea level to 960 m above sea level and although positioned in a south-easterly direction had a good mixture of sunny and shady faces with a wide range of differing aspects. The bush was relatively untouched and fell into a broad pattern of podocarp in the gullies, with red and mountain beech the dominant forest in the upper reaches. The lower Ote Makura stream reflected some of the coastal vegetation existing in the reserve system. Near the main ridge top Halls totara was evident. Along the forest fringe some areas gave way to manuka scrub, a result of past firing.

While 30 percent of the forest mirrored the coastal vegetation of mahoe and five finger the presence of matai, rimu and totara along the main riparian forest was exciting. To date only one rimu had been recorded in the reserve system south of Kaikoura. Also this forest included in it many plants that reach their southern limits, species such as *Collospermum haastatum* and *Coprosma australis*. Also noted was the fierce lancewood which is found in few local areas in Marlborough, and the special Marlborough endemic bluff plants — the Marlborough rock daisy and the New Zealand lilac. Wetter, more inaccessible areas, hosted a variety

of ferns, as well as several native herbs.

Everyone agreed Ote Makura should become a reserve. As access was available up the Ote Makura stream, Bill Dowle felt that if the area could be enjoyed without impeding his farming operation he was interested in gifting the land to the Crown.

Fencing prohibitive

The grand plan for 24 km of fencing was estimated to cost \$149,000. This amount was prohibitive so a revision saw a five-year programme to erect 14 km of fencing at a cost of \$79,450 of which \$47,671 was Catchment Board grant and \$31,779 Mr Dowle's share.

It was agreed that half the local share would be met by the Dept of Lands and Survey on the condition that the status of the retired lands became scenic reserve.

Unfortunately in late 1986 the scheme appeared to founder. Tight economic times meant that Bill Dowle was reluctant to commit himself to a fencing programme he could ill afford. Even though the fencing would improve his operation, the cost advantages would not be readily apparent. It seemed likely Ote Makura bush would continue to be heavily grazed and damaged by stock.

Enter, at this point, retired Westland National Park Chief Ranger and Forest and Bird member Allan Cragg, a near neighbour from Goose Bay who had a keen interest in Ote Makura. He mentioned the case to Forest and Bird Head Office who suggested the Society could help with the fencing to save the bush. However fast action was needed since the Lands and Survey Department was to be disestablished on March 31 and longer term funding after then was uncertain. Therefore Forest and Bird committed itself to spend \$16,000, paid the money from its reserves and immediately

launched an appeal throughout central New Zealand. Members responded generously; to date the appeal has raised \$10,000.

Meanwhile the Marlborough Catchment Board, Lands and Survey and farmer Stuart Wood have also negotiated a comparable deal in the Omihi Stream, the next major catchment south. This proposal, funded from all parties, results in an extension of existing reserves in the Omihi catchment and along the coastal face by some 240 ha. Also a portion of the Oaro River was being protected under a covenant. This will preserve in perpetuity another major area of forest that will add considerably to a concept of a "representative reserve system."

These major forests fall within the Hundalee Ecological District, an area poorly represented in reserves. Gifts of the Ote Makura and Omihi and a willingness of farmers, local bodies, conservation groups and government departments to get together for a common cause augur well for the future. It is hoped these examples will provide an impetus for land owners and the new Department of Conservation to work together in the future.

Certainly if Bill Dowle's example is one to go by, farmers see the benefits of such a common approach.

"It's a great way of preserving the bush for the future and of sharing it with more people. I always welcomed people who wanted to come up and have a look, or go for a walk up the creek," he says. 🐦

Mike Clare is a Conservation Department Conservation Officer based in Blenheim. He has worked as a national parks and reserves ranger for 14 years. Mike regards covenants like the above as a priority in Marlborough and has already earmarked a number of key areas for reserve — their owners willing.

- native forests and natural areas generally should be recognised as matters of national importance under the Planning Act and protection encouraged through district schemes.
- the Rating Act should be amended so that land not being used for commercial purposes, and therefore not requiring local authority services, will not be rateable while it is not being used (rating of non-used land creates financial pressures for logging and/or clearance).
- greater financial incentives such as fencing assistance, leasing arrangements through the Conservation Department and Catchment Authorities are needed.
- the proposed Nga Whenua Rahui (land protection) scheme involving land exchange or leasing for conservation purposes on Maori land

deserves government funding.

- the Protected Natural Areas programme — identifying and protecting representative habitats and ecosystems — should be accelerated to provide guidance in setting protection priorities.

The problem that confronts us is enormous. Although there are no longer incentives to clear bush for pasture or pines, the rural downturn has seen logging and woodchipping on private land jump to unprecedented levels. Thousands of hectares are being destroyed each year. Native timber exports have increased twenty-fold in the last year.

The Society's executive views the thousands of dollars spent on bush purchase as being better spent in lobbying the Government over the above options.

We aim to do this by increasing our small staff. Private bush protection will

be the highest priority in 1987/88 for our new Northern conservation officer and staff generally. We need to put pressure on big logging companies still clearing forest; we need to liaise with the Maori community and local authorities. Ote Makura provides a good example of this.

Obviously there will be times when bush purchase is the only option, such as very important areas where all other options are unsuccessful. However, such fund raising campaigns set dangerous precedents. They can inflate the value of bush remnants and excuse the Government from taking effective action. Free marketeers will adopt the attitude that because conservationists can afford to buy bush, that is the best solution to the problem. We must resist this line of argument. There is a better way.

Dr Gerry McSweeney, Conservation Director

The case for the BLACK STILT

In the November 1986 issue of Forest & Bird Conservation Department scientist Dr Murray Williams put forward some personal views on native bird management. It included comments on the black stilt programme in the Mackenzie Basin, questioning the value of the programme in light of the fact that black stilts are naturally hybridising with the self-introduced pied stilt. Conservation Officer (Aviculture), Christine Reed, who is working on the black stilt, here replies to Murray Williams' arguments.

Endangered species generate public support and finance for wildlife conservation in general. However there are other side benefits of endangered species research and management.

Often it is on the basis that areas are of critical value to an endangered species that it is set aside for conservation, benefitting *all* wildlife. The application by the Wildlife Service for conservation of the Ahuriri River was a case weighted strongly on the dependence of black stilts on this river.

At the time of application, 50 percent of all black stilt breeding pairs were nesting on the river. However, other species will now benefit: wrybill, banded dotterel, black-fronted tern and black-backed gulls.

The two predator exclosures erected by the Forest and Bird Society around black stilt nesting areas near Lake Tekapo also benefit scaup, shoveler, paradise shelduck, marsh crane, grey teal and other waterfowl.

Similarly the eradication of cats on Little Barrier Island has long term consequences not only for kakapo and stitchbirds, but also the assemblage of other birds on the island. Internationally, the establishment of

reserves in India for the tiger benefitted this species as well as leopards, the rare swamp deer, and nilgai (blue bull). In this case, an individual species approach was necessary for the greater impact that could be made on decision making. To have taken a community approach to this conservation problem would not have been successful. Attention needed to be drawn to a critical need for conservation before anything was achieved.

Research on endangered species-related problems has wider implications for whole communities. A two year study of predator ecology, movements and population dynamics within the Mackenzie Basin has provided information for black stilt management and has implications for the wider sphere of community conservation (R. Pierce, pers.comm.).

We are fortunate in New Zealand to have access to a productive valuable pool of researchers, through our six universities. Graduate students should continue to be encouraged to conduct conservation orientated research and avoid a wholly scientific, purely theoretical approach to research.

The "Black stilt Dilemma"

In the face of major predator problems, I would agree with Williams that management of an endangered species on the mainland can only be achieved through long-term population maintenance. We may never be able to leave an endangered species to its own devices on the mainland, unless effective long-term predator control methods are devised while habitat protection continues. This may be impossible for some, if not all mainland endangered species such as the black stilt. At present there are few options open to managers since we are only now beginning to understand predator ecology and control. For this species at least, maintenance of the population on the mainland is the *only* option until an alternative such as an island situation can be appraised.

Management of black stilts for conservation has come under particular criticism from not only Williams but from some scientific staff of the Conservation Department and universities. As Williams points out, hybridisation between black and pied stilts is a problem of much concern. However, he offers a simplistic view of what he terms the "black stilt dilemma", that is that black stilts are being genetically swamped by pied stilts through a natural process.

Firstly, hybridisation cannot be proclaimed a completely "natural process" in the black stilt context, as it is an after fact of a declining population brought about through human alteration of the natural environment. Black stilts evolved in the absence of mammalian predators within a relatively little modified system. With the introduction of ferrets, cats and stoats, black stilts declined dramatically. They have less effective behavioural displays for coping with predation pressure than do their global relatives. Their distraction displays are not very effective against aggressive ground predators.

Black stilts are specialists in their feeding



Left: Although black stilts do readily hybridise with pied stilts, research has shown that they prefer the darkest plumaged mate available.

Photos: Peter Cook

Opposite: The argument put forward by black stilt managers is that the rare bird – scarcely 50 remain in the wild – has not declined "naturally" but through human modification of its environment.





Rates rebate helps save forest

New Zealand's largest city, Manukau City, has granted all landowners a 75 percent rebate on native bush on their land. This follows recent controls on clearance of native forest on private land.

Most of the city is rural, containing many magnificent totara and taraire forest remnants and the Hunua Ranges. The rating rebate for ARA forests in the city includes part of the Hunua Ranges, where a small kokako population survives.

Manukau now joins a growing group of local authorities which are assisting landowners to protect our heritage. Their actions are commended.

Takahe impasse to clear?

By October the Conservation Department would like to release into the wild some of the juvenile takahe they have been raising at Burwood Bush near Lake Te Anau. This would form the basis of a second wild population in Fiordland and provide a safeguard should any mishap befall the 200-strong Murchison Mountains population.

However, as readers will recall (see *Forest & Bird* November 1986), the Deerstalkers Association has claimed that the release will be illegal, since under the National Parks Act no animals can be introduced into a Wilderness Area. The area where the flightless birds are to be located – the Edith and Glaisnock catchments – are in a Wilderness Area.

The National Parks and Reserves Authority has therefore recommended to the Southland National Parks Board that the Edith and Glaisnock catchments be excluded from the Wilderness Area, which will now be expanded to the north to compensate.

The Society is very pleased with the plan. It is vital that the juvenile takahe are given a home in their natural habitat as soon as possible, rather than keeping them at the lower altitude Burwood Bush.

Crown Land carve up

It has been described as the biggest conservation story of the decade; certainly Forest and Bird's head office has never seen members respond in quite the same way as they did to the Crown land allocation issue.

The land carve up was proof that ordinary people are a vital part of decision making in this country. When head office first alerted our 53 branches to what was happening, the response was overwhelming. At nights, weekends, even sometimes by taking time off work, members looked up maps and searched out the areas involved to assess their conservation and recreation value.

This information was relayed back to head office where Bruce Mason, Mark Bellingham, Alison Davis, Kevin Smith and Liz McMillan compared it to the notes they

had. The final document they assembled ran to 200 pages and contained approximately 3000 misallocations covering 600,000 ha.

The Government's response to this was to ask officials from the Conservation Department and the corporations to work out between them the misallocations which were against Government policy and the mistakes (draughting errors etc). A third category involved lands which could not be agreed on. To guide the officials, a Technical Advisory Committee which included Conservation Director Gerry McSweeney, devised criteria for which land should go where.

At the time of writing (late June) officials were dividing up the land once again. The Public Lands Coalition – comprising the Royal Forest and Bird Protection Society, Federated Mountain Clubs and the acclimatisation societies – will be consulted on all the recommendations of the inter-agency committee, and any it does not agree with will be the subject of a more detailed investigation.

It is to be hoped that by the time the officials have had another crack at the problem that there should not be too many disputed areas left. Past experience, however, does not inspire confidence.

The following is part of a *Dominion* editorial from June 17, 1987:

Land fiasco averted

The Government has been forced to recognise the sad state of the proposed land carve-up that accompanied corporatisation. Inadequate procedures meant that vast areas of land with water and soil, environmental and recreational value were scheduled for transfer to the corporations. Thanks almost entirely to a public lands coalition of the Royal Forest and Bird Protection Society, the Federated Mountain Clubs and the acclimatisation societies, that error has been averted. Now the Government has

quite rightly decided to keep disputed allocations of land under Crown ownership till the issues have been resolved.

A technical advisory group of officials and representatives from the coalition, the Maori community and Federated Farmers has drawn up criteria for solving disputed allocations with Government policy. They discovered areas of pastoral leasehold land, over which recreational permits were held, were scheduled for transfer, contrary to the State Owned Enterprises Act. Now that land will remain under Crown ownership. Likewise, large river beds and a number of other areas will remain with the Crown.

The chairman of the Cabinet committee on state owned enterprises, Geoffrey Palmer, has been generous in his praise of the coalition in presenting "the most comprehensive, thorough and best-researched submission of all". So he should be. The coalition checked every scheduled land transfer against topographical maps and presented it to the Government. This should have been done by the new Department of Conservation, which failed in its task.

The coalition spent about \$15,000 on maps, technical equipment, extra research staff, travelling and printing costs. In addition, six to seven people worked well into the night, seven days a week for six weeks to complete the task. Mr Palmer should demonstrate the sincerity of his praise and ensure the Government reimburse the coalition in full for its time and expenditure.

The coalition has done the job which the Government should have ensured was properly completed by the Department of Conservation. It has saved the Government the embarrassment of the inevitable results of its own inadequate efforts.

It has also saved taxpayers vast amounts of money. Had the scheduled land transfers gone through, taxpayers would have had to pay millions of dollars to buy land back from the corporations. These efforts should be recognised.



The Deputy Prime Minister, Geoffrey Palmer, receives the Public Lands Coalition Crown land allocation submission from Conservation Director Gerry McSweeney, Federated Mountain Clubs spokesman Hugh Barr (back to camera) and acclimatisation societies director Bryce Johnson.



From left, Maureen Burgess (Lower Hutt), Don Eade (Canterbury), Fergus Sutherland (Southland) and deputy president Gordon Ell at the seminar on branch problems and priorities.



Conservation Department director-general Ken Piddington, deputy director-general Alan Edmonds and Forest and Bird president Dr Alan Mark at the session on the role of the Conservation Department and the conservation organisations.



Former Executive member Stewart McKenzie (Wanganui) makes a farewell speech.

Golden Bay Summer Gathering

For approximately one week in early January 1988, Nelson Forest and Bird will be running a gathering for active members keen on full and half day tramps around Collingwood, Farewell Spit, the Heaphy Track and North-West Nelson Conservation Park. Accommodation: camping and marae-style at the local school.

For details, contact:

Julie McLintock

18 Cherry Ave Stoke. Tel: (054) 77-214

Annual General Meeting

The Society's 64th Annual General Meeting and Council meeting were held in Wellington on June 13.

Urgent work on the vital issue of Crown land allocation had prevented Head Office staff from completing the Annual Report in time to give sufficient notice to members of the date and time of the AGM.

However, at the wish of the members present the meeting proceeded. The remits advertised to make changes to the rules of the Society were not dealt with, and it was decided to call a Special General Meeting in November to consider these remits.

At the Council meeting following, three new Executive Committee members were elected, Sandra Lee, Fergus Sutherland, and Geoffrey Mills. The retirement of Professor John Morton was accepted with regret.

Through the remits, the Council decided to ensure that all Society reserves would be made Private Protected Land, and to seek National Reserve or National Park status for Waipoua Forest Sanctuary, to seek adequate funding for national parks and the Department of Conservation. They voted to increase the annual subscriptions for 1988 to keep pace with inflation, and to ensure that the standard of professional work done by staff was not curtailed.

The Sanderson Memorial Address was presented by Guy Salmon who reflected on the history of the conservation movement, and spoke of the battles to come in protecting forests on private land.

At a dinner in the evening Professor John Morton and Mr Stewart McKenzie were both presented with a small token of appreciation for their many years of dedicated service, and both spoke eloquently of the enjoyment of their association with the Society.

Molesworth Labour Weekend trip

As a follow up to an extremely successful Kaikoura Queen's Birthday gathering, Forest and Bird is organising a Labour Weekend (October 24-26) gathering. This will be based in the hot springs town of Hanmer, with focus of attention Molesworth and pastoral leases.

Molesworth, the 182,000 ha Crown-owned block in southern Marlborough, is virtually unknown botanically, but what has been discovered to date has shown that it is a very special place. Members will be aware of the battle that we won last year to retain the huge block in public control.

Other than a few tourists who have travelled the private road through Molesworth, the station workers and a few scientists, the public have largely been excluded from the area. Plans are now afoot to open it up, with a management plan due to be put together soon. We hope that you will be able to show that the public are interested in access to Molesworth. One of the best ways to

start is by having a good turnout to this Labour Weekend meeting.

For details, please contact Lyn Prattley, Canterbury branch secretary, Ellesmere Rd, RD2, Christchurch, (03) 252-685.

South-West World Heritage

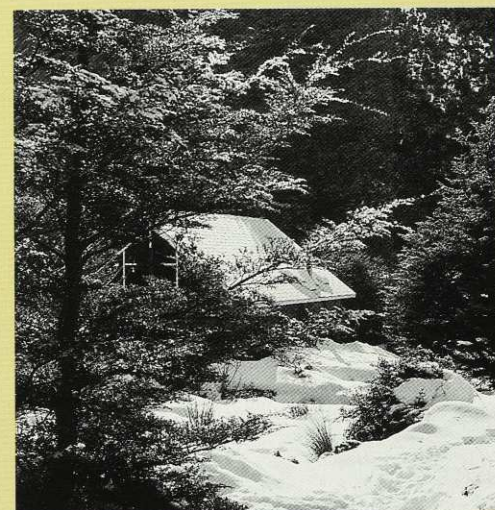
The National Party has said that it is opposed to the concept of World Heritage; the Labour Government has set up a committee under the chairmanship of Environment Secretary Roger Blakeley to consider the South-West NZ proposal, which is due to report by the end of March 1988.

The committee will hold public meetings in Whataroa, Fox and Haast on August 11, 12 and 13 respectively. A public discussion document will then be circulated on August 15, with public submissions to be received on this in November.

Meanwhile, the Society's South-West book, *Forests, Fiords and Glaciers* has been delayed by these political announcements and will not be available until September-October. We apologise for this delay.

Conservation Staff

Books Received



Beech trees and snow, Arthur's Pass. Just one of the many impressive black and white photographs featuring in the book *Landscape Impressions*, by David Harding.

Landscape Impressions, by David Harding (\$39.95, softback, Government Printer).

Readers of *Forest & Bird* magazine from the 1970s and early 1980s will recall David Harding's photos in frequent issues. He has now produced a book which thoroughly covers the field of landscape photography, with plenty of attractive examples of his work. It is good to see that black and white photography has not been ignored as they are among the most striking illustrations.

Richard Henry of Resolution Island, by Susanne and John Hill (\$49.95, McIndoe).

Exhaustive research has brought to life the story of this pioneer conservationist from the turn of the century. Henry might not have succeeded in his attempts to transfer kakapo and kiwi to a safe sanctuary on Resolution Island, but it was a gallant effort which paved the way for later rescue work carried out by the Wildlife Service.

NEW ZEALAND'S NATURE HERITAGE

Royal Forest and Bird Protection Society
1988 Calendar

Forest and Bird's 1988 calendar highlights endangered species and their habitats throughout New Zealand – from the golden sedge plant pingao, kauri forest and our delightful songster the kokako, to blue duck and giant snails.

Similar in format to our beautiful World Heritage calendar, the 1988 calendar costs \$11.00 (inc. GST and postage).



August



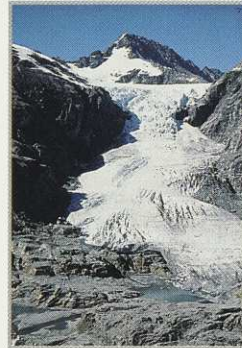
Forest and Bird
1988 Calendar



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

FIVE CLASSIC POSTERS

ALPINE • WETLANDS • FORESTS
• TUSSOCKS • MARITIME



Alpine



Forests



Wetland



Maritime



Tussock

As part of New Zealand's celebration of the Centennial of National Parks, Forest and Bird has produced five high quality posters, each exploring a natural theme – alpine, wetland, forest, tussock and maritime.

Produced on high quality paper, these magnificent posters will be sought-after mementos of the Centennial. The dramatic Snowball Glacier in Mt Aspiring National Park, the bronze tints of a wetland in front of Mt Cook, golden tussocks in Tongariro National Park, a northern rata in dense forest of Urewera National Park and an evocative sunset mirrored in rock pools, Motuihe Island, Hauraki Gulf Maritime Park – each poster depicts the diversity of our natural heritage.

Buy a set or buy them singly. Forest and Bird will deliver your posters in a strong cardboard cylinder to ensure they remain in good condition in the mail.

Only \$17 a set (inc GST and postage and packaging) or \$6 each (inc GST and postage and packaging).

See order form below.

ORDER FORM

(for calendars and posters)

☐ Please send me calendars at the discount price of \$11.00 (inc GST and postage). Shop price will be \$13.00. Direct to a nominated overseas address by surface mail: \$14.00.

☐ Please send me a set of 5 posters for \$17.00 (inc GST and postage)
or posters at \$6.00 each (inc postage and packaging).
☐ Alpine ☐ Wetland ☐ Forest
☐ Maritime ☐ Tussock

Name _____

Address _____

Send cheque or postal order (payable to RF & BPS) to:
RF & BPS Mail Order
PO Box 631, Wellington

OF HERBS AND HERPS

New Zealand lizards have long been known to consume large amounts of fleshy fruit. Recent studies have shown they also take considerable quantities of nectar. Here Tony Whitaker summarises a forthcoming paper which examines how geckos and skinks may aid the pollination and seed dispersal of several native plants.

The combined impacts of habitat destruction and introduced predators have taken their toll on the New Zealand lizard fauna. Some species have become extinct, several are now confined to predator-free islands, and yet others show disjunct or markedly reduced ranges. The species which remain on the New Zealand mainland are generally secretive, elusive and/or nocturnal, and of small size. Furthermore, in most districts they are now relatively scarce. It is hardly surprising, therefore, that botanists have failed to recognise the potentially important role these animals may play in the reproductive strategies of many New Zealand plants.

Pollination

For many decades the instructions for keeping lizards in captivity (before they were protected under the Wildlife Act) usually said they could be fed on "honey-water". Whilst such a diet is hardly a balanced one it provides a long-neglected clue to their potential role in pollination.

First records of lizards taking nectar in the wild were obtained in New Zealand over 20 years ago but the significance of these observations to pollination biology was overlooked. More recently reports from other parts of the world have shown several species of small lizards regularly visit flowers to feed on nectar or pollen but only one of these studies suggested lizards should be seriously considered as pollinators. Work with New Zealand lizards over the last few years has now shown that some geckos are indeed capable of acting as pollinators for some native plants.

In New Zealand the lizards most commonly seen feeding on nectar are the nocturnal geckos, in particular the giant (or Duvaucel's) gecko and the Pacific gecko. Where these two species are still abundant, such as on the northern off-shore islands, they can easily be observed feeding from the flowers of a variety of trees and on honey dew. There are also records of the diurnal green geckos feeding on manuka nectar but as yet there have been no reports of skinks visiting flowers.

Pohutukawa, flax and ngaio

Favourite nectar sources of the nocturnal



Above: While feeding on nectar from flax flowers a giant gecko becomes covered in pollen – visible here on its jaws, throat and even on its eye. Geckos feeding on flax prise the petals apart and lap the nectar through the side of the flower. Photo: Tony Whitaker



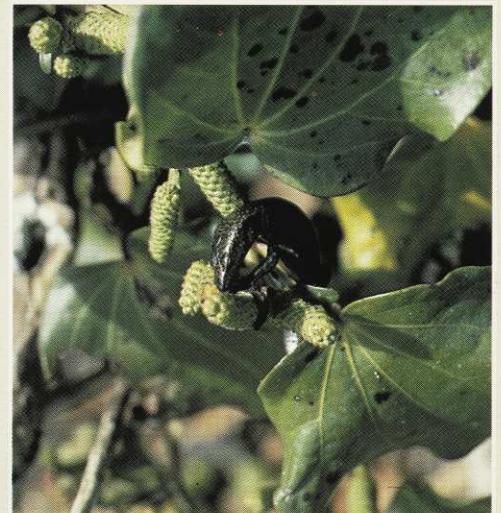
Left: When feeding from pohutukawa flowers Pacific geckos crawl over the blossoms and push their heads down between the stamens to reach the nectar. In doing so pollen adheres to their feet and the underside of their body, particularly the throat. Ultrastructural differences of the skin on the throat may indicate a specific adaptation for pollen transmission. Photo: Tony Whitaker

– The possible roles of lizards in plant reproduction



Above: Pacific geckos congregate on newly opened pohutukawa flowers to feed on nectar. As many as five geckos have been seen crowded on to a single inflorescence and geckos preferentially seek out trees in bloom.

Photo: Tony Whitaker



geckos appear to be pohutukawa, ngaio and flax. The geckos emerge from their hiding places at dusk and quickly gather in trees or flax plants that are in bloom, often travelling considerable distances to do so. They forage through the foliage seeking blossoms that have recently opened as these seem to produce the greatest amount of nectar. The geckos lap the nectar from each flower in turn in an inflorescence and then move on in search of further flowers.

The density of geckos in plants with flowers at the right stage for pollination can be very high. As many as five geckos have been observed crowded on to one pohutukawa inflorescence and overall densities in flowering pohutukawas have been calculated at 5-8 per square metre of canopy surface. At one site every flax flower spike had geckos on it, most with four to six!

When feeding from pohutukawa flowers geckos scramble over the brush-like inflorescences and push their heads down be-

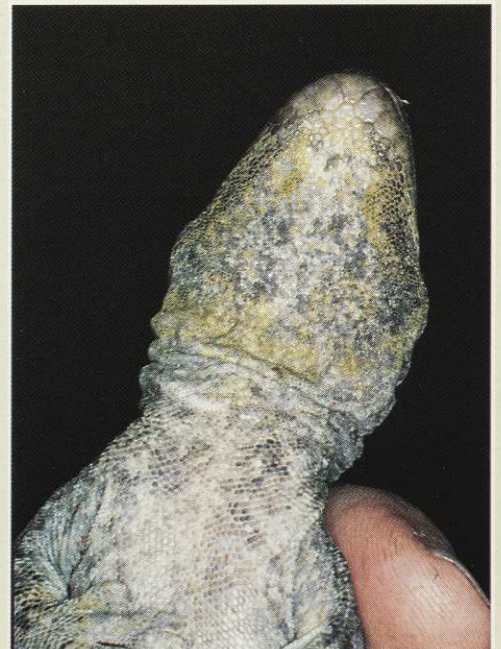
tween the stigmas and stamens to get at the nectar. In doing so their heads, and in particular their throats, become covered in pollen. Because of the way they feed, the throat is the best part of the body for transferring

Middle: Competition amongst lizards for fruit is so fierce in some places that ripe berries are plucked straight from the plant. Here a normally terrestrial shore skink has climbed a metre and a half up the smooth, vertical stems of kawakawa to reach ripe fruit. Any fruit that were dislodged were rapidly snatched up by other skinks and frequent fights developed for choice morsels.

Photo: Tony Whitaker

Right: Geckos which feed on nectar commonly accumulate large amounts of pollen on their throats – here yellow pohutukawa pollen on a giant gecko's throat at least 12 hours after it last had access to pohutukawa flowers.

Photo: Tony Whitaker





Above: A ripe karaka berry is more than a mouthful for a giant gecko. Maori history tells of feeding large pet lizards on the fruit of tawa. Perhaps in the recent past the extinct *Hoplodactylus delcourtii*, at over 60cm long the largest gecko ever, may have eaten and distributed a variety of the larger fleshy fruits of forest trees such as karaka, tawa, taraire and miro. Photo: Roy Slack

Right: Birds have usually been considered the seed dispersal agents of fleshy fruits, particularly those that are red, orange or black. However, many of New Zealand's divaricating shrubs have white or colourless berries buried inaccessibly within a dense tangle of twigs, the extreme perhaps being *Hymenanthera alpina* shown here turned over to reveal the berries hanging beneath the stems. These fruits are all eaten by lizards and these divaricating shrubs may be specifically adapted to lizard dispersal. Photo: Tony Whitaker



pollen from stigma to stamen and it is certainly the area where pollen adheres longest. Examination of the skin of geckos with a scanning electron microscope has revealed interesting differences between that of the throat and other parts of the body suggesting there may be special adaptations to carry pollen.

The opportunities for carrying pollen from one flower to the next, or one inflorescence to another, are obvious as geckos covered with pollen can be seen scrambling from one pohutukawa or flax flower to the next in a matter of minutes. The opportunities for geckos to carry pollen from one plant to another of the same species that is at an appropriate stage of floral development requires the geckos travel greater distances and retain pollen for longer periods. To test this, pollen smears were collected from inactive geckos and geckos foraging away from a nectar (pollen) source. Pohutukawa pollen was recovered from over 60 percent of the geckos sampled just before they became active, meaning they must have been carrying it for at least 12 hours. Of greater interest was the fact that many geckos collected 20-25m from flowering pohutukawa trees were carrying pohutukawa pollen, and one was over 50m from the nearest tree.

Clearly geckos have the potential to be effective pollinators of pohutukawa and, as brush-structured blossoms seem to offer the best opportunities for pollen collection and deposition, they may also have (or have had) a similar association with other species with similarly structured flowers. On

flax, ngaio and other species geckos are probably nectar robbers which effect some pollination.

Seed Dispersal

Worldwide there are many large species of herbivorous lizards which include fruit in their diet, and some of these are recognised dispersers of plant seeds. Smaller species of lizards are almost exclusively insectivorous and this is generally true of the skinks and geckos in New Zealand. For many years it has been known skinks here consume some soft fruits or berries, and more recently it became apparent that geckos do also. Studies have now shown fruit to be present in the diet of many species.

Lizards from all four genera present in New Zealand have been recorded eating fruit, including diurnal and nocturnal geckos and skinks, and both arboreal and terrestrial species.

The fruits consumed are in a variety of families. All are fleshy and most are small – most are drupes or berries 3-6mm in diameter – although there is one record of a gecko taking a karaka berry. Small fruits such as *Coprosma* or *Hymenanthera* berries or pohuehue fruits are swallowed whole, larger fruits like kawakawa berries are eaten in pieces.

The lizards either take the fruits as soon as they fall, or scramble around the branches in search of those that are ripe. Geckos are all adept climbers but the normally terrestrial skinks can move relatively easily through divaricating shrubs or tan-

gled vines and have even been observed scaling the smooth and vertical stems of kawakawa to reach ripe fruit. In some places in Otago skinks strip all the ripe fruit from shrubs of *Hymenanthera* and *Gaultheria*, and pohuehue vines.

Fruit important in diet

Seasonally, fruit is an important component of the diet of many species of lizards. A study of common geckos near Wellington showed that in summer over half of the animals had been feeding on *Coprosma* and pohuehue fruit. Over summer more than 30 percent of the diet of robust skinks is fruit (kawakawa, *Coprosma* and *Solanum*). Over a two year period fruit (*Gaultheria* and *Leucopogon*) comprised 15-18 percent by volume of the diet of common skinks in Otago but over the short season when ripe fruit was available would have been even more important.

Most fruit taken by lizards is swallowed whole and the seeds it contains are undamaged. These usually pass through the gut within 36 hours and germination trials have shown that many are viable. New Zealand lizards commonly forage over tens of metres and clearly have the ability to transport seed well beyond the limits of the parent plant.

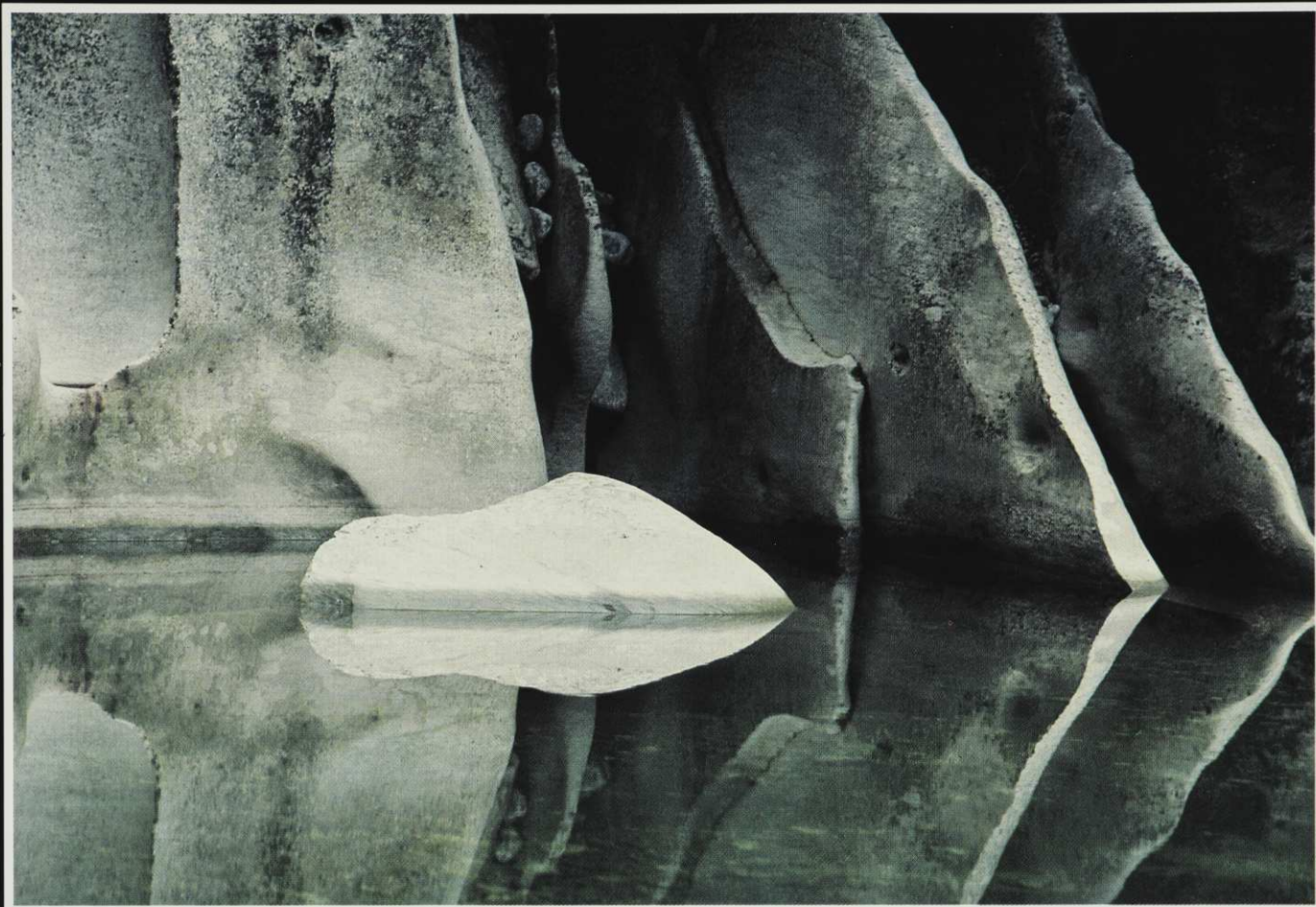
Lizards have no aversion to defaecating in their hiding places and often the crevices where lizards live are full of droppings crammed with seeds of a variety of plant species. In some environments, such as arid or exposed ones, these places provide particularly good micro-sites for germination and seedling establishment.

Many of the fruits commonly eaten by lizards are from divaricating shrubs, or densely tangled vines, where they are all but inaccessible to birds. Often these fruits are white or nearly colourless in marked contrast to the red or orange fruits normally associated with bird dispersal. The most extreme example is perhaps *Hymenanthera alpina* which bears white fruit beneath a tight tangle of hard spiny twigs. Perhaps these are plants which are specifically adapted to dispersal by lizards?

Evolution and Adaptation

With the present density of lizards over most of New Zealand it is hard to imagine that lizards could play a significant role in pollination or seed dispersal. At a very few mainland sites and on predator-free offshore islands it is still possible to observe lizards at densities similar to those which must have prevailed over much of New Zealand in the past. At Turakirae Head the number of lizards exceeds 1 per square metre. At that density about a million seeds per hectare per year will pass through lizard guts. When geckos taking nectar from flowering pohutukawa reach densities in excess of 5 per square metre their potential as pollinators is enormous. Reptiles arose long before birds so the new information on their possible involvement in plant reproduction indicates they could have played a role in the evolution of flowering plants. 🦎

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The Ashley

A Riverbed First



Left: Fluffy balls of fur, two wrybill chicks lie well camouflaged among the greywacke riverbed shingle. *Centre:* The curious wrybill, the only bird in the world with a sideways turning beak, breeds in the braided river beds of the South Island's east coast. The proposed Ashley Riverbed Reserve should go some way towards securing the future for this declining species.

Right: Wildlife Officer Ken Hughey shows, from left, Nicola Stevens (pupil), Barbara Spurr (teacher) and Keryn Rickerby (pupil), wrybill food on the underside of a rock. Nicola and Keryn accepted the Young Conservator of the Year (1986) Award on behalf of their class. All photos Dean Kozanic.

New Zealand's first riverbed reserve could be soon a reality if Canterbury's Ashley River reserve proposal is agreed to. Much time and effort by Wildlife Officer Ken Hughey and Rangiora High School pupils has paved the way for the historic gazettal and provided an example for other areas in the country. Margaret Baker reports.

Not many school pupils would relish the thought of hours spent slashing broom and lupin — but a few in North Canterbury have approached the task with zeal.

Spurred on by Wildlife Officer Ken Hughey's talk on a proposed reserve for part of the Ashley River, Rangiora High School's seventh form biology students set out to make the riverbed a safer place for birds to nest — and for their efforts were awarded a national Young Conservator of the Year award for 1986.

Encouraged by their teacher, Barbara Spurr, the pupils worked on their "conservation experiment" as part of their environmental education syllabus.

Their aims were to clear exotic vegetation, which was reducing the size of the nesting area and encouraging predators, and to monitor public use of the proposed reserve.

"After listening to Ken's lecture at a Forest and Bird meeting we decided the only thing to do was to get involved," says Keryn Rickerby, the group leader of the project. "I'd never really been interested in birds before — but now I want to do a wildlife course at Lincoln."

In March, the 20 pupils spent many hours at the riverbed slashing lupins and broom (and sometimes having enforced lessons on river crossing!) They also spent 10 days monitoring the amount and type of traffic using the reserve area, a 5km section of riverbed stretching west from the Rangiora traffic bridge to the Okuku river confluence.

Sense of purpose

"It was great doing a project that was relevant to here and now, it gave the whole class a real sense of purpose," says Keryn."

Their report concluded that if the braided riverbed birds, particularly the wrybill, were to continue nesting on the Ashley, the vegetation needed to be cleared continually, vehicles should be banned between September and December (the breeding season), and for overall protection the area should be made a reserve.

"Maybe we have saved the lives of only one bird, maybe a family pair — but therefore we have proved that clearing the vegetation is a good method of assisting the various species during the nesting seasons.

"Even if all we have done is give the proposal a higher profile, we hope our work will help convince local authorities of the need for a reserve," says Keryn.

Ken Hughey is just as hopeful.

"Their project has been a big help, it's shown that the public are becoming more aware of the special value of the Ashley —

and what's even more important is that a wrybill nested in the area they cleared!"

Ken first proposed the reserve to the North Canterbury Catchment Board in 1984. If accepted, it will become the first river and its habitat in New Zealand to be protected by such a reserve status.

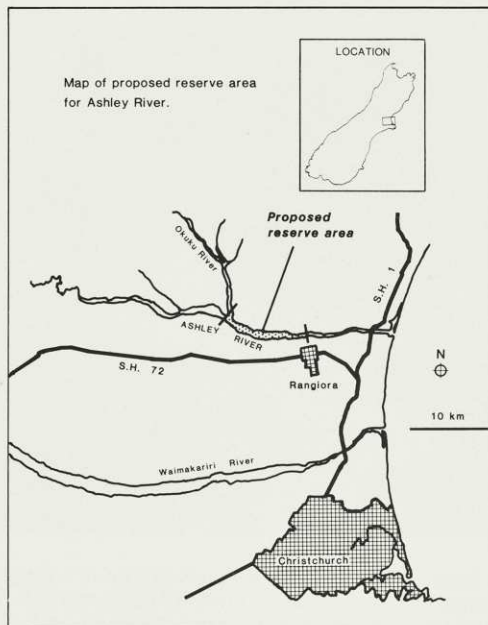
"The area is of outstanding value to wildlife, and the reserve would mean protection for birds which are fast becoming endangered species."

Of these, the wrybill (endemic to New Zealand), is the most threatened. The five known pairs that nest in the reserve area are the only ones found on the Ashley River. There are only about 5000 of the birds in total.

The vulnerable black-fronted tern also breeds in the 5km stretch of the Ashley.

"The Ashley carries a breeding stock of all the main riverbed bird species," says Ken. "The reserve is the most critical nesting area for them."

Other birds that nest there include the



banded dotterel, pied stilt, South Island pied oyster catcher, black-billed gull (the only colony on the river), and pipit. The Caspian tern, black shag, kingfisher, black-billed gull, welcome swallow, Australian harrier, paradise shelduck, white-faced heron and spur-winged plover also feed and roost in the area.

Ken says many of the birds return to exactly the same spot each year to nest.

"But now some are being frightened off by the intrusion of vegetation, trail bikes and a changing riverbed due to mechanical works — their range for nesting is shrinking."

Small chances of survival

He says some birds are so few in number that once one pair is frightened off their chances of survival become very small.

As the Rangiora students have shown, the threats to the birds can often be minimised easily and effectively.

Clearing vegetation leaves the bare shingle the birds prefer for nesting, and removes

predators such as ferrets, which prey on eggs and chicks. Ken believes clearing would also promote Catchment Board aims of keeping a clear flood-way between river control lines.

Gravel extraction is another major threat to the birds. If left uncontrolled, as it was in 1983, it can have a severe impact on them. In that season a black-fronted tern colony and a black-billed gull sub-colony deserted the area because of gravel works disrupting the natural riverbed and nesting areas.

By creating shallow pools with gently sloping banks, and clearing vegetation from islands, carefully managed work can enhance the birds' habitat, says Ken. Restricting extraction to between January and August would also reduce the impact.

Conflicts exist with the Rangiora District Council over this matter, as the best shingle mixture is found in the reserve area, and the best time to remove it is spring, for use in summer.

An agreement was, however, reached after the Wildlife Service pinpointed wrybill nesting areas and directed the council to areas where shingle could safely be removed.

Ken would also like to see recreation minimised during the nesting season, especially trail biking. Fishing and shooting have had isolated impacts, although in 1983 shooters were caught killing protected black-billed gulls in the area. Swimming and picnicking don't usually cause much conflict as they begin at the end of December.

"Good public relations is needed to make people aware of the special status of the area, and the impact their activities have on the birds," says Ken. "Nobody needs to miss out on their own fun if we work sensibly together."

Finally, river and flood control works could interfere with nesting, particularly by reducing the width of the riverbed. Provided these works are kept to existing areas, such as below the traffic bridge, Ken believes they should make little impact.

The Catchment Board, which controls the reserve's land tenure and water resources, is presently dealing with submissions to its draft management plan for the Ashley, and is considering the reserve proposal alongside these.

The board's resource planner, John Glennie, says a decision should be made in about six months.

"Personally I don't think there should be too many problems in accommodating the proposal in some form, whether it's under the Reserves Act or as a special designation," he says.

Ken has proposed that the reserve be given a scientific designation, which would offer considerable scope for wildlife habitat in the area, without compromising Catchment Board aims.

"All I want is for the birds to keep coming back, and as long as I'm alive and kicking I'll keep fighting for the reserve — and I think the board knows that," says Ken.

Opposite: The black-fronted tern nests only in the shingle riverbeds of the South Island.

What Happened to the

MOA?

by Barney Brewster

What happened to the moa? One thousand years ago this remarkable bird was the dominant animal of the New Zealand landscape; now we find it only in museums and crossword puzzles.

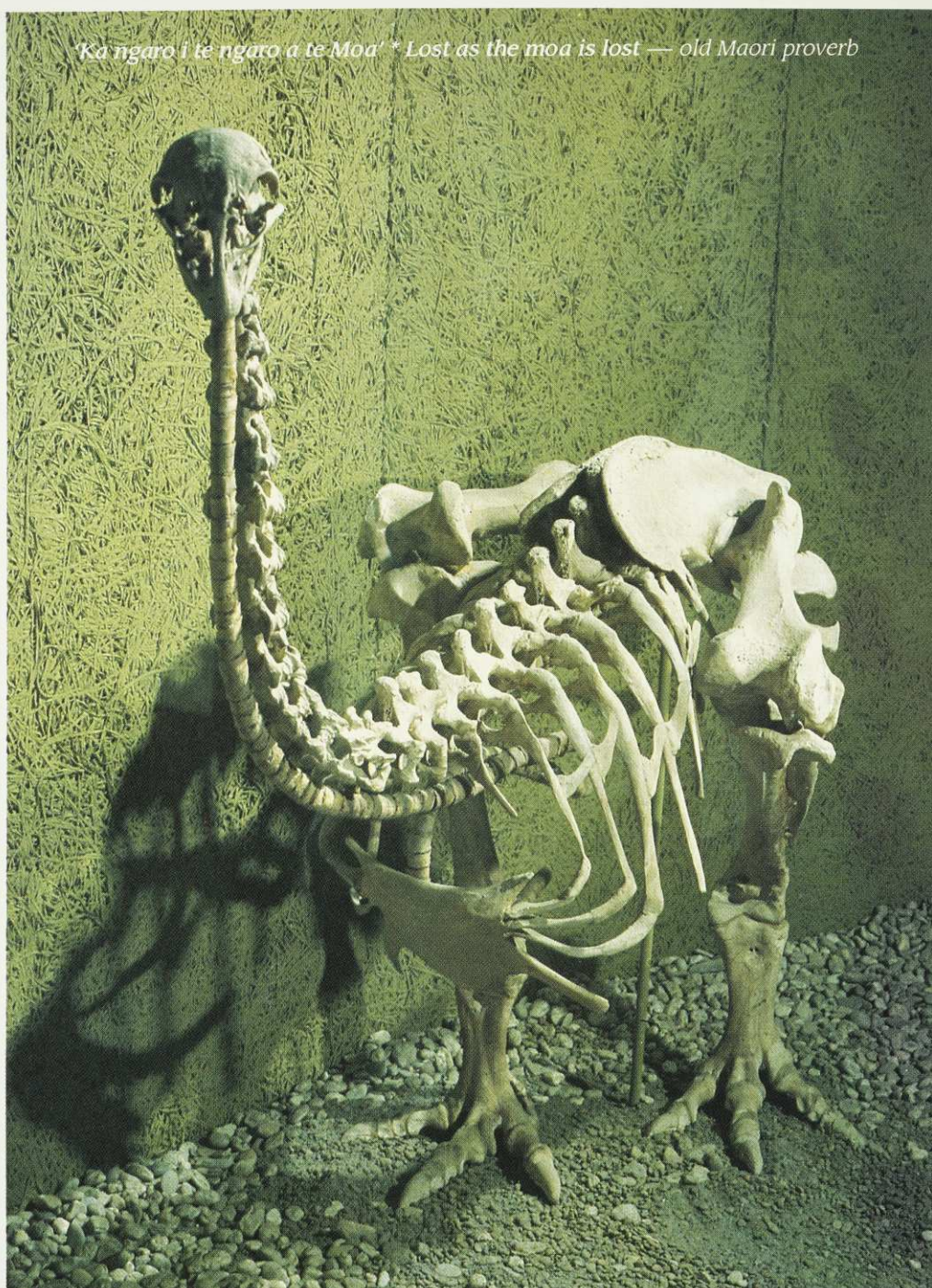
Moa extinction was the great controversy of New Zealand science last century; this century the disappearance of the moa has been firmly linked to the arrival of the Polynesians, but resistance to this idea was previously strong, and some novel and now quite amusing theories were put forward to explain the demise of the moa. Mass tutu poisoning, the shrinking of southern mossbeds on which the bird was supposed to feed, and the clean sweep of glaciers across the land each had their advocates as the primary cause of extinction.

Other writers put the death of the moa down to a general biological malaise. James Drummond, columnist and biology professor at Canterbury University, pontificated in 1907: 'In the moa, at any rate, we can see the result of laziness and neglect. Life was so easy in New Zealand that it first refrained from flying and then lost the power of flight. It is the emblem of stagnation and decay, and its fate is a shocking example to all who are inclined to give way to slothful habits'.

In the 1950s and '60s some scientists talked of the moa having reached the end of its evolutionary life. But it was surely an impossible coincidence that such a large number of other native birds species – and so many of them flightless – had attained old age and extinction over the same period. According to modern biology, species do not simply die out through lack of interest or vigour. Any decline in a species must relate to unfavourable changes in the creature's habitat.

Reluctant to blame

Not all early European observers were blind to the coincidence of the moa's decline with the arrival of the Maori, their kuri (dog) and kiore (rat). But even to the present day, some have refused to recognise that Polynesian settlers were the most likely cause of the moa's extinction. As Sir Charles Fleming commented in 1962, 'it seems we are reluctant to blame our fellow men for a pre-historic offence against modern conservation ideals and would rather blame climate or the animals themselves'.



A Canterbury Museum reconstruction of a medium sized moa, *Euryapteryx gravis*, from bones found in Pyramid Valley north of Christchurch. The prevailing scientific theories last century held that Polynesians were not largely responsible for the moa's demise, but that it was either a declining species, it had been affected by glaciation, or even that the giant bird had suffered mass tutu poisoning. Photo: QE II National Trust

"On a world-wide scale, there is incredibly strong evidence in New Zealand that the extinction of the moa had human causes," says archaeologist Richard Cassels. "The human hand is implicated to a fantastic degree." He points out that the case for the human destruction of the many giant marsupials which once roamed Australia is supported by only two archaeological sites, yet a human cause for these extinctions, dating from around fifty thousand years ago, has become generally accepted.

Excavations in the Oparara caves in the 1980s, and at other places, have added further to the picture of life in New Zealand before human disturbance. Extinct birds found in these caves include the flightless goose, the NZ swan, a flightless duck, the giant flightless rail (*Aptornis*), other extinct rails, the flightless coot, the giant NZ eagle (*Harpagornis*), the NZ goshawk, the NZ owl-nightjar, and the NZ crow, as well as moa species. Subfossil bone discoveries else-

where show that the nesting or breeding of other animals, such as sea birds and seals, has been restricted. On the Coromandel Peninsula and in the far north, for example, the bones of fur seal pups predate the arrival of European sealers.

The Path to extinction

Of New Zealand's original animals, ground-nesting moa were highly visible and vulnerable to new immigrants from Polynesia. That a technologically primitive people, whose numbers seemed tiny compared with the extent of the islands they occupied, could have such an impact on birdlife is at first hard to credit. Joseph Banks, Cook's naturalist, observed in 1770 that over most of the country 'the number of inhabitants seems to bear no kind of proportion to the size of the country'. In Cook's time the Maori population was concentrated in the northern North Island, but by far the greatest number of moa hunting sites have been

found along the eastern coast of the South Island. In the North Island even coastal sites are not common, with very few moa-hunter sites known from inland. However, other factors may have had a bearing on the apparent lack of moa-hunter sites in the north.

A clear association between moa remains and a definite material culture – then known as ‘moa hunter’ – was not established until schoolboy Jim Eyles’ discovery of the Wairau Bar burials in Marlborough in 1939. Archaeologists now prefer to call the early stage of Polynesian colonisation of New Zealand the Archaic phase, and tend to downplay the role of moa in the diet of these early people. In both islands the evidence for direct hunting of the moa is highly variable from area to area. Although in general it appears that *Dinornis* was the most common moa hunted in the North Island, and *Eurypteryx* in the South, the pattern is quite irregular. At one time, for example, it was thought that the moa had been a rare bird in the North Island by the time the Polynesians arrived, but as archaeologist Janet Davidson explains in *The Pre-history of New Zealand*: ‘It now appears that in parts of the North Island a greater range of moa species was available for longer than in much of the South Island. Even so, there were other parts of the North Island in which moa seem never to have been at all important in the diet’.

Maori traditions

Some hunting techniques are recalled in Maori traditions recorded last century. The moa was said to stand on one leg when attacked, holding the other leg close to the body, poised to strike. A hunter struck by a kick from the bird was likely to be killed. The moa was ‘quite clever at warding off thrusts made at it, with the upraised leg . . . One very effective way was to strike the leg the bird stood on with a long heavy pole which usually brought it down, when it was killed by spears or clubs’. Other traditional methods included netting, snaring and pit-trapping, which made use of the forest paths of the moa.

The earliest investigations of moa kill sites left scientists aghast at the sheer quantity of the remains, and the area which they covered. Near the Rakaia rivermouth in 1869 Haast found an area of over ten hectares ‘covered with ovens, and moa and other midden bones, together with large numbers of flake knives of flint’. At some coastal sites the ploughing of the pioneers is said to have turned the fields white with bones. While the large kill sites of the eastern coast might represent several centuries of hunting, the general impression has still been that large numbers of moa were killed over a short space of time, with considerable waste of both flesh and bone.

What did moa meat taste like?

Moa flesh was surprisingly fatty, judging by the greasy residues of moa meals found in old ovens. It shared this quality with kiwi flesh, which is dark and was much favoured by the pioneers and pro-

spectors of last century. According to American ornithologists Austin Rand and Thomas Gilliard, ‘Cassowary flesh is prized and we found it dark, rich and tasty, quite unlike that of most birds.’ Sir Robert Falla thought roasted moa would have resembled roast ox.

A nesting moa may well have been an especially attractive food source, assuming that the moa stored up fat reserves for the long incubation in the way that the male emu does. On the nest, two generations of moa were at risk, and it is highly likely that the moa was doomed as equally by nest robbing as it was by hunting. During the season – most likely in early spring – moa nests would have been fairly easy to locate.

Repeated year after year, nest robbing would soon lead to a whole generation of birds being lost in any one area, as large birds tend to adopt what biologists call the K strategy of small broods and long lives, especially if they have few predators. Opportunistic hunting of the remaining adult and juvenile moa might see the local extinction of these birds in no more than a century. In this manner it is not difficult to imagine relatively small numbers of people eliminating the moa – and other ground-nesters – over large areas.

Although eggshell fragments are not commonly found with moa bones at archaeological sites, in 1865 at Puketoi in Central Otago, W. D. Murison saw a long line of old ovens, and in them an enormous quantity of eggshell fragments. Geologist Alexander Mackay said in 1905 that at one of his collecting spots near Wellington he had found “gallons” of eggshell fragments, which had plainly been cooked, and the contents doubtless eaten.

A moa egg would have made a good meal. ‘As a rough guess, I may say that a common hat would have served as an egg-cup for it: what a loss to the breakfast table!’ exclaimed Walter Mantell, who could be considered New Zealand’s first archaeologist for his excavations at Kaupokonui in 1847. But a moa egg was also a useful container and an item of trade. The moahunter burials uncovered on the Wairau Bar in the 1940s turned up 11 moa eggs that had been interred with other artefacts. Thus the eggs played a significant role in the simple economy of the early Maori, just as did the bones, when no longer green, and the bird’s skin and feathers.

Dog and rat

Although hunting and nest robbing might explain many local extinctions, the moa had also to contend with the dog and the rat. Whether the dog roamed wild is still in dispute. It is significant that kuri bones, though common in middens, are quite unknown from any natural deposit of animal bones in caves or elsewhere, and that the moa bones found in middens or ovens are only very rarely gnawed. From this latter observation Haast deduced that the moa-hunters did not have dogs, because the animals ‘would not have refrained from attacking the remains of their masters’ feasts’.

However, Hector remarked in 1872 that the wild dogs seen in the Otago interior in the 1850s were ‘not to be confounded with the true wild dogs of New Zealand, of which only a few specimens have been obtained, and always in dense bush as the district between the Maitara and Waikawa’. Archaeologist Atholl Anderson believes the southern Maori bred their kuri especially for hunting large birds, and cites the marked neck and jaw muscle development discernible in the remains of these southern dogs. Maori use of dogs for hunting kiwi and kakapo in the early days of European contact has been recorded in many accounts, and Heaphy noted in 1846 that the Maori of the upper Buller attributed the local extinction of the kakapo to wild dogs.

It has been suggested that the kiore could also have affected moa, damaging their breeding success by harassing the birds on the nest. Kiore have actually been observed to kill nesting sea birds on an atoll in the Cook Islands, but the lack of other protein on the island has been put forward as the most likely cause. In New Zealand the kiore has been regarded as predominantly vegetarian, with naturally a much wider choice of food than that on an infertile coral island. Nevertheless its presence on some offshore islands of New Zealand corresponds with a marked decline in numbers of large insects, seabirds and tuatara on these particular islands.

The fires of Tamatea

Other pressures on the moa developed with the arrival of the Polynesians. Soil horizons and pollen analyses have revealed that after Polynesian settlement, large areas of both islands, especially in Hawkes Bay, Marlborough, Canterbury, and Otago were set alight. Only a thousand years ago almost the whole of the country was in forest, or at least in scrubland. Even the swamps, then far more extensive, had their own cover of forest. Only alpine altitudes and those areas freshly disturbed by volcanic action appear to have been open country, apart from some persisting open areas in Central Otago, where charcoal from natural fires dates back to 6,000 BC. With these exceptions, permanent forest clearance began about one thousand years ago, with the most dramatic phase occurring about 1250 A.D. Even by that time however, as Atholl Anderson points out, the most intensive period of moa hunting was over, at least in southern New Zealand, suggesting that moa numbers were already significantly reduced. Although some very favourable habitats – vast tracts of rich podocarp forest – had been destroyed in these fires, it is also obvious that immense refuges of forest still remained on both islands, especially on the wetter western side of both islands. Yet moa disappeared from these unfired forests too.

There is also a widespread Maori tradition that ‘the fires of Tamatea’ were chiefly responsible for the demise of the moa, although sources vary as to whether these fires were natural or induced, and as to their main purpose. A tradition recurrent in the South Island, noted in the 1840s and 1850s, was that the moa were child-stealers, and the fires were a revenge involving all the tribes.

The Progress of extinction

The earliest Europeans to comment on the fate of the moa drew on Maori tradition and their own observations of the more populated North Island in suggesting that the bird had vanished there before disappearing from the South Island. The later exploration of the South Island by settlers and scientists confirmed this with the discovery of moa remains which seemed much fresher.

In the North Island the moa first disappeared from the far north, and from coastal areas; then progressively south. The bird seems to have lingered longest in the deep interior bounded by the King Country, the Wanganui and Taupo regions, and in the endless forests of the Wairarapa. The evidence for this is, however, only fragmentary, and only the general course of extinction can be suggested. Within the South Island, the moa was first exterminated from the eastern seaboard, from Marlborough down to Southland, then from most of Nelson and the West Coast, and from Central Otago. Post-European archaeological finds in Fiordland support Maori traditions that this region was the moa's last stronghold. Fiordland was also the final refuge for Maori tribes pushed south and west, by northern invaders.

There was some memory amongst the Maori of the progress of extinction. On the Auckland isthmus a woman of the late 1600s, Rangihau-moa, was so named because the day of her birth coincided with the last nest of moa eggs to be found in that

area. In the nineteenth century it was common wisdom that the last moa in the northern North Island had lived on top of Whakapunake, a mountain on the East Coast. In the south of the South Island, Beattie found a number of traditions concerning the last known birds of different localities. He was told the last moa in northern Southland, for instance, was supposedly killed on the Waimea Plain by one Parawhenua, sometime around 1800, while the last refuge of all was said to be 'in the area between Te Anau and Big Bay', on the West Coast. The archaeological record shows that moa numbers were severely reduced over most of the country by 1500 A.D., and very few moa hunter sites have been dated to later than 1600 A.D. Scientists have differed widely in their estimates of the date of extinction of the moa, but obviously as the bird became rarer, the corresponding kill sites did too, and very little of their evidence is available.

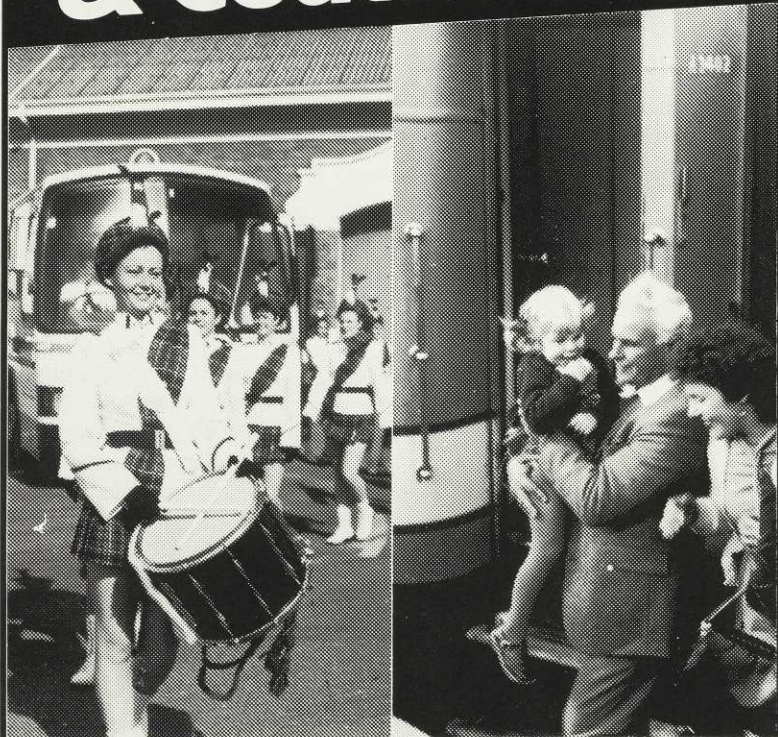
The succession of occupying tribes over the centuries – always descending from the north where the moa had already largely vanished – is a reasonable explanation for the very minor place of the moa in tradition and legend, and in place names and proverbs. This surprising absence is best summarised in the later chapters of Roger Duff's *The Moa Hunter period of Maori Culture*, yet there is strong evidence – traditional, archaeological and historical – that the moa was by no means extinct in the south of the South Island in the 1700s.

The extinction of the moa and other ground-dwelling birds is counter to prevailing attitudes that the Maori of old was a conservationist. Certainly this century the destructiveness of the Pakeha has been contrasted with the perceived care of the Maori for their lands and food resources. 'The Maori was always careful to conserve his food supplies, and to prevent fires from injuring or destroying his food-reservoirs, the forests. He had his closed season, the rahui, when no bird might be taken; would he not have his rahui for the moa?', asked the scholar J. C. Andersen. However, the clearance of the forests and the pre-European loss of 22 flightless bird species belies this image of their Polynesian ancestors. This is no special indictment of those people, but of human nature in general.

In the story of New Zealand then, Maori supplanted moa, and valley by valley, forest by forest, the big birds gave up their ground until at last their furthestest refuges were penetrated. There, at a time almost certainly after 1800, the last meal was made of moa and egg. ✎

Barney Brewster has taken up where he left off in his "Moa's Ark" article in the May 1986 Forest and Bird. This article is abridged from the second chapter of his book Te Moa: the life and death of a unique bird, to be published in October.

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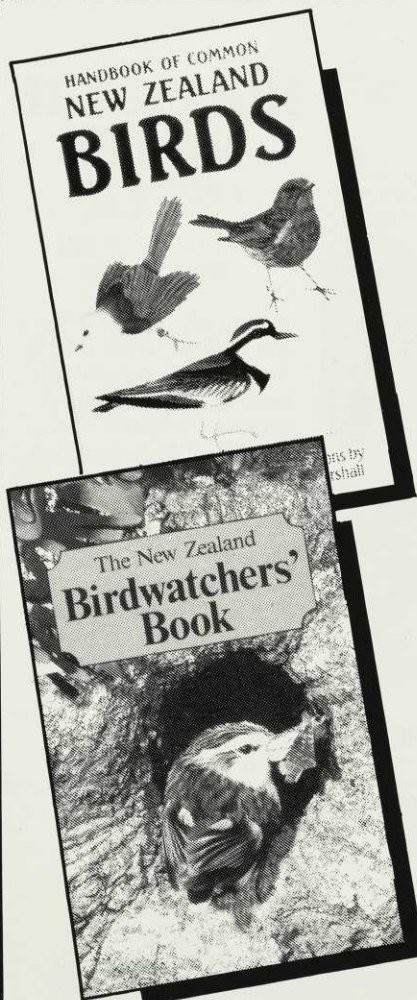
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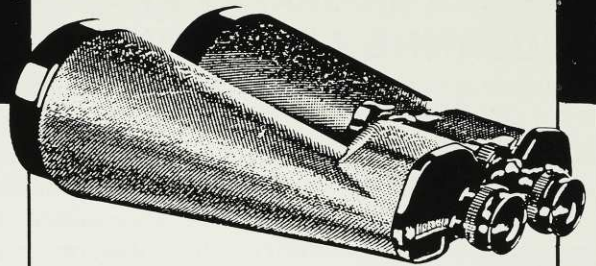
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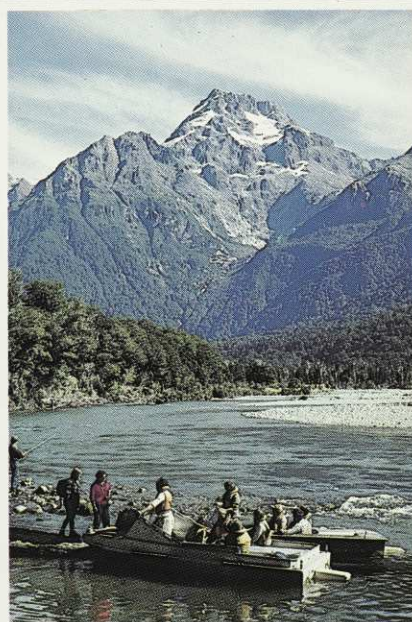
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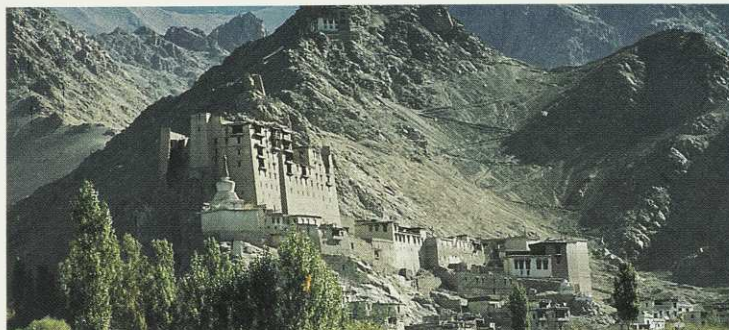
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This is a leisurely 20 day trip which slowly wends its way through the villages of the Guangdong Province. Cycling on modern 10 speed cycles, accompanied by a mini bus to carry all the luggage, you get to browse in villages amongst fascinated locals.

On this trip you leave the ordinary tourists behind and visit areas few tourists see. This is a rare opportunity you shouldn't miss. A highlight for many are the Zonghua Hot Springs and Seven Star Crag, "a place that fell from heaven" they say. Here gigantic limestone crags rear out of lakes dotted with ancient pagodas.

The China cycle trip allows you to visit schools, factories, communes, ancient temples and bazaars. All travellers stay in very comfortable local hotels and feast on excellent Chinese meals.

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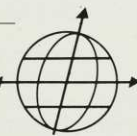
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DUCKS UNLIMITED

A Force for Conservation?

Do Forest and Bird members have anything in common with duck shooters? As the Public Lands Coalition – a third of which is made up of Acclimatisation Societies – has recently proven, such partnerships can be extremely beneficial. Tauranga member Ann Graeme argues the case for Ducks Unlimited.

Ducks Unlimited NZ is a private non-profit membership organisation dedicated to the preservation, restoration, creation and maintenance of wetland habitats in New Zealand, and to the propagation of our country's rare waterfowl. Unlike Forest and Bird members, many Ducks Unlimited members are farmers and duck shooters.

Although Ducks Unlimited members

write submissions and lobby politicians, they are not as outspoken or as politically assertive as our own Forest and Bird Society. However, this difference of attitudes towards political action does not mean we should ignore them. By working with them we could combine our talents and perhaps motivate valuable allies in the political battle against wetland destruction.

Ducks Unlimited activities

With practical advice, assistance and finance, Ducks Unlimited encourages the development and improvement of wetlands on members' properties. Their most notable property is the Sinclair wetlands near Dunedin, recognised as amongst the top 20 privately owned wetlands in the world. The Sinclair wetlands were gifted to Ducks Un-



Top: Between 1974 and 1984 the grey teal population jumped from 20,000 to 40,000. The increase is accounted for by the provision of 900 nest boxes throughout the country, which keep the ducks safe from rats and mustelids. *Photo: Ducks Unlimited*

Bottom: Hopes of saving brown teal rest in its adaptation to captivity, according to wildlife experts. Largest numbers are found on Great Barrier Island – up to 1000 – with dwindling remnants in Fiordland, inland Bay of Plenty, the Waikato, the tip of the Coromandel Peninsula and Northland. *Photo: Dick Knighton*

Top: New Zealand's rarest mainland waterfowl is the brown teal. Since 1976 Ducks Unlimited have released 550 into the wild.

Photo: Dick Knighton

Bottom: How "natural" is it to intervene with a species to this extent? The author argues that humans have a moral responsibility to save endangered species, since their actions placed the species in jeopardy. This bantam hen zealously defends her brood of brown teal ducklings as if she was the natural mother. *Photo: Dick Knighton*

limited by member Horrie Sinclair, and are managed jointly by Ducks Unlimited and the QEII National Trust.

Ducks Unlimited is now fundraising to build a complex of manager's and visitor's accommodation and education facilities on pasture adjoining the wetland.

Our most recent project began in May 1986. It is the installation of a pipe from the Raumahanga River adjacent to Lake Wairarapa to reflood the 80 acre Home lagoon, which has been dried up by nearby drainage. Ducks Unlimited has organised and financed the project, with financial assistance from the Wildlife Service and the Wellington Acclimatisation Society, and the work is being carried out by the Wairarapa Catchment Board.

Ducks Unlimited encourages waterfowl populations through specific "operations"

Operation "Gretel" is the name of the grey teal project. Grey teal introduced themselves to New Zealand from Australia last century but their numbers never increased because of the lack of suitable nest sites. In Australia grey teal nest in holes in trees (particularly eucalypts) near lagoons, but we have few suitable trees in New Zealand.

Ducks Unlimited members are erecting nest boxes in swamp areas considered suitable for grey teal. The ducks adapt well to the artificial nest boxes and in several areas all the boxes are being used each season. The nest box design makes it difficult, if not impossible for rats or mustelids to rob the nests, so usually most of the clutch are hatched.

Members of local Ducks Unlimited chapters have erected more than 900 boxes throughout New Zealand and their efforts are now being joined by local Acclimatisation Societies. The grey teal population, estimated at about 20,000 in 1974, has risen to around 40,000 in the 1984 count and the provision of nest boxes must take much of the credit.

Operation "Pateke" – From being widespread in the early 1900s, the endemic brown teal has declined dramatically to become our rarest species of waterfowl, mainly found in North Auckland and Great Barrier Island. Operation "Pateke" is aimed at reversing this decline by breeding brown teal (pateke) in captivity and releasing them into suitable wild areas. Close liaison is kept with the Department of Conservation.

Thirty-two Ducks Unlimited members hold over 50 breeding pairs of brown teal. The breeding aviaries are inspected, and permits to keep the birds are issued by the Conservation Department. Each autumn all the progeny (except a few kept for breeding) are released at selected sites in Northland, notably Mimiwhangata Conservation Park, Matapouri estuary and Takou Bay. The survival and breeding of these birds in the wild has since been confirmed.

This year 110 birds have been released, and since its inception in 1976, Operation Pateke has released 550 brown teal into the wild. Ducks Unlimited hopes that in the long term our effort can increase the population to a level where the species is no longer endangered. Ducks Unlimited is also financing a Ph.D. research programme into

the ecology of brown teal on Great Barrier Island.

Operation "Whio" – although accurate figures are not available, there is a growing awareness that blue ducks are declining in numbers. Mt Bruce and Ducks Unlimited have had some success in breeding blue ducks, and Ducks Unlimited members will be assisting in returning some of these strange and beautiful birds to the mountain streams where they are no longer found.

Operation "Branta" – has involved the distribution of South Island Canada geese to the North Island, where wild flocks of some 4,500 geese are now established.

Operation "Royal Swan" – is our newest project. The exotic Mute Swan population, once numbering several thousand birds on Lake Ellesmere, has shrunk to less than 200 birds, probably due to the devastating effects of the Wahine storm.

In April 26, 1986, Mute Swans were collected from the Isaac Wildlife Trust and distributed to Ducks Unlimited members throughout New Zealand. It is intended to eventually establish 50 pairs with members, and then begin releasing birds into suitable wild areas. Mute Swans in the wild are no threat to our native waterfowl, and the project has the approval of the Conservation Department.

The Conservation Ethic

As a non-hunting "pure" conservationist, I was at first very sceptical of Ducks Unlimited's motives. Are Ducks Unlimited really conservationists? About 60 percent of their active members are waterfowl hunters and trade members include sporting goods stores and gun merchants. Are they simply boosting duck numbers so that one day rare species may be prolific enough to be shot?

Despite my dislike of shooting, I now realise my first reaction was ignorant prejudice. Ducks Unlimited hunting members have a very real interest and concern for wildlife. (Sir Peter Scott said recently that his great interest in waterfowl had stemmed from his years as a duck shooter). Certainly, Ducks Unlimited would welcome the day when our rare birds are so plentiful that their populations could sustain hunting, but it would be wrong to suggest that Ducks Unlimited is motivated by such self interest.

It is not legitimate hunting of sustainable wild populations that jeopardises our waterfowl. It is the destruction of their habitat.

The hunter can be just as great a force for conservation as can the mainstream conservationists. In 1983 Ducks Unlimited received the Wildlife Service Conservation Award, recognition of the conservation efforts of an organisation largely made up of duck hunters.

Are the "Operations" worthwhile?

No-one would argue that the preservation or restoration of habitat is the best way of assisting waterfowl. Enhancing the habitat with nest boxes also seems ecologically sound. But can the same be said for captive breeding?

I have heard conservationists say that preserving the habitat is the only valid way of saving a dwindling species and that to


perpetuate them through captive breeding is to manipulate the species, to "play God" in an unacceptable fashion. Extinction, they argue, is a natural process.

But at the present time I would consider that it is not natural selection processes but human activities that are causing the greatly accelerated dwindling and extinction of species which we are witnessing. If these activities have led to the decline of the brown teal (as they almost certainly have) I think it is morally responsible to use our human ingenuity to try and redress the situation and assist the survival of the species. That the captive-bred brown teal are seen to be surviving and breeding in the wild suggests that we have not manipulated them to an unacceptable degree. Their period in captivity has not destroyed their ability to survive and multiply out of captivity.

In my eyes, the real criticism of captive breeding is that it is *selective*. Worldwide, great effort is being made to assist threatened bird and mammal species which are visible and appealing to people. The giant panda is a classic example.

Yet even such anthropomorphic conservation has some merit. Protecting the panda's home range for pandas, must mean protecting a whole ecosystem in which countless unregarded species live. And the panda has considerable educational value, for it can represent the vulnerability of the natural world, and focus interest on conservation.

It has been my experience when trying to interest people in conservation, that things unseen are things uncared for. Who would care about the Antarctic continent and its wildlife if they had not seen and learnt about them on film or TV? Who has not felt a deeper commitment to forest conservation after hearing the song of the kokako at dawn? Such experiences make people care, and this is where Ducks Unlimited's operations have great value. They involve people seeing and working for waterfowl. Like other Ducks Unlimited members, I get enormous pleasure from our small wetland and its waterfowl and our neighbours take pleasure and pride in our free-flying birds. Many Ducks Unlimited members make their wetlands available for visiting and host school parties and interested groups. By making waterfowl visible and accessible to people, Ducks Unlimited helps in a small way to arouse public interest in our waterfowl and our wetlands.

In an increasingly city-oriented world, we need to interest and involve people in our wildlife. I see lack of interest and caring as the greatest threat to our wild places, and we all, hunter and naturalist, Ducks Unlimited and Forest & Bird members, have a contribution to make. 



This edition of *Tracks* features birds which most of us see regularly – seagulls. Worldwide there are 45 species of gull, living everywhere from the polar ice caps to the Equator. In New Zealand we have just three species, and their story is unfolded below. The winner of the “Link the caterpillar to the butterfly”

competition is Vaughan Magnusson of Manurewa. Thank you to the 60 entrants who took part and a special thanks to those teachers who copied the competition for a class project – we promise more to come.

Terry Fitzgibbon



Gulls wheeling over a boat in Hokianga Harbour. Photos: Terry Fitzgibbon



Imagine you are a hungry seagull soaring on the breeze high above a sandy beach wondering what might be on the lunch menu. Fish and shellfish are getting a bit scarce these days, but look . . . there are some picnickers – they’ll leave some crumbs. And a flight inland might turn up something . . . a freshly ploughed field, the local rubbish tip, a freezing works. There’s always plenty to choose from if you’re a hungry seagull!

No doubt that’s why there are large numbers of seagulls – as humans have spread, seagulls have followed, surviving off left-over food scraps and waste.

Life never used to be quite so good for New Zealand’s three gull species – the black-backed, red-billed and black-billed.

Last century, for example, the karoro – as the black-backed was called by Maoris who hunted it – was relatively uncommon. Today large flocks of these seabirds even nest in tall city buildings.

In fact, although they can be found breeding in these unusual places, black-backs prefer islands, headlands and riverbeds where they breed either in isolated pairs or in colonies. You can also find them living as high as 5000 ft.



A young explorer discovers black-backed gull eggs. Look but please don’t touch!

Both black-back parents incubate the purple or brown spotted eggs for up to four weeks and the emergent chicks are fed on regurgitated food. Within only two weeks the chicks desert the nest and by seven or eight weeks they can fly. They will eventually grow up to 60 cm long.

Red-billed and black-billed gulls are almost half the size of the black-backed gulls and are easy to tell apart because of the different colouring of their bills and legs.

Both have webbed feet with strong toes for clinging firmly when gale force winds threaten to blow them away.

The red-billed is the most common, living on the coast; the black-billed on the other hand breeds and lives mainly in inland areas of the South Island, although it has breeding colonies in the North Island.

These two species of gull usually return to the same breeding spot year after year where they lay a clutch of two or three eggs. After three weeks the chicks emerge into the world, using their pronounced egg tooth to chip their way out.

If you do discover a breeding colony, do not approach too close as you will panic the chicks into running in all directions. That could mean that they lose their parents or are pecked to death by neighbouring gulls.

Gulls take up to four years before they can finally be described as adults, with a full adult plumage. That is why you often see flocks of immature gulls roosting and scavenging in cities all year round, rather than going off to breed as the adults do.

Humans have created difficult situations for themselves and seagulls. We have built rubbish dumps or sewage outfall pipes near airports and made it more likely that an aeroplane might hit a gull because there are now so many of the birds nearby. And so today we have to look at ways of getting rid of gulls in such dangerous areas – perhaps if we had thought about it beforehand, we could have avoided the problem.

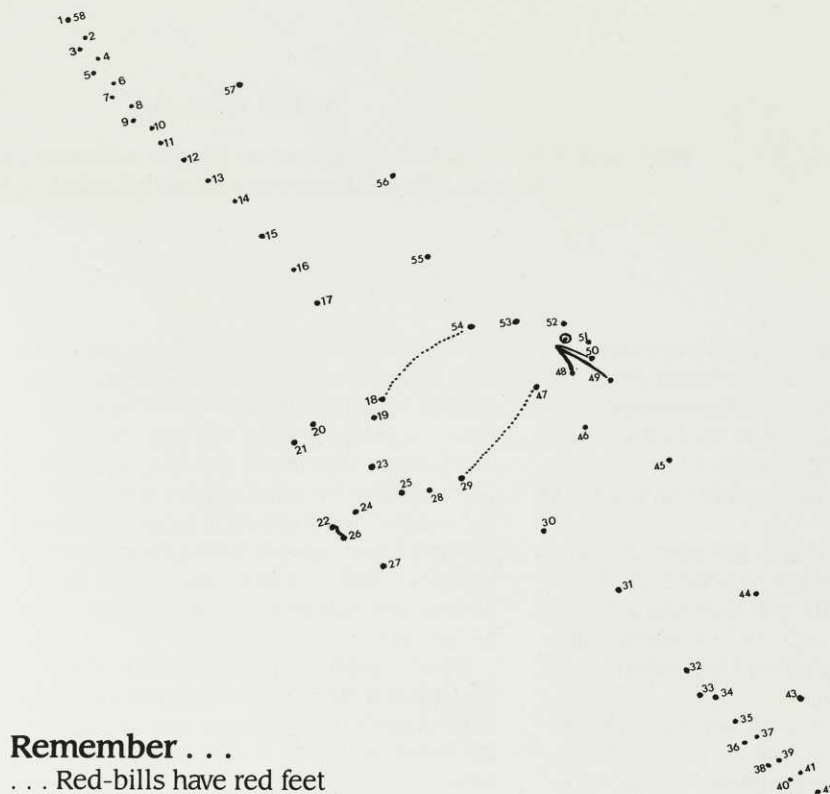


A black-backed fledgling snuggles into pohuehue on Wellington’s Mana Island.

Join THE DOTS E' COLOUR-IN

Questions

1. Rather than shooting or poisoning gulls, what would be some good ways of ensuring their numbers stay in balance?
2. Why do seagulls have smaller eyes than forest-dwelling birds?
3. A seagull is depicted in the emblem for the Edgecumbe Primary School. Where else have you seen a gull in a design?
4. What colour is the plumage of young black-backed gulls?
5. 15 percent of the world's 280 species of seabirds have been found to have eaten plastic. Can you think of ways to stop the spread of plastic around our shores?



Remember . . .

- . . . Red-bills have red feet
- . . . Black-backs have yellow bills
- . . . Black-bills have black feet



SCIENTIFIC CATCHING

Whale of a Loophole

by Bill Wieben

**When is a commercial whaling boat no longer a commercial whaling boat?
Answer: when it becomes a scientific whaling boat.**

At the beginning of 1986 the International Whaling Commission (IWC) won what it and conservationists regarded as an important victory in the battle to save the world's largest animals: a ten-year commercial whaling moratorium starting in the Antarctic.

Within a few months, however, the glow of success soon faded. In what is an enormous loophole, the IWC allows any country to issue an unlimited number of scientific permits for taking whales for research, and to use the products.

Japan, Iceland, Norway and South Korea swiftly moved to exploit the escape clause, not convinced that a number of species might be rare and endangered.

Incredibly, a country can set its own rules for "scientific whaling" — it can make up its own quotas and decide which species to kill.

Japan's proposed "scientific" programme for the Antarctic is to last 12 years. It is divided into three blocks of four, during which different parts of the Antarctic will be "surveyed". Each year, 825 minke whales and 50 sperm whales will be killed. The Japanese Fisheries Agency euphemistically describes this exercise as "assessing whale resources."

The US Government has it in its power to stop Japanese whaling overnight, but it has chosen not to use it. Had the US Supreme Court recently upheld a Fisheries Act amendment that would penalize Japan for "diminishing the effectiveness of the IWC", the Reagan Administration would have been ordered to cut Japan's fishing rights in US waters by half — a move that would have almost certainly brought Japan's whaling to an abrupt halt.

Japan's other strategy for evading the commercial moratorium is to ask the IWC to re-classify its small-type coastal whalers as "small-scale and traditional". They would then come into the same category as Alaskan Eskimos who hunt in the "aboriginal subsistence" category.

When it declared its commercial whaling moratorium, the IWC also announced that a comprehensive assessment of whale stocks would take place during 1990. Japan, Iceland, Korea and Norway are clearly anxious that their whaling fleets do not rust away by then — hence their reason for hunting with scientific permits and gathering data which they hope will justify the resumption of commercial whaling in 1990.

Although New Zealand no longer carries out whaling, we have a direct interest in the

Japanese whaling in the Antarctic, since the minke whales they hunt possibly migrate through New Zealand waters. The most disturbing recent whaling incident in New Zealand occurred on Kapiti Island in 1986, when a sperm whale which died and floated ashore on Kapiti was plundered for whatever was valuable. Whale teeth are in demand as jewellery and other products are used in cosmetics overseas.

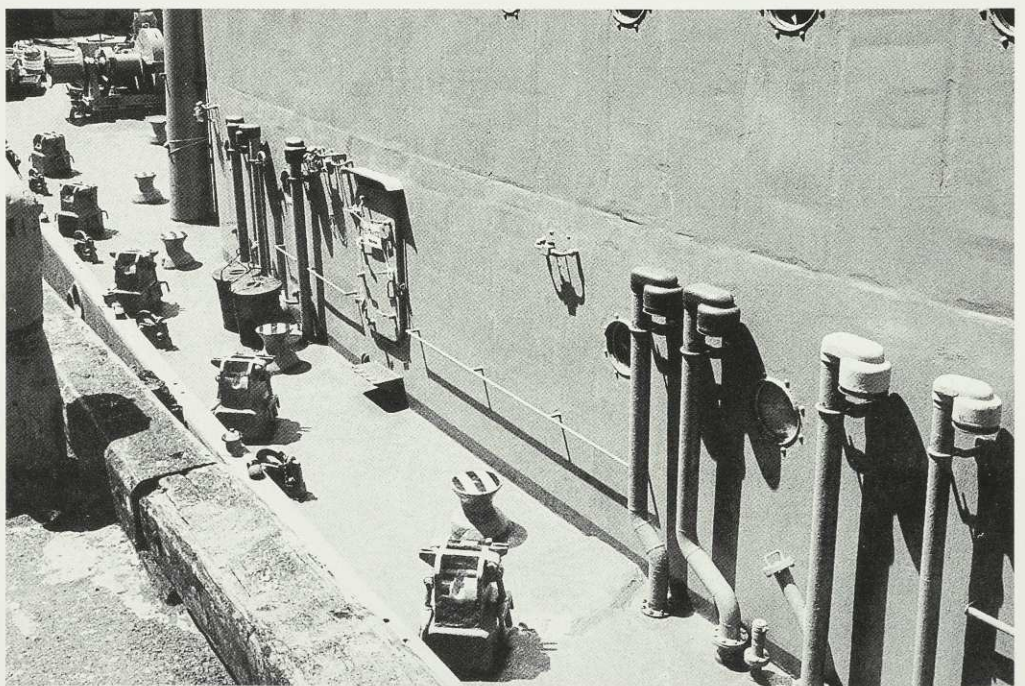
Such plundering also denies legitimate researchers — as opposed to the "scien-

Whale Numbers

Blue Whale	6,000-
Bryde's Whale	80,000
Fin Whale	70,000-80,000
Humpback Whale	6,000-
Minke Whale	300,000
	(Antarctica)
Sperm Whale	500,000
Sei Whale	100,000
Southern Right Whale	3,000



When Greenpeace activist Mark Roach chained himself to this Japanese "scientific" whaling boat in Wellington Harbour in 1985, some of the crew were not amused by his protest. Photo: The Dominion



These winches are used to haul whales up to the sides of the "scientific" whaling boats until they meet with the factory ship.

Photo: Bill Wieben



tific" whalers — the opportunity to study whales which have died of natural causes.

With so few of the large species remaining, it is imperative that scientific whaling is halted immediately. It would be a start if the United States used its legal powers in a way that reinforces the spirit of the IWC, and if it were more actively supported by other conservationist members of the IWC.

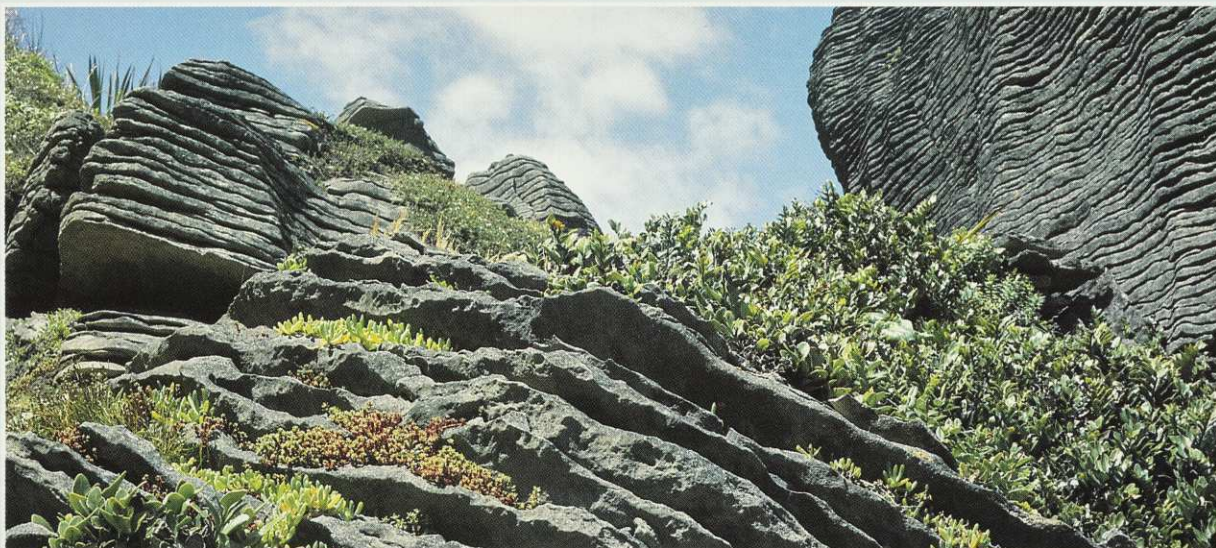
A minke whale recently photographed in Akaroa Harbour. Minke are the main whales hunted in Antarctica by the Japanese, who claim that such kills are needed to "assess whale resources." Photo: Steve Dawson

Bill Wieben is Project Jonah's representative in Wellington. He also started an urban "Tree Rescue" project in Wellington several years ago.

STOP PRESS • STOP PRESS •

By a vote of 19 to 6, the International Whaling Commission has decided to clamp down on the issuing of scientific whaling permits. Countries which attempt to defy the ruling risk United States sanctions which include a ban on fishing in US waters and an embargo on the export of fish products to American markets.

Aboriginal subsistence whaling will still be allowed in Greenland, the Soviet Union and Alaska — about 300 whales per year.



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JS Watson Conservation Trust Grant

This Trust invites applications from individuals or groups for financial assistance for conservation projects starting or current during 1988.

The criteria for assistance are:-

1. The conservation of the flora and fauna and natural features of New Zealand.
2. The advancement of knowledge in these matters by way of research, literary contribution, essay or articles, or other effort.
3. General education of the public to give them an understanding and a love of the earth on which they live.

A total of \$5000 is available for 1988, and at the sole discretion of the Trustees, this may be awarded in whole or part to one or more applicants, or held over for a subsequent year.

Further details and application forms available at PO Box 631, Wellington.

Applications close 30th September 1987.

Notice of a Special General Meeting

A Special General Meeting of the Royal Forest & Bird Protection Society will be held at Whakapapa Village, Tongariro National Park, on Sunday 22 November 1987, at 8.30 am at the request of the National Council.

The meeting will consider remits which were not considered at the Annual General Meeting because insufficient notice was given of the meeting. The remits are as follows:

1. Rule 16 (a) be altered to read as follows:
"A Special General Meeting of the Society may be called at any time by the Executive and shall be called upon the written request of the President or 50% of members of the Council or 5% of members of the Society. Such requests shall be sent to the Secretary and shall specify the resolutions to be moved at the meeting.
Notice of such Special General Meetings shall be advertised in the next issue of 'Forest & Bird' subsequent to the receipt of such request by the Secretary and shall take place within 30 days of the notice appearing in the Journal.
The same percentage shall apply to Special General Meetings of the Branches."
 2. Rule 6 (3) shall be added:
"The Register of Members of the Society shall not be made available to any other organisation."
- No other business will be considered.

New Subscription Rates

For three years the annual subscription has remained the same. Unfortunately, it has now become necessary to make an increase for 1988.

From this year's Annual Report you can see that our expenses have been carefully budgetted, allowing for tight control on all expenditure. However, even with a substantial increase in subscriptions we cannot make ends meet. Telephone and postage rates have skyrocketed, and Journal printing costs are up, however, this is partially compensated by increased earning from our mail order service.

Over the last three years the Society has developed very professional conservation staff and made major gains in protecting New Zealand's heritage in the Coastal zone, the South Island High Country, West Coast and North Island forests, in protecting wetlands and threatened wildlife. We must maintain that work and also need to respond to demands from our members for a Conservation Officer in the north and for increased conservation education work.

Your subscription is vital to the Society's funding. Remember that this magazine is the most tangible benefit of belonging to Forest and Bird, but it is only a small part of our activities. With your help we can employ 11 conservation staff working around the country.

Of course, members benefit in other ways - they can stay at lodges, buy exclusive products through the mail order service, join weekend trips and attend interesting natural history talks.

Look on your subscription with Forest and Bird as an investment in your children's and your grandchildren's future.

We count on your support.

Subscriptions

As from 1st July 1987 all new members will be joining for the 1988 year, and their subscriptions will continue until 31st December 1988.

The following rates will apply as from 1st July 1987:

Schools & Libraries	- \$17.00
Junior (under 17 or at school)	- \$17.00
Student (with ID proof)	- \$17.00
Ordinary	- \$33.00
Family (partners with or without children)	- \$33.00
Senior Citizen (over 60) (partners or single)	- \$25.00
Life (single only)	- \$450.00
Groups	- \$33.00 (Includes GST)

Tussock Grasslands - Landscape Values and Vulnerability

by Michael Ashdown and Dianne Lucas

A tawny tussock expanse of golden summer peaks, vast braided rivers, and emerald glacial lakes. High country landscapes have been celebrated by our painters, poets and photographers and are a key element in our efforts to safeguard conservation values over pastoral lease lands. This book published by the Environment Council is evidence of the concern for high country landscapes. It identifies their values, threats to them and ways to safeguard them. 100 pages, lavishly illustrated with landscape photos. Available through the RF & BPS Mail Order Service for \$10, inc postage and GST. See mail order catalogue for details.

PHOTOGRAPHS NEEDED

Transparencies of native birds are required for purchase by a publisher of New Zealand Calendars and Cards.

Send your submissions to:-

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PO Box 558, HASTINGS.
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Political Advertisements

The Labour and National Party advertisements inserted with this magazine are political promotions paid for at normal commercial rates. Their inclusion does not imply any endorsement of the policies contained therein.

Whanganui National Park Matemateaonga Walkway

A four day guided walk along the 42 km walkway of the Matemateaonga Range.

Our experienced guides will take time to show you the giant trees and point out the native birds seen and heard along the trail. We travel five hours per day and have two nights camping, the third night at Ramanui Lodge on the picturesque Whanganui River.

Tour price of \$320 + GST per person covers all mini-bus and jet boat travel, meals and guiding fees.

Further information and bookings write

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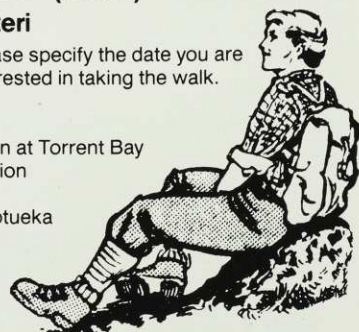
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For further details and colour brochure contact

John Wilson
Greentree Rd,
Motueka, RD3, Nelson

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



Ph 87-801 Motueka

SOCIETY'S LODGES AND HOUSES

Bushy Park Lodge

Kai Iwi, 24km north of Wanganui on sealed road.

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

Accommodation: for 15 in six bedrooms, single and double beds, electric blankets, heater and vanity units. Sleeps 24 with mattresses. Bedding, linen and towels supplied. Showers, drying cupboard, kitchen with electric stoves, refrigerator, deep freeze, cutlery and crockery. Bring own rations. Milk may be ordered.

Fees: (House Guests) Members \$20 single, \$25 double, Non-members \$25 single, \$30 double. Children 6-12 \$8. (Day Visitors) All adults \$2, children 5-15 \$1, Family \$3 or \$5. Closed to day visitors but not House Guests Mon & Tues except holiday periods.

Bookings and Information Leaflet: 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. \$4 per person per night. Bookings: Bill Minehan, Private Bag, Hokitika, Ph 734 Whata-roa.

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 refrigerator.

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

For rates send a stamped addressed envelope to the Booking Officer, June Norther, 212 Kennedy Road, Napier, Telephone Napier 438 193.

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 tramp, skiing, botanising and exploring.

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

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

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

No animals or pets are allowed in the lodge or the National Park.

There is no key at the lodge, but one will be posted ten days before occupancy. No member may occupy the lodge without first booking through Head Office, Wellington.

Tautuku Lodge, Coastal Otago

Tautuku Highway 92, South East Otago. Situated on the Royal Forest and Bird Protection Society's 550ha Lenz Reserve 32km south of Owaka. In a bush setting and with 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.

Turner Cottage, Stewart Island

Turner Cottage, is on Stewart Island and is a two-roomed dwelling furnished for three people.

For details write, enclosing a stamped, addressed envelope, to: "Turner Cottage", C/o Mrs N. Fife, P.O. Box 67, Halfmoon Bay, Stewart Island.

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, One-tangi, 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).



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Bookings to:- The Taumarunui Travel Centre P.O. Box 82, Taumarunui. Phone (0812) 7117

W. G. Oliver

R.D.6

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SI Dec 15 1987 : Jan 30 1988

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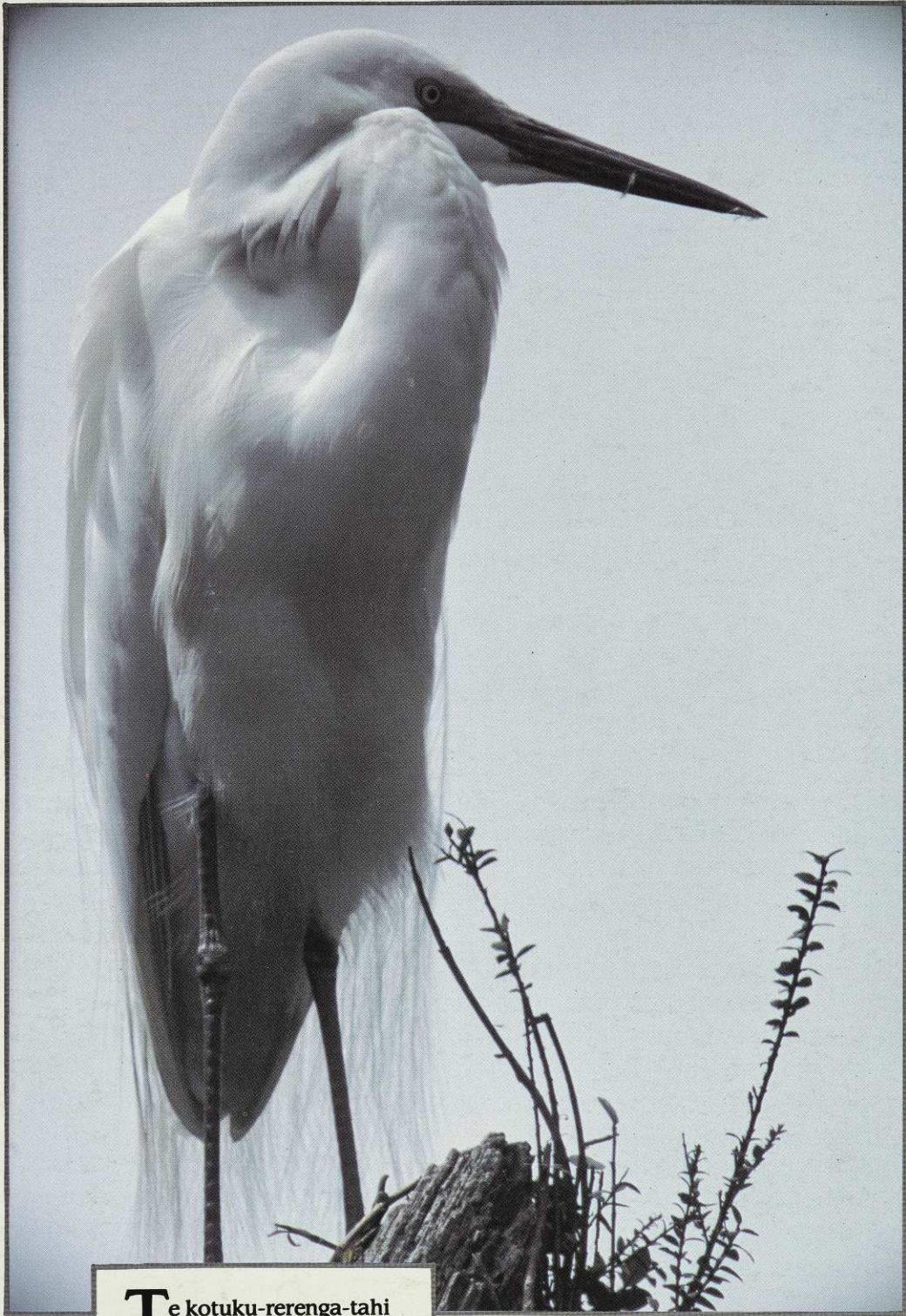
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Te kotuku-rerenga-tahi – “the rare white heron of a single flight.” In spring the white heron returns to Okarito, its only breeding area in New Zealand. This photograph is featured in the Society’s forthcoming South-West New Zealand World Heritage book.

Photo: P and J Morrin