Forest and Bird

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IN THIS ISSUE

COVER: The pied stilt or poaka, *Himantopus himantopus leucocephalus*, is a wader common to wetlands and mud flats. This pied stilt was photographed roosting by a shallow Waikato pond. Photo by Brian Enting.

INSIDE COVER (OPPOSITE): Moss hummocks in the Rahu Saddle-Maruia area. Surrounded by a mosaic of pakihi and beech forest, this delightful bog is in the catchment of the Grey River. Photo by Brian Enting.

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Use of public land

SIR WILLIAM MARTIN, New Zealand's first Chief Justice, once remarked that most of the cases that came before him were disputes about women or land. Though such a statement would today be branded as male chauvinism at least in part, it is only too obvious that the status of women in society and the use of land, especially public land, are issues that arouse passion and protest today.

Fortunately our Society's aims in this context are limited to land use. For the use of land is the very essence of our efforts to protect native animals and native forests. Habitats must be protected if their inhabitants are to survive. Our concerns must extend to wetlands and coastal areas.

We find ourselves interested and involved in such issues as the claims by the Te Atiawa people to prevent possible pollution of their fishing beds on the North Taranaki reefs. The report of the Waitangi Tribunal is subject to political veto, and the power of decision really rests with the Executive Government.

The position is the same under the National Development Act, the Mining Act, the Forests Act, and the Reserves Act. Under all these Acts the public inquiries that are conducted by the appropriate tribunals or departments are subject to final political decision. This decision need not follow the recommendation in the reports and recently it has not in several notable areas. This procedure is neither new nor particularly objectionable in form. Appeals to the Privy Council from the decisions of our Court of Appeal are in this form. The Judicial Committee only recommends its decisions to Her Majesty. By convention the Crown invariably accepts the recommendations. No arbitrary power is used. So public confidence is retained.

On the other hand ultimate decisions and exercise of power by Ministers in the name of the Crown, over public lands, are criticised as being motivated by short-term political gain. It is impossible to allay this criticism, however unfounded, when decisions are made by a Cabinet holding office for 3 years at a time.

Our Society has since 1974 at least championed the importance of full and open public inquiry and non-political decisions on the use of public land. The publication of management plans and the holding of public hearings to evaluate them are already provided for in the Forests Act and the Reserves Act. However, this is not obligatory. The Minister can effect decisions as to the use of forests and reserves without doing so. There is also inadequate provision for observing the decision-making process. Reasons for decisions are not usually given. An obligation to give reasons is a salutary requirement. Failing to give full reasons precludes analysis and criticism by opponents or vindication by proponents. It offends common sense to say that the decisions are too important for such a process and requirement.

I would very much like to think that reforms in this area will be considered in line with avowals of more open government so popular at the moment.

—A. A. T. Ellis, President

Permits must not be granted to moor at the Snares Islands

THE SNARES ISLANDS are a small group south-west of Stewart Island, of which they are regarded as an outlier only 113 km distant. They are uninhabited, and a strict control on landings has been enforced up until recently. Seals, sea lions, muttonbirds, petrels, and unique plants are in an undisturbed balance, which makes the islands of outstanding world significance. Last summer the granting of permits for the first time for fishermen to moor at the islands brought a real threat to the wildlife there. In this article Ronald M. Lockley, co-vice-chairman of the Auckland Branch, discusses the gravity of the threat for birdlife in particular if permits are granted again next season.

IN JANUARY the Department of Lands and Survey (with the approval of the Minister of Lands, Mr Jonathan Elworthy) announced in a Press release that fishermen could moor at the Snares Islands.

In earlier correspondence with the Minister, dating back to October, I had strongly objected, as a conservationist who has visited the Snares (in March 1981), to Mr Elworthy's giving permission to just one fisherman to moor at that time.

In his latest letter to me Mr Elworthy said that four fishermen had been granted permits to moor, but under certain conditions which were intended to lessen the risk of rats getting ashore from these boats moored in the Snares harbour. These permits were intended to last "for the current season to 28 February". It is understood, I believe, that during the winter the Department of Lands and Survey will be calling for public submissions on the future of the Snares.

This freedom to moor boats at the Snares, despite the precautions mentioned by Mr Elworthy (discussed below), brings too great a risk to the unique wildlife and rare species for which the group is internationally renowned. It is quite inexplicable that, for the sake of commercial profit by a handful of Southland lobster fishermen, the objections of thousands of conservationists the world over and nearer at home, including the 36 000 or more members of the Society, should be overruled.

Description of islands

The Department of Lands and Survey's booklet *The Sub-Antarctic Islands* gives the area of the islands as 242.8 ha. They were reserved in 1961 for the preservation of flora and fauna and are situated 209 km south-west of Bluff (113 km south of the southern extremity of Stewart Island).

The booklet says: "Because of the complete absence of introduced mammals and the virtually unchanged natural vegetation and animal life these islands form *one of the most important sanctuaries in the world*." (The italics are mine.)

The Department of Lands and Survey description further notes that the islands were not discovered until 1791 by British naval explorers (the Maori never visited them and seemed unaware of their existence so far south in the wild latitudes of the Roaring Forties).

The booklet adds: "Four species of birds are found nowhere else in the world—the Snares black tit, the Snares fernbird, the Snares snipe, and the Snares crested penguin. The islands are the breeding ground for vast numbers of sea birds—uncountable (but now believed to be nearly 3 million pairs of sooty shearwaters) muttonbirds, endless thousands of Snares crested penguins, up to 5000 pairs of

Discovered in 1791

The Snares Islands, home to millions of sea and land birds, were discovered independently on the same day — 23 November 1791.

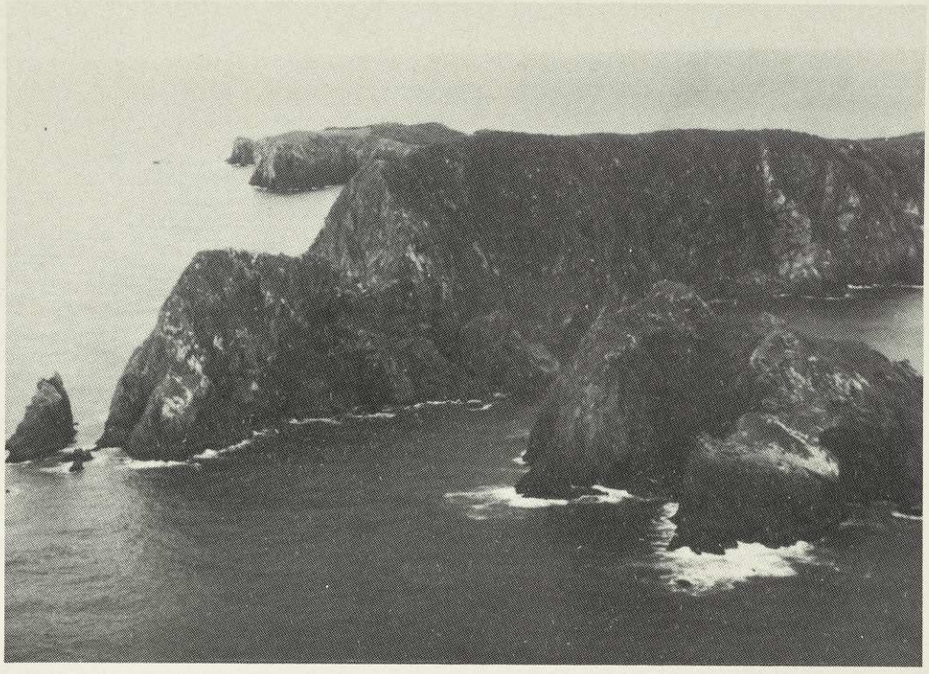
Captain George Vancouver, in HMS *Discovery*, sighted the island in the morning, and Lieutenant William R. Broughton, of HMS *Chatham*, saw them in the afternoon.

Vancouver named the group The Snares because of "their lurking situation and appearance".

There is one large triangular island (North East Island), a smaller island off to the south-east (Broughton Island), and several off-shore islets, pinnacles, and reefs.

Buller's mollymawks (this is a Snares subspecies nesting later than the subspecies at the Chathams), southern skuas, and Cape pigeons (petrels) to name only a few."

This enthusiastic Department of Lands and Survey description also briefly notes the vegetation: "There are only 30 species of plants. The deep peaty soil is densely vegetated, mainly by tupari (*Blearia lyallii*), which makes an almost closed canopy about 6 m high. The other woody plants are *Senecio stewartise* and *Hebe elliptica*. Also occurring are the punui (*Stilbocarpa robusta*), found nowhere else, and some small meadows of two southern tussocks."



The Snares Islands are only small in area, but they support a sea bird population equal to that of the British Isles.

Significantly the description ends with the warning: "Landing by anyone is prohibited except by permission of the Department of Lands and Survey."

When the *Lindblad Explorer* anchored off shore for a day in March 1981, on her Antarctic cruise, we were guided in several small zodiacs (rubber floats) around the coast by Lands and Survey officer John Mazey, and we saw for ourselves (some 80 naturalists from many nations) the enormous concentrations of sea birds and fur seals which certainly make the Snares probably the finest sub-Oceanic island nature reserve in the world.

We were, of course, not allowed to land, though we would dearly have enjoyed a walk to see the unique land species. We accepted this restriction gladly, in the interest of not disturbing the unmodified fauna and flora (though these little rubber inflatables could not possibly harbour rats, since they are carried when not in use on the boat deck and deflated, and the *Lindblad Explorer* is a rat-free passenger vessel).

Proposed control of rats

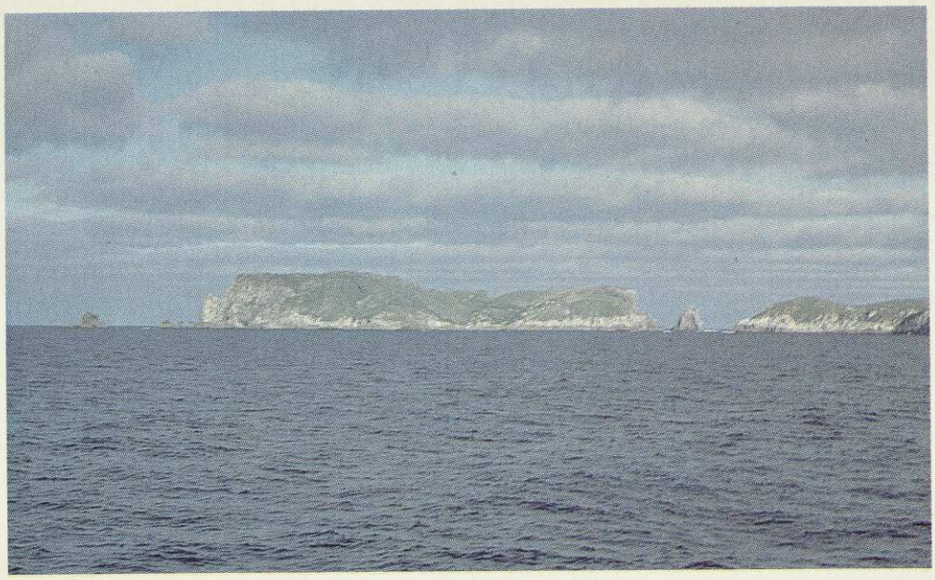
Mr Elworthy's letter laid down certain conditions with which fishermen were to conform. But we have yet to meet the fisherman who would not evade the rule, impossible to police adequately, that "boats must not leave their mainland (Southland and Stewart Island) ports"—notably infested with ship rats—"except in daylight". At that time some rats are likely to be hidden aboard and fast asleep in their self-fashioned nests below the floorboards or behind the walls of the fish-holds.

Ship rats emerge to feed at night only when there is a minimum of human activity — as at moorings. They find plenty to eat aboard a fishing vessel in the inevitable scraps of fish and human waste lying about and often washed down into the bilge.

"Putting down poison baits aboard." This rule (if it is observed—but who will police it?) may well kill a few young inexperienced rats, but it has many times been proved that mature rats, with their keen olfactory sense, avoid poison-tainted baits. (Try poison-baiting your compost heap; few rats will touch such bait.) Poison baits have never been reliably reported to achieve 100 percent kill.

It is quite ludicrous to insist that "any **additional** mooring lines must be weighted so that they are **partly submerged** between the boat and the shore". The terms (in bold type) are vague; such provision is meaningless to an experienced fisherman and can have been thought up only by a landlubber. Any boat in a small harbour, except in a rare dead calm (not often experienced at the Snares), will surge naturally at its mooring ropes, freely lifting, alternately, the rope each side.

In any case rats are expert swimmers and can swim for up to ½ km unaided by rope or other floating object. A rat descending from a boat on a mooring rope would swim easily across the gap of "submerged" rope to gain the rope tied to the shore. Indeed it is more likely that once in the



Broughton Island, a smaller island lying to the south-east of the main island in the Snares group.

Hardy coastal vegetation persists above the shore on the Snares.

Erect-crested penguins, one of the many bird species on the Snares, gather in conference on the beach.

A Snares bull sea lion, typical of Snares wildlife, showing its canines in a seemingly pugnacious display.

water it would swim direct to the shore.

"Landing at the Snares to be made only in daylight for the sole purpose of maintaining the mooring." Who will supervise this? A tired fisherman, arriving after that long crossing of 100–200 km, will certainly ignore this rule, for his life may depend on making the harbour when bad weather blows up. Like the first rule above, it is quite unenforceable.

The Snares lie in the belt of notoriously rough weather in the Lower Forties latitude, and any fisherman arriving and mooring is certain to be, at frequent intervals, weather bound in the harbour. This of course will give any rats on board additional time in which to get ashore at night, more especially as the fish waste aboard will diminish and disappear during this period of cessation of fishing.

With their keen sense of smell rats will be lured by the enticing odours of birds, seals, and plants to swim ashore. In rough weather the moored fishing boat may well need the additional lines to hold it against surging waves, which may be so bad that unless the

boat can escape through the narrow entrance of Hoho harbour it may well be wrecked by loss of all ropes. Both rats and fishermen will thus be thrown ashore!

Once ashore rats will never be exterminated by man. In the large, thick bush cover they will disappear from human ken. They will thrive on the abundant burrowing sea birds and their eggs and young all summer; in winter they will enjoy seeds and vegetarian food, as well as devouring the small, unique tomtit, snipe, and fernbird. These birds will be helpless to evade rats, which will hunt them out in their roosting places in holes in the ground or in the olearia bush. For a while, until in a year or so their numbers build up, the rats may not be detected even by searching human eyes.

Rat destruction on other islands

Rats landed from small boats and from wrecks of early sealing and whaling vessels on many subantarctic islands — the main Campbell and Auckland Islands, Macquarie, Stewart Island, and others—as well as islands in the tropics and the Northern Hemisphere. In all of these the endemic bird species were eliminated and only a few large birds survive today.

More recently we have the tragic example of the result of Southland fishermen tying their boats up at the South Cape outliers of Stewart Island in 1962; within 2 years rats ravaged the fauna and flora, exterminating insular forms of the saddleback, snipe, tit, fernbird, and bush wren. The last is now extinct to the world as a result. The thousands of muttonbirds and smaller petrels are approaching extinction there, and the smallest of these have disappeared.

Scientific surveys

In his reply (26 January 1983) to my letters of objection Mr Elworthy said: "As you mention in your letter, the department has funded an expedition from the University of Canterbury to work on the Snares until the end of February. As well as carrying out a research programme they will be able to keep an eye on the mooring and report any unauthorised landings. They will also maintain poison bait stations on the island."

Certainly this is a very necessary precaution, but, for the several reasons given in the section above on control of rats, rather like closing the stable door after the horse has bolted. Rats may well have landed already and be ranging far out of sight of even searching scientists. We can only hope not.

It is good news that the Department of Lands and Survey has subsidised this research by the University of Canterbury (unfortunately one suspects, because the Minister has a very uneasy conscience about the whole unfortunate change of policy which has opened the island to human and rat exploitation). But it should be known that this research is not new; it began with the publication of papers by scientists led by Dr John Warham on the unique fauna and flora, which proved the international importance of the Snares as a wildlife sanctuary. (A summary of this work is given in

Important island sanctuary

This article by R. M. Lockley is correct and timely, and the President has already made a strong submission from the Society against the permitting of moorings in the Snares. The important factor is that we are dealing with a notable fishery surrounding one of the most important island sanctuaries in the world. The mooring permits have now run out for this season, which enables further submissions to be made, and Society members should, if they feel so inclined, write to the Minister of Fisheries and to the Minister of Lands, emphasising the Society's and their own concern.

A marine reserve **must** be declared around the Snares Islands and encompass at least a 10-km minimum distance from the shore. This is a matter for the Ministry of Agriculture and Fisheries and its Minister. The islands already are nature reserves under the supervision of the Department of Lands and Survey, and such a marine reserve would tend to prevent the possibility of illegal landings and the consequent danger of rats.

There must therefore be a meaningful policing of the area with fishery protection boats, and with such an important responsibility laid on New Zealand to protect this unique island sactuary, this means a constant presence in the area, and expenditure on special protection vessels must be incurred.

It is an island group of scientific importance, and the need to maintain and house a shore-based party of scientist rangers must be met to safeguard the fragile ecosystem that exists there.

Since I wrote the above the Director-General of Lands has told me that shortly he will release for public comment a draft management plan for the Snares Islands nature reserve. With it will be an issues paper to cover the implications of the surrounding fishery to the management of the nature reserve. The decision to approach the question in this way and invite public comment on both the draft plan and the issues involved follows consultation between the National Parks and Reserves Authority and the Director-General of Lands at the Authority's meeting on 7 April.

—David G. Collingwood

Notornis 29: 262–292, published in 1982.)

The University of Canterbury team has followed up the earlier studies of the expedition of 1947, when Sir Charles Fleming, Robert Falla, R. C. Murphy (head of the Natural History Museum of New York and a world authority on sea birds), and Robert Wilson made the original observations which properly identified the four unique bird species. The story of this expedition is attractively written up by Wilson in his book *Bird Islands of New Zealand*, which everyone interested in our remote island reserves should read.

That book reveals that the Snares boat harbour is far from safe in the frequently wild weather the party encountered:

"Our approach was delayed by 2 days' bad weather . . . when at least we entered the harbour our propeller grazed a rock . . . there was a decided swell . . . the *Alert* was moored with lines fore and aft." However, "several of the ropes parted. It had been proposed that the party should sleep aboard, but the weather got worse with waves rolling in [on the rising tide]". The party was hastily put ashore, and with difficulty the *Alert* had to put to sea. "Had the *Alert* not gone out that evening, it seems almost certain she would have been wrecked, and as daylight was necessary to negotiate the narrow entrance, it would have been difficult to leave during the night."

For 5 days the party had to endure rain and wind in their tents ashore, which were also rained on by thousands of sooty shearwaters at night, even to invading the tents. These muttonbirds are so numerous that they are short of underground accommodation. Ornithologists should note that the younger first-breeder muttonbirds stand little chance of winning a desirable tunnel, for which reason thousands lay their eggs in the open.

Unsuitable for mooring

It is clear that the boat haven at the Snares is dangerous and unsafe entirely with an onshore wind. Then, with moorings parting, a boat must get out into the open sea and (if it is able) lie in the lee of the cliffs or steam the long, rough passage home. But it is this lack of safe boat refuge which has helped to preserve the island's unmodified fauna and flora. Of the many islets within the New Zealand 200-nautical mile exclusive economic zone only the harbourless small islands, unmodified by human settlement, are rat-free sanctuaries, for example, the Antipodes and the Bounty Islands and several small islands off Stewart Island; in the north several small islands in Cook Strait and the Hauraki Gulf.

To allow any one of these priceless international treasures to be at risk for permanent degradation by introduced mammalian predators is really monstrous.

Interference by foreign vessels

In the Department of Lands and Survey Press release it was stated that "discussions have disclosed that it is more probable that any danger to the wildlife on the Snares is likely to come from the larger vessels sheltering off shore while they are fishing in New Zealand's territorial waters". The Department would be reminding joint-venture fishing vessels of their obligations and asking that they remain at least 1 mile off shore.

This is very necessary; but one cannot enforce such a provision without policing the coast with fishery protection craft. However, if it were internationally known that the Snares are off-limits to all fishing craft, that would help to persuade foreign fishermen to respect the ruling. Though these large ocean-going fishing vessels are unable to enter the small Snares harbour, their dinghies or plyboats are likely to put ashore when such a vessel is anchored or idle near any coast. This is especially so on remote, unwatched islands, where the crew can raid sea bird and seal colonies for fresh "tucker" (a nice change from processed galley food).

It may also not be known that bird and seal flesh is regarded by fishermen as "sure-catch" bait for lobsters and crabs. For a grievous example, Bass Strait fishermen of Australia constantly raid, and have almost exterminated, the gannets breeding on small islets there.

I write from experience: I was for 10 years a crayfish and lobster fisherman living on a small island off the coast of Wales. I was appointed an honorary fishery protection officer to assist (in my strategic position) the United Kingdom Ministry of Fisheries in intercepting and occasionally arresting French fishermen who were illegally poaching at night, setting their craypots within the 3-mile limit and raiding the sea bird islets for the abundant gannets, puffins, shearwaters, and other edible birds, as well as rabbits and an occasional sheep.

If no New Zealand fishermen are permitted to moor at the Snares, there may well be less chance of foreign crews calling in there while their vessels are anchored near.

The only reason fishermen have been granted permits to moor at the Snares is purely commercial. They have overfished the Stewart Island, Foveaux Strait, and Fiordland

rock lobster and blue cod grounds and now wish to make a quick profit out of the comparatively virgin Snares ground.

After a few years these Southland fishermen (using smaller boats able to be moored at the Snares) will have overfished and so depleted the Snares in-shore grounds that they will not be worth the long voyage and small returns and so will be abandoned. Rats may well be established by then, and so for the sake of a temporary profit for these few fishermen the whole nation and the world will be deprived of these irreplaceable treasures of living species.

Reserve and research station

A plan should be worked out over the winter by which the Snares Islands will be declared a marine, land, and wildlife reserve and biological research station. This must include a reserve with a radius of at least 10 km from the shore (preferably 20 km) to protect the marine ecosystem and make a reservoir for the undisturbed breeding of lobsters and other fish. Such a reservoir would of course provide a continuous outward flow of commercially valuable fish for the benefit of the species and for those fishing vessels having a permit to fish beyond that in-shore limit.

With its new legal control of the 200-mile exclusive economic zone around our shores, New Zealand is entitled to enforce such a regulation. There are precedents both nationally (Poor Knights and Three Kings) and internationally (some Galapagos and Seychelles islands and areas elsewhere in the world, British waters included, where marine reserves are attached to wildlife island reserves).

The present permit system, which applies to all subantarctic and other New Zealand unmodified fauna and flora island reserves, would remain —of landing permits issued by the authority only for genuine scientific research. In addition the control of tourists would have to be supervised by officers appointed by the authority.

If the Government takes such a course, it will be applauded world wide and receive support accordingly. The International Union for the Conservation of Nature is eagerly awaiting this move, and the World Wildlife Fund is ready to give practical help.

There is only one major worry meantime. Have rats already got ashore? We will not know for certain until next year—or the year after. ■

BOOKS

New Zealand's Birds: Geoff Moon and Ronald Lockley

It is with great enthusiasm that I begin this review. The authors, Geoff Moon and Ronald Lockley, are, moreover, important members of the Society known internationally for their ornithological work.

As I carefully considered the pages and admired the photographic excellence I found myself considering that surely this book presented the zenith of New Zealand bird photography. There could be nothing better produced from today's techniques of colour photography.

It is because no better or more complete book could be conceived from colour photography to portray New Zealand birds that I claim it is the zenith. It will in my view remain so for many years to come, and it will become an enduring classical work. After all, the birds will not change, but in 100 years some of them may have become extinct, which makes these vibrant photos important to the inquiring specialist of the future, for here are the birds, clear, exactly as they are today.

What has made the book and Geoff Moon's photos so important in the long term is the happy fortune that Ronald Lockley has written the text. This world-renowned naturalist elected to live in New Zealand some years ago after all his work on Skokholm Island, off the coast of Wales, with sea bird research and his monographs on seals and rabbits. He has now brought his expert knowledge of New Zealand ornithology into this most readable and informative support for Geoff Moon's glorious photos.

Ronald Lockley has the rare ability to tell abstruseness in understandable terms. His introduction chapter alone could stand on its own as a monument to the whole long saga and recently troubled ornithological history of our New Zealand birds; it is so informative that it should be in all schools, for with such an understanding the young could be counted on to care for New Zealand birds in the future.

The book is right up to date; it was published in September 1982 and yet it refers to Government decisions made only weeks earlier.

There are 350 full-colour illustrations with their compelling text. Each bird is described in the same lucid way.

There are supporting chapters dealing with introduced birds, the study and conservation of New Zealand birds, the photography of New Zealand birds, and a species guide.

The book is large in format, 280 by 255 mm (11 by 10 in.), and is in a grey cover with a brilliant photographic loose over-cover. It is printed on good quality art paper.

In the plethora of books appearing lately about birds of New Zealand this one is no "catch penny". The authors and the publishers are to be congratulated for their courage and they deserve every success, for they have produced the book that tells all accurately in picture and in text. In my view it is the high-tide mark as a New Zealand book on birds and the one which will endure.

It is pleasing that such an important book is priced at $48.95. It is worth much more to the interested public as well as the professional ornithologist.

It is accorded the highest commendation and it is my hope that members will be moved to obtain the book for themselves or as a wonderful and enduring gift.

—David G. Collingwood

Heinemann, $48.95.

Pack ice, with Mount Discovery in the distance. The ice surrounding most of the Antarctic continent hinders any off-shore oil operations.

ANTARCTICA—a continent under threat

WITH MORE ICE than land Antarctica is a continent unlike any other. Remote from the rest of the world and almost inaccessible during the long polar night of every winter, Antarctica is a lonely place, stunning for its vastness and its pure and desolate beauty.

By Barney Brewster, Friends of the Earth

ANTARCTICA'S interior, a platform of ice averaging 1600 m thick, is the coldest desert on earth and is barren of all but the most primitive life-forms. The withering cold can easily kill those who are ill prepared for it, as Captain Scott discovered.

Yet Antarctica's shores, and the surrounding Southern Ocean, abound with life. The nutrient-rich waters sustain a broth of algae and plankton, which in turn supports great numbers of fish, seals, penguins, sea birds, and (at one time) whales. Unlike the human intruders, these animals have all adapted superbly to the rigours of the polar environment.

Why then have people ever ventured into so bleak and hostile a land? Though Cook despaired of the world ever benefiting from "a Country doomed by Nature never once to feel the warmth of the Sun's rays" (and he did not see the continent), many followed in his wake, keen for commercial promise and national gain.

Plundered for seals

In the 1820s the Antarctic peninsula and nearby islands were plundered for seals and again in the 1860s to 1880s. By then, too, whalers were looking south, having wiped out the northern whale stocks with the new harpoon gun. The first landing on the continent itself, in Victoria Land in 1895, was made by a Norwegian expedit-

ion in search of new whaling grounds.

By the turn of the century several national flags fluttered over Antarctic horizons. All other continents had already been explored and carved up; only Antarctica remained. Considerable prestige was at stake in its exploration, and especially in the quest for the South Pole. The tragic heroism of Scott's struggle against Amundsen for the pole has rather overshadowed the dawn of science in Antarctica. Between 1900 and 1914, however, there were scientific expeditions from Sweden, Germany, Australia, France, and Japan as well as those from Britain and Norway.

In this period also came the first national claim on the continent, by the British in 1908. In claiming the peninsula region they legitimised an income of licence fees and royalties from Antarctic whalers. A succession of claims was to follow, including those by New Zealand and Australia, until Antarctic maps resembled a pie cut into frosty slices of various sizes.

At mid century, when polar exploration again resumed after the Second World War, only Marie Byrd Land was still unthumbed. Though the Americans had been active there, they chose to keep their options open, and this most inhospitable of sectors was never claimed.

The strategic Antarctic peninsula region, on the other hand, was also claimed by Chile and Argentina, which created an impossible three-way contest with Britain. Antarctica's territorial dissection was complete, and the legacy today in Antarctic affairs is an extremely knotty problem.

Fortunately, science intervened and inspired a workable solution. During the International Geophysical Year of 1957–58 (IGY) the 12 nations with interests in Antarctica co-operated to implement a scientific programme on an unprecedented scale. The International Geophysical Year was a great success in international co-operation, and Antarctica's human population burgeoned. The shelving of political activity which made it all possible was formally promulgated in the Antarctic Treaty of 1959, which was signed by all the participating countries, or consultative parties, as they are officially termed (see box on page 13).

International science in Antarctica has no parallel, and the success of IGY has been sustained by a genuine freedom of information and scientific exchange. Antarctic science has yielded remarkable results in a wide variety of disciplines, and New Zealand's contributions have been highly regarded. The continent has provided crucial clues to the mysteries of plate tectonics (the movement of continental plates), as well as a much better understanding of world climate. Studies of the Southern Ocean have revealed a highly productive ecosystem, yet one whose simple food chains make it vulnerable to disruption.

Sterile laboratory

Antarctica's remoteness from the industrial centres of the Northern Hemisphere has made it a sterile laboratory, invaluable for baseline studies that can monitor increases in world pollution. It is at the poles, too, that the global warm-up, stemming from rising atmospheric carbon dioxide levels, will have its direst effects. Research suggests that the West Antarctic Ice Sheet (the smaller partner in the polar ice cap) is already in danger of collapse, which implies an eventual rise in world sea levels by about 5 m.

Of course, science is not the only reason for the human presence in Antarctica. Since the 1950s national interests in the continent have been fuelled by two tangible concerns — strategic considerations (underlined by the global impact of the Second World War) and the prospect of mineral wealth, which dates from Shackleton's discovery of coal in the Transantarctic Mountains. But by the time of IGY it was obvious that world interest in Antarctica was too great for any one country to assert its claims and "go it alone". Scientific activity in the Antarctic is therefore the only way in which a country may participate in the collective decisions of the Treaty nations.

Until the 1970s the Treaty system worked remarkably well. True, the bases there were strewn with rubbish and discarded supplies, as were the favourite haunts of scientists, but the world was intrigued by a peaceable kingdom of ice, penguins, and seals—and what remained of the whales. In this decade, however, the world's industrial economies for the first time felt the pang of limited resources. Simultaneously, the Arabs discovered the power of their oil cartel.

Negotiations also began for the United Nations Law of the Sea Conference, whose principal concern has been the mineral resources of the deep sea bed. Though in the past the Treaty nations had always forestalled UN initiatives in the Antarctic, these particular discussions posed some awkward questions regarding control of the sea bed adjacent to Antarctica. Given the icy fluctuations of the continent's coastline, the Antarctic Treaty's delimitations had never been very clear, yet some answer to

the UN challenge was now needed.

The move towards a regime for possible minerals extraction has acknowledged not only this diplomatic pressure but also the economic muscle of Arab oil and recent technological developments in high latitude oil exploitation. The discovery of large oil fields in the Alaskan and Canadian Arctic has not surprisingly piqued interest among the industrial nations as to what Antarctica might offer. Though an immense volume of ice utterly precludes 98 percent of the polar land mass from any chance of minerals development, the tapping of the continental shelf is a more feasible prospect, especially for the Meccano generation.

Oil potential

The geological picture so far hints at hydrocarbons in three off-shore areas. Though so far estimates of Antarctica's possible oil wealth have been purely speculative, governments and oil companies have not remained poker faced. Japan and West Germany, both heavily dependent on the Middle East, have shown notable enthusiasm for Antarctica's oil potential.

Despite the current recession and oil glut, the oil companies are also interested in securing options now for future development. Last year, as minerals negotiations opened in Wellington, a British consultancy was offering in the oil industry Press two volumes of Antarctic "secrets" for $10,000.

Pending the conclusion of a minerals regime, however, the Treaty nations have a gentlefolk's agreement forbidding oil exploration or exploitation in the Antarctic. This has not discouraged ambitious "scientific" projects by the Japanese, West Germans, and Americans, respectively, that amount to resource surveys of the continental shelf.

Their ship-borne seismic surveys in the Ross, Bellingshausen, and Weddell Seas — the three most likely areas for hydrocarbons — have been under way since 1979. Though they have not involved drilling, these expensive programmes are evidently regarded as an investment in Antarctica's industrial future and indicate the seriousness of the economic powers concerned.

The technology for polar sea drilling and production will soon be at hand, but with the much-vaunted "economic imperative" beginning to sag as oil prices tumble, many believe that Antarctica's industrial age might yet be decades away. Conservationists are naturally appalled at the thought of such an age ever arriving. In the icy, isolated environment of the Antarctic every risk associated with oil production over more temperate seas is magnified a thousand times.

REMEMBER:

Forgotten habitats matter.

Conservation Week— 30 July to 6 August

An oil spill, whether by well blow-out or tanker disaster, would be foremost in this catalogue of horrors. As all Antarctic wildlife depends on the sea, a major oil spill any distance from the coast would threaten the lives of thousands of sea birds, penguins, and seals. Grim examples of this have already occurred. The penguin colonies of the South African coast suffered severely in the spill from two tankers which collided in 1977. In the Baltic Sea in early 1981 an oil spill killed about 100 000 sea birds. Most froze to death after receiving a coating of oil from the slick.

Effects would linger

The effects of an Antarctic oil spill would linger owing to the slow break-down of oil in polar temperatures and because of the lack of any rescue operations. Even in temperate oceans efforts at spill salvage have been largely ineffective.

Canadian scientists are worried that drilling in the Canadian Arctic is proceeding when technology to clean up large cold water spills does not exist. The Canadian fields are at least relatively accessible; in Antarctica the great distances and shortage of labour would make a well blow-out or tanker spill impossible to contain.

A blow-out in winter would be completely uncontrollable. The long-term effects of such a worst-case spill on wildlife and the Southern Ocean are simply not known.

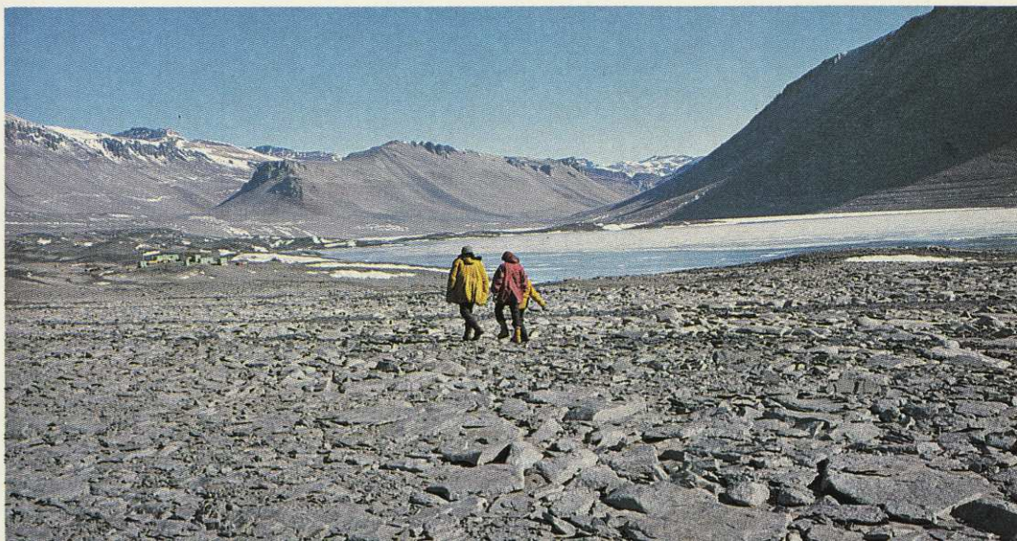
Nor could Antarctic oil exploitation be a modest affair. Only a very large field could be developed to offset the enormous costs incurred. A fleet of supertankers would be needed. Platform production would require a land base for servicing and this would pose problems of construction, mooring, and waste disposal — if a site could be found. Stretches of ice-free coast in Antarctica are particularly scarce, and penguins, seals, and scientific stations already compete for the little space available.

The risks of environmental degradation would be further compounded by human error and design failure, given the hostile conditions that oil operations would face: sudden storms, moving pack ice, and colossal icebergs. These

Above left: Because of the dangers oil exploitation would bring to Antarctica's wildlife, there is an obligation to speak up in the defence of creatures like these emperor penguins — the largest penguins in the world.

Above right: The interior of Antarctica is a platform of ice averaging 1600 m thick. Glaciers like the Barne Glacier, shown here, plunge down to the surrounding seas.

Right: Man's presence is seen in a network of bases located mainly around the edge of the continent. Scott Base is New Zealand's main Antarctic base.



Right: Ninety-eight percent of Antarctica's land mass is covered in ice. The remaining 2 percent is the area most at risk from minerals development. Shown here are Lake Vanda and Vanda Station, Wright Dry Valley.

First-day covers

First-day covers issued in 1973 to mark the golden jubilee of the Society are still available from head office.

A special 6c stamp showing birds flying over a lake was issued for the occasion, and on the first-day covers it is date stamped 28 March 1973.

These first-day stamped covers have appreciated in value and are becoming a collector's item.

They will make good gifts to stamp collectors and the young and will be sent in a protective envelope. The price is $2.50 each.

Orders and payment should be sent to the national secretary, P.O. Box 631, Wellington.

dangers would also multiply the minor "routine" spills of production, transfer, and shipping.

The openness of Antarctic science will suffer as well if commercial ventures, with their traditional secrecy, come to the continent. A new era in polar science may have already begun; two ministries within the Japanese government are reported to be at odds over the release of findings from the continental shelf surveys.

Under the banner of ASOC (Antarctic and Southern Oceans Coalition), conservationists have lobbied delegates at the Wellington meetings to express their concern for Antarctica's environmental integrity. The continent has no other constituency. Even its committee of scientists appeared to be inadequately represented at these most important of Treaty discussions.

With an absence of scientific consultation, and no calls at all from the Treaty delegates for the baseline research any oil exploitation would require, the promises of protection for Antarctica sound rather hollow. The urging of permanent wilderness status for the continent by ASOC was, of course, unheeded, as was its more pragmatic suggestion that the regime incorporate a 15-year moratorium on minerals activity to enable the necessary baseline studies to be made.

Not encouraging

As expected, environmental considerations have been quickly overshadowed in the regime proceedings by economic and political objectives and by the accommodations which result. Like the Southern Ocean Marine Resources management regime before it, the minerals regime will be judged by the degree of encouragement given to scientific research and by its openness to scientific advice. With the Marine Resources regime the signs have not been encouraging. Catch quotas for krill, for example, have yet to be set.

The Treaty nations are seeking an urgent solution, which favours a loosely framed regime and allows possibly much of it to be written in after the signatures are dry. As in the Marine Resources regime, a management authority will almost certainly be set up to govern any Antarctic minerals ventures, and it is here that the credibility gap will yawn its widest.

Experience from the Arctic raises grave doubts that the severe environmental codes that are obviously vital if Antarctic operations eventuate would be properly followed or fully enforced. The Canadian Government has already found the activities of its nationals in Arctic drilling hard to regulate.

Effective supervision of heavy-weight oil companies involved in Antarctic exploitation would require the

THE ANTARCTIC TREATY

THE TREATY was quite a landmark on its inception. It established Antarctica as a free port for international science, demilitarised the continent, and declared it the world's first nuclear-free zone. With the admission of Poland and West Germany, the Treaty now has 14 members.

Many other countries have acceded to the Treaty, but this ratification gains them no say in Antarctic affairs. Consultative membership is confined to those with a substantial scientific presence in Antarctica. Many Third World countries have opposed the Treaty as an elitist club.

Treaty meetings are held every 2 years, with special sessions for exploitation conventions. Proceedings are conducted in strict seclusion; the Press and the public are excluded. Decision making is by consensus, a factor which has reinforced co-operation but also led to a slow response on some issues. The Treaty will be open for renegotiation in 1991.

Claimant states, non-claimant states, and acceding nations are:

Claimant states	**Non-claimant states**	**Acceding nations**
Argentina	Belgium	Brazil
Australia	West Germany	Bulgaria
Chile	Japan	Czechoslovakia
France	Poland	Denmark
New Zealand	South Africa	East Germany
Norway	USA	Italy
United Kingdom	USSR	Netherlands
		Papua New Guinea
		Peru
		Rumania
		Spain
		Uruguay

strongest management possible, but any authority set up by the regime is unlikely to be vested with the necessary bureaucratic clout. In the Marine Resources regime — which many saw as a dress rehearsal for the more crucial minerals agreement booked to follow—the Treaty nations favoured feeble and flabby procedures that indicated a reluctance to interfere with market forces.

Future not bright

The future of the white continent, then, is not a bright one. Though New Zealand has a good record in the Antarctic, our Government appears to be just another voice in the "Promise it won't hurt" chorus. As a convenient staging post, though, New Zealand is sure to be involved if exploitation on this side of the Antarctic was to eventuate.

Environmental measures so far agreed on by the Treaty nations have lacked the conviction of completeness. In the face of the frightful dangers of petroleum extraction, the Treaty nations have not backed their supposed concern for the beautiful Antarctic wilderness. They have declined a development moratorium that would at least have enabled informed decision making. Their failure even to make provision in the interim for much-needed scientific research tells of their insincerity.

Despite a permanent presence of 25 years, polar science has a good way to go before our understanding of this world apart is complete, though Antarctica's value as a scientific laboratory and ice-library of world history has long been established.

Conservation organisations like the Royal Forest and Bird Protection Society have an important role in publicising the threats of Antarctic exploitation and in advocating permanent protection for this outstanding natural area.

The white continent is too important to sacrifice for a short-term supply of oil. But only permanent wilderness status will secure for Antarctica and its wildlife an untroubled future. ■

Conservation Week

Conservation Week this year will begin on Saturday 30 July and extend to Saturday 6 August.

Supplements to issue

Accompanying this issue are a copy of the Society's annual report and a supplement, *Bush Telegraph*.

Hope yet for black robins

THE BLACK ROBIN population on the Chatham Islands has dropped to 11, one fewer than last year. But though the news is not good, Wildlife Service officer Mr Don Merton remains "quietly optimistic" for the birds' future.

MR MERTON, who recently returned from the Chathams, 800 km east of the mainland, admits: "The season was disappointing. It just wasn't a good breeding year."

He attributes the season's lack of progress to unusual weather—a dry winter followed by a wet, cold, and windy spring and early summer.

"The birds are closely attuned to environmental and climatic conditions. One can't draw conclusions from previous seasons; their breeding success and behaviour have been different each time."

Contributed by the Wildlife Service

Two died last winter

Not unexpectedly, two black robins died last winter; so the season started with 10 birds, including only two good breeding pairs. Another pair, both yearlings, did not breed. This is normal.

Much time was wasted waiting for eggs, says Mr Merton. "They generally lay 8 to 12 days after the nests are completed. This year the birds waited about a month." But even then the result was nothing to write home about: there were only four normal two-egg clutches where nine had been expected.

Three single infertile eggs were also laid, an indication perhaps of overcrowding within the tiny remnant habitat on Mangere Island.

Above: One of the world's rarest birds—the black robin.

Right: A black robin fledgling photographed on Little Mangere Island.

Wildlife Service photos

Four eggs hatched, but only two chicks survived past the nestling stage. And then a tragedy occurred.

"A valuable 2-year-old female disappeared during a wet, cold spell, of which we had many," says Mr Merton.

The bird had laid two clutches this season and was about to lay her third. A thorough search of the island failed to find any trace of her.

Spectacular results

In the past two breeding seasons the Wildlife Service's cross-fostering programme on Mangere has brought spectacular results. When it was started, in 1980–81, five black robins existed, including only two males and one productive pair, which made it perhaps the world's rarest and most endangered species of bird.

The programme included transferring black robins' first clutches to the nests of foster parents (Chatham Island warblers and Chatham Island tomtits) for incubation and rearing. Thus the Wildlife Service induced the robins to renest and in the first year boosted the population to eight.

Last season started with seven birds. Six young fledged and five survived to bring the population to an encouraging 12.

It has been suggested that this season's poor results were due to the Wildlife Service pushing the black robins too hard by producing additional eggs.

"This is a natural reaction," says Mr Merton "but we have thought it through carefully and don't believe it is valid. Many bird populations failed to breed successfully this season and a number apparently failed to nest at all. Furthermore, the young robin pair which have never bred before behaved in the same way as the other birds this season. They can't possibly have been overstressed."

Old Green (previously known as Old Blue) is now at least 12 years old and still going strong. She is the mother of seven of the surviving 11 robins and raised one chick this year. There is every chance she will be around next season, too.

Second population

But the most significant development this season must surely be that permission was granted by the Department of Lands and Survey to establish a second population of black robins on South East Island, another of the Chatham group. One pair of black robins was moved to the island in January and it is hoped that another two birds will be transferred there later this year.

South East is larger than Mangere, with considerably more habitat (about 100 ha compared with Mangere's 4.2 ha.) It has a northerly aspect, and prevailing southerly and south-westerly gales are broken by huge bluffs. Unlike Mangere's habitat, which loses the sun in the early afternoon, that of South East gets sun all day.

"This must have psychological and physiological benefits for the birds. They just love the sun, often basking in it for long periods when they are not busy nesting or raising chicks," says Mr Merton.

The range of plant species and communities is greater on the new island. "On South East the robins can choose exactly what they want instead of being confined to a tiny bush remnant".

Gourmet's delight

The new island is also a gourmet's delight for black robins. There is a greater range of insects available, including three species of weta (one of which does not appear to be present in the bush on Mangere). Wetas are a favourite food for the robins.

"The wetas live in sea bird burrows, of which there are tens of thousands on the island. At dusk the insects come out and hop and forage in the litter on the forest floor.

"On a calm evening you can hear them—pitter-patter—everywhere. When we released the robin pair on South East in January they spent much time sunning themselves. But at dusk they would descend to the forest floor and feed on the nocturnal insects until it was almost dark."

There was concern the robins might disperse on such a large island. But they have remained almost exactly where the Wildlife Service officers have put them and radiated out from those points.

"We were also worried that the tomtits (which do not live on Mangere) might bully the robins or vice versa. For a start the tomtits, especially those with dependent young, did try to drive the robins away. But the robins learnt not to be afraid.

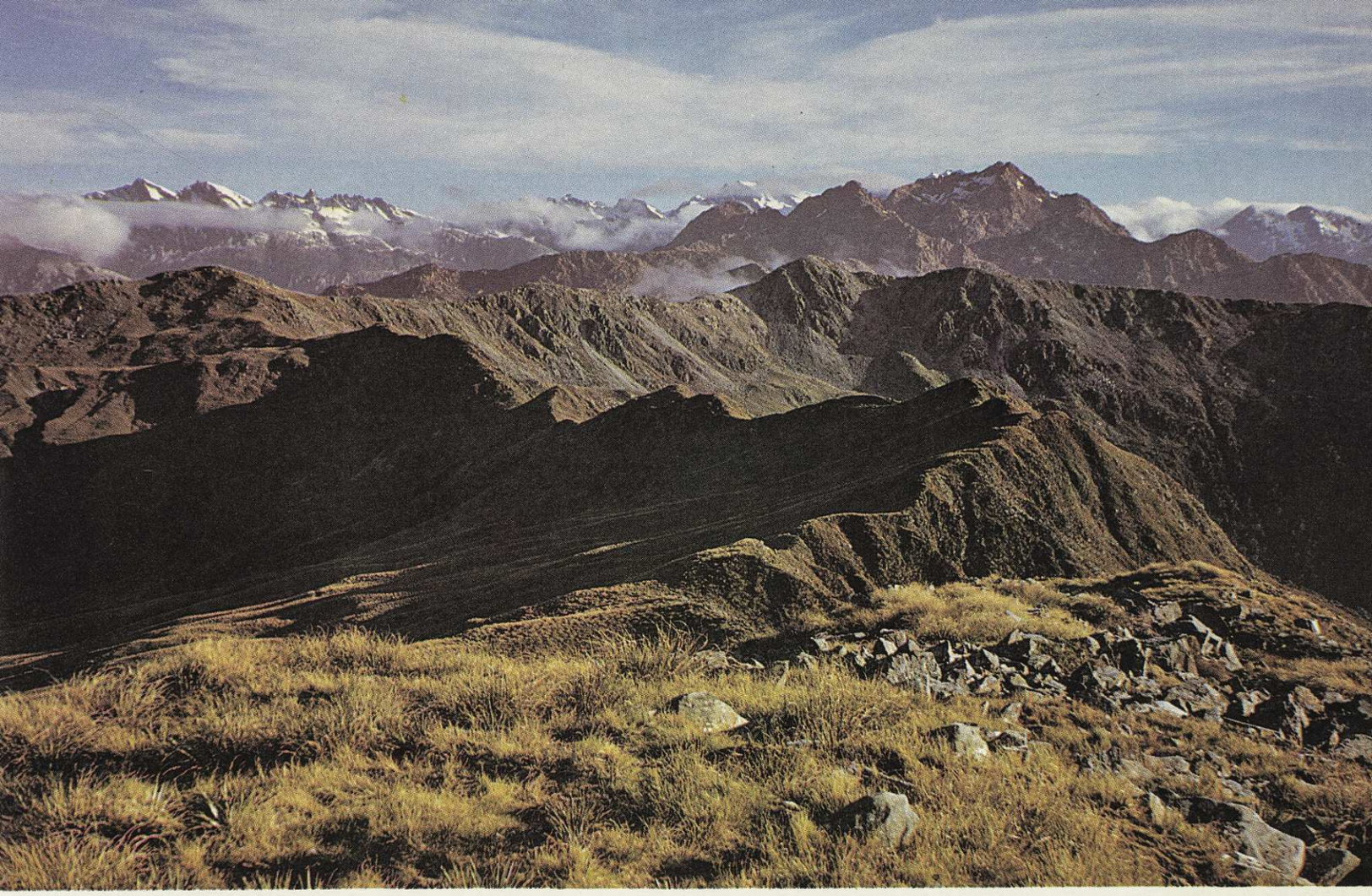
"Soon the two species, which belong to the same genus, were taking no notice of one another."

Mr Merton says the cross-fostering programme will continue next season, though funds are strictly limited. Last season this cost about $15,000 (excluding Wildlife Service officers' wages).

"Transport is the most costly item. Five Wildlife Service officers and several (unpaid) volunteers were involved this season. Much of the cost has been met by donations from the public and especially from the Royal Forest and Bird Protection Society and World Wildlife Fund (N.Z.), for which we are most grateful," says Mr Merton.

"All going well, we will have three good breeding pairs of robins next season. That's the most we will have had since the historic decline on Little Mangere 10 years ago, when the tiny forest habitat died off, and with it the robins.

"Next year is just as likely to be a bumper one. We sincerely hope so." ■



Red Mountain and the Red Hills Range from Gorge Plateau. The main Olivine Range is in the distance.

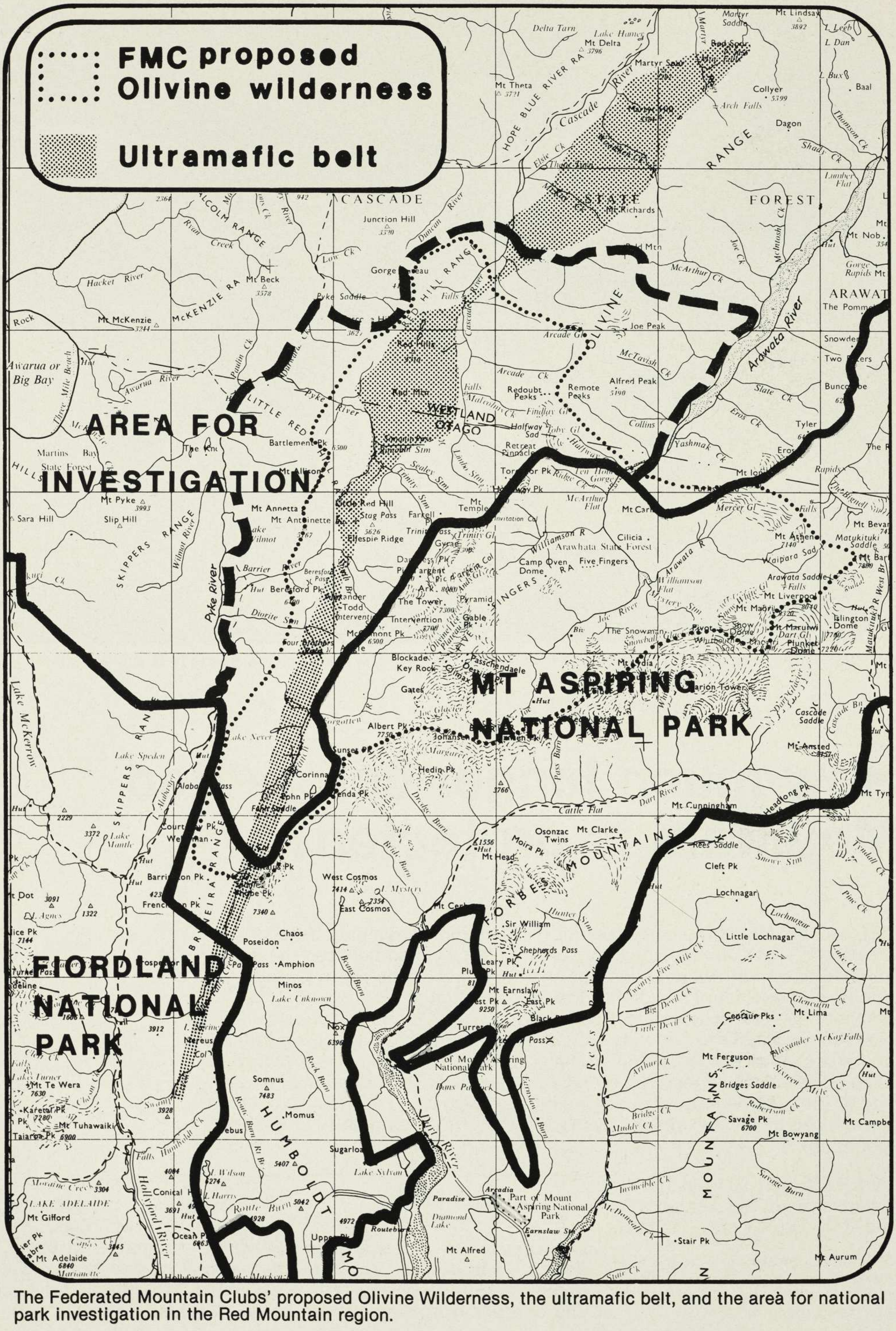
How much longer before Red Mountain is protected?

RED MOUNTAIN is the highest point (1700 m) in a 50-km-long band of ultramafic* rock, an ancient volcanic intrusion wedged between the schist mountains of north-west Otago and the hard, crystalline rocks (granite, diorite, and gneiss) of Fiordland. The whole region is remote and uninhabited, one of the wildest parts of the South Island, yet the scenic grandeur and mineral curiosity of Red Mountain have attracted explorers and prospectors since Captain James Cook on the *Endeavour* in March 1770 observed the "steep red cliffs" of Cascade Point (the coastal end of one of the huge lateral moraines marking the extent of the Ice Age glacier that flowed down the present Cascade Valley from the vicinity of the Red Mountain).

By Les Molloy

FOR THE past 20 years the ultimate use of this remarkable but little-known area has been a subject of considerable debate, within Government, mining, nature conservation, and outdoor recreation circles. Though the protection of Red Mountain, a representative segment of the Cascade-Olivine ultramafic country, has been a priority goal of the Federated Mountain Clubs of New Zealand (FMC), the

*Ultramafic means high in levels of magnesium- and iron-containing minerals; low in silica content (ma: magnesium, fic: iron).



The Federated Mountain Clubs' proposed Olivine Wilderness, the ultramafic belt, and the area for national park investigation in the Red Mountain region.

former Mount Aspiring National Park Board, and sections of the conservation movement, the area is still far from being a household word.

Because it is a remote wilderness, it is known in detail only to a fairly small number of mountaineers, prospectors, and scientists. Yet hundreds of thousands of people have by now seen the popular "Wilderness — New Zealand's Heritage" poster, little knowing that the spectacular scene depicted is Red Mountain and the northern peaks of the Olivine Range.

Situation in 1977

In an earlier *Forest and Bird* article (Molloy 1977) I outlined in chapter and verse the very sorry record of Government mismanagement of the area up to that time.

The joint Forest Service/ Department of Lands and Survey South Westland Land Use Study (Wilkinson and Garratt 1977) had just been published and it ranked 12 000 ha of the Red Mountain region in the **highest** category for nature conservation, recreational value, and scenic significance —the same ranking as that given to Waikukupa State Forest, recently incorporated within Westland National Park.

The Minister of Lands and Forests invited submissions on the study, and the National Parks Authority late in 1977 recommended that this area be added to the park and, further, that it would make a more detailed recommendation after further investigation of detailed boundaries.

Government's approval in 1981

Subsequently, Department of Lands and Survey scientific and planning officers further investigated the proposal and did some good work in presenting the various options to the Authority in March 1978.

The Mount Aspiring National Park Board wished to see the western boundary along the Pyke River, which would thereby provide a western buffer to the proposed Olivine Wilderness Area, which would then lie completely within the park. This Pyke River boundary was again promoted by FMC when it published its outdoor recreation plan for the West Coast (Molloy 1979) in June 1979.

Earlier presentation of case for protection

Nearly 6 years ago the Society and the Federated Mountain Clubs of New Zealand jointly published a 16-page supplement to the August 1977 issue of *Forest and Bird*, entitled "Red Mountain — national park or asbestos mine?" This supplement was an article by Dr Les Molloy which won a Mobil Environment Award, for it presented a cogent case for the future protection of the Red Mountain region within Mount Aspiring National Park and documented a sorry chapter of political and bureaucratic ineptitude concerning poorly regulated prospecting and roading which were threatening these national park values. This article updates the situation on the eve of a further national park initiative.

After agreement had been reached with the Mines Division and other mining interests, the Authority decided in March 1980 to accept the option of extending the park to the Pyke River, but to exclude the prospecting area on the Little Red Hills and an access corridor up the Pyke River.

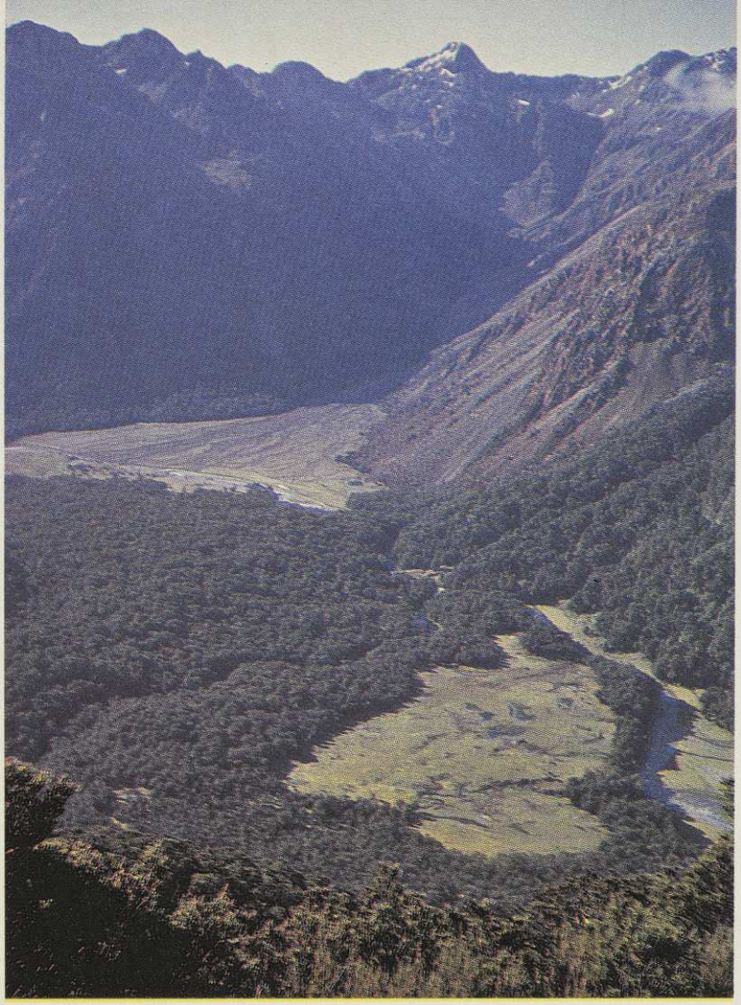
A rather messy part of the compromise deal was the designation of a "scenic reserve" around the excluded prospect area. The Land Settlement Board gave its approval to this proposal in August 1980, but the Director-General of Forests subsequently criticised the complexity of the proposed boundaries and tenures and, instead, suggested a simplified boundary along the eastern border of the prospecting licence area. This, in effect, ensured that the entire middle section of the Pyke Valley would remain under Forest Service management.

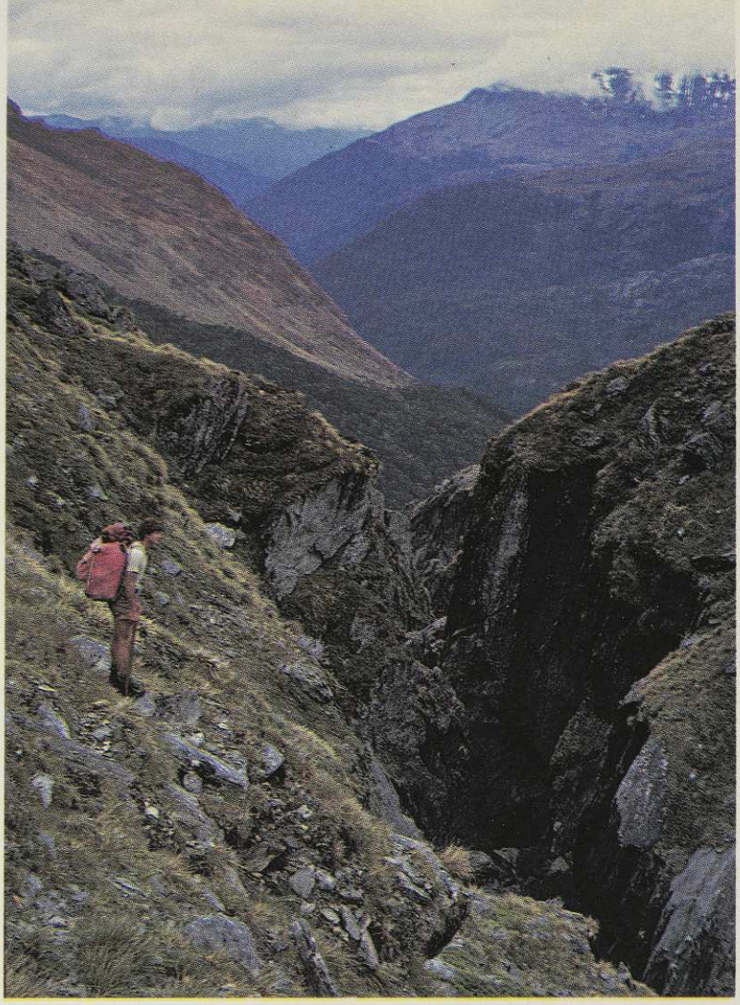
In the light of this Forest Service objection the Director-General of Lands withdrew the "scenic reserve" proposal, and the option preferred by Forest Service went to the Minister of Lands and Forests for approval. At the final meeting of the former National Parks Authority on 12 March 1981, the Minister, Mr Venn Young, announced that he had approved the proposal, which in effect added 27 875 ha (19 540 ha of State forest and 8335 ha of Crown land) to Mount Aspiring National Park.

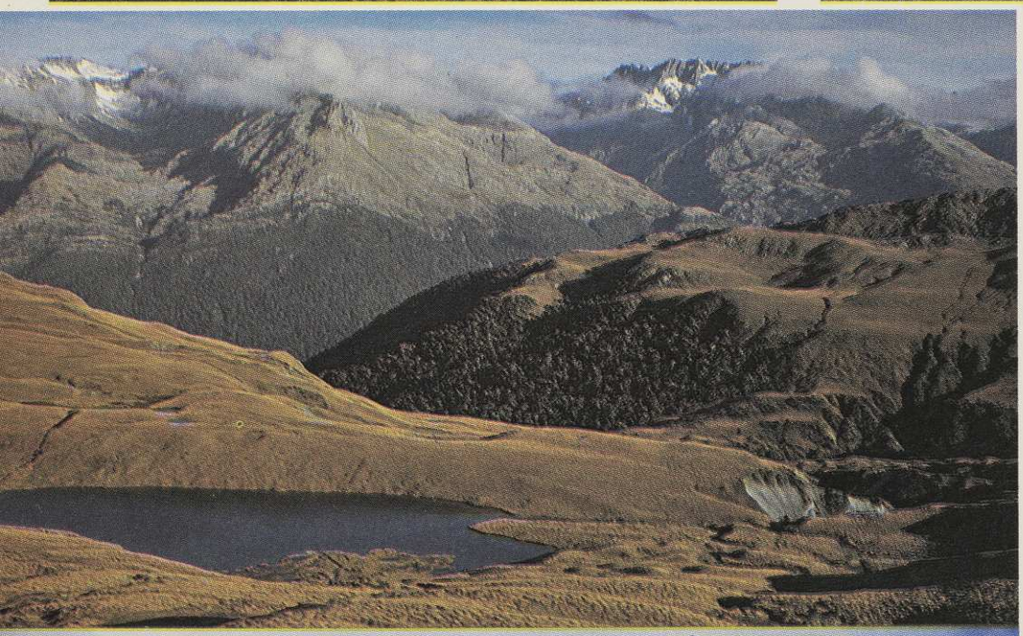
United Council reaction

It looked as if a long-standing conservation battle had at last been won, though, in the manner of all compromises, every party was not completely happy. However, the euphoria was quickly shattered by a thoroughly inept Press release from the Minister's office, a release which was not made until 20 May 1981, nearly 2 months after the NPA had been disbanded and national parks were being administered under the new provisions of the National Parks Act 1980. Unfortunately, the Press release **failed** to make clear:

- that the Government did not intend to gazette an extension until the proposal had been discussed with the local and regional authorities involved, and
- that the proposal specifically **excluded** the Little







Above, left: Upper Barrier flats from the slopes of Mount Ark, showing ultramafic slopes descending from the Little Red Hills. This is the area of most prospecting activity.

Above, right: Limbo Gorge, with the gorges of the upper Cascade below. The ultramafic flanks of Red Mountain can be seen on the left, showing the sharp transition to beech forest on the schist.

Left: Northern Olivine Range peaks across the Cascade Valley, from Gorge Plateau on the Red Hills Range.

Left: The remote Limbo Glacier, source of the Cascade River. This glacier and the surrounding peaks of the northern Olivine Range are key elements of the proposed Olivine Wilderness Area.

Red Hills area held under prospecting licence.

Reaction from local authority circles on the West Coast and in north-west Otago (Lakes County) was swift and loud. A well-known opponent of the national park proposal, Mr T. J. Thomson, chairman of Lakes County Council and the Clutha–Central Otago United Council, expressed concern at the "inclusion" of the asbestos deposits of the Little Red Hills within the park (Anon. 1981) and lamented:

- that the Government had not allowed the public to comment on the national parks proposal by using the provisions of the Lakes County district scheme, and
- that if the Government considered that the district planning authority was not competent, the regional authority should have been asked to handle the issue, because it had recently been set up by the Government as a "resource management authority".

Similar concern at the lack of formal consultation was expressed by the Labour M.P. for West Coast (Mr K. Burke) and the West Coast United Council.

An embarrassed Minister of Lands quickly responded with another Press release (27 May 1981), stating that he had meant only "approval in principle" for the national park and that he would be seeking the views of both united councils "before any final decisions are made".

The whole issue then degenerated into something of a year-long tragi-comedy as the Department of Lands and Survey attempted to explain the issue to both united councils, who, in their turn, used the whole issue as a chance to "flex their political muscles" over their new-found regional planning powers. The West Coast United Council (WCUC), in particular, made a very strong effort to make the nature conservation planning powers of Central Government (under legislation like the National Parks, Reserves and Forests Acts) subservient to the stringent provisions of its draft regional scheme—an absolutely untenable situation for any Government.

The poor communication within Government agencies charged with explaining these national park proposals further contributed to the confusion—the most serious, and incredible, instance being a meeting of the land resource advisory committee of the WCUC on 27 August 1981, at which the local representatives of the Department of Lands and Survey, Forest Service, and the Wildlife Service said, in effect, that they did **not** support the Red Mountain addition, even though a careful compromise had been hammered out in their head offices in Wellington!

After a lot of correspondence and travel between Wellington and Hokitika the departments concerned gradually opened an effective dialogue with local representatives, but the whole delay was a frustrating indication of how much importance departments must place on good resource information and communication by officers who can speak with authority on such nature conservation issues.

In Otago a joint Department of Lands and Survey/Otago National Parks and Reserves Board delegation ran into similar frustrations in attempting to discuss the issue with the Clutha–Central Otago United Council (CCUC). The crowning indignity was the refusal of the CCUC chairman, Mr T. J. Thomson, even to allow the department and local board representatives to speak when the issue was discussed at the united council's regional planning committee.

Predictably, both united councils in April 1982 informed the Minister of Lands that they opposed the addition of the Red Mountain region to the park.

The 1983 investigation

In September 1982 the National Parks and Reserves Authority (NPRA) had to assess this impasse, since it could be argued that the whole issue was once again wide open because of the requirements of the 1980 National Parks Act. The NPRA had a difficult decision, but concluded that the issue should be tested under section 8 of the new Act; that is, it called for an "investigation" by the Department of Lands and Survey. Though the Authority accepted that the proposal was a long-standing one and had been pretty thoroughly canvassed in responses to the South Westland Land Use Study, and the draft management plan for Mount Aspiring National Park, there had never been any **specific** invitation to the public to comment on a documented addition proposal.

Furthermore, the NPRA considered that the most appropriate western boundary for the investigation was the original one proposed 10 years before by FMC and the Mount Aspiring National Park Board — the Pyke River.

At some time in the near future the views of the public will be sought on the proposed addition, and there is bound to be a polarisation of opinions. But the issue is much clearer now than a decade ago.

The extent of the asbestos deposits are known and we have much more information on the ecology and recreational values of the area. The issue

cannot be left in limbo forever, and the appropriate course of action is to have it fully appraised in public.

Even though members of the Otago National Parks and Reserves Board and the Clutha–Central Otago United Council have told the NPRA that little will be gained by further debate on the issue, I believe that the interested public do have the right to make their views known on **detailed** proposals for the future use of important public lands.

The mineral issue

No one doubts that the ultramafic belt is prospective; the question really is how much geological and prospecting information do we need before we are able to balance this against the area's national park values? The stock answer "we will never have enough mineral information about such a prospective area" is quite unsatisfactory; the whole issue has been delayed for a decade while detailed prospecting has been carried out and it would be unreasonable for the mining industry to insist on further postponing a decision on these grounds.

Furthermore, addition to the national park does not "lock away" the area in some permanently protected status. The Mining Act 1981 is still paramount in that it clearly allows mining in national parks, if that is where the Minister of Lands (and presumably his Cabinet colleagues) considers that the greater public interest lies. I believe that this Act, and the earlier 1978 amendment to the Mining Act 1971, have greatly improved our ability to make a rational decision. I am convinced that the best decision would be to add the area to the national park (particularly to protect the area of Crown land which is really under threat because of its low status in terms of the Mining Act), but to allow continued prospecting so that future generations can make the ultimate decision on mining anything of proven economic and social importance.

In the light of the known health risks associated with **all** asbestos fibres and the considerable efforts being made to find industrial substitutes, delaying any decision on mining asbestos makes a lot of sense.

National park criteria

In my opinion the proposed addition of about 27 900 ha more than adequately meets the NPRA's criteria for national park additions (NPRA, in press).

Ecological systems

The Red Mountain ultramafics are demonstrably the least modified and most scientifically interesting examples in New Zealand of this unusual habitat (see box page 23).

The area is probably not unique, since there is a much smaller ultramafic belt behind Anita Bay in Fiordland National Park, as well as the Dun Mountain complex in Nelson. However, Dun Mountain is not a reserve and is considerably modified, especially by the progressive invasion of exotic pines.

Outstanding scenery

No visitor could fail to be impressed at the first sight of Red Mountain. There has never been any question of the outstanding scenic character of this huge massif — as a DSIR study team reported (Bishop 1975) in 1975:

"Scenically and geologically, Red Mountain is a magnificent exposure of an ultramafic belt."

In addition to the ultramafics the proposal also includes much of the Olivine Range (with its rocky spine and cirque glaciers) and the wild upper reaches of the Cascade River, which tumbles down over Durward Falls (a 50-m scarp on the Livingstone Fault) into the Cascade Gorge. There are scenic features too numerous to name in detail:

- The White Slip and the flats of the mid Cascade.
- The spectacular view of Mount Ark and the Furies from the upper Barrier Flats.
- The golden tussock and blue tarns of the Gorge Plateau on the Red Hills Range.
- The podocarp forest and still backwaters of the slow-flowing Pyke River.

Recreational and historical features

The whole area is steeped in the mystique of the prospecting ventures of the nineteenth century, when remarkable adventurers like Barrington and Simonin and Douglas and Paulin explored the area. Later, the near-legendary Arawata Bill spent much of his life searching for his holy grail —the "lost ruby mine"—and in the 1930s the complex topography of this forgotten corner of the Otago Alps was unravelled by Jackson and Holloway and other students from the University of Otago (Galloway and Molloy 1971).

The recreational attractions of most of the area relate to its superb wilderness qualities, qualities which have long convinced the New Zealand Alpine Club, FMC, and the Mount Aspiring National Park Board that much of this country should be protected as

REMEMBER: Forgotten habitats matter.
Conservation Week—30 July to 6 August

the "Olivine Wilderness Area" (Molloy, in press).

The hanging valleys of the Olivine, Forgotten, Diorite, and Barrier are all routes to the Olivine Ice Plateau within the park; the upper Pyke is also an important transalpine route across the northern Olivine Range via Trinity Pass. The upper Cascade and northern Olivine Range are superbly suited to wilderness recreation, and the broad, flat glaciated trough of the Pyke Valley is a popular tramping route, the round trip from the Hollyford to Martins Bay via Lake Alabaster and Big Bay.

Boundaries and size

The addition makes a lot of sense in terms of improving the western boundary of Mount Aspiring National Park, a boundary which at present makes no geographic sense, since it cuts across peaks and glaciers of the Olivine Range in order to exclude the ultramafic area, because of the wishes of the mining lobby when the park was formed in 1964. The Pyke River is a major geographical feature and popular walking route that is the logical western access to the wilderness hinterland.

Further north, the proposed boundary follows the obvious escarpment of the great Alpine Fault above the Duncan River and crosses the northern Olivine Range near Bald Mountain, so that the large, but less visually impressive, Raddle Peak ultramafic area lies outside the national park.

Besides the value of the features within the proposed addition, the extension to the Pyke River ensures that the proposed Olivine Wilderness Area has an effective buffer which can protect it by effectively filtering out the impact of other recreational uses—an important feature of wilderness policy (Wilderness Advisory Group 1982).

Formed millions of years ago

Hundreds of millions of years ago the Red Mountain ultramafic belt was intruded from deep within the Earth's mantle at a point where the vast Pacific and Indian-Australian crustal plates were grinding past each other. We now know of this great zone of geological contact as the Alpine Fault of the South Island.

Of major scientific and educational significance is the lateral movement that has occurred along the Alpine Fault over these hundreds of millions of years to the extent that this ultramafic rock has been wrenched apart a distance of 500 km. Today Dun Mountain in Nelson and Red Mountain in South Westland stand at opposite ends of the Southern Alps axis—one of the most interesting markers of our geological history.

The rock making up most of this ultramafic intrusion is called **peridotite** and in places it is sheathed in a band of **serpentinite**, another magnesium-containing mineral formed by the stresses of temperature and pressure. The peridotite weathers to a rich red-brown, analogous to a "skin of rust" from the high iron content of the rock. In fact the term *dun* is an old Gaelic name for a "greyish-brown colour", and the name *dunite* is often used to describe the rock.

In addition to their high concentration of magnesium and iron, these ultramafic rocks are often associated with deposits of minerals containing the metals chromium, nickel, cobalt, and platinum; hence the interest of the mining industry in ultramafic deposits.

Chromite deposits are found on Red Mountain and, indeed, were mined earlier this century on Dun Mountain, but no metallic deposits of economic importance have been found on Red Mountain. However, recent and present prospecting has concentrated on deposits of a non-metallic magnesium-bearing mineral—chrysotile asbestos. Whereas the other minerals appear to be diffused thinly throughout the entire ultramafic belt, the asbestos is more localised, with the most important deposit lying on the slopes of the Little Red Hills Range above the upper Pyke River.

The soils derived from these ultramafic rocks are generally stony and shallow. In addition to these factors, which adversely affect plant growth, there are levels of exchangeable nutrients (particularly magnesium) which are toxic to many plants. Consequently, these ultramafic soils support very distinctive floras. The striking transition from mature silver beech forest on the surrounding schist to "serpentine scrub" or a depauperate tussock/herb field on the ultramafics can occur over just a few metres. Such a contact zone is particularly well expressed in Simonin Creek, which follows the Livingstone Fault.

Investigations so far have not identified any plants that are endemic to the Red Mountain ultramafic belt, unlike the Dun Mountain region, which supports two endemic plants. However, populations of the streamside Portulacea (*Montia australasica*) and the woodrush, *Luzula crinita* var. *petriana*, are genetically adapted (Lee 1980) to the ultramafic soil conditions in the Red Mountain area.

Conclusion

The effort to give greater protection to the remarkable Red Mountain area has been a tortuous saga spanning the past 20 years. It is no use dwelling too much on the laxness that has characterised some of the poor management of the area by Government agencies in the past, for the National Parks and Reserves Authority now seems determined to have the issue investigated and publicly appraised, hopefully once and for all.

Ultimately it is up to the public to make their views known. In my opinion the inclusion of the Red Mountain area within our national park system would be a step of considerable national maturity, the protection of a priceless

heritage, while forgoing some possible short-term economic activity. For nowhere else in New Zealand is the unusual and scientifically significant assemblage of ultramafic rocks, soils, and vegetation as extensive or apparent as on Red Mountain.

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Photos by L. F. Molloy ■

BOOKS

Wild Islands: Gordon Ell

Among the scatter of islands in the Hauraki Gulf, more than 100 of them, Gordon Ell has selected the wilder ones, the ones that grab the imagination for their history, their naturalness, and their ruggedness, and has produced an eminently readable book.

The colour photography and the excellent black and white photos combine to give vision to the scenes conjured by the text.

That New Zealand has these islands rivalling the remote islands of Oceania, right here on Northland's and Auckland's doorstep, gives the cry "See New Zealand first" real truth.

"Hope you enjoy the story", said Gordon Ell when sending me the review copy. That I certainly did.

One marvels at the story, for such is the skill of the author to weld natural history, archaeology, early mining ventures, pioneer settlements, vistas of landscape and seascape, geology, and people into an impelling narrative.

In all this is a book of great beauty, brimming with all the things one would wish to know of these islands. It is surprising and delightful.

—David G. Collingwood

Bush Press, $17.85.

Field Guide, Stewart Island Plants: Hugh D. Wilson

This is quite a bulky book and yet in format it is a true field guide and a must for those going to Stewart Island. This field guide, however, has a use anywhere in New Zealand, as I have proved for myself in the field.

The plants of Stewart Island are the same as those growing on the mainland, and the author has (unwittingly perhaps) produced a most valuable field guide for New Zealand flora, and one which I can recommend to all in its comprehensiveness.

Clear wash drawings, many in colour are presented on each alternate page through most of the 528 pages. Each drawing is numbered to the text for easy cross-reference — a real boon.

The book is fitted with a removable plastic field jacket.

Hugh Wilson has produced an admirable field guide. It is practical and is enormous in its span of the species of New Zealand. In the one book there are not only the trees, but the grasses, the ferns, the flowering plants, the flaxes, and the reeds. In this factor it is unique among field guides on New Zealand plants. It is highly recommended to members and the interested public alike.

—David G. Collingwood

Field Guide Publications, $17.25.

Holiday house on Weber farm

Mr and Mrs Wallace Bennett, members from near Dannevirke, have made a kind offer to the Society. They have a vacant house on their property at Weber which they would lend, for a nominal charge, to members wanting a country holiday.

The house is fully equipped with utensils and crockery, and only bedding would need to be taken.

Weber is about 35 km south-east of Dannevirke on the road to Herbertville and Akitio. The countryside is interesting for walking, and the house is within driving distance of Herbertville and Akitio beaches.

Anyone interested should write for details direct to Mr and Mrs W. Bennett, Private Bag, Weber, Dannevirke, or telephone 658 Weber.

Subscription rates

The Society's subscription rates are:

Ordinary	$15
Family (with each member, including children, nominated)	$15
Junior, in own right	$10
Senior citizen (including spouse)	$10
Schools or classes	$10
Life member	$250 (per head)

Old man's beard now a national threat

By
David G. Collingwood,
National Conservation
Officer

LATE last year I attended a *Clematis vitalba* seminar sponsored by the Department of Lands and Survey, and delegates came from other Government departments, local government, catchment boards, and noxious plant agencies. Several members of the Society from branch areas suffering from an infestation of the weed also attended.

Though all the people there were left under no misapprehension about the grave threat to our forests now affected in many places, the public knows little of the threat, and indeed nurserymen are still selling the plant as ornamental or are using it as root stock for more benign clematis species.

Disappointing response

In the last 2 years after a council directive head office has repeatedly asked branches to report the presence of *Clematis vitalba* in their areas. I have been disappointed that there was such a low response even from some branches I knew had heavy infestations.

We have our own bush reserves and surely we should know if this spreading menace is present in our own properties. All reports are sent to the Department of Lands and Survey to help produce an accurate national register of the presence of the plant from which its spread may be gauged; urgent action can then be taken.

Clematis vitalba is an introduced plant fondly remembered by our English colonists, but now a voracious weed. It is variously known as traveller's joy, mile a minute, and old man's beard.

Grows rapidly

It is a deciduous climbing shrub with woody stems growing up to 15 m and even higher if support is available. It grows rapidly and is light loving, and not only is it destroying large areas of central North Island forests, but it is spreading elsewhere.

It simply grows over healthy trees and shrubs, blocking out the light and so killing them. Even scenic reserves are being destroyed.

The flowers are dull white and faintly almond scented. The seed vessels are long and plume-like and when ripe form grey tufted balls conspicuous in autumn and winter. The seeds seem to have a mechanism which enables them to

Old man's beard vines on kiwifruit.

The flowers of old man's beard are a dull white.

Old man's beard scrambling over native bush in Queen Charlotte Sound.

burrow into suitable niches for germination.

If the plant grows along the ground looking for support, it can put down roots and form new plants every 15 cm, and one plant can blanket an area of 180 sq m. Thus a 5-year plant can produce over 100 vines and can produce 1000 seeds per square metre of growth. Just fancy buying such a plant from a nurseryman and planting it as an ornament in your own garden.

Control

Unfortunately, there is only one proven and successful method of control and it is time consuming, labour intensive, and even controversial. Even so, if only small new infestations can be controlled, the spread of the plant will be diminished.

The method is as follows:

1. Cut the weed at two places, first at root and then at waist height. Burn the cut-away pieces. **A single cut at ground level is insufficient.**

2. Paint the stump and the hanging cut stem with a mixture of diesel oil and 2, 4, 5-T.

3. Persevere and repeat the operation each year until regrowth is checked.

4. Replant cleared areas with native species to re-establish good ground cover and sub-canopy.

Clearly this is a task that is massive and urgent enough to involve some of these work schemes that we unfortunately have today, and local councils could well consider this possibility.

Resolutions

Seminar resolutions were as follows:

1. To bring to the attention of the Noxious Plants Council the damage *Clematis vitalba* causes to the environment and its serious effect on exotic and native flora.

2. To seek the Noxious Plants Council's assistance in any way possible to:

- Control the further spread of the plant.
- Eradicate it where possible.
- Educate the public and increase public awareness of the problem.

3. To call on the Nurserymen's Association to urge its members to stop selling *Clematis vitalba* as an ornamental plant.

4. To call on all local authorities to urge their ratepayers to eradicate *Clematis vitalba* in private lands and to take the same measures themselves in public gardens.

5. To call on Central Government and local bodies, private enterprise, and public conservation groups to allocate funds for co-ordinated research into the control of *Clematis vitalba*.

Finally I undertook at the meeting that branches of the Society and members would give every assistance and support to those attempting to control this weed, and I stated that several branches had already spent time and money in control of the weed in their own areas.

I hope a true measure of the extent of *Clematis vitalba* spread will now be forthcoming from branches or even individual members. Please write to me at P.O. Box 631, Wellington.

Photos by C. S. Butcher.

Annual meeting next month

The sixtieth annual general meeting of the Society will be held at the Hotel St. George, Willis Street, Wellington, on Saturday 11 June at 9 a.m.

Agenda

1. Apologies.
2. Welcome.
3. Declaration of councillors.
4. Minutes.
5. Annual report and statement of accounts.
6. Appointment of auditors.

Note: The annual report and statement of accounts is enclosed as a supplement to this issue.

Council meeting

A council meeting will follow at the same venue, with the election of president, deputy president, treasurer, and an executive of 10 members.

Thrush waifs rescued and fostered

By Thelma Clarke

LAST NOVEMBER my sister Edna picked up two tiny birds, only partly feathered, from the footpath of Arney Road, Remuera. One bird was in the gutter. There had been heavy gales in the previous 2 or 3 days, and the remnants of a nest hung in tatters in a nearby tree. With so few feathers, it was hard to decide what the birds were. As the beaks were brownish, we thought that they were more likely to be thrushes than blackbirds.

We bedded them down in a makeshift nest of soft toilet tissue in a small plastic bowl with a cloth cover, and they showed no signs of distress.

We named them Andrew and Koo, Andy showing the more dominant personality and slightly larger size and Koo the characteristics of a gentle little hen.

First diet

Their first diet was canned dog food and water administered with an eye dropper. Edna had been advised to feed the dog food to the birds on a match-stick, but we learnt a real lesson from this. Little Koo not only sucked in the meat on the match-stick but the match-stick itself. Edna, of course, had removed the head from the match beforehand, but the little bird had sucked in the match like a vacuum cleaner.

Our first lesson was therefore: don't use a match-stick for feeding birds. We thought we had killed Koo, but, as luck would have it, there was the match-stick on the floor of their "nest" the next morning, having passed through the little bird's system. Thereafter, the birds were hand fed, the food being inserted into open beaks with fingertips.

In a short time Andy had acquired the knack of getting out of the bowl; so we transferred them to an empty parrot cage. Their bodies were now too big to squeeze between the bars of the cage, though the first night in the cage was traumatic for them (and for us) until they resigned themselves to confinement.

New diet

The birds soon tired of the dog food diet; they just refused to eat what they did not like, and a replacement of boiled egg yolk, mincemeat, and wholemeal breadcrumbs, mixed with a little water, was tried.

This new diet met with their entire approval. They allowed themselves to be hand fed to capacity; "stuffed" might be a more appropriate but indelicate word. One could really measure their daily growth visually and their intelligence emerging.

They both showed unusual exuberance when Edna approached the cage with the glass of water and the eye dropper in her hand. They jostled each other to be first at the door of the cage to get their tipple of plain water. We were warned that they must not be allowed to dehydrate. Two little beaks snapped shut when the food and water administered was deemed sufficient by them.

Edna varied the birds' diet with garden worms, which were hard to get at the time through lack of rain. As with the "egg nog", the small worms were hand fed into their open beaks.

The birds became bored with their confinement; so we gave them some "toys" to play with—small jam-jar lids, which they could grasp with their beaks and play shuffleboard around the floor of the cage, and a tethered bell, which they could grasp and ring vigorously. They played their own version of soccer with a plastic ping-pong ball in the bottom of the cage, and it was comical to see their surprise when the ball sometimes rolled between their long legs.

Darker colouring

As the down gave way to feathers and their breasts were splashed broadly with spots there was no question of their not being thrushes, though they were darker than the usual thrush. Perhaps the prolonged egg yolk diet was responsible for this.

We knew that the birds could not be released until their tails were fully grown and the birds themselves mature. We thought that Andy might have been ready for release before Koo, and both birds appeared to want to be hand fed indefinitely; so we decided to place the "egg nog" on the floor of the cage, and they, with some reluctance, learnt to peck the food.

For greens we tried a small piece of thistle in the cage, but the birds were terrified of it; so we removed it. However, they showed a real interest in pecking at the residue of earth from the thistle's roots.

It has been interesting to observe the daily development of these two "harum-scarums". At first they played baby games of gently pecking each other's toes, with a sly peck at the other bird's wing tip in passing. Then came fast cir-

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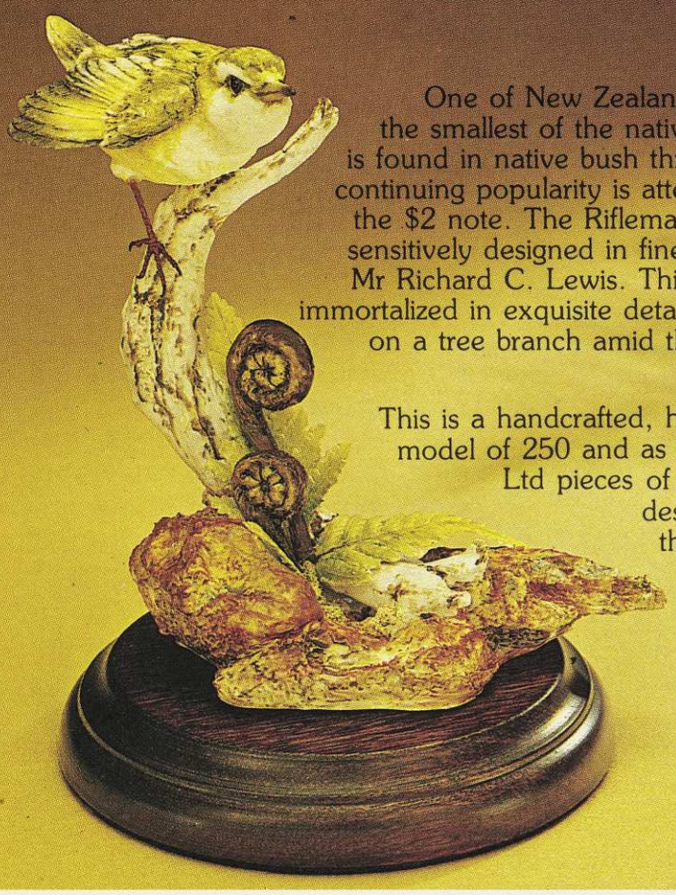

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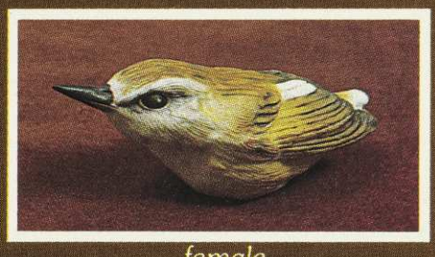

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REMEMBER: Forgotten habitats matter.
Conservation Week—30 July to 6 August

cular, controlled flights up and over the perch, chasing each other and ending in a beak-to-beak confrontation, short of actual fighting.

But one morning, when the birds had been with us about 5 weeks, Edna took the cover off the cage and noticed that the tiny feathers on the top of Koo's head were missing. Closer inspection revealed pinpoints of broken skin. Andy had "picked" on his sister literally, but she had retaliated, as there were beak marks above his eyes.

We knew the time had come for release. The pair were fully grown, with their measure of the natural aggression of wild birds and insistent demands for freedom.

Release in park

We released them in Cornwall Park, One Tree Hill, among the magnificent trees there.

Koo, who seemed to be dominated by her brother when caged, took the initiative, when the cage door was opened, by a direct flight to a branch of a smallish tree, where she happily perched and surveyed her new domain.

Andy had trouble finding the open door to freedom, but with a little assistance he shot out into a thick silver-leafed shrub. We think that Andy and Koo would quickly adapt to the ways of the wild birds that they are.

Though two such ordinary little thrushes can never approach the significance of, say, our kiwis or the news headliner — the rare black robin — some of the many happy recollections that we will retain of our short-term house guests are:

- The professional approach they both brought to shredding the clean paper floor coverings of their cage.
- Andy's discovering the cool delight of dipping his head right into a glass of water that Edna held for him.
- The "tizz" they went into one day when one of us approached their cage wearing hair rollers.
- The endearing way Koo had of suddenly plopping down on the floor of the cage with her feathers fluffed out like a mother hen on a nest.
- The comical gymnastics of imaginary worm-pulling in practice for the real thing. ■

A record breeding season for black stilts in the wild

THOUGH the 1982–83 breeding season was generally disappointing for endangered birds in New Zealand, black stilts were reasonably successful. At least 18 chicks were reared in the wild—a record season. Seven were reared at Mailbox Exclosure, six on the Ahuriri River, four at Mick's Lagoon, and one on the Cass River delta. In addition, two clutches were laid by captive birds at Mount Bruce Reserve.

By Ray Pierce

THE HIGH PRODUCTIVITY of the wild population resulted primarily from Wildlife Service cross-fostering of early clutches to nests of pied or hybrid stilts mainly in the exclosures and trapping for predators around the renesting pairs of black stilt. This high success was achieved in spite of persistent, cold westerly winds, rain, and snow throughout the season.

Four clutches were lost during a heavy snowfall at Labour Day weekend, and at least four clutches were preyed on at other times. On three separate occasions clutches were successfully rescued as rising flood waters threatened nests, and these eggs were given to foster parents.

"Lucky"

During the Labour Day weekend whiteout a 3-week-old chick was rescued from Mailbox Exclosure. Up until the Sunday night two chicks had been present with their foster parents—a female hybrid and a male black. On Sunday night the hybrid disappeared (later found dead) and one of the chicks was dead by first light on Monday morning.

The surviving chick was being brooded by the black stilt during blizzards and emerged to forage in shallow water during calms, but it was plainly very weak. During one of its foraging bouts a particularly severe blizzard struck, and the chick was marooned on the down-wind side of the stream. It tried to swim across the stream to its parent, but was forced back to the bank, where it stumbled about at the water's edge.

It was time to act. The chick was collected and transferred to the comparative warmth of the belly skin of its rescuer, then a brooding box, and finally a box beside a fire. There the chick ("Lucky") stayed for 3 days, eating up to 2000 insects each day, including about 1500 mayfly larvae brought from the nearby Cass River.

Lucky's destiny was problematical. Ideally the chick should be returned to its foster parent, but that seemed unlikely to succeed, as the parent's chicks and mate had been gone for 3 days. But, perhaps . . .

On a warm afternoon, 78 hours after the rescue, Lucky was released into the breeding territory, which the parent was still defending against other stilts. For over 2 hours it was not clear whether there had been acceptance or whether it was going to occur at all.

The high frequency of displacement activities performed by the parent suggested that he was confused and, at first, he avoided approaching the chick too closely. Suddenly heavy clouds rolled overhead and the air temperature dropped. Lucky needed warmth. Adult and chick converged on a dry bank and Lucky was brooded.

Lucky recaptured for measuring and banding.

Mick's Lagoon, with recently enclosed flat extending 350 m beyond the lagoon.

Acceptance had conclusively occurred.

Three weeks later Lucky was recaptured and banded, and shortly after that he took to the air.

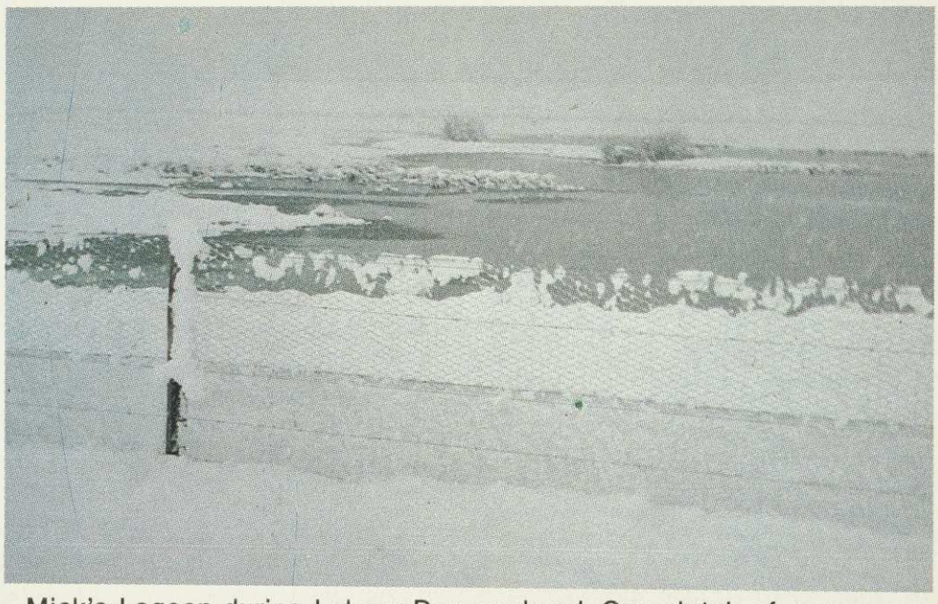
Exclosure extended

Mailbox and Mick's Lagoon Exclosures were each extended by one-third in area before and after the 1982–83 breeding season, respectively. The Society again funded these fencing projects, and labour was provided by the Wildlife Service.

New wetland habitat has been formed in both the extended areas, and this will result in an increase in the numbers of stilts and other water birds using these relatively safe areas for nesting.

Both exclosures will continue to be used mainly for cross-fostering of stilt eggs. Attempts are made to ensure that cross-fostered chicks are colour-banded to enable their progress to be followed.

This autumn both areas are being grazed by sheep; this will help stem the undesirable proliferation of introduced grasses which has followed the the fencing off of these breeding grounds. ■



Mick's Lagoon during Labour Day weekend. One clutch of eggs was buried beneath 35 cm of snow.

Lucky and foster parent. Shortly after Lucky could fly the two moved to drying-up ponds 2 km north of Mailbox Inlet.

Nelson Lakes National Park was a pleasant setting for summer camp

SEVENTY-SIX CAMPERS from Auckland to Dunedin attended the summer camp held in January at Rotoiti in Nelson Lakes National Park. Two people from Australia and even a young man from Canada stayed at the camp. All assembled at the Lodge on Saturday, 8 January, where many friendships were renewed.

After the evening meal Frank Alack gave an official welcome and then introduced Alec McConochie, who has lived in the area for many years and was able to tell us much of the history of the lake area. This talk was followed by the screening of some impressive summer and winter slides of the area that was given by senior ranger Mal Clabrough (Nelson Lakes National Park). He gave us an insight into the Maori legends and geology of the district and explained the concept of a national park.

The different days' events were as follows:

Sunday

This was a free day during which people could get to know the beauty of their immediate environment. Some went to the service at the nearby chapel and were most impressed by the beautiful view from the chapel window.

An enthusiastic party, led by Peter Mulligan, climbed to Parachute Rocks and then continued to the top of the St Arnaud Range. Others walked the Peninsula Track with Bert Kaye, who is good at plant identification, or climbed Black Hill with Jean Espie to see the alpine plants.

One party went by water taxi to the head of Lake Rotoiti, followed the Travers River up stream to cross the bridge, and then walked back to St Arnaud along the eastern side of the lake.

That night Mike Bradstock (fisheries scientist, Ministry of Agriculture and Fisheries) showed underwater slides of the plants and animals in Lake Rotoiti and various coastal habitats. After this there was the customary summer camp judging of the Moira Cox slide competition, for which some good pictures had been submitted.

Monday

The campers travelled by two buses on the next 3 days to nearby localities.

The outing on the Monday — to the Big Bush area—was organised by Roger Frost (a resident Department of Education teacher at the Lodge). Alex Johnston (principal forester) with two other Forest Service officers and Ted Field (Nelson represenative for the Queen Elizabeth II National Trust) accompanied us and spoke at some of the stops.

Roger had done much preparation to ensure a balanced picture of what had been done to the forest and what was being planned both by the Forest Service and private landowners. The area illustrated a number of concepts, each of which has application elsewhere in New Zealand, for example, lowland forest remnants, representative ecosystems, native forests on private land, and preservation of successional forest and scrub.

The evening talk, based on the day's outing, took the form of a lively discussion between Henk Heinekamp (chairman of the Nelson Branch), Alex Johnston, Roger Frost, and the campers.

Tuesday

The buses took the campers to Lake Rotoroa, where ranger Pete Braggins gave a talk on the area and walks available, including views of the lake from vantage points on the Porika Track.

Stoats are, at present, a problem in the park and a few campers were shown two trapped by a park assistant. A heavier trapping programme is needed if a reasonable native bird population is to be maintained there.

That night, Bruce Thomas (ecologist, DSIR) gave an interesting talk, with slides, on the work his department is doing in the park. This included red deer collaring methods, bird counts, and records of rat and mice population increases after good beech seeding years. Members had been invited to bring their own slides, and after Bruce's talk Sue Harris showed these while campers guessed the location of each.

Wednesday

This was the last of the three bus trip days.

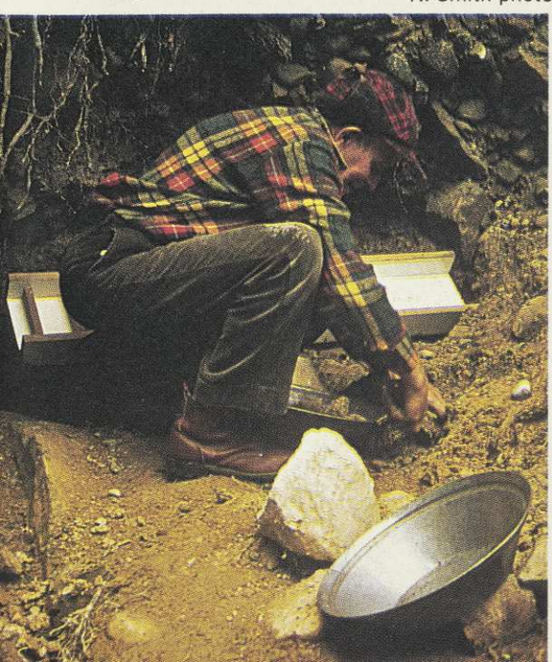
We were taken to the Howard State Forest valley, which lies between Lakes Rotoroa and Rotoiti. Gary Basher, who owns the farm at the head of the valley, spoke about farming management in a climate of severe winters and hot summers, and the profitability of the velvet from his red deer herd.

Some of the campers grouped outside the Rotoiti Lodge. R. Anderson photo

One of the bus drivers provided some unintended light entertainment when he accidently perched the tail of his bus on a bank. Help from Gary's tractor and the arm muscles of some of the campers finally freed it.

The Howard has an interesting gold mining history. Ray Clarke, an old identity of the area, demonstrated how to pan for gold, at which he is adept. Many campers tried their hands at this in the Louis Creek, a tributary of the Howard River. Some, who were really keen, continued gold panning while a group headed further up stream with Ray, who knew just where gold was to be found. Many saw the Miners' Monument and tailings from past gold mining operations near the head of the creek.

Ray Clarke preparing to pan for gold. N. Smith photo



A mid afternoon return to Rotoiti Lodge enabled campers to have time to swim or walk.

That evening Guy Salmon (NFAC) gave a slide show on Waitutu Forest and told us of the urgency of saving this forest and having it joined to the Fiordland National Park. It is a lowland wilderness area having a unique series of forested marine terraces and is one of the few remaining habitats of the yellowhead bird. Some of the most beautiful slides were taken on the Maori land, where the forest meets the shore, and showed coastal scenery too wonderful to be destroyed.

The lack of Maori membership in conservation groups was commented on and broader, outreaching strategies were suggested.

During question time a resolution was unanimously passed that the Forest Service uphold its definition of forests by acknowledging manuka and kanuka of 6 m and more in height when applying their indigenous forest policy. This resolution was sent to Mr Jonathan Elworthy, Minister of Lands and Forests, who has acknowledged receipt.

Thursday

This was another free day and though the weather was showery, it was possible to go for walks. The ranger kindly had two showings of several interesting films in the Deerstalkers Lodge.

That night Nancy Mason and her troupe initiated us into the enjoyable art of folk dancing, aided by the local Bush Band and interspersed by concert items from members. In the Deerstalkers Lodge Frank Alack also had a showing of slides entitled, "From Farewell Spit to the Bluff".

Friday

On this day came the parting of the ways after a good clean-up of the Lodge.

Credit must be given to the three cooks who did an excellent job of providing meals with a smile; Sue Harris and Jean Espie, who arranged all the trips, provided speakers, and made sure that we all had the relevant papers and information for each day; all those who had a hand in the arrangements of the camp and the day-to-day running of it; and all those who attended the camp and by their presence made it an enjoyable one.

—J. E. Hudson,
Nelson Branch

Native Orchids of New Zealand

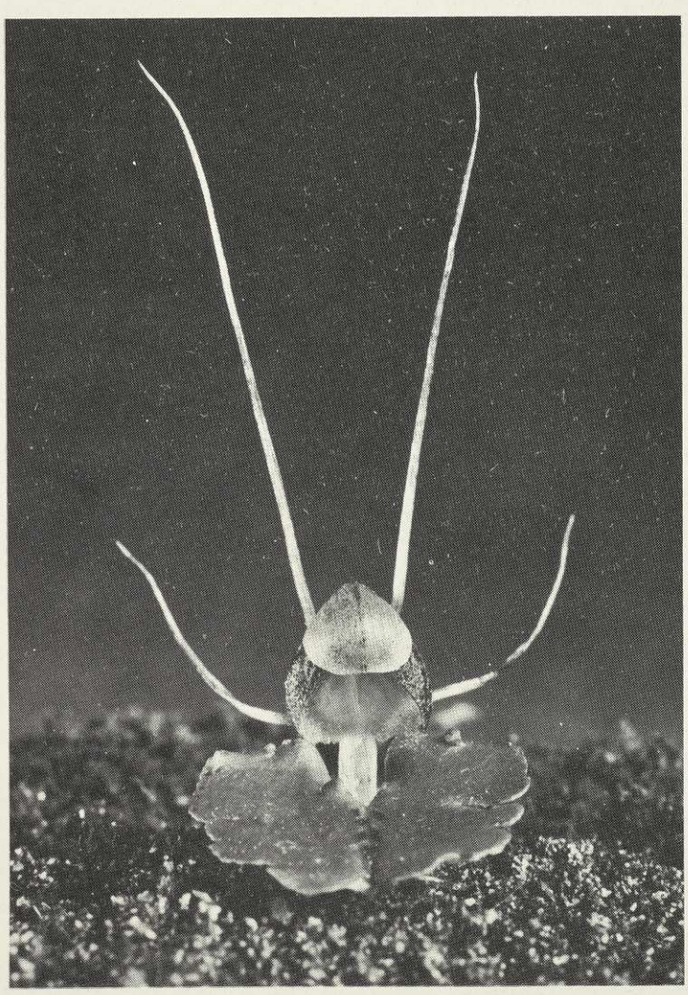
JOHN JOHNS · BRIAN MOLLOY

There are almost 80 species of native orchid growing wild in New Zealand. Poking out of banks, hiding under scrub, half-sunk in swamps and perched on trees, they provide ample proof of the beauty and vibrant colour to be found in our plant world.

Many of the species are readily accessible in various parts of the country. Others are barely known to exist, so rare are the sightings of them. Most have delicate, exquisite flowers, many are quite tiny. All display a remarkable array of flower types, especially at close range.

The beauty of these flowers is now presented in book form by photographer John Johns, with supporting text by botanist Brian Molloy. John John's work is represented in 64 pages of full-colour plates and many black and white photographs. Brian Molloy has provided information on the names, origins, cultivation and distribution of the orchids.

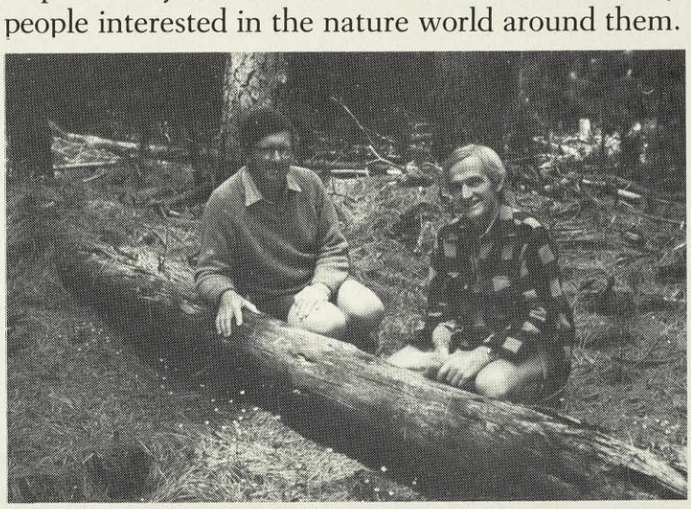
Native Orchids of New Zealand is a book to delight and inform. It stands as an important addition to the growing library on New Zealand's nature world.



Corybas trilobus (x1.5)

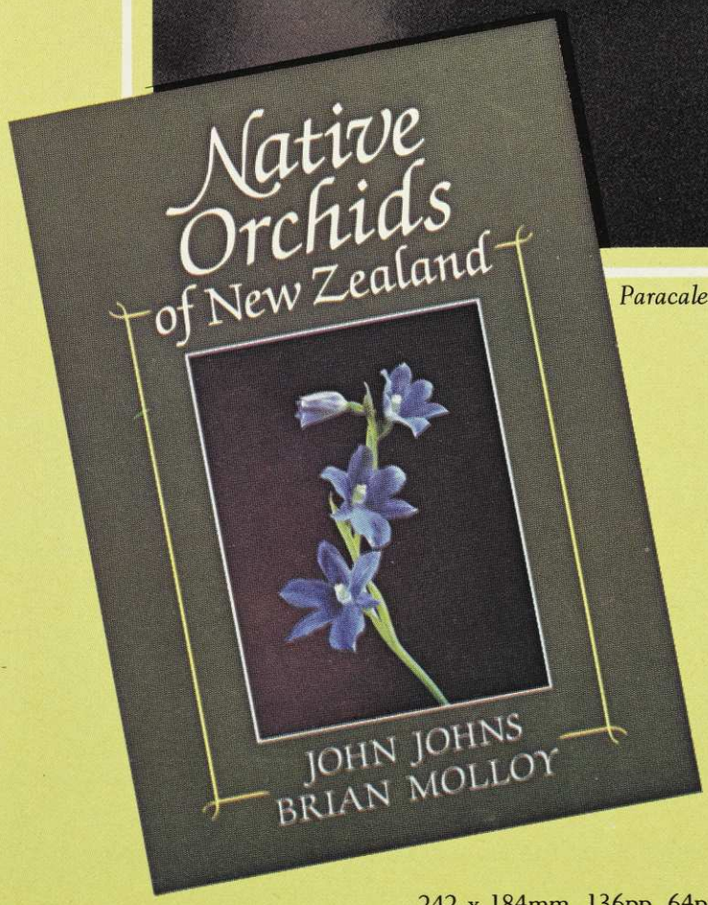
JOHN JOHNS, an Associate of the Royal Photographic Society, is one of New Zealand's leading outdoor photographers. As staff photographer for the New Zealand Forest Service he has travelled throughout the country and has a deep experience of our flora and fauna. His work is already well known through two earlier books, *The Forest World of New Zealand* (with Geoff Chavasse) and *Know Your Camera*.

BRIAN MOLLOY Dip. Agr., Dip. Tchng, M.Sc. (Hons), Ph.D. is a senior botanist with the DSIR at Lincoln, where his work includes the study of several plant types, nature conservation and vegetation history. He believes strongly that botanists have a responsibility to make their work accesssible to lay people interested in the nature world around them.



Brian Molloy (right) and John Johns with a group of *Adenochilus gracilis* under *Pinus ponderosa* in Hanmer Forest.

Paracaleana minor (x4)



Native Orchids of New Zealand

JOHN JOHNS · BRIAN MOLLOY

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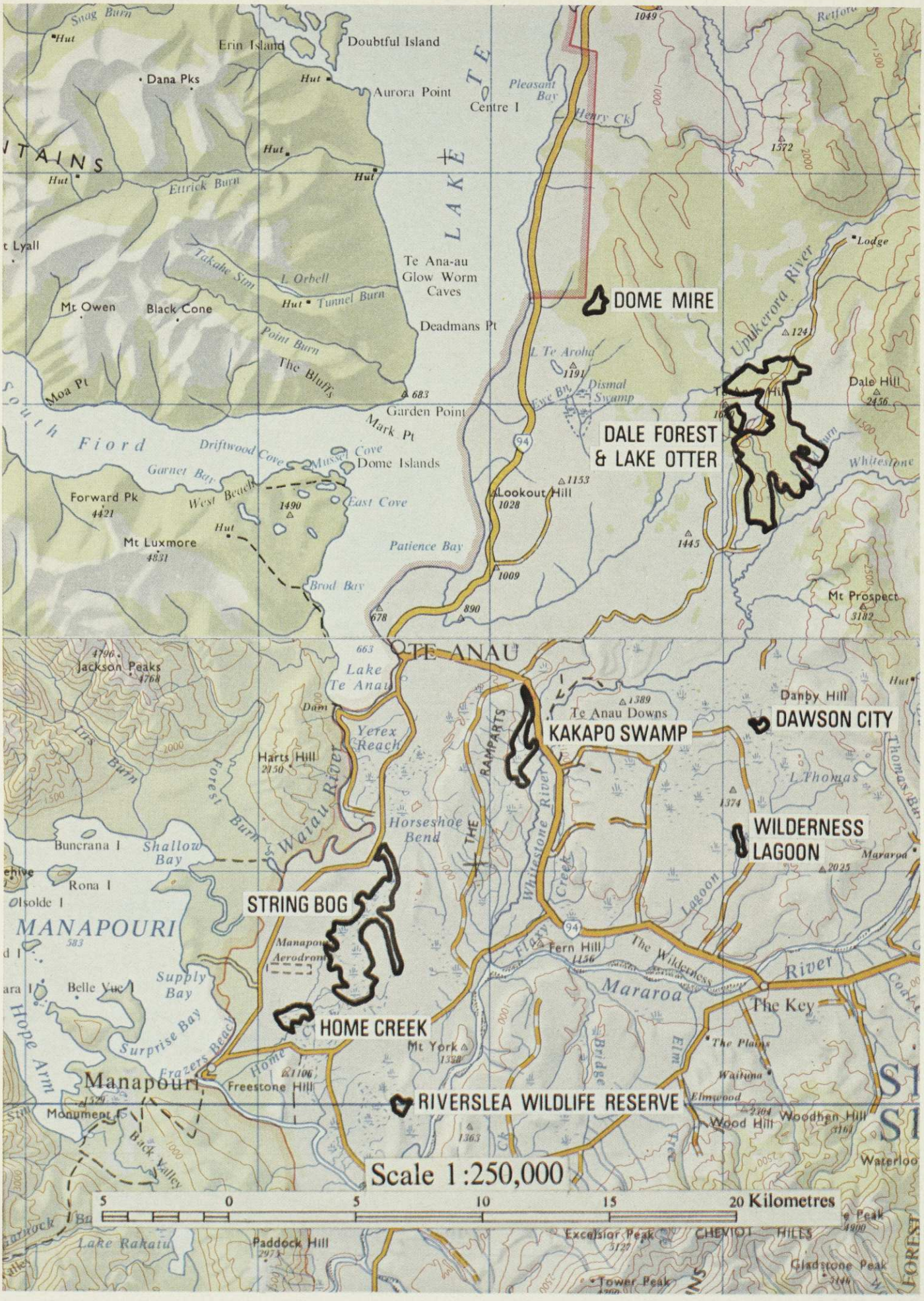


The Te Anau basin, showing the wetlands set aside as reserves by the Department of Lands and Survey.

Preserving the Te Anau wetlands

AS BUS-LOADS of tourists thunder along the highway between Lake Manapouri and Lake Te Anau few of them would guess that just out of sight to the east is one of the finest examples of a string bog outside the Boreal peatlands of the Northern Hemisphere.

By David Gregorie, Department of Lands and Survey

THE FIRST IMPRESSION that any visitor to the Te Anau basin must get is of thousands of hectares of well-tended farm land. There is little to suggest that hidden behind the rolling pastures there are some 3000 ha of wetlands and forest remnants of considerable geomorphic, biological, and palaeobotanical interest.

The Department of Lands and Survey, which is responsible for farm development and settlement in the area, is excluding from development a number of bogs, swamps, stream berms, and other wetlands and patches of less-modified bush and scrub. These areas are important scientifically for their unique or unusual plants and plant-associations, for the opportunity they give to study peat samples dating back for several thousand years, and for the secure habitat they offer for breeding waterfowl and other wildlife.

Managed as reserves

At present these areas are being fenced off and managed as reserves. When the surrounding farm units are surveyed for settlement the reserved areas will themselves be surveyed and gazetted as wildlife, nature, or other reserves.

The Kepler String Bog, also known as the Old Channel Bog, occupies the ancient channel of the Waiau River between banks of old glacial moraine. String bogs have a characteristic pattern of pools elongated at right angles to the main line of drainage and stepped up the slope like a staircase.

The Kepler Bog drains into Home Creek, itself to be set aside as a reserve, and thence into Lake Manapouri.

The complex vegetation pattern includes wire-rush (*Empodisma minus*), turpentine plant (*Dracophylum oliveri*), sedge (*Baumea rubiginosa*), and the mosses (*Eucamptodon inflatus, Campylopus kirkii*, and *Sphagnum falcatulum*).

The impressive pool system near the centre is divided by islands and isthmuses supporting bog pines (*Dacrydium bidwillii*, *D. intermedium*, and *D. laxifolium*), which have probably been protected by their isolation from the fires that have swept the district since pre-European times and which severely modified the previous vegetation pattern.

A recent survey by the Wildlife Service recorded grey and paradise ducks, Canada geese, marsh crakes, bitterns, fernbirds, and black-backed gulls nesting around the pools.

The peat is about 6 m deep, and borings taken for pollen and macrofossil analysis have provided a valuable record of the post-glacial history of the surrounding vegetation.

Noel Hellyer, assistant director (survey) in the Wildlife Service, describes the Riverslea Farm Development Block, south of the Kepler String Bog, as being an excellent example of land management. A wildlife reserve has already been established on the block.

"Bruce Newlands, the farm manager, has done an incredible amount to protect wildlife habitat in the area," he says.

Dome mire

East of the main road north of the Te Anau township, but screened from it by the intervening forest and scrub, lies one of the best specimens of a dome mire anywhere in New Zealand. Known simply as "Dome Mire", it is a classic raised bog with a domed centre and a concentric pattern of ponds, similar to bogs found in the vast peatlands of northern Scandinavia, Siberia, Alaska, and Canada.

Like all true bogs, it depends largely on rainfall for its water supply, and the acidic, infertile water supports little other than the normal bog plant species found in the district.

The main interest for the botanist lies in the margins. The north-western and north-eastern edges of the bog support stands of silver pine (*Dacrydium colensoi*), which is not found elsewhere east of the main divide. Subfossil remains suggest that it was once widespread in the Te Anau basin.

A small orchid (*Acianthus fornicatus*) has been found in a fen just south of Dome Mire, which has considerably extended its known range. Black-billed gulls, pied stilts,

and fernbirds nest around the ponds.

To the east of Dome Mire lies the Dale Development Block, about 30 percent of which will be excluded from pastoral farming and set aside in reserves. These include Dale Forest and Lake Otter, berm areas along the banks of the Whitestone and Upukerora Rivers, and another small reserve at present managed by the Wildlife Service.

Luxuriant cover

Kakapo Swamp, close to the main road about 6 km east of Te Anau, is a prime waterfowl breeding area and contains luxuriant cover of flax, niggerhead, and abundant watercress. The water level has been raised and the swamp area extended to increase the breeding space available to birds.

The curiously named Dawson City Swamp, an interesting fen dominated by the sedge *Carex diandra*, and the Wilderness Lagoon, both in the Wilderness Road area, have also had their water levels raised by weirs to add to their potential as waterfowl breeding areas.

Land development has been seen by some as a menace to the remaining wetlands of the Te Anau basin because of the burning off and the drainage of swamps and bogs associated with it.

But devastating fires, as we have seen, are nothing new. They have swept the area for centuries. The clearing of vulnerable dry scrub and its replacement by pasture plants should lessen the chances of widespread fire in the future.

The Kepler String Bog and the Dome Mire, both regarded as wetlands of international significance, have been excluded from development, and any interference with their drainage patterns is being avoided. These and several other small wetlands have been set aside as potential reserves, and the swamps mentioned above have been extended and enhanced to improve their carrying capacity for breeding water birds.

Part of the pool system in the Dome Mire. The wind-swept appearance has been caused by down-wash from the rotor blades of a helicopter.

The pool system of the Kepler String Bog, with Lake Manapouri behind. The bog drains from right to left, across the line of the pools.

An aerial view of the Dome Mire, looking towards the north. The stands of bog pine (*Dacrydium colensoi*) are on the far side of the bog.

"Lands and Survey policy is to strike as equitable a balance as possible between the various conflicting land-use options for the basin," says Bing Lucas, the department's director-general. ■

State forest dedicated areas

STATE FOREST dedicated areas throughout the country are not generally well known, and some members may wish to have this information when they are travelling or on holiday. An up-to-date listing of all State forest dedicated areas appeared in *Forest Management Information*, No. 25, issued by the Forest Service in November last year. This listing is published below and should be a useful reference to those interested.

Forest sanctuaries

The original Forests Act 1874 recognised the problem of resource depletion in our forests and the need for the institution of conservation measures. Succeeding this, the 1921–22 Forests Act contained limited provisions for the setting aside of areas for ecological conservation, these being further supported by the Forests Act 1949. The latter greatly enhanced the ability of the Forest Service to dedicate areas for scientific purposes to be known as State forest sanctuaries.

Since 1951, 14 such areas have been gazetted by proclamation of the Governor-General and the Minister of Forests, their primary purpose being to preserve indigenous flora and fauna in their natural state. The areas are shown below.

Declaration of a forest sanctuary precludes any form of exploitation such as timber felling, mining, and the granting of lease or privileges over the land or the forest produce. Public entry is by permit only, and any use by the public is restricted whenever activities are likely to affect the values for which the sanctuary is dedicated.

Ecological and allied dedicated areas

The combination of the Forests Amendment Act 1973 and 1976 enabled State forest areas to be dedicated for specific purposes where some special natural value or management objective needs to be protected. Such areas may have ecological, historical, cultural, educational, or other special values.

New Zealand is at present being partitioned into a mosiac of ecological regions and districts principally based on the unifying of features of vegetation pattern, climate, geomorphology, and soils. Within each district a series of ecological areas is being established. Most commonly these areas are representative of the district's forest pattern and sequence.

Forest sanctuaries

Name	State forest (park)	Conservancy	Area (ha)	Gazette (year)
Omahuta	SF 5	Auckland	6	1951
Waipoua	SF 13	Auckland	9 105	1952
Erua	SF 97	Wellington	7	1954
Oapui	SF 125	Wellington	1	1956
Esk	SF 115	Wellington	157	1963
Rocky Hills	SF 49	Wellington	404	1970
Te Arai	SF 187	Auckland	5	1970
Whirinaki	SF 58	Rotorua	163	1971
Manaia	CSFP	Auckland	481	1972
Hikutau	NWNSFP	Nelson	850	1973
Hihitahi	SF 69	Wellington	2 170	1973
Wairahi	SF 165	Auckland	470	1973
Ngatukituki	K-MSFP	Auckland	1 600	1973
Wararawa	SF 6	Auckland	869	1979
		Total	16 288	

Abbreviations

CSFP: Coromandel State Forest Park.
K-MSFP: Kaimai-Mamaku State Forest Park.
Pir SFP: Pirongia State Forest Park.
Pur SFP: Pureora State Forest Park.
NWNSFP: North-West Nelson State Forest Park.
VSFP: Victoria State Forest Park.
HSFP: Hanmer State Forest Park.
AA: Archaeological area.
Am A: Amenity area.
BA: Biological area.
EA: Ecological area.
GA: Geological area.
HA: Historical area.
KMA: Kauri management area.
WA: Wetlands area.

In situations where particularly outstanding or unique features cannot be accommodated within the representative concept additional smaller reserves are dedicated.

Though such areas may be varied or cancelled by Gazette notice, the legislation requires public notification and opportunity for objections. General entry into these dedicated areas for public appreciation and harmless forms of recreation is permitted.

Ecological and allied dedicated areas gazetted are as follows:

Ecological and allied areas

Name	State forest (park)	Conservancy	Area (ha)	Gazetted (year)
Waipoua KMA	SF 13	Auckland	3 747	1976
Lookout BA	SF 179	Auckland	57	1976
Lake Okaihau BA	SF 179	Auckland	12	1976
Hodges Basin BA	SF 179	Auckland	25	1976
Coal Seam Hill BA	SF 179	Auckland	22	1976
Otahu BA	CSFP	Auckland	396	1976
Pukekura HA	SF 194	Auckland	1	1977
Waitangi WA	SF 193	Auckland	159	1977
Rotokuru EA	SF 100	Wellington	240	1977
Waimangarara EA	SF 42	Canterbury	459	1977
Riverhead EA	SF 131	Auckland	12	1977
Taumatatawhero EA	SF 167	Auckland	415	1977
Moehau EA	CSFP	Auckland	3 634	1977
Todea Barbara EA	SF 193	Auckland	1	1978
Pukawhau EA	SF 193	Auckland	33	1978
Pikiariki EA	Pur SFP	Auckland	457	1978
Waipapa EA	Pur SFP	Auckland	1 830	1979
Pou-toko-rua HA	SF 187	Auckland	7	1979
Blackwater River EA	SF 58	Westland	9 150	1980
Big River EA	VSFP	Westland	6 733	1980
Capleston EA	VSFP	Westland	143	1980
Fletchers Creek EA	SF 127	Westland	2 586	1980
Coal Creek EA	VSFP	Westland	3 025	1980
Greenstone EA	SF 31	Westland	1 144	1980
Three Mile Hill EA	SF 30	Westland	176	1980
Deadman EA	SF 33	Westland	240	1980
Roaring Meg EA	SF 34	Westland	3 600	1980
Flagstaff EA	SF 26	Westland	1 622	1980
Waipuna EA	SF 47	Westland	1 910	1980
Saxton EA	SF 34	Westland	4 120	1980
Mangatutu EA	Pur SFP	Auckland	2 533	1980
Oparau EA	Pir SFP	Auckland	981	1980
Parakawai GA	CSFP	Auckland	68	1980
Punaruka AA	SF 123	Auckland	1	1980
Pukepoto EA	SF 122	Rotorua	1 906	1980
Porarari EA	SF 128	Westland	6 448	1980
Tiropahi EA	SF 128	Westland	3 451	1980
Charleston Am A	SF 128	Westland	547	1980
Lake Ahaura Am A	SF 26	Westland	812	1980
Reefton Am A	SF 194	Westland	1 083	1980
Shamrock Creek Am A	SF 43	Westland	500	1980
Upper Arahura Am A	SF 21	Westland	360	1980
Pukekohe Stream EA	SF 5	Auckland	269	1981
Onekura EA	SF 4	Auckland	2 351	1981
Manganuiowae EA	SF 2	Auckland	1 769	1981
Lake Christabel EA	VSFP	Westland	10 648	1981
Deep Creek EA	SF 33	Westland	600	1981
Saltwater EA	SF 40	Westland	1 438	1981
Lake Hochstetter EA	SF 26	Westland	1 803	1981
Oroko Swamp EA	SF 39	Westland	173	1981
Mt Bruce Mgt Area	SF 38	Wellington	55	1981
Omihi HA	SF 93	Canterbury	1	1981
Kapowai EA	CSFP	Auckland	1 400	1982
Te Hura EA	SF 6	Auckland	999	1982
Papakai EA	CSFP	Auckland	3 200	1982
		Total	89 352	

Recreation areas

A recreation area is an area of State forest land set apart by the Minister of Forests under section 63A of the Forests Act (as substituted by section 19 of the Forests Amendment Act 1976) for the purposes of public recreation. The public has freedom of entry without permit. The areas are as follows:

Recreation areas

Name	State forest (park)	Conservancy	Area (ha)	Gazetted (year)
Hanmer	HSFP	Canterbury	204	1970
Tairua	SF 150	Auckland	369	1971
Whareorino	SF 43	Auckland	14 733	1973
Pukenui	SF 164	Auckland	592	1973
Great Barrier	SF 165	Auckland	7 556	1974
Ohau	SF 81	Southland	13 636	1975
Eyre	SF 1	Southland	24 889	1975
Snowdon	SF 24	Southland	44 752	1975
Gwavas	SF 110	Wellington	203	1976
Balmoral	SF 85	Canterbury	17	1976
Atuanui	SF 29	Auckland	607	1976
Aupouri	SF 187	Auckland	68	1977
Taringatura	SF 121	Southland	1 389	1977
Opua	SF 117	Auckland	1 932	1977
Esk	SF 115	Wellington	46	1980
Waipunga	SF 115	Wellington	145	1980
Clark River	SF 187	Nelson	4	1980
Pioneer Park	SF 95	Canterbury	120	1980
Raincliff	SF 95	Canterbury	84	1980
Fox Creek	SF 4	Canterbury	75	1981
Berwick	SF 100	Southland	471	1982
		Total	111 892	

State forest parks

State forest parks are established "for the purposes of facilitating public recreation and the enjoyment by the public of any area of State forest land". They are managed under approved management plans with the assistance of advisory committees appointed by the Minister. Those proclaimed by the Governor-General so far are:

State forest parks

Name	Conservancy	Area (ha)	Gazetted (year)
Tararua	Wellington	117 226	1967
Craigieburn	Canterbury	35 736	1967
Kaimanawa	Wellington	76 368	1969
NW Nelson	Nelson	375 728	1970
Coromandel	Auckland	68 693	1971
Pirongia	Auckland	13 324	1971
Rimutaka	Wellington	14 217	1972
Kaweka	Wellington	67 247	1974
Lake Sumner	Canterbury	100 424	1974
Haurangi	Wellington	16 198	1974
Catlins	Southland	57 881	1975
Kaimai-Mamaku	Rotorua	36 965	1975
Whakarewarewa	Rotorua	3 830	1975
Ruahine	Wellington	93 224	1976
Mt Richmond	Nelson	180 747	1977
Hanmer	Canterbury	16 833	1978
Pureora	Auckland	69 532	1978
Raukumara	Rotorua	115 102	1979
Victoria	Westland	201 000	1981
	Total	1 660 275	

Exploring the Wanganui River by canoe

A PARTY of 14 members of the Mana Branch canoed down the Wanganui River from Taumarunui to Upokongaro in January. This report, compiled by Isabel Robertson, describes some of the highlights of the trip.

Most of us were novice canoeists. We quickly learnt to navigate around obstructions and to paddle successfully through rapids. The few experienced canoeists in the party encouraged us all the way. Mike Peers, our trip leader, helped by shouting "Paddle" at tricky moments.

When we had mastered our erratic canoes, we were able to observe and hear much of interest around us. The birdlife ranged from the more common introduced species to swallows, pukekos, tuis, bellbirds, native pigeons, hawks, pied stilts, shags, ducks, and the ubiquitous fantail. Other birds glimpsed or heard were fernbirds, quails, pheasants, and wekas. There was no positive hearing of kaka or parakeet.

Once in the gorge we experienced long, tranquil stretches of water and enjoyed the continuous sound of bird song. Bellbirds, tuis, cuckoos (shining and long-tailed), robins, grey warblers, and whiteheads were abundant. We wondered why there were no swallows. Possibly the moist fern- and moss-clad papa cliffs were unsuitable for nesting sites.

Unique experiences

The gorge forest appeared untouched by fire or axe, but large numbers of goats were present. This stretch of the river offered unique experiences: perpendicular fern-covered cliffs mirrored in the water; waterfalls plunged to the main river; strikingly narrow gorges wound in from the river to more waterfalls. There was no room to turn a canoe in there.

At most breaks and camp sites we observed the flora and fauna more closely. We squelched through the mud of the Mangapurua Stream, a tributary of the Wanganui, scrambled up the bank, hand over hand up the rope, to the track to the Bridge-to-Nowhere. This was a most attractive walk.

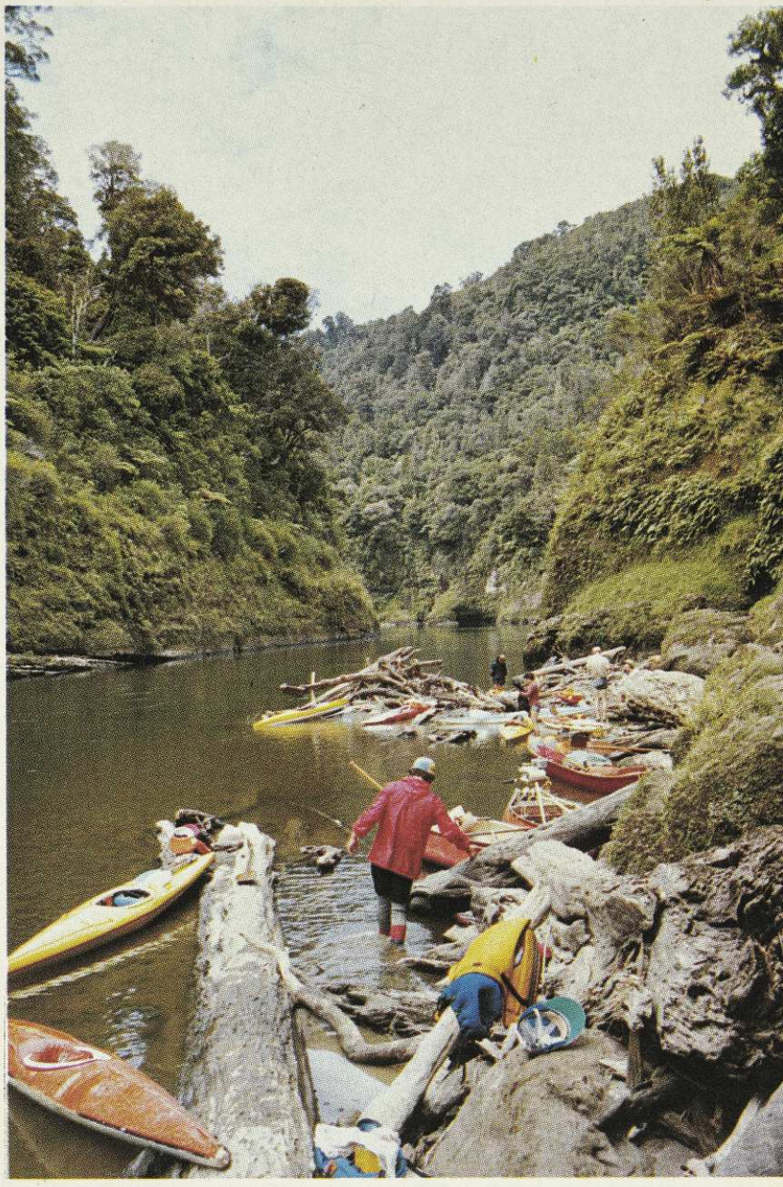
In the 10-day trip the two huts we slept in were the old school house, situated up the Retaruke River, and the John Coull hut, fairly new and well designed. Both huts were clean and comfortable with innerspring mattresses. Mike was pleased to note that improvements to the river facilities were well under way.

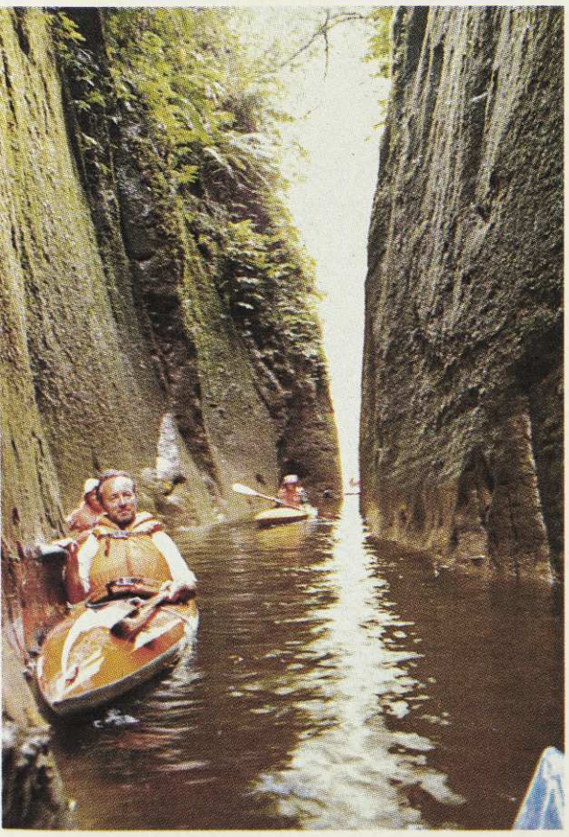
Pipiriki, where several of our party finished their journey, marked our return to more open country. We saw many hawks and other birds common to farm land. We completed our expedition at Upokongaro. This avoided tedious paddling into Wanganui City.

We appreciated our trip leader, Mike Peers. His initiative and leadership resulted in a trouble-free, rewarding experience for us. Canoeing down the Wanganui River is fantastic.

The party arriving at the Pipiriki landing.

A stop down river from Pipiriki.



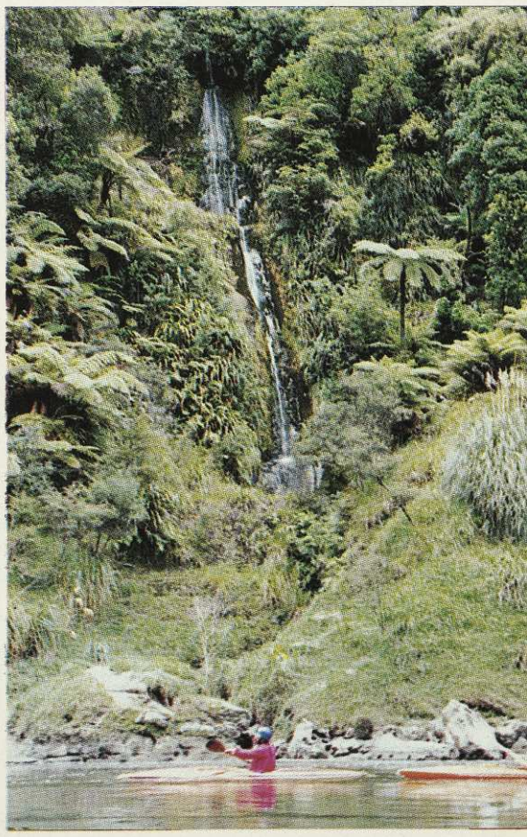


Top, left: A view from Tamatea's Cave down the Wanganui River.

Top, right: After tying the canoes the party climbed the "goat track" to the New Zealand Canoe Association shelter above Mangawaiiti Stream.

Bottom, left: One-way traffic in a narrow, winding side gorge. Mike Peers, the leader, is in the foreground.

Bottom, right: Water from some waterfalls in the gorge section tasted sweet.



No need to fear the N.Z. lamprey

LAMPREYS are strange, very primitive, fish-like creatures, slimy, lacking jaws, with no paired fins, and looking snake- or eel-like. They are not true fish, but are related, most nearly, to the marine hagfishes, though even this relationship may be both very distant and ancient.

By R. M. McDowall, Fisheries Research Division, Ministry of Agriculture and Fisheries, Christchurch

IN THE GREAT LAKES of North America in the 1940s, when the St Lawrence seaway opened access for sea-living fish, sea lampreys invaded the lakes and established land-locked populations. Numbers exploded and within a very short time the lampreys had attacked and almost eliminated the populations of lake trout or "mackinaw" (*Salvelinus namaycush*). They feed by attaching themselves to larger fish, rasping away the flesh and eventually killing their prey. A valuable and thriving commercial and recreational fishery for mackinaw (which grows to almost 50 kg) was destroyed.

Not only did lampreys invade the lakes, but other marine species did also. And not only was the mackinaw population destroyed, but the entire ecology of the lakes suffered massive disruption.

New Zealand has a lamprey (*Geotria australis*), a species which we share with Australia, Tasmania, and South America. Occasionally there are fears expressed that New Zealand's lamprey may have harmful effects on our trout populations. Fortunately it has so far shown no indication of adopting the destructive habits of its North American relative.

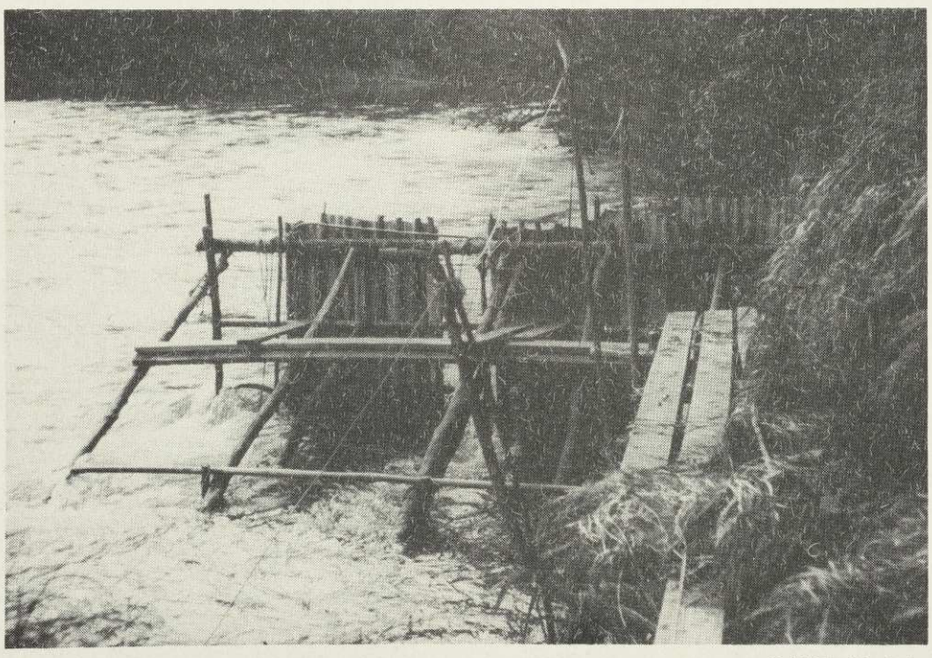
I suppose it is natural to wonder whether the lamprey will attack man. There is nothing to suggest so. There is no evidence to indicate they feed at all or attack anything in fresh water. The few lampreys that are seen in rivers and streams are adults migrating from the sea to spawn. As with the North American sea lamprey, a part of the life of the New Zealand species—probably more than half—is spent in the sea.

Resemble eels

Lampreys leaving the sea are very slender, more so for their length than eels, which they superficially resemble. They are about 500–600 mm long and are very handsome — silvery on the belly, the back deep blue, with a pair of brilliant turquoise bands along each side of the midline. The mouth is a circular sucker armed with spiral rows of horny, orange teeth, and at the centre of the sucker is a piston-like tongue, also armed with teeth.

During its several years in the sea the lamprey has fed by attaching itself to marine fishes, rasping away the flesh and consuming the juices of its prey. Essentially it is a parasite.

During winter and spring the adults begin to leave the sea and move up rivers and streams. They are sometimes seen by whitebaiters, but seem to move mostly at night. Occasionally accumulations of lampreys may be found below obstructions such as falls and dams. They usually lie deep in the water, attached by the sucker to rocks on the river bed. As they migrate their once-beautiful colours fade to a drab, muddy, grey-brown, and the male develops a baggy



P. R. Todd photo

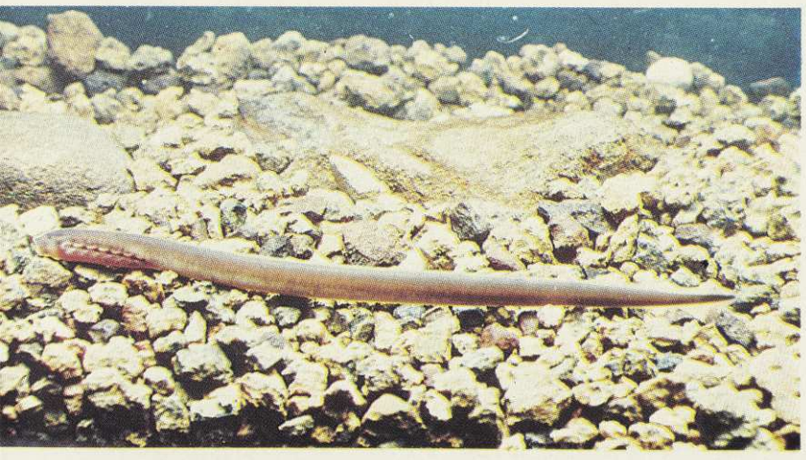
A lamprey weir or utu-piharau on the Wanganui River.

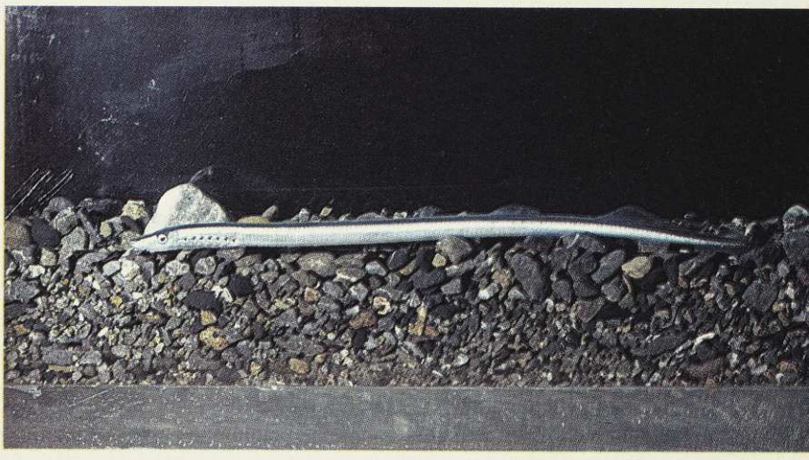
Above: An adult lamprey, *Geotria australis*.

Right: The sucker of a lamprey.

Below, left: An ammocoete larva. W. Fulton photo

Below, right: A macrophthalmia ready to go to sea.





pouch beneath the head; what for, no one knows. They seem to move well up stream into small rocky tributaries in the bush, but how long it is before they spawn and when and where they do so is not known. They are probably in fresh water for many months.

Tiny larvae

Tiny larvae hatch from the eggs and may later be found inhabiting burrows in gently flowing, sandy or silty backwaters. They are about 11 mm when first found and over several years they grow to a length of about 100 mm, feeding by filtering micro-organisms from the water. This larval stage, or **ammocoete**, is decidely worm-like in appearance, is a pinkish-brown in colour, and lacks eyes.

During autumn, several years after hatching, a dramatic transformation takes place. The drab brown and eyeless ammocoete becomes a silver and blue **macrophthalmia**, so called because it has large eyes. The macrophthalmia is a miniature of the adult, in both form and colour, and it heads down stream to the sea to begin growth to adulthood in just the same way as its parents did—by parasitising marine fish.

The lamprey once formed a significant food resource for the Maoris, who used to construct elaborate weirs across rivers to catch the up-stream migrating adults. A lamprey weir, or utu-piharau, is still used on the upper Wanganui River by the Maori population to catch lampreys as food.

Today lampreys seem little known and their migrations are largely unmolested by man. In a few places they are recognised and may be taken for food, especially in Southland. In a few rivers large runs are known and are harvested semi-commercially. Maoris and European immigrants compete for them as a sought-after, though rather esoteric, delicacy. ■

Seashore stay-at-homes

MANY DIFFERENT types of seashore animals spend their whole lives in one place. Instead of wasting energy swimming around looking for food, they have it delivered to them twice a day by the tide.

By David Gregorie

ONE REASON for this odd behaviour is that it's safer. When the sea is rough and the waves use boundless energy to pound the rocky shore, any living creature that is not firmly stuck down or well hidden in a crevice is likely to be smashed to pulp. Try swimming in even small waves and you will see what I mean.

Barnacles, tube-worms, mussels, rock oysters, and some sea anemones spend their lives firmly cemented to one spot. Chitons, limpets, pauas, and other types of sea anemone move about very little and are able to cling on to a rock very tightly by muscular contraction if anything tries to dislodge them. Pipis, tuatuas, toheroas, and cockles bury themselves in the sand and let the sea roll harmlessly over them.

These animals have developed several different ways of getting their food.

Chitons, limpets, and pauas creep slowly over the rocks, grazing on algae or seaweed. The bivalve molluscs that live under the sand have long tubes called siphons, which they push up through the sand to the surface. One tube sucks sea water down to the animal, which feeds on the microscopic plankton that lives in the sea; the other tube takes the filtered water and the animal's waste products back to the surface.

*Sponsored by the J. R. McKenzie Trust.

"Filter feeders"

Mussels are also "filter feeders". You will find them on rocks and wharf piles in more sheltered water. When the tide is in they open their shells and filter plankton out of the water that surges through them. When the tide is out they shut their shells up tightly and wait for high tide again for their next meal.

Sea anemones are often very colourful and look more like plants than animals. They belong to a group called Coelenterata, which means hollow gutted. They are shaped like an empty sack, open at the top, with a fringe of deadly stinging tentacles around the open end. The closed end is usually stuck firmly to a rock. When they are hungry they open out their tentacles so that they look like the petals of a brilliantly coloured flower. They don't look at all dangerous.

Each of the tentacles is equipped with a tiny barbed sting, rather like a bee sting. If a small fish or a shrimp brushes against one of the tentacles, the sting shoots into it and the barb holds it fast. The more the victim wriggles around the more tentacles it will touch and the more firmly it will be caught. Poison sacs inside the tentacle pump a paralysing venom into the victim so that it cannot swim away.

When the prey stops wriggling, the other tentacles gradually fold over it and it is drawn down inside the anemone and digested. Any indigestible bits are ejected through the mouth again when the anemone opens for its next meal.

Blob of jelly

The red beadlet sea anemone (*Actinia tenebrosa*) is common all around New Zealand, but it is not always easy to find. When it folds in its tentacles it looks just like a blob of dark-red jelly. There is a picture of a red beadlet anemone in colour on the inside front cover of the November 1982 issue of *Forest and Bird*.

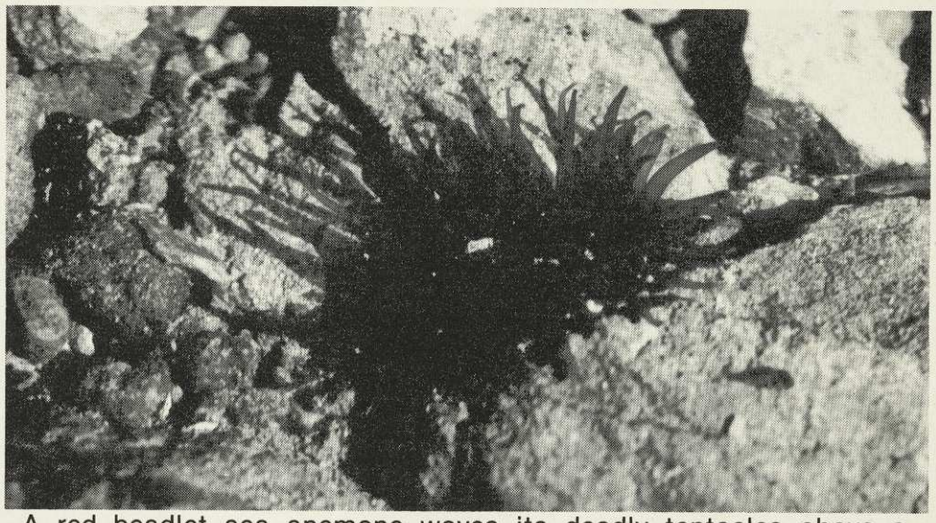
The striped anemone (*Epiactis thompsoni*) is usually larger and has bright orange and white stripes up and down its body. It is common around Wellington and further south.

The wandering anemone (*Phlytenactis tuberculosa*) is much larger—up to 15 cm long—and is covered completely with what look like brown blisters. Its tentacles are creamy white. You will probably find it stuck to seaweed in rock pools, but it can detach itself from the seaweed and float about in the water.

Barnacles are another family of stay-at-homes. The barnacles you are most likely to see are the modest barnacle

A snake-skin chiton and a limpet shelter in a small rocky crevice.

Modest barnacles, probably the commonest of the small tide-pool barnacles, compared with a 2c coin to show their size.



A red beadlet sea anemone waves its deadly tentacles above a sheltering rock.

(*Elminius modestus*) and the pink barnacle (*Balanus decorus*). The modest barnacles are only about 5 mm across and you can see them in off-white clusters on rocks between the tides. Pink barnacles are much larger and you will most likely find them on empty shells inhabited by hermit crabs.

Little castles

Barnacles look like little castles with steep, two-piece roofs between their battlements. It is hard to believe that they are crustaceans and are related to crabs and crayfish. When they first hatch out of their eggs, barnacles can swim around like tiny shrimps looking for a place to live.

When they find a likely spot, they fix themselves to the rock by their heads and grow hard, stony plates around their sides and a roof over their tails.

They still have legs, just like any other crustacean, but they are hidden behind the two movable plates that form the roof. When they are hungry, they open their roof plates and use their legs to comb through the sea water in search of food.

You could say they stand on their heads and kick food into their mouths with their feet!

From a distance a group of tube worms looks like a patch of dried bird-droppings. When you get closer you can see that they are hard, off-white, limy tubes that seem to be empty. The open end is smooth and trumpet shaped.

Inside the tube lives a polychaete worm (probably *Pomaceteros cariniferus*) which you won't see unless it is under water. If you watch carefully, you will see a flash of purple as a fringe of tentacles darts out into the water in search of food.

Related to snails

The limpet and the paua are both univalve molluscs, distantly related to snails. You will find plenty of limpets of at least two or three species clinging to rocks when the tide is out. When the tide returns and they are safely under water they will start moving about and feeding on seaweed. Pauas are much larger and stay under water all the time. They, too, graze on seaweed.

Chitons are also molluscs, though they look quite different from other types. Our commonest chiton, the snake-skin chiton (*Sypharochiton pelliserpentis*), has eight shell plates arranged across its back with a band of leathery, snake-like skin around the edge.

Once you get interested in seashore life, you will find that it is rather like an incurable disease. There are so many different seashore habitats, all of them with different kinds of plants and animals, that you could spend all your sunny days pottering around the pools and finding something new all the time.

Nobody with any love of living things could be bored. ■

BIRDS I HAVE MET

18. The little blue penguin—korora

MY FIRST MEETING with the little blue penguin, face to face, was an unpleasant experience for both of us. She, poor creature, was being held firmly by a fellow bird-watcher and was not in an amiable mood. Nor was I. It was raining. The wind was blowing, our launch was rocking on a choppy sea, and I felt very sick.

We had set out that morning, an enthusiastic party of bird-watchers, to visit several small islands in the Marlborough Sounds.

By Avis Acres

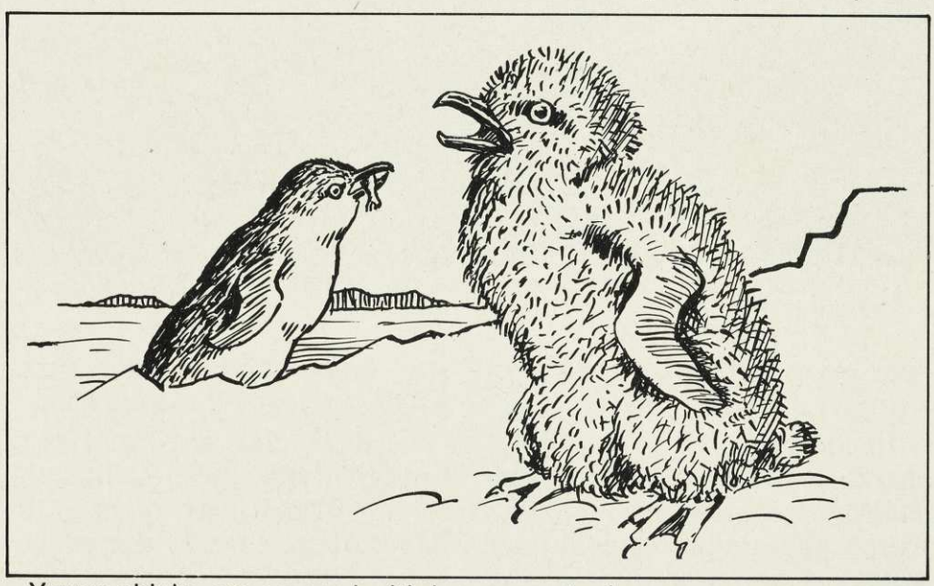
When we left, the weather was fair, but a storm blew up and ruined our day. It was too rough for most of us to go ashore on any of the islands. A few hardy souls braved the elements and one kind friend, knowing that I had hoped to sketch a blue penguin, brought one on to the launch.

After being dragged from her burrow she was not inclined to pose gracefully for her portrait. She was also frustrated. Her kidnapper was an experienced handler of penguins and wore strong leather gloves; so she was unable to peck his fingers.

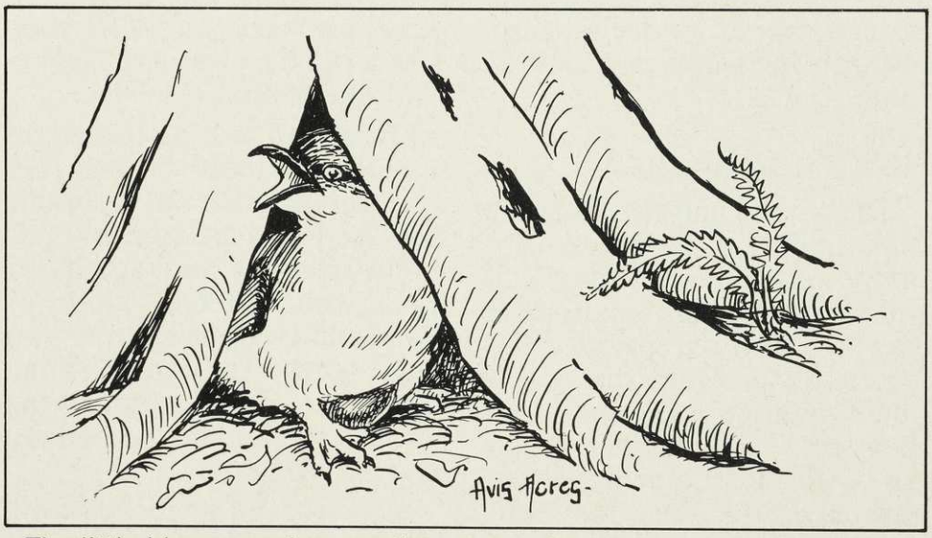
It was a wonderful opportunity to sketch a penguin at close quarters. I had to work quickly and by the time I finished the sketch my sea sickness was cured. I am certain korora was relieved when her ordeal was over and she was returned to her burrow.

My second meeting with a blue penguin was quite dramatic and gave us both a nasty shock. I was searching for a kiwi's nest on Kapiti Island and eventually found a hollow tree which looked a likely place.

I knelt down and peered inside. Immediately a furious white-fronted figure darted out, shrieking abuse at me. I backed out smartly to avoid being attacked with a sharp beak. I hadn't realised that penguins occasionally nested in hollow trees.



Young chicks are covered with brown sooty down.



The little blue penguin sometimes nests in a hollow tree.

Extraordinary habits

Penguins have extraordinary habits. They build their nests some distance from the sea, often on top of steep cliffs. The nest I found was a stiff climb up from the beach. I imagined those little birds, with their tiny, short legs, trailing up and down that cliff several times a day with food for their chicks. They sometimes nest in old petrel burrows.

About midnight on my last evening on Kapiti my sleep was shattered by the most hideous racket. It sounded directly under my bed. There

were loud mews, screams, and growls as though puppies or kittens were being tortured.

I leapt out of bed and searched everywhere, but found nothing. The noise stopped suddenly. I crept back to bed. All was quiet for an hour and then pandemonium broke out again. Then I guessed the cause of the uproar—a family of penguins nesting under the hut!

When Mum and Dad Penguin arrived home with fish (minus chips) for supper they received a rowdy welcome from their chicks.

When the chicks are young they are covered with brown sooty down. The adults have slate-blue plumage on the back and head, a white chin, breast, and underparts, and a black bill. Their feet are pale flesh coloured with black soles, and their eyes are silver grey. They are about 41 cm high.

Two eggs are usually laid and take 39 days to hatch.

New Zealand plants

By Sheila Cunningham

Kowhai

The kowhai (*Sophora microphylla*) is deciduous, and flowers on the bare stems from September to October. The flowers are abundant in nectar and attract tuis and bellbirds. Long seed pods later develop.

The tree has a twiggy juvenile stage and is more attractive when older. It grows up to 10 m high.

The wood is attractive and very durable and is excellent for fence posts.

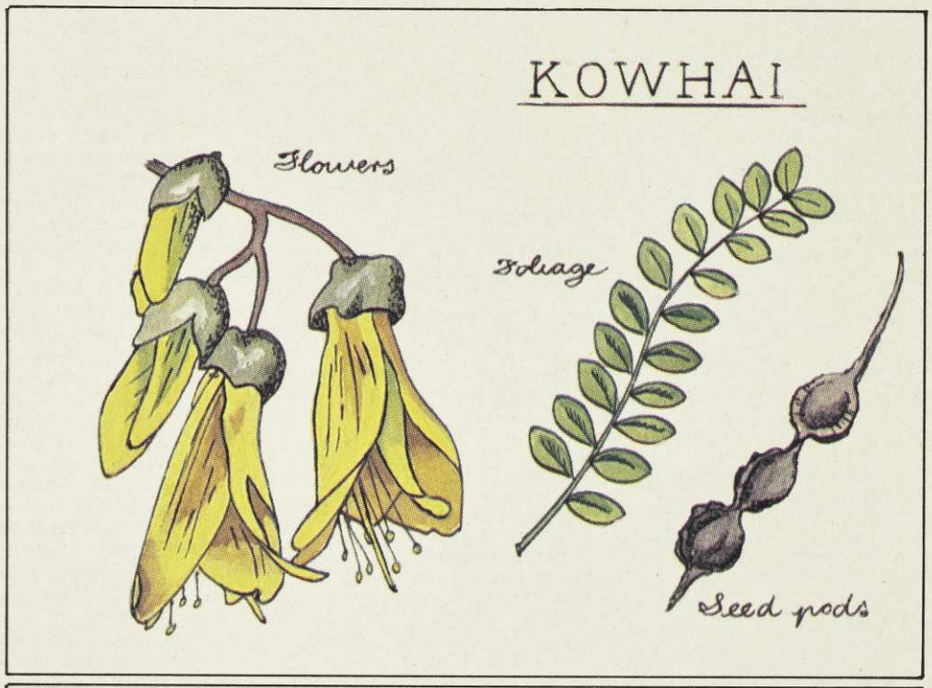
Sophora microphylla grows on the edges of forests and in other open places throughout New Zealand, except in Hawke's Bay and Poverty Bay, where its place is taken by the larger-leaved *Sophora tetraptera.*

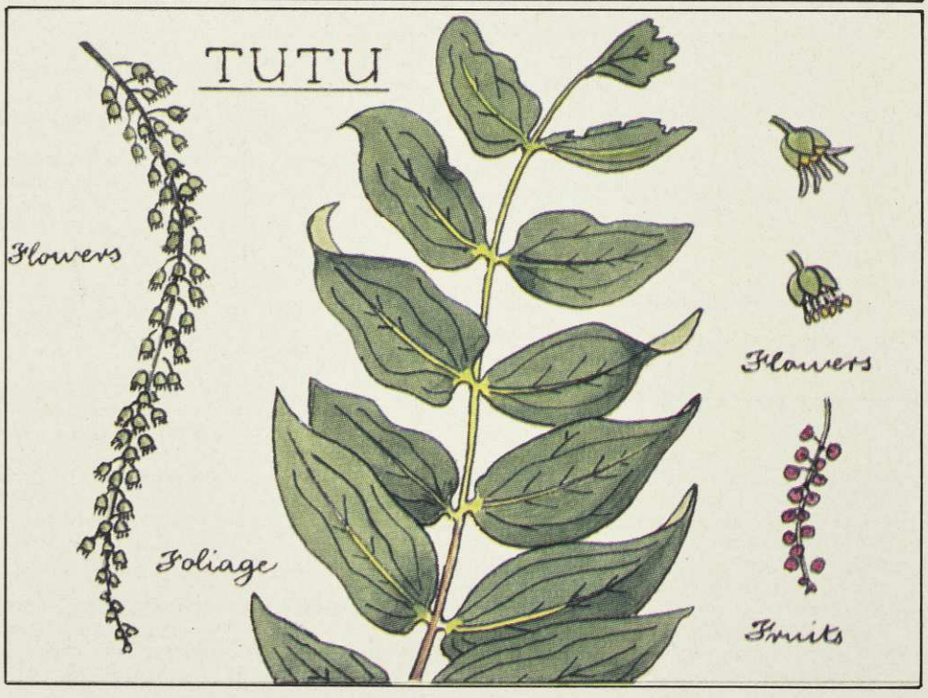
Tree tutu

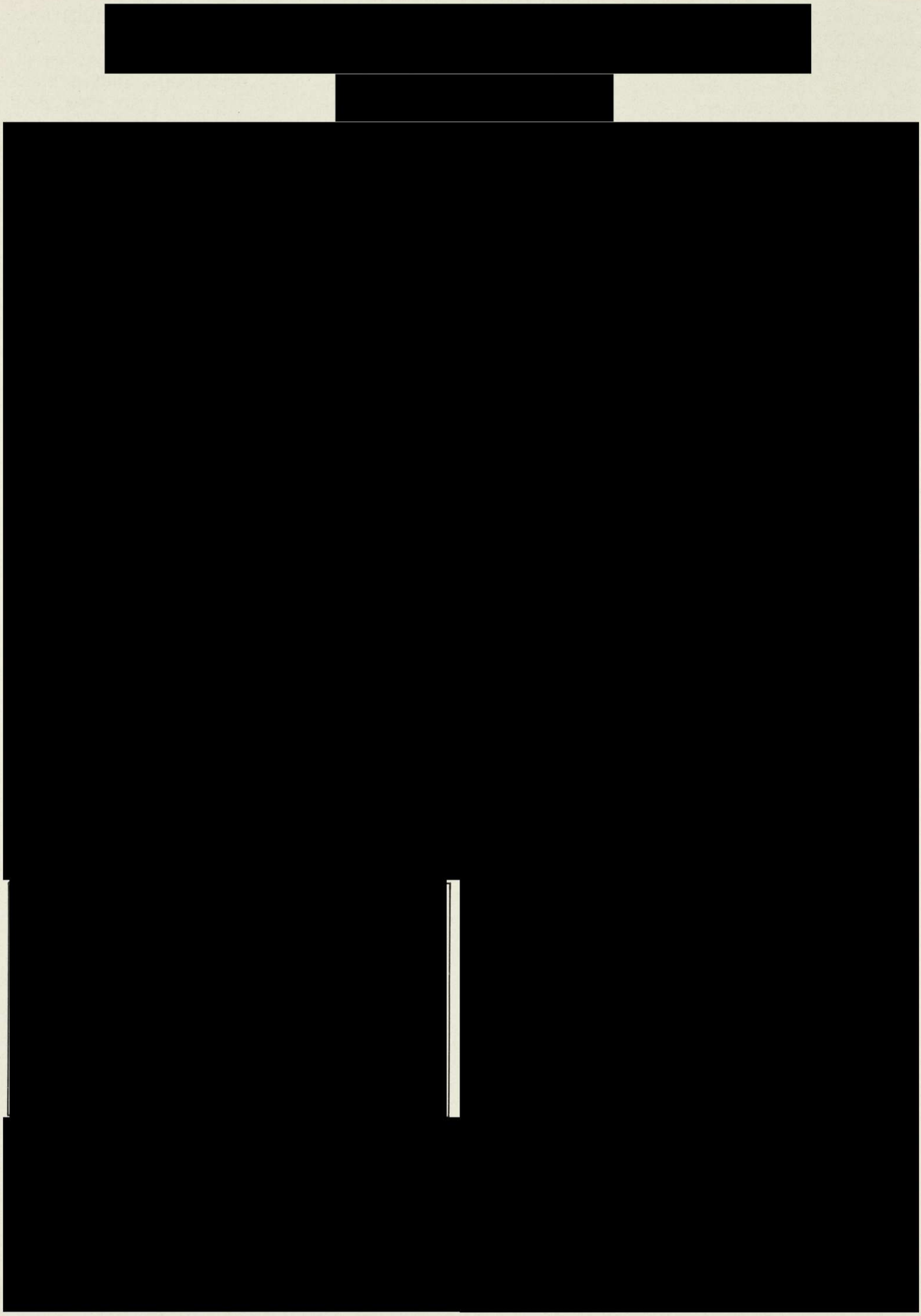
Tutu (*Coriaria arborea*) is probably best known as a poisonous plant. Early settlers lost numbers of stock from the eating of this tree, and more than one travelling elephant has perished from reaching out for roadside titbits.

The plant's poison affects the brain, causing vomiting, convulsions, frothing at the mouth, and then death. The Maoris, however, made a strong wine from the shining black berries, but were careful to exclude the poisonous seeds.

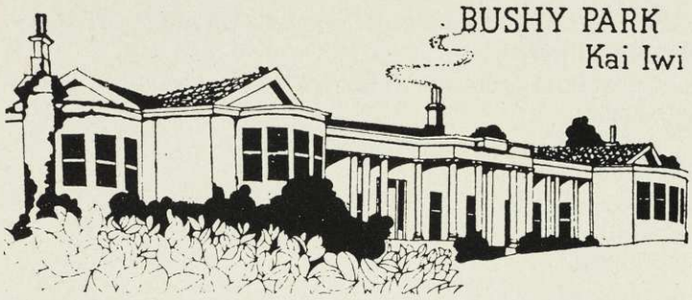
It is most often seen as spreading branches growing from ground level, and the stem is four sided and slightly grooved. It grows up to 9 m high.







SOCIETY'S LODGES AND HOUSES



Bushy Park, Kai Iwi

24 km north of Wanganui

Fine old homestead, lovely grounds, 89 ha of native bush.

Make your own programme.

Electric stove, hot water, and other facilities available. Bring your own rations. Bedding supplied. Linen and towels $1.50 per bed*.

Fees: Members: single, $9 per night; double, $14 per night. Non-members: single, $14 per night; double, $18 per night. Children aged from 1 to 12 years, $6 per night. Day visitors, members and non-members, $1; children under 12 years, 50c; family group of two adults and children, $3.

Custodian: C/o Bushy Park Homestead, Kai Iwi, R.D.8, Wanganui. Telephone Kai Iwi 879.

The park is closed to daytime visitors on Mondays and Tuesdays.

Patoka Lodge

Hawke's Bay

The lodge is situated 48 km from Napier on the Puketitiri Road 8 km past Patoka, amid the 14-ha William Hartree Memorial Scenic Reserve. The lodge offers quiet retreat and bush walks of botanical interest. There are also many places of interest within a short distance.

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

Visitors supply their own linen, pillow cases, blankets or sleeping bags, and cutlery. The nearest store is 8 km away. No animals are permitted.

An information leaflet is supplied with notice of booking. A key will be posted a week before the date booked and this is to be returned with payment after occupation.

Fees (per night): Adult members, $1.50; junior members, 75c; adult non-members, $2; junior non-members, $1.
A 50 percent deposit is required with each booking.

For information and bookings apply to: 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) $7 per night
Summer season (1 November to 1 May) $5 per night
Children $2.50 per night

Bookings may be made 9 months in advance and must be secured by a deposit of $1 per night per member. The full amount must be paid not later than 4 weeks before occupation.

If full payment is not received by the due date, the bunks may be relet.

All refunds are subject to a $12 surcharge.

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 within 10 days of booking.

No member may occupy the lodge without first booking through head office, Wellington.

Tautuku Lodge

Coastal Otago

Situated 72 km from Balclutha on State Highway 92, Tautuku Lodge on the Society's 550-ha bush-clad Lenz Reserve in coastal south-east Otago is the place for that weekend or holiday in beautiful, peaceful, unspoilt surroundings.

The reserve has interesting bush walks, and native birds are numerous. The round track is a comfortable 4 hours' walk, and as this is in its formative state, visitors are requested to keep to the marked track route.

The lodge is fully equipped and accommodates eight or nine people. It has a lounge, kitchen, two bunkrooms with innerspring mattresses and foam rubber pillows, washroom with tub, basin, and shower, and an ablution block with toilets, basins, and showers. The cooking facilities in the modern kitchen are excellent.

There is also a self-contained A-frame cabin, for two adults.

Bring with you all food supplies, bed linen, and pillow cases, blankets, towels, tea-towels, etc.

Bookings are accepted up to 9 months in advance. No refunds are made unless cancellation is advised at least 1 month before reserved occupancy.

Rates per night are: Senior members, $5; junior members, $2; senior non-members, $8; junior non-members (5-17 years of age), $3.

A deposit of 50 percent is to be made with each booking.

For free brochure and all bookings send a stamped, addressed envelope to Mrs F. C. Bennett, Papatowai, R.D. Owaka. Telephone 160M.

*All charges in these notices are subject to alteration from time to time.

(Continued on next page)

Waiheke Island Cottage

Onetangi, Waiheke Island

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

Summer (mid-October to Easter, inclusive)

Nightly (not weekends): $2 per person per night.

Weekends: $12 minimum. More than 2 adults, $2 per person per night.

Weekly: $30 minimum. More than 2 adults, $2 per person per night.

Winter (after Easter to mid-October)

Nightly (not weekends): $1.25 per person per night.

Weekends: $12 minimum. More than 3 adults, $1.25 per person per night.

Weekly: $20 minimum. More than 2 adults, $1.25 per person per night.

Children 15 years and under: First two, half rates; others, no charge.

A deposit of 50 percent is payable on booking, the remainder before entry.

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

Turner Cottage

Stewart Island

Turner Cottage, on Stewart Island, is available for renting. The cottage, a one-roomed dwelling furnished for three people, can be obtained at a rental of $6 a day for members and $8 a day for non-members.

For details write, enclosing a stamped, addressed envelope, to:

"Turner Cottage", c/o Mrs N. Fyfe, P.O. Box 67, Halfmoon Bay, Stewart Island.

Gallery of New Zealand flora

THE ILLUSTRATION of the kumarahou opposite is reproduced from *The Art Album of New Zealand Flora*, volume 1, by Mr and Mrs E. H. Featon, published by Bock and Cousins in 1889.

The kumarahou, *Pomaderris kumeraho*, is a small branching shrub reaching 3 m. Its generic name is derived from the Greek *poma*, a covering, and *derris*, a skin, which refers to the membranous covering of the seed vessel.

Its leaves are 5 to 7.5 cm long, elliptical, alternate, and green above, with veins and midrib prominent beneath, where the leaves are entirely white or grey. The shrub is covered with a white or grey down except on the surface of the leaves.

Kumarahou's flowers are numerous and collected into large bunches; the seed capsule is small. The old-gold colour of the flowers when the shrubs are spread on a hillside is a lovely sight.

Gumdigger's soap

The Maoris named it kumarahou because it had a root rather like the kumara's and grew deep. It was also known to the early settlers as gumdigger's soap because when the blossom was swished in water it produced a soapiness which could be used for washing.

Though originally thought to be similar to a plant growing in eastern Australia and Tasmania, the New Zealand species is now known to be different in respect of its leaf veins and calyx form. It is thus endemic to New Zealand and remarkably uniform throughout its range.

Abundant in Northland

It is abundant on dry hills in Northland, particularly near the Bay of Islands, and is distributed on poor clay hills from the far north to the Bay of Plenty and to the west of Te Kuiti.

Though it was noted by Banks and Solander, who accompanied Cook in 1769, A. Cunningham collected and described it in 1834.

Kumarahou prospers in rich soils, which improve its foliage and flowers. It has thus become a garden plant and its handsome flowers are seen even in England. Because it is a true New Zealand plant, we should make more use of this beautiful *Pomaderris* in our own gardens.

—David G. Collingwood

Gallery of New Zealand flora

A forest is more than trees

A forest, large or small, native or exotic, is home to countless varieties of plant and animal life, many of which cannot survive outside the forest environment. It protects the ground from the effects of heavy rains, which cause soil erosion, provides attractive scenic backdrops in the countryside, and gives wide scope for recreation pursuits.

Huhu Beetle (Prionoplus reticularis)

The huhu beetle is one of over 200 species of native longhorn beetles. The prominent many-segmented long feelers which sometimes exceed the length of the body give these beetles their name.

The larvae or grubs of these beetles feed on woody tissues by boring into tree trunks and branches of native trees and introduced pines.

The well-known huhu beetle is attracted to lights and lit windows. It is a strong flier and being up to 5 cm in length is the largest beetle found in New Zealand. Its jaws are strong and can inflict a painful bite.

The female lays her eggs in a crevice under dead bark. When the grub hatches it bores into the wood where it grows to about 75 mm in length during its several years of development. The ivory coloured grubs with their small head and swollen thorax were a favourite food of the Maoris.

New Zealand Forest Service

NZFS4