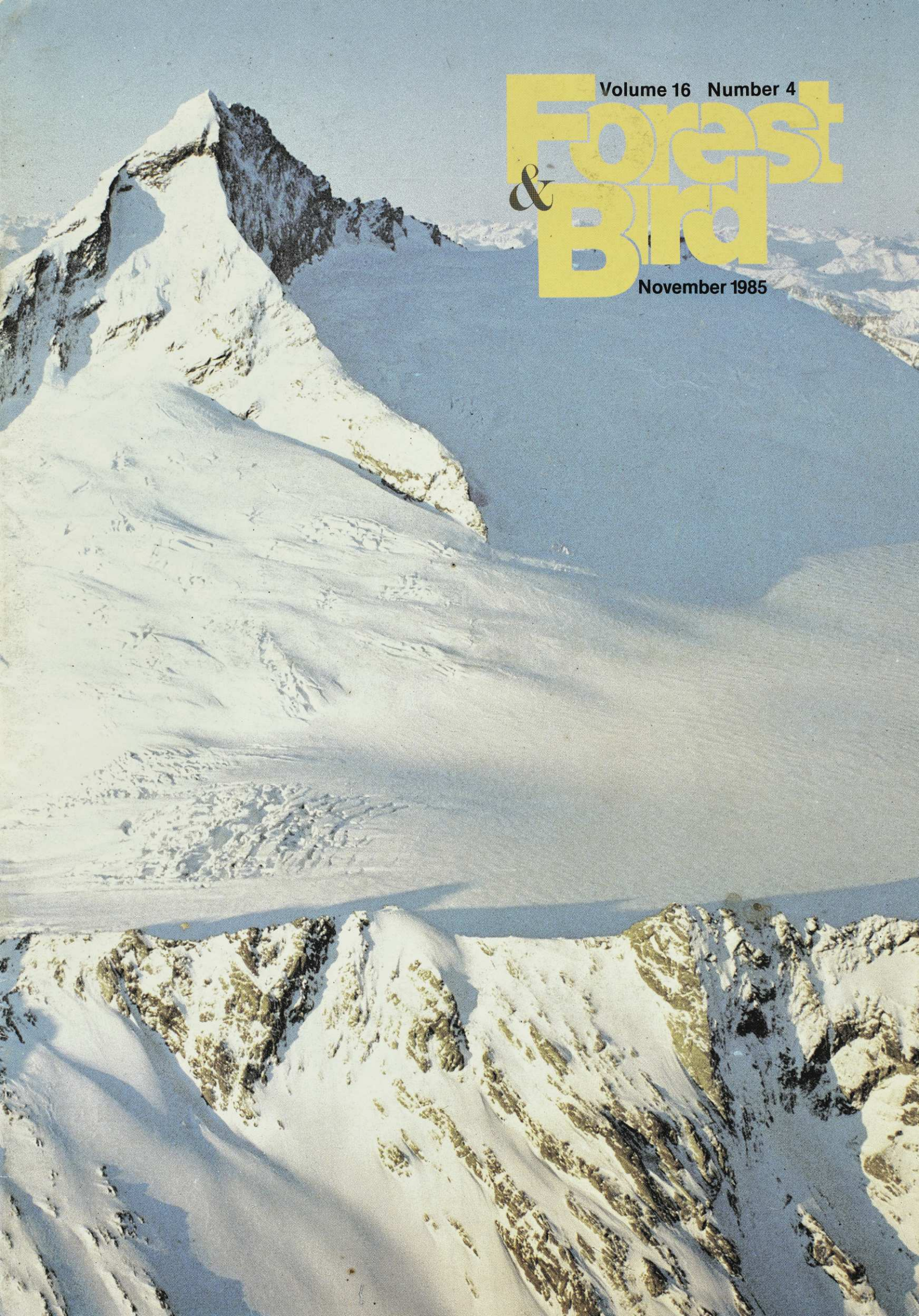

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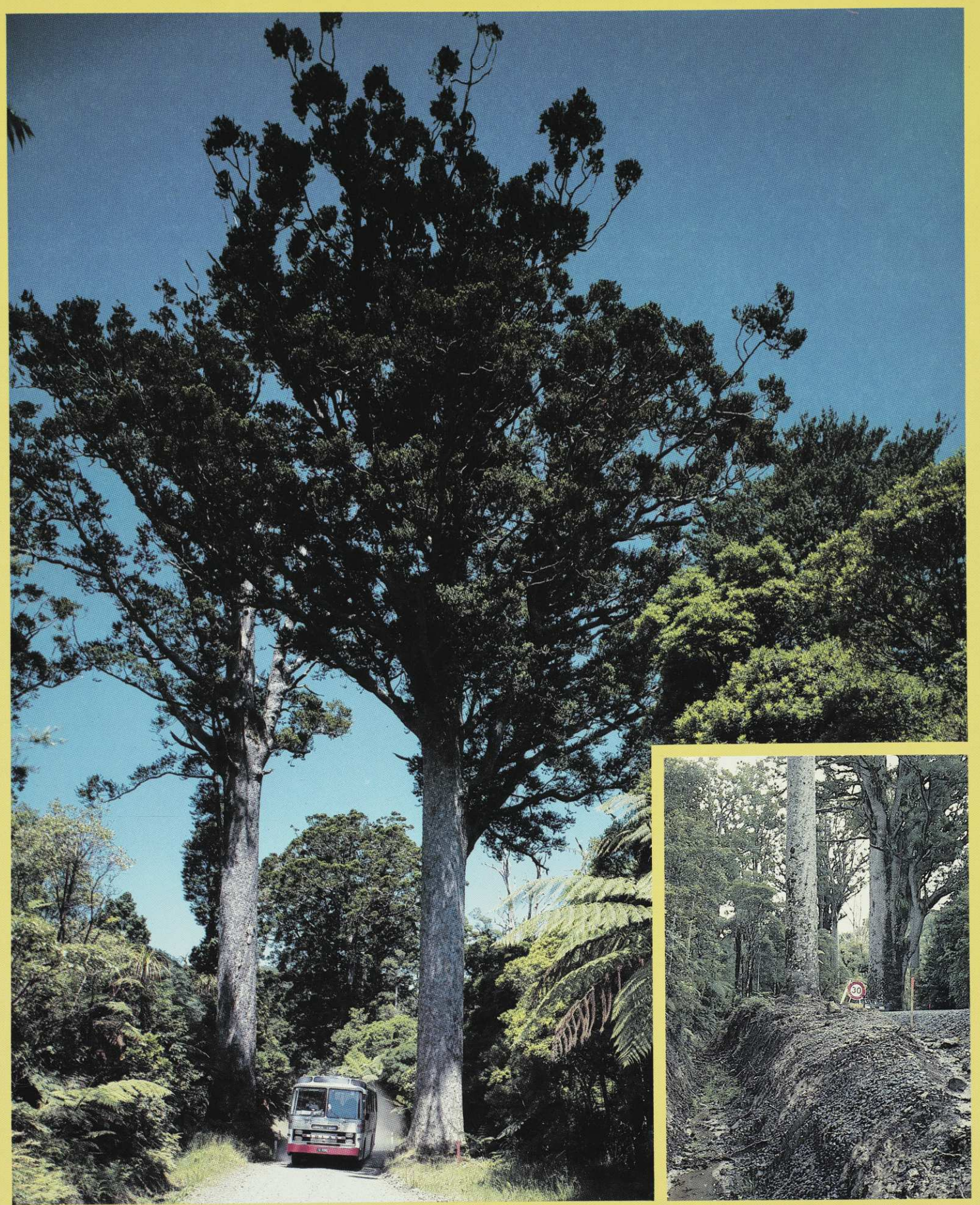

Photo: National Publicity Studios Inset photo: Terry Fitzgibbon

As this edition of Forest and Bird is going to press, the fate of a 15 km stretch of Waipoua Road running through New Zealand's most famous stand of ancient kauris still hangs in the balance. The Ministry of Works and Development has already cut a 5-km swathe of destruction through the Waipoua Forest Sanctuary, but protests from the Society about these "upgrading" efforts should force the ministry to be more sensitive. The upgrading was requested by the Northland Tourist Industry Board, which did not expect exotics to be planted on fill pushed into the forest, the famous Sir Joseph Ward kauri to be damaged or the roadside forest to be slashed back. The ministry's own Environmental Division condemned the work.

The photo shows two well known kauris which lie in the path of the "upgrading" — Darby and Joan — and the inset is a striking depiction of their eventual fate unless the ministry proceeds with more care. The nearest kauri has its roots cut by the culvert on the left, the other, the Sir Joseph Ward kauri, has its roots sealed over.

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Cover caption: The Society is pressing for the inclusion of Mt Aspiring National Park in an all-encompassing "South-west New Zealand World Heritage site." (article page 2). Here the beautiful symmetry of the mountain itself (3027 metres in height) is captured in a late March evening. The Bonar Glacier is in the foreground and Mt Cook can be seen in the far distance to the left of Mt Aspiring. Photo: Lloyd Homer

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Forest & Bird

Department of Conservation — An historic turning point

In 1937, the founder of Forest and Bird, Captain Val Sanderson, first advanced the notion of a separate "Department of Conservation" to look after all protection forests. Sanderson's pleas, however, fell on deaf ears, and it was not until the 1970s that the concept of such a department was taken up with vigour.

The Government's historic decision of September 16 to set up a Department of Conservation should signal the beginning of the end of more than a decade of uncertainty and conflict; for too long conservationists and developers have been at loggerheads over the best way to protect our public native forests and other natural areas. The Society congratulates the Government, and particularly the Minister for the Environment, Russell Marshall and his Parliamentary Under-secretary Phillip Woollaston, for making a decision which will not be universally popular, but which will prove to be a turning point in our relationship with our environment.

From now on, all the energy that has been expended on conflict can be channelled into protecting natural areas and running efficient commercial corporations. Both departmental staff and the public will welcome the new move — staff because they will now have a clear mandate for conservation, and the public because it will end the confusion over all the different natural lands managed by a range of Government agencies.

Lands in the new department will not be "locked up" but will be in demand for a whole host of uses — water and soil protection, outdoor recreation, tourism — and of course as a legacy for future generations.

Important too is the close link between our culture and our natural heritage which has been recognised, especially as it relates to Maori people whose interests will in part be looked after by the new department. The department will also have a key role in safeguarding New Zealand's cultural heritage through having the Historic Places Trust included in it.

But is the battle over? Obviously not, since major decisions still have to be made over which lands are to go into the new department. Presumably most state forests will be in the department, but what is to be the fate of Te Paki farm park in the Far North, the huge Molesworth Station or the kiwi-rich shrublands of the Waitere and Aotuhia land development blocks? There is also likely to be considerable future debate over the division of South Island high country pastoral lands into farming and protection areas. Many of these Crown lands are areas that Society members have fought hard to protect; it will be a bitter pill to swallow if they are placed in a commercial corporation.

Finally, the new Ministry for the Environment will find itself "toothless" unless it has a planning and control role. The Government has left open the possibility of change when the Town and Country Planning and the Water and Soil Protection Acts are overhauled. Meanwhile, the ministry remains the "Clayton's Ministry" that its critics have dubbed it.

Dr Alan Edmonds, President

WORLD HERITAGE

South-West New Zealand

by Gerard Hutching

The Rocky Mountains of North America, Australia's Great Barrier Reef, Mt Everest National Park and a total of about 170 of the premier natural areas of the world, have one thing in common: they all share World Heritage status, the highest form of international recognition that can be bestowed upon a natural or cultural area.

Now New Zealand has the opportunity to nominate any of its protected areas of global significance for inclusion on this prestigious register, having signed the UNESCO World Heritage Convention in early 1985.

International recognition for 1987

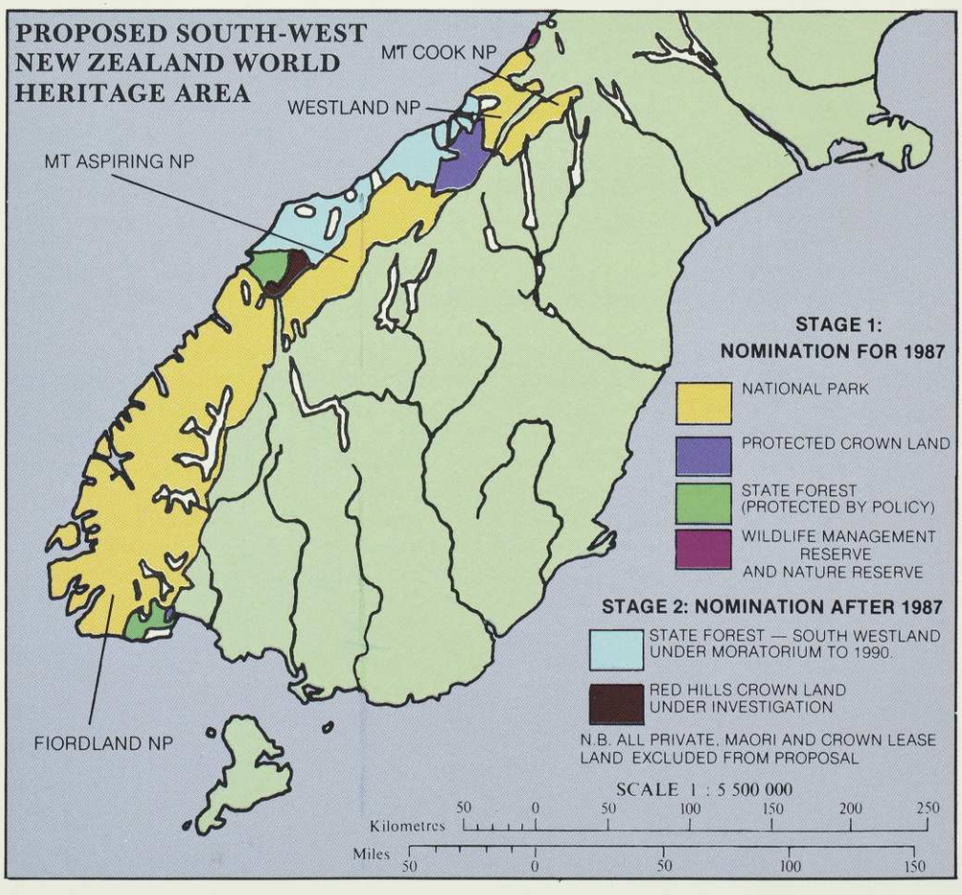
By 1987 — New Zealand's National Park Centennial Year — this country is almost certain to have at least one World Heritage site, and perhaps two of three. Deciding exactly what areas we should nominate is of critical importance, for conservationists and the tourist industry alike. World Heritage status greatly elevates an area's international profile, it underlines its conservation significance and gains for it what botanist Dr David Bellamy describes as the best advertisement an area can be given. It also adds the weight of international censure to any activity likely to damage the area's natural or scenic features.

So far, the National Parks and Reserves Authority has said three national parks should be nominated: Fiordland, Mt Cook and Westland.

However, the Authority has agreed to consider a larger, more exciting proposal advanced by conservation, recreation and tourism groups: a World Heritage site encompassing much of the south-west of New Zealand, from Okarito in the north to Waitutu in the south. The grand scale of this proposal befits the grandeur and majesty of this unbroken expanse of untouched forests, lofty mountains, scenic lakes, wild rivers and coastlines — in all a vast tract of temperate wilderness of world significance. Already the Otago National Parks and Reserves Board and many tourist operators have strongly supported the proposal.

World Heritage areas can cater for a wide range of activities, from intensive tourism to undeveloped wilderness such as the Landsborough Valley shown here.
Photo: Hugh Barr.

It is envisaged the proposal would include four existing national parks (Mt



Cook, Westland, Aspiring and Fiordland), the Okarito Lagoon and adjacent Waitangiroto Nature Reserve (breeding place of the white heron). It would also take in the Crown lands of the Hooker-Landsborough, Red Hills and Hump Ridge (Waitutu), protected state forests of southern South Westland, and the Olivine, Pyke and Waitutu State Forest of Southland. No private, Maori or leased Crown lands would be included.

The overwhelming bulk of this area is already set aside for protection. However, decisions on the future management of the South Westland state forests, which contain the nation's last extensive kahikatea forests, await Forest Service proposals due out next year. Logging may be promoted, but even so the predominant uses will assuredly be for tourism, recreation and nature conservation.

Nomination in two stages

The World Heritage proposal would proceed in two stages: the national parks and other protected areas first (to coincide with the 1987 Centennial). These would be joined later by South Westland state forest areas zoned for conservation after the expiry of the 1990 moratorium and the Red Hills Crown Lands. Significantly, the entire area need not become a national park. World Heritage status is conferred regardless of tenure. The only requirement is that there must be laws or policies providing for preservation of such areas.

The large Fiordland crested penguin nests along forested coastlines from Okarito in the north to Waitutu and Stewart Island.
Photo: Wildlife Service.

Once gazetted, the reputation of a World Heritage site on an international level soars. As the successful alliance between conservation and tourism has shown, the two interests need not clash, but in fact can be of mutual benefit.

The wonders of the south-west

South-west New Zealand is a region of superlatives, as generations of scientists, tourists and residents have testified. Few areas of the world have such a concentration of natural scenic splendour within a comparatively small space.

"Natural properties" must meet four main criteria for World Heritage Site listing: they must be outstanding examples of the major stages of the world's evolutionary history; outstanding examples of ongoing biological evolution, geological processes and man's interaction with the natural environment; contain rare and unique areas of exceptional natural beauty; and finally, be habitats where rare or endangered animals and plants survive.

On all four counts south-west New Zealand qualifies effortlessly as a World Heritage site.

Geological and biological evolution

South-west New Zealand contains the most extensive and spectacular natural lands remaining in New Zealand. When linked with southern South America and western Tasmania, the area provides a classic example of lands originating from the break up of the super-continent Gondwanaland, 60 million years ago.

- The area encompasses a substantial portion of the Alpine Fault, junction of the Indian and Pacific Continental Plates. It contains representative examples of all the sedimentary and metamorphic rocks of New Zealand found on either side of the Alpine Fault.
- New Zealand's mountain building epoch that commenced in the Late Pliocene era and continues to the present is dramatically illustrated within the proposal area which contains New Zealand's highest and most spectacular mountain ranges.
- The Waitutu forest contain a time sequence of 13 marine terraces that date from progressive uplift of the south coast of New Zealand.
- The whole south-west area provides the finest Australasian example of the Pleistocene glaciations that continue to the present day. It includes the extensively glaciated hard rock of Fiordland, most of New Zealand's remaining glaciers and a full range of glacial deposits. It also contains a wide range of post-glacial deposits; parallel sand dunes and the forested alluvial surfaces of southern South Westland.
- The examples of plant succession after glaciation found within the area are internationally recognised. This includes the full suite of soil surfaces from the most youthful post-glacial surfaces through mature forests to the old infertile soils supporting natural low shrubland vegetation.
- The southern South Westland beech-podocarp ecotone is the only complete unmodified example of this process of forest readjustment after glaciation in New Zealand. As such this ecotone is internationally recognised. The ecotone near Greymouth at the northern end of the beech "gap" has been severely modified by forest clearance.
- The area contains the finest and only complete altitudinal zonation encompassing virtually the full range of forest communities of southern New Zealand — from kahikatea swamp forest to bushline [elsewhere in New Zealand the kahikatea and alluvial forest components of this sequence have been cleared].
- The area contains the most extensive remaining natural freshwater wetlands and estuarine systems in New Zealand. Of particular note is the Okarito lagoon-Waitangiroto complex, Meyer, Kini, Mataketake and Hermitage Swamps.
- The area contains the most extensive lowland native forests remaining in New Zealand. Of particular note are the extensive areas of kahikatea forest in southern South Westland, the beech/podocarp forests of this region and of Hollyford/Waitutu and red beech forests of the Dart Valley.

Exceptional natural beauty

From Okarito to Waitutu, one can gain scenic vistas of unsurpassed beauty, taking in sea, forest and mountain.

The Mt Cook/Westland region includes the country's highest peaks and largest glaciers. Lower but no less spectacular mountains and wide beech forested valleys are found in the Landsborough/Aspiring area. The ultramafic (high in levels of magnesium and iron containing minerals) rocks of the Red Hills and the ultramafic moraine of the Cascade plateau are a unique feature.

Further south the massive crags of Fiordland, split by vast glaciated fiords, make an outstanding scenic feature, contrasting with the lowland landscape and coastline of Waitutu.

Rare plants and animals

South-west New Zealand is largely the only home of these birds: the Okarito brown kiwi, South Island brown kiwi, takahe, Fiordland crested penguin and yellowhead.

Outstanding populations of other birds whose habitats have been elsewhere dramatically reduced also occur here: kaka, kakariki, blue duck, southern crested grebe.

Many unique, distinctive and nationally important plants and plant associations occur in the region. In the whole of New Zealand, dense kahikatea stands have been reduced to 2 percent of their former extent — the coastal lowlands of southern South Westland are the tree's last stronghold.

Natural dunelands are a "forgotten habitat" well represented in the area. These are dominated by the vulnerable plant pingao.

The Poison Bay-Transit area of Fiordland contains some of the last native forest on mainland New Zealand virtually unaffected by possums and deer.

Major benefits for tourism

The larger World Heritage area would spread the tourism benefits over the whole of the south-west region, rather than just funnel tourists to the "hot spots" of Mt Cook and Milford. Tourism promotion could be co-ordinated, and divisive parochialism about attractions would have to stand aside.

Dave Osmers, tourist operators from Makorora — near the Haast Pass and next to Mt Aspiring National Park — sees the proposal as an exciting one. "The bottom line is that World Heritage status means more tourist dollars. It would be tragic if Otago and South Westland missed out on this great idea," Dave says.

Towns like Haast and Wanaka which lie between the Fiordland and Mt Cook/Westland proposals and are surrounded by land of comparable beauty and ecological importance stand to gain a lot from the larger proposal.

Moreover, it would be folly for New Zealand to nominate two separate World Heritage areas in the south-west which exclude a number of unique natural features and ecosystems found in the area. These include the world's only extensive kahikatea swamp forests; the beech-podocarp forest boundary of South Westland which dates from the time when great glaciers obliterated forests, throughout the region; outstanding wetlands near Haast and the unusual ultramafic rock landforms and vegetation of the Red Hills and the Cascade Plateau.

By nominating a south-west Heritage area, New Zealand would be achieving a notable milestone in international conservation — what better way to celebrate our National Park Centennial year?

***Celmisia markii*, a recently named needle-leaved species that forms loose cushions up to 1 metre across in the low alpine zone of South Westland-Fiordland. First collected by Dr A. F. Mark in his vegetation survey of Mt Aspiring National Park, it is restricted to the coastal ranges of the Park, apart from two records in Fiordland near Cascade River and above Caswell Sound.**

Photo: A. F. Mark

Some places have special importance for people. They have inspired us by their beauty; given us insights into the history of life on our planet; taught us about the functions of natural ecosystems; informed us about the evolution of our own species and culture; enthralled us with wildlife spectacles; saved species of outstanding universal value; and provided us with examples of how man can live in harmonious balance with his environment. Many such places are so valuable that they form part of the heritage of all mankind.

Jeffrey McNeely
International Union for Conservation of Nature and Natural Resources

Only 2 percent of New Zealand's dense kahikatea remain, spread across the South Westland coastal plain. The forests are under management moratorium until 1990, but would be a vital part of the World Heritage area. — Heretaniwha Point and Ohinemaka State Forest.

Photo: Quentin Christie, Soil Bureau

This Dusky Sound rata is likely to be the tree to which Captain Cook moored the *Resolution* on March 27, 1773, staying until April 28. The cultural significance of south-west New Zealand is highlighted by the fact that the first pakeha boat and house were built in Dusky Sound.

Photo: A. F. Mark

CONSERVATION UPDATE

Environment management shakeup — but conservation work must continue

The restructuring of environmental management announced by Government in mid-September concludes years of review and reorganisation of Government agencies with nature conservation roles. Implementation of the Government decision will take until 1 April 1986 and probably even longer. Meanwhile the important and valuable conservation work undertaken by staff in the Wildlife Service, National Parks and Reserves and Environmental Forestry must continue.

Our Society and our members acknowledge and appreciate the tremendous efforts made by those staff. We will participate with many of the public in the excellent holiday programmes which will be organised again this summer in our National and Forest Parks and Reserves. Environmental Forestry staff will continue their vital vegetation and introduced animal survey work to monitor and control damage to native forests by deer, possums and goats. Wildlife Service staff plan this summer to complete the first ever fauna survey of the whole of New Zealand and continue efforts to rescue many of our endangered species from the brink of extinction.

Earlier this year 1100 environmental staff within these three departments united to press for the establishment of a Conservation Department. Wildlife Service Director, Ralph Adams, spoke for many of these environmental staff in welcoming the Government decision.

"It's a constructive move towards caring for the natural resources of New Zealand ... and a real opportunity for the Wildlife Service to now work closely with those other organisations that will be coming together. It will lead to a far more cohesive approach, particularly in habitat protection."

Representative reserve programme in trouble

The Government's 1984 environment policies promised that in implementing a strategy to integrate conservation and development it would ensure that "our remaining endangered species and ecosystems and representative examples of our full range of plants, animals and landscapes are protected".

Unfortunately the Protected Natural Area (PNA) programme fundamental to that policy is in danger of imminent collapse for lack of adequate funding and staffing. For the last two years PNA teams have surveyed Central Otago, the Mackenzie Basin and parts of Northland and East Cape. The work has been largely funded through Labour Department job schemes which recently ceased. Lands and Survey which administers the PNA programme has been so far unable to obtain long term funding to cover the whole country for PNA (estimated at around $7 million over the next 10 years). The fact that $10 million can be found by Lands and Survey for uneconomic farm development in the shrublands of Aotuhia in eastern Taranaki for the third time in 80 years (see *Forest and Bird* August 1985), suggests a review of spending priorities is long overdue.

Our Society executive recently urged Government to give money to the PNA programme, and to ensure that their recommended reserves are designated — especially where this can easily be done on public lands. The new Conservation Department should have the establishment of representative reserves through the PNA programme as one of its central functions, since chances to preserve examples of our diverse natural landscape are rapidly disappearing.

Our Society plans to increase public awareness by running a series of one day seminars throughout the country. These will highlight what's left of our nature heritage in each area and focus on the diversity of wetlands, dunelands, shrublands and, of course, native forest that remain.

Aorangi Forest — test case for nga whenua rahui

Aorangi ... "cloud piercer". Not the monarch of the Southern Alps but a spectacular flat topped 1200 metre peak 30 kilometres east of Taihape. The surrounding 4751 hectares of native forest and volcanic plateau cedar, toa toa and red tussock forms one of the nation's most important privately owned natural areas. It adjoins the Ruahine Forest Park and for years has been sought for protection by the Forest Service. Aorangi is a meeting place: native forest meets red tussock, sedimentary rocks grade into volcanic ash, predominantly South Island alpine plants grade into northern species and the area is rich in Maori spiritual tradition and values.

Until now Aorangi has been secure from development because of its inaccessibility, but Maori owners are seeking approval to helicopter log the block to at last obtain revenue from it. There is widespread public support throughout the Taihape-Rangitikei region for the block to be preserved. Local people are working with Aorangi Maori owners to explore alternatives to logging. Most favoured is the Nga Whenua Rahui (land preservation) scheme promoted by Northland Maori people and endorsed recently by Maori Affairs Minister Koro Wetere. The scheme envisages a partnership in conservation through a protective lease arrangement involving a financial commitment by the Crown.

"Each case will have to be considered on its own merits", said Mr Wetere recently. In the largely deforested southern North Island protection for a valuable block like Aorangi must rank of outstanding merit.

Waitemata Harbour Maritime Park

New Zealand's first maritime plan published in August is a good example of the dilemma we face in coastal planning. The Waitemata Harbour Planning Authority is the Auckland Harbour Board, the major developer on the harbour.

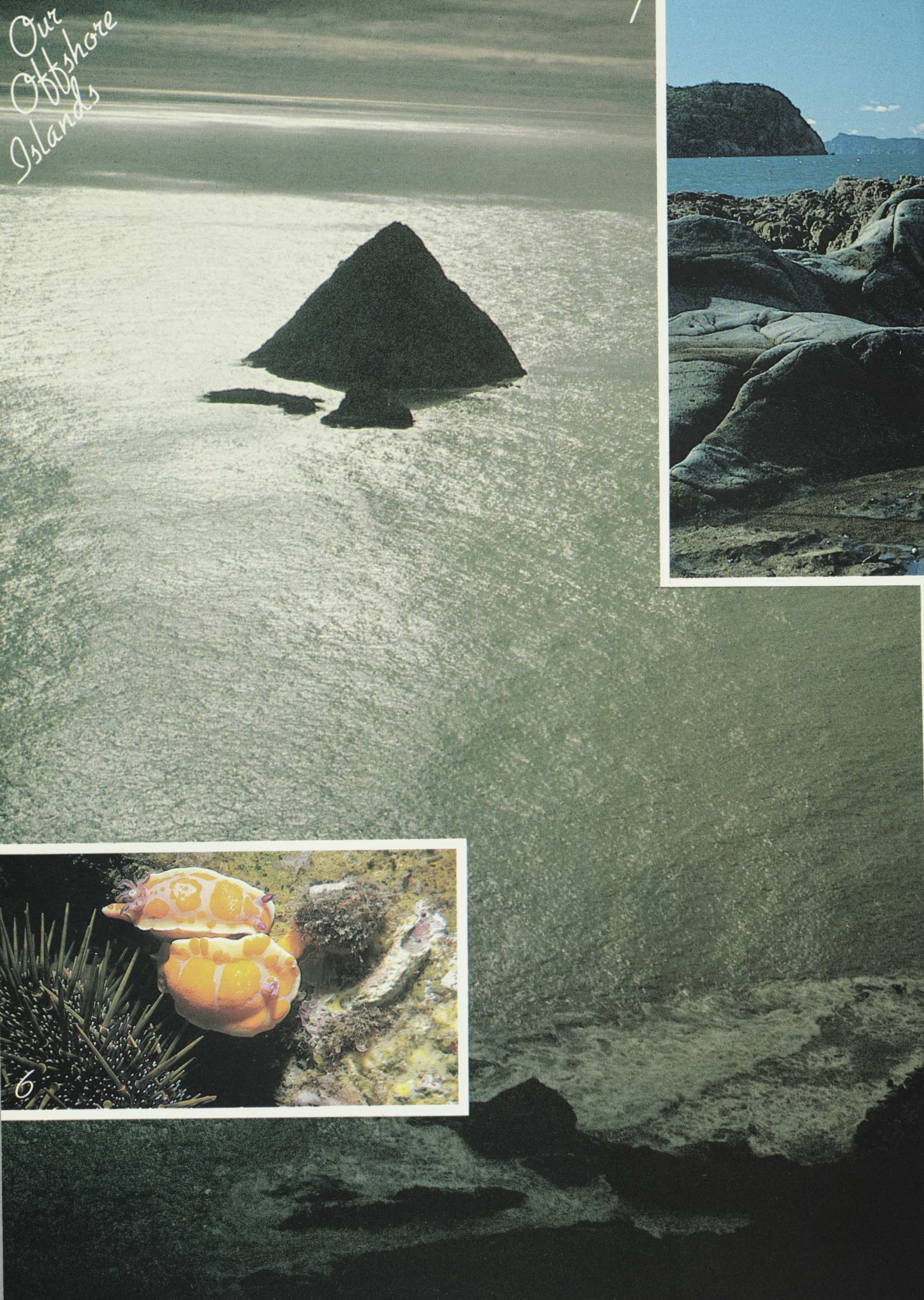
Because of this the plan shows a strong bias towards development:

- Pollen Island wetlands are zoned for port development. This saltmarsh island and mangrove system is the highest value natural area on the harbour. It has the only fernbird population on the harbour.
- Many of the numerous Harbour Board reclamation approvals need to be revoked. Some of these old reclamation approvals are in conservation and recreation zones, where no reclaiming should now be contemplated.
- Over 60 percent of the harbour has not been zoned. Imagine a County Council forgetting to zone 60 percent of rural land!

Gerry McSweeney Conservation Director

Bush clearance for the Southland chipmill — Progress Valley south-east Otago. The Catlins coastline contains the last extensive native forests on the South Island's east coast. Much is in private or Maori ownership. Within these forests breed yellow-eyed penguin — the world's rarest penguin — in trouble because of bush clearance, stock intrusion and predators. Forest and Bird is encouraging farmers to maintain coastal forest and penguin habitat in the Catlins, and the latest news is that Maori owners have agreed to lease 2885 ha of their land to Lands and Survey until 1988. A long term lease after this may follow. The Society's 16–17 November Council meeting will be held at our Tautuku Lodge just north of here and will focus on forest and coastline conservation.

Photo: Chris Ward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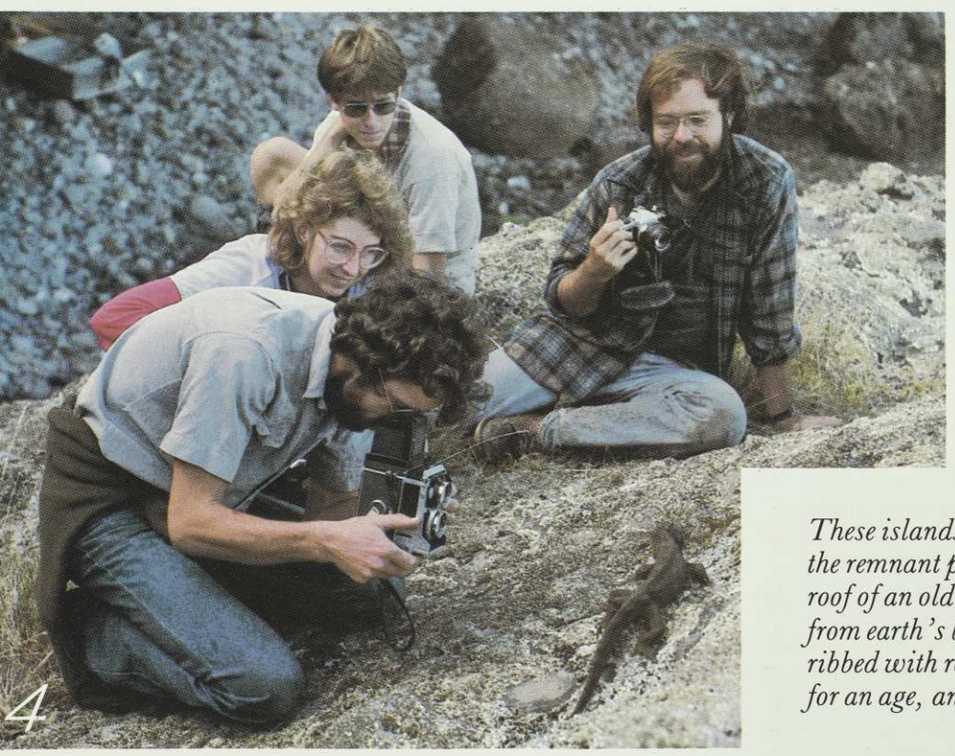


These islands;
the remnant peaks of a lost continent,
roof of an old world, molten droppings
from earth's bowels, gone cold;
ribbed with rock, resisting the sea's corrosion
for an age, and an age to come.

from *Album*, by **A. R. D. Fairburn** (1904–57)

New Zealanders are an island people; descended from islanders, living on islands, and, if they frequent coastal population centres, always aware of islands: Rangitoto, Motiti, the Sugarloafs, Kapiti, Green Island, Stewart Island. The island constellations surrounding the mainland amount to an astonishing 634 offshore and 30 outlying. Many of these are the final refuges of our endangered plants and wildlife whose importance cannot be too highly stressed. The articles in the following pages describe the threats to and wonders of our island havens, reminding us that "the price of freedom is eternal vigilance."

1. Moturoa Island, New Plymouth. Photo: Taranaki Catchment Commission; 2. Hen and Chickens (Taranga), near Whangarei. Photo: Terry Fitzgibbon; 3. Shy Mollymawks, Disappointment Island. Photo: Rod Russ; 4. Taranga Island. Photo: Dick Anderson; 5. Female Hooker sea lion, Auckland Island. Photo: Fred Bruemmer; 6. Orange spotted nudibranch molluscs adjacent to a sea egg, Sugarloafs, New Plymouth. Photo: Lesley Bolton.

RATS

ecological anarchists

"And the muttering grew to a grumbling;
And the grumbling grew to a mighty rumbling;
And out of the house the rats came tumbling.
Great rats, small rats, lean rats, brawny rats,
Brown rats, black rats, gray rats, tawny rats,
Grave old plodders, gay young friskers,
Fathers, mothers, uncles, cousins,
Cocking tails and pricking whiskers,
Families by tens and dozens,
Brothers, sisters, husbands, wives —
Followed the Piper for their lives."

The Pied Piper of Hamelin
Robert Browning

by David Gregorie, Tourist and Publicity Department journalist, working with Lands and Survey Department.

Rats are the weeds of the animal world — opportunistic species that will take advantage of any change made in the natural order of things by a natural disaster, or of the many radical alterations in the world ecology made by human beings.

They are the camp-followers of the human race, living on our rubbish, surreptitiously sharing our homes, spreading disease, and waxing prosperous on our precious stores of food.

They are tough, adaptable, intelligent and prolific.

Where rats are endemic, such as on the Eurasian land mass, they are kept partly in check by predators, but more importantly by fierce competition for the available food. In densely populated areas like China, India, and Europe, they take advantage of the enormous increase in available food — chiefly stores of food grains and edible rubbish produced by cities.

Ecological chaos

Rats are capable of creating ecological chaos, especially when they invade territories such as islands which have hitherto been rat-free.

The oft-quoted example of the 1964 rat irruption on Big South Cape Island — off the south coast of Stewart Island — shows the catastrophic effect rats can have on wildlife.

When Brian Bell of the Wildlife Service arrived on the island for a survey in 1964, he found no saddleback, wren, fernbird, robin or snipe, and there were few bellbird or parakeet.

Birds were not the only sufferers. The Stewart Island short-tailed bat is apparently extinct and the once-abundant insect life has been all but eliminated. Plants were seriously damaged too, especially *Pseudopanax* species and the punui (*Stilbocarpa lyallii*), but these have recovered somewhat since the ship rat population has declined to a lower level.

The tragedy of Big South Cape Island could have been prevented if boat owners had been more aware of the importance of keeping their boats rat-free, or of the dangers of mooring their boats with shore lines to rat-free islands.

New rat infestations of offshore islands have happened too recently for us to be complacent about them — Lord Howe Island (1918-ship rats); Raoul Island (1921 — Norway rats); Big South Cape (1962 — ship rats); Somes Island in Wellington Harbour (1968 — ship rats); Lizard Island, near Great Barrier Island (1977 — kiore).

Many people take the attitude that since there are rats already on about 80 percent of the world's oceanic island, it is only a matter of time before they reach them all. But New Zealand's experience suggests that with proper precautions and an aware population, it need not happen.

Suggested precautions include allowing no wharves or shoreline mooring points, on rodent-free islands. Boats should moor at least 300 metres offshore, stores and equipment should be packed in rodent-proof containers and poison bait used on boats.

On the mainland, rats must be deterred from boarding boats. They are known to get on to boats moored near the shore at night. Apparently, most leave by the morning or earlier if disturbed, but there is no guarantee that all will go, and a few might remain if the boat leaves its anchorage before daylight.

Unfortunately, it seems that except on the smallest of islands, once rats have become established, they are there for keeps. The DSIR, Lands and Survey and the Wildlife Service have experimented with various rodent control methods to see if there is any feasible way of exterminating rats that have become established, but the answer has been far from encouraging.

In this case, prevention is the only cure. People who use boats and visit offshore islands will have to be made to realise the responsibility they face in keeping islands rat-free.

Aggressive and omnivorous

New Zealand does not have the huge populations of the longer-inhabited countries, but we do have a natural environment that is extremely vulnerable to an aggressive, omnivorous animal — the rat.

Rats' main food is invertebrates, particularly insects, and seeds and fruits. They will eat small birds, nestlings and eggs, lizards, and the growing shoots of some plants. Our native animals are particularly vulnerable because they have evolved in an environment without mammalian predators and because they are not generally very prolific. Newly-arrived rats found themselves presented with a food bonanza without any effective predators to keep their numbers down.

Mice are not a direct threat to our bird life but they do compete with them and with the larger invertebrates for food so we must do our utmost to stop their spread.

There are three species of rat found in New Zealand — the kiore or Polynesian rat (*Rattus exulans*), the ship or black rat (*R. rattus*), and the Norway or brown rat (*R. norvegicus*) — and one species of mouse, the house mouse (*Mus musculus*). All were brought to New Zealand by human settlers or arrived as stowaways in their canoes or ships.

The kiore is believed to have spread into the Pacific from South-East Asia with the first human settlers more than 3000 years ago, island-hopping with the Polynesian people and eventually reaching New Zealand with the Maori people about 1000 years ago.

The ship rat was the common rat in European ports and cities until about the beginning of the 18th century. It began its spread around the world with the voyages of Christopher Colombus in 1492. Most of the ships leaving Europe

on voyages of trade or discovery during the next 200 years were infested with ship rats and these were able to establish themselves easily on any islands free of ship rats.

Early in the 18th century the Norway rat spread from Eastern Europe into Western Europe where it largely displaced the ship rat in the cities and ports. It too began to spread around the world as an uninvited passenger on the sealers, whalers, traders and immigrant ships bound for the newly-discovered lands.

The Norway rat is the largest of the three species, with adult weights of 350–450g. It excavates and nests in burrows far more frequently than the other two species, but appears to climb trees less readily. Birds nesting on the ground are more likely to be preyed upon than tree nesting birds. Twenty seven of more than 50 bird species known to be eaten by the rat are seabirds.

The ship rat usually weighs 100–180g. It is an excellent climber and commonly nests in trees. Twenty five of some 40 recorded prey species are perching birds.

Attacks adult albatrosses

The kiore is the smallest of the three rat species, seldom exceeding 130g in weight. It commonly nests in vegetation on or near the ground or in short burrows. Although it preys on fewer bird species, it will sometimes tackle larger birds than the other two rats. On some Pacific islands, for example, it has been known to attack adult and nesting albatrosses and frigate birds.

The effect of kiore on the bird life of early New Zealand is not known with any degree of certainty, since the major impact was prehistoric and many of the birds that could have been affected are now extinct. However, a great deal can be inferred from the present distribution of small birds, lizards and invertebrates and from comparison between rat-free and rat-infested offshore islands.

The disappearance or reduced numbers of small perching birds during the Polynesian period is unlikely to have been caused by either hunting or habitat destruction. Any small birds nesting near the ground may have been vulnerable to the kiore and larger birds may also have been at risk at the nestling stage.

Ian Atkinson, of the DSIR Botany Division, pointed out in a paper for Symposium on the Ecology and Control of Rodents in New Zealand Nature Reserves, that the difference between kiore-free and kiore-inhabited islands was most marked. The abundance of certain plants, diving petrels, tuataras, lizards and some invertebrates on those islands without kiore contrasted with their absence or very low numbers on kiore-inhabited islands.

He and other investigators have pointed out that many of the smaller petrels and all sub-species of the New Zealand snipe are restricted to rat-free islands. It is now known that the snipe did occur on the mainland as well as the offshore island before the arrival of the kiore.

Some rat invasions of oceanic or offshore islands in modern times are well documented. In 1918 ship rats came ashore on Lord Howe Island from a wrecked steamship and within a few years five species of endemic forest birds had become extinct.

Climbers and swimmers

Ship rats are easily the most widespread rat species in New Zealand. They are abundant on both main islands, on Stewart Island, Chathams, Great Barrier, Arapawa, Big South Cape, Motuwhakakewa (western Coromandel), and Solomon. As their name implies, they are thoroughly at home on ships and boats and it takes only momentary inattention on the part of boat-owners and cargo shippers for them to slip on board from any of the ports in New Zealand and then to travel round with the boat, ready to trigger an ecological catastrophe.

They do not need a wharf or jetty to get ashore, although this would obviously help, but are quite adept at climbing along mooring lines or even swimming moderate distances to the shore.

The Norway rat, once widespread in New Zealand, now has a very patchy distribution on the mainland, being confined to pockets of infestation usually associated with human occupation. Offshore it is found only on Stewart Island, Raoul, Campbell, Kapiti, Mayor, main Chatham Island and Breaksea and some smaller islands.

R. H. Taylor, of the Ecology Division of the DSIR, believes that the introduction of stoats to the North and South Islands in the 1880s is the main reason for the decline in Norway rat numbers and quotes adjacent islands in the Fiordland National Park to make his point. Both islands were inhabited by Norway rats until about 1900, when stoats were released on Resolution Island but not on nearby Breaksea. There are now no Norway rats on Resolution Island but they are plentiful on Breaksea.

Kiore are also no longer common, being confined to the south-west part of the South Island, Stewart Island, Cook Strait and about half of the offshore islands in the Northland-Hauraki Gulf-Coromandel region. They are present on Raoul and Macauley Islands in the Kermadec group but seem to be extinct on Chatham Island.

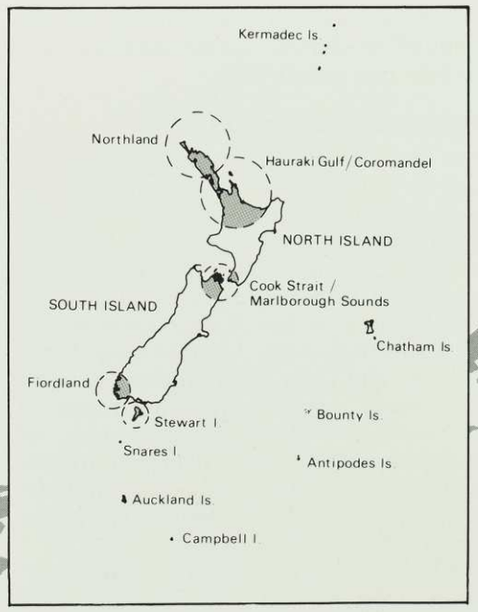


Figure 1. Most of New Zealand's offshore islands are found in the encircled areas

Taylor believes that competition from the house mouse has led to the gradual disappearance of the kiore from the mainland and other inhabited areas. He points out that kiore exist alongside ship rats and Norway rats on Stewart Island, where mice have not become established.

Many of the northern islands where kiore occur were inhabited or visited by Maoris in pre-European times and the rats may have been taken for food or have arrived by accident. Atkinson points out that islands with precipitous shores, like the Three Kings and the Poor Knights, are free of kiore in spite of being inhabited by Maoris.

Island treasure houses

Forty nine of 196 northern islands are rodent-free. This includes only a few of the larger islands, such as Great Island (Three Kings), Tawhiti Rahi and Aorangi (Poor Knights), and Moturoa Island (Mahurangi Heads). Kiore is the most widespread, occurring on at least 33 islands, while the more recently introduced Norway rat, ship rat or the house mouse occur on some others.

The rats have had a marked effect on island faunas, eating lizards, land snails, annelid worms, spiders, centipedes and a large variety of insects. They are also believed to have eliminated or reduced the smaller species of petrels and terns and are probably responsible for the extinction of smaller ground nesting or perching birds in prehistoric times.

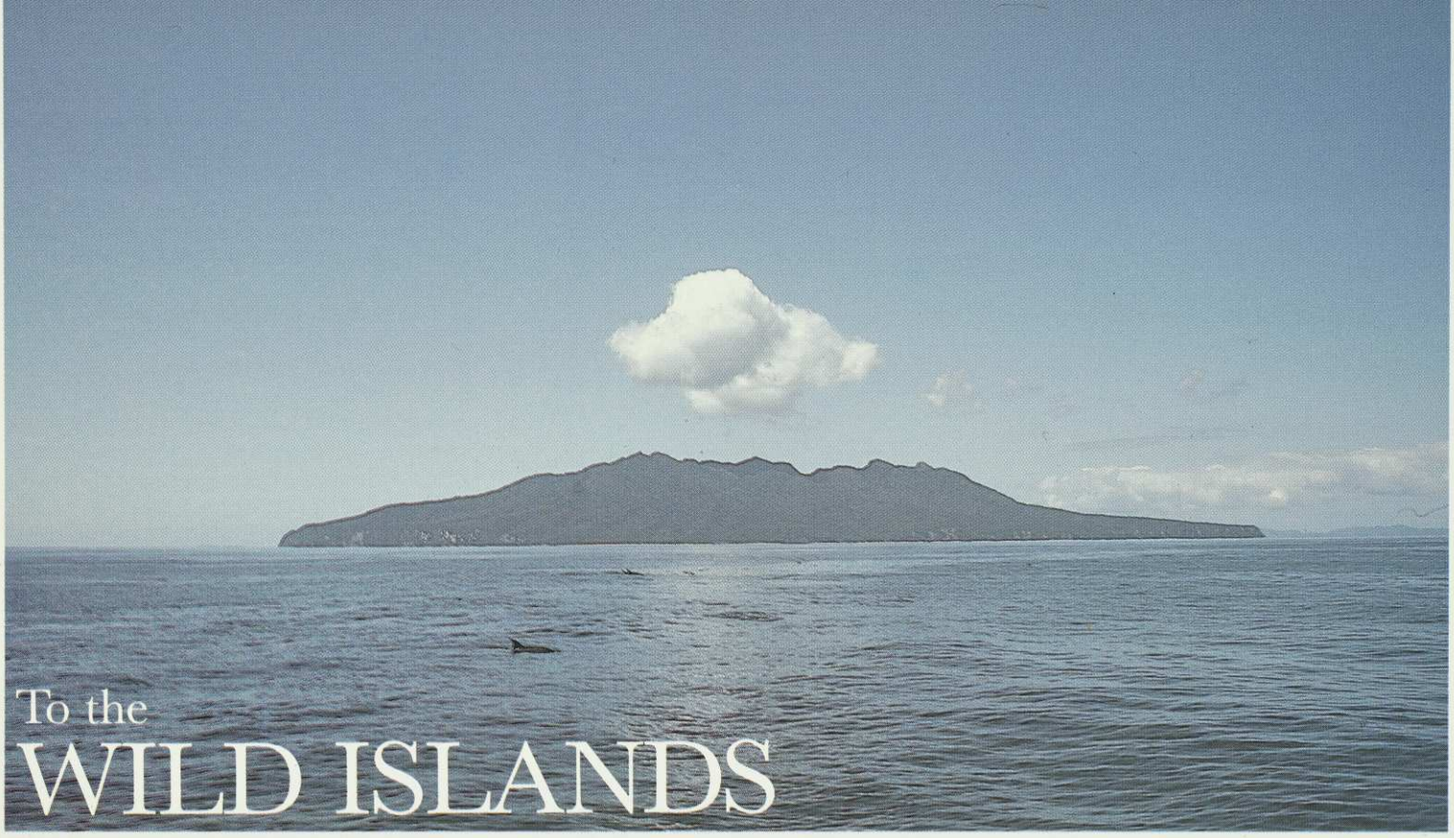
The distribution of lizards appears to be a reflection of island extinctions caused by rats, particularly kiore. For example, Lizard Island (Mokohinau group) had five species of lizard in abundance before the accidental arrival of kiore in 1977 but only three species remain today in very low numbers.

Some very small rat-free islands support five or more species of lizard, for example, seven species on Motuharakeke (Cavalli group), six species on Pupuha (Chicken Group). Both these islands are only one hectare in area.

The tuatara is numerous only on rat-free islands.

There can be no doubt human beings are the primary agency for distributing rats and mice — the kiore came to New Zealand with the Maoris and was spread by them to the offshore islands. The other rodent species came with European settlers and it is our careless habits which allow their spread to continue.

With rats, prevention is the only cure. People who use boats, whether for pleasure or business, have the future of our offshore nature reserves in their hands. Only by their awareness and co-operation can we ensure that these natural treasure houses remain inviolate.



To the WILD ISLANDS

exploring the Hauraki Gulf and beyond

by Gordon Ell

There is an island in the Hauraki Gulf where you climb through moss forests and the haunt of kakapo to emerge on a mountain peak which looks down on Auckland. Admittedly the glinting towers of "downtown" are 50 km away, but their existence still looks bizarre from the top of the island where time is standing still. The view from Little Barrier Island south to the petrochemical haze of Auckland encompasses all the centuries of New Zealand history, for the island is one of the few places left where the fortunate may glimpse the primeval past.

Little Barrier Island, on the outer edge of the Hauraki Gulf, is perhaps the best known to naturalists of New Zealand as the last hope of our endangered birds. Yet it is only one of at least 100 islands and islets with names which scatter the chart, from Auckland north to Whangarei and beyond the Coromandel. These are the islands which form the familiar horizon of Aucklanders, but they remain unknown to most people. They are simply too hard to get to, or remain absolutely protected places in the interest of conservation. Yet there are fortunately some, where, at a little inconvenience, the enthusiast can find a landing and see some of the rare wildlife at first hand.

Adventure and discovery

The surprising thing about the Hauraki Gulf, and the islands which spill from its mouth, is the variety. There is adventure and discovery enough for a lifetime of weekend exploration. The islands range from a volcano perhaps 800 years old (Rangitoto) to the cattle-mown pastures of adjacent Motutapu Island. There are settled places with attendant ribbons of houses and baches, like the hillcrests of Waiheke, and there are raw rocks, jagged molars against the storms, where gannets and shags breed. There are friendly little groups of islands, not much more than hummocks scattered at the feet of the Coromandel Ranges and there is the rugged bulk of Great Barrier and Great Mercury (round in the Bay of Plenty).

One of the reasons for this plethora of islands is the reshaping of the earth after the ice age. Once the rivers of Auckland isthmus wound out towards the coromandel Ranges, in valleys like the Matakana, the Mahurangi, Tamaki and Waitemata. Now the rivers still run but into shallow bays, their olden valleys flooded by the end of the last ice age. Since then the intruding sea has cut the ends off headlands and eroded the shores of hills into island cliffs.

Spectacular forests

On the islands there are often dense forests of coastal trees. Groves of pohutukawa stain the cliffs crimson in high summer. Inland, beneath the protecting canopy of taraire, puriri and pohutukawa there are gullies of nikau, an understorey of kawakawa, large-leaved whau and coprosma. On places like Little Barrier and Lady Alice, former forestry and farm respectively, the forest is recovering under the protection of manuka and kanuka. Still mercifully safe from grazing and browsing animals, these islands have botanical riches vanished elsewhere.

On Lady Alice the large-leaved puka is spectacular, its giant leaves more than half a metre long, spreading away from a tender growing shoot that would elsewhere be the food of possums. On Little Barrier it is the sheer density of new growth which contrasts with the browsed interior of mainland forests. It is impossible to step off the track without crushing some delicate young plant. Both these islands are rich in the epiphytic plants which are so often eaten out, even in our national parks. Yet both are distinctly different.

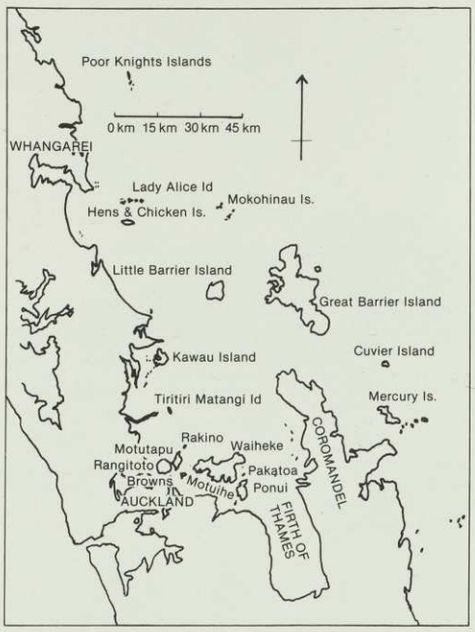
Lady Alice is a low island, not much more than 100 metres, a place where thousands of shearwater breed in season. Little Barrier Island, named for its function as a protection to the gulf, is a microcosm of a mainland mountain. Called Hauturu in Maori, its name translates as "the resting post of the wind". In its 800 metres of steep gully and ridge it carries the clothing of a natural transect of New Zealand's northern bush; from coastal scrub and kauri, up through the podocarps and beeches, into the windswept alpine zone about is misty cap.

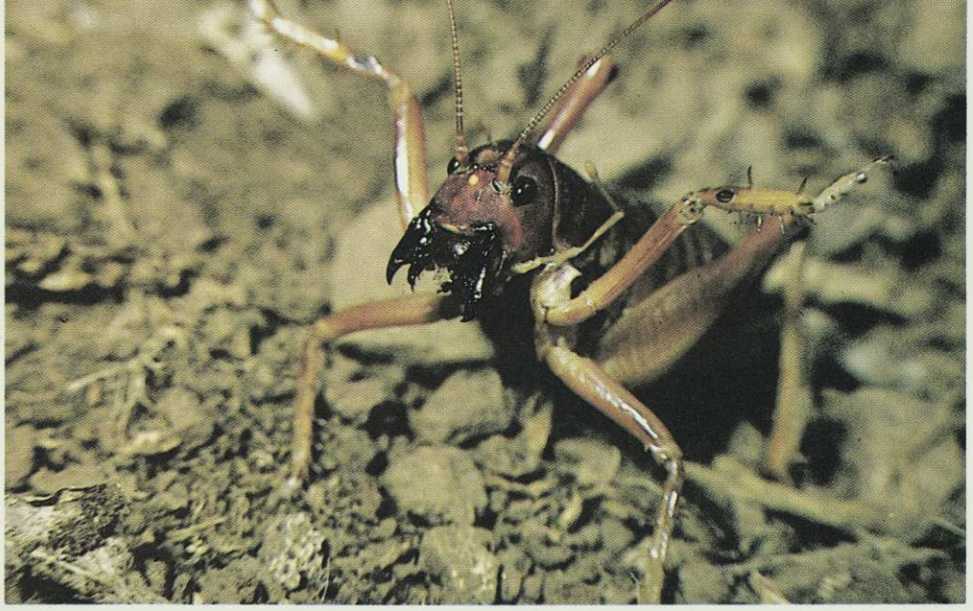
Animal treasures

The sanctuary islands are famous for their birds but they have other animal treasures too. Lady Alice has tuatara. Here scientists are investigating the absence of younger animals, perhaps the result of a population of Polynesian rats or kiore, thought to eat the tuatara eggs during their vulnerable months of gestation in the ground. Little Barrier has the giant weta; at 225mm it has a body about the size of a mouse, and a fearsome exterior in no way diminished by the suggestion that it is really just a large form of grasshopper. Rare and unusual lizards inhabit the island, yet it is some years

Looking towards Little Barrier Island (Hauturu). A school of dolphins plays in the middle distance.
Photo: Mark Bellingham

GULF COUNTRY





An as yet unnamed Mercury Island male weta. Some island wetas, such as that found on Little Barrier, can be as long as a mouse.
Photo: Mark Bellingham

Oliver's skink (*Cyclodina oliveri*) on the rat-free "Stack H" of the Mokohinau Islands. Less than a hectare in size, "Stack H" is possibly the only rat-free island left in the group.
Photo: Alison Davis

since a tuatara has been recorded there. Also on Little Barrier there is a record of 42 kinds of bush snail.

Nothing stays the same, even on an island sanctuary. Cats on Little Barrier wiped out thousands of petrels which once bred in burrows above its cliffs.

Yet an outstanding effort by wildlife rangers and conservation volunteers has recently rid the island of cats. Now it is being used as a place to put the last mainland survivors of endangered species. Kakapo, saddleback and kokako are among recent introductions.

At the same time the risk in the concentration, on just one island, of an endangered species has led to the spreading of rare birds about the islands of the Gulf to provide alternative populations. Saddlebacks, originally on Taranga (the Hen of Hen and Chickens Islands, off Whangarei) have been spread to other sanctuaries including the Chickens themselves (Lady Alice is one), Cuvier of Coromandel and now Little Barrier. In turn the stitchbird from Little Barrier, down to 300 survivors in the days of the cats, has been successfully introduced to Taranga, while at the same time its original population soared past 3000 on Little Barrier. On this island it often seems the birds are tame: whiteheads feed almost at ground level about the expedition hut; native pigeon graze on clover in the ranger's paddock, while flocks of red-crowned parakeet cackle through the trees.

Opening to the public

Most of these sanctuary islands are closed, to all but scientific expeditions, though qualified visitors have been allowed on Little Barrier in recent years. The Hauraki Gulf Maritime Park Board, which administers many of the islands, recognises lay interest and is developing Tiritiri Matangi Island, within sight of Auckland, as a place where people may visit freely and see rare birds. Conservation folk are helping with a replanting programme on this island, formerly a farm. Already saddlebacks and parakeets can be observed on a day trip, besides the only northern population of bellbirds. The journey out, as any trip in the Gulf may do, provides the keen birdwatcher with the opportunity to see gannets, penguin, and any of the 12 kinds of petrel and shearwater which visit the islands of the gulf to breed.

There are two islands which are easy for visitors to reach, though time allowed ashore tends to be short during the week. One is Rangitoto, right in the middle of Auckland's downtown view, a recent volcano with fascinating plantlife. It looks covered in bush from the mainland and indeed there is a cloak of green over much of the island. The reality ashore, however, is of broken lava (wear boots for it's sharp) and high temperatures beyond the extending shade of the trees. Thousands of black-backed gulls nest there in spring, feeding on the city dumps of Auckland and commuting home to roost. On the bare rocks the beginning of life, algae and lichens, form a thin crust. Pohutukawa forms a sheltering canopy, creating some shade for ferns and orchids which, along with astelia and griselinia, here find a perch on the rocks. The roots of the trees go down many metres to reach a miniscus of water in the heart of the volcano. While there is no soil in the conventional sense, plants thrive sufficiently on the pockets of decaying humus to support a population of wallaby, possums and a few fallow deer.

These animals may have originated from the introductions of Governor Sir George Grey, whose hideaway Mansion House on Kawau Island, is another favourite of visitors. Reached by boat, usually via Sandspit near Warkworth, Kawau is like a large letter E, with its deep arms drowned by the sea. Governor Grey, whose bizarre taste in plants and animals included the introduction of zebras, set in motion a process which has virtually stripped the island of its native species and replaced them with exotics. Largely kanuka, manuka or pines cover the island now, its remaining puriri and pohutukawa turning to skeletons under the final depradations of possums. Wallabies of several species graze out the settlers' gardens and keep native plants from regenerating. Around the Mansion House strange trees grow, including Chilean palms and other botanical souvenirs of Grey's colonial adventures.

Kawau is an ecological disaster yet a place of great charm and restfulness. As a demonstration of what the introduction of foreign species can do it is in direct contrast with the carefully sequestered sanctuaries of Little Barrier. Yet both serve to demonstrate the extremes and fascination of the world of islands which lie in view of the northern shores of New Zealand.

Footnote: Gordon Ell has visited the islands of the Kauraki Gulf as a wildlife film-maker and author of books, including *Wild Islands* and *Rangitoto*, both from Bush Press. He is presently national deputy president of the Society.

Kapiti Island — The Last Possum?

by Phil Cowan (Ecology Division, DSIR), Ian Atkinson (Botany Division, DSIR) and Brian Bell (N.Z. Wildlife Service)

Forest and Bird and Kapiti Island have had close links over the years. The public outcry over the state of this special sanctuary provided the impetus for the setting up of the Society, and Society founder Captain Val Sanderson took a keen interest in Kapiti. Today it is one of our most important island havens, partly because of its accessibility. Kapiti's regenerating forest gives one a sense of what New Zealand was like before Europeans arrived, before they brought with them animals such as possums, which have spread inexorably on the mainland and are now threatening the Far North. Unfortunately, there are still possums on Kapiti. The good news is they may not be there for much longer.

For the first time we have a chance of eradicating the last possum from Kapiti Island. Possum control began on the island before 1920 but varied in effort from year to year until 1968. Then followed a 12 year interval while the effects of possums on the island's plants were closely watched. (see *Forest and Bird*, 224:18) Trapping began again in February 1980 and over 15,000 possums had been killed by September 1982, about three quarters of the island's possums. Their numbers fell so low that the commercial trappers were no longer interested.

Eradication feasible

Inspired by the success of the Wildlife Service in eradicating cats from Little Barrier Island, Peter Daniel, the island's ranger, suggested that eradication of possums from Kapiti Island was now a feasible goal. After discussions between the Department of Lands and Survey, Forest Service, DSIR and Wildlife Service, an intensive control programme began in February 1983. A team of dedicated possum trappers, including Bob Cairns and leader Geoff Alexander, was employed by the Department of Lands and Survey, Forest Service, and Wildlife Service and overseen by Peter Daniel. Starting at the southern tip of the island they gradually extended a network of narrow tracks northwards, covering the entire island, except the western cliffs, and trapping both along and between tracks. No possum could have been more than 50–100 m from the nearest trap, well within their nightly range of movements, and traps were left set for many weeks, even after they had ceased to catch possums.

Gin traps were set on slanting posts about a metre above the ground to pro-

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tect ground birds like little spotted kiwis and wekas. Often as many as 1500 traps were set in a night. Many different kinds of traps: snares, instant-kill traps and bird-proof poison bait stations were tried, but none proved as efficient or as safe for native birds as the gin traps.

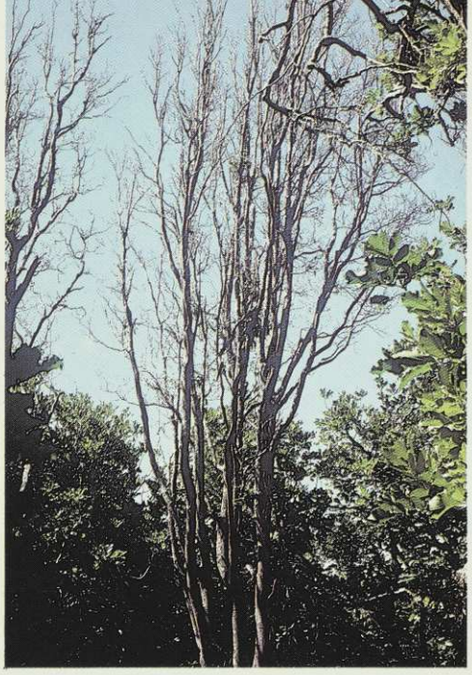
The first complete trapping of the island ended in December 1984. In less than two years about 4000 possums had been killed in more than 600,000 trap nights (= number of traps x number of nights set). This is the most concentrated trapping programme ever undertaken in New Zealand. Thus only a quarter as many possums were removed as were killed by the commercial trappers and with about ten times as much effort. This highlights the effort and dedication needed to eradicate possums from the island. We estimate there are no more than 5-600 possums now left (the actual number could be considerably lower) and eradication appears feasible.

Kapiti's steep western cliffs were initially considered a serious problem. Trapping began on the cliffs but was not considered sufficient, and after discussions with various conservation organisations (including the Royal Forest and Bird Society), the Forest Service was contracted to drop 1080-poisoned carrots onto the western cliffs in August 1983. This reduced possum numbers on the cliffs by about 75 percent, with little effect on native birds detected by either the Wildlife Service or the Ornithological Society of New Zealand. Since then, however, the trapping team has cut a network of tracks over the entire length of the cliffs; if further aerial poisoning is required, it may only be on small areas where access is dangerous.

Not without cost

A campaign as intense as that on Kapiti, is not without cost. During the last two years, 52 native birds, mostly NZ pigeons, moreporks and wekas, have been killed in traps. No little spotted kiwis, saddlebacks or stitchbirds have been caught. The losses have occurred at an average rate of one bird per 11,000 trap nights (approximately equal to 1 bird per 365 possums, a remarkable achievement), a rate far less than that for commercial operators using traps or cyanide paste on the mainland. The trappers take all practicable precautions to minimise bird deaths. The small number of birds killed poses no threat to the survival of their populations on Kapiti, and the long-term benefits to the birds from the removal of possums far outweigh the few regrettable deaths.

In February 1985, the trapping team started their second sweep of the island from the southern end. As the surviving possums could be trap-shy, they began using trained dogs with muzzles to locate individual possums. The dogs have proved their worth locating trap-shy possums, some of which were living in dense flax. If the last possum is to be eradicated from Kapiti, still further techniques may be needed — for example, night-shooting and the playing of taped possum calls to attract male possums.



Tawa tree killed by possums on Kapiti Island.
Photo: Ian Atkinson

The possum campaign is presently costing more than $100,000 a year, and it is important that this expense is justified in terms of its expected benefits. Why should possums be eradicated from Kapiti Island?

Three good reasons

There are several reasons. The first is that with possums eradicated, the island's native vegetation can develop unchecked by possums. The extensive browsing of kohekohe and tawa, and the more localised browsing of northern rata, toro and kamahi, would cease. Thus the regeneration and life-span of five of the more important trees on the island would no longer be either inhibited or shortened by possums. Species such as fuchsia and wineberry, which in the absence of possums would have been much more abundant in the young vegetation, would be able to recover. Other plants such as swamp maire, Kirk's tree daisy and at least two species of mistletoe, all very palatable to possums, could re-establish healthy populations.

Possums eat flowers and fruit of many native plants, foods that are also eaten by native birds. Eliminating possums from Kapiti would increase the flowers and fruit available for birds as well as removing any effect that possums have in disturbing nests and eggs.

Tim Lovegrove has made annual counts of all birds seen and heard in three sample areas on the island from 1982 to 1985. His results show a steady increase in bird numbers in all three areas during the four-year period suggesting that the great reduction in possums could already be having a measurable benefit. Even insectivorous birds can benefit because increased foliage can result in more insects.

A third reason for eradicating possums is the scientific value of having areas without any browsing mammals. On the mainland this is possible only in fenced enclosures or temporarily after intensive control. Enclosures are usually not made possum-proof. Thus to measure the effects of possums on a species like northern rata, a possum-free island can provide a suitable area for appropriate comparisons. The value of doing so can be seen when one considers that northern rata is a major tree of lowland rain forest in the North Island but it is declining. Unless we understand the extent to which possums are responsible we have a poor chance of protecting this tree for the future.

Endangered birds located

The adverse effects of possums on some native trees greatly exceed the effects of foliage-eating birds like pigeons, parakeets and kokako. Although we cannot restore Kapiti to its pristine state, we do have a responsibility to protect it in such a way that what is unique to New Zealand is not submerged by the influence of plants and animals that belong to other countries — in the case of the possum, Australia.

Three endangered species have been introduced to Kapiti Island from other parts of New Zealand: the little spotted kiwi, North Island saddleback and stitchbird. There are others that could be introduced and hopefully established, especially if possums are removed. For example, kokako are continuing to decline in some parts of the North Island but this endangered wattle bird has been introduced to only one island — Little Barrier. It does occur naturally on Great Barrier Island but in low numbers. There is a significant overlap in the foods eaten by kokako and possums so that removing possums from Kapiti would increase the chances of establishing kokako there. A second example is the takahe which has now been introduced to Maud Island in Pelorus Sound. If island-bred takahe become available from Maud, Kapiti is another possible island where the future of this endangered rail could be secured.

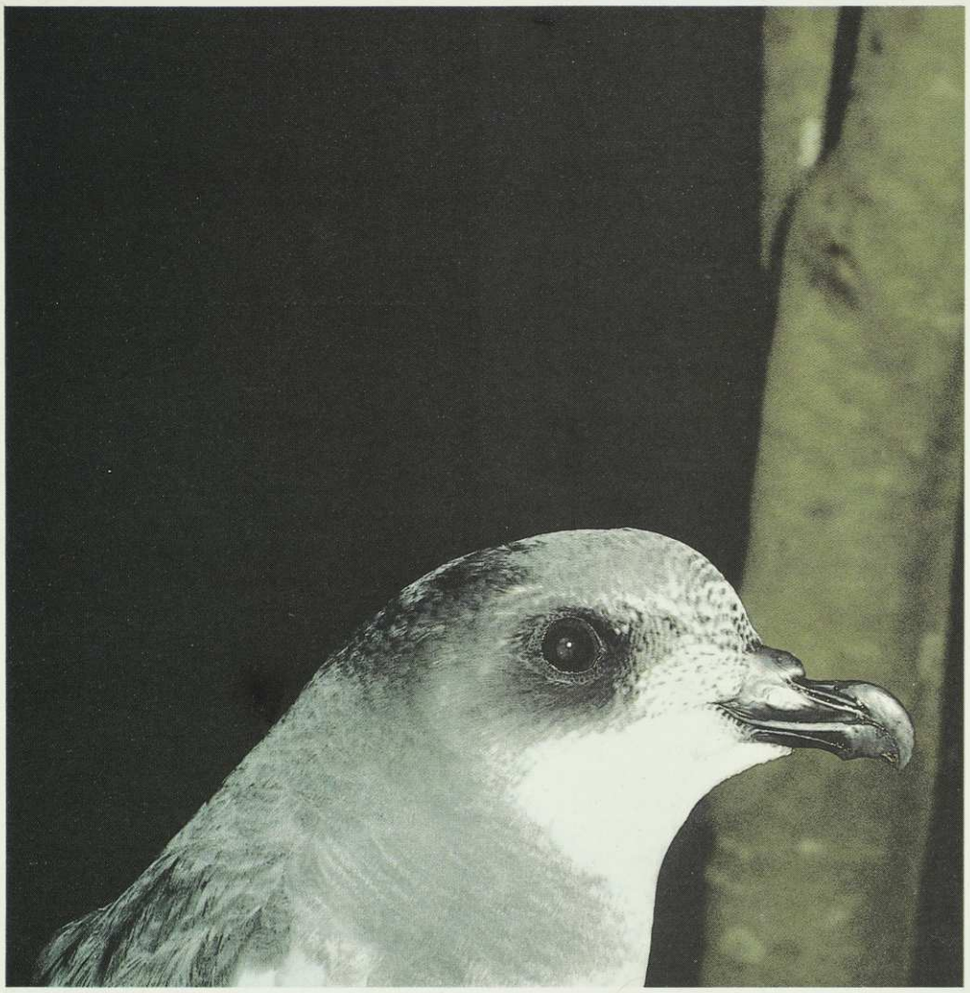
New Zealand has very few offshore islands larger than 1000 ha that are suitable as bird refuges. With an area of 1900 ha Kapiti is the second largest such island. At any time it could become even more important if a catastrophic event on an island elsewhere necessitated transfer of further endangered species to Kapiti.

The alternative to eradication is continuing control of possums. But nobody can guarantee that their present low numbers could be maintained indefinitely. Lack of money and loss of motivation would probably return the island to its 1960's state, an island with a reduced biological value and requiring a never-ending expenditure for possum control. Eradication of possums is a permanent solution to the problem. It may also be the cheapest solution as well.

Footnote: The Nature Conservation Council, through its sub-committee Conservation New Zealand, has recently awarded conservation citations to Bob Cairns and Geoff Alexander.

Rangatira — a key nature reserve

Few mainlanders ever have the opportunity to visit the Chatham Islands, a wind-swept group of two large and more than a dozen smaller islands about 870 km to the east of Christchurch. And yet these remote islands are among the most important for our native flora and fauna. **Alison Davis**, a research student at Auckland University, outlines in this article the significance of Rangatira, or South-East Island. Only 218 hectares in size, the island nevertheless harbours a large number of endangered bird species, as well as rare insects and plants.



Rangatira (South-East Island) is a haven for rare bird life. The Chatham Island petrel breeds only on the island, returning to its nesting burrow at night. Fewer than 20 of this rare petrel have been banded.

Photo: Mark Bellingham

Rangatira Island (South-East Island) must rank as one of the most important of New Zealand's nature reserves. All the bird species recorded by ornithologists in 1871 are still present; only on Rangatira are the rare New Zealand shore plover and the Chatham Island petrel found. Thirteen of the 15 endemic Chatham Island birds, the Chatham Island skink, numerous endemic insects and two-thirds of the endemic Chatham Island plants make their home on the island.

The reason why Rangatira abounds in wildlife is simple: there are no rats on the island. Incredibly, no rats became established from ships that called in during the whaling days, and no exotic animals remain today.

Humans first came to Rangatira more than 700 years ago. The Moriori used to collect seabirds and eggs, but they did not live on the island, and today no sign of their presence remains.

European sealers and whalers arrived in the early 19th century, and a whaling station was established in 1880. Sheep, cattle and goats were introduced during this time and the goats soon reached epidemic numbers. Until 1957 the island was farmed, with the last sheep removed by the Wildlife Service in 1961.

Today the birds, insects and plants have the island to themselves, except for the occasional company of human beings who come to observe them. The forest is regenerating to the extent that it is almost the same as when man first arrived.

Endangered birds

The rare Chatham Island petrel spends most of its life far out in the Pacific Ocean, but during the breeding season returns to its nesting burrow at night. Petrels have an uncanny ability to fly directly to their burrows without losing their way.

Once widespread in New Zealand, by the 1880s the colourful shore plover had become restricted to the rocky shore and salt meadows of Rangatira, where a population of 120 now remains. Its habit of nesting under vegetation made it vulnerable to mammalian predators. This appears to be why it disappeared from mainland New Zealand and Chatham Island.

The best known of the Chatham Island birds is the celebrated black robin, which has increased its numbers to 38 from a low of seven. In 1982 some were transferred from Mangere Island to Rangatira, where the better forest has given the population an opportunity to expand.

A semi-nocturnal bird of tussock and forest, the Chatham Island snipe — the smallest of New Zealand's snipe — had at one stage disappeared from all of the Chathams except Rangatira. In 1970 it was successfully re-introduced to Mangere. The bird's unusual aerial display, and the sound made during this display, has given rise to Moriori legends of a large mythical bird.

The forests on Rangatira support all the forest birds of the Chathams except the Forbes parakeet. The Chatham Island parakeet is especially common; I saw many of their nests in holes in the old stands of akeake *(Olearia traversii)*.

At night the forest is alive with the sound and movement of thousands of nesting seabirds, whose burrowing has left the forest floor bare of most vegetation. Rangatira is the main breeding ground for the broad billed prion and the white-faced storm petrel — more than a million pairs of the latter breed on the island! One of the world's smallest seabirds, the storm petrel is not found on any island with mammalian predators.

Only 120 shore plovers remain, all living on Rangatira, although they once occurred on mainland New Zealand. An easy prey for predators, the colourful shore plover had disappeared from New Zealand by the latter half of the 19th century.

Photo: Alison Davis

The extensive rocky shore is important, not only for the shore plover but also for the Pitt Island shag and Chatham Island oystercatcher. Of 50 surviving oystercatchers, half are on Rangatira and it appears that only these birds are breeding successfully.

Scurrying and jumping insects

Pitt Islanders are familiar with the large, hairy spiders of Rangatira, but not so well known are the island's unusual insects.

Of particular interest are several large flightless insects — a weevil and click beetle. Because the weevil lives on the endangered Chatham Island speargrass *(Aciphylla dieffenbachii)*, its survival is in doubt. At night, the forest floor is alive with scurrying cockroaches, beetles and jumping wetas. The two species of weta present differ from their mainland counterparts as they are cave wetas.

On warm, sunny days the brightly coloured Chatham Island red admiral butterfly flits among the muehlenbeckia and bracken.

The Chatham Island skink is common in tangled vegetation. It can be seen and heard scurrying through the leaves when one passes by.

Our "Cook's tour" of the wildlife of the island finishes up on its southern shores, where the largest colony of fur seals in the Chathams is found. In the summer months bulls guard harems of females whose pups bask and play in the sun.

Gnarled forest trees

The Chatham Island forests are unique, with most of the forest trees endemic.

On Rangatira the gnarled akeake trees *(Olearia traversii)* grow on the exposed coastal niches, while *Mysine chathamica* and Chatham Island lancewood and ribbonwood flourish in more sheltered areas. During summer droughts the ribbonwood trees lose their leaves. Such semi-deciduous ribbonwood forests are unusual in New Zealand.

Most of the south coast is salt meadow, which is regularly showered with salt spray during strong southerly winds. In spring, the meadow is a sea of pink iceplant flowers, with splashes of yellow, white and purple from *Cotula*, sea primrose, cress, the creeping *Hebe chathamica,* and Chatham Island geranium.

Away from the salt spray *Poa chathamica* and *Carex trifida* form a dense tussock sward in exposed places. Scattered among this are the endangered speargrass *Aciphylla dieffenbachii*, the giant nettle *(Urtica australis)* and the spectacular Chatham Island forget-me-not. These giant herbs are also found on the steep cliffs and summit with the purple-flowered *Olearia chathamica* and *Hebe dieffenbachii* scrub.

The Chatham Island red admiral butterfly *(Vanessa gonerilla ida)* is a colourful sight on sunny days on the island.
Photo: G. W. Gibbs

Hold breath and hope

Botanist David Bellamy, in the foreword to the recently published book, *Black Robin Country,* writes in reference to the black robin that "New Zealand holds her breath in hope."

The same can be said of Rangatira Island. The greatest threat to it is the accidental introduction of rats. If these vermin arrive we would certainly lose the New Zealand shore plover, the black robin, snipe, the Chatham Island oystercatcher and petrel, along with millions of seabirds, the skink and many rare invertebrates.

To quote David Bellamy, if all these animals become extinct, it will indeed be a black day. "And so the world waits with baited breath...."

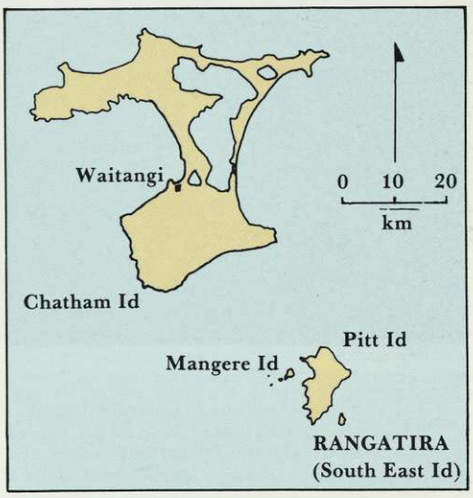
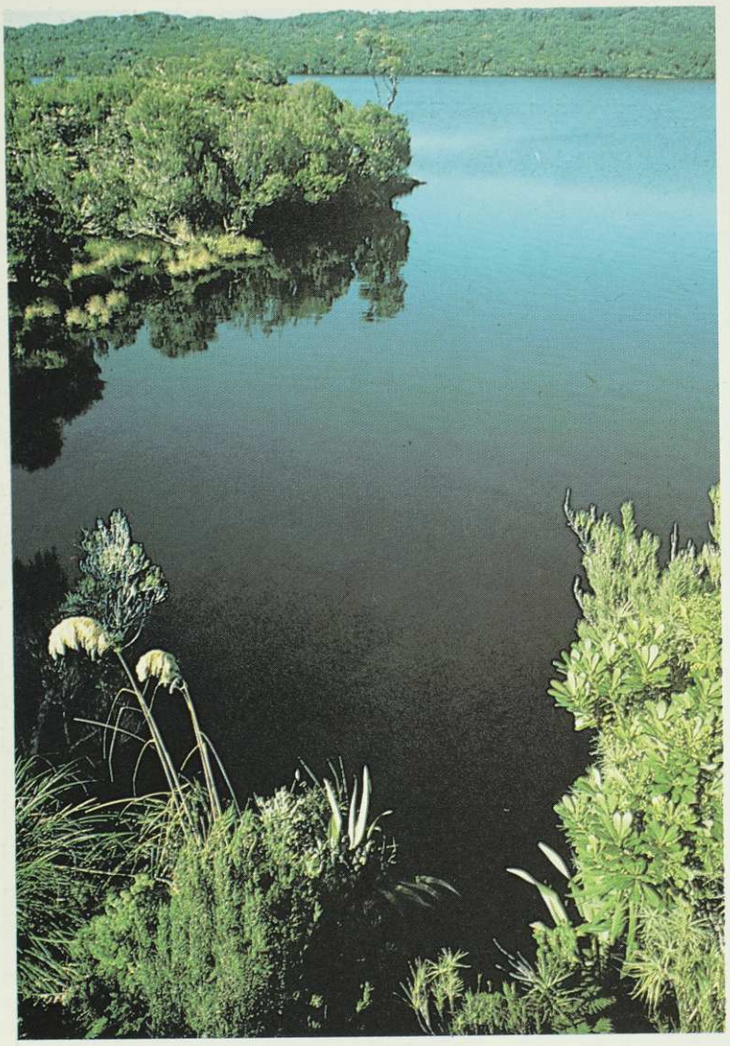


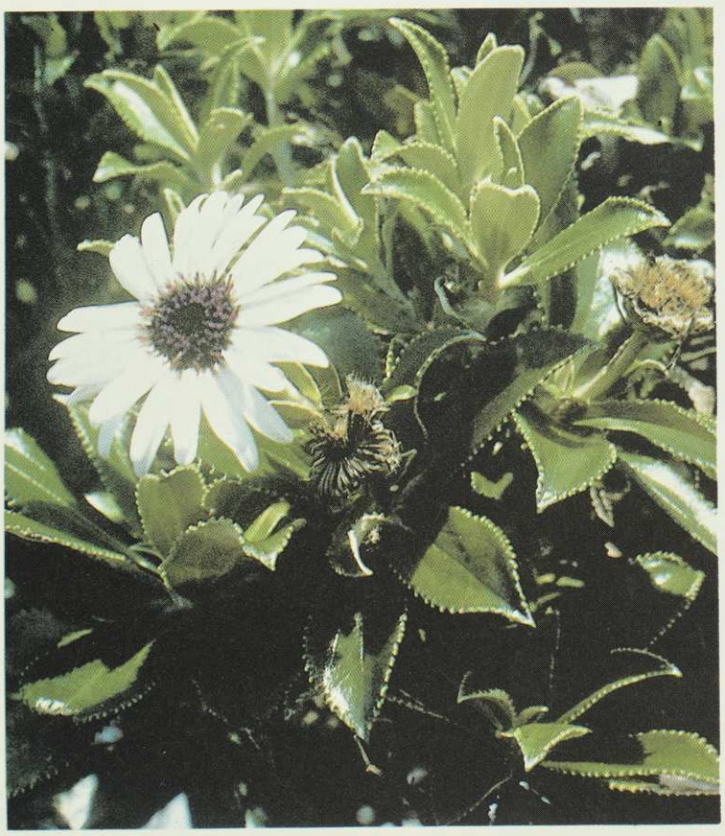
Fig 1: Map of Chatham Island and other main islands.

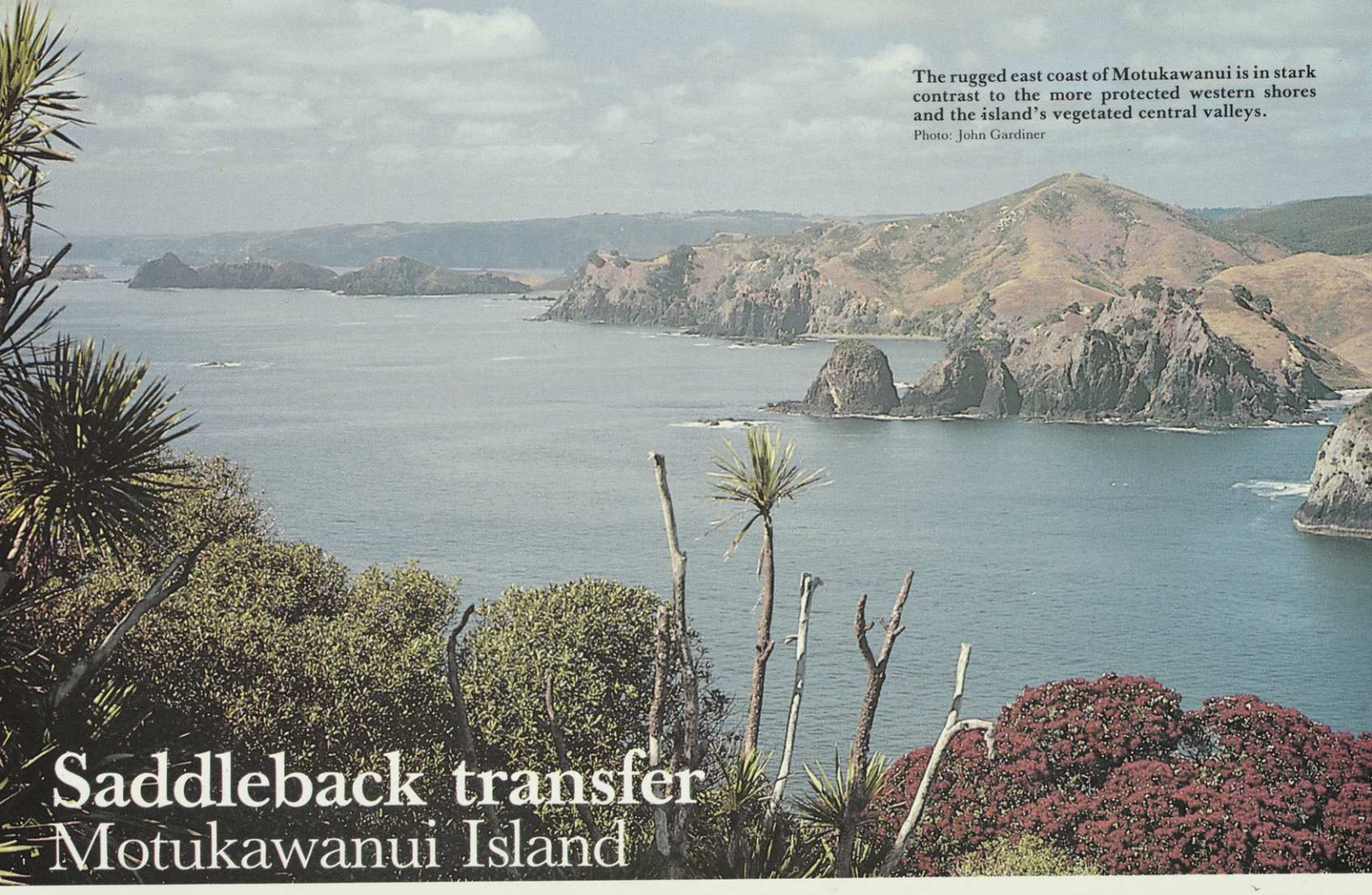
Like its mainland relative, the spotted shag, the Pitt Island shag builds a nest of ice plant, grass and other plants in eroded pockets or on cliff edges.
Photo: Mark Bellingham

The southern tablelands of main Chatham Island, a unique biological area with a mosaic of bogs, forest, lakes and scrub, is under possible threat from a huge peat mining proposal. Fletcher Challenge has recently been granted four prospecting licences to assess the viability of a scheme which could replace up to 45 percent of imported crude oil products. Not only are conservation interests at risk; the social fabric of the Chathams would be seriously affected with the arrival of more than 2000 project staff — overwhelming the Chathams population of 750. See pictorial on page 16.



1. Lake Rakeinui, one of several attractive lakes on the southern tablelands. 2. Chatham Island forget-me-not *(Myosotidium hortensia)* is an outstanding plant endemic to the islands. 3. Chatham Islands Aster *(Olearia semidentata)*. One of the glories of the peatlands, this attractive shrub is threatened by peat mining. 4. *Olearia chathamica* is one of several prominent daisies endemic to the Chathams.
Photos: David Given





The rugged east coast of Motukawanui is in stark contrast to the more protected western shores and the island's vegetated central valleys.
Photo: John Gardiner

Saddleback transfer Motukawanui Island

by Bay of Islands Maritime Park staff

In February 1983 a Wildlife Service and Bay of Island Maritime and Historic Park team released 16 rare North Island saddleback on Motukawanui Island in the Cavalli Islands. The question on everyone's minds was: would the birds adapt and survive in their new environment, or would they succumb to undetected predators?

The answer to that question is not yet at hand, although recent results are not encouraging as early ones. The coming breeding season will be critical to the hopes of everyone who has taken an interest in the release programme.

Once widespread in the North and South Islands, the saddleback declined rapidly towards the end of the last century, surviving only on Hen (Taranga) Island and a few islands off Stewart Island.

By 1962, Taranga supported the last remaining population of North Island saddleback; the species was staring possible extinction in the face. In response, the Wildlife Service started a research programme, then gradually transferred the birds onto nine other islands over a number of years.

After a bird's capture, a Wildlife Officer bands, measures and sexes it. The saddleback is then placed in a temporary aviary for a settling down period prior to being moved.
Photo: S. Anderson

Valuable national asset

Meantime, Wildlife and agencies such as the Bay of Islands Maritime and Historic Park have continued to survey islands for rodents and mustelids. It was therefore with some excitement that our park staff confirmed Motukawanui might be free of rodents, except for the relatively innocuous kiore. Newly-discovered predator-free islands are as rare as the endangered species liberated on them. Motukawanui had emerged as a valuable national asset.

The Wildlife Service proposed a trial release of saddleback on Motukawanui for February 1983. The team which went to Taranga included Wildlife Service and park staff, as well as members of the public.

Excitement of the hunt

Mist-netting saddleback amongst the rugged, volcanic features of Taranga is quite an art. It has all the excitement and pumping adrenalin of the hunt, with none of the recriminations of carnage. Some participants, however, are known to suffer from smug satisfaction.

Sixteen birds were caught and released, four fewer than the target level. To those involved, this represented the first tangible reward, and the remainder of 1983 was tense and full of speculation.

Then, in February 1984, a routine monitoring team was jubilant to find conclusive proof of breeding. As a consequence, a second release of 30 birds was quickly planned and put into action by the Wildlife Service.

Bad luck dogged the second capture programme: first rough seas delayed the start, and then rain set in. Two weeks later a disappointed team left the island with a saddleback catch which barely made double figures. A redeeming feature of an uncomfortable but memorable trip were the seven female birds caught. These would help the initial imbalance of sexes resulting from the first transfer.

Today, at the beginning of the 1985 breeding season, the number of saddleback on Motukawanui are estimated at 20. As yet the reasons for the low population are not apparent, especially since the birds have established well on Tiritiri Matangi in the Hauraki Gulf, an island similar in many respects to Motukawanui. It is managed by the Hauraki Gulf Maritime Park.

The co-operation and goodwill of all those involved in the project has been its single most impressive feature. Were it not for the two Government departments, numerous individuals and private organisations assisting the park, saddleback would not be on Motukawanui.

Calculated risks

Island reserves and their wildlife are preserved in perpetuity for all New Zealanders and other peoples. Usually entry permits are required if you want to visit an island where at risk species live. Often this means that the very people the land was reserved for are denied access because they directly or indirectly constitute the greatest threat to the endangered species.

For this reason, an important part of New Zealand's heritage has been locked away, and often the only chance the public has had to view an endangered species was in a museum or zoo. Even so, this protective attitude still has not stopped the introduction of predators — a Norway rat was caught on Codfish Island recently. Reservation and management alone are not sufficient if they lack the support of well informed users.

A time of changing departmental attitudes was signalled by the quiet beginnings of two projects: Motukawanui and Tiritiri Matangi. Both islands are essentially calculated risks. They harbour endangered species which are vulnerable to predators and yet they remain open to the public. People might also, accidentally or otherwise, set fire to the regenerating forests. The open sanctuary concept is on trial in the hope that the privilege will not be abused.

Our unthinking forbears left us with a legacy of endangered wildlife. Will the new generation be responsible for the loss of this new opportunity? Education is the important factor, and with this in mind both parks have started raising public awareness by involving the public with such activities as tree planting on Tiritiri and bird surveys on Motukawanui.

Another way of minimising risks is through the use of by-laws, such as bans on open fires.

Take advantage of the opportunity provided by these parks, but before you depart obtain all the information warning visitors of what might be a risk to the reserve. A miscalculation on your or any visitor's part would most likely be permanent. The release of a single rodent or mustelid could be as irreversible as extinction, and the visiting privilege extended to all New Zealanders would be unalterably retracted by nature.

Those who go to Motukawanui or Tiritiri Matangi expecting a mantle of climax forest will be heartily disappointed. Yet those with a sense of discovery and a little knowledge will be rewarded by a memorable experience which will broaden their appreciation of offshore islands and the role they play in protecting New Zealand's endangered plants and animals.

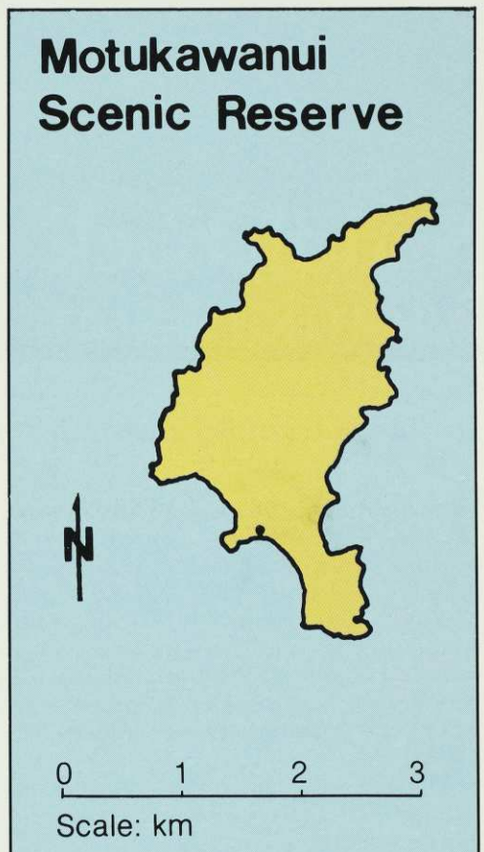


Fig 1: Map of Motukawanui Scenic Reserve, part of the Cavalli Islands.

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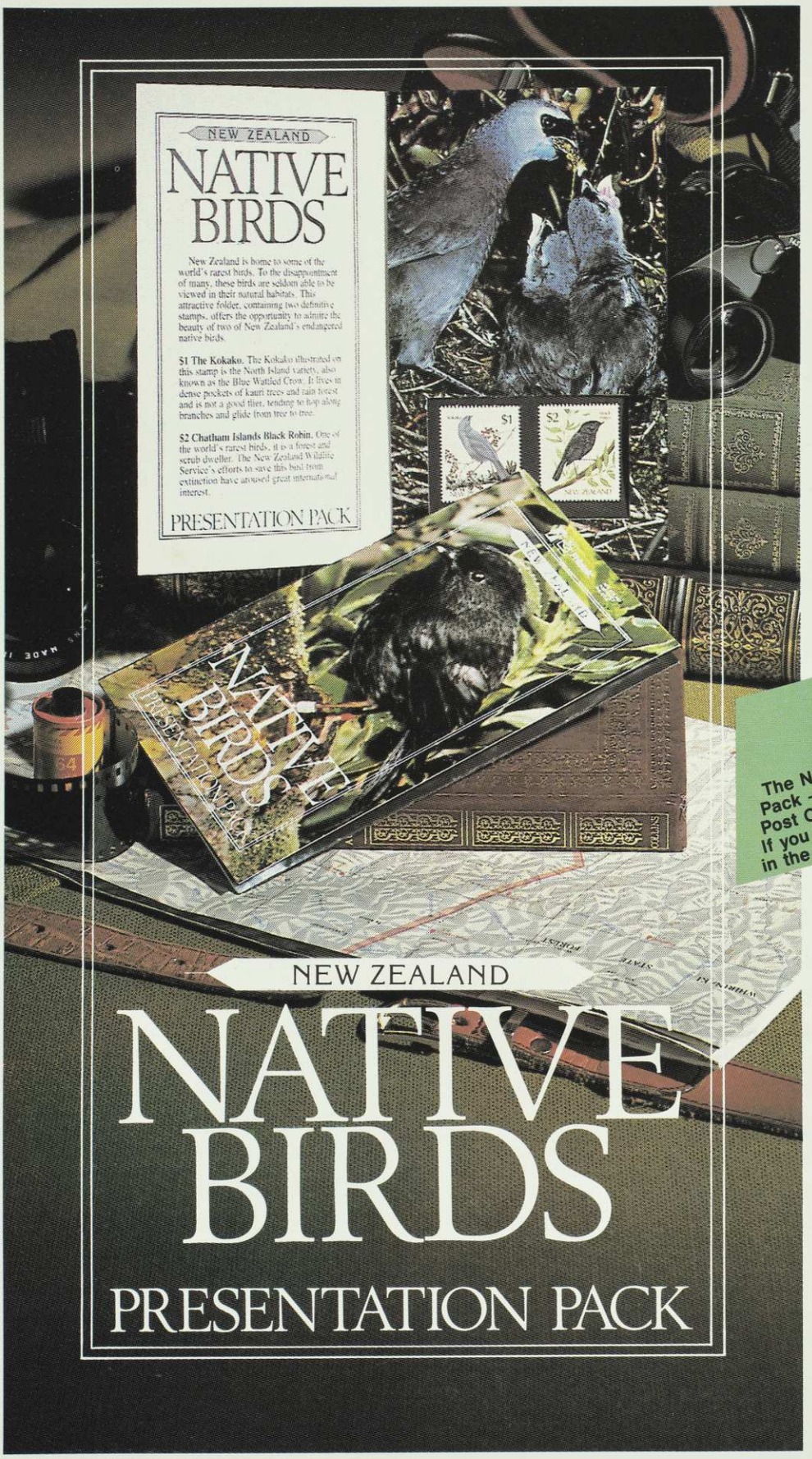

A STORY OF HOPE

Two native New Zealand birds are given the limelight on a 1985 New Zealand definitive stamp issue. The perky Kokako lives in danger of habitat destruction and is becoming scarce; the Chatham Islands Black Robin has gamely fought its way back from five remaining birds to a 1985 population of 38. Their's is a story captured on two colourful stamps now available in a beautiful and informative Presentation Pack. Add it to your collection now. This Presentation Pack is a story of hope and a must to make your collection complete.

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A diver's view of the sun shining through native spike rush (*Eleocharis sphacelata*). Photo taken on the fringe of Lake Ngatu, Northland.
Photo: Chris Tanner

Ousted from the depths

native underwater plants

by Chris Tanner* and Lucy Harper†

Tall reeds fringed Lake Ngatu, the Northland dune lake where we started our scuba survey of underwater vegetation. Peering down through two metres of clear water, we could see the delicate and filmy, but carnivorous bladderwort floating around at the bases of the reeds. Below the surface the scene was even more captivating.

The sun shone through as we dived over the top of brilliant green meadows of native characean algae. Occasional bright orange fruiting bodies or a spiky pine tree-like form quickly identified the two major species in the rich carpet of plants. Smaller, less common plants nestled against the shoreline.

What a contrast to the murky waters and dense dark weed beds of exotics we have floundered through in many of our North Island lake surveys!

We later met to compare notes, talk of our finds and commiserate with each other that so few New Zealanders see this small but distinctive section of our flora; and that the opportunity for them to do so is rapidly disappearing.

Exotics are invading and taking over more and more of our freshwater habitats — yet there is no legal protection for native water vegetation. Northland has possibly the only examples of lakes where the vegetation is totally native.

*Technician, Aquatic Plant Section, MAF. † Formerly Aquatic Plant Advisor, MAF, now scientist, Electricity Division, Wellington

In their early fervour to spread trout, acclimatisation societies also introduce "Babington's curse", the common oxygen-weed *Elodea canadensis*. Since then, other ornamental aquarium and pond species have rapidly escaped and spread.

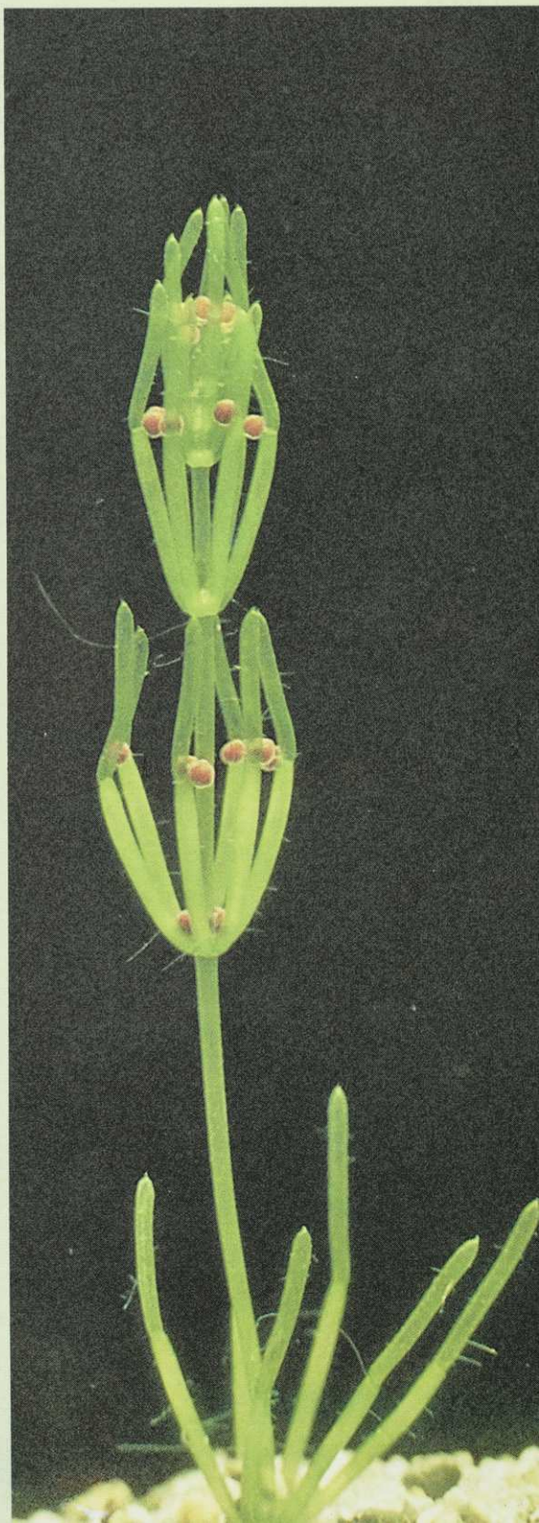
The most notorious of these are the three other oxygen-weed species (egeria, hydrilla and lagarosiphon) and hornwort (*Ceratophyllum demersum*). As none of these species set viable seed in New Zealand, they rely on regrowth from shoot fragments to spread within catchments. Humans are responsible for spreading these weeds from one catchment to another — often via boats or drain-clearing equipment. Unfortunately some misguided people, especially anglers and duck shooters, deliberately introduce such plants in the mistaken hope that they will attract more birds or increase fish numbers.

A diver's nightmare, these dense beds of introduced lagarosiphon tend to take over completely from the useful natives they have replaced.
Photo: John Clayton

Natives down under

The exploratory scuba survey we carried out of 24 Northland lakes (along with Rohan Wells and John Clayton) showed a sharp contrast between the vegetation of lakes infested with introduced water plants compared with that of purely native lakes. The majority of Northland lakes remain untouched by exotic water plants because of their isolation and unsuitability as trout fisheries.

These native dune lakes are characteristically fringed with tall emergent plants (*Eleocharis sphacelata* and *Baumea* species), with rich carpets of charaphytes (particularly *Chara fibrosa* and *C. corallina*) growing from shallow water through to the deepest limit of plant growth (maximum 17.5 m recorded in Lake Taharoa near Dargaville). Occasionally the rare emergent milfoil *Myriophyllum robustum* may sprawl amongst marginal vegetation. Taller growing native pond weeds (*Potamogeton* sp.) and milfoils (*Myriophyllum* sp.) often occur at mid depths, while on sandy, low gradient shores diverse communities of low-growing semi-amphibious plants may occur if sheltered from waves. The latter community commonly includes *Lilaeopsis lacustris*, *Myriophyllum pedunculatum*, *Glossostigma* sp., and more rarely the tiny endangered species *Hydatella inconspicua*. Bladderwort occurs in sheltered sites of some lakes. The bladders of this plant act as traps for small animals which are digested for their nutrients.



Close up of the carnivorous native bladderwort (*Utricularia protrusa*), showing the bladders which open and shut to trap tiny animals.
Photo: Rohan Wells

Native underwater plants such as *Chara corallina* rarely interfere with our use of lakes because they form a low-growing carpet, unlike exotic species.
Photo: John Clayton

Exotic domination

In Northland, the exotic plants which infest certain lakes tend to take over completely. These include Lakes Omapere, Owhareiti and Rotorua (egeria); Waingata (elodea); and Ngakeketa (hornwort). As in the Rotorua and Waikato lakes, they form tall, dense, monospecific weedbeds which exclude natives from large areas. Mounds of broken off plants may also smother shallow water communities.

Unlike introduced species, native plants rarely interfere with our use of lakes. They generally form a low growing mixed canopy which provides stability to bottom sediments and rich habitats for invertebrate and fish species. Native *Potamogeton*, *Ruppia*, and *Myriophyllum* species may cause temporary weed problems when they grow to the surface and flower, but on the credit side their seedheads are an important part of the diet of many waterbird species.

Protection

The myriad of small, often isolated lakes scattered amongst the fossilised dunelands of Northland remain as possibly the only substantial areas in New Zealand largely free of introduced water weeds. Up until now, the region's isolation has kept it relatively free of such weeds, but those days could be over with the recent spread of introduced species into Northland.

In the past, management of any submerged vegetation has been haphazard and fragmented, and a "fire brigade" approach has been taken in order to tackle politically sensitive weed problems (eg in the Rotorua Lakes).

Thus there exists the ridiculous anomaly whereby lakes, while they are probably our most widely valued wetlands (some forming the central focus of national parks), rarely have their beds of native plants reserved. They are also often excluded from management plans and legal protection.

Pressure is now mounting to have reserves which protect significant native habitats and areas representative of New Zealand's original character. Unless suitable measures are soon taken to include "native lakes" into this concept the opportunity will be lost, as introduced water weeds are very difficult to eradicate once established. After areas are reserved, positive action will have to be taken by a specific authority. It must make ecological assessments, monitor for plant introductions, and develop contingency plans to deal with these, exclude stock from lake margins, promote public education and erect warning signs to increase local awareness of the dangers of exotic introductions. Motorboats and floatplanes may have to be excluded from such lakes.

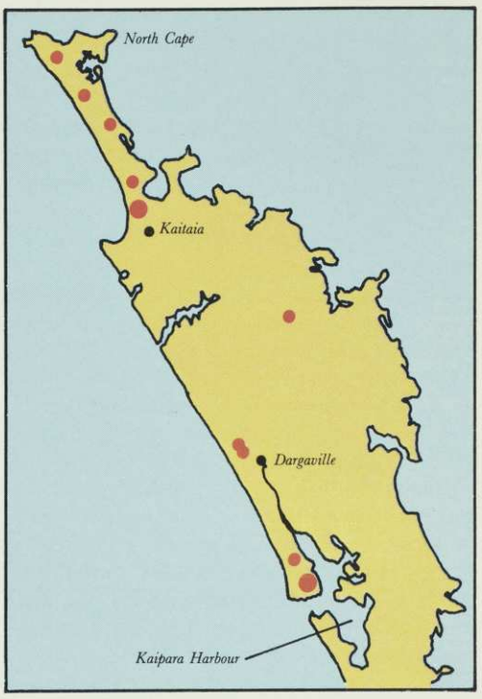
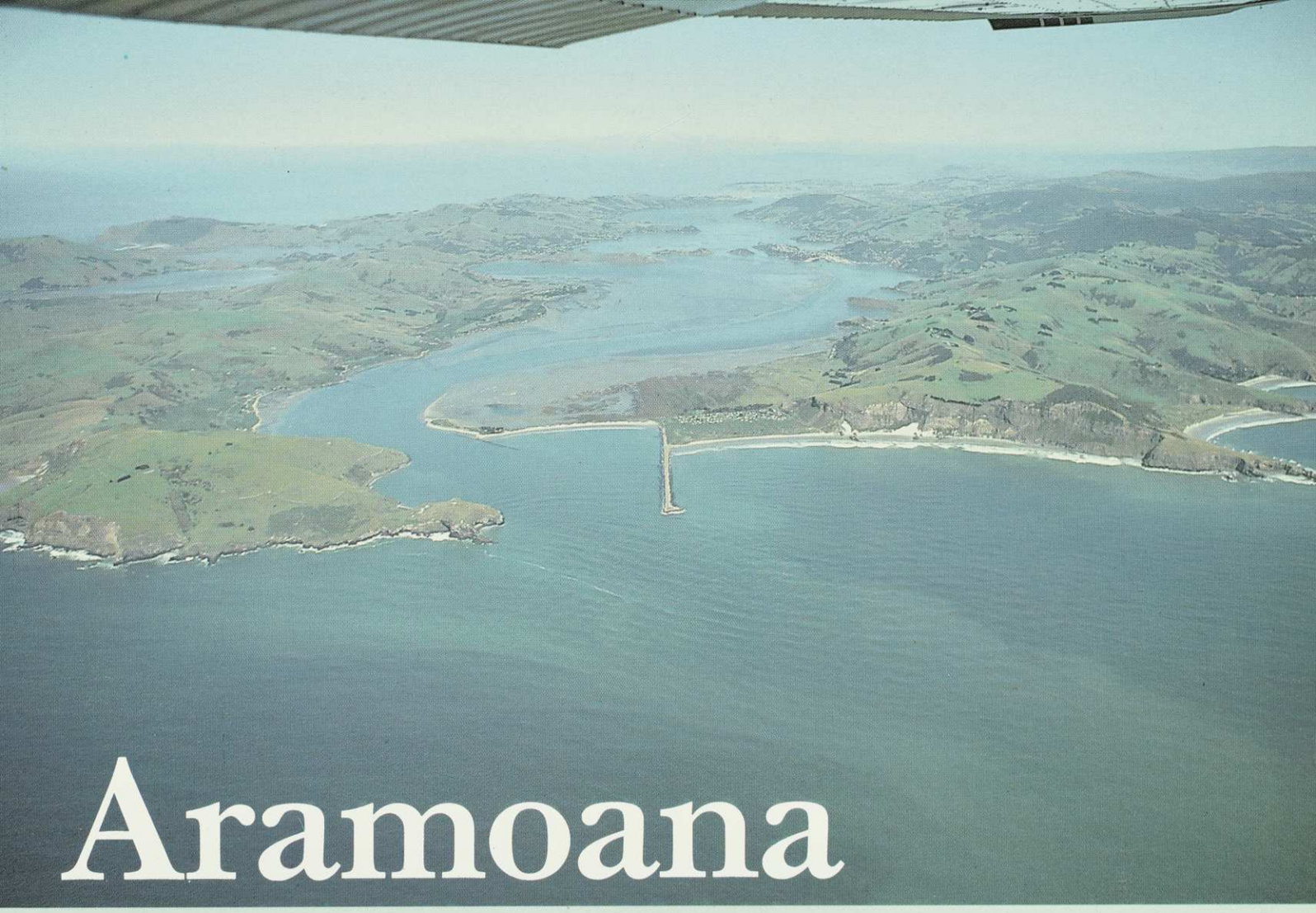


Figure 1: Map of main Northland dune lakes.

Many of the Northland lakes, especially Lake Ngatu (near Kaitaia), the Kaiiwi lakes (near Dargaville) and a number of the Kaipara lakes are worthy of protection and further study in order that we don't forget our unique and rapidly disappearing native submerged plant flora.



Aramoana

Path to the Sea

Aramoana — "The path to the sea." Shaping the entrance to Otago Harbour, the beautiful ocean beaches and sweeping salt marshes of Aramoana lie opposite Taiaroa Head and the important Maori community of Otakou.
Photo: Ralph Allen

by Ralph Allen, Dunedin botanist, who reports that the Save Aramoana Campaign is not yet over.

The ill-fated Aramoana smelter proposal, the flagship onto which the National Government pinned its "Think Big" hopes in 1980, could not have been more of a developer's heartache.

The unsuitability of the site, its high natural values, the poor economic returns for aluminium and the fierce resistance of the local people all mitigated against heavy industry sitting alongside the entrance to Port Chalmers. By the end of 1981 the consortium South Pacific Aluminium Ltd had bowed to the inevitable and the threat to one of the more memorable of our coastline areas had been averted.

But had it? To this day, despite its avowed intentions to make the salt marsh — next to the site of the proposed smelter — a reserve, the Otago Harbour Board still says it has "decided to defer the establishment of firm reserve boundaries until industrial development or zoning is a reality."

The latest in a long series of attempts to defer protection of the internationally-recognised biological values of Aramoana, this excuse confirms a misdirected philosophy which often prevails: only protect that which has no obvious economic value. A cynic might interpret it as a case of sour grapes, in light of the fact that the Board was a firm smelter supporter.

The saga really begins in the late 19th century when the Board was given control of Aramoana. In the early part of this century, it helped establish a holiday settlement by leasing land at a very low rental and assisting with road access, and over time a close-knit family community of 70 cottages and upwards of 400 people settled at the road end under the shelter of low dunes.

Quiet backwater

For most of this century, Aramoana has remained as its residents preferred: a quiet backwater with no pretensions of being anything else. However, a more commercially-oriented Harbour Board took a different view, and inspired by examples of heavy industry in other parts of the country in the late 50s and early 60s, it published a widely circulated brochure "Ready and Waiting for Big Industrial Expansion."

Visions of steel mills, pulp mills, nickel smelters, zinc smelters, car assembly plants, petrol refineries and other industrial juggernauts dominated the imaginations of Board members. In the heady rush to join the 20th century, rational consideration was as lacking at Aramoana as in many other industrial proposals of the times.

Nevertheless, it was not long before the limitations of the site became evident. Certainly, it was adjacent to a deep water port and encompassed several hundred hectares of flat land. However, access was poor with only a winding, unsealed and periodically inundated road. There was no ready or inexpensive source of electricity or water to supply an industrial complex. And over half the area was subject to tidal flooding. Not surprisingly, no industrial proposals were forthcoming.

Looking north-west along Aramoana beach, now reserved, unlike the salt marsh. Soaring in the air are royal albatrosses from the nearby Taiaroa Head breeding colony, the only mainland colony in the world.

Painting: Ronald Cometti. Reproduced with the kind permission of the artist, from the recently published *Margins of the Sea* (Hodder and Stoughton) with text by John Morton.

Save Aramoana

The idea of an aluminium smelter first surfaced in 1972, when Otago Metal Industries Ltd pointed to the "success" of the Tiwai smelter as an example which could be emulated in Dunedin. The public was then little aware of the immense costs to New Zealand of establishing the electricity supply for this industry, and to this day the costs remain a secret.

However, environmental costs were also uppermost in people's minds at the time, highlighted by the campaign to prevent the raising of Lake Manapouri. Studies at Aramoana confirmed its exceptional natural values.

Consequently, in mid-1974 the Save Aramoana Campaign was launched to spearhead the massive public opposition to the smelter, but its research and lobbying efforts came to an end later that year when the Government rejected the smelter on the grounds that sufficient electricity was not available.

National's "Think Big" scheme for the rapid industrialisation of New Zealand led to the resurrection of the Save Aramoana Campaign at the end of 1979. Believing that surplus electricity could be made available to energy-intensive industries in the "underdeveloped" South Island, the Government published the document "Growth Opportunities", advertising the supposed surplus for sale.

There was no shortage of bidders. Four smelter proposals came forward, and South Pacific Aluminium emerged as the front runner. By 1980, Aramoana was the chosen site.

A massive campaign was started to prove the disastrous environmental, economic and social consequences of the smelter; the independent state of Aramoana was formed and stamps printed to declare its sovereignty.

In the end, it was the economic argument which largely won the day. Perhaps more important in the long term though, was the outcome of Planning Tribunal hearings on the review of the Silverpeaks Country District Scheme. This had zoned Aramoana as a potential industrial site. The case put forward by the Save Aramoana Campaign, Aramoana property owners, Otago Peninsula residents, the local Maori community and a range of other people convinced the Planning Tribunal that Aramoana was not suitable for industry.

Despite representations by developers, the Harbour Board and the County Council, Aramoana is now zoned to protect its rural environment, residential and recreational qualities, and biological values, explicitly excluding industrial use.

The ocean beaches of Aramoana are now formally reserved. But the campaign will not be truly won until the salt marsh, inter-tidal flats and wet "slack" areas are similarly reserved.

The Department of Lands and Survey, responsible for reserve administration, supports the case for protecting Aramoana. Only the obstinacy of a conservative and seemingly embittered Otago Harbour Board — a Board publicly committed to reservation but only after industry is established — stands in the way. While this obstructive attitude remains, it is difficult to see any progress being made.

Aramoana is land owned by the people of New Zealand and vested in the Board for the good of those people. Perhaps here is a case for strong action from the Government acting in the best interests of the country. Perhaps the time for negotiation is past, and control of Aramoana should revert to the Crown and reserve status be conferred as a matter of course.

Aramoana's sub-tidal sand flats are the home for large numbers of juvenile flatfish in summer and autumn — these fish sustain the local trawl fishery. A rich community of snails, bivalves, anemones, worms and crustaceans thrive amongst the eelgrass which grows on the low tide sand flats. The eelgrass is also grazed by grey and mallard ducks and in winter by up to 300 black swans. The cockle population is high, and the cockles are amongst the largest known in New Zealand. Invertebrates in the sand provide food for large flocks of the common waders and plovers and for rarer migrant waders. Mid-tide sand flats support large numbers of burrowing invertebrates, and provide an important low tide roosting area for large flocks of gulls and terns.

Best known of the biological communities at Aramoana are the salt marshes. The lower salt marsh stretches above the eastern tidal flats, on and inland of the crescent of low sandy islets which provide the only reliable high tide roosts for the large flocks of wading birds in the harbour. Its short turf, dominated by two native salt marsh plants, glasswort (*Sarcocornia quinqueflora* previously *Salicornia australis*) and *Samolus repens*, supports a rich assemblage of sandhoppers, crabs, mudsnails and insects. Wading birds eat these at high tide, especially important during winter storms.

Inland of the lower marsh is the salt meadow or middle marsh, with its denser and more continuous turf of several more salt marsh plant species. Above this again, out of reach of all but the highest spring tides, is the upper marsh. Characterised by the salt marsh shrub *Plagianthus divaricatus* and the tall jointed rush *Leptocarpus similis*, it is absent from most other Otago salt marshes: removed for farming, or covered by rubbish dumps.

Especially important at Aramoana are sand ridges, probably former beaches, and the intervening swampy areas known as slack, characterised by flax and jointed rush. There is no comparable area in Otago, and throughout New Zealand such areas are much depleted.

The tidal flats are the most important areas for waders in Otago. Rare migratory waders are more common here than elsewhere in eastern Otago, and godwits, oystercatchers, pied stilts and banded dotterels all find a home here. Ducks and black swans use Aramoana for breeding, feeding and resting, and as a refuge during the shooting season.

Aramoana is a prime area of study for nearby Otago University with its specialist facilities for marine research. It provides a baseline for measuring and monitoring changes in coastal ecosystems, thus allowing better and more informed decisions for managing these areas. The sand ridges also can give clues about the coastal evolution of southern New Zealand, especially as coastal erosion is such a grave problem, affecting rural, urban and industrial land.

Most of this article has focussed on the threat to the people, plants and animals posed by industry at Aramoana. It would also be an affront to the physical beauty of the area. The landscape around Aramoana is magnificent and the area has an air of untrodden isolation, despite its popularity. The royal albatross colony, the only mainland example in the world, is immediately opposite. Aramoana is central to the view from much of Port Chalmers, and from many other harbourside settlements. Of particular importance is its relationship, both physical and spiritual, to the Maori community and marae of Otakau, on the opposite shore of the harbour.

TASMANIA
treasure isle under threat

by Gerry McSweeney, Conservation Director, RF&BPS

"Two centuries ago, south of the smallest continent and set in the wildest seas, there was an island which exemplified the beauty and complexity of the whole world's wild face. Remote, windswept shores and ranges, heathlands, snow-fed streams and damp, life-filled forests. No canvas, symphony or temple compares with its wild intricate beauty."

Bob Brown, A Time to Care.

"Tasmania's settlement by uneasy and frightened Europeans saw a savage attack on everything that made this land so different, so hostile to them. The native people were persecuted to the brink of extinction. The silences of vast forests were splintered by the crash of falling trees. The wind itself was put to work; it fanned the flames as fires razed the island's woodlands. And the emptiness, the fearful loneliness of the wide spaces were dispelled as settlers built roads, houses and fences: achievements, visible and reassuring. At last the countryside conformed.

Tasmania has been made comfortable and safe. Scenes of farmland and historic township please the European eye, and a still wilder beauty can be found along the roads that penetrate so deeply into the once remote mountains. But so often the roads end in the scars of dam works or logging operations. The visitor finds that the assault on Tasmania's wilds continues: forest are wood-chipped; the western rivers drown unmourned; and fires, often deliberately lit, eradicate the remnant Ice Age forest of King Billy and pencil pine.

Tasmania is still an incredibly beautiful island. But so much of its is a beauty betrayed, like the mountains mirrored in the grave of the flooded Lake Pedder. Only in the remoteness of wilderness can be found the wholly unaffected beauty of nature, and only in the Central Highlands and South-West of Tasmania can be found true wilderness.

But if the destruction has intensified, then so too has the manifestation of our concern for this land. Mountains and rivers that appeared in the first awkward paintings of western Tasmania today inspire evocative photography. The eager exploratory expeditions today inspire bush-walkers and canoeists. In response to the same vision that saw the first great national parks proclaimed in the 1920s, Tasmanian and Commonwealth Governments alike have nominated those areas for World Heritage listing. And the lonely cries for wilderness, so eccentric fifty or a hundred years ago, have coalesced into a persuasive voice heard the world over. Whether arguing on scientific, economic or spiritual grounds, the advocates of wilderness are linked by an intuitive conviction that to destroy these last fragments of wild Earth is akin to destroying ourselves."

Geoff Law Franklin Blockade.

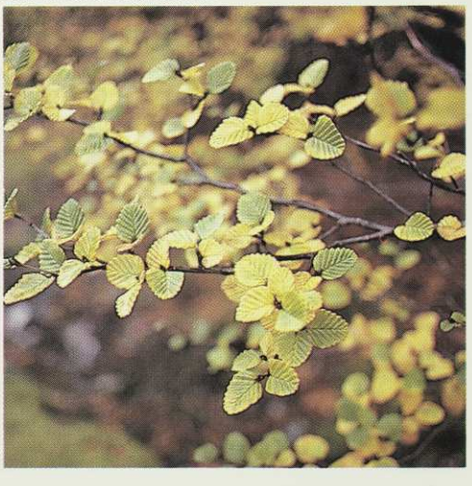
Tasmanians write about their land with a passion shared by many New Zealanders. Their words echo sentiments that we too feel strongly. Both our cultures and our history of European settlement and exploitation of the land and its native people are similar, even though New Zealand was never a convict settlement. Both countries are buffeted by the roaring forties and in recent times were heavily scarred by Ice Age glaciations.

Cradle Mountain — Lake St Clair National Park, Western Tasmania World Heritage Area.

Our links stretch far beyond the last 200 years of European settlement. Until about 50 million years ago, New Zealand, Tasmania (then joined with Australia), South America and Antarctica were linked as the southern supercontinent of Gondwanaland.

Crustal movement separated Gondwanaland and as the land masses parted they each carried a sample of the ancestral beech (*Nothofagus*) rainforest, and other plants and animals including ancestral ratites which evolved into New Zealand's moas and kiwi and Australia's emu and cassowary. The Australian continent drifted slowly northwards. Its original plants and animals were boosted

Fagus (*Nothafagus gunnii*) a deciduous Tasmanian beech of exposed bushline and sub-alpine areas turns hillsides brilliant orange-yellow for a few weeks in autumn.



The carnivorous Tasmanian devil is a scavenging marsupial still widespread in Tasmania. It was formerly common in mainland Australia but became extinct through competition from dingos.

Jane Burrell, *The South West Book*.

by plants and animals from land links with Asia and *Eucalyptus*, *Acacia* and other species adapted to a hotter, more arid climate.

However temperate rainforests still flourished in the cool wet climate of the south. Finally, 14,000 years ago Tasmania became separated from mainland Australia when sea levels rose to form Bass Strait at the end of the last ice age. Since that time, repeated Aboriginal burning has substantially reduced the area of rainforest. This is replaced by fire-tolerant eucalypts, through which rainforest only regenerates slowly. Rainforest today still dominates the south and west of Tasmania while drought and fire tolerant eucalypt, wattle and paperbark (*Melaleuca*) forest dominates the east, centre and north of the State.

Because of the original Gondwanaland link, Tasmania and New Zealand still share many common genera and even species of plants, particularly in rainforest and alpine areas [*eg Phyllocladus, Astelia, Coprosma, Aristotelia, Cyathodes, Pimelea* and *Lagarostrobus* (formerly *Dacrydium*)].

Tasmania's great diversity of plants and animals makes the state a naturalists paradise. Rufous wallabys are widespread. Although protected in National Parks and Reserves, nearly a million are shot each year in Tasmania for sport and to reduce grazing competition with sheep and cattle.

Huge diversity

The combination of species of ancient, tropical and arid-Australian origins, subject to a great range of climates and altitude, result, in Tasmania's enormous variety of plant and animal species. Although only a quarter the area of New Zealand, Tasmania has 1543 species of plants (1460 species in New Zealand) 306 of which occur only in Tasmania and not in mainland Australia. Tasmania also has 280 bird species and 32 species of mammals. Because the dingo never invaded Tasmania, a number of carnivorous marsupials including the Tasmanian Devil, native cats (quolls), (and until recently the Tasmanian tiger or thylacine) survive here but are extinct or endangered in mainland Australia.

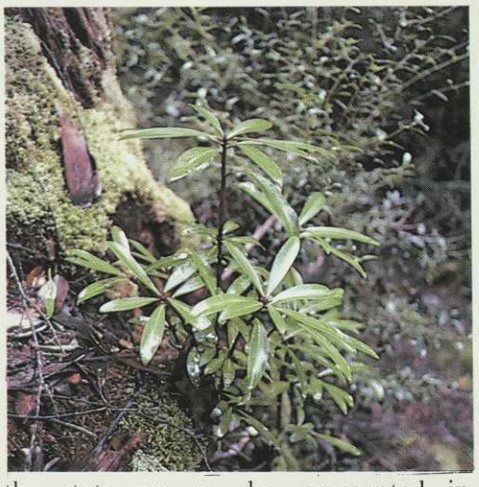
About 13% of Tasmania is protected within National Parks or State Reserves administered by the Tasmanian National Parks and Wildlife Service (NPWS). The 13 National Parks cover a total area of 890,000 hectares. Significantly both mining and domestic stock grazing are prohibited in these Parks. There are a small number of other reserves administered by the Forestry Commission, Lands Department and local authorities which have conservation value but do not have strong legal protection and may permit incompatible uses. The Tasmanian Forestry Commission manages a huge area of the State although control of much of this area has been ceded by an Act of Parliament to three woodchip companies (see map). The Forestry Commission's only contribution so far to the protection of a representative network of natural areas are its 32 Forest Reserves. These total 15,300 hectares and have been set aside since 1975 "for the pleasure of local communities and visitors". These are primarily small scenic and recreational areas featuring waterfalls, lakes, big trees and even pine plantations.

Mountain dominated National Parks

Tasmania's national park and reserve system, like New Zealand's is mainly comprised of high rainfall mountainous areas usually with no merchantable timber. Two of the National Parks, Mt Field and Hartz Mountain, have had their best lowland forest excised (1950s, 1970s respectively) for logging!

Lowland rainforest in the north-west and drier lowland areas of dry eucalypt forest and native grasslands in the east of the state are poorly represented in reserves.

The rainforest shrub (*Tasmannia lanceolata*), like New Zealand's peppertrees (*Pseudowintera*) belongs to the most primitive family of flowering plants and dates back to the rainforests of ancient Gondwanaland.



Pure rainforest has been reduced by at least a third since European settlement. Today it is still being cleared for farming and is threatened by fire, flooding, hydro dams and by logging and woodchipping. There is a moratorium until 1988 on the logging of State-owned pure rainforest [defined by the Forestry Commission as forest over 8 m in height having "less than 5% eucalypt eucalypt canopy cover]".

However this narrow definition has allowed extensive logging of "mixed forests" which contain only between 5% and 10% eucalypt canopy cover which in reality are also rainforests. The NPWS and conservation groups spearheaded by the Wilderness Society and the Australian Conservation Foundation are seeking extensive rainforest reserves in the north-west and south of Tasmania.

Huon Pine — a major tourist attraction

The Huon pine (*Lagarostrobus franklinii*), a close relative of New Zealand's silver pine, grows alongside rivers on Tasmania's West Coast. Today it is the State's rarest forest association. It is slow growing and can live for up to 3,000 years. Formerly widespread, it has now been almost eliminated as a forest association because of logging for its prized resilient timber and through flooding by hydro lakes. A major craft and tourism industry has now developed around the timber which in appearance resembles our kahikatea. The present annual timber cut of 200-300 cubic metres is almost exclusively used for high quality craftware. Even Huon pine woodshavings sell for $1 in small bags labelled "Product of the world's last temperate rainforest". Eat your hearts out New Zealand West Coasters! There is no replanting of Huon pine and the few significant mature stands that remain are unreserved and threatened by helicopter logging. The present supply largely comes from 8,700 m^3 of timber salvaged before the Gordon River and Lake Pedder were flooded in 1972.

Woodchipping is the major threat to Tasmania's remaining dry eucalypt forest. In the space of only four years (1969–73) the State's major forest industry switched from sawmilling to wood chipping involving clearfelling primarily of dry eucalypt forest. Twenty-six of Tasmania's 30 eucalypt species occur in these forests which have a very high species diversity. After chipping, many of the areas are converted to farmland, the remainder are often regenerated and where this is successful become single species tree farms.

Tasmanian conservationists are seeking a 14,000 hectare national park for the largest remaining unmodified area of dry eucalypt forest in the Douglas-Apsley valleys on the east coast.

Roads threaten grasslands

Tasmania's natural grasslands and grassy woodlands were once extensive in the centre of the island. Today they have been reduced to remnant patches in cemeteries, railway embankments, golf courses and roadside verges. Even here they are not safe. The huge Australian Commonwealth Bicentennial road improvement programme is likely to polish off the remnants and the race is on against the bulldozer to identify and reserve these natural grasslands.

About 20 percent of Tasmania's plant species are either unprotected or poorly protected in reserves. Scientists and conservation groups have documented a network of bioreserves aimed at protecting all Tasmania's endemic plant species.

As well as seeking better protection for Tasmania's native plant communities, Australian conservationists are battling hard to preserve wilderness areas in the south and the north-west of Tasmania. To do this they want substantial enlargement of the present National Parks in Western Tasmania. This is the only way to prevent logging, mining, and hydro dam construction.

Dams destroy wilderness

They have an enormous challenge before them. Tasmania has a long tradition of environmental destruction. Lake Pedder was flooded in 1972 after huge protest. The Liberal Premier of Tasmania, Robin Gray and his dam-loving colleagues, still feel very bitter towards conservationists. In 1983, the Australian High Court empowered the Federal Government to stop the Tasmanian State Government building the Franklin-Gordon dam in South-West Tasmania. The dam site and river were the scene of huge public protest and even world-famous botanist David Bellamy was arrested. The Franklin dam issue became a key Federal election issue in 1983. The Tasmanian Labour opposition are little better. In March 1985, Opposition Leader Ken Wreidt stated "we stand by the view that we should develop our hydro resources to the maximum....".

One of the leaders in the campaign against more hydro dams in Tasmania's wild south-west, Wilderness Society's Bob Burton, has produced an excellent report called "Overpowering Tasmania". This reveals that the Tasmanian Hydro Electric Commission's power demand projections have grossly over-estimated demand. The State has an embarrassing oversupply of power which can only be sold at bargain basement prices. Present and planned hydro power developments in the rugged west are hideously expensive and far more costly than low pollution thermal generation from low sulphur coal in the north-east of the State.

The Gordon River was dammed in 1972 despite huge public protest. Today dead trees scar its fluctuating shoreline and bear testimony to a fate which our Lake Manapouri narrowly avoided.

Mountain ash (*Eucalyptus regnans*) is the world's tallest hardwood tree. After pressure from the timber industry this forest was excised from Mt Field National Park in the 1950s for logging.

The tiny pigmy possum is found mainly in Tasmania and nests under bark and in hollow trees. Pigmy possum need natural forests to survive because clearfelled, burnt and regenerated forests contain no old trees and are burnt at regular intervals to reduce "trash".

Photo: Anne Wapstra

MEMBERSHIP APPLICATION

TO: THE NATIONAL SECRETARY
ROYAL FOREST & BIRD PROTECTION SOCIETY OF NZ INC
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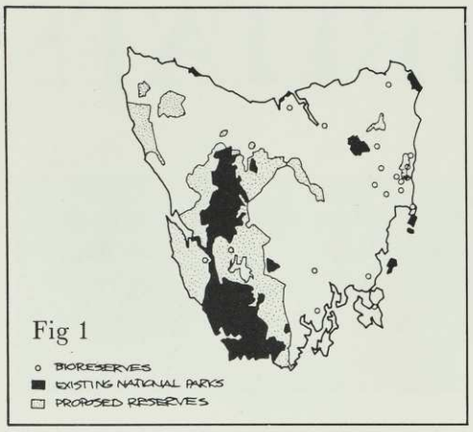


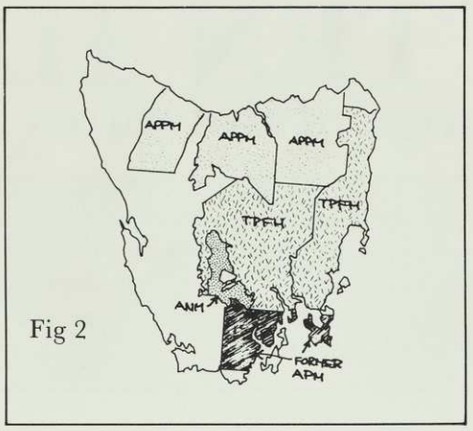


Fig 1: Existing national parks and reserves and park extensions proposed by Tasmanian conservationists to preserve wilderness areas and create a representative park system. Bioreserves are smaller areas proposed to protect all Tasmania's endemic plant species.
(Source: Forest Action Network)

Fig 2: Three woodchip companies have exclusive and long-term rights over most of Tasmania's forests. One company, Associated Pulp and Paper Mills (APPM) controls state forest over half the state.
(Source: Forest Action Network)

400 ha a week.

The major threat to Tasmania's native forests is now woodchipping. A huge 2.6 million cubic metres of hardwood native forests are chipped each year. Virtually all of this is exported unprocessed to Japan. Over 400 hectares of forest are cleared in Tasmania each week and woodchipping threatens all the proposed reserves. Clearfelling for woodchips is irreversibly turning natural tapestries into controlled tree farms or derelict land.

One company, Associated Pulp and Paper Mills (APPM) alone holds the exclusive and long-term rights to pulp the wood from over half of Tasmania. Two other woodchip companies have concessions over much of the remainder of the forests. The companies operate under export licences issued by the Federal Government which expire in 1988. Conservation groups and even Forestry Commission staff want controls on these licences to help Tasmania's environment and economy. Studies published by Tasmanian conservationists show that far from benefitting the Tasmanian economy, woodchipping incurs major economic costs. Since woodchipping commenced twelve years ago, 4,000 jobs have been lost in the State's forest industry. Woodchipping employs eight times fewer people per volume of wood cut than paper-making and is also propped up by a $20 million annual public subsidy for roads, railways and administration. Alternative forestry schemes which create more jobs, generate more revenue and are far less environmentally destructive have been put forward in a *Forest Industry Strategy for Tasmania* by conservation groups who have united in a coalition called the Forest Action Network. Overall their plan shows that it is possible to create all the proposed reserves and improve environmental controls on forestry operations without loss of jobs.

Nature tourism booming

The Network is also actively promoting nature-based tourism which provides jobs without destroying natural and wilderness values. Their booklet *Explore Tasmania's Wild* describes hundreds of natural areas throughout the State for camping and nature walks and other outdoor activities. They have also produced brochures to guide tourists through Tasmania's South-West World Heritage Area.

Sadly their enthusiasm cannot be harnessed by State Government agencies, well aware of the world-wide boom in nature-based tourism.

''The Franklin-Gordon River blockade focussed world attention on Tasmania, however we've been instructed by Government not to capitalise on the publicity in our tourist promotions'', says Tourism Department director, Gordon Dean. The State Government has even banned Tourism Department and Parks and Wildlife Service offices from displaying attractive tourist road guide brochures produced by the Wilderness Society. Parks and Wildlife Service staff were recently instructed by Government not to even talk to the Wilderness Society!

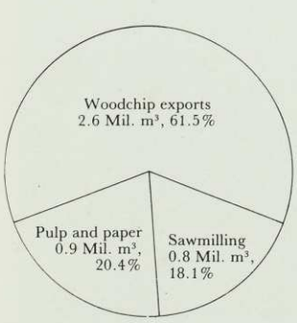
Despite this, the tourists keep coming and last year 72,000 people went on tourist cruises up the Gordon River from the small West Coast town of Strahan.

Times are changing. Tasmanians know that if they don't promote their natural areas, mainland Australia visitors will simply go to New Zealand which has no hesitation in such nature tourism promotions. The tourist attractions of convict settlements and casino are giving way to rainforests, wild rivers and wilderness. Meanwhile the courageous stand of Tasmanian conservationists both within Government agencies like the Parks and Wildlife Service and in the coalition of conservation groups can only be admired. They deserve our full support.

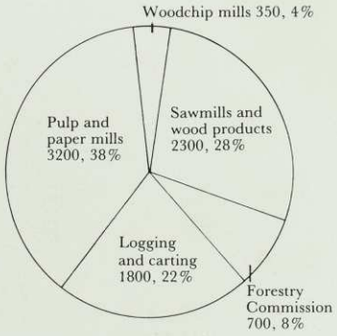
In 1976, the Tasmanian state government commissioned a Canadian consultant, David Young, to report on Tasmania's forests and forestry. In a chapter entitled ''It Tolls For Thee'' he concluded: ''The 400,000 people who live in Tasmania enjoy one of the richest and one of the most beautiful parts of the earth. What they have done to it, and what they are doing to it, is an offence against nature, and a crime against their fellow [humans] .... What is needed is the scarcest resource of all: humility. Until the people of Tasmania abandon the arrogant view that they have a right to destroy the island, desecration, despoilation and waste will continue. No report, no recommendations, will generate humility.'' The report was not released.

The author acknowledges the assistance of an ANZAC Fellowship for a four month conservation study tour in Australia in early 1985, and the help of the Wilderness Society and Australian Conservation Foundation.

All photos except for the pigmy possum by Gerry McSweeney



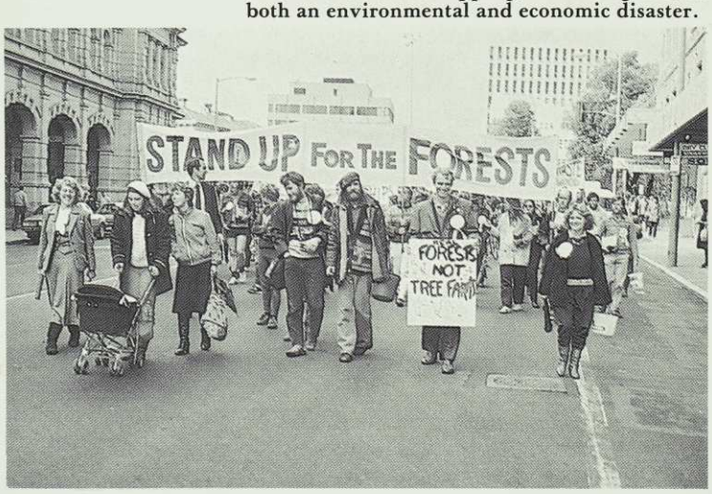
Wood use, Tasmanian Forest Industry



Jobs, Tasmanian Forest Industry

Fig 3: More chips — fewer jobs. 61.5% of the state's wood is chipping for export but this generates few jobs and is propped up by hidden subsidies. (Source: Tasmanian timber industry statistics 1983–84)

6,000 Tasmanians marched through Hobart's main streets on 19 April 1985 to protest against uncontrolled woodchipping, now recognised as both an environmental and economic disaster.



FORGOTTEN HABITATS
conservation challenge of the future

The battle for protection of non-forested natural areas of New Zealand — tussocklands, wetlands, shrublands and dunelands — is one of the major challenges facing the Society. Executive member **Alan Mark**, a professor of botany at the University of Otago, has long been interested in conserving these important parts of our natural heritage. This article is an abridged version of this year's Sanderson Memorial Address which Professor Mark delivered.

How representative are the formally protected natural areas of the total biological resource of this country? It is generally accepted that the representation is very poor, although significant areas of non-forested ecosystems have been protected in most national parks, in several scenic and allied reserves, as well as in some state forest parks, sanctuaries and ecological areas.

In Canterbury, we know from the DSIR Botany Division's inventory of scenic and allied reserves that, while about 70 percent of the natural landscape is non-forested (mostly tussock grassland), less than six percent of the total reserved area is in tussocklands or some other type of non-forest cover.

Otago is no better off — 68 percent of the original landscape is non-forested, mostly tussock grassland, but less than 13 percent of the reserves system is of tussock (and only about 0.11 percent of it lowland tussock grassland). However, 400 hectares has been set aside as the Lindis Pass Scenic Reserve. Though the landscape here is impressive, the condition of the grassland is very poor. The area is still retained within pastoral lease and is grazed on a co-operative management basis — an example of a compromise that could be more widely used in the future.

The representation is similarly poor in Southland and Marlborough. In Marlborough there are no tussock grassland reserves, although naturally these were important.

There are, however, in the latter some small shrubland reserves to retain areas of the unique broom species in their natural habitats. The 3500-hectare Waituna wetland adjacent to Foveaux Strait has been ranked of international importance, though its conservation and scientific values could be greatly enhanced by the addition of adjacent areas of Crown-owned lowland cushion bog. Two hectares of red tussock grassland has been reserved alongside the main highway at Pukerua near Gore in northern Southland. We have also been promoting the Gorge Hill area alongside the highway to Te Anau as a combined scenic-scientific red tussock reserve. The case was finally clinched after 13 years of deliberation with the request of the Wildlife Service to release takahe raised from eggs collected in the wild, into a part of the area. Lands and Survey has now recommended a relatively large (3200 hectare) area, half red tussock and half beech forest, for reservation.

In an adjoining ecological district, the Land Settlement Board has recently confirmed a 35,000-hectare pastoral park for the Lake Mavora area — the balance of the land development block considered unsuitable for intensive development. The National Parks and Reserves Authority recommended, along with a majority of those making submissions, that the area — a magnificent mountain landscape of mixed tussock grasslands, alpine barrens, wetlands and beech forests — should be destocked and formally reserved.

Ecological Areas

Within state forests, ecological areas, though mostly forested, have made a significant contribution to the national system of non-forested protected natural areas within the last decade. Tussock grasslands, wetlands and shrublands are all included in the almost 200 areas involving a third of a million hectares that have been accepted for reservation.

The concept, together with that of ecological districts, was initiated by a scientific committee which has now been disbanded and replaced by the Protected Areas Scientific Advisory Committee which is to look at reserve needs throughout New Zealand regardless of tenure.

An important feature of these ecological area reserves is the criteria used to identify them — a substantial size (at least 1000 ha) with natural (catchment) boundaries and fully representative sequences of ecosystems. Moreover, the exercise of ecological area identification was not constrained or even influenced by the Indigenous Forest Policy. Indeed, the committee at its last field meeting in 1984, expressed its concern to the Forest Service that the Government's Indigenous Forest Policy had the undesirable effect of implying that only indigenous forests were worthy of conservation, whereas to the committee a full range of native ecosystems justified preservation and conservation.

In this context I noted with satisfaction an announcement made by the Director General of Forests in March of this year regarding the classes of natural vegetation that in future are to be regarded as indigenous forest for the purpose of the Indigenous Forestry Policy. Included was:

> "Seral vegetation, or other natural vegetation, considered locally important as native wildlife habitat or as representative of a vegetation type otherwise rare in the ecological district."

Clearly this widening of the scope of the IFP is most significant and represents an important move by the Forest Service is response to these and other expressions of concern.

Current Issues in Non-Forested Ecosystems

Shrublands

Three current major issues here are the Te Paki, Waitere and Aotuhia areas of the North Island.

Te Paki in the far north involves some 20,000 hectares bought by the Crown in

At Te Paki in the far north, beautiful Spirits Bay was zoned for clearance by the Lands and Survey Department, but pressure from the Society and others has forced a deferment of the Department's plans. This photo looks south-west to Cape Maria van Diemen.
Photo: A. F. Mark

1966 to protect important natural features, as well as to develop areas for farms. Pressure from the Society (see article in November 1984 issue) and others has led to Lands and Survey deferring development of Spirits Bay, a 2250-hectare area with high biological values. The Society believes Te Paki should become a National Reserve because of its biological and cultural importance.

At Waitere near Napier, a 1650-hectare land development block contains substantial areas of indigenous shrubland with relatively high numbers of North Island kiwi, fernbird and robin — indeed the highest density of kiwis on public land in Hawkes Bay. The Land Settlement Board has placed a three-year moratorium on the block to allow it to resolve the conservation issues.

The August 1985 *Forest and Bird* looked at the issue of Taranaki's Aotuhia Land Development Block adjacent to the proposed Wanganui River National Park, where 12 farms are identified for development at cost of $10 million. Besides being an uneconomic proposal, it would also destroy shrublands which are ideal habitat for kiwi.

A further North Island issue, as yet unresolved, is a substantial area of the now rare monoao *(Dracophyllum subulatum)* scrub on the Whakatau Farm Development Block in the Rotorua district. The case for reservation here is also compelling.

Wetlands

The 1983 report of the Environmental Council's Wetland Task Force highlighted the seriously diminished state of the remaining wetlands, and prompted strongly-worded conservation policies from several Government departments and statutory bodies, eg Land Settlement Board.

Several wetland areas presently being considered for reservation demonstrate a range of problems still being encountered.

Unauthorised drainage of wetlands contained within pastoral leases have undermined the integrity of important wetlands in South Canterbury (eg the Wolds) and in the Matukituki Valley of western Otago (Big Boggy Burn) while boundaries defined within the perimeter of some wetlands destined for reservation has undermined their integrity as ecosystems. This occurred with Borland Mire near Monowai in western Southland and at Kepler Mire, a unique string bog in the Manapouri-Te Anau basin of western Southland — in the latter case subsequent realignment of the fence has resolved the problem.

The Waituna Wetland Scientific Reserve in Southland is one of only two in New Zealand recognised as being of international importance. Here two adjoining areas of cushion bog, Awarua Bog and Seaward Moss, would provide a much better representation of the unique lowland cushion bog communities. These two areas of Crown land are under threat from land development and possible lignite exploitation. Reserve proposals supplied on request by DSIR Botany Division in 1977 to Lands and Survey Department have received no action to date.

The nationally important Whangamarino wetland, of almost 10,000 hectares in the lower Waikato Valley, in which biological, ecological and hydrological values are all recognised — it is an integral part of the lower Waikato flood protection scheme — has been the subject of recent significant decisions by the Planning Tribunal, High Court and Court of Appeal. Two farmers who own land on its margin were granted water rights by the local catchment authority to allow them to drain their areas for farming. The Planning Tribunal dismissed appeals against these rights and ruled that the Water and Soil Conservation Act did not provide procedures for identifying and protecting important wetland ecosystems in perpetuity.

Significantly, the judge said the efforts of the appellants (including Lands and Survey) would have been better directed to providing for improved control and preservation of wetlands. The Department appealed this decision to the High Court and eventually to the Court of Appeal. Amendments to the law are clearly called for if wetlands are to received adequate legal protection.

Coastal wetlands are equally vulnerable — the Aramoana salt marsh, at the entrance to Otago Harbour, remains vulnerable to industrial development, as is the Ahuriri estuarine wetland near Napier.

Coastal dunelands are seriously under-represented in the protected natural areas system and many important ones remain under threat. At Kaitorete Spit, which encloses Lake Ellesmere, native dune plants and ecosystems are threatened by sand mining (see *Forest and Bird* August 1984).

The Protected Natural Areas Programme is at present investigating areas such as Otago's Old Man Range. As a result, these magnificent tors and the unique vegetation surrounding them may be formally reserved.
Photo: G. Romseur

Some tussockland areas have been accepted for reservation as State Forest Ecological Areas. The photo shows snow tussock on the Tararuas, just below Mt Hector. (c.4500 metres)
Photo: A. F. Mark

Tussock grasslands

Major debate focusses on the South Island, but in the North Island the substantial upland Ngamatea red tussock-wetland near Taihape is being rapidly diminished through the injection of Rural Bank finance for farming. The area is privately owned, but given the high elevation and its importance as a water source, the use of Government money to develop it appears to be highly questionable.

Most of New Zealand's unique tussock grasslands are contained within the Crown-owned pastoral leasehold land of the central and eastern South Island — 2.7 million hectares or 10 percent of the country's land surface.

Several recent official publications have highlighted the lack of formally protected natural areas within this region. The Society is financing, in collaboration with Federated Mountain Clubs, NZ Acclimatisation Societies and the Deerstalkers Association, a fulltime researcher into the conservation and recreational aspects of this land.

The Society strongly supports the Government's recently restated policy of de-stocking, retirement and resumption of Class 8 and severely eroded Class 7 lands — areas that have no sustainable productive capacity. Many unique natural features of New Zealand are contained in these areas and virtually none have been formally recognised to date. There are also important recreational values in these areas that complement those available in our national parks.

Values of Non-Forested Natural Areas

The protection of non-forested natural areas will serve a multitude of purposes that are in the national interest. For example, protecting wetlands and high-altitude tussock grasslands will improve management and production of water for a range of human uses, as well as enhancing soil conservation.

The education, recreation and tourist values of such areas will continue to grow as they become better known. An increasing number of eminent overseas biologists are visiting New Zealand with the express purpose of studying various aspects of these largely non-forested areas. Clearly New Zealand's non-forested natural ecosystems are internationally as important and as unique as the native forests which have received strong public support and official recognition.

Protected Natural Areas Programme

This was started in 1982 with the completion of an Ecological District Map, followed by publication of a comprehensive Register of Protected Natural Areas in New Zealand. This has allowed the reserve needs to be clearly defined. It has certainly highlighted the dearth of reserves in the central and eastern South Island, especially on Crown pastoral leasehold land.

Over the first two summers seven ecological districts of the MacKenzie Ecological region, plus four ecological districts in Central Otago, together with part of the Heron Ecological Region in Canterbury, have been surveyed and reports are now beginning to appear. Other districts are also being surveyed in the North Island — that for the Raglan Ecological District is now available.

The organisational procedure to assess these reports and act on recommendations is at present being put in place. It will involve an initial assessment by the Protected Areas Scientific Advisory Committee, and subsequently by the Forest Service and Lands and Survey for land in Crown tenure, but also by the QE II National Trust for private lands.

Clearly, the substantial investment of finance and personnel now committed to the PNA programme, and the publicity it has received both here and abroad, has heightened expectations about what it will achieve.

Continued support for the exercise and its objectives will be assured from the scientific community. However, it is likely that success will be even more dependent on widespread public support, similar to that generated for saving native forests.

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 12 in five bedrooms, single and double beds. Sleeps 18 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 $14 single, $18 double. Non-members $20 single, $25 double. Children 5–12 $6. Continental breakfast available $4. (Day Visitors) All adults $2, children 5–15 $1, Family $3 or $5. Closed to day visitors but not House Guests Mon & Tues.

Bookings and Information Leaflet: Custodian, Bushy Park Lodge, Kai Iwi, RD8 Wanganui. Telephone Kai Iwi 879.

Okarito Beach NFAC Cottage

Sleeps 4–6 in basic but comfortable facilities, water, wood stove, 2 rooms. Sited in historic township, coastal and bush walks, Okarito lagoon, Westland National Park and glaciers. $3 per person per night. Bookings: Bill Minehan, Private Bag, Hokitika, Ph 734 Whataroa.

Patoka 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 sent a stamped addressed envelopes to the Booking Officer, June Northe, 212 Kennedy Road, Napier, Telephone Napier 438-193.

Ruapehu Lodge, Whakapapa Village, Tongariro National Park

Ruapehu Lodge is now available for MEMBERS ONLY, and all bookings must be made with the Society's head office, P.O. Box 631, Wellington.

Fees: Winter Season (1 June to 31 October and Christmas and Easter holidays $8.00 per night. Summer Season 1 November to 31 May) Adults $6.00 per night Children $3.00 per night

Full payment must be paid four weeks before occupation, (otherwise bookings may be forfeited) 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

Situated 72km from Balclutha on State Highway 92, Tautuku Lodge on the Society's 550ha bush-clad Lenz Reserve in coastal south-east Otago.

The lodge is fully equipped and accommodates eight or nine people. Bring with you food supplies, bed linen, blankets, towels, tea-towels etc.

For rates apply to the Booking Officer Miss M. Roy, Papatowai, Waipati, RD, Owaka, enclosing a stamped addressed envelope.

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 surf beach and close to bush reserves and walking tracks in the Waitakere Ranges.

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

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

Different rates apply for winter and summer, for rates send a stamped, addressed envelope to the Booking Officer, Mrs B. Marshall, 160 Valley Road, Henderson, Auckland. Telephone 836-5859.

Waiheke Island Cottage, Onetangi, Waiheke Island

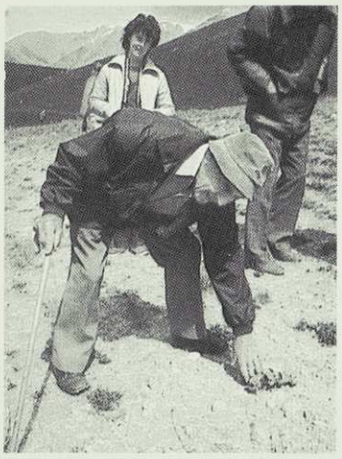
The cottage has comfortable bunk accommodation for eight people and has a stove, refrigerator, and hot water. Adjacent to a 49ha wildlife reserve, belonging to the Society it is in easy walking distance from shops and beach. It is reached by ferry from Auckland City (two or three returns daily) and by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

Different rates apply for winter and summer. For rates sent an addressed envelope to the Booking Officer, Mrs R. Roley, 23 Stoddard Street, Mt Roskill, Auckland. Telephone Auckland 696-769 (evenings).

Bulletin

TRIBUTE TO A CONSERVATION CAMPAIGNER

DR LANCE McCASKILL OBITUARY



Lance McCaskill in his natural environment — the Castle Hill Nature Reserve. This photo was taken in November 1983.

On 8 August, our Society lost a distinguished life member and an outstanding conservationist when Lance McCaskill, aged 85 died in Christchurch. He had a long remarkable career in education, agriculture, high country and soil conservation management and in recent years as a prolific natural history writer. His booklets on New Zealand's scenic reserves and on Molesworth station, soil conservation and wilderness are well known. A founder member of Forest and Bird, he recently recalled that the origins of the Society followed heated discussions conducted along the Wellington waterfront!

From the 1920s onwards Lance actively promoted the appreciation and planting of native plants, particularly through his work in schools and universities. To commemorate the NZ Centennial in 1940 he helped organise a scheme to establish native plants throughout our schools. He also played a pioneering role in soil conservation work — especially in the South Island high country.

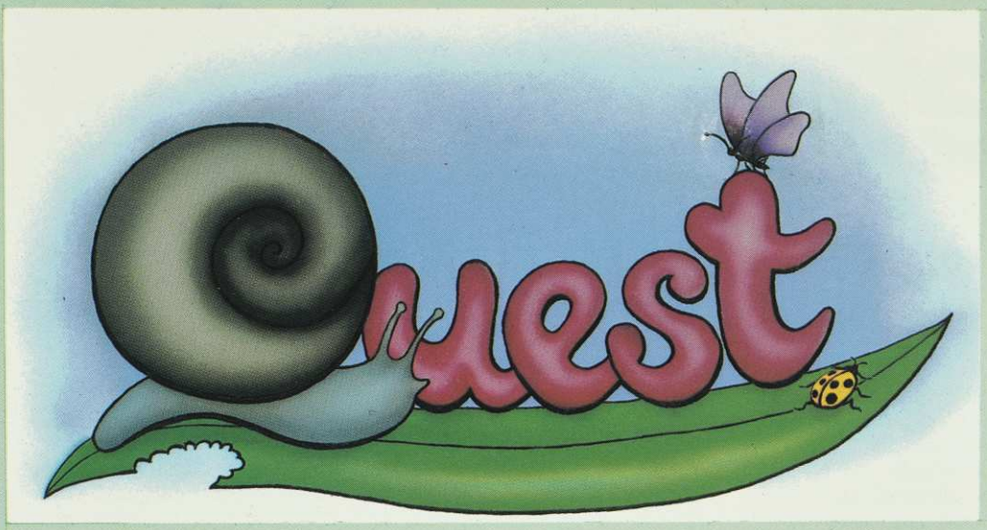
Lance McCaskill was a committed and determined nature conservationist. He was always prepared to argue persuasively for conservation — whether in 1958 to convince West Coast local bodies that they should establish a National Park to commemorate Westland's Centennial; to preserve and protect his beloved and rare Castle Hill buttercup or in his battles to stop an ecologically disastrous road realignment over the summit of Arthurs Pass. His determination and enthusiasm usually won through, particularly because of his talent for linking conservation principles to practical actions.

In recent years, Lance maintained his close interest in our Society. He strongly supported our efforts to add the lowland forests of Okarito, Punakaiki and Waitutu to the National Park system he campaigned so hard to establish. He was delighted when we recently began major efforts to protect natural areas in the South Island high country. I'm sure he would be equally delighted to hear that at last we are to have a nature conservation department.

Lance McCaskill's death is a sad loss to our Society but we plan to remember his conservation efforts by establishing a McCaskill Trust, to fund further conservation work, especially by young people.

These I remember, with the wind that blows
Forever pure down from the tussock ranges,
And these remain, like the everlasting snows,
Changeless in me while my life changes,
These and a thousand things that prove,
You rooted like a tree in the land's love.
James K Baxter "To my Father"

G. D. McSweeney



In this issue of Quest you will find the results of our first competitions. Congratulations to the winners, who have already received their prizes, and thanks to all of you who entered. Thank you, too, for sending in the survey slips. They will help us a great deal when planning your future Quests.

Don't forget to keep sending us your ideas, and there's another competition for you this time. Tui has an important message for you as well.

Piers Hayman

Famous Frogs

Illustration of Hamilton's frog kindly supplied by the New Zealand Post Office.

You really need to be someone extra special before having your portrait on a stamp — particularly if you are a frog.

Here in New Zealand, the three kinds of native frog that still survive are *all* special, because they belong to what is considered to be the oldest family of frogs in the world. Like their salamander ancestors, they have muscles with which to wag their tails, even though as adult frogs they no longer have any tails to wag. Also, the joints between their vertebrae, or sections of the backbone, are shaped in a special way, which, apart from one related group in North America, is quite unlike the backbone of any other frog alive today.

Another unusual feature of our native frogs is that they seem to have adapted to a life away from still water. Their eggs are laid on land, and the tadpoles do not swim about in the water but develop inside the eggs to emerge as baby froglets. The adult frogs do not live in the water either, and only one of them has any webbing between its toes at all. Webbed feet are not much use on dry land.

Actually, the land on which they live could hardly be called dry, for they all three prefer cool damp areas were they can creep about under stones or fallen logs. They only venture out at night, and then, more often than not, only in wet weather.

Of the three, Hamilton's frog is the most special, simply because it is the rarest. It is named Hamilton after Harold Hamilton, a scientist from Wellington's Dominion Museum who made the first formal studies of this frog in 1916. In fact, its first European discovery was made 2 years earlier by Mr R. G. Smith, the son of a lighthouse keeper, so perhaps it should really be called Smith's frog. However, the scientific name was officially registered as *Leiopelma hamiltoni*, and that is how it has remained.

Mr Smith found the frogs living in a boulder bank on Stephens Island in the Cook Strait. At the time the bank was shaded by dense kohekohe forest and the boulders were covered with moss, but in the years that followed the forest was cleared for grazing stock, and the land dried out. No-one seemed particularly interested in the fate of the frogs once they had been identified, and as they had not been found anywhere else, it was assumed that they had all died out after the land was cleared.

In 1949, a Dr Dawbin decided to see whether this was in fact the case, and a year later he was able to announce to the world that Hamilton's frog had managed to survive. The frogs were still living in their boulder bank, which although now dry and bare on the surface, was able to retain enough moisture deep down between the rocks from mist and rain, to allow the frogs to keep going.

Since then there has been a Wildlife Service programme to protect the frogs and to replant their boulder bank, now known as Frog Bank. There are no other Hamilton's frogs anywhere else on Stephens Island, not even in the remaining patch of kohekohe forest which is only a short distance from the boulder bank. Possibly the rocks are the only place where the frogs are safe from prowling tuataras or burrowing petrels.

In 1961, frogs living in preserved kohekohe forest on Maud Island, also in Cook Strait, were positively identified as Hamilton's frogs. This was a great relief, for the total area of Frog Bank is only about 600 square metres. That is hardly large enough for the entire world population of Hamilton's frogs, even though

they are less than 5cm long. Also, Maud Island has no tuataras and no burrowing petrels, so the forest there is probably safe for frogs.

There are now estimated to be about 200 frogs living in Frog Bank, and a further 1000 or so on Maud Island. It is thought that they are the last survivors of a frog population that also existed on the mainland until destroyed by the activities of man and the predators he brought with him. Maud Island and Stephens Island are still free of rats, and there is hope that on these offshore islands Hamilton's frog can be sufficiently protected.

Perhaps frogs are not your favourite creatures, but they have just as much right to survive as kokako or kauri, or even you and I.

(Information about Hamilton's Frog was provided by Dr Brian Gill of Auckland Museum).

Offshore Islands are of great value to conservation in New Zealand. They can provide naturally isolated and protected homes for many of our endangered species.

Some of these islands even have their own plants and animals that are found nowhere else. The Poor Knights Lily (above left) was discovered in 1924 by a scientific party visiting the Poor Knights Islands, 25km off the east coast of Northland.

It was a certain Mr H. Hamilton of the Dominion Museum who brought the plant back to camp — perhaps he had been out looking for frogs?

When not in flower, this plant looks very much like New Zealand flax, which is possibly why it had not been noticed by previous expeditions. It also grows on another island close by, but apart from that the only other plants remotely related to it are found in the mountains of New Caledonia.

The Auckland Islands lie 320km south of Stewart Island. Long ago these islands were settled by brown teal, and the birds have lived for so long in this different environment, seperated from their mainland relatives, that they have developed their own individual characteristics.

Auckland Island teal (above right) are smaller, and there are subtle differences in the colour and pattern of their feathers. Their life on the islands has not required them to fly about, for everything they need has been within walking or swimming distance. More important, there were no predators from which they had to escape, so Auckland Island teal have lost the ability to fly. Introduced rats and cats have, of course, completely altered the situation, and there are now thought to be only about 600 of these birds left.

Frank Alack Award winners.

First prize of $90 goes to 15-year-old **Karen Johnston** from Wanganui. Her entry entitled 'The Parson Bird' was judged "quite outstanding" and will appear in a future issue of Quest. Second prize of $30 goes to 10-year-old **Sarah Markham** from Waverley, Dunedin for another original piece of colourful writing, and the third prize of $10 is also for a 10-year-old, **Alison Robinson** from Manaia, South Taranaki.

A special mention, too, for 15-year-old **Dean Starnes** from Bombay, Auckland, for some excellent drawings.

All the entries were of a high standard, and some of them were exceptionally well presented, but in the end it was the originality and style that counted.

You will no doubt be all agog to know the answers to the questions in our other competitions. We asked you what is so unusual about a male *Acanthoxyla* stick insect. Well, it is unusual in that no-one has been able to find one! The females are able to produce baby stick insects without the assistance of a male, if indeed there are any males at all. Which means that the female stick insects are pretty unusual as well.

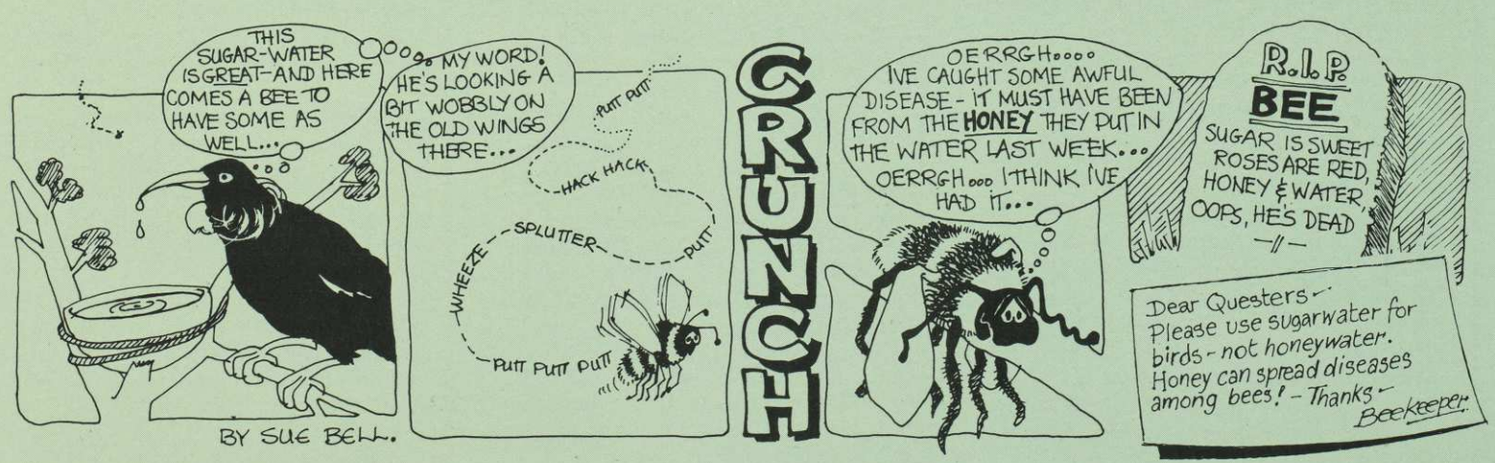
We had a lot more trouble with the number of individual tuis you can band with four different coloured bands, using no more than two bands per leg. We are reliably informed that the answer should be 440, which seems like an awful lot of tuis. We must confess that we have not tested this answer out on the birds, but our experts and their computers assure us they are never wrong!

A $30 book token this time for the first correct answer we receive to these two cryptic clues:

1. Rearrange a scientific hedgehog to save a Scotsman. (The answer is two words, the first with 6 letters, the second with 3 letters.)

2. Captain Cook's dumplings? (Two word answer again here, the first with 4 letters, the second with 7 letters.)

There is no closing date for this competition. As soon as you have worked out the answers send them to Quest Clues, PO Box 33220, Takapuna, Auckland 9. The first one right is the winner, so hurry!



These pages sponsored by J. R. McKenzie Trust

Index to subjects and authors, Vol 16, 1985

VOLCANOES OF THE SOUTH WIND

VOLCANOES OF THE SOUTH WIND

At long last a superbly illustrated book on the volcanoes of Tongariro National Park — the volcanic peaks that lie at the heart of the North Island of New Zealand.

This new book focuses on the fascinating geological history which shapes these distinctive active volcanoes. 'Volcanoes of the South Wind' has 128 pages, measures 208 x 202mm and is illustrated by more than 100 colour photographs. Subtitled a field guide to the volcanoes and landscape of Tongariro National Park this book is ideal for the keen park visitor. It is also highly suitable for your New Zealand or overseas friends.

It is worth noted that 'Volcanoes of the South Wind' is the first publication of the Tongariro National History Society — a non-profit organisation formed to promote a better understanding of the natural features of Tongariro National Park.

A field guide to the Volcanoes and Landscape of Tongariro National Park

by Karen Williams

- ★ Special price $19.00 a copy post paid in New Zealand.
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  P.O. Box 2421
  Wellington

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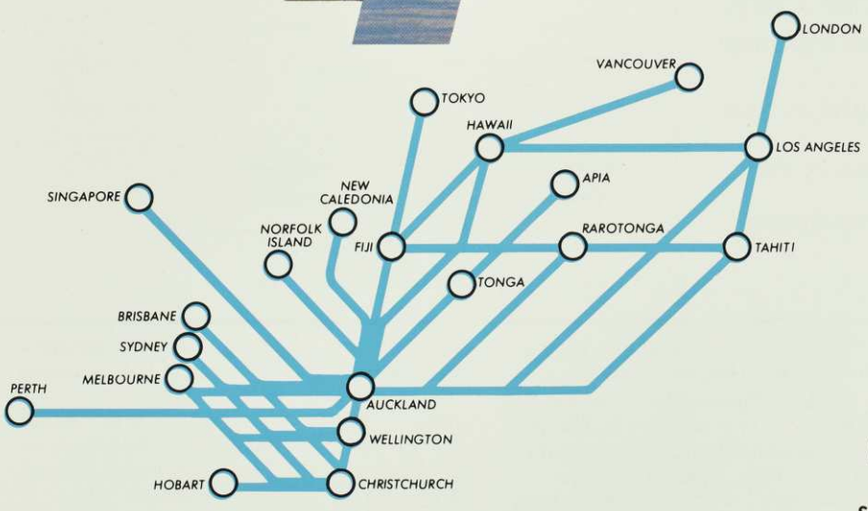

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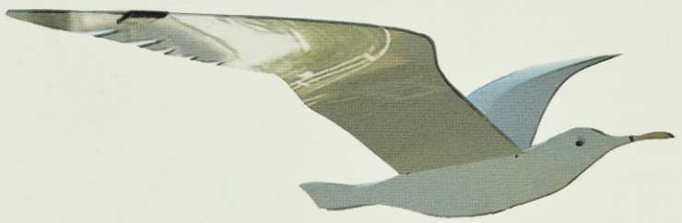

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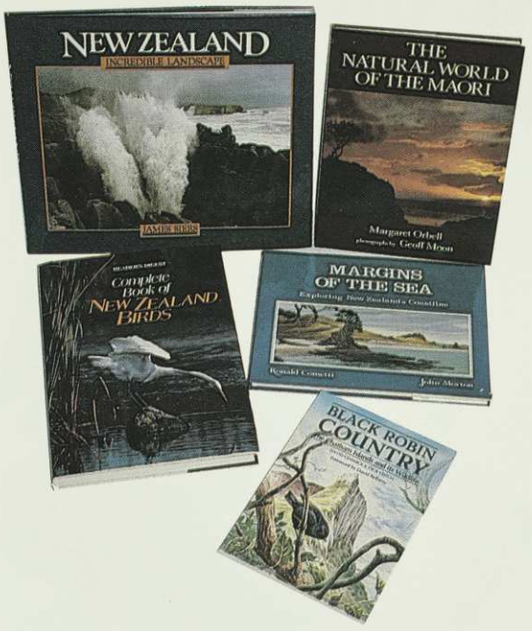
GREETING CARDS

Old Yellow — Chatham Island black robin. Artist Pauline Morse was specially commissioned by the Society to paint this endearing bird. 8 for **$4.00**.

Historic reproduction — this greeting card is a reproduction of a 1920's Society poster. 8 for **$4.00**.

BOOKS



New Zealand — Incredible Landscape by James Siers. Special Christmas offer, reduced from **$50** to **$20**!

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Photo by courtesy of Wildlife Service

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