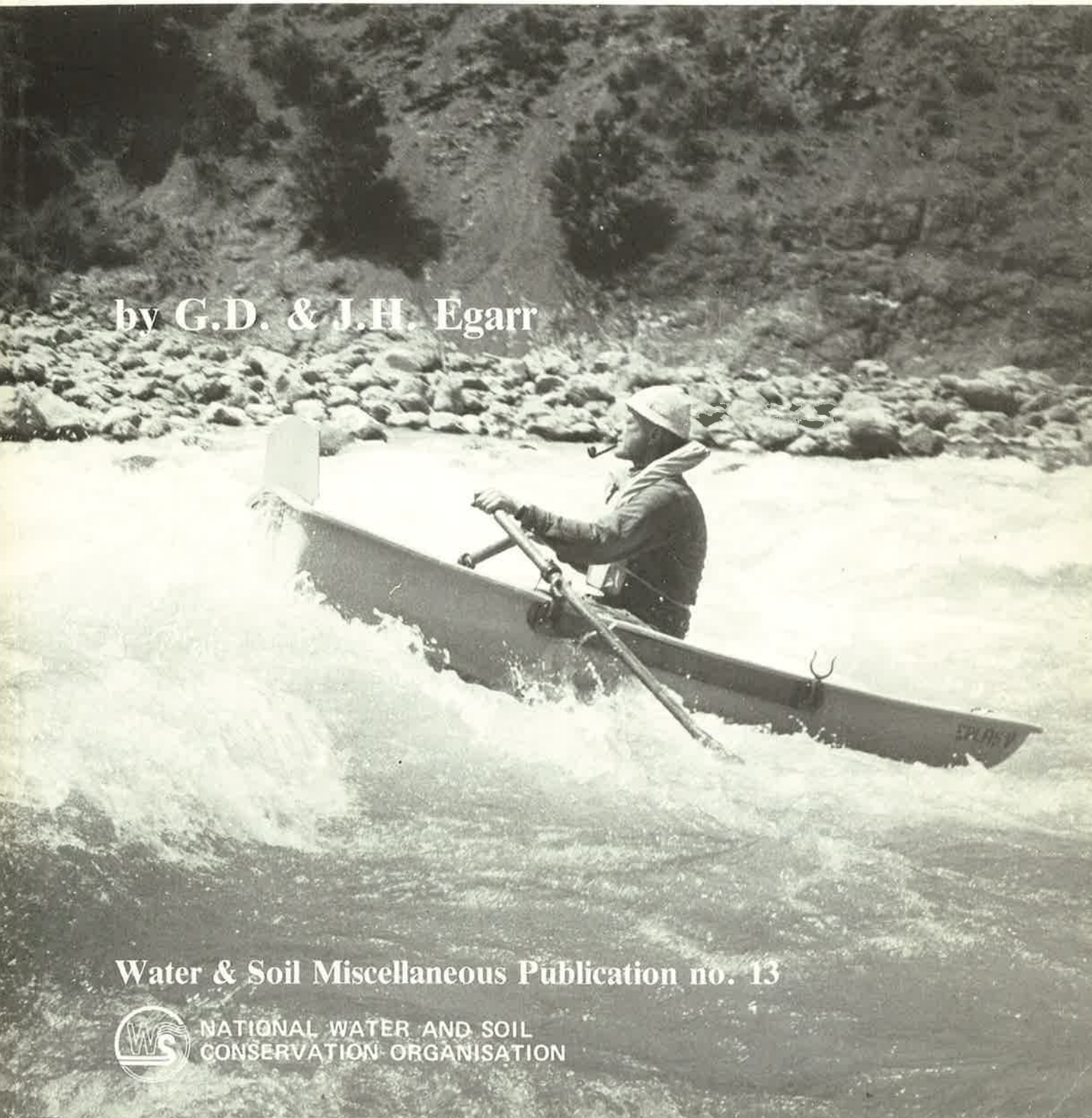
ISSN 0110-4705

New Zealand Recreational River Survey

PART I Methods & Conclusions



by G.D. & J.H. Egarr

Water & Soil Miscellaneous Publication no. 13

NATIONAL WATER AND SOIL CONSERVATION ORGANISATION

WATER AND SOIL MISCELLANEOUS PUBLICATIONS

1.	Rainfalls and floods of Cyclone Alison, March 1975, on the north-eastern Ruahine Range. P J Grant, N V Hawkins, W Christie. $1-00	1978
2.	Water quality research in New Zealand 1977. Sally F Davis. $2-50	1978
3.	Liquid and waterborne wastes research in N Z 1977. S F Davis. $2-00	1978
4.	Synthetic detergents working party report. $1-00	1978
5.	Water quality control committee report. $1-00	1978
6.	Suggestions for developing flow recommendations for in-stream uses of New Zealand streams. J C Fraser. $1-00	1978
7.	Index to hydrological recording stations in New Zealand 1978. $2-00	1978
8.	Water rights for the Clyde Dam, Clutha hydro power development. $1-50	1979
9.	Index to hydrological recording stations in New Zealand 1979. $2-00	1979
10.	Water quality research in N Z 1978. Denise F Church. $3-00	1980
11.	Liquid and waterborne wastes research in N Z 1978. D F Church. $2-00	1980
12.	Catchment register for New Zealand. Volume 1. $8.00	1981
13.	N Z Recreational River Survey. Pt 1 : Introduction. G D & J H Egarr $5-00	1981
14.	N Z Rec River Survey. Pt 2 : North Island rivers. G D & J H Egarr $5-00	1981
15.	N Z Rec River Survey. Pt 3 : South Island rivers. G D & J H Egarr $12-00	1981
16.	Waimea East Irrigation Scheme information booklet. (Out of stock)	1980
17.	Hawke's Bay Area Planning Study: Urban capability assessment. $4-00	1980
18.	Index to hydrological recording stations in New Zealand 1980. $2-00	1980
19.	Rakaia water use and irrigation development. $3-00 D R Maidment, W J Lewthwaite, S G Hamblett.	1980
20.	Water quality research in New Zealand 1979. B J Biggs. $4-00	1980
21.	Liquid and waterborne wastes research in N Z 1979. B J Biggs. $2-00	1980
22.	Baseline water quality of the Manawatu Water Region 1977-78. K J Currie, B W Gilliland. $3.00	1980
23.	Effects of land use on water quality - A review. R H S McColl & Helen R Hughes. $5-00	1981
24.	Summaries of water quality and mass transport data for Lake Taupo Catchment, New Zealand. C J Schouten, W Terzaghi, Y Gordon. $5.00	1981
25.	The report of the Water Quality Criteria Working Party. $3-00	1981
26.	Handbook on mixing in rivers. J C Rutherford. $8-00	1981
27.	Index to hydrological recording stations in New Zealand 1981. $2.00	1981
28.	Bibliography of Oceanography and Sedimentology for the Northland - Auckland coast. T F W Harris & T Hume. $3.00	1981
29.	Aquatic Oxygen Seminar Proceedings, Hamilton, November 1980	in press
30.	Future Groundwater Research and Survey in New Zealand	in press

New Zealand Recreational River Survey

An investigation into the recreational potential
of New Zealand's inland waterways

PART I
Methods and conclusions

by

G.D. and J.H. Egarr

with the assistance of
NZ Jet Boat Association, Department of Lands and Survey,
Ministry for Recreation and Sport, and
Commission for the Environment

Published for the
New Zealand Canoeing Association
by the
National Water and Soil Conservation Organisation

New Zealand Recreational River Survey Part I

G.D. & J.H. Egarr
NZ Canoeing Association

Water & Soil Miscellaneous Publication No. 13 1981. 68p.
ISSN 0110-4705

An investigation into the potential of New Zealand rivers for recreation by motor launch, jet boat, drift boat, raft, canoe/kayak, pack floating and swimming has been made by the New Zealand Canoeing Association.

Part I contains conclusions and recommendations. Part II contains the results for the North Island rivers, while Part III describes the South Island rivers.

National Library of New Zealand Cataloguing-in-Publication data
EGARR, G.D. (Graham David), 1949-
New Zealand recreational river survey : an investigation into the recreational potential of New Zealand's inland waterways / by G.D. and J.H. Egarr; with the assistance of the NZ Jet Boat Association ... [*et al.*]. — Wellington : National Water and Soil Conservation Organisation for New Zealand Canoeing Association, 1981- . —
3v. ; 30 cm. — (Water & soil miscellaneous publication, ISSN 0110-4705). — (New Zealand Water and Soil Division)
Pt 1: Methods and conclusions. — lv. — (Water & soil miscellaneous publication, ISSN 0110-4705 ; no.13).
333.784509931
I. Rivers — New Zealand — Recreational use. I. Egarr, J.H. (Jan Hazel), 1951- . II. New Zealand Jet Boat Association. III. New Zealand Canoeing Association. IV. Title. V. Title: Methods and conclusions. VI. Series.

Cover photograph by Mannering & Associates Ltd.

Other photographs by G. Mannering, D. Gardiner and G. Egarr.

Catchment numbers have been added for ease of identification and use by Catchment Authorities and other organisations. The text is printed without alteration (apart from minor correction and editing) and the opinions expressed are those of the authors and not necessarily those of the National Water and Soil Conservation Organisation.

Water & Soil Division, Ministry of Works and Development,
P.O. Box 12-041, Wellington, New Zealand.

Contents

Foreword

In recent years recreational use of New Zealand rivers has greatly intensified. The availability of lightweight boats, such as fibreglass canoes, and the development of the jet boat, together with improved access to recreational areas including those in National and State Forest Parks, have all played a part in this.

At the same time the recreational potential of some of our rivers is being altered by hydro-electric development, irrigation and water supply schemes. The Water Resources Council has been conscious of these changes and was pleased to support the New Zealand Canoeing Association's initiative in undertaking an evaluation of rivers which are important specifically for canoeing, boating and rafting.

Graham and Jan Egarr travelled widely around the country and personally visited many of the rivers they describe. From their own work and from the reports they have used, they have assembled in this survey a base document which will be of value to recreationalists, planners and administrators throughout the country. No doubt further boating experience and the continued development of our water resources will cause some of the particular assessments they have made to be modified but that does not detract from their achievement. I commend their work to all who are interested in our inland waterways.

Chairman
Water Resources Council

I. Historical note

In this chapter we wish to examine the ideas and events that were responsible for the undertaking of the survey, and why it was necessary. It was these events, and the underlying philosophy of preservation in the minds of those directly responsible for them, that have directed the methods, aims, and concepts behind the survey.

The idea of conducting a survey of all New Zealand's rivers providing recreational use for such groups as canoeists and jet-boaters, has been around for some time, but those ideas that came to directly influence the present survey developed among members of the Auckland University Canoe Club in the early 1970s. John MacKay, Dave Lee, Stuart Hodder, and Grant Stevens, among others, had talked of the need to preserve certain rivers solely because of their recreational value. All four had been influenced to some degree by the American 'Wild and Scenic River System' and had adapted the idea to suit New Zealand conditions by advocating that the Motu River, the Wanganui River, and the Buller River be set aside in their natural state for preservation along the lines of a national park. I recall that in 1971 I had been working towards writing a canoeist's guide to New Zealand's rivers and Grant Stevens had mentioned his interest in river preservation and that a river guide would provide the basic data necessary for setting up a New Zealand equivalent of the American 'Wild River System.' However, nothing constructive was done for some years – Grant had left for an overseas trip, I had become involved in the collection of data for my river guides, John MacKay was writing his book on his canoeing and rafting trips, and the others from Auckland University had become involved with the then newly-formed Environmental Defence Society which diverted their interests in setting up the wild water scheme into investigating hydro and irrigation schemes so that objections could be lodged when recreational interests were threatened.

Nevertheless, the concept of a wild river system for New Zealand was not completely forgotten and it was still a much-talked about subject whenever canoeists met. As members of the Auckland University Canoe Club travelled throughout the country, so too did the idea of a New Zealand Wild River System.

In the September 1974 issue of *Soil & Water* (the official journal of the National Water and Soil Conservation Organisation), the Chairman of the Soil Conservation and Rivers Control Council, Mr Lindsay Poole, was reported as saying:

> "The days have gone when a single body or organisation could pre-empt the use of water from any river or part of a river... Water supplies, recreational use, metal extraction, the replenishment of underground natural reservoirs, control of floods and bank erosion, the effects of altered flows and other environmental considerations all demand attention, and need to be studied in relation to one another... there is a tendency for electrical administrations to consider rivers as being solely at their disposal for power purposes. Local electrical authorities must acknowledge the multiple use of rivers to allow for all interests in their planning...."

This report prompted Ian Milne, at that time the Touring Commodore of the New Zealand Canoeing Association (N.Z.C.A.), to insist that regional water boards be made aware of canoeing activities in their areas so that some recreational interests could be considered when water rights were applied for. Consequently, he wrote to all boards informing them of the existence of various canoe clubs and asking them for information on any schemes in their areas. At this time, too, Keith Needham, University of Canterbury Canoe Club, was proposing that a national cruising party visit the lakes and rivers of the Upper Waitaki before the hydro scheme, then being constructed, obliterated all the white water of any real significance. The Kaimai Canoe Club was beginning to collate material for its objection to the Wairoa River, Tauranga, hydro scheme and Ross Douglas of the Kupe Canoe Club (Wellington) was objecting to proposals to dam the Otaki River at around this time. So the first steps to actively protect some of our threatened rivers were beginning.

In connection with the Otaki scheme, Ross Douglas in a letter to the Commission for the Environment in late July 1975 said:

> "We are concerned that power schemes have already destroyed many of our canoeable rivers and we refer to such rivers as the Clutha, the Waikato, and the Waitaki. It follows therefore that we are concerned about our national waterways... We would seriously suggest that the Government give some thought to the preservation of our national waterways which we consider are our national heritage..."

This was the first offical mention of any river protection scheme to come from the N.Z.C.A. or from any other recreational group. This idea of a national waterways scheme was officially adopted by the N.Z.C.A. in October 1975, when the Touring Commodore, Ian Milne, after hearing of a proposal to build a hydro scheme on the Whakatane River, wrote to the Commission for the Environment:

> "The New Zealand Canoeing Association would like to see a national waterway system set up, similar to the 'Wild and Scenic Rivers Scheme' in North America. The Wanganui River has its Scenic Board with whom we are co-operating to the fullest possible extent. The Motu River should be included, and the Whakatane River in particular should have some form of legislative protection as most of it is not within the Urewera National Park..."

Ian followed this up by writing to all canoe clubs for comments on local rivers or lakes that could be included in such a national waterways scheme. In this letter he mentioned:

> "Investigations are in the early stages into the possibility of setting aside a number of rivers around the country as national waterways, similar to the American 'Wild and Scenic Rivers', which are protected against development, such as hydro-electric projects. The organisations involved are the Commission for the Environment, Department of Lands and Survey, Environmental Defence Society, and the New Zealand Canoeing Association, and a grant is to be applied for from the Council for Recreation and Sport... This is your chance to say something positive about the environmental issue. Please send me the names of any rivers and lakes in your area which you would like to see preserved in their natural state. This will provide a starting point for field investigations... Local electricity authorities are being encouraged to build small hydro-electric schemes, which do a tremendous amount of damage to the area affected, in proportion to the amount of power generated ..."

The response to this letter was immediate and by May a list of rivers to be considered was drawn up, as follows:

Northland	Wairua
	Mangakahia
	Waitangi (Puketona)
	Lake Kai-iwi
Auckland	Wairoa (Hunua)
	Lake Pupuke
Waikato	Waipa
	Waikato
	Tongariro
	Waitetuna
	Mokau
Hauraki	Kauaeranga
	Ohinemuri
	Waitawheta
Bay of Plenty	Wairoa (Tauranga)
	Kaituna
	Tarawera
	Rangitaiki
	Whirinaki
	Whakatane
	Waimana
	Lake Rotorua
Poverty Bay	Waioeka
	Koranga
	Motu
	Ruakituri
	Mata
	Wairata
	Kahanui
	Raukokore
Hawkes Bay	Mohaka
	Ngaruroro
Taranaki	Waitara
	Patea
Rangitikei-Wanganui	Rangitikei
	Wanganui
	Whangaehu
Manawatu	Manawatu
	Otaki
	Mangeore
	Mangahao
Wairarapa	Akitio
	Awahanga
	Ruamahanga
	Waiohine
	Wainuioru
	Pahaoa
Wellington	Hutt
	Akatarawa
Nelson	Pelorus
	Rai
	Wakamarina
	Aorere
	Anatoki
	Waingaro
	Motueka
	Baton
	Wangapeka
	Wairoa (Nelson)
Marlborough	Clarence
	Wairau
Westland	Buller
	Matakitaki
	Maruia
	Gowan
	Grey
	Landsborough
	Haast
	Karamea
North Canterbury	Waiau
	Hurunui
	Waimakariri
Sth Canterbury	Rangitata
Waitaki	Lower Waitaki
Otago	Shotover
	Pomahaka
	Hollyford
Southland	Mararoa
	Mataura
	Waiau

Notable omissions were in the southern part of the South Island where canoeing seems to be organised in a more informal manner and is not necessarily centred around organised canoe clubs. This list was to be the basis of the study but would have to have further rivers added to include a fair sample of all New Zealand's rivers.

It was now time to look for funds to carry out the survey and so a submission was prepared to request a grant from the Ministry for Recreation and Sport.

The submission explained the need for the survey of rivers in terms of the increasing pressure being placed upon them as a source of water for irrigation and small hydro schemes in particular. It demanded that such uses as farming of the land surrounding a river, scenic attractions, recreational value, wildlife refuges, and fishing should be balanced against the economic advantages of a hydro-electric scheme within a national context before a decision is made as to how a river should be used and developed. The multiple use of rivers was seen as obviously desirable, but complemented by the systematic preservation of chosen rivers and waterways in a near-pristine state. The survey was to choose those rivers. If this was not done then it was seen that hydro schemes could be installed river by river all around the country until there would be, for instance, no canoeable rapids left. While most people would agree that all rapids cannot be preserved for canoeists, some clearly should be.

The aim of the survey was to establish criteria for assessing the recreational use of rivers within a national framework; to assess the data gathered, and to identify rivers or sections of rivers that should be set aside; and lastly, to formulate legislative proposals that would guarantee the preservation of the chosen rivers. A budget of $7500 was drawn up, consisting of $5000 to sustain an investigator in the field for six months; $1500 for a law researcher to draw up the legislative proposals; and $1000 for administration and printing expenses.

The submission was prepared jointly by Ian Milne and Peter Horsley of the Environmental Defence Society. It was lodged in July 1976 with the Ministry for Recreation and Sport as a request for a grant under their National Projects Scheme, and was approved in principle in late November. A meeting to discuss the grant with the Ministry and other interested Government departments was requested in order to determine exactly its extent. The meeting, held in late January 1977, discussed the related work of various Government agencies and consequently the original submission needed to be amended. The legal research and the drafting of suitable legislation proposed in the original submission were in fact already under action to some extent by the Commission for the Environment who had envisioned consulting organisations such as the N.Z.C.A. at the appropriate stage. It was considered more valuable for the survey to concentrate on the field work and to leave the legal work to departments more experienced in that field. Consequently, the original submission was amended to cover the travelling and living expenses of a team of two, investigating in the field for nine months ($6500) with $1000 for administration, stationery, photography and expenses involved in the preparation of the report. The final submission was approved and the grant given on 29 April 1977. (Appendix I gives the original and amended grant submissions).

Contemporaneous with this growing concern among the recreationalists over the loss of our wild rivers, there had been discussions among senior members of the Public Service to achieve some degree of protection for what they saw as being the only section of our natural environment that was not adequately covered by protectionist legislation.

Mr P.H.C. Lucas, Director of National Parks and Reserves, had written a pamphlet — *Conserving New Zealand's Heritage* — on his return from a visit to North America. It was one of the first statements from any official source that some concern was felt over the loss of our natural waterways. He had followed this up in 1972 by calling for a nationwide outdoor recreation and conservation plan that would include not only the national walkway concept but also some similar scheme for rivers. (His concept of a wild rivers scheme was outlined in a paper he presented to a seminar on small hydro schemes in March 1977, and is essentially that of his earlier concept).

Very little was done, however, until 1975 when the Minister of Lands received representations from the 'Waiau River Preservation Committee' who were suggesting that a national waterway be set up that would include the Waiau River. The committee was concerned about proposals for taking water for irrigation from the Waiau. The Minister agreed to undertake a study of a 'Waterways Concept' that would parallel the national walkways proposals. A background paper for this study was prepared by the Department of Lands and Survey, in which mention was made of the involvement of the Commission for the Environment in a waterways protection scheme.

The paper emphasised the need for some protective measures, but it was concerned primarily with scenic and passive recreational groups (the motorist, picnicker, etc). It stressed that guaranteed access to water for public enjoyment was of equal importance to the preservation of waterways. It also tended to see hydro lakes as a recreational resource equal to natural, free-flowing rivers and in this respect it plainly ignored the real need of the recreational groups who initially demanded the setting up of a waterways system. (If hydro lakes were, in reality, as great a recreational resource as this paper seemed to indicate, then surely there would never have been such a demand for any protective measures at all).

Consequently, various discussion papers were prepared by persons involved for their own departments. A meeting was called to discuss these papers and other matters pertaining to a proposed protection scheme for our rivers.

At the meeting in June 1977, the idea of a Wild Rivers Act was well received by all except two representatives. The Forest Service representative seemed to be quite unhappy about the whole idea but was non-commital when it came to suggesting possible alternatives, agreeing with the NWASCO representative who was concerned that the suggested Wild Rivers Act would separate the narrow issue of protection of waters for their outstanding scenic and natural value and for their recreational value, from the wider issues of water use and management. It was felt that a single-purpose approach was not preferred to multi-objective planning. It was pointed out that the need for the Water and Soil Conservation Act in the 1960s was as a direct result of the multitude of statutes that at that time dealt with water use each in a single-objective manner; and consequently, any suggestion of additional single-objective water use control (for example, the proposed Wild River Act) would revert to the unsatisfactory situation of the past.

These objections have directed thinking along the lines of amending the existing legislation to fit the need for wild river protectionists' ideas. While the recreationalists feel that the single-purpose objections are valid, they feel that at the present time, when a river is threatened, it is up to the recreationalist or conservationist to prove that damage or great loss will result from the threat and not for the scheme proposer to prove the opposite; thus it is necessary to label particularly valued rivers as 'protected' so that the very motions of removing that label will assist in protecting it. That is to say, at the moment when a river is threatened, there is a tendency to treat it in isolation and it is up to the conservationist to prove that it is unique. The problem of gaining a consensus between these two points of view continues.

Meanwhile, the idea of preserving rivers in their natural state has 'caught on' in many sectors of the community. In a speech at Twizel on 24 September 1976, the Minister of Lands, Hon. Venn Young, spoke of the "...need to ensure that the best stretches of many of our rivers are preserved in their natural state for the delight of future generations."

And in September 1977, the editor of the *New Zealand Herald* also wrote of the need to protect our rivers from 'development'.

At the present time, a proposal for a national Wild Rivers Act has been drawn up for the purposes of discussion; whether it can be fitted into the requirement for multi-purpose objectives as required by NWASCO remains to be seen. However, it appears that some protection for our rivers is accepted as a necessary thing.

In January 1978 the Commissioner for the Environment issued a discussion paper that set out a number of differing viewpoints on the alternatives seen as being available in obtaining some protection for our wild and scenic rivers. The object of the discussion paper was to collect and collate public opinion on the matter. Submissions on the discussion paper were made by 31 March 1978 and a summary of the submissions was published in August 1978.

The Commission for the Environment received over 100 submissions to its discussion paper, and in its appraisal the Commission concluded that there was indeed a need for a formal commitment by the Government to a protection policy for recreational and scenic rivers. The Commission also claimed that there was a need for further information on our use of rivers, (particularly recreational use) and that a national inventory of scenic and recreational values of rivers should be made. This survey is an attempt to produce such an inventory for a selection of recreational uses, but was begun well before the commission made its comments.

Following the appraisal the Minister for the Environment announced that a policy paper would be prepared on the subject. However, nothing more was heard for some time. Many recreationalists felt let down by this.

The N.Z.C.A. then took the initiative by distributing a suggested draft 'Wild and Scenic Rivers Bill' in order to bring the matter back into the light (refer to Appendix II).

Meanwhile the Water Resources Council had requested that catchment authorities and regional water boards give more attention to the recreational and scenic value of water, and it specifically directed that data was to be collected on all facets of such water use, and potential uses. Obviously this was to make clear that NWASCO was alert to its responsibility of considering recreational values of waters under its control, and made it clear to catchment authorities and regional water boards that recreational use of water was indeed a legitimate use. Unfortunately, between the date of this request and the river survey there was little time for a response on behalf of the catchment authorities to this directive.

Then, most significant of all, came a joint statement made on 6 December 1979 by the Minister of Works and Development and the Minister for the Environment. It made the following points:

> "That rivers, or sections or rivers that have outstanding wild, scenic or other natural characteristics should be protected, and their environs, where recreation and scenic characteristics have special significance"

The statement went on to say that statutory provision should be made for a wild and scenic protection policy in the suggested amendments to the water and soil legislation.

The statement, whilst it marked a change of heart of Government, did not actually commit the Government to protect anything at all. Whether or not anything will come of this statement has yet to be seen.

These more recent developments were summed up by Mr D. Leather in *Soil & Water*, in the issues of February 1979 pp 9–21, and February 1980 pp 22–23.

Meanwhile, the issue of minimum flows has gone on as a possible means of protecting rivers for recreation (refer to Chapter XIV).

II. Aims and objectives

The historical background examined in the last chapter, is important in explaining the major characteristics of the survey that we outline in this chapter. The main aims and objectives are:

- It is a survey of recreational resources carried out by the recreational user groups themselves.
- It is a brief and cursory examination intending merely to set directions and to pinpoint particular valued interest areas for further, more detailed investigations.
- It is a survey extremely limited in time, financial resources, and, consequently, in depth.
- It is a survey brought about by what recreationalists saw as a need to have a nationwide inventory of recreational resources so that, when decisions were to be made concerning those resources, there would be adequate data on which to make proper and informed decisions. Recreationalists believed that, in the absence of such data, those Government agencies charged with the responsibility of considering the recreational viewpoint were failing to make balanced judgements.

The organisation charged with the responsibility of administering and controlling rivers and natural waterways within New Zealand is the National Water and Soil Conservation Authority (NWASCA). The responsibilities of the Authority are set out in the Water and Soil Conservation Act 1967 and its amendment of 1974. In the preamble to the Act it is stated that the intention of the Act is to "...promote a national policy in respect of natural water, and to make better provision for the conservation, allocation, use and quality of natural water... and for ensuring that *adequate account is taken of the needs of all recreational uses* of natural water..." Later in the Act, under paragraph 14 (4) (1) it is stated that the Authority is to "...Take into account the present and future needs of all forms of recreation, and to have due regard to scenic and natural features... when planning and advising on the allocation of natural water..."

Unfortunately, NWASCA has given only lip service to these responsibilities. Whilst NWASCA and the catchment authorities and regional water boards have been prepared to employ engineers and soil conservators, they have never employed the services of an experienced recreationalist to advise on the recreational uses of the waterways they administer. Consequently, there has been a tendency to consider recreation as consisting of fishing and boating. To a limited extent, they have noted the more popular swimming holes - these uses are the more obvious recreational activities. 'Boating' has been interpreted to embody powercraft (often associated with fishing) with an almost total disregard of a host of other 'boating' activities such as rafting, drift boating, and canoeing which come very close to fishing in representing the majority of river recreationalists in terms of numbers of participants and time spent on rivers. Because of this, the over-riding aim of this survey has been to provide the missing information to NWASCA that it has not been able to gather for itself. We have been concerned with the gathering of information regarding the differing needs of those sub-groups within the 'boating' classification so that in future, when decisions are made regarding the recreational use of rivers, adequate regard will be made to **all** recreational groups.

It seems that it was not until this survey was well underway in November 1978, that any serious directive came from NWASCO to the catchment authorities and regional water boards, that an inventory of recreationally important rivers, streams, and lakes was to be made. It also appears that only a very few of the catchment authorities and regional water boards have responded to this directive. It may well be that the only comprehensive survey of New Zealand's recreational waterways will be this very survey, and with supplementary notes from fishing and acclimatisation interests, this may well be all that is required.

One important feature of this survey is worth noting at this point: it is a survey of recreational use made by the recreationalists themselves. While we have been critical of the lack of consideration given to recreational interests in the administration of our nation's water resources, this in no way implies that we expected that our interests would be considered without recreationalist involvement within the planning process. This survey is an attempt to provide a nucleus of information or data which can be used in the planning process. The expertise of the survey team lies in the field of river-based recreation and consequently, when comments are made regarding the recreational value of a particular resource, these comments are made with some authority. However, comments regarding a number of other recreational factors are also made, particularly when describing the scenic attributes of a given resource. Such comments are made from the viewpoint of a 'well-informed layman' and not from the viewpoint of a botanist, geologist, forester, or a graduate from a school of landscape architecture.

It must be remembered, however, that the survey team shares the viewpoint of the average recreationalist himself/herself, so that comments regarding the acceptability of the aesthetic qualities of any given landscape, or vista, will be compatible with the appreciation of the recreationalists who follow. It will be apparent that the survey may be biased towards a particular set of landscape types. However, this bias is shared by the recreationalists whose opinions and needs we are attempting to reflect within this survey. In speaking of the relative recreational values of one resource as opposed to another, it is important that the relative values be measured from the viewpoint of the recreationalists who will be using that resource.

One aim of this survey, then, is to provide the user input on which administration decisions can be made regarding the management of water resources in respect to recreation.

III. Modes of recreation

In this chapter we outline the differing types of recreation that the survey considered when measuring 'recreational value' in respect of rivers. It would have required an extremely large survey team to consider all possible modes of recreation, from the passive tourist and motorist-based interested in a wholly aesthetic component, to the white-water canoeist who requires excitement, adventure, and a challenge. Fishing and shooting are recreational activities, clearly outside the expertise of the survey team. However, there is already adequate information on these recreations held by the various acclimatisation societies throughout the country.

The survey only took into account those recreational activities that depend upon the river as the primary ingredient, and not those activities where the river is of additional, or secondary, importance.

The recreational activities we are concerned with have been summarised as 'boating' and, indeed, almost all authorities are unaware that there are very important differences within the boating group and that their needs differ in respect to river recreation.

Perhaps one of the primary aims of the survey was to compile a catalogue of what natural, free-flowing rivers were left in the country and which are available for recreation. In the submissions to the Commission for the Environment's wild and scenic rivers protection discussion paper the Manawatu-Oroua Electric Power Board advocated the development of "... rough unkempt gorges ..." into hydro lakes which it maintained "... appear to be beneficial to the surrounding country ..." It went on to say, "... while we would accept that the odd area of rough water is of interest we are sure that sufficient would remain in normal circumstances (Huka Falls as an example) ..." There is an obvious lack of understanding expressed in citing the example of Huka Falls as a candidate for a wild and scenic resource, because, as the discussion paper was at some pains to emphasise, a wild river was of value for recreation as well as tourist interest.

What is implied in this comment, by citing the Huka Falls as likely to remain after development, is that it takes considerable spectator appeal to save a resource. Hence, not only Huka Falls but also Aratiatia Rapids remain. Lesser rivers of considerable worth, but not as accessible to the tourist dollar, are likely to go under, and it is these rivers that are of value for recreation. What our survey has set out to do is to ascertain what resources are left, and if sufficient are likely to remain.

It has always been assumed that New Zealand has a surplus of water resources. The simple fact that New Zealand has a large number of rivers does not necessarily mean that there is an ample supply of rivers suitable for recreation. Our survey was aimed at ascertaining exactly what we do have remaining in our rivers. Only when we have some idea of our total resources can we make the proper decisions on allocating any particular river for a specific use.

Given that our aim was to compile a list of what river resources we have suitable for a specific range of boating activities, we then had to come up with some criteria for measuring one river against another. Our objective, therefore, was to establish some method for assessing the use of a river and also to place the importance of any particular river within a national framework. This establishment of assessing criteria was one of the major aspects of the survey, because we saw the survey as being very much an on-going activity. As rivers change, so do the uses to which we can put them. Any listing of potential uses is only valid for the moments at which they are assessed. This survey is intended to set some direction, and to pinpoint particular valued interest areas for further, more detailed investigation and monitoring.

Lastly, and probably most important, the aims and objectives of the survey were limited by the financial and time restraints. The survey was conducted under a grant from the Ministry for Recreation and Sport. This totalled $7500 and was intended to keep a team of two people in the field for some 9 months to look at around 80 rivers. These limitations were extended considerably by frugal budgeting to allow us to look at approximately 1500 rivers, streams, and creeks over a period of 18 months.

It must be appreciated that there are severe limitations imposed by a mere $100 per week and the need to observe 20 rivers in that week. The financial constraints very much dictated the methods we were able to employ in order to assess the rivers. Mention of this is made in Chapter VI. Although we would have liked to ascertain the levels of present use - that is, the numbers of people using each resource - we were unable to do so because of our limited time and facilities. It must be remembered, however, that recreational value is not necessarily reflected in present user numbers. Ease of access often has more effect upon user numbers than does the quality of the recreational experience. Our prime aim was to assess recreational potential which encompasses both the recreational value and present and/or future frequency of use.

1 PASSIVE RECREATION

Passive recreation generally consists of those activities that involve using the environment for its **visual** attraction. Such activities could be put under the broad heading of 'tourism' and would include sight-seeing and, to a limited extent, picnicking.

A glance at the tourist bus itineraries, and at road maps that mark scenic routes, will show that scenery involving a river environment tends to be regarded as being of high value. It should be considered, therefore, that passive recreation is an important recreational use of rivers. The tourist industry is worth a considerable amount ($239 million overseas exchange for the year 1980/81), and passive river recreation must be regarded as the draw-card for a significant proportion of that amount.

While it is difficult to measure with certainty the contribution that scenic river vistas make to the total tourist attraction, any cursory glance over what is represented to the country's most scenic views, shows that river views do tend to dominate. Consequently, as the natural grandeur of New Zealand is often cited as being the reason for most tourism, we must acknowledge that scenic riverbank routes - such as the Cromwell Gorge, the Haast Pass, the Gisborne to Opotiki highway, the Awakino Gorge, the Manawatu Gorge and the Wanganui River road - all represent tourist attractions. One can also point to the number of scenic reserves, picnic, camping, and roadside areas that are sited beside moving water; certainly the most popular ones are.

The prime requirement for passive recreation is, of course, that the environment should be as scenic as possible and wilderness (natural) qualities are to be preferred over urban or rural surroundings. Accessibility is also of great importance as few tourists or sightseers will wish to step outside their vehicles.

2 RIVER-BASED RECREATION

The range of user groups seeking river-based recreation is diverse; from the individual who floats down a stretch of white water on a car tube, to the more affluent jet boater. In the past launches, such as those that once plied the Wanganui River, provided the easiest manner in which the population at large could participate in a river journey. Canoes and kayaks are, however, by far the most popular group today, as they can use the smallest of rivers, on water too shallow for swimming and too boisterous for jet boats.

(a) Motor Launches

Previously, motor launches provided the main means by which ordinary folk could travel on a river. Today, many of the popular launch trips have been replaced by the commercial jet boat operator. For those people without the necessary skills or equipment, or for those not fully committed to a water-based recreation, motor launches and jet boats provide their only opportunity to see New Zealand as it used to be, before roads developed the more accessible areas. Today, motor launches use rivers mainly as a mooring area and as access to the sea from inland areas. When motor launches are discussed in this report, screw-driven vessels (as opposed to jet boats) are referred to. Screw-driven craft are seldom used on New Zealand rivers and are, generally, restricted to the lower tidal stretches, to the lower lengths of the largest of rivers (Waikato, Clutha, Buller, Wanganui, Ruamahunga, Grey) and to lakes, both natural lakes and artificial hydro lakes.

Motor launches are seldom used for recreation but are used, rather, to enhance other forms of recreation such as passive sight-seeing, for fishing parties, and water skiing.

Motor launches, because of their size, require some investment in facilities - launching ramps, or mooring areas - and the lack of such facilities will be the major constraint on their use. Shallow areas, shoals, rapids, and logs (snags) may also prevent navigation by motor launches. The most common factor reducing the amount of navigable water available for motor launch use is the rapid silting up of almost all New Zealand's rivers.

(b) Jet Boats

Few New Zealanders will not be aware of the tremendous capabilities of the jet boat as developed by the late Bill Hamilton. Jet boats can cope with extremely shallow water and with any rapid that is relatively devoid of solid objects. The majority of New Zealand's rivers are jet-boatable but they improve with flooding. The great advantage of the jet boat is its ability to travel upstream with ease, opening up areas where access from the top (in mountainous country) is difficult. They also provide a 'there-and-back' trip whilst the majority of other forms of river recreation tend to travel in a downstream direction only. The jet boat, as we know it today, has largely resulted from the development work of Bill Hamilton, whose first experiments were conducted on the rivers of the Mackenzie Basin which are all now in the process of being diverted into the Upper Waitaki Hydro Scheme. Although jet boats are capable of handling powerful white water (such as in the Grand Canyon of the Colorado River), the vast majority of jet boaters prefer the shallow, braided, shingle rivers found on the Canterbury Plains, the West Coast, and the Wairarapa area. The only facility usually required by jet boaters is access to the river bank and a gentle sloping beach over which to launch their craft and retrieve them.

The greatest problem facing the use of jet boats at the moment is the 5 knot speed restriction placed upon them by the Water Recreation Regulations 1979. Although exemptions have been given on a number of rivers (particularly in the South Island) the continued enforcement of these regulations is doing far more harm than good, as a jet boat travelling at 8 km/h creates far more wake and more interference with other recreational groups than a jet boat that has attained its planing speed. Fisheries are also less interfered with by a speeding jet boat, than by one travelling at the required 8 km/h (evidence for these claims can be obtained from the New Zealand Jet Boat Association).

(c) Drift Boats

The term 'drift boat' is applied to all those boats, rafts, and other vessels which are used to drift down a river and which are not propelled by a motor of any sort. Canoes and kayaks are a form of drift boat but they are usually excluded from this particular category. In New Zealand there are three distinct types of drift boat:

(1) The dory-shaped craft designed especially for river travel. These dories are particularly popular in the USA but they are not seen here in New Zealand in any great numbers as they require large rivers with ample room for manoeuvering. They use big rivers with big white water rapids of which there are few good examples in this country. The Cromwell Gorge of the Clutha (soon to go under water with the construction of the Upper Clutha Hydro Scheme) provided ideal water for these craft.

(2) Inflatable rubber dinghies. These craft are often referred to as rafts, but we prefer to use the term 'raft' for another river craft, (q.v.). Rubber dinghies are a very popular mode of river recreation and are becoming more and more common as their availability increases.

Rubber dinghies are propelled by either of two methods - oars on the bigger rivers, or paddles on the smaller rocky rivers, paddles being by far preferred.

Rubber dinghies offer, to the less experienced river traveller, the safest and most stable form of water transport and for this reason alone they are the choice of the commercial river tour operators. However, they fall short of the canoe in terms of manoeuverability and in their ability to survive severe rapids. The tremendous bouyancy of the inflatable dinghy can get it into as much trouble as it avoids. It is a common misconception that inflatable dinghies can go places safer than a canoe can.

(3) Hard-skinned dinghies. There has been considerable use made of the small (up to 3 metres) dinghy of the type commonly used as a yacht tender in this country. Many extremely rocky rivers (such as the Clarence, Karamea, and Ashley) have been navigated in these craft. They require little modification for river use, particularly for those rivers containing large pressure waves.

The normal practice of the drift boater is to row, or paddle, upstream while facing downstream, so that the upstream movement of the craft is slightly less than the downstream speed of the current. The resultant action is a slow downward drift of the craft with movement from side to side to avoid obstacles - a technique termed an 'upstream ferry'.

(d) Kayaks and Canoes

In New Zealand, the term 'canoe' is used to denote both kayak and canoe forms of craft, with the open canoe of the North American birch-bank type being called a 'Canadian'. Generally, the term 'canoe' will refer to the modern, glassfibre kayak. Canoeists generally enter the river high up in the headwaters and travel downstream. They do not paddle upstream except on the very quietest of rivers, and then only if there is limited access further upstream. Canoeists like rapids with a good deal of water - they dislike the quiet flowing, lower reaches of rivers as excitement is the main reason for their involvement in the activity. Consequently, the most sought-after areas are those sections of river having a high gradient and sufficent water for manoeuvering their 4+metre long craft.

Willows along the river bank are considered to be their greatest hazard as the water can flow through the branches creating a natural sieve that may trap the canoe and drown the canoeist. Some stopbank works and bridge debris are also potentially dangerous. There are some restrictions on access to river but, on the whole, landowners are generally well-disposed towards canoeists wishing to cross their land to the river. Hydro-electric develoments and irrigation schemes are seen as the major threats to canoeing facilities.

(e) Rafts

There have always been individuals who floated down rivers on truck or car tyre tubes. They have the advantage over swimmers in they they are lifted out of the water to some ex-

tent, and hence, are able to ride over obstacles, and they can carry equipment such as food and camping gear. Rafts are cheaper than canoes, and on rivers with access problems (the upper Rangitikei, Karamea) you need only walk in over mountain passes, inflate your tubes and float down the river. Deflate your tubes and you are ready to catch a bus or train home. Kayak paddles are nomally used, except for the larger two-man rafts, which tend to use the one-bladed Canadian paddles.

Rafts are, however, harder to paddle than a canoe and consequently, they are used on those rivers that have a swift current, usually the upper reaches of our mountain rivers. Rivers considered ideal for tyre rafting are the Motu and the Karamea. Both are small rivers with a considerable gradient.

(f) Pack Floating, Cascading, and Li-lo Drifting

An activity popular in Australia is cascading — a tramper, clothed in normal tramping equipment, merely floats down a river feet foremost, using his pack for additional floatation. Although not a recognised activity in its own right, tramping clubs have been known to organise such trips down river gorges during weekends. The Canterbury University Tramping Club used to hold an annual Ashley River Gorge trip of this nature that was very popular.

The Mangahao River in the Tararua Range provides a popular pack-floating and li-lo trip, as do the upper Mohaka and Ngaruroro Rivers, especially for li-lo trips. Such activity is usually sought on the small mountain streams where there are ample small waterfalls, quiet pools, and a current that obviates the need to actually swim or paddle. Walking down the river banks is part of the fun. Trips are usually confined to single-day trips and, because the floater will be immersed a good deal of the time, an unpolluted stream is the prime essential.

Another variation of the pack-floater is the free swimmer. In 1972 there appeared on the shelves of bookshops, a book by Geoffrey Dutton, entitled *Swimming Free* in which he outlined a mode of recreation that was, at that time, quite unusual. Dutton maintained that it was quite ridiculous to teach a person to walk and then expect him to spend his life walking around a room, never venturing outside. It was just as ridiculous, he claimed, to teach a person to swim and then expect him to spend his swimming life in a concrete pool. Dutton sought to spend his time swimming downriver, and along the coast, clothed in a wet-suit but unhampered by an aqua-lung or other equipment. Whilst canoeists have accidentally swum down rapids for some time, the deliberate traversing of a river by swimming is not a common activity, but is one that may well become popular in the future. The swimmer would demand clear flowing streams, preferably with shingle or rock beds rather than mud or silt, free of willows and other obstructions.

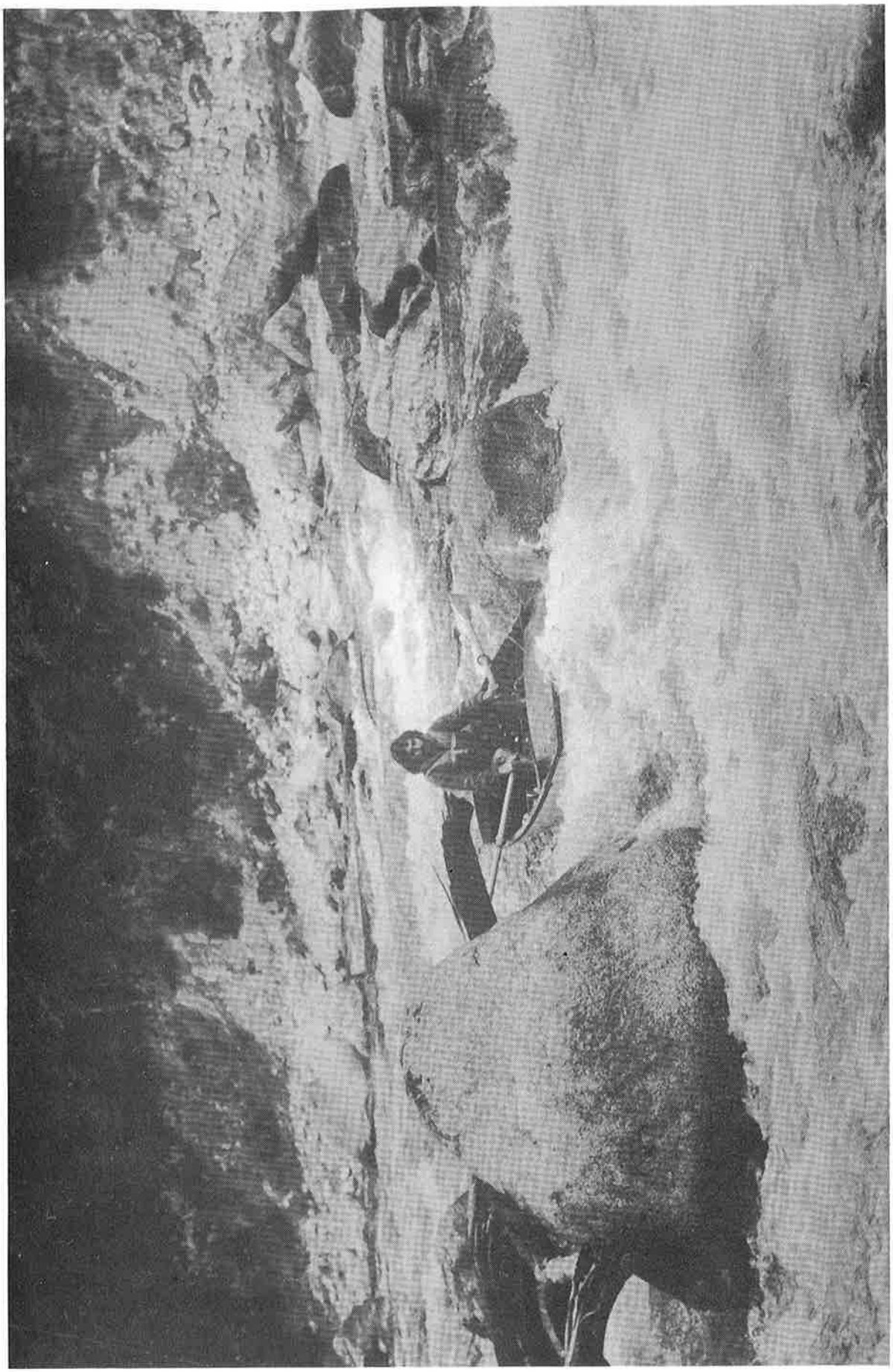
(g) Swimming

While it is true that most New Zealanders swim only in swimming baths, most have, at some stage of their childhood, used swimming holes in rivers and it is, perhaps, only the lack of adequate supply of suitable pools with good, clean water in the vicinity of urban areas that makes them less used than the concrete boxes supplied by municipal authorities. There is an increasing need to maintain good clean water in our smaller streams at road-side picnic spots and rest areas for the use of swimmers.

3 RIVER WILDLIFE RECREATION

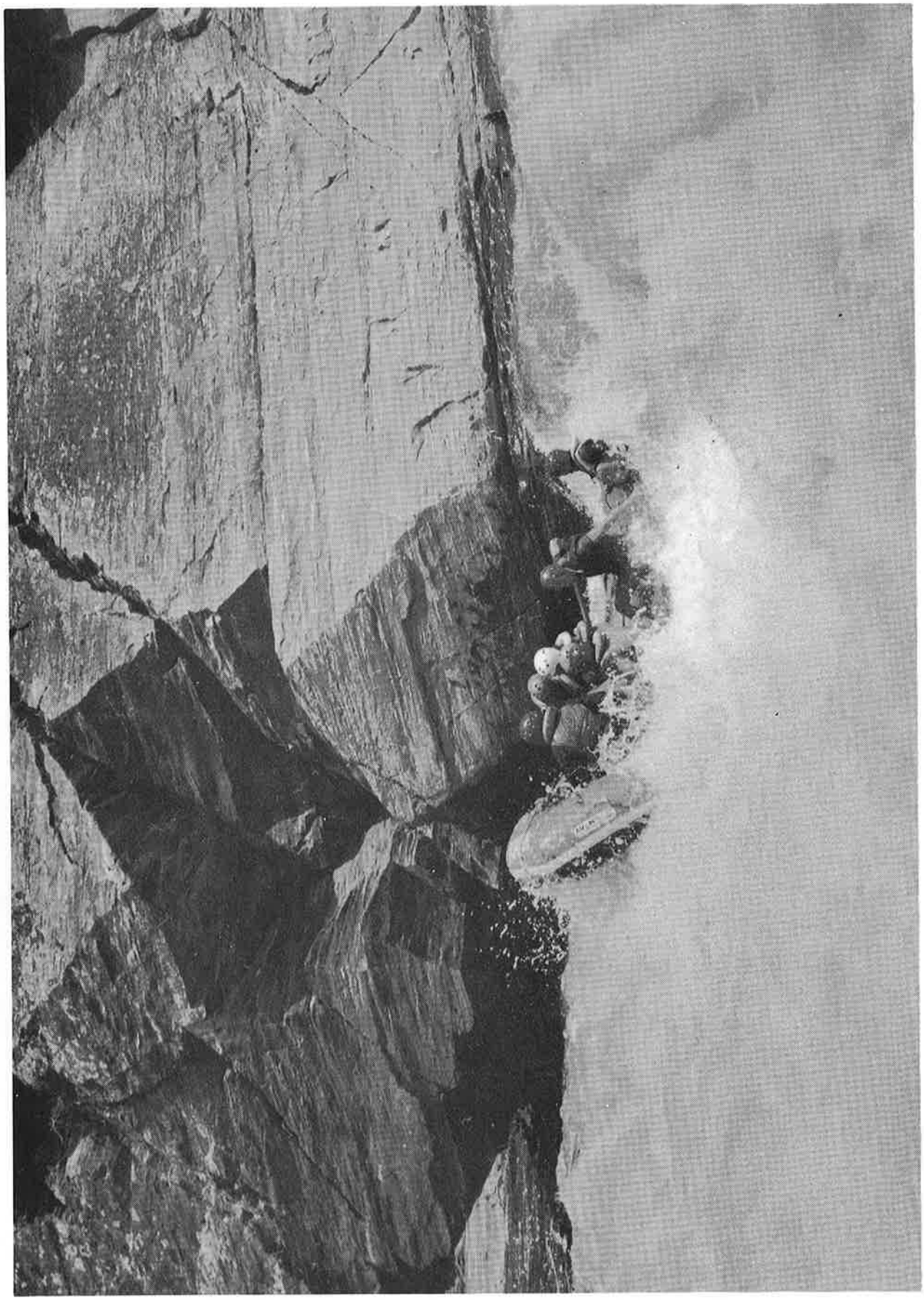
Fishing and wildfowl shooting are two activities that depend upon the existence of a river environment for their continued existence. These activities were clearly outside the terms of this survey and, consequently, they have not been referred to in the data collected. There is ample data in existence on these recreational activities, and reference ought to be made to the excellent information that is available from the various acclimatisation societies throughout the country.

Canoeing down the Jaw Breaker Rapid, Clarence River (see Part III, p.133–4).

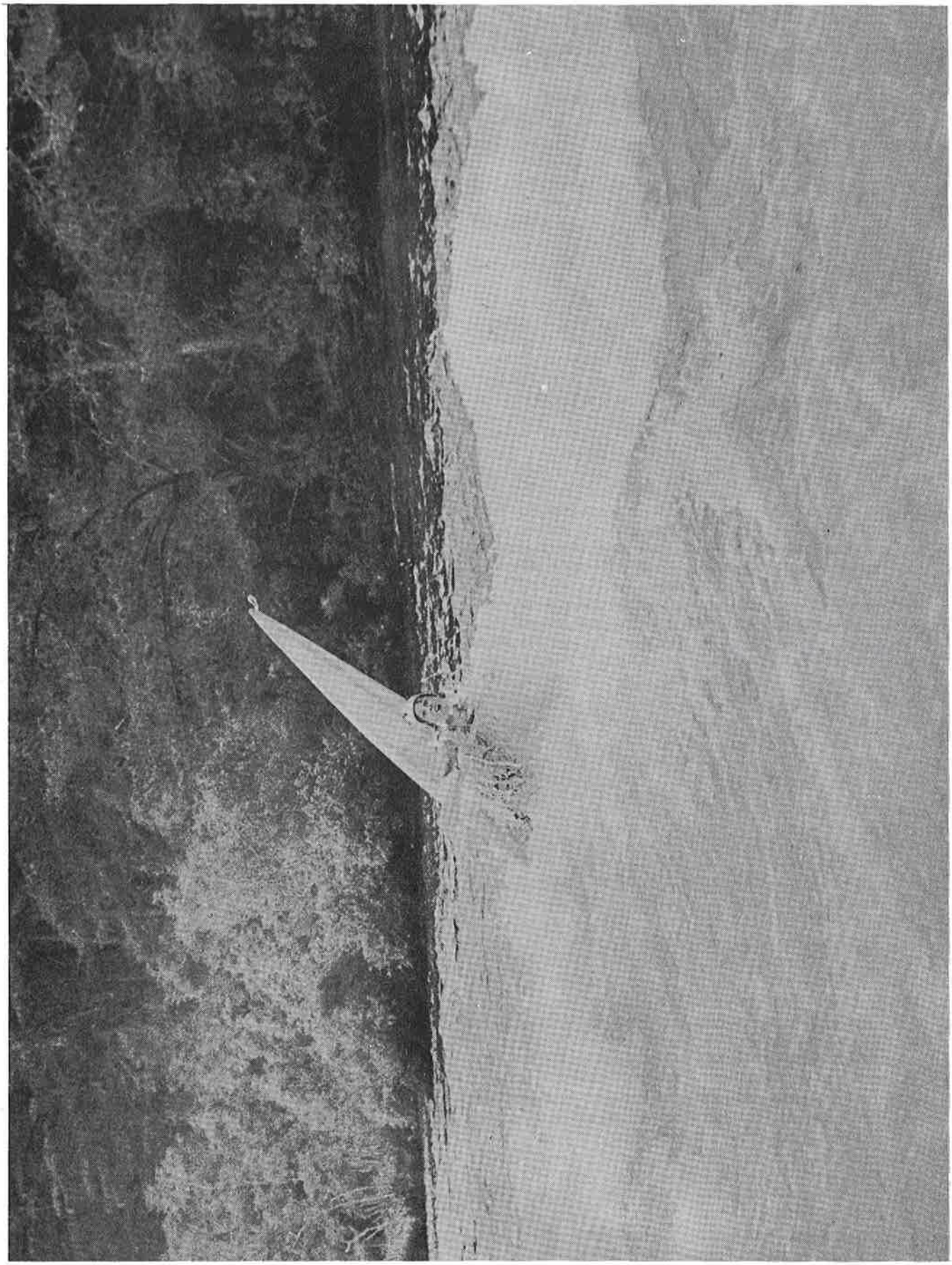


A well managed drift boat can negotiate narrow gaps: the Upper Grey above Robinson River (see Part III, p.20).

Jet boating downstream requires considerable skill: coming down the Clarence (see Part III, p.132).



Rafting on the Shotover **(see Part III, p.81).**



A major part of river recreation is simply 'playing' in rapids on the river: the Fulljames, Waikato River (see Part II, p.19).

IV. Recreational use measurement procedure

1 RECREATIONAL POTENTIAL

Obviously, when measuring the potential recreational value of any given section of river, we must be able to give a positive response to the question, 'Is it suitable for, and able to be used by, the recreational groups in question?'. Unfortunately, the qualities that go to make up a good jet-boating river are not necessarily those qualities sought by a rafter, or by a canoeist. Consequently, one cannot simply rank, in order of priority, those resources able to be used by all groups down to those resources able to be used by only one group, and leave it at that. There is also the problem of deciding how to rank a river considered to be exceptionally good canoeing water and mediocre for jet boating, with a river considered to give average conditions for both jet boating and canoeing. We hold the belief that no one recreational group has any prior right for consideration when talking of recreational facilities. For example, a fisherman has no right to more consideration then a canoeist; a jet boater has no right to prior consideration before a child who wishes to swim in a river. How, then, do we arrive at a method of ranking rivers in terms of recreational suitability? Obviously this is a problem.

There have been a number of methods proposed for the measurement of recreational suitability, so that one can compare one resource with another. The more interesting methods are:

(a) The "enjoyment-level" method

Simply put, this method assumes that the outcome of recreation is enjoyment. If you could measure the degree of enjoyment of a representative sample of persons using the given resources, then you might be able to judge the relative values of each resource on the basis that the resource of the greatest value is the one that gives the greatest pleasure to the greatest number.

This method has a number of problems, namely:

(i) How, in practical terms, do you measure enjoyment? Perhaps with a detailed questionnaire? And do you measure the pleasure, or enjoyment, whilst the recreation is taking place, or later?

(ii) Is it correct that enjoyment is the outcome of recreation? Should we not also be measuring 'degree of satisfaction' in meeting a challenge? Are there not other responses that are equally as important as enjoyment?

(iii) How do we know if we have a representative sample? There are no statistics on who uses rivers for recreation. Could we not be biased in measuring, for example, a greater number of canoeists than their user-numbers would allow?

(iv) There is the problem of restricted use which we might strike, for example, on the Arawata River, where fisherman, hunters, and jet boaters use the river whilst rafters and canoeists do not because of difficulty of access. If we register a high degree of enjoyment amongst these people does that place the Arawata River higher than another river which is used solely by swimmers?

(v) How do you compare high enjoyment amongst a few, with average enjoyment amongst a great number?

(b) The "dollar-spent" method

This method is based on the assumption that the greater the recreational experience to be had, the more willing people are to spend money to get there. Consequently, if we were to measure the amount of money spent, per head, per day, on a number of rivers, then we might arrive at a ranking of value for all rivers.

Obvious problems with this method are:

(i) If we have a small stream flowing near a city to which hundreds of children bicycle to swim, fish, and float in, it would be a very low dollar per head, per day ratio; whilst a river, more isolated from urban areas and used solely by jet boaters using expensive equipment, would have a very high ratio of dollars per head, per day. Does this truly reflect the relative values of the two rivers?

(ii) We know that recreational activity is in no way related to a willingness to spend money. Any assumption based on what amounts of money are spent must also take into account the ability of those to spend money. Thus, we must know the economic circumstances of the recreationalists themselves.

(c) The "visitor day" method

This method assumes that those areas of greatest value are measured by the numbers of people who use the area. Thus, a river valley that is visited by 100,000 people per year is said to be more valuable than a valley visited by only 100 people per year.

(i) The obvious problem with this method is that it takes no account of the quality of the recreational activity. Those areas of greatest accessibility will obviously rank higher. The value of 'wilderness experience' is denied.

(ii) The second problem lies in the fact that there are no statistics on any river valley which give an accurate head count of users. The New Zealand Jet Boat Association once did a count on the Waimakariri of those people visible from the centre of the river; on a short distance of the lower river there were in excess of 30 people per kilometre. This would place the lower section of the Waimakariri as one of the most valued rivers in the country, and yet a lot of people will tell you that the Waimakariri Gorge is by far a better area for recreation. Similarly, a study of recreation patterns in Marlborough showed that while the local people preferred to use the Sounds for recreation, the area that received the highest use was the lower Wairau River. Our survey did not have the facilities to establish head counting machines on river valleys.

(iii) Lastly, if we take the 'visitor day' method to its logical conclusion it would be possible to say that it would be beneficial to convert the Mount Cook National Park into a series of rugby fields and race courses because then there would be greater recreational activity. But is this really the point?

2 SURVEY CONSIDERATIONS

In the absence of any statistical data on user numbers, and because of our lack of facilities to prepare and organise the distribution of questionnaires on 1500 rivers in the country, the survey could merely look at each river, participate in a range of recreational activities on each river and measure our own response in as objective a manner as possible after consultation with local users.

We consider that recreational potential could be broken down into a number of factors:-

(a) Suitability for each of the recreational groups

Here we were looking for rivers that were considered to be exceptionally good from the point of view of each recreational activity that we were interested in. For every river and for every recreational group we classified the rivers into four categories

Class I	Easy boating	-International Grade 1. Suitable for beginners and families.
Class II	Advanced boating	-International Grade 2 to 3. Suitable for the average boater with at least one or two seasons' experience.
Class III	Difficult boating	-International Grade 3+ to 4. Adventure-type boating.
Class IV	Unboated	-Unlikely to be boated at any time, either because of a lack of water or because the rapids are too extreme. Such rivers may be boated under extemely high flows or by a hardy group of rugged canoeists, rafters, or jet boaters of exceptional ability.

In most cases we found a great deal of consensus between recreational groups concerning the classification of rivers into these categories. The main differences arose because of the need for bigger rivers for the larger rafts and jet boats. For example, the Ashley Gorge below the middle bridge was considered to lie between Class II and Class III for canoeists, Class III for drift boaters, and Class IV for jet boaters. These differences were caused by the lack of room between rapids at normal flow which did not allow for the safe use of jet boats. However, canoeists found this river section ideal.

We were looking for rivers that gave a good deal of versatility so that when we came to a river section such as the Cromwell Gap on the Clutha, which received a Class III category from all recreational groups, we felt obliged to consider its recreational potential to be greater than a nearby river which had a range of classifications as it was canoed and rafted but was not jet boated.

While keeping this need for versatility in mind, we had to take care not to overrate its application to all groups to the degree that we would end up with rivers of mediocre value to many groups and exclude those rivers of tremendous value to a few groups.

It is also important to note that the classification I to IV does not imply an ascending, or a descending, order of priority. We felt that a Class III river could not be considered to be of any more value than a Class I river. We were looking for the best examples of Class I, II, and III rivers in each region as there is a need for low skill rivers as much as there is a need for rivers for the competent boater. However, we noticed that there was a preponderance of Class I and II rivers so that when we came to a Class III river it tended to rank higher for its uniqueness.

(b) Access - launching sites, vehicle access

The question of access is an important one in the calculation of potential recreational use. Obviously a river can be particularly valued but, unless people can get to it, it may never realise its full potential. This applies to most of the rivers of Fiordland. Some rivers, like the Waiatoto, have access at only one end and jet boaters may boat the river upstream and back again, but rafters and canoeists will not be able to use the river at all because they cannot get to the upper catchment except by the expensive use of helicopters. Consequently, the river will never realise its full potential for all recreational groups. Power boats and jet boats require vehicle access to the water's edge, preferably in the lower river area, and they boat in an upstream direction and return downstream (which is a little more difficult) to retrieve their boats. Canoeists, drift boaters, and rafters require access to a boatable section of the upper catchment in order to travel downstream. Access need not be vehicle access as most boaters will be prepared to portage some distance to the river. Most of the South Island's West Coast rivers do not have access to the upper catchment, so that when you do have rivers with access (the Grey and the Buller) they become particularly valuable.

(c) Problems to users

(i) The presence of unnavigable obstructions will make a river less valuable. Obstructions such as dams and weirs must be portaged. Or, in the case of jet boaters, dams will turn boaters back to where they launched so that they have to drive around the obstruction and relaunch.

(ii) Bridges with debris from construction work - many bridges on the west coast of the South Island offer hazardous boating because of old bridge piles that have been cut off at water level.

(iii) River protection works (such as wire ropes and concrete blocks with railway iron protruding) effectively prevent cautious boaters from running many rapids. Canoeists seldom dare canoe down to the Clarence River road bridge for this very reason. Fences and wires across rivers, often at neck-height, are also hazardous.

(iv) Willows are the single most hazardous obstacle met with on a river and no matter what degree of skill a boater may possess, the willows must be avoided at all costs. The existence of willows which line the river banks and interrupt the flow of a river must downgrade the river's recreational potential. Willows can make an otherwise pleasant river a nightmare.

Problems such as these add nothing to a river's desirability and account must be taken of them when calculating recreational potential.

(d) Proximity to population

All other factors being equal, a river closer to an urban centre will be more valuable than a similar river some distance from the residences of those people seeking recreation. This is, of course, an obvious point but the problem that faced the survey team was in judging when a river of low interest close to a city becomes of greater value than a more interesting river further away. In many cases the popularity of any river will rise and fall dependent upon the cost of transport, and with fuel prices ever increasing, we see that good rivers close to cities will become more important for city recreation. The further from a city the river lies, the more special, or unique, it must be in order to attract recreationalists.

We have found by experience that most rafters and canoeists will think nothing of travelling 80 km for a day's canoeing, and even 150 km for a good river offering a weekend's activity. Jet boaters, because they require a larger river and perhaps because they have a greater investment in their recreational equipment, seem prepared to travel much further. Good swimming rivers must be much closer to town, preferably within a 10 to 20 km distance

(e) Skill factor

The opportunity to take risks and meet challenges is an essential element in recreation. People at different levels of skill will find this challenge on different sections of river. What we were looking for was a range of resources offering a range of skill demands. Basically, this dove-tailed with our suitability classification (see **(a)**). We believe that what we require is a range of rivers suitable for the complete novice and for the more passive recreation of families, through to the more demanding resources needed for young people seeking a challenge.

(f) Method

Once we had settled on the above factors as being of prime importance for recreation we then had to evolve some method of considering all these factors to come up with a method of comparison between one river and another. This was done in the followng manner:

(i) To classify according to suitability for each recreational group and skill level so as to arrive at a classification for recreational activity generally.

(ii) Is there access for each group? Any lack of access would tend to downgrade recreational potential.

(iii) Are there obstructions (other than access) to users? Note that we might consider water pollution as a possible obstruction, but we considered pollution to be a temporary obstruction and, in cases where a river is of high value but polluted, water quality could be improved.

(iv) How 'popular' is the river likely to become?
(v) Considering all these factors, we attempted to come up with a classification on a five point basis – from exceptional through to insignificant.
(vi) We asked ourselves the question, "Does this resource offer anything unique to recreationalists that other resources in the region do not?" Our answer to this question tended to shift our overall assessment up or down so as to reflect this uniqueness.

A further and more detailed discussion on aspects of recreational potential may be found in Chapter VI.

3 THE GRADING AND CLASSIFICATION OF RIVERS

One of the more important aspects of recreation on rivers is the degree of difficulty, or the skill factor, to be encountered. One of the factors that tends to make outdoor recreation so valuable is the degree of challenge, or the desire for a challenge, in spite of the danger. There is a need for adventure, but the usefulness of a recreational resource rapidly decreases when the degree of danger goes beyond what is commonly recognised as an acceptable risk. The optimum is a skill factor that requires a degree of skill and concentration for the average boater without being hazardous, and yet not being so easy that there is no enjoyment, satisfaction, or elation on the successful completion of the task.

To have a system of grading the recreational resource so as to provide an index of skill factor is a particularly valuable thing, especially when the index is kept consistent throughout a region or country. Although any such system is valuable in describing a resource, it requires caution in its use. Firstly, there are different types of difficulty in a rapid as well as different degrees of difficulty, and any system must take account of this. Nor will rapids remain the same with differing water levels, or after flooding.

In the classification of New Zealand's rivers we have used the 'mean summer flow' – that is, because by far the major use of rivers occurs between October and February, we have graded the rivers for the mean flow levels to be encountered during that period. This has led to complications in the Canterbury-Otago regions where summer flows can be almost nil. For these areas we have assumed an above normal flow, or a flow to be encountered in the earlier part of the summer period. Or, it could be said that our grading is based on the mean flow for that period of the year when the river receives the greatest intensity of recreational activity. In a number of instances we have noted that a particular river can only be used when flowing above normal; in this case we have assumed normal to be the mean spring or early summer levels.

The international system

The internationally accepted system is to divide rapids up into six broad categories: from grade 1, flat but moving water, to grade 6, which would tax the expert to the limit. Grade 7 (we tend never to think of such horrors) would represent impossibility or the absurd (Sutherland Falls with 580 metres of vertical water). The grade or difficulty of any given section of white water will depend upon the degree of skill required to negotiate it, or, indirectly, the nature of the obstructions that the boater needs to overcome. Such obstructions are created either by the turbulence of the water around or over the river bed and solid objects that protrude into the water flow, or by sections of the river bed that actually protrude above the surface of the water. That is, the obstructions can be either disturbed water, or solid objects.

The international system was designed initially for canoeists so that grade 3 represented the degree of skill found in the average canoeist after a year or two of paddling. When this system is applied to different craft, such as rafts, or jet boats, there will be some inconsistencies. For example, the average rafter should be able to attempt a rapid that a canoeist would classify as grade 4, whilst the average jet boater may find that a grade 2 rapid is all that he is prepared to cope with. Also, there may be a rapid commonly used by canoeists that is very steep and narrow but graded at grade 3, but because of the nature of the rapid, it may need the skill of a very experienced rafter to negotiate his craft through without damage.

Jet boaters tend to use a four-point system of classification. The first three grades roughly coincide with those of the canoeist. A fourth grade denotes those rivers or rapids that are only negotiable under exceptional conditions – either very high floods, very low flows, or for the most competent drivers only.

To simplify matters, we have used the canoeists' international system and we leave it to the reader to translate this into jet boater or rafter classification systems.

Obstructions

Solid hazards in rapids, which we shall term 'objective dangers' because no matter what the boater does he has to avoid them, can be divided up into three broad categories:

1 The existence of boulders and stones, shallows and stone banks.
2 Solid bedrock causing undercut ledges and bluffs.
3 Trees, fence wires, dams, and other man-made objects.

Other types of obstructions consist of powerful water currents (referred to as 'turbulence') which can also be divided into a number of categories:

1 Varying waves.
2 Haystacks (large standing waves).
3 Stoppers.
4 Whirlpools, vortex, boils, eddies, and surges.
5 Backlash.

The existence of objective dangers will remain constant to a large degree, but turbulence will vary according to the strength of the water. That is, on the current speed, volume of water, and the gradient of the river bed. Further, difficulty can arise in the directness of the route that the boater must take in order to avoid the obstacles. Split-water can pose quite a problem in a fast-moving river which leaves little time to assess which channel is the better. The length of the rapid and the existence of pools between rapids will also have an effect on the classification or grade.

We can therefore say that the degree of difficulty of any given stretch of water will depend upon five factors:

1 Strength of the water flow.
2 The existence of objective dangers.
3 Turbulence.
4 The directness of the route.
5 The length of the rapid.

The difficulties will be summed up and expressed by a number from 1 to 6 which will denote the degree of difficulty to be found in the rapid. Thus, as an example, a river flowing at ten knots into the branches of a dead tree may be considered as difficult as a six-foot waterfall festooned with rocks and waves.

The Grades

What we ought to consider now are the general characteristics of the six grades of white water. The difficulties to be met with in any rapid of any grade could be made up of any one of the five factors, or a combination of the factors interacting with each other in such a manner as to represent, to the boater, a single difficulty. Each rapid will consist of a certain combination of factors requiring a unique method of approach in order to overcome the obstacles.

GRADE ONE Slow-moving lowland rivers, canals, and lakes. Also the lower part of many wild rivers after they have lost altitude and spent their force. Log jams may occur but because of the lack of force in the current they will not present any difficulty in avoiding. Rapids will consist of riffles over shallows, and the occasional boulder bank requiring some manoeuvering to pick a clear way through. Scarcely any white water except for waves little more than riffles. The current is slow to moderate and the river's course is obvious. A muddy river bed with rushes and other water weeds along the bank is characteristic.

GRADE TWO Rivers showing a definite movement but without any real violence. Straightforward rapids with regular

standing waves, rock dodges, and small falls of up to 30 centimetres which boaters can simply 'plop' over. Water may slosh over the decks of canoes and small rafts, but with no real force. The course of the rapid is still easily recognisable.

GRADE THREE Normally these rivers would have a current force that would prevent you from standing up in the water. More formidable and tricky rapids and fast rock dodges requiring the deliberate guiding of the craft down the chosen route. Higher irregular waves of up to one metre in height which might hit the paddler solidly in the face. Falls of up to one metre in height into which a canoe might disappear for a few seconds in the foam at the foot of the fall. The course of the river is navigable but may require inspection either from the bank or from a slow-moving craft above the rapid. Canoeists would be constantly needing draw and recovery paddle strokes to combat unexpected eddy surges. The river will be quite free from weeds or other growth.

GRADE FOUR While grades one, two, and three may be found in any river, grades four, five, and six are only found in rivers with a fast flow and a high volume of water, the rapids being created by narrowing and restrictions in the flow. The current will be quite impossible to stand in with big powerful waves foaming and varying in position and irregularly spaced. Powerful backlash and moderate stopper waves all require anticipation in order to get through. Water will splash over your head. This will be the upper limit of jet boat travel as the aerated water will cause a loss of thrust from the jet unit. Canoeists will need to use draw and recovery paddle techniques. Rocky banks with the bed cleaned of small stones as the current would have swept them away. Careful inspection of the river's course will be necessary before navigation is attempted.

GRADE FIVE Long stretches of very powerful water, confused and violent, foaming and boiling, making a planned course extremely difficult to follow. Very powerful backlash and high varying waves with stopper waves difficult for paddled craft to break through. Too fast and difficult for paddle strokes; eskimo roll techniques essential for canoeists. Inspection from the bank is essential. Falls of up to two metres with little slack water.

GRADE SIX The extreme, so difficult that navigation is virtually impossible but not manifestly impossible. A definite threat to life. Nevis Bluff rapid on the Kawarau River is a fine example of such a rapid.

4 EXPLANATION OF DESCRIPTIVE TERMS USED

The following terms are used throughout the text of the survey, probably with a slightly narrower meaning than is usual. Most refer to terms used in describing and grading rapids and white water.

(a) Valley type

When speaking about a river valley, as opposed to a river channel or a river bed, we refer to the limit of the landscape visible from the river surface. That is, from river bed to the skyline.

Symmetrical A river valley where either side and the flanking hillsides are similar in shape, form, and appearance. A symmetrical valley might not necessarily have similar vegetation cover on either side.

Asymmetrical A valley type other than symmetrical.

Sheer canyon A deep gorge, often with overhanging walls, and at the bottom of which flows the river without beaches. Often the term 'ravine' is used to denote particularly narrow canyons.

Ravine A particularly narrow canyon.

Gorge A river flanked by steep hillsides that may be, and usually are, in the form of solid rock walls. Any narrow river valley in the form of a steep sloping vee, where there are no margins of flat land flanking the river channel, is referred to as a gorge.

Saw-cut gorge A particularly narrow gorge that is more in the nature of a ravine, usually found on small streams cutting through soft rock.

Hilly Hillsides flanking the river but with a margin of flat land and beaches on either side of the river channel. Less dramatic than a gorge.

Undulating Rolling hill country flanking the river. Often referred to as 'mature land forms'.

Flood plain Generally found on aggraded rivers. Extensive flat landforms on either bank of the river - usually old river terraces or silt deposited by floods.

(b) Channel type

When talking of a river channel we refer to the river and its banks, not to the land forms found beyond the banks.

Symmetrical With banks of roughly similar type on either side of the water channel.

Asymmetrical A channel other than a symmetrical one. The river may have shingle beaches on one bank with bluffs on the other, for example.

Bedrock The river banks consist of hard rock, often, but not necessarily, worn smooth. Bedrock is a term applied to those river channels that have an absence of any great quantity of loose shingle and where the bed is composed of rock.

Soil Banks of clay, crumbling mudstone, or mud. Usually the lower reaches of most rivers which flow quietly through rural countryside between muddy banks. Often grasses cover the banks.

Marsh Swamplike, with the channel edges swampy and merging with the vegetation in such a gradual manner that there are no banks.

Sloping The surrounding countryside, be it soil, rock, or marsh, slopes into the water channel so that there are no high banks although beaches will be prominent.

Terraces The river channel has definite banks, often with a margin of beach. Generally old river terraces beyond the present banks will be noticed.

Beaches A sloping margin of land at least 3 metres wide on either side of the river channel.

Dunes Normally of sand, found on the very lower reaches of rivers as they meet the sea. Often covered in lupins or grasses.

Straight Where the river channel takes a definite line in one particular direction.

Meandering Where the river winds and twists about, often creating large loops and ox-bow lakes. Usually the pattern in more mature river valleys when the river meanders over its old flood plain. This pattern will also be found in the North Island hill country where the river winds through soft mudstone hill country as in the Patea, Wanganui, and Waitara Rivers.

Braided Where the river splits into multiple channels which join, split, and rejoin again successively. Usually the pattern of the South Island's West Coast rivers, e.g. Waiho River, although found on most rivers composed of aggraded shingle and which are of low gradient.

(c) River bed

When speaking of the river bed, as opposed to the river channel or river valley, we refer to the composition of the river bed itself, and not to the banks and the wider landscape. In most cases a description of the river bed consists of a description of the rock particle size making up the substance of the river bed. During the survey no attempt was made to physically measure rock particles to classify them according to the categories below. We tended to look at the overall pattern of rock fragments and place them in that category that seemed most appropriate. In most cases the classification used covers the rock fragment size of that material on the surface. Those terms used are:

Rock Generally, the term 'rock' refers to bedrock, or to solid rock, and not to loose rock particles for which the plural is used i.e. rocks. The bedrock may be solid, waterworn rock bluffs and river bed, or factured and split rock in large pieces.

Boulders Boulders are pieces of rock varying in size from a room of the average house down to 0.6 metre diameter. Often boulders will be rounded in shape whilst the term 'split boulders' refers to those boulders with hard, angular surfaces as found in much of Central Otago.

Rocks Smaller than boulders, varying from 0.6 metre diameter down to 0.2 metre diameter. That is, down to the size of a normal person's head. Rocks between 0.2 metre and 0.05 metre diameter are usually called 'cobbles' but the distinction between 'rocks' and 'cobbles' is a hazy one within this survey; we have called cobbles small rocks.

Pebbles From 0.05 metre diameter to 0.02 metre diameter.

Shingle 0.02 metre diameter to pea size.

Gravel The term 'gravel' is often used to denote a mixture of pebbles, gravel, and sand. Normally, gravel is finer than one would expect when talking of shingle.

Sand Fine particles of rock fragments.

Silt and mud When the major proportion of the shingle, sand, or gravel mixture consists of soil particles as opposed to sand and rock fragments.

Scree Loose angular-edged rock fragments which may vary in size from cobbles to shingle. Usually from newly-eroded hillsides and found in the upper catchment areas of rivers.

(d) Movement

The movement characteristics of a river have been broken up into three components: water flow (describing the water levels), strength of flow (giving current speed and force), and rapid types.

Basically, we have used three adjectives to describe the range of water from quiet, still water through to torrents of white water. These are: placid, disturbed, turbulent.

If a river contains waves (other than waves created by wind conditions), then it warrants a 'disturbed' category. When the water surface contains lengthy sections of white water, then we have classed it as being 'turublent'.

(i) Water flow

In describing the level of water in a river at any given time it is necessary to give a comparison to normal flow. This is done on a six-point basis from Very Low to Flood conditions, as follows:

Very Low With substantial portions of river bed showing dry. Certainly, the main obstacles that go to make up a rapid will be above water.

Low Below normal.

Normal

High Above normal but still running relatively clean.

Fresh When the river is well above normal but still contained within the river banks. We might expect the water to be discoloured and branches of trees to be drooping into the current. Normally the river will be flowing swiftly the full width of the river. Logs may be floating downstream.

Flood The river banks are overwhelmed and the surrounding low-lying countryside is flooded. Water flow becomes quite powerful with pressure waves along the banks and where rapids normally existed. Rivers will seldom be used for recreation whilst in a flooded condition.

(ii) Strength of flow

The strength or force of water flowing in any river bed is very dependent upon the height of the water above or below normal, the volume of water, and the shape of the river bed. Strength can often be gauged by observation of the surface of the water and it is usual to describe the force of water on a five-point scale:

Still Mirror-like with no noticeable current; glassy, reflections.

Sluggish Current present with some ripples on the surface, particularly over shallows. Paddler still able to make headway upstream. There will be no broken water, i.e. not above 4 knots in speed.

Flowing Only able to paddle upstream by use of eddies behind rocks and by using back eddies at the river banks. Only just possible to stand in water that is thigh deep. There will be broken water in mid-stream.

Strong Unable to stand in the current, no water weeds able to grow. Waves quite broken and wild.

Powerful 'Heavy' water with strong boils and currents. Waves start to topple and rapids with any fall tend to cascade.

(iii) Rapids

In describing any given section of a river it is usual to make reference to rapids and/or obstructions creating hazards and white water. It is possible to subdivide all rapids into two distinct types:

(a) Those created by horizontal currents generated by obstacles.

(b) Those created by vertical currents generated by the water current falling over undulations in the river bed.

As a general rule, horizontal-type rapids tend to become more hazardous as water flow (both level and speed) increases, whilst the vertical type tend to decrease in difficulty as the increase in water flow 'drowns out' the rapids.

A HORIZONTAL TYPE:

Shallows Shallow areas in the river bed provide a quickening of the current over, or around, the shallow area, creating ripples, riffles and, with high flow, small pressure waves. Usually comprising shingle or gravel.

Weir A shallow bank composed of rocks and cobbles. The shallow bank normally stretches from bank-to-bank, causing a drop from one level to another. The difficulty arises on the lip of the bank where the water is particularly shallow. An artificial weir is a dam-like structure with the water flowing over it.

Rockgarden A shallow area with numerous rocks or boulders showing above the water surface so that river craft much pick out a complex route. Normally broken water and small pressure waves exist.

Graveyard A more severe rockgarden with larger boulders. So-named because of the similarity to tombstones in a graveyard.

Filter When boulders and rocks predominate to the extent that the water flow is split up and filters between the stones so that there is insufficient space for the passage of a river craft, then it is called a filter. Generally such obstacles must be portaged.

Bluffs On corners, particularly in gorges, the river current piles up on the outside bend and builds up a long pressure wave against the confining bluff. Such a pressure wave, curling back upon itself and into the oncoming current, is called backlash. Eddies, whirlpools, and boils may also develop.

B VERTICAL TYPE:

Chute When confining bedrock narrows the water channel and it drops over a ledge as a tongue of water into a pool of swirling water, it is called a chute. These rapids are easily run by most river craft and are usually found in gorge conditions. A shingle chute may be encountered in steep aggraded rivers where the current has cut down through the shingle bed creating a steep tongue of water before widening out into an area of pressure waves.

Cataract A chute with a significant drop of water level (at least 2 metres or more) which may be in one step or more. Bullivants Cascade on the Motu River is such a rapid, as is the Aratiatia Rapid on the Waikato River.

Waterfall A ledge creating a definite hard edge where the water falls over into a pool. In this respect the Huka Falls on the Waikato is more in the nature of a cataract than a waterfall, whilst the Aniwhenua Falls on the Rangitaiki is a waterfall.

(iv) Obstacles

In describing the contents of rapids the following terms may be used:

Stonebanks As for a weir; naturally-occurring stone banks of small rocks and shingle.

Ledges A hard rock structure standing above a pool created by the wearing away of a softer rock. In these situations the ledge creates either a chute or a waterfall-type rapid.

Trees In a current they provide potentially the most hazardous situation on a river for river craft, as they allow the water current to flow through but not the boater, who will be held fast beneath the water surface.

Pressure waves Any 'lump' of water created by obstacles that alter the pressure of the water current and thereby create waves.

Haystacks Large standing waves, larger than simple pressure waves. Haystacks are large pyramid lumps of water showing little white water at their crests.

Stopper waves A large wave that is toppling its upper portion down the downstream face. Unstable haystacks develop into such waves. These waves have the effect of stopping and rolling most small river craft.

Souse hole The depression in water levels found on the immediate upstream side of a stopper wave, and into which the top of the stopper wave falls. A particularly violent part of a wave to be in.

Eddies The dividing line between two bodies of water moving at different rates and in different directions. They create sudden changes in direction of river craft moving from one eddy to another.

Whirlpool A circular eddy.

Vortex A whirlpool with a definite centre.

Surge Any wave, haystack, or stopper which moves or varies its position by building up and then collapsing in a set pattern.

Boils Upwellings of a current creating vicious eddies and surges.

V. Scenic evaluation

1 THE IMPORTANCE OF SCENERY AS A FACTOR IN RECREATIONAL USE

By far the majority of those people who seek recreation on rivers in New Zealand are attracted by the scenic attributes of the river valleys and the wilderness experience of nature as well as by the more explicit objectives of shooting rapids, catching a fish, and competitive water sports.

Consequently, the scenic aspect of river valleys is an important value when measuring the recreational value of rivers. It is worth noting that as the skill factor of a river increases (that is, as the degree of difficulty or challenge offered by the river increases), the role of scenic attributes becomes less important in the total measurement of a river. However, most of our wildest rivers (in the sense of moving, wild, white water rapids) lie in rugged and unspoilt scenery. Where a high skill factor river is required, and where a choice between a scenic river or a 'developed' river is available, the scenic one must rank greater in value.

The fact that river scenery is considered by most people to be of a high value is borne out by the fact that our most scenic highways are those that follow rivers - for example, the Waioeka Gorge on the Gisborne to Whakatane Highway, the lower Buller Gorge on the Murchison to Westport Highway, and the Haast Pass Highway.

2 FACTORS OF SCENIC QUALITY

To measure a somewhat esoteric and nebulous thing as scenic value, we found it necessary to break down any given scenic vista into a number of components or factors and to give the scene a ranking on each factor so that, on adding the rankings, we could sum up the total value of the vista and compare it with other vistas. The different factors we felt as being of importance and which we isolated as contributing towards the scenic quality of a given vista were:

(a) Vegetation

The vegetation cover is one of the most immediately apparent aspects of any given vista. As with all the other factors in the assessment of scenic quality, we looked at vegetation from the point of view of a reasonably well-informed recreationalist. We were interested in measuring the response of the recreationalists who will follow us - we were not at all interested in the emotions of a botanist, or scientist, as such fellows are comparatively rare. Whether the particular vegetation was rare, of commercial value, or of a scientific curiosity mattered not. What we were interested in was the aesthetic appreciation of fellow boaters.

It is difficult to lay down hard and fast rules as to what comes at the 'aesthetically enjoyable' extreme of the scale, and what comes at the 'dull' end of the scale. Gorse is seen as an ugly noxious weed by some, a colourful ground cover at certain times of the year, by others, or as an attractive adjunct to barren grassland by still others. Native bush tended to be more consistently regarded as of great aesthetic value, whereas continuous lines of old willows along the river bank tended to rank low.

Three aspects of vegetation tended to be given value in our measurements. **Volume**, or the extensiveness of the ground cover. **Variety** - continuous lines of willows, farmland, and bush tended to rank low, whilst bush containing a variety of colours and species tended to rank high. **Virginity** was of importance, although here we were measuring on appearances only. We were not impressed by native vegetation types so much as by natural-looking vegetation cover.

(b) Geological makeup

By geological makeup we were interested more in the immediate river bank area than, for example, distant papa rock bluffs, or limestone cliffs rising from the bush. Such more distant phenomena, tended to be considered with vista (q.v.). A variety of rugged bluffs, beaches, and low banks tended to be regarded more highly than continuous sections of any one type of geomorphological phenomena. For example, short gorges and low banks as found on the Ohinemuri River tended to rank higher than the constant flat farmlands of the Piako, or the aggraded shingle of the Canterbury rivers. The papa rock bluffs of many North Island rivers seemed to be so common that they were not valued as greatly as one might expect.

(c) Vista

In this factor we were considering the more distant views beyond the immediate river bank area. Our investigations have shown that a vista composed of a glimpse of far off landscape forms (mountains) together with more dramatic, localised landforms tends to be more highly regarded than a vista composed entirely of river bank scenery. Dramatic gorges and ravines, because of the tendency to draw the eye upwards to towering cliffs, are also highly regarded.

We measured vista from the river bed, so that a glimpse of far-off places was rare except in the South Island where snow-capped mountains standing proud above the bush tended to score highly.

(d) Wilderness or naturalness

In considering this factor we are not simply measuring the distance from the nearest pocket of 'civilisation', but rather, how 'non-urban' the area feels. Given the assumption that a prime motive for outdoor recreation is to escape from the problems and habitat of urban living, we tended to rank high an environment that represents unspoilt, natural landscape. Wilderness, or naturalness, therefore, was measured according to how it appeared from the river. In some cases, such as in the Buller Gorge, or on the lower Wanganui, there is a major road along the river bank, but in both cases a margin of bush or scrub tends to screen the road off so effectively that we were quite unaware of it.

(e) Water quality

Water quality is not of great importance to scenic enjoyment until the pollution becomes so bad that the smell is oppressive, or the sight of rubbish becomes distracting. Pollution is a 'fixable' aspect of scenery, and as such we have not allowed it to greatly affect our rankings. Any attractive vista that contains pollution would be recommended for a clean-up. Impressively pure and sparkling clear water did tend to affect the overall aesthetic appreciation of an area while silt-laden sections of many of the North Island's rural streams tended to rank lower.

(f) Water movement

The existence of white water, rapids, or waterfalls tends to enhance any river landscape. However, one cannot measure the contribution of water movement to landscape aesthetics simply on a scale of water speed or degree of white water. Patterns of gently swirling water are often more visually interesting than the heaving turmoil of bigger rapids. Specific waterfalls are a spectacle in themselves so we tended to ignore such highly localised events, but multiple cascades of rapids do contribute to the overall scenic value of a section of river and have to be considered.

(g) Utilities and misfits

Scenic qualities are degraded if man-made objects impose themselves upon an otherwise natural landscape. Some buildings, road structures, and bridges certainly do add to the wonderment of some scenes – viaducts, man-made rock walls as found near Whangarei and in the Clutha, and historic sites add to, rather than detract from, a vista. Some natural phenomena, such as erosion scars and willows, in an otherwise natural bush area can be considered as misfits and they alter scenic value accordingly.

(h) Wildlife

Wildlife can add to, or detract from, scenic values. Sandflies and other insects can completely ruin an enjoyable vista and there is no doubt that our memories of Lake Hochstetter will be forever dominated by the swarms of wasps that chased us out of the area. Nesting sea birds on the lower Clarence River and heavy populations of ducks, pigs, and deer do significantly add to a landscape, and we feel that quietly grazing cattle do add to rural landscapes and must be considered as contributing to scenic value.

VI. Ranking recreational potential

1 RECREATIONAL VALUE-MEASUREMENT

As outlined in Chapter IV we isolated a number of factors which we believed to be pertinent in measuring recreational value, or recreational potential. Briefly, these were

- Suitability of use for each recreational group.
- Access.
- Problems and obstructions to use.
- Proximity to demand.
- Skill, or challenge factor.
- Scenic value.

The problem of actually measuring recreational value, even after breaking down recreational value into these factors, was immense. What we could have done was to allocate a number of points to each of the six factors, and then rank each river according to its allocated points.

For instance, scenic - 20 points; skill - 15 points; proximity - 10 points; problems - 15; access - 20; and suitability - 20 points: TOTAL - 100 points. Then when investigating any particular river we might have ranked it - 15 for scenic value; skill - 5; proximity - 2 (because of its isolation); problems - 15 (because there were none); and access - 10, and hence have come up with a total recreational value of 47 out of a possible 100.

Once we had so ranked a number of rivers we would then be able to compare their scores and come up with an idea of relative values. However, we found that it is quite impossible to achieve a formula that will give reliable results on this basis.

Firstly, we could not find a satisfactory formula for ranking the importance of, say, scenic value with skill. In some cases, ease of access is a major factor in attracting recreation while in other cases the fact that access is difficult is a reason why people are attracted to the area. Also, we found that people in Northland preferred not to travel great distances for their recreation while people in Canterbury regarded travelling 100 kilometres as quite acceptable to get to a good river. Unless we had fluctuating standards of measurement, we found it would be impossible to compare a river in one area with a river in another on this basis.

We did attempt to come up with a formula. We used two rivers in Taranaki as a pilot scheme. We chose the Waiwhakaiho and Waitara Rivers because of their importance to canoeists and also because they had a similar skill/challenge factor. The similarity of skill factor was important initially as we soon discovered that it was this factor that was the most awkward of all to cope with. We wanted a simple formula excluding skill, as a base. We then tried to adapt it to allow for the complex nature of the attraction of challenge as a motive for recreation. We had discovered that one cannot simply say that if a river has a high skill factor it will be more desirable than a similar river of low skill factor. Nevertheless, we interviewed a number of canoeists who used both rivers, in order to discover why they preferred to use one river rather than the other. We arrived at a formula which seemed to reflect the value of the two rivers as borne out by usage numbers and according to the degree of enthusiasm expressed by the canoeists for these two rivers. Briefly, we found that where skill factor was highest then the factor of scenery was less important and acted as a bonus in that, all other factors being equal, scenery was considered to be irrelevant to actual enjoyment although it was appreciated in the less exciting sections. We also discovered that access and proximity was of major importance to actual usage numbers but not to degree of appreciation of the experience. Suitability for each recreational group was really dependent on the size of the river.

We then applied our formula to the Mangakahia (upper section) in Northland, which is a river similar in size and skill factor to the Waiwhakaiho and with very bouldery rapids like the Waitara River. We discovered that our formula did not reflect user numbers at all and that this was largely because of local attitudes to recreation. Northlanders tended to be spoilt by the relative ease of splendid harbour recreation whilst Taranaki people had no such facilities. On the other hand Taranaki people had the Egmont National Park.

We came to the conclusion that the reasons why people sought recreation on rivers differed from region to region and this affected the relative importance of our factors. Hence any attempt to arrive at a set formula that would work from one end of the country to the other, was hopeless.

It appears that each river is a unique entity that cannot be compared to any other on exactly the same formula of comparison. Each river is of local, national, and in some cases international importance. The Mount Cook National Park, for instance, seems to receive something like 80% of its visitors from overseas while the Abel Tasman National Park receives 80% of its visitors from New Zealand residents (our own calculation, not based on official statistics) and it would seem to us that similar variation of user patterns exists on most rivers.

The sort of problems encountered with any proposed formula based on the assumptions above meant that we needed some other method of measuring recreational value if we were to conduct a survey of all rivers within a relatively short period of time. Bearing in mind that our aim was merely to locate the more valuable rivers so that more detailed investigation could be carried out later, we decided that actual user numbers would serve as an adequate guide to relative importance in the first instance, no matter that the reasons why people sought recreation differed from region to region.

Our reluctance to use actual user numbers initially was for two reasons:

- Firstly, there were no statistics on actual user numbers. Our first investigations tended to show that almost all attempts to discover user numbers were hopelessly inadequate and under-estimated the numbers of people actually using the river.
- User numbers is not the complete answer to recreational value as user enjoyment must also be taken into consideration.

If it were possible to actually count the number of people using all rivers over a period of one year and also to measure their level of enjoyment, then it would be a relatively simple matter of ranking rivers in order of recreational value. But what tremendous obstacles such a proposition would pose.

In practice, we took each river or river section in turn and observed what recreational activities took place. We then talked to individuals who used the river and estimated each recreational activity on the following scale according to user numbers.

1. **Valueless** — not usable ever.
2. **Mediocre** — possible to be used but seldom used and considered of no particular value. Not used because of the presence of better facilities elsewhere.
3. **Average** — often used and containing a variety of recreational experiences. We would expect to find somebody on such a river on any given fine weekend.
4. **Popular** — often used and sought out in the local area (within a radius of some 150 km).
5. **Extreme** — high usage with people seeking recreation from outside the local area, a river of national importance.

We repeat that it was quite impossible to further subdivide beyond a 5-point ranking scale; our measurement was based upon **apparent** usage numbers as we had neither the time nor resources to make accurate or detailed user number counts. We intended to use this ranking as a **guide** to recreational value on the assumption that those resources of greatest value would receive the highest participant loading. We were not particularly concerned with the lack of detail as we were only to use this as a basis for further investigations and as an indicator of areas of particular value.

In some instances we were surprised at the high level of informal recreation going on in our rivers. that is to say, on some rivers there were vast numbers of people who generally picnicked (this is about the only way of describing the activity - messing about on the banks, skipping stones and such) and also rafted on all manner of floating devices. They were often not apparent until we were actually floating down the river itself. Seldom were such users represented by clubs or other organisations.

Having ranked each recreational group after initial field study, we then investigated factors that might inhibit usage. These were access, obstacles, proximity to demand, and the skill/challenge factor.

(a) Access

This was the major inhibiting factor. For canoeists and rafters this was a major deciding factor upon whether or not a river was used, although, if a river was of particular value (that is, if, for example, it had high quality white water in an area where white water was rare, such as in Northland) most access obstacles would be overcome one way or another. In the Tararua Ranges numerous people raft the Waiohine, Ruamahunga, and Otaki by using helicopters to drop equipment - this is in an area with high population and with the presence of helicopter equipment to provide the service.

On the other hand, lack of access also meant that user numbers might be kept down and this might make the area more attractive to others who seek wilderness-type activities. We had to look at each river independently and try to assess the effect upon user numbers if access were not a problem and so adjust our ranking accordingly - we were interested in recreation potential rather than actual recreational use.

(b) Obstacles

In numerous cases the reason why a river may not be used might be because of some obstacles other than mere access difficulties. If the obstacle was removable or temporary (such as polluted water, mild willow infestation, rubbish, or dangerous bridge piles cut off at water level) we treated the problem in the same manner as access, that is, we re-ranked the river on the basis of the obstacle not being present. However, non-removable obstacles (dams, or legal restrictions such as a catchment being restricted for water supply collection, e.g. the Hutt River catchment) were regarded as part of the river and we would not be so willing to adjust our potential user numbers.

(c) Proximity to demand

This was obviously an important factor as a river closer to a population centre would, all other variables being equal, receive a higher usage. Consequently, if a river further from a population centre was used to a greater degree than one closer to a city, this would indicate a greater recreational value for the further river and we were obliged to find out why. In these days with oil resources becoming scarce, proximity to demand is becoming an important consideration.

In Nelson, we have two similar rivers - the Wairoa and the Baton. The Wairoa receives heavy use while the Baton is not often used, solely because of the Wairoa's proximity to Nelson. We were, however, reluctant to allow proximity to become too dominant in allocating increased ranking at the level of measuring recreational value. We felt that once we had arrived at a recreational value and come to choose suitable rivers to protect for recreational use, then at that stage proximity should be a deciding factor in opting for one river or another of similar type. (Refer to Chapter XII).

(d) Skill/challenge factor

This factor was a most difficult one to integrate with the others in arriving at a recreation value and it cannot be related to user numbers as a guide to recreational value. It is, like scenic factors, more related to the quality of the recreational experience. It is a relatively simple matter to measure the degree of challenge one river might offer in comparison to another. We rated this on a 1 to 6 scale according to the International Grading System used by canoeists.

We then had to examine the user numbers to see if these were a reflection of skill factor. For instance, the Wairua River near Whangarei has considerable use. Much of this use by canoeists is due to the presence of white water; remove the white water and the river would not be used to any greater degree than other rivers in the area. Skill factor appeared to be an attraction on every river, increasing the river's value as the difficulty increased up to the canoeist's grade 3 level, and then sharply decreasing in value when the skill requirements exceeded this level.

However, a river considered of national importance and attracting even overseas recreationalists was often considered valuable merely because the skill factor was greater than a grade 3 rating. It would seem that experienced river recreationalists are attracted from all over the country to a river of grade 4 level (such as the upper Rangitikei). However, we felt that such a skill factor was restricting the bulk of river recreationalists and we could not allow for the presence of grade 4 water distorting our values. On the other hand, if we excluded these rivers we would have ended up promoting lesser rivers at the expense of valued rivers offering skilled water. A river such as the Wanganui is attractive because it has a low skill factor and is able to be used by a full range of recreationalists including families and tourists. Of course, the absence of skill demand on the Wanganui is compensated for by a high scenic factor.

Consequently, no set formula could be found for measuring the skill factor element in overall recreational value. We could only look as objectively as possible at each river and assess the importance of skill in the overall picture of recreational value.

(e) Limitations of usage numbers in the ranking of rivers

We felt that it was most important that rivers should not be treated in isolation. In most cases the user numbers of a river reflect the presence or absence of better rivers in the local area. If we had used a numerical point-score method as we had initially investigated we might have found that (and indeed we had this very problem with the Mangakahia River as cited above) we had two rivers of equal numerical ranking and yet user numbers would not reflect an equal value. Such a discrepancy might be due to a greater-valued river very close to one of these rivers which would tend to overshadow the valued, but unused, river nearby. It was important that we first located, for each recreational group, the most valued river in each area and that we investigated why they should be so valued.

A river such as the Waioeka River receives a moderate amount of use mainly because the large population areas of the Bay of Plenty and Gisborne are adequately catered for by equally good rivers and, consequently, there needs to be special factors to justify travelling to the Waioeka. Such a river as the Waioeka might be a prime candidate for recreationalists on long weekends or annual holidays, but this is not the case because of the attraction of the Motu River. However, if the Waioeka River were to exist in Northland, Taranaki, Wairarapa, or even in South Canterbury, it would be regarded as a river of exceptional value and would be used to a far greater degree than it is at present, located where it is.

Consequently, we could not use a standard, or fixed, ranking checklist throughout the whole country; otherwise we would have found great discrepancies with our rankings, and the opinions and usage of the rivers by the recreationalists themselves. For instance, we had to allow for, and explain why, the Wairoa (Hunua) River in South Auckland receives such high usage while the Waioeka is left very much alone. Also why

a seemingly valueless creek such as the Rangitopuni Stream receives a good deal of use when better rivers in other areas are neglected.

Thus we had to allow for some degree of fluctuation in our standards depending upon the overall average standard of rivers in each area. We tried to locate a river characteristic of rivers in each area and to use this as a standard, or norm, for all rivers in the area. In fact, we found that our standard rivers did not alter as much as we at first expected and that the regions of greatest deviation were Westland and East Cape (both having their standard river above other areas,) and Wairarapa and Marlborough (having a standard river below the norm for other areas, due to dry water levels making most rivers unusable for much of the year).

We had interviewed a number of recreational groups and discovered that most were prepared to travel up to 150 km to a river of particular value. In Northland, this distance was much less, in Canterbury and Otago the distance was much higher. Nelson people would often travel to the Buller and seldom beyond there. We also found that jet boaters, because they require a river of greater size, tended to be prepared to travel even greater distances; this was also because they have a greater investment in their recreational equipment and were consequently prepared to spend more in using that equipment.

Canoeists were more cost conscious and rafters even more so. However, the standard seemed to be 150 km and we used this as a rough guide in determining area boundaries in the comparison of rivers. In fact, we found geographical barriers more important than actual distance travelled; hence we tended to look at Northland, the Waikato Valley, Hauraki, etc., as units, rather than a mere 150 km radius circle, when looking at local areas.

Having ranked each river on user numbers and then adjusted it according to the above factors, we then placed the river or river section on the following scale of recreational value:

Low
Intermediate
High
Exceptional

Generally, a Low recreational value reflects a valueless and mediocre rating on user numbers. An Intermediate value reflects an average ranking, a High value reflects a popular ranking, and Exceptional reflects an extreme ranking.

It will be noticed that our Intermediate/average value holds a lower than central position on our scale. We were interested mainly in the upper end of the scale and were more interested in a finer division at this end, rather than bothering with a detailed investigation of essentially little-used and little-liked resources.

2 SCENIC VALUE - MEASUREMENT

As with Recreational Value measurement, Scenic Value was also difficult to measure, to give a value to each of the factors that we had isolated as being relevant in making up a scenic vista. These factors (refer to Chapter V) are:

Vegetation
Geological makeup
Vista
Wilderness or naturalness
Water quality
Water movement
Utilities
Wildlife

The fact that river scenery is considered by most people to be of a high value is borne out by the fact that many of our popular highways follow rivers - Waioeka Gorge, lower Buller Gorge, Haast Pass Highway.

We felt that vegetation tended to be the most dominant factor. When initiating the paper work for the survey, we studied postcards and calendar pictures for an idea of what was generally felt to be a scenic vista. A number of things became apparent from this - the majority of pictures depicted scenes that could be seen from main roads or from easily accessible points. To a river recreationalist floating down a river, this is not a particularly relevant view of the vista. Also, the preponderance of pictures taken from accessible sites tended to mean there were more tranquil scenes depicted than there were pictures of gorges, cliffs, rapids, and such-like. Most views also contained a full range of vista from colourful foreground to a glimpse of far-off mountains. Colour (especially autumn colours) was an important part of vegetation.

What we wanted to measure was the aesthetic judgement of the average river recreationalist and the three factors that were important in measuring vegetation were: volume, variety, and virginity (see Chapter V).

Along with vegetation, we considered that vista and naturalness were the most important factors of scenery. Geological makeup was less important to a river recreationalist except that the geography of the country decided the type of river that was created. Water quality was not overly important unless the river was so badly polluted that people would not use the river. Utilities and misfits did affect the Scenic Value but did not prevent people from using the river. Wildlife was a factor, as was water movement, but these latter five factors were of minor importance compared to vegetation, vista and naturalness for Scenic Value measurement.

Despite this minor division between vegetation, vista and naturalness, we could not agree that any one factor was much more important than any other, so we could not agree on any set formula of ranking the various components that would give us a definite guide to Scenic Value. We are of the opinion that aesthetics depend upon the harmonious blending and integration of all the various factors into a single scenic unit, as much as upon the high incidence of the various valued components.

In some cases the presence of a single misfit could spoil the scenic vista. For instance, the lower Crooked River (Westland) was reasonably attractive with a quiet and tranquil rural outlook, some willows, but with a generous sprinkling of native timber including white pine. The presence of rusting railway wagons dumped into the river tended to spoil the whole atmosphere. On the other hand, the rusting remains of mining equipment on another Westland river tended to enhance the area with an aura of history. What was an obtrusive misfit of rubbish in one area could enhance a scene with history in another area. Gorse and broom in Canterbury can add a splash of brilliant yellow colouring that blends in with the dry tussock colourings and the deep greens that go to make up a scenic vista, and yet the very same vegetation in other areas may be a source of irritation.

We kept a checklist of all the relevant scenic components (see Chapter VIII and Checklist 3) and on the basis of that checklist and after examination of our own personal reactions we ranked each river, or river section, on a six-point scale:

Dull
Uninspiring
Moderate
Picturesque
Impressive
Exceptional

Upon completion of the field work for each region we examined the colour photographs taken so that we could compare each river, or river section, with others in the region; and in some cases made minor adjustments as we felt them justified.

By using only a six-point scale there needed to be quite drastic changes to cause an adjustment from one category to the other. We did feel that short sections of very impressive scenery often tended to overpower even extensive lengths of uninspiring scenery. For instance, a short section of the Avon River flows through the Botanic Gardens of Christchurch and this tends to give the river a higher ranking than one would have expected when comparing the length which flows through untidy and muddy areas in the lower river.

In many cases we allowed short impressive sections to dominate more extensive dull areas as we are of the opinion that aesthetics cannot be measured on a quantity basis. That is to say, a river with 100 km of picturesque scenery should not be

considered of greater value than a river of moderate value but with 10 km of exceptional value, where the exceptional section tends to linger in the memory. We felt that what one remembers of a scene is as important as what is actually perceived, when measuring aesthetic values. People tend to remember the good parts of trips, be they of scenery, tramping, canoeing or whatever.

As with recreational values, we found that it was necessary to adjust our standards of comparison from region to region. A scenic river in Westland had to be particularly scenic to deserve an exceptional ranking as most rivers there are, on a national basis, very attractive. On the other hand, we felt that, generally, the Waikato region had little impressive scenery and it took less to justify an impressive ranking here than it did in Westland. However, the variation in standard throughout the country was not as great as we had first expected it to be, and our rankings are valid in comparing a river in Westland with a river in the Waikato.

3 CO-ORDINATION OF RECREATIONAL AND SCENIC VALUES

The appropriate value for each river, or river section on the six-point Scenic Value scale, and on the four-point Recreational Value scale, has been given in this report in Part II (North Island Rivers) and in Part III (South Island Rivers). Having arrived at a value for each of these two variables it was necessary to combine them so that we could rank all of the nation's rivers in some order and pinpoint those rivers of particular interest. The basic measurements that go to make up our two values are in many ways indisputable. We have ranked two values into a small number of categories; if we had used, for instance, a 100 point scale for recreation, rather than a four point ranking, then there may have been some dispute as to whether a particular river section was worth a ranking of, say, 23 or of 25. However, as we are dealing with only four rankings or categories, it is usually quite clear as to which ranking or category any particular river belongs. Most problems come with a finer splitting of ranking order.

Most argument is centred on the problem that arises when you come to combine the two variables to arrive at a final ranking for each river, or river section. To give an example: some people may feel that recreational values must have a greater value than purely scenic values. Other people perhaps with a conservationist background rather than a recreational background, may feel that scenic values should take precedence. We have maintained a separation of scenic and recreational values up until this stage so that, should our rankings be needed for another purpose, requiring a shift of emphasis from, for example, recreational value to scenic values, then our rankings may be rearranged to suit. Nevertheless, it appears that even with some re-emphasis of ranking values, those rivers that we have identified as being in the highest value categories will remain so.

Obviously, any river that has an exceptional ranking for both recreation and scenic values should head the list. However, at the next level, does a river with an exceptional recreational value and impressive scenic value have a greater worth than a river with a high recreational value and an exceptional scenic value? As you go down the list dividing rivers up in this way according to their combination of scenic and recreational values, the problem becomes considerably more complex.

Remembering the initial aims in undertaking this survey, namely to locate for further study those rivers of prime importance for recreation, we concluded that we should only bother with those rivers at the upper end of the scale. Further, because the survey was essentially a recreational survey, conducted to locate rivers of **recreational value** rather than scenic value, we built in a recreation-preferred bias when it became necessary to have a bias one way or the other. Consequently, we divided our more impressive rivers into four categories - A, B, C, and D, on the following basis:—

Category A to consist of all those rivers with:
Exceptional recreational value & Exceptional scenic value.

Category B to consist of all those rivers with:
Exceptional recreational value & Impressive scenic value
High recreational value & Exceptional scenic value.

Category C to consist of all those rivers with:
Exceptional recreational value & Picturesque scenic value
High recreational value & Impressive scenic value
High recreational value & Picturesque scenic value
Exceptional recreational value & Moderate scenic value.

Category D to consist of all those rivers with:
High recreational value & Moderate scenic value
Intermediate recreational value & Exceptional scenic value
Intermediate recreational value & Impressive scenic value
Intermediate recreational value & Picturesque scenic value.

As can be seen, this categorisation is recreation-preferred. Any reader who wishes to dispute the emphasis on recreation over that of scenic values in our categorisation, or who wishes to locate rivers on a scenic-preferred basis, may analyse our rivers for himself as the appropriate recreational and scenic values for each river are given in Parts II and III. In dividing rivers up beyond Category D the combinations become more numerous and consequently, the list of rivers becomes longer. As we were only really interested in the upper 10% of our rivers, we felt justified in not going beyond this level of analysis. Those rivers that lie within these four categories are given later (Chapter VII).

We were also interested in locating those rivers of purely recreational significance, irrespective of scenic values. (We have listed in Exceptional and High ranked rivers for recreational values in Chapter VII).

4 A NOTE ON SUBJECTIVITY

A major criticism of the methods used in arriving at recreational and scenic values concerned the degree of subjectivity involved. It is true that because we failed to come up with some purely mathematical or numerical method of allocating a score to each factor of scenic or recreational value, we have introduced a degree of subjectivity into our measurement procedure. We feel that it is tremendously difficult to remove all elements of subjectivity or personal bias and preference when dealing with aesthetics and essential enjoyment levels which is what recreation is all about. If there were some method of objectively measuring a degree of satisfaction, enjoyment, or feeling of accomplishment whilst recreation is taking place, then it could be possible to arrive at a method of eliminating subjectivity. Enjoyment is a conditioned response depending upon previous experience and in this sense subjectivity cannot be completely eliminated. Even if it were, we feel that the problem of giving one factor more weight than another, when adding factor results to give a total recreational or scenic score, is a difficult one and subjectivity again enters the arena.

We are of the opinion that we, the authors, could be considered to be fairly 'normal' recreationalists and would react to any given recreational experience in the same manner as the vast majority of other New Zealand river recreationalists. This survey was aimed at locating those areas of importance **according to the recreationalists** themselves, not to locate areas of importance for recreation according to administrators or any other group. Consequently, we feel that any bias displayed by ourselves is also the bias that would be displayed by any other normal canoeist, jet boater, or rafter.

Subjectivity is not a great problem in dealing with a comparative study of this type. What we aimed to do was locate rivers of prime importance. This involves a comparison of one river with another and as such consistency is of greater importance than subjectivity. Because the whole of the country was surveyed by the same team a great deal of consistency was automatically ensured. Any bias displayed by the survey team has been applied systematically throughout the entire country, and because of this we feel that little concern need be taken concerning the issue of subjectivity. Consistency is an appropriate antidote for subjectivity in this instance

VII. Results

ANALYSIS OF RIVER SUMMARIES

For explanation of categories, see Chapter VI.3

Category A

NORTH ISLAND:

Wanganui River — from Retaruke River confluence to Pipiriki (46.3).

Motu River — from Motu Falls to Mangatutara (103.2, 103.3).

SOUTH ISLAND:

Grey River — from the Gentle Annie Gorge to Ikamatua (23.2).

Ahaura River — the gorge (23.3.5).

Shotover River — the central length (107.3.2.).

Clarence River — Sawtooth Gorge (154.6).

Category B

NORTH ISLAND:

Motu River — from Mangatutara to the sea (103.4).

Rangitikei River — from the Napier-Taihape Road to Pukeokahu and from Tarata to Mangaweka (49.2, 49.4, 49.5). Also its tributary, the

Moawhango River — from Moawhango to its confluence with the Rangitikei (49.4.2, 49.4.3).

Mangahao River — in the Tararuas (50.2.4).

Ngaruroro River — gorge (77.2).

Ruakituri River — gorge (84.6).

Whakatane River — upper section through the Urewera National Park (109.1).

SOUTH ISLAND:

Pelorus River — upper section to Pelorus Bridge (164.1).

Buller River — from Murchison to Newton Flat (14.4) and including its tributary, the

Maruia River — from its confluence with the Warwick Stream to the Buller (14.4.4, 14.4.5).

Haupiri River — (23.3.6),

Lady Lake Creek — (23.3.9).

Clarence River — from the Acheron River confluence to the sea, excepting a short middle section (154.2, 154.5, 154.7).

Ashley River — the gorge (142.2).

Waimakariri River — the gorge (141.3).

Hall River — (48.2).

Waiatoto River — (56.0).

Arawata River — (57.0).

Hollyford River — Lower section (62.2).

Wairaurahiri River — (92.0).

Category C

NORTH ISLAND:

Waipapa River — from Puketi Forest to Waihou confluence (4.1).

Waipoua River — (7.0).

Wairua River — from below Wairua Falls (8.5.4).

Waikato River — below Aratiatia Rapids (Fulljames) and from Karapiro to Hamilton (12.2, 12.9).

Awakino River — upper section to Mahoenui (26.1).

Mokau River — Totoro Gorge and down to tidal area (27.2, 27.3).

Waiwhakaiho River — (34.0).

Patea River — Tangahoe to Patea (43.4).

Wanganui River — Taumarunui to Retaruke, and Pipiriki to Wanganui (46.2, 46.4).

Rangitikei River — above the Napier-Taihape Road, and from Pukeokahu to Tarata (49.1, 49.3).

Manawatu River — the gorge (50.3).

Otaki River — the gorge (53.1).

Waiohine River — in vicinity of Wall's Whare (61.3.2).

Ngaruroro River — upper catchment (77.1).

Mohaka River — Pungahuru to Willow Flat (82.2, 82.3).

Raukokore River — (100.0).

Waioeka River — upper section (107.1).

Waimana River — in National Park area (109.2.1).

Rangataiki River — Aniwhenua Falls to Matahina Dam (110.6).

Tarawera River — upper section to Kawerau (111.0).

Wairoa River — (115.2).

Kauaeranga River — (133.0).

Ohinemuri River — gorge (134.1).

Hatea River — below the Falls (142.0).

Kerikeri River — (144.0).

SOUTH ISLAND:

Buller River — from Gowan River confluence to Murchison and from Newton Flat to Lyell (14.2, 14.3, 14.5). Also the tributary of the Buller, the

Gowan River — (14.2.1).

Ahaura River — Upper Tributaries — (23.3.4).

The Upper Crooked River — (23.3.8).

La Fontaine Stream and Ianthe Creek — (33.1).

Upper Whataroa and Perth Rivers — (35.1).

Okarito River — to the lagoon (37.0).

Fox River — (41.2).

Upper Karangarua River — (43.1).

Landsborough River — (52.2.3).

Clarke River — (52.2.4).

Jackson River — (57.2).

Waiau River — Te Anau to Manapouri (94.2) and its tributary, the upper section (94.4.1).

Mararoa River — (104.0).

Tahakopa River — from Lake Wanaka to Low Burn, the Cromwell Gap, and Cromwell to Alexandra (107.2, 107.3, 107.4,) also its tributary streams,

Clutha River — (107.1.1) and its tributary, the

Makarora River — (107.1.4).

Wilkin River — upper section (107.1.5).

Matukituki River — from Hindon to Outram (110.4).

Taieri River — the section in the Mount Cook National Park (122.2).

Hooker River — (124.0).

Ahuriri River — the gorge and the river immediately below the gorge (132.2, 132.3).

Rangitata River — the gorge (135.2) and its tributary, (135.1.4).

Rakaia River — in particular, the section through Hagley Park (140.0).

Lake Stream —

Avon River —

Waimakariri River	from Woodstock to the motorway (141.4), and its feeder, the
Groynes Stream	(141.5.4).
Okuku River	(142.3.2).
Boyle River	(148.2.2).
Clarence River	the central section and gorge (154.3, 154.4).
Waihopai River	in particular, the gorge below the powerhouse (162.2.5).
Wairoa River	(Nelson) (168.2).
Lee River	(168.3).
Motueka River	lower length (170.3) and its tributaries,
Wangapeka River	(170.2.2),
Baton River	(170.2.3).
Upper Takaka River	(173.1).
Aorere River	the gorges (174.1).

Category D

NORTH ISLAND:

Waima River	the gorge (8.1.1).
Mangakahia River	upper and middle section to the main road (8.4.1, 8.4.3) and its tributary, the
Waiokumurau Stream	(8.4.2).
Hoteo River	river mouth area (10.1).
Waikato River	Atiamuri Dam to Whakamaru (12.4).
Waitetuna River	(19.0).
Awakino River	the gorge (26.2).
Mangaotaki River	(27.2.2).
Waitara River	upper section to Purangi and from Tarata to Bertrand Road (33.1, 33.3), also its tributary, the
Manganui River	(33.3.1).
Patea River	Mangamingi to Tangahoe (43.3).
Retaruke River	(46.3.5).
Manganui-A-Te-Ao	(46.3.4).
Whangaehu River	Tokiahuru Stream to Collier's Bridge, and from Aranui to the sea (47.2, 47.4).
Rangitikei River	Mangaweka to Vinegar Hill (49.6) and its tributary,
Kawatau River	(49.5.3).
Hutt River	the gorge (56.1).
Ruamahanga River	Mt Bruce to Masterton (61.2).
Tukituki River	(76.0) and its tributary, the
Waipawa River	(76.2).
Mohaka River	Willow Flat to the sea (82.4).
Waikare-Taheke River	(84.2).
Mata River	(95.1).
Waioeka River	middle section (107.2) and its tributary, the
Koranga River	(107.1.1).
Mangorewa River	(113.2.1).
Tairua River	(122.0).
Waitawheta Stream	(134.1.2).
Wairoa River	Falls to tourist road bridge (138.2).
Waitangi River	(143.0).
Tongariro River	above Tree Trunk Gorge and to the Prison Farm (151.1, 151.2).

SOUTH ISLAND:

Karamea River	(9.0).
Little Wanganui River	(10.0).
Buller River	from Lake Rotoiti to the Gowan confluence and from Lyell to Westport (14.1, 14.6), and also its tributaries, the
Mangles River	(14.3.1),
Matakitaki River	(14.4.1),
Maruia River	upper section to Warwick River (14.4.3),
Inangahua River	inland of Reefton (14.6.1).
Grey River	upper section (23.1), and its tributaries,
Lake Brunner	(23.3.9),
Arnold River	(23.3.11).
Kokatahi River	(28.2.1).
Poerua River	(34.0).
Lake Mapourika	(38.0).
Copland River	(43.2).
Paringa River	(48.0).
Ellery Lake and Creek	(57.2.1).
Hollyford River	upper section (62.1) and its tributary
Pyke River	(62.2.1).
Waiau River	from Manapouri to Mararoa and from Monowai to Clifden (94.4, 94.6), also tributaries
Eglinton River	(94.1.1),
Hankinson River	(94.1.5).
Mataura River	gorge between Athol and Tomogalak (98.2).
Clutha River	from Roxburgh to Balclutha (107.6, 107.7), also its tributaries
Hunter River	(107.2.1),
Lindis River	(107.2.6),
Kawerau River	(107.3.1),
Pomahaka River	Conical Hill to Clydevale (107.7.5).
Taieri River	from Sutton to Hindon (110.3).
Waitaki River	lower river (120.2) and its feeder, the
Tasman River	(122.1).
Hae Hae Te Moana River	(130.2).
Orari River	the gorge (131.1).
Rangitata River	upper river valley (132.1).
Ashburton River	(134.0).
Rakaia River	upper river (135.1).
Waimakariri River	upper river (141.1) and its tributaries
Kowai River	(141.4.1),
Kaiapoi River	(141.5.3).
Hurunui River	entire river down to Three Peaks and the Lowry Peaks Gorge (146.1, 146.2, 146.3, 146.5).
Waiau River	upper river and the lower river (148.1, 148.5).
Clarence River	upper river (154.1).
Awatere River	the gorges (161.2).
Wairau River	upper section and lower section (162.1, 162.3).
Rai River	lower river (164.2.1).
Wakamarina River	(164.2.2).
Motueka River	middle section (170.2).
Waikoropupu Stream	(173.2.3).
Aorere River	lower river (174.2).

ANALYSIS OF SURVEY DATA SHEETS

Recreational Values only

For explanation of Scale, see Chapter VI.1

Exceptional

NORTH ISLAND:

Waikato River	Fulljames Rapid (12.2).
Waiwhakaiho River	(34.0).
Wanganui River	Taumarunui to Pipiriki (46.2, 46.3).
Rangitikei River	Napier-Taihape Road to Pukeokahu, and from Omatane to Mangaweka (49.2, 49.5).
Manawatu River	gorge (50.3).
Ngaruroro River	gorge (77.2).
Motu River	from Motu Falls to sea (103.2, 103.3, 103.4).
Rangitaiki River	Wheao confluence to Murupara (110.3).
Wairoa River	(115.2).

SOUTH ISLAND:

Buller River	Murchison to Newton Flat (14.4).
Middle Grey	gorges (23.2).
Ahaura River	gorge (23.3.5).
Clutha River	Cromwell Gap (107.3).
Shotover River	(107.3.2).
Rangitata River	middle reaches (132.3).
Avon River	(140.0).
Waimakariri River	gorge to motorway (141.3, 141.4).
Ashley River	gorge (142.2).
Clarence River	from the Acheron to the sea (154.2, 154.5, 154.6, 154.7).
Wairoa River	(168.2).
Lee River	(168.3).

High

NORTH ISLAND:

Waipapa River	upper section (4.1).
Waipoua River	(7.0).
Mangakahia River	down to Twin Bridges (8.4.1, 8.4.3).
Waiokumurau Stream	(8.4.2).
Wairua River	from the 'rapids' to the falls (8.5.4).
Waikato River	Arapuni to Hamilton (12.8, 12.9).
Awakino River	to Mahoenui (26.1).
Mokau River	Totoro Gorge to sea (27.2, 27.3).
Waitara River	Tarata to Bertrand Road (33.3).
Manganui River	(33.3.1).
Patea River	Tangahoe to Patea (43.4).
Wanganui River	Pipiriki to Wanganui (46.4).
Whangaehu River	Tokiahuru Stream to Collier's Bridge (47.2).
Moawhango River	(49.4.2, 49.4.3).
Rangitikei River	(49.1, 49.3, 49.4, 49.6, 49.7).
Mangahao River	in the Tararuas (50.2.4).
Mangaore Stream	(50.5.5).
Otaki River	gorge (53.1).
Ruamahanga River	Mt Bruce to Masterton (61.2).
Waiohine River	(61.3.2).
Ngaruroro River	upper catchment (77.1).
Mohaka River	from Pungahuru to sea (82.2, 82.3, 82.4).
Waikare-Taheke River	(84.2).
Ruakituri River	gorge (84.6).
Mata River	(95.1).
Raukokore River	(100.0).
Upper Waioeka River	(107.1).
Whakatane River	(109.0).
Waimana River	(109.2.1).
Whirinaki River	(110.4.1).
Rangitaiki River	Aniwhenua to Matahina (110.6).
Tarawera River	above Kawerau (111.0).
Kauaeranga River	(133.0).
Ohinemuri River	gorge (134.1).
Wairoa River	falls to tourist road bridge (138.2).
Hatea River	(142.0).
Waitangi River	(143.0).
Kerikeri River	(144.0).
Upper Tongariro River	to Prison Farm (151.1, 151.2).

SOUTH ISLAND:

Buller River	Gowan confluence to Murchison, and from Newton Flat to Lyell (14.2, 14.3, 14.5).
Gowan River	(14.2.1).
Matakitaki River	(14.4.1).
Maruia River	below the Warwick confluence (14.4.4, 14.4.5).
Ahaura River	upper tributaries (23.3.4).
Haupiri River	(23.3.6).
Crooked River	upper section (23.3.8).
Lake Brunner and Lady Lake	(23.3.9).
Arnold River	(23.3.11).
Kokatahi River	(28.2.1).
La Fontaine Stream and Ianthe Creek	(33.1).
Whataroa River	(35.0).
Okarito River	(37.0).
Fox River	(41.2).
Upper Karangarua River	(43.1).
Hall River	(48.2).
Landsborough River	(52.2.3).
Clarke River	(52.2.4).
Waiatoto River	(56.0).
Arawata River	(57.0).
Jackson River	(57.2).
Hollyford River	lower (62.2).
Wairaurahiri River	(92.0).
Waiau River	above Clifden excluding a short section below the Mararoa Dam (94.2, 94.6).
Mararoa River	middle section (94.4.2).
Tahakopa River	(104.0).
Makarora River	(107.1.1).
Wilkin River	(107.1.4).
Matukituki River	(107.1.5).
Clutha River	Wanaka to Low Burn, Cromwell to Alexandra, Beaumont to Balclutha (107.2, 107.4, 107.7).
Pomahaka River	Conical Hill to Clydevale (107.7.5).
Taieri River	Hindon to Outram (110.4).
Waitaki River	lower section (120.2).
Hooker River	(122.2).
Ohau River	(123.4).
Ahuriri River	(124.0).
Rangitata River	gorge and lower river (132.2, 132.4).
Lake Stream	(135.1.4).
Rakaia River	gorge (135.2).
Waimakariri River	Mount White to gorge (141.2).
Groynes Stream	(141.5.4).
Okuku River	(142.3.2).
Hurunui River	from Lake Sumner to Lowry Peaks Gorge (146.2, 146.3, 146.5).
Waiau River	to Leslie Hills (148.2).
Boyle River	(148.2.2).
Clarence River	middle section (154.3, 154.4).
Waihopai River	(162.2.5).
Wairau River	lower section (162.3).
Wangapeka River	(170.2.2).
Baton River	(170.2.3).
Motueka River	lower (170.3).
Upper Takaka and Cobb Rivers	(173.1).
Aorere River	gorges (174.1).

Data Collection

1 GEOGRAPHICAL BOUNDARIES

When we set out to look at every river in New Zealand (North and South Islands) we expected to spend at least 12 months in the field. This necessitated organising ourselves to ensure that we were not in any one area during its worst climatic period. The central North Island is very cold in mid-winter, the Wairarapa rivers tend to be flowing very high in winter and are very low in mid-summer, and hence we had to avoid these extreme periods. Also, Otago and Southland tend to experience the same extremes.

We began our survey field work in Northland during July and worked south, avoiding the forested areas to the east of Taupo during the summer when forestry roads would be closed to us for fire prevention reasons, and hence we went into the north of the South Island during the mid-summer period and back to the East Cape region in the following June-July. We did experience low levels in Otago, as the 1977-78 summer was a very dry one, though we encountered rain later when rivers returned to normal. We were able to observe most rivers at least twice, or at normal flow levels.

It would have been a physically exhausting proposition to simply begin in Northland and to study the rivers non-stop down to Bluff over the 18 months that it eventually took. Consequently, we divided the country into nine regions of roughly equal size and allocated some two months for each region. These regions are as follows:

Northland. All that area north of Auckland City. We subsequently subdivided this region into east and west coast areas.

Waikato-Hauraki. Those river catchments on the east coast north of Tauranga Harbour to Auckland, including the Coromandel Peninsula, and the west coast between Auckland and the Marakopa River. This region was considered under these sub-regions: Waikato catchment (includes the Waipa Valley), west coast river catchments, Hauraki Plains, Coromandel Peninsula. We omitted the Waikato tributaries flowing into Taupo from this region.

Taranaki-Wanganui. West coast rivers between the Marakopa River and the Wanganui catchment.

Wairarapa-Manawatu. All those rivers whose river mouths lie south of the Wanganui River in the west and the Wainui River in the east (north of the Akitio River).

East Cape. The rivers of the Bay of Plenty, East Cape, Gisborne and Hawke's Bay down to the Wainui River.

Nelson-Marlborough. Those rivers from the Big River on the west coast, including Farewell Spit, Tasman Bay, Golden Bay, the Sounds and down the east coast to the Conway River.

Westland. All rivers from the Big River in the north down to those rivers flowing into the northern coast of Milford Sound, including the Cleddau River catchment.

Otago-Southland. Fiordland rivers from the Arthur River and all rivers flowing onto the coast up to the Waianakura River, south of the Waitaki River mouth.

Canterbury. All rivers between the Waianakura River and the Conway River.

We found that these nine regional units were of sufficient size to provide a variety of rivers for comparison, and not so small as to distort our 'standard' or 'average' river from the other 'standard' rivers in other regions (refer to Chapter VI).

The survey team tended to work in each region, consulting all the relevant river recreational groups that used the area (in some cases such groups had their headquarters outside the region), with a short break to tidy up notes and data collected before beginning the next region. Within each region we worked on a catchment-by-catchment basis from headwater to sea and this gave us a good picture of how the river developed or changed as it grew.

2 ORDERING OF RIVERS AND RIVER SECTIONS

When faced with the problem of ordering our collected data into a form readily understood by the readers of our report, we were faced with the prospect of either lumping the data together into our nine regional divisions, in which case the mass of data tended to be very bulky and difficult to draw conclusions from, or to divide the data up into catchment groups. We decided on the latter course of action, mainly so that we could then arrange the data in an order that did not require an index system to locate any given river.

We generally followed a similar system to that used by the Soil Conservation and Rivers Control Council in giving computer numbers to each river and its tributaries. However, we were not happy with their method in that we felt that most rivers show dramatic changes in character as they flow from one region to another, from high country through gorges and onto lowlands.

These river sections were so distinct as to be almost completely different rivers in character. We saw no merit in using a system that regarded the whole of the Waikato, Clutha, Waitaki, or Buller Rivers as single units. We wished to make distinct references to particular river sections and not to complete rivers. We also felt that tributaries should not be regarded as separate rivers in themselves but because they have similarities to the river section into which they flowed, they should be regarded as subdivisions of the present river section.

Tributaries of tributaries were regarded as subsections of subsections of river sections and this is how we have organised our data. In order to distinguish our system from that of the Soil Conservation and Rivers Control Council, we worked in an anti-clockwise fashion around the coastline, giving each river mouth a number, and river sections sub-numbers. In order to find any given river it is only necessary to know the approximate point at which the river flows onto the coast. Tributaries are numbered in the order in which they flow into the parent stream, working in a downstream direction. In order to aid cross reference with the computer data held by NWASCO, the computer numbers have been given in Parts II and III.

3 DATA COLLECTION

Three distinct methods of data collection were used.

(a) Descriptive Notes

Because we were primarily interested in what a particular river contained, or what it looked like, we kept a notebook that gave a running commentary on the appearance of the river valley from headwater to sea, and detailed descriptions of rapids, obstacles, and other items of interest. We also collected, from interviews with recreationalists, comments regarding usage numbers, opinions of value, and details of how the river changed with altered flow characteristics. From these notes the brief summaries of scenic and recreational values were written and these appear in Parts II and III.

(b) Photography

To back up our descriptive notes, and also as a record of the present characteristics of the river, we took a great number of photographs - some 4300 frames of black and white film, and some 1800 frames of colour slide film. We hope to be able to investigate the more valued rivers again at a later date and a comparison with the photographs taken during this survey will assist in showing how river characteristics change. The colour slides were used to assist with the measurement of scenic value.

(c) Assessment Sheets

Much of the data we were interested in collecting was the same for each river. We did not wish to finish the field work and then discover that we had omitted to collect certain pieces of information on particular rivers. We formulated checklists so that we would collect a consistent range of data. These checklists are given at the end of this chapter and should be self-explanatory. (Technical terms used are explained in Chapter IV). We were continually surprised with the lack of technical data that has been collected on our rivers - particularly flow characteristics, flood capability, and water quality control.

It seems to us that the administration of our water resources takes place in an absence of technical data. This is particularly true of recreational patterns and recreational use. Our survey would never have been necessary had catchment boards and water and soil administrators been doing their job under their controlling Act. However, we appreciate that data collection is not cheap and that finance is limited. We had hoped to be able to investigate how usage numbers varied with the changing flow levels, but this has not been possible because in most cases there are no records of flow levels on the vast majority of those rivers that we were looking at.

It seems that flow characteristics are only known for those rivers which have been investigated for hydro-electricity potential, irrigation needs, or flood control work. In many cases, the only help catchment boards could give us was data on rainfall expectancy and with a rough estimate of water run-off rates. This was generally estimated by use of 'representative catchments'. Our fourth assessment sheet was in fact redundant before we even began because of this lack of data.

Assessment Sheet Number One was designed to back up our descriptive notes and to give details of geological and vegetation cover. It also attempted to gauge first impressions of scenic value. We filled in at least one sheet per river section, often two or three.

Assessment Sheet Number Two was designed to collect data on skill factor and to describe the nature of the river itself, as distinct from the river valley and environment. We completed one sheet for every significant rapid, to describe typical rapid characteristics, or any uniquely different rapid.

Assessment Sheet Number Three was designed to provide a scenic value. After ranking each factor on the given scales we were then able to compare rankings and arrive at a consensus or average for the river section in question. It was from this assessment sheet that scenic values were actually arrived at. The rankings given for each scenic factor were 'averaged' to provide the overall scenic ranking (refer to Chapter VI).

CHECKLIST FOR ASSESSMENT OF RECREATIONAL POTENTIAL - I

RIVER	SECTION	START FINISH
OBSERVER DATE	WEATHER	MAPS AERO-PHOTOS GROUND PHOTOS

VALLEY TYPE
- SYMMETRICAL ☐
- ASYMETRICAL ☐
- SHEER CANYON ☐
- STEEP GORGES ☐
- HILLY ☐
- UNDULATING ☐
- FLOOD PLAIN ☐

CHANNEL TYPE
- SYMMETRICAL ☐
- ASYMETRICAL ☐
- BEDROCK ☐
- SOIL ☐
- MARSH ☐
- SLOPING ☐
- TERRACED ☐
- BEACHES ☐
- DUNES ☐
- STRAIGHT ☐
- MEANDERING ☐
- BRAIDED ☐

RIVER BED
- ROCK ☐
- BOULDERS ☐
- SHINGLE ☐
- SAND ☐
- MUD & SILT ☐

MOVEMENT
- POOLS
- STILL REFLECTIONS
- CALM
- SLUGGISH
- FLOWING
- RIFFLES
- SHALLOWS
- CHUTE/LEDGE
- GRAVEYARD
- CASCADE
- FALLS
- BOILS

WATER APPEARANCE

CLARITY
- Bottom visible ☐
- Bottom not vis ☐

DUE TO: _____

FLOATING MATTER: _____

COLOUR: _____

WATER USE (POTENT.)
- SWIMMING ☐
- PACK FLOATING ☐
- LI-LO DRIFT. ☐
- TYRE RAFTS ☐
- KAYAKS ☐
- CANOES ☐
- RUBBER INFLAT. ☐
- DRIFT BOATS ☐
- JET BOATS ☐
- SCREW DRIVEN ☐

BUILT STRUCTURES
- BRIDGES ☐
- HOUSES ☐
- FARM BUILD. ☐
- TRANSM LINES ☐
- DAMS ☐
- WEIRS ☐
- FENCES ☐
- ROADS ☐
- TRACKS ☐
- OTHER: _____

HAUL-OUT SITES
- NUMBER: _____
- QUALITY: _____

CAMP SITES
- NUMBER: _____
- QUALITY: _____
- DRINKING WATER:

HISTORIC SITES

VEGETATION	PREDOM. SPECIES
NATIVE FOREST	☐
EXOTIC FOREST	☐
RIVER-BANK WILLOW	☐
UNDERSTOREY	☐
SCRUB	☐
NOXIOUS WEEDS	☐
CULTIVATED CROPS	☐
GRASSLAND	☐
EROSION	☐
AQUATIC	☐
BARE	☐

ANIMAL LIFE		PREDOM. SPECIES
LAND	ABUNDANT	☐
	OCCASIONAL	☐
	SPARSE	☐
BIRD	ABUNDANT	☐
	OCCASIONAL	☐
	SPARSE	☐
FISH	ABUNDANT	☐
	OCCASIONAL	☐
	SPARSE	☐

INSECTS _____

NATURAL STATE
- UNMODIFIED ☐
- PART MODIFIED ☐
- HIGHLY MODIF. ☐

SCENIC QUALITIES
- DRAMATIC ☐
- IMPRESSIVE ☐
- PICTURESQUE ☐
- MODERATE ☐
- UNINSPIRING ☐
- DULL ☐

SPECIAL SCENIC FEATURES & OTHER COMMENTS

CHECKLIST FOR ASSESSMENT OF RECREATIONAL POTENTIAL - II

RIVER	SECTION	RAPID NAME/NUMBER
MAP REFERENCE: NZMS 1 -		INTERNATIONAL GRADE

WATER FLOW

- LOW ☐
- NORMAL ☐
- HIGH ☐
- FRESH ☐
- FLOOD ☐

STRENGTH OF FLOW

- STILL ☐
- SLUGGISH ☐
- FLOWING ☐
- STRONG ☐
- POWERFUL ☐

RAPID TYPE

- SHALLOWS ☐
- WEIR ☐
- CHUTE ☐
- ROCKGARDEN ☐
- GRAVEYARD ☐
- FILTER ☐
- CATARACT ☐
- WATERFALL ☐

ROUTE

- CLEAR ☐
- OPEN INDIRECT ☐
- SLALOM ☐
- INTRICATE ☐
- SPLIT/DIVIDED ☐

PORTAGE

- NOT PORTAGABLE
- RIGHT BANK
- LEFT BANK
- EASY
- MODERATE
- DIFFICULT

RAPID CONTENTS

- SHALLOWS ☐
- STONE BANKS ☐
- FILTER ☐
- BOULDERS ☐
- LEDGES ☐
- BLUFFS ☐
- UNDERCUT LEDGE ☐
- TREES ☐
- LOGS ☐
- DAM/WEIR ☐
- STANDING WAVES ☐
- HAYSTACK ☐
- STOPPERS ☐
- EDDIES ☐
- VORTEX ☐
- SURGE ☐
- BOIL ☐
- BACKLASH ☐
- OTHER.....
- .....
- .....
- .....

DIAGRAM

OTHER FEATURES:

CHECKLIST FOR ASSESSMENT OF RECREATIONAL POTENTIAL - III

RIVER	SECTION	OBSERVER DATE WEATHER..... .....

VISTA

1 UNCONFINED
2
3
4
5 CONFINED

GRANDEUR

1 DRAMATIC RELIEF
2
3
4
5 FLAT

SOLITUDE

1 UNDISTURBED
2
3
4
5 MAJOR DISRUPTION

NATURALNESS

1 WILDERNESS
2
3
4
5 MODIFIED & URBAN

COLOUR/TEXTURE

1 MAXIMUM VARIETY
2
3
4
5 DRAB/MONOTONOUS

WATER QUALITY

1 CLEAR & FRESH
2
3
4
5 POLLUTED

RIVER SPECTACLE

1 BALANCED
2
3
4
5 JUMBLED

SCENIC NOTES:

CHECKLIST FOR ASSESSMENT OF RECREATIONAL POTENTIAL - IV

RIVER	SECTION	START/FINISH

DATE: TIME:	WEATHER:	RIVER LEVEL CONDITIONS:

MONTHLY MEAN WATER FLOW DATA:

JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

CATCHMENT AREA:

AVERAGE RAINFALL FIGURES FOR CATCHMENT:

FLOOD DATA:

ACCESS	EGRESS

CAMPSITE FREQUENCY:.....
CAMPSITE QUALITY:.....
FUEL AVAILABILITY:.....
DRINKING WATER AVAILABLE:.....

NATURE OF RIVER SECTION: HIGH SKILL / MODERATE SKILL / LOW SKILL
DAY TRIP/ WEEKEND TRIP / EXPEDITION TRIP

EXISTING USER GROUPS:

IX. Using the summaries

Parts II and III, which complement this part of the river survey, are summaries of the data collected on each recreationally significant river and catchment area of the two islands. Because of the almost total absence of any freely-available information or description of river scenery, we feel that the summaries that comprise these two volumes will be the most valuable information to come out of the survey.

On close inspection it will be discovered that the information given is very general and brief: it had to be, because of the number of rivers inspected (some 1500) – the cost of printing any greater detail would have been prohibitive. The survey amassed a far greater quantity of information than is given here, both in the checklists described in Chapter VIII, and in the copious notes made in the field. The authors are quite willing to enlarge upon details given in the summaries at the request of any reader and may be contacted c/o P.O. Box 26, Nelson.

As mentioned elsewhere in the report, the survey was intended to be a comparative survey, a comparison of one river with another. People and organisations charged with administering open space for recreation and with development proposals, seek information on rivers to arrive at a **value** that can be placed upon one river in comparison with another. The scenic and recreational values given in the summaries are not intended to stand on their own, and will not have any significant meaning unless contrasted with similar rivers, or with other rivers in the immediate vicinity of the river in question.

To explain how we envisaged the survey summaries to be used, we shall give examples:

Suppose, as indeed there was, a proposal to dam the Manganui-A-Te-Ao River for hydro-electricity or irrigation and it is required that any effect upon recreational use should be assessed.

STEP ONE:

First locate the river by map and within our survey summaries. The river is a tributary of the Wanganui River, hence it is located in the Cape Egmont to Manawatu section, river number 46.3.4 (catchment number 333310 according to the Soil Conservation and Rivers Control Council's numbering system).

STEP TWO:

While you have the map opened to locate the river, make a list of other main rivers in the area. Such a list will include:

Manganui-A-Te-Ao	46.3.4	(333310)
Wanganui River	46.0.0	(333000)
Mangapurua Stream	46.3.3	(333390)
Mangatiti Stream	46.3.3	(333360)
Retaruke River	46.3.5	(333490)
Whakapapa River	46.1.1	(333700)
Mangawhero River	47.4.1	(331160)
Whangaehu River	47.0	(331000)
Tongariro River	151.0	(434680)

STEP THREE:

To assess scenic attributes first refer to the scenic values given in our summaries for each of these rivers and list the rivers in descending order of value. Where one river has been treated in sections (as the Wanganui, Whangaehu and Tongariro have been, for instance), it will be necessary to regard each section as a separate river. Hence we have:—

Exceptional:	Wanganui River below Retaruke.
Impressive:	Mangapurua
	Mangatiti
	Manganui-A-Te-Ao
	Wanganui River below Pipiriki
Picturesque:	Whakapapa
	Retaruke
	Wanganui River - Taumarunui to Retaruke
Moderate:	Whangaehu River
	Mangawhero
	Tongariro River

From this very rough order we can see that the Manganui-A-Te-Ao is considered to be one of the more scenic rivers in the area with the exception of the Wanganui River which is equal to or better than it. We must also consider the Mangapurua and Mangatiti Streams which are listed along with the Manganui-A-Te-Ao as being of impressive scenic value. However, both these streams are small and their recreational value is insignificant.

One must also consider the fact that those sections of the Wanganui River that are considered to be the equal of, or better than the Manganui-A-Te-Ao, do not have vehicle access other than at spot points (Retaruke confluence and at Pipiriki) whilst the Manganui-A-Te-Ao has a road following it for a greater length. Although user access is not considered to be a factor in scenic value, one might expect more people to be aware of its attractions because of the ease of access. Hence, the scenic value of the Manganui-A-Te-Ao should be regarded as being of considerable importance in the region.

STEP FOUR:

Having decided on the present scenic status of the river (assume that the survey assesses rivers as at August 1978) it now becomes necessary to assess the impact of the proposed development on the scenic values of the river. To do this you will need to examine the proposed scheme to see how it will affect the factors we used to arrive at scenic value (Chapters V and VI) and give the river a 'Post-Development Scenic Value'. Such a value then can be compared with our original list, remembering that it will be necessary to update our list by giving a new value to other rivers in the area affected by development (i.e. the Tongariro and the Whangaehu which have been affected by the Rangipo Scheme). One should now be in a position to consider if the scheme will adversely affect the scenic values in the area, and to what degree.

STEP FIVE:

From our summaries and our list of rivers, follow exactly the same procedure for recreational values as for scenic values in Step Three. Hence:—

Exceptional:	Wanganui from Taumarunui to Pipiriki.
High:	Wanganui below Pipiriki.
	Whangaehu from Tokiahura to Collier's Bridge.
	Tongariro River to the Rangipo Prison Farm.
Intermediate:	Retaruke River
	Manganui-A-Te-Ao
	Whangaehu below Collier's Bridge
	Mangawhero
	Lower Tongariro

STEP SIX:

It will now be necessary to bring our recreational values up-to-date. There has been no scheme brought into commission since August 1978 that affects the Wanganui River. However, the Rangipo Scheme has taken water from tributaries of the Whangaehu and this has reduced its value from the High and Intermediate status down to a Low status. Also, the Tongariro River to the Poutu Intake will be unusable by all our recreational groups considered here and must be downgraded to Insignificant.

This leaves us with three rivers of importance in the area: the Wanganui, Retaruke, and Manganui-A-Te-Ao. With investigation it will be found that the Wanganui offers a different kind of recreational experience to that offered by the Manganui-A-Te-Ao and the Retaruke. Recreationalists must consider the Wanganui as an 'expedition', that is, a multi-day trip with a low skill requirement. This is quite different from the more boisterous water found on our other two rivers. (Note that the Mangawhero only attains Intermediate ranking upon carrying above mean flows. At normal flows it is too shallow over its better sections for anything larger than a canoe). A closer inspection may be needed to compare the Retaruke with the Manganui-A-Te-Ao, should it be so desired.

STEP SEVEN:

A study of the proposed development should enable you to assess the effect upon recreation and arrive at a new ranking ('Post Development Recreation Value') for our river and then arrive at a judgement as to the real effect of the scheme upon the river. It may be necessary to look at any growth of tourist facilities in the area that might boost user numbers needing an outlet for recreation.

In this instance, consider the development of a nearby skifield where the proprietors of accommodation facilities may be interested in the scenic attributes of rivers to attract people in the skiing off-season. Also, the Outdoor Pursuits Centre in the area may increase the use of the Manganui-A-Te-Ao with the loss of the Tongariro for rafting and canoeing - they will need one-day trips rather than the type of trip offered by the Wanganui.

With these considerations in mind, the investigator ought to be able to assess the recreational impact such a proposed development would have. Of course there are other recreational considerations to be borne in mind; for instance, fishing, wildlife values, tramping. For data on these activities, reference should be made to the appropriate user groups and similar surveys that may have been carried out by them.

X. Limitations on use of rivers

When we had completed the field work for the survey and had looked at our results we discovered that about one third of the total rivers looked at were usable by most recreational groups. Of these rivers that we considered to be usable, about one half were suitable for recreation in that they provided a worthwhile or satisfying trip. What, then, causes the unsuitability of five-sixths of our rivers?

1 RIVER SIZE

River size is perhaps the most obvious limitation on recreational use. Firstly, there must be sufficient room for the various craft to manoeuvre between the banks, although it is quite satisfactory to have only sufficient space to pass in rapids themselves. In this respect river width is probably more important than river depth.

Obviously, such craft as **motor launches** (screw-driven craft) require more depth and lack of obstructions than do jet driven boats or oar-powered craft. On the whole, screw-driven craft are restricted to lakes and the tidal lengths of a river.

Jet boats are capable of navigating extremely shallow water, perhaps as little as 2 cm. However, no sustained length of water of this depth can be negotiated. Usually the technique of running shingle or sand shallows with a thin cover of water involves attaining planing speed and, immediately prior to passing onto the shallow water, the craft is allowed to yaw, building up a cushion of water below the hull which carries the craft over the shallow water. Consequently, very shallow rivers and log-strewn rivers require numerous deeper pools so that the boaters can pool-hop over the shallows.

It is not always possible to maintain planing speed at the same time as navigating hazardous (shallow) water for great distances. To slow down requires deeper water as the boat settles into displacement configuration. Should a jet boat be in shallow water when speed is dropped below planing speed, then the bottom of the boat could well rest on the river bed, or be extremely close. Sudden acceleration whilst in this position often results in the jet-unit intake sucking the bottom of the boat onto the river bed, or at least small stones being sucked up onto the intake grille, clogging the intake and resulting in a lack of power, restricting speed to the extent that the jet boat cannot attain its planing speed and is unable to negotiate shallows.

What this means is that once a jet boat passes onto shallow water it cannot slow down below planing speed until it reaches a deeper pool of sufficient size and depth to allow it to regain its planing speed. A jet boat creates a wake, which, in very shallow water, may carry what water there is, beyond the shallow area. A jet boat travelling at speed, attempting to execute a 180 degree turn in shallow water may find that the waves generated by its own wake have washed away what was formerly sufficient water to negotiate and the net result is that the boat is sucked down onto the riverbed, loses speed, and is left high and dry.

It is necessary, therefore, that small and shallow rivers, if they are to be negotiated by jet boats, should have a variation in river depth and occasional pools. The jet boat must maintain planing speed to negotiate most rapids except those with pressure waves. This requires sufficient room to give the driver time to see obstacles and react in time to miss them.

When going upstream, the speed of the river current may allow the jet boat to maintain high speed yet still have a low speed relative to rocks and boulders which allows for negotiation. Unless the jet boater has access suitable for vehicle and trailer at the upper end of the river, he will not go in an upstream direction beyond rapids that he can safely negotiate when coming downstream. Coming downstream, his boat speed plus current speed requires greater room for manoeuvring.

Drift boats require greater depth of water than do jet boats, but they can negotiate rock-strewn or bouldery rapids more successfully. Drift boats are used in a downstream direction with the oar-power applied upstream at a slightly slower speed than the current. Working on the principle of vectors, the drift boat is able to move from side-to-side without either losing ground downstream, or gaining ground upstream.

In effect, to manoeuvre through a tight rapid the drift boater backs down to an obstacle then moves sideways into a clear channel before drifting down onto the next obstacle. Provided there is at least sufficient space between obstacles in which to fit the length of his craft, then a drift boater can safely negotiate the rapid. Drift boaters cannot, except on very slow moving rivers, allow their craft to swing side-on to the current as they are then required to drift at current speed and cannot manoeuvre.

Paddle-powered rubber dinghies require more room than drift boats, as they maintain manoeuvreability by travelling downstream at a greater speed than the river current. A great deal of co-ordination is necessary between the crew members of a paddle-powered raft. A raft generally requires more room within a rapid for all crew members to appreciate what is happening and to react as a team. Oar-powered drift boats generally only have the one crew member on the oars and he can react much faster, needing less room to manoeuvre.

Canoes and kayaks need even less water for a successful trip. Kayakers are able to back-paddle and to manoeuvre as drift boaters do - a technique known as ferry gliding - or they can paddle like the paddle-powered raft and use eddies to turn in behind rocks to survey the river ahead. Having less displacement than other river craft, the kayak can run relatively shallow water. However, canoeists are seldom content to merely paddle down a river; they like to explore the variations in a river's current, and enjoy diving from a tongue of water into back eddies. They like to catch the stopper waves and ride the crest as a surfer rides a breaking wave. In short, a canoeist likes to 'play' in a river and this requires more room than if he were content to merely float downstream.

Lilo floaters and pack floaters require a river of small size, devoid of powerful stopper waves. However, they lack the manoeuvreability that the canoeist has, and tend to ride up on obstacles and bump their way around bluffs. Thus any river with sharp-edged or shattered bedrock tends to be avoided. A bouldery river with well-rounded rock is preferred. The upper sections of mountain streams seem to offer the best water and this would explain the high use by these people of rivers such as the Mangahao, Upper Ruamahunga, Waiohine, and the Waiwhakaiho. Any fast moving, small, and rocky stream close to towns is popular for this type of activity.

Swimming demands a much slower moving stream than do any of the other groups, and naturally a river of clear water. Depth is important as swimmers must be able to swim in water deep enough not to hinder their strokes.

How much water is required for recreation? This is a question often asked and for which there is no answer. It is a little like the ridiculous question asked of the mountaineer - why climb mountains? The asking of the question merely displays a complete lack of understanding of the situation. An experienced recreationalist knows perfectly well how much water is required for any particular section of river to be usable; he may also be able to predict how much more water is required for the river to be at its best; and he ought to know how much more water is required before the river becomes unsafe or the rapids drowned out and their usefulness diminished.

The assessment of water sufficiency depends on a number of variables - the type of rockbed (shingle, sand or bedrock, with bedrock streams needing the greatest quantity of water); the gradient; the type of boulders found there; the presence of willows; the presence of bluffs and creation of backlash; the existence of quiet pools between boisterous water; and the presence of haul-out spots for the recovery of capsized craft. Obviously, river width and depth are important considerations.

There is no hard and fast formula for calculating how much water is required but ask any experienced paddler or boater how much is required at any particular place at any particular time and he could tell you at an instant if there was sufficient at that time; but not in cubic metres per second or any other such measurement. The simple answer to the question of how much water is required is simply to ask an experienced boater!

There have been attempts to measure ideal river size in the past. I well recall an officer of the Ministry of Agriculture and Fisheries in Ashburton who claimed that a river with a mean flow of 10 cubic metres per second generally indicated a river of sufficient size for canoeing. Whilst such a claim might possibly have been true of the type of river found within the area he was familiar with, such an all-embracing claim could not be made for all rivers, nor for all areas of the country.

2 RIVER LENGTH

How long must a river trip be before it represents a worthwhile trip? This question is a little easier to answer.

Fast moving craft such as jet boats require a longer river although, because of their tendency to travel both upstream and downstream, a river length that would satisfy a canoeist may also satisfy a jet boater. Generally any river that takes a boater two hours to negotiate would be of sufficient size to offer a worthwhile trip.

In some instances, like the Cromwell Gap on the Clutha River, or Fulljames Rapid on the Waikato River, a short length of river can give a satisfactory recreational experience. We have observed, one weekend in December, over 200 canoeists on the Fulljames Rapid, and few of them used anything other than the 200 metres of water surrounding the rapid.

In very general terms a river length of 12 kilometres would offer a reasonable afternoon's recreation although a river length of 25 kilometres may be considered to be about right. It is interesting to note that the American criterion for eligibility for inclusion in their Wild Rivers Scheme is that the river should be at least 25 miles in length (40 km).

3 WATER QUALITY

What represents water quality of sufficient purity will depend upon the degree of immersion a recreationalist expects to receive. A jet boater, drift boater, and perhaps a rafter would not expect to be wet very often whilst a canoeist expects to be as wet as a swimmer, and a swimmer not only expects to be receiving a mouthful of water on occasions, he also expects to be able to see underwater to some degree.

For those activities where people expect to be immersed one could set water quality conditions as follows:

(a) The water, in general terms, would be suitable if it has the quality of bath water, or so that fish can live in it.

(b) In respect of bacteria the concentration of enterococci or faecal streptococci must not exceed 250/100 ml water and the concentration of thermostable coliform bacteria must not exceed 1000/100 ml water.

(c) The water must not have an offensive odour, nor look unpleasant, nor contain chemicals or green algae in a concentration which could endanger the human organism.

4 SKILL FACTOR

The presence or lack of water requiring some degree of skill from the boater is not so much a factor limiting usability as a factor limiting desirability. A river of Grade 1 (International Canoeists Scale - see Chapter IV) is often regarded as being of little desirability and is seldom used unless the scenic values are dramatic and impressive, or unless the river section has to be boated after a section of higher grading.

It would be true to say that New Zealand does not have a great number of rivers of recreational size containing significant lengths of water of Grade 3 difficulty. Grade 3 is the optimum for the average recreationalist with two or three seasons' experience. Much of the value of outdoor recreation becomes meaningless unless there is a challenge in spite of the danger.

5 ACCESS

The accessibility of rivers is an important factor when considering whether a river resource will be used often, or not at all. Accessibility is not merely a direct result of the existence of suitable roads, it may also be a legal problem.

Problems the survey team encountered were:

(a) Land Tenure

Owners of property restricting the passage of boaters over their land to reach a river. In some cases, such as on the upper Mohaka, the attitude of land owners completely restricts all activity on what would otherwise be a very valuable recreational resource.

(b) Prohibited areas

Wildlife reserves were the most frequent reason for prohibiting access by recreationalists, although in most cases, if boaters have a good enough reason for visiting an area and if safeguards are taken to avoid disturbing the wildlife, then permits are obtainable.

Military. In one case a rifle range is situated so that shots are fired across a river (Rangitopuni Stream), a situation that is not necessary. Military installations in the central North Island and in the Mackenzie Basin also restrict some activity, as do old Army shell sites (Moawhango).

Justice Department. The location of prison farms, although not preventing access to rivers, often require some thought when planning a trip. We are not suggesting that such organisations should not be placed by rivers, but merely note this as an instance where access has been restricted.

Water Catchment. In numerous cases where a water supply is collected recreationalists' activities are restricted. It seems to many people that if ducks are allowed to use a reservoir; if goats with lice, footrot and tuberculosis; if opossums and all their associated diseases, are permitted into an area, then so should relatively clean human beings. Access to some valuable areas (e.g. Hutt River catchment) is restricted because of the policy of water supply authorities. Perhaps consideration could be given to relaxing some of the restrictions presently imposed. This is a very complex issue that we have neither the space nor the inclination to delve into here.

6 MAN-MADE OBSTRUCTIONS

In many instances river travel has been restricted because of the siting of man-made installations.

(a) Dams and weirs

Dams and weirs were the most frequent installations we discovered on rivers. Such obstructions are not, in themselves, a problem to those recreationalists who have easily portagable equipment. But for jet boaters the situation is entirely different.

In most instances, it is not so much the dam or weir itself that is the greatest hindrance, but the lake of still water that is backed up behind it. Canoeists prefer moving water, particularly for river canoes which are designed for manoeuverability

and are difficult to paddle on flat water. For rafters, still water is very difficult and for drift boaters still water is almost impossible as the fittings required to make drift boat handling possible may also restrict normal rowing action.

River recreation and lake recreation are two entirely different activities, generally requiring different equipment, and each provides an experience sought by people with different needs. These facts are often not appreciated by those who have the responsibility for administering our nation's water resources. We comment further on these aspects in Chapter XIII.

(b) Bridges and bridge debris

Generally speaking, bridges do not hamper the recreational use of rivers; in fact, they assist in that they offer convenient access to the river and also allow boaters to observe water levels to determine if a river may be usable at any given time.

On some rare occasions a bridge can hamper navigation: ***A bridge built at an angle*** to the natural current of the river will result in the current building up onto the bridge piles, thus creating backlash. Generally, this situation can be avoided by boaters except where the piles are so close together that no clear path can be found through; thus they must enter the area of backlash flowing off one of the piles. The Waiau River Bridge (North Canterbury) is one such example, where water flows through the wooden pile structure creating hazards for craft other than jet boats which have sufficient power and acceleration to avoid the problem area.

Low bridges. Seldom did we discover a bridge that was too low to boat beneath. A canoeist is fortunate in that he can capsize and roll up again after having passed beneath the low bridge but this is **not** recommended: Jet boaters are perhaps the worst affected. Most bridges are built at a reasonable height above normal water levels to avoid flood damage.

Debris. This was the major problem encountered, particularly on the west coast of the South Island. When bridges are replaced it has been the habit to remove only that part of the original bridge piles that are above the lowest flow levels of the river. Such obstructions lying just beneath the surface of the water where they are difficult to see pose tremendous dangers. Piles, unlike boulders, do not create pressure waves that indicate to the boater the presence of an obstacle, and a row of piles is difficult to avoid.

Another problem concerned the discarding of bridge-building scaffolding and other iron work into the river below the bridge. Such iron work frequently causes damage to boats and equipment. We see no reason why piles and other items of building material cannot be removed by the bridge building contractors and such removal could be a condition of the building tender conditions.

(c) River protection works

The greatest danger presented to river floaters is to be caught in a sieve situation. Any obstacle that acts as a net where water may flow through but which catches and holds solid objects offers a considerable hazard, as boaters and their equipment could be caught with the force of the current holding them onto the obstruction and water flowing over them. Such situations have contributed to drownings on numerous occasions.

Any obstacle which will allow water but not objects to pass through must be avoided at all times. Unfortunately, river bank protection works often take the form of such obstructions. A fallen willow tree is the most common obstacle, with the network of branches and roots forming the obstruction. Wire ropes stretched along river banks to hold stonework, willows, and other items to consolidate the river bank, can often be scoured out by changed river channels and then they offer a sieve situation. Pipelines, wires, fences, and other obstructions do the same.

7 RECOMMENDATIONS CONCERNING LIMITATIONS

Obviously we would wish to see as many limitations as possible removed. We see no reason why river protection works could not be removed as soon as the backing material has been washed away by the action of the water. Once the material has gone, the restraining wire ropes and piles are of little use and it is only at this stage that they offer a hazard to boaters. We also see no reason why bridge piles cannot be completely removed on the completion of the new substitute bridge.

As far as other limitations are concerned, water extraction due to the granting of water rights is the main problem. If often seems to recreationalists that those charged with the administration of rivers regard a natural, free-flowing river as a resource going to waste. There is often the attitude that recreation is a suitable use for rivers until such time as a productive use can be found for the river and its water

If recreation were to be considered as a water use in the same manner as hydro-electricity, irrigation, waste discharge, and other uses, then perhaps there would be less of a problem. Unfortunately, recreation is seen as non-productive utilisation and when water rights are allocated, purely economic arguments seem to have priority.

Recreation is a vital part of the New Zealand lifestyle and water-based recreation is a major element in the pattern of recreation. This fact is often not recognised by the authorities. Also, the dearth of resources offering water for skilled boaters is a fact not widely known.

Any alteration made to the banks or flow of a river should have first been considered in the light of the present usage of the river, including recreational use. Environmental impact reports should consider the sociological implications resulting from an alteration in recreational facilities offered, both on lakes and rivers. Lastly, no river should be considered in isolation, but should be considered in its position as an element in a nationwide network of river systems offering a range of uses and recreations.

XI. Facilities required

When dealing with recreation and preservation of areas primarily for recreation, some important questions must be asked:

- How important is recreation to New Zealanders and to New Zealand?
- When dealing with facilities and resources, particularly land, what share of the nation's resources should be apportioned to recreation?
- How important is outdoor recreation within the whole sphere of recreation?
- How important is river-based recreation as a part of outdoor recreation?
- What proportion of the nation's rivers should be kept for recreation? The answer to this question obviously depends upon the answers to the above questions.
- Are we obliged to provide recreational facilities for purely local communities, or for the nation as a whole, or do we owe obligations to those who live beyond our shores? Eighty per cent of the visitors to Mount Cook National Park were from outside New Zealand. Could it be that we owe it to the outside world to provide recreational facilities?

Assuming that we agree that recreation is important, and that rivers as a medium for recreation are also important, we now have to decide what river recreational facilities are required to meet the demands of present and future recreationalists.

1 WHITE WATER

White water is an essential element in river recreation. To offer a paddler or boater a river without any rapids or white water, no matter how easy or difficult, would be like offering a mountaineer a mountain without a summit. White water is the essence of all that attracts people to rivers. Certainly, tranquil sections of rivers are attractive but they are meaningless without the comparison of white water.

White water boating is an adventure; and an element of skill, of challenge, and of apparent danger is an essential ingredient of all river recreation. Because of this, it will be necessary to protect from destruction by development examples of good white water rivers in all regions of the country.

As has been mentioned elsewhere, we consider that white water of Grade 3 difficulty, as rated on the Canoeist's International Grade System, ought to present the optimum. Grade 4 examples are necessary but only the very competent ever attempt such water, consequently a lesser degree of wildness would offer the majority of boaters facilities to express their skill.

We must seek to preserve examples of Grade 3 water that exist within 150 kilometres of all major population centres and, wherever possible, within 75 kilometres of all major population centres. Also, wherever possible, such water should be navigable by as full a range of boaters as possible, from jet boaters through to canoeists and rafters. Scenic values are less important on high-skill water, but wherever possible those rivers with higher scenic values are to be preferred.

2 PLACID WATER

It is not possible to begin recreational boating on white water without first gaining some experience on quieter water. Also, we need less strenuous water for family recreation, for those who wish for a more relaxing experience, and for those who like to escape from the pressures of urban life. We require, wherever possible, highly scenic examples of quiet flowing rivers for picnicking beside, for swimming and fishing in, as well as quiet sections of river for more relaxed boating. Fortunately, the lower sections of most New Zealand rivers offer such water.

However, in the selection of a river for protection, only those rivers with very high scenic values ought to be considered first. Like examples of white water, we need these rivers to be close to where the greatest demand will come, within a 150 km radius of urban areas, and, wherever possible, within 75 km.

3 LAKES AND HARBOURS

New Zealand has an extensive coastline which offers many recreational boating facilities. There are numerous sheltered bays and harbours where people might fish, water-ski, sail and hold power boat races. Unlike rivers, lakes are not a scarce commodity as our rivers are gradually being converted to lakes in the form of hydro-reservoirs. Also, the very lower reaches of rivers offer similar recreational opportunities as do the still waters of lakes. Nevertheless, there are areas of the country without good sheltered harbours and here lakes are valued as recreational areas. It will be necessary, therefore, to protect the scenic qualities of some of our natural and artificial lakes for the purpose of enhancing recreational use. This survey was primarily directed towards rivers as it was here that we felt that the danger of losing recreational facilities lay. Where there is a need to protect lakes as recreational facilities, we make comments.

4 WILDERNESS

As land development proceeds, there is a threat to our wild places. The area of wilderness is rapidly diminishing. We believe that areas of natural New Zealand ought to be preserved and, wherever possible, recreation should be allowed where it does not harm the main object of preservation.

In many ways, wilderness areas that have rivers running through them are of particular value, as here people may float through the wilderness area, leaving no sign of their passing through. There are few examples left in the North Island of wilderness that includes rivers, and consequently, a decision to preserve or not to preserve must be made soon before there are no such areas left.

Wilderness is really a special type of scenic area, rather than a special type of recreational area. However, there is a need to allow people to penetrate into seeming wilderness and natural areas as a direct contrast to the urban environment. It is true that not all of us would wish to go into such wilderness areas, but it is important that people should know that if they did want to, then the areas do exist.

It would be wrong to include wilderness areas within a recreation network where we expected high numbers of users, because such user numbers would undoubtedly harm the area. When drawing up a list of recreational facilities required, it will therefore be necessary to allocate separate wilderness areas. Such areas need not be common, in fact, being such a special area few are required. Wilderness areas would not be required on a local level - they are of national and international importance. Perhaps one such area (with a river) in each island would suffice.

5 EXPEDITION FACILITIES

The general pattern of river recreation seems to be that people use local rivers for most of the year, but with long weekends or annual holidays they expect to be able to spend a number of days in one area. Some may spend a week or more on the Wanganui River — a placid river with notable scenery. Others may wish to spend a week in the wilderness area of the Motu. Still others may wish to spend a few days on the Buller using

vehicles to carry equipment. Again, other people may wish to boat on a lake such as Te Anau, or Rotoiti.

We therefore need rivers that will offer such opportunities. In contrast to those rivers of high use close to urban areas, we will require quite lengthy sections of a few rivers that offer some form of escape from normal living patterns. Such rivers need not be wilderness areas but they should appear, wherever possible, undeveloped and lie beyond urban areas. They should be as scenic as possible.

6 URBAN PROXIMITY

An examination of users shows that a very high percentage of those using rivers are young people. Often a family will picnic on the river edge with the children taking the most active part in using the river itself rather than the general environs. Children have less opportunity to travel great distances, often being restricted to within bicycling distance of town, and hence it is important that river resources within urban areas be maintained wherever possible. A high percentage of users in the swimming activity were children.

With the present fuel oil shortages and expected price increases we might expect that the closer a resource lies to the demand, the more valuable it will be. Rivers close to urban areas receive high use and here the activities tend to be user-oriented rather than resource-oriented, and hence scenic and environmental considerations are less important. The fact that water of reasonable quality and quantity exists is usually enough to satisfy most needs. Cities and town on the coast have less need of such urban river resources.

7 COMPETITIVE WATER SPORTS

Competitive water sports have been considered somewhat beyond the sphere of this survey. However, because they use the same facilities as river recreationalists, mention must be made of them. Competitive water sports include:

Power boat racing.
Mini power boat racing.
Jet boat marathon racing.
Rowing.
Marathon canoeing.
White water canoe racing.
Slalom canoeing.
Raft races.

8 COMMERCIAL ADVENTURE SAFARI AND TOURISM

In recent years there have appeared a number of commercial operators offering organised river trips to the public. The first of these began before the turn of the century on the Wanganui River using a steamer service, and there have always been launch trips on some of the quieter waterways.

The 'boom' in adventure safari-type trips began in the 1960s and first appeared using jet boats. Since then there have been one or two operators using kayaks but the recent increase in numbers has been confined to raft operators. Such trips are a very important aspect of the tourist industry and, as such, provision must be made for their operation.

New Zealanders are apt to talk of the great advantage of promoting a tourist industry by providing hotels and such like. However, we tend to forget that the main reason people visit this country is for the scenic values and amongst these scenic values our natural flowing rivers play a major part. Strangely, no attempt has ever been made to assess the actual importance of preserving river scenery primarily for the tourist industry.

In the following chapter we consider the above points to construct a network of rivers as a suggested list of rivers to be protected.

XII. A Waterways Network

The following suggested network of rivers has been formulated using the results obtained from our assessment procedures and in the light of our assessed needs according to Chapter XI. We have selected the best examples of each river type in each area, irrespective of other suggested uses such as irrigation, waste disposal, and hydro-electricity.

In some cases we have selected substitute rivers. Such rivers are similar rivers but are slightly inferior for one reason or another.

In those cases where we have selected a river as ideal for preservation, there may be a clash of interests between recreational groups and other user groups. In this case we have given substitutes to solve this conflict. In many cases there are no such substitutes and one might expect that recreationalists will be more willing to argue their claims for these rivers.

1 NORTHLAND

That area north of Wellsford and the Hoteo River valley. The main population centre in this area is Whangarei with subsidiary centres at Dargaville and Kaitaia and a more scattered population in the Kerikeri–Kaikohe region.

Travelling is generally not difficult except to the harbours on the west coast. There are ample harbours of sheltered water in this region and most rivers tend to be slow moving and rather muddy, with the tidal reaches often lined with mangroves. Most rivers are lined with willows above the mangrove area.

Rivers of significance include the Waipapa, Waipoua, Kerikeri, Hatea, Wairua, Waima, Mangakahia and Waiokumurau Stream, and the Waitangi River. Most of these lie within easy reach of the residents of Whangarei.

White water: Northland is short of good white water trips for river floaters. Of those rapids that are usable, the Wairua's rapids have restricted access for jet boaters because they lie between waterfalls except for a short section below the Wairua Falls themselves. The Mangakahia River and Waiokumurau Stream are both very small in the region where rapids exist. Some easy rapids lie below Rainbow Falls on the Kerikeri, and the rapids on the Waitangi are shallow and obstructed by willow growth.

Placid water: There are ample examples of flat water with the greatest use being made of the Upper Wairua.

Lakes: Ample sheltered harbours on the east coast and the Kai-iwi Lakes (Lake Taharoa) cater adequately for most recreationalists. Lake Omapere is very shallow, windswept, and swampy.

Wilderness: There are no real wilderness areas. The Waipoua River from the main road appears to offer a wilderness area but the kauri forest soon changes to a pine plantation that is of some disappointment to those expecting grand scenery.

Urban streams: The Hatea flowing through Whangarei has a high level of use from below Whangarei Falls. The Kerikeri from Rainbow Falls also receives some use. There seems to be little demand for the Awanui River amongst the residents of Kaitaia.

Competitive sports facilities:

Power boat racing: Some races have been held, in the past, on Lake Omapere and on one of the Kai-iwi Lakes. However, present use seems to be concentrated on the Wairoa River in the Dargaville area.

Rowing: Harbour use only, and perhaps upper section of the Wairoa River. Most rivers are too small to offer suitable rowing sites. Kai-iwi Lakes should also provide good water although wind problems are common.

Marathon racing: Wairua River from Jordan Valley Bridge to near Puketitoi Road. A waterfall lower down restricts further use.

White water canoe racing: No suitable sites although it may be possible to use the rapids below Wairua Falls on the Wairua River. However, these rapids are not spread over a long enough section of water to provide good racing.

Slalom: The site above Wairua Falls is used twice a year for competitions involving more than local canoeists. A number of competitions are held on this site throughout the year. No other suitable sites in Northland.

Raft races: We believe that a short section of the Hatea River has been used.

RECOMMENDATIONS: The following river or river sections should be protected for recreational use:

- Upper Mangakahia and Waiokumurau Stream.
- Wairua River from Jordan Valley Road bridge to the confluence of the Wairoa River.
- Kai-iwi Lakes.
- Kerikeri River from Rainbow Falls (substitute Waitangi River).
- Hatea River from Whangarei Falls.

2 AUCKLAND

That area from Wellsford in the north down to the Waikato River, as far south as Te Kauwhata, and no further east than the Hapuakohe Range. The main population centre is obviously the greater Auckland area and this population places a high demand on recreational resources. It is fortunate that the area does have the Waitemata Harbour to take the bulk of this recreational pressure as there are few rivers in the area providing recreation.

Those people who seek rivers of high skill are obliged to travel to the Bay of Plenty (Rangitaiki River near Murupara), to the Motu River, or to North Taranaki (the Mokau River), or to Fulljames. Rivers of note in the area are few with most use being centred on the Rangitopuni Stream (also known as Riverhead Stream and Mill Stream), and on the Wairoa River (Hunua).

White water: None except very easy water on the Wairoa below Hunua Falls.

Placid water: The harbours in the vicinity of Auckland City provide ample water.

Lakes: Lake Pupuke.

Wilderness: None.

Urban streams: Rangitopuni Stream.

Competitive sports facilities:
Apart from harbour use, there is sprint canoe racing on Lake Pupuke that is of national importance as it is used for Olympic training. This lake is also used to a very limited extent for power boat racing, water skiing, sailing, and rowing. There is also marathon canoe racing on the lower Waikato River from Hamilton to Mercer.

RECOMMENDATIONS: The following river or river sections should be protected for recreational use:

- Rangitopuni Stream.
- Wairoa River from Hunua Falls to Clevedon.
- Lake Pupuke (substitute Waitemata Harbour).

3 WAIKATO

The area encompassed by the Waikato River catchment, including all tributary streams and the west coast from the Waikato River mouth, south to Tirua Point, but not including the catchment above Taupo. The main population centre in this area is Hamilton with the smaller centres of Cambridge, Te Awamutu, Otorohanga, Ngaruawahia and Huntly.

The Waikato River with its hydro lakes obviously dominates the recreational patterns of this region. The Fulljames Rapid below Aratiatia and the river from Karapiro to Hamilton are the highlights of the river. To the west, Raglan Harbour provides sheltered water and the Waitetuna is also important. The Marokopa Falls and the Bridal Veil Falls are scenic spots of some repute but do not offer significant recreational facilities.

White water: Fulljames Rapid on the Waikato is perhaps the most used and most valuable section of white water in the whole country for canoeing. There are some rapids on the Waitetuna but they are not important.

Placid water: There are ample resources in the Waipa. and in the Waikato River below Hamilton, but neither is used to any great extent, being spoilt mainly by willow growth.

Lakes: Lake Karapiro is the most used of the hydro lakes, but all are important. Raglan and, to a lesser extent, Kawhia Harbours attract sailors and power boat owners from Hamilton and these harbours do relieve the demand for recreation on the lakes. Lake Waikare has a sailing club but is otherwise unused. Hamilton's lake is a most important facility with canoeing and sailing on it.

Wilderness: None.

Urban streams: The Hamilton population obviously uses the Waikato to a great extent, as does Cambridge, but most small streams in the region tend to be muddy and choked with willows. The Mangakino Stream is perhaps the only one of particular value.

Competitive sports facilities:

Power boat racing: This takes place on most of the hydro lakes and also, to some extent, on the Waikato River itself near Hamilton. Hamilton Lake has also been used on occasion although it would appear that quieter sports are preferred on this lake.

Rowing: Uses the Waikato River at Hamilton but the centre of this sport is obviously Lake Karapiro now that they have invested considerable capital in facilities there.

Marathon canoe racing: Appears to use most of the Waikato River and, in particular, the sections Hamilton to Mercer, Cambridge to Hamilton, Atiamuri to Whakamaru. Also the Waipa from the Whatawhata Bridge to Ngaruawahia. Hamilton Lake is also used for sprint racing.

Slalom canoeing: Some events have been held on the Mangakino Stream and this is of considerable value locally with some three or four events held annually. It is also an important training venue and the site of the Annual Secondary School Canoe Championships.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Waikato River from the Aratiatia dam to Hamilton, in particular the Fulljames Rapid (no substitute for this rapid).
Waipa River from Whatawhata to Ngaruawahia (substitute lower Waikato).
Mangakino Stream (no substitute).
Hamilton Lake.

4 HAURAKI-COROMANDEL

That area from the Hapuakohe Range eastward to the Kaimai Range and as far south as Putaruru. Also the Coromandel Range. The population of this area is scattered with minor concentrations at Morrinsville, Te Aroha, Paeroa, Waihi, Thames and Matamata. Hamilton and Auckland residents partake in most of the recreation in the area. Tauranga residents seem to prefer the Bay of Plenty area.

Notable rivers are the Kauaeranga and Ohinemuri Rivers.

White water: The Hauraki area is noted for its slow moving, somewhat muddy streams that form the Waihou and Piako River systems. The only white water in the region exists in the Coromandel and in the Kaimai Ranges, notably the Ohinemuri River (Karangahake Gorge), and the Waitawheta Stream, although this latter stream has little flow and is not usable by all recreational groups. The Kauaeranga River and the Tairua River both offer some white water although both are of low skill value.

Placid water: There is remarkably little usable water in this region as both the Piako and Waihou catchments tend to be overgrown by willows. The Firth of Thames, Tauranga Harbour and the Coromandel harbours tend to attract most people away from the Hauraki rivers.

Lakes: None, but ample harbours offer substitutes.

Wilderness: None, although the Coromandel State Forest Park sections of the Tairua and Kauaeranga Rivers give the appearance of wilderness - neither river is of boatable size in this area.

Urban streams: None of any importance.

Competitive sports facilities:
Some rowing used to be held on the lower Piako but it seems that it has been some years since this section was used. It is probably worth preserving sufficient water in the lower Piako for this use and no problems should be experienced in doing this. Most sports fixtures are held beyond this area.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Tairua River from State Highway 25a bridge to Hikuai.
Kauaeranga River.
Ohinemuri River - Karangahake Gorge.
Lower Piako River near Ngatea

5 BAY OF PLENTY

That area containing river catchments flowing into the Bay of Plenty between Waihi Beach and the Waiotahi River. This area is bounded by the Huiarau Range, Ahimanawa Range, the Taupo catchment, the Waikato catchment and the Kaimai Range. It does not include the rivers flowing into Lake Taupo nor those flowing into the Waikato.

The main population centres are Tauranga, Rotorua, Kawerau, Te Puke and Whakatane with some movement by Taupo and Tokoroa residents into the area. Travelling is generally easy with recreationalists being prepared to move throughout the region to find their preferred river sites.

Most rivers provide good recreational facilities but do become very low and unusable in the summer months, obliging the keener boaters to travel beyond the area to the Motu, or to the Taupo area. Many recreationalists change from river to lake boating over the summer months.

Rivers of significance are the Whakatane, Wairoa (Tauranga), Waimana, Rangitaiki, Tarawera, Mangorewa, and the Whirinaki.

White water: The best white water in this region is provided by the Wairoa (Tauranga) River which is limited to canoeing and rafting. A commercial rafting organisation now runs trips on this river. The Rangitaiki above Murupara is of considerable value, as is the upper Tarawera down to the town of Kawerau. However, this river has limited use in summer due to fire risk in the forest. The Waimana is also a very popular trip, but again, can be too low in summer.

The Mangorewa is an interesting stream but requires a considerable commitment on the part of the canoeists and rafters who use it - it cannot be said to be a river available to the average boater.

Placid water: The lower sections of most rivers provide ample quiet water although some are polluted (Tarawera and Kaituna). The Wairoa is particularly important as is the Whakatane. The Rangitaiki from the Aniwhenua Falls to the Matahina Dam is important, especially for jet boats.

Lakes: Ample natural lakes exist in this region to cope with any demand (Rotorua lakes, in particular). There is also the Matahina Reservoir but this is silting up badly in the upper section, limiting boating, particularly rowing, which requires some depth of water to reduce 'bottom drag'.

Wilderness: The Whakatane River is of particular value as it flows through Urewera National Park. However, the Whakatane is of limited use because of extreme low levels during summer.

The Whirinaki River also has wilderness characteristics.

Urban streams: Of particular value is the Wairoa River below McLaren Falls. The Puarenga Stream is of value to the residents of Rotorua.

Competitive sports facilities:

Power boat racing: Some of the Rotorua lakes have been used as has Lake Matahina. Tauranga Harbour seems to be able to cope with most power boat racing and is adequately sheltered.

Jet boat racing: Although no rivers in this region have been included in the jet boat marathon series, we believe that the lower Whakatane has been used for some competitive events.

Rowing: Most of the Rotorua lakes except Lake Rotorua are considered to be suitable. Most rowers now travel to Lake Karapiro. Lake Matahina used to be a popular site; however, rapid silting of the upper lake has caused events to be held less frequently. The lower lake area is prone to wind gusts.

Marathon canoeing: There is an annual Mokoia Island race on Lake Rotorua and there have been short races on Lake Tarawera.

White water canoe racing: The Tarawera River rapids above Kawerau are a particularly valued site, being used three or four times a year for national events. This is also the site of national championships. The Rangitaiki River above Murupara is also a valued site where there are two separate courses. Both are used for national championships and are used at least five times a year for events.

Slalom canoeing: As for white water canoe racing, the Tarawera and Rangitaiki sites are of particular value, with the Rangitaiki site being probably the best in New Zealand. The Wairoa (Tauranga) is also used three or four times a year for events of national importance. The Puarenga Stream (Rotorua) is a small training site used frequently.

Commercial trips: Commercial river trips are conducted on the Rangitaiki from Aniwhenua Falls to Matahina Dam; the lower Whakatane (jet boating); and on the Wairoa River (Tauranga) for rafting and canoeing.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Rangitaiki River from Wheao confluence to Murupara, and from Aniwhenua Falls to Matahina (no substitute).
Tarawera River above Kawerau (Waimana substitute).
Whirinaki River (for scenic and medium white water).
Wairoa River (Tauranga) from McLaren Falls.
Whakatane River down to Ruatoki North.

6 EAST CAPE

That area east of the Waiotahi River and as far south as the Mohaka River catchment, including the Waiau River catchment. The population of this area is somewhat scattered and sparse, the only centre of any significance being Gisborne and possibly Wairoa. Opotiki residents tend to look towards the Bay of Plenty for their recreation.

Most rivers in this region tend to be very dry in summer. Those rivers in the vicinity of Gisborne lie in badly-eroded valleys and have silted up, restricting recreational opportunities. People seem less prepared to move far for recreation, the Gisborne residents tending to look towards the Hangaroa/Ruakituri/Waiau River system.

The Motu is the river of greatest significance, with people travelling from all over New Zealand to use this river. Other rivers of importance are the Waioeka, Hangaroa, Ruakituri, and Waikare-Taheke.

White water: The best examples of white water to be found in this area are contained in the Motu River and Waikare-Taheke River, with easier water on the upper Waioeka below the Karanga confluence, and also in the Ruakituri River gorge. The Mata seems to be popular when flowing high, as is the Raukokore River.

Placid water: Quiet water can be found over the lower lengths of most rivers with the lower Waioeka and the Waimata being the most popular rivers for a quiet trip. The Hangaroa from the Te Reinga area to Marumaru is also a very popular trip. Jet boaters use the lower Motu to a great extent, particularly when the Whakatane is too low in summer.

Lakes: This area does not have great resources in lakes. The best is Lake Waikaremoana which is very scenic, tranquil, and well-known. The lower Wairoa (from Frasertown) offers lake-like water. However, without great population centres, there seems to be little demand for lake recreation. Gisborne Harbour caters adequately for fishing interests with some water-skiing on the lower Waimata and Waipaoa Rivers.

Wilderness: There are two notable areas of wilderness in this region, the Motu-Raukumara area and the Waiau-Huiarau area. Of these two, the Motu area is accessible by river as boaters can enter the upper Motu and drift through a large tract of native bush. The Waiau remains essentially inaccessible and unused. The Motu also offers a degree of skilled water to give added satisfaction to the wilderness attractions of the area.

Urban streams: With Gisborne the only significant urban area, the Waimata River is the only urban stream of significance.

Competitive sports facilities:

Power boat racing: There has been some demand to use Lake Waikaremoana for power boat racing. However, because of the high value of tourism in this area, notably because of the tranquil nature of the lake, it would seem preferable to confine this activity to the lower Wairoa (below Frasertown) or to the Waipaoa River.

Marathon canoeing: Waimata River Race from Anzac Park upstream and return.

White water racing: The Waikare-Taheke River below the Piripaua hydro station is of considerable value with some four events of national significance held per year.

Slalom canoeing: The same course on the Waikare-Taheke is used for slalom canoeing. It is of considerable value although less used now that the Rangitaiki course has been developed.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

The most important river in this region is the Motu which is of national and international significance as a wilderness experience with some skill requirement (there is no substitute river).
Waioeka and its tributary the Karanga is of value for its white water (Whakatane substitute).
Waikare-Taheke is of value for competitive events (no substitute).
Ruakituri is of value for scenic and moderate skill requirements (Hangaroa substitute).
Waimata for placid water (Waipaoa substitute).

7 TARANAKI

The area of the west coast between Tirua Point in the north and the Wanganui River mouth to the south, including the Wanganui catchment and the Mokau catchment. The main population centres are New Plymouth and Wanganui, with smaller centres on the ring plain about Mount Egmont, and at Taumarunui.

For the most part, the population of the Taranaki area seems reluctant to travel far for recreation; most movement seems to be between New Plymouth and Wanganui with little movement into north Taranaki. Lakes and good harbours are scarce in this area and probably for this reason aquatic sports,

other than surf lifesaving, are not well developed.

The most notable river in the region is the Wanganui River which is the country's most heavily used river. The Waitara, Mokau, and Awakino are also of importance along with their tributaries, the Manganui and Manganui-A-Te-Ao.

White water: Very little except for a section on the Mokau below Wairere Falls which is of very high skill quality. Also a short length of the Waitara and the Waiwhakaiho Rivers. The Cape Egmont rivers offer exciting white water only at very high flows. The Stony River (Hangatahua River) is the only one that really gets used.

Placid water: There are ample examples of rivers offering a quiet float in this area. The most used rivers are the lower Mokau, upper Waitara, Patea and Wanganui.

Lakes: Most are very small such as the small lake near Rawhitiroa. However, the Patea River Hydro Scheme should produce a lake to satisfy the needs of the Taranaki boaters for some years to come. The lower Mokau River is tidal for a considerable length and is used as if it were a lake for water-skiing and other sports. The very bottom of the Waitara is similarly used.

Wilderness: There are no real wilderness rivers in this area although sections of both the Mokau and the Wanganui above Pipiriki have all the appearances of wilderness and would qualify for a wilderness designation as far as satisfying the needs of recreation. A short section of the Patea could be termed wilderness in the vicinity of the Tangahoe Bridge; however, this is far inferior to that of the Mokau.

Urban streams: Of the main population centres, the residents of New Plymouth use the Waiwhakaiho to a great extent for a wide variety of recreational activities. The picnic spot below the Mangorei powerhouse is a particularly popular area and almost suffers from over-use. The New Plymouth Kayak Club has a slalom training course on the tail-race of the powerhouse. Taumarunui canoeists and rafters use the upper Wanganui when it has sufficient water and the river offers a popular swimming spot near the camping ground.

Competitive sports facilities:

Power boat racing: The lower Waitara, at Waitara, was used for power boat racing but has not been so used for some years now. Lake Ratapiko, an artificial lake inland of Tariki, is still used for power boat racing and for water-skiing. Mini power boat racing enthusiasts use the pool at the mouth of the Waiwhakaiho. Some racing has also been held on the lower Wanganui.

Jet boat racing: The Wanganui River from Taumarunui to Wanganui is part of the annual jet boat marathon series, and is considered to be a most important section of the series.

Rowing: The lower Waitara River and the lower Wanganui still receive considerable use, the latter being a very important facility with a number of clubs which are very strong.

Marathon canoeing: Not as popular in this area as it once was, when the lower Mokau, Waitara and the Wanganui below Taumarunui were used. At the moment, only the Taumarunui section of the Wanganui is used. All sites should be preserved as we expect a revival of interest in this sport.

White water canoe racing: Currently utilises the Waiwhakaiho and there is an intention to use the white water length of the Waitara.

Slalom canoeing: Held on the Waiwhakaiho River.

Commercial river trips: Carried out on the Wanganui River by jet boat (two groups) and canoes (two groups) and also by one tramping group which uses jet boats for part of the safari. Jet boat safari trips are also organised on the Mokau and Waitara as demand requires.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

The Wanganui River is the most valued river in the region with people travelling from all over the country, and from overseas, to visit it. The Wanganui is used by all recreational groups, tourist organisations, and competitive sports groups (no substitute).

The Waiwhakaiho is a heavily used local Taranaki river, and the Waitara, between the Manganui River confluence and Bertrand Road, is of great importance as a medium skill river (no substitute).

The Mokau is of value as a scenic river.

The Manganui-A-Te-Ao is also important scenically. It should remain as it is - the last remaining river flowing from the central mountains that has not been interfered with. It is a valuable fishing river and will be of increasing recreational interest once the Tongariro River becomes unusable.

8 MANAWATU

The area covers all those rivers whose catchments drain into the sea south of the Wanganui and north-west of the Orongorongo River (including the Orongorongo River). That is, between the Wanganui River and the line formed by the Ruahine, Tararua and Rimutaka Ranges. The Manawatu River is divided by the Ruahine and Tararua Ranges. Its upper catchment should be considered as being in the Wairarapa area as it is similar in character to the Wairarapa rivers, but the gorge between Woodville and Ashhurst should be considered as a river in the Manawatu because, for the most part, its users come from the Manawatu.

The main population areas are Palmerston North, Levin, and the Paraparaumu-Porirua area, with Wanganui and Wellington, Lower Hutt, and Upper Hutt at the extreme edges of the region. Palmerston North residents tend to use local rivers (Manawatu and Rangitikei) while Wellington/Hutt residents tend to use the rivers in the Tararua Ranges. There is not a great movement of recreationalists within the region other than between Paraparaumu and Palmerston North.

Lakes and harbours are not plentiful and every piece of sheltered water seems to attract heavy usage - the Manawatu River mouth, Lake Horowhenua, and Porirua Harbour, although in recent years weed growth in Lake Horowhenua has restricted use there.

The most important rivers, in use terms, are the Whangaehu, Rangitikei, Manawatu and Otaki Rivers, with the Moawhango River being of importance to canoeists, and the Oroua and Pohangina Rivers being important locally for more passive recreation.

White water: Undoubtedly the best example of white water in the region is the upper Rangitikei above Tarata. In fact, canoeists and rafters come from all over the country to run the Grade 4 rapids on this river. Recent publicity is beginning to give the river an international reputation for its water of high skill demands. This section of the Rangitikei is not suitable for most recreationalists and does not have high use. However, the lower river, below Utiku, is very popular with all recreational groups for its white water of medium skill requirements and dramatic gorge scenery. The Whangaehu was of considerable importance to canoeists as its white water was used for white water racing and for slalom canoeing of international standards, but it was too small for other boating groups. Water extraction for the Rangipo Hydro Scheme has made the river unusable for high quality white water competitions and it is of limited importance for non-competitive use. The Manawatu Gorge is well known for its 'White Horse Rapid' which is of medium to low skill requirements (Grade 2) and should only be considered to be marginally within the category of white water.

Placid water: There are numerous examples of quiet water for recreational use of low skill demands. Most of these rivers, however, do have willow growth problems which can create hazardous conditions. The Oroua and Pohangina are rivers with slow moving currents, but with shingle rather than mud beds. Both are pleasant swimming rivers. The slower current speed renders the willow problems less dangerous. The Kawatau River is of a similar nature and is very popular for picnics and canoeing, although it has a very low flow in summer and is further from population centres than picnickers are wont to travel.

Lakes: Lake Horowhenua is the best known lake within the region but, unfortunately, weed growth has restricted its use.

Wilderness: The upper Rangitikei River is, perhaps, the only river with any semblance of wilderness. The area around Lake Colenso is particularly wild country, and few people ever penetrate into that section of the Ruahine-Kaimanawa Range area. The upper Rangitikei lies within a very rugged area, with dramatic gorge scenery and without thick native bush that is usually associated with New Zealand's wild places. The gorges of the Rangitikei are every bit as scenic as the better-known Wanganui region.

Urban streams: There are a number of high use areas close to urban areas. The canoeists of Palmerston North and Levin are often to be found on the Mangorei Stream (Shannon) or on the Oroua. The Otaki is of particular importance for the greater Wellington area. The Hutt River receives high use with some interesting white water when flowing high, above the Akatarawa confluence. The Wainuiomata River seems to be rather neglected.

Competitive sports facilities:

Power boat racing: There have been events held on the lower Manawatu, but, in general, harbours seem to be preferred.

Jet boat marathon: The Rangitikei River below Utiku is a major section of the annual marathon series, as is the Manawatu which offers splendid spectator appeal on the gorge section.

Rowing: Lake Horowhenua used to be used, but we believe this has now been discontinued. There are no good rowing courses within this region now and most travel to the lower Wanganui.

Marathon canoeing: Three courses are of importance. The Manawatu River from the Ballance Bridge to Palmerston North (Fitzherbert Bridge), also from Palmerston North to Opiki, and the Oroua River Race from the Almadale Swing Bridge to Feilding. The Hutt River has been used in the past, but is now not used for canoe racing.

White water racing: The main course within the region was the short section of Grade 3 water above Collier's Bridge on the Whangaehu River. However, the reduction of water flows now makes the river too low for the course to be of international standards, meaning that competitive white water racers have to travel to the Waikare-Taheke River to experience water of international standard. The White Horse Rapids in the Manawatu Gorge have been used, but these are neither long enough nor difficult enough for serious racing. The same can be said of the Hutt River (upper section) which seldom has sufficient flow to offer good conditions.

Slalom canoeing: The most valued site is the hydro-controlled Mangahao course which, under certain conditions, can meet international standards. It lies on the Mangorei Stream at Shannon. Sites on the Hutt (Akatarawa confluence) and Pohangina Rivers have been used but are of a low order of difficulty and are of training significance only. The Manawatu Gorge has been used also.

Commercial rafting trips: Trips operate on the upper Rangitikei River.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Rangitikei River, particularly the section above Vinegar Hill which is of great importance for all groups of recreationalists.

Moawhango River, or what remains after the hydro scheme has diverted most of its water into the Rangipo Scheme, should be considered a vital part of the Rangitikei.

Manawatu Gorge - a scenic area, much-used, of medium skill requirements.

Oroua and Pohangina Rivers, lower sections.

Otaki River, particularly the gorge area including the Otaki Forks region.

Hutt River, from the water supply weir down to Stokes Valley. Also the lower Akatarawa River.

(*There are no substitutes for any of these*).

9 HAWKE'S BAY-WAIRARAPA

This region stretches from the Mohaka River, south to the Orongorongo River and east of the Ruahine-Tararua Range axis. The main population centres are Napier, Hastings and a line of smaller country towns in the Wairarapa (Dannevirke, Woodville, Pahiatua, Masterton, Greytown, Martinborough and Featherston). However, the population of the Wellington-Hutt region, and of Palmerston North, move into this area for their recreation.

Riversdale Beach is a holiday recreation resort patronised by people throughout the district and from the Palmerston North and Wellington areas. On the whole, there is not a great selection of rivers within the Wairarapa and most people go north of the region to the Ngaruroro and Mohaka Rivers, both of which are extremely popular recreational assets.

White water: Unlike the East Cape and Bay of Plenty regions, the Hawke's Bay-Wairarapa region does not have a great selection of rivers offering skilled water for boaters. People in the southern section of the region tend to use the Rangitikei River and the Manawatu Gorge. However, those boaters in the northern section of the region have the Mohaka and Ngaruroro Rivers which are highly thought of. Many Napier residents use the Waikare-Taheke River. The Ngaruroro suffers from inaccessibility and is too small, in the gorge region, for good jet boating. Canoeists and rafters are the real users of the upper section where the best water is to be found. There are some rapids in the Waiohine River, but they do not reach Grade 3 difficulty.

Placid water: Undoubtedly, the Ruamahanga is the most heavily used river of low skill requirements and is a popular jet boating river. The upper section of the Mohaka is also a popular placid float for rafters and canoeists, but its distance from demand and its wilderness aspect tends to restrict user numbers. The lower Ngaruroro and Tukituki Rivers are placid and used, but both are lined with willows which tends to make them hazardous when running above normal level. At normal levels the rivers seldom have sufficient depth over the shingle banks to allow good boating.

Lakes: There is neither a good selection of lakes, nor good harbours in the region. Lake Wairarapa receives considerable use partly because of a lack of alternatives. Many river estuaries are used (Mohaka, Porangahau, Akitio, and Whareama Rivers) but these are limited in size and are muddy at low tide.

Wilderness: Two rivers with outstanding wilderness qualities exist in this region - the Mohaka and the Ngaruroro. The Mohaka is the larger and has a greater variety of water type (skill requirements). It is also accessible at a number of points and yet retains its wilderness qualities. Unfortunately, the attitude of landowners in the very upper catchment of the Mohaka is a limiting factor. The Mohaka is a popular rafting river (upper region) and rock hounds tend to be numerous in the middle reaches. (There are fossil remains of some note). Canoeists are to be found between the Napier-Taupo Road and the sea, although the section down to Willow Flat has rapids of higher skill requirements (Grade 3). The Ngaruroro, on the other hand, has more spectacular scenery, is more isolated and has more difficult rapids but, being smaller, is restricted to rafters, canoeists, and boaters with smaller craft. Jet boaters can, and do, use the river but for no great distance up into the gorge. The Mohaka, because of its variety and size, is a better candidate for preservation, although very different in character from the Ngaruroro with its harder rock types. (The Mohaka has a great deal of papa mudstone rock).

Urban streams: In the Wairarapa most rivers tend to have a bad willow problem and are muddy. The northern rivers are generally of shingle, wide and shallow, also with a willow problem. The Waiohine and Waingawa are used to a great extent, particularly by Featherston and Masterton residents. Hastings and Napier people use the Ngaruroro and to a limited extent, the Tutaekuri. The upper Waipawa has been used, but not extensively. In the south a picnic spot on the Tauherenikau is extremely popular.

Competitive sports facilities:

Power boat racing: Lake Wairarapa, lower Ruamahanga River.

Jet boat marathon: Ruamahanga River.

Rowing: Lower Ruamahanga River.

Marathon canoeing: None at present although the Ruamahanga River has been used in the past.

White water racing: None, although part of the Mohaka could be so used.

Commercial rafting trips: Are held on the Mohaka and are particularly well patronised.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Mohaka River for a wide variety of user groups and skill demand, also a semi-wilderness trip and offers a multi-day expedition trip.

Ngaruroro River for a wilderness trip of medium to high skill requirements, and offering the best white water in the region.

Waiohine River, scenic, quiet with some rapids.

Ruamahanga River, placid with wide variety of user groups. Easily accessible.

(*There are no substitutes for any of these*).

10 TAUPO REGION

The Lake Taupo catchment. The only really significant river in this region is the Tongariro River which, although retaining only a token flow for fishermen when the Rangipo Scheme is finally commissioned, does at present cater for all recreational needs in the area with boaters attracted to the gorges from all over the North Island. On completion of the scheme the only accessible river with any rapids will be the Kuratau, but this is exceptionally small and only marginally usable by canoeists - it is controlled by a small hydro scheme and its lake is rather bleak and windswept. The region is particularly important for fishing and is a tourist drawcard. There are few good rivers remaining in the Lake Taupo catchment to offer a selection for preservation.

11 NELSON

The Nelson region is that area which includes a number of small west coast streams north of Kahurangi Point to Cape Farewell and all the streams of Golden Bay and Tasman Bay as far north as the Whangamoa River mouth. The main population centre is Nelson city with the minor towns of Motueka and Takaka.

The main rivers in this region are the Aorere, Takaka, Motueka, and Waimea, and these rivers seem to cater for most river recreation. Some canoeists and most jet boaters travel beyond the region to the Buller or Wairau Rivers. (Jet boaters are hampered by rigidly imposed speed restrictions on **all** rivers).

White water: There are three rivers offering good white water in this region; all are very small and are not usable year round, even by canoeists who require the least water volume of all recreational groups. The upper Takaka, the Baton, and the Wairoa Rivers are the best with some good water in the Aorere, but this is of a lower skill requirement and is too distant from the main residential area. (Takaka Hill intervenes and is a discouraging factor for many boaters). The Wangapeka River has milder water but is usable for a greater percentage of the year. The Wairoa is particularly valued for its proximity to Nelson city. The Lee is popular for its white water but needs flood levels to give usable white water.

Placid water: The Motueka is particularly popular for its quiet water and beautiful swimming holes. In midsummer it, and the Aorere, are the only boatable rivers in the region, and the Aorere is rather distant; consequently the Motueka River is highly valued as a recreational resource. The Waimea is very shallow for most of the year and irrigation almost brings it to a stop in midsummer - it is seldom boated.

Lakes: Nelson Lakes National Park caters for most lake recreation in the region, although it lies outside the boundaries we have drawn for this region. The Nelson Haven, Mapua, and Motueka inlets, and Abel Tasman National Park cater for sheltered water recreation, although the first three all have very strong tidal currents. Water-skiing is centred at Monaco, a tidal inlet, and also occurs at Kaiteriteri Beach. There is no good sheltered lake for competition rowing or for flat water sprint canoe events but there does not seem to be a great demand for such usage. However, a proposed dam on the Maitai River could offer such a facility.

Wilderness: There is no wilderness river in this region.

Urban streams: Nelson city has two rivers of great demand for general recreation - the Maitai and the Wairoa/Lee. The Maitai is very small and shallow and is going to be required in the near future for domestic water supply. The Wairoa/Lee Rivers are particularly popular and offer recreation for a wide range of activities. However, there are proposals afoot to dam these rivers to supply irrigation water Although further from the city, the Wairoa is preferred as a recreational resource, over and above the Maitai, because of its larger size and the presence of deep pools ideal for swimming.

Competitive sports facilities:

Nil, although there have been canoe slalom events on the Wairoa and jet boat rallies on the Motueka (with a temporary lifting of the speed restrictions).

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Wairoa River is the most used river in the region and offers the greatest range of recreational activities.

Motueka River is required for its placid water and, together with Baton and Wangapeka Rivers, can offer a wide range of conditions for skill.

Aorere River would be an adequate substitute for the Motueka except that it is so distant from the population.

Takaka River is similar to the Wairoa but is not a substitute because of its distance from Nelson.

12 MARLBOROUGH

The Marlborough region covers the coastline and river catchments from Croisilles Harbour east to Cloudy Bay and south along the coast to Kaikoura. The main rivers in this region are the Pelorus, Wairau, Awatere and Clarence, all of which tend to be very dry in summer and flow through tussock country for the most part, except for the Pelorus catchment.

The main population centres are Blenheim, Picton, and Kaikoura, but most boaters using the Marlborough rivers are from Nelson and Christchurch along with many holiday boaters from the North Island who come to the Sounds, but who may travel further inland and use the rivers. (Refer to the Marlborough pilot recreation study undertaken by the Department of Lands and Survey).

White water: Apart from the Clarence, there is little white water in the region, and few rivers that are boatable year-round. The Rai has a number of small ledge falls but these are easily drowned out with flows slightly above normal. The Wakamarina River provides exciting water at very high flows but generally is far too low, even for canoes. The Pelorus has easy rapids (Grade 2) which should not be classified as white water. The upper Wairau has a number of easy rapids, but by far the best white water is to be found along most of the length of the Clarence. No rapid exceeds Grade 3 and consequently the river is not restricted to a hardy elite few with the necessary skills. In some respects the Clarence is experiencing a 'boom' in user numbers (rafters, canoeists, and jet boaters) and it may become the 'Wanganui of the South'.

Placid water: The Pelorus and Wairau are unquestionably the best examples of quiet water for boaters. Probably the lower Wairau is of greater value because of its size, but the Pelorus is noted for its scenery. The Pelorus Bridge picnic and camp site is of particular value.

Lakes: The lower Wairau offers lake-like conditions, but most sheltered water boaters use either the Sounds or the Nelson lakes. The Sounds offer ample scope for most boaters and

canoeing in the outer Sounds area is taking some of the pressure off the Clarence and the Nelson lakes area.

Wilderness: Although the tussock country of the Clarence Valley is not normally associated with the term 'wilderness', we tend to classify it as such because of its remoteness from obvious habitation. It remains in a natural state and the rugged gorges of the lower river region tend to lend an atmosphere of wilderness in the real sense. Scenically, the river is very different from west coast rivers and is the most scenic of all the east coast South Island rivers of similar type (alluvial shingle, gorges, and tussock, beech, and manuka vegetation types).

Urban streams: Blenheim people do use the Opawa Stream to a small extent, but by far the preferred area for recreation is the lower Wairau River which experiences the second greatest number of people per kilometre in the whole of New Zealand as far as user numbers are concerned. (The lower Waimakariri has slightly higher user numbers while the Wanganui (North Island) has the highest **boating** user numbers).

Competitive sports facilities:

Power boat racing: There used to be some power boat racing on the lower Wairau; however, the Nelson lakes now seem to cater adequately for this sport.

Jet boating: Primarily on the Wairau River for rallies, not in the marathon racing series.

Slalom canoeing: Has been held on the Pelorus but this site has not been used for some time. The lower Clarence would make an ideal site for both slalom and white water racing.

Commercial trips: Outward Bound groups use the Wairau, Pelorus, Wakamarina, and Rai Rivers extensively.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Clarence River from the Acheron confluence to the sea. There is no adequate substitute offering such extensive lengths of moderate white water, wilderness, and expedition facilities.

Lower Wairau River.

Pelorus River at Pelorus Bridge and the Rai from Rai Falls.

13 NORTH CANTERBURY

From Kaikoura to Banks Peninsula (inclusive). In this region Christchurch is the dominant population area with its people using whole of the region, even for single-day recreational trips, as well as travelling further to Marlborough, Nelson, and Westland for weekends and holidays. The main rivers are the Waiau, Hurunui and Waimakariri.

White water: Unquestionably, the Maori Gully section of the Hurunui offers the best white water (Grade 3). The Leslie Hills section of the Waiau and the Waimakariri Gorge do offer some white water, but these rapids are very mild and of no great interest to experienced boaters. The Ashley Gorge and the Okuku are sought out when water levels are flowing high, but these rapids are more difficult (Grade 3 +) and are restricted to smaller craft (canoes and small rafts).

Placid water: The lower Waimakariri has the highest use in the country, for all recreational activities. The lower Hurunui and Waiau Rivers are similar but smaller, too shallow in summer, the Waiau particularly so with the large irrigation scheme drawing water off at Marble Point.

Lakes: Banks Peninsula and Lake Sumner take the main brunt of sheltered water boating. Lake Sumner is rather out of the way, yet is still very popular.

Wilderness: There are no good examples of wilderness-type rivers although the Waimakariri River Gorge is close to being a wilderness trip. However, its length would hardly qualify for classification as a wilderness river.

Urban streams: The Avon takes considerable recreation numbers, particularly in the region of the Botanic Gardens.

Competitive sports facilities:

Power boat racing: Banks Peninsula harbours.

Jet boat marathon racing: Waiau River and Waimakariri River.

Rowing: Avon River (Kerr's Reach).

Marathon canoe racing: Avon River.

Slalom canoeing: Hurunui River (national competitions).

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Hurunui River - Maori Gully (substitute Ashley Gorge, although this is far inferior because of the size of the river).

Waimakariri Gorge and lower river.

Avon River.

14 SOUTH CANTERBURY

South Canterbury is that area of the east coast of the South Island extending from Banks Peninsula (Selwyn River) to Oamaru, including the Waitaki Catchment. The main population centres are Ashburton, Timaru, and Oamaru with most recreationalists coming from Christchurch, and Dunedin people coming north into the Waitaki region. The main rivers are the Rakaia, Rangitata, and Waitaki.

White water: The Rangitata Gorge is well known for its boisterous water, but this is graded too high for the average boater and is not used to any great extent; it cannot be jet boated. The Rakaia Gorge also has a reputation for rough water which it certainly does not deserve as it is quite placid. (The wind is bad in this gorge). The best water used to lie in the Ohau, Tekapo, and Pukaki Rivers, but these have gone, or are about to go, into the Upper Waitaki Hydro Scheme. The only white water left in the Mackenzie Basin is in the Ahuriri River; and the Rangitata River, between the gorge and Peel Forest, also has white water. The Hooker has good Grade 3 water and is used by rafters and canoeists, but not by jet boaters. Its water is normally considered to be too silt-laden and cold for most boaters. The Ashburton Gorge really needs high flows to be usable.

Placid water: The lower reaches of most rivers offer good, quiet water with the Temuka (Hae Hae Te Moana) River of some note. The Ashburton and Selwyn Rivers tend to be too shallow for use in their lower lengths. The Rakaia and Rangitata Rivers tend to be shallow and windswept, with gorse and broom making the area unpleasant. The Rakaia Gorge is really placid water and is a popular trip when the wind is not blowing too strongly.

Lakes: Lake Ellesmere is now seldom used as it is so shallow and has a weed growth problem. Small mountain lakes like Lakes Pearson and Lyndon are used for water-skiing; however, the most popular is Lake Tekapo. The hydro lakes (Benmore, Aviemore and Waitaki), despite the launching and mooring facilities, are not as much used as most people would seem to believe - all are rather barren in appearance, as is Lake Pukaki. Lakes Ohau and Tekapo seem to be used in preference to all other lakes in the region.

Wilderness: None.

Urban streams: The Opihi and Hae Hae Te Moana Rivers are popular local rivers for Temuka and Timaru residents with the Orari getting some use from Geraldine residents who do not wish to travel to Peel Forest and the Rangitata River (a very popular picnic spot). Oamaru people use the lower Waitaki.

Competitive sports facilities:

Jet boat marathon racing: Rakaia Gorge.

Marathon canoe racing: Rangitata-Highbank Water Race.

White water canoe racing: Rangitata River (to Peel Forest), and the Ahuriri River.

Slalom canoeing: Rangitata River (at irrigation canal intake - international events). Ahuriri River (South Island championships).

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Rangitata River - the gorge and river down to Peel Forest (substitute Rakaia Gorge but this is quite a different type of river).

Hae Hae Te Moana River at Temuka.
Ahuriri River above State Highway 8 turnoff.
Hooker River.

15 OTAGO

From the Waitaki catchment down to, and including, the Clutha River catchment. The main population centre is Dunedin and recreationalists from this city move throughout the region, even in mid-winter. Other smaller towns are Wanaka, Cromwell, Alexandra, Queenstown, Roxburgh, Milton, and Balclutha.

The main focus for recreation is the Cromwell Gap on the Clutha River, and the nearby Kawarau and Shotover Rivers. The other most used rivers are the Taieri and the Pomahaka.

White water: The Shotover is undoubtedly the best usable river for white water. The Kawarau has dramatic rapids at Nevis Bluff and at Sargood's Weir but boaters have yet to attempt them - they are a tourist spectacle and are not of recreational significance. The Hindon Gorge of the Taieri River also contains good white water but it is not as good as the rapids found below Skippers on the Shotover. A short length of the Matukituki River also contains rapids.

Placid water: The lower Clutha below the Roxburgh Hydro Dam is essentially flat water and is scenic in places.

Lakes: The tidal section of the Clutha is lake-like; however, Lakes Hawea, Wanaka, and Wakatipu cater for most recreation and there is some boating on the Roxburgh hydro lake and on Lake Mahinerangi. There is no boating on the Falls Dam Lake (Manuherikia River).

Wilderness: The rivers of the upper Clutha catchment are all wilderness in character (Wilkin, Matukituki, Shotover, Rees, Dart, and Greenstone). However, few are accessible by boaters other than jet boaters.

Urban streams: Residents of Wanaka, Cromwell, and Alexandra all use the Clutha River for most recreation, while Queenstown people use the Shotover. Dunedin people have the Waipori for picnicking, but the river is not large enough for boating and for these activities Dunedin people use the Taieri River near Outram.

Competitive sports facilities:

Power boat racing: Lake Mahinerangi.

Rowing: Lake Waihola.

Marathon canoe racing: Clutha River - Cromwell to Alexandra.

White water canoe racing: Little at present although the Taieri would be a suitable site.

Slalom canoeing: A site on the Pomahaka has been used a little. There are also suitable sites on the Taieri River.

Commercial trips: Rafting on Kawerau, Shotover, Matukituki Rivers. Jet boats on the Shotover and Kawarau Rivers.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Clutha River - Cromwell Gap, also from Luggate to Alexandra.
Shotover River - the entire river.
Taieri River - from Sutton to Outram.

16 SOUTHLAND

The Southland region comprises all those rivers south of the Clutha catchment and all of Fiordland as far north as Milford Sound. The main population centres are Invercargill, Gore, Riverton, Winton, Wyndham, Lumsden, and Te Anau. Most recreationalists come from either Dunedin or Invercargill. The principal rivers are the Mataura, Oreti, Aparima, Waiau, Mararoa, and the Wairaurahiri.

White water: Most rivers in the Southland area become very low in summer when there is the greatest demand for river recreation. At this time of the year there is little white water remaining in the area except for the Wairaurahiri which is a little too inaccessible for most boaters. The Mararoa has good rapids when flowing high, but most boaters travel north to the Clutha and Shotover for skilled water.

Placid water: There are many examples of quiet flowing water with the Mataura and Waiau (Te Anau to Manapouri) being the best examples and the most frequently used rivers.

Lakes: There are ample lakes and most are often used. Te Anau and Manapouri are the most popular with Monowai and Hauroko increasing in popularity. The Mavora Lakes are popular for picnicking because of the tranquil nature of the area.

Wilderness: Probably the Wairaurahiri River is the best example of wilderness. However, access problems at the river mouth tend to limit its use.

Urban streams: The Mataura River is used by Gore residents and some Invercargill people use the Oreti despite the shallow water and willow problems.

Competitive sports facilities:

Power boat racing: Lakes Manapouri and Te Anau have been used in the past but not very often.

Slalom canoeing: Mararoa River below the Mavora Lakes.

Commercial trips: Jet boating and rafting on the upper Waiau River.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Wairaurahiri River is of value for its wilderness aspects and moderate skill requirements.
Upper Mavora River and Mavora Lakes are of value for their scenic qualities and white water.
Upper Waiau River for its scenic qualities, its placid nature and for its ability to offer water for all recreational groups.

17 SOUTH WESTLAND

South Westland is that region extending from Milford Sound in the south to the Hokitika River in the north. The population of this region is evenly scattered along the narrow coastal strip of flat land but most recreationalists come into the region from outside (Christchurch, Dunedin, Invercargill, with a large percentage from North Island holiday-makers and international tourism). Rivers of note are the Arawata, Waiatoto, Haast, Karangarua, Whataroa, and Hokitika.

White water: Almost all South Westland's rivers have sections of difficult white water high in the Alps, but for most rivers the gradient is very steep and the water volume too low for pleasant boating. The best usable water can be found in the Landsborough, Okarito, Whataroa, and Wanganui Rivers. The Okarito is too small for jet boaters, while other boaters find the rest of the rivers a trifle inaccessible.

Placid water: The lower sections of most rivers offer quiet water flowing over braided shingle beds. The Waiatoto and Arawata are both particularly scenic as is the Arawata's tributary, the Jackson. Hall River, flowing between Lake Paringa and the Paringa River, is of particular value, being a quiet, meandering stream with an overhanging canopy of bush. The Hollyford is also of importance.

Lakes: There are ample examples of scenic lakes, although few harbours. Lakes Ellery, Paringa, Mapourika, and Ianthe are the most notable.

Wilderness: Almost all Westland's rivers originate in the rugged wilderness of the Southern Alps, but the Arawata and Waiatoto lie for a significant portion of their lengths within wilderness areas and are the best examples of wilderness rivers. The Waiatoto with its narrower valley is more scenic than the Arawata.

Urban streams: Because of the lack of large urban areas we do not consider any particular river to be of importance as a high use urban facility.

Competitive sports facilities:

Power boat racing: Lake Kaniere which drains into Hokitika River has been used for power boat racing and this is the only

competitive river sport of any importance in South Westland.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Waitoto River (substitute Arawata River).
Landsborough River (substitute Karangarua River).
Whataroa River (substitute Wanganui River).
Okarito River.
Hall River (substitute Jackson River).
Hollyford River.

18 NORTH WESTLAND

North Westland is that region of Westland from Hokitika north to Kahurangi Point. The main population centres are Hokitika, Greymouth, Westport, Reefton, and Murchison. A good percentage of boaters using the region come into the area from Christchurch and Nelson with the greatest concentration on the Buller and Grey Rivers which are the most significant rivers in the region.

White water: The most frequently visited rivers of high skill value are the Buller (below Murchison), the Matakitaki, Arnold, Taipo, and Ten Mile Creek. The Buller and Matakitaki are the most important of these.

Placid water: The lower Buller, the Grey, and the Ahaura Rivers are noted for their high scenic values and placid water and are much visited for these reasons.

Lakes: Lake Brunner is the largest lake and is boated on most frequently. The Haupiri Lakes, Lake Hochstetter, and Lady Lake are the most scenic and all are boated on.

Wilderness: The Karamea River is unquestionably the best example of a wilderness river in the region. However, its rapids are too boisterous for use, being earthquake slip debris that has created natural dams with the river trickling down between the massive boulders. Boating is almost impossible in such conditions, along the lower Buller the main highway tends to be invisible from river level, and road noises tend to be inaudible to the boaters below. Consequently the Buller could be classified a wilderness river, but perhaps a better example is the upper Grey River with its beautiful beech forest.

Urban streams: To the canoeists of Greymouth, the rapids of Ten Mile Creek are the best in the region and few people seem to bother to use other rivers. Jet boaters in this region are to be found on either the Arnold or the Ahaura - both are popular canoeing and rafting rivers too.

Competitive sports facilities:

Power boat racing: Lake Brunner.

Jet boat racing: Lake Brunner.

Jet boat marathon racing: Taramakau River.

Marathon canoe racing: Buller River and Grey River (lower).

White water canoe racing: Matakitaki and Buller Rivers.

Slalom canoeing: Matakitaki River, Crooked River, Taipo River, Upper Buller River - all have been used for national events.

RECOMMENDATIONS: The following rivers or river sections should be protected for recreational use:

Buller River from Owen River to Westport.
Grey River down to Ikamatua.
Ahaura River.
Matakitaki River.
Ten Mile Creek.

19 SUMMARY

To simplify the above network of rivers, which we recommend as being important for protection for their recreational value, we give the list below as being of the **utmost importance.**

North Island:

Motu River.
Rangitikei River, including its tributary, the Moawhango.
Wanganui River, including its tributary, the Manganui-A-Te-Ao.
Mohaka River.

South Island:

Clarence River.
Shotover River.
Grey River, including the Ahaura.
Buller River, including the Matakitaki.
Waimakariri River.

XIII. The case for protection

How important is recreation to New Zealand and to New Zealanders? This particular question is the basis of any suggestion that part of our nation's resources should be put aside for recreation.

One of the strongest arguments against the creation of recreational areas, of National Parks, and such other areas, is that it limits the economic opportunities and alternatives available to the local community. The argument that faces those who lobby for an increase in areas for recreation, is that recreation is non-productive whilst the land that is 'locked up' has a productive value.

These arguments come to the fore when a suggestion is made that a river ought to be maintained in its natural state rather than be converted into a hydro lake, or have its flow reduced for irrigation. It is difficult to affix a monetary value to recreation, and yet it clearly does have a value.

Early in the 1970s it was fashionable to speak of a condition known as 'suburban neurosis' which was said to be a complaint affecting housewives who were housebound with a young family. The theory was that the housewife became trapped within a suburban environment, unable to escape, thus leading to increased nervous tension and ultimately to a mental collapse.

Arnold Toynbee, the noted historian, put forward an interesting thesis that urban-based crime, violence, political riots, and general unrest in our cities have been caused by the inability of urban dwellers to escape the city environment. He pointed to the fact that when city limits move beyond the population's affordable means of locomotion, then problems arise.

Today in New Zealand about 80% of our total population is urban. We have large areas of the countryside in agricultural production that necessitates some degree of restriction on individuals from wandering across the landscape. City folk must be content to look from the roadside.

We have a tremendous shrinking of wilderness areas, and the conversion of state-owned natural bush areas into pine forest where, because of forest management policy and fire risk, individual right of access must be restricted.

From this, we see a large urban population locked out of large areas of countryside by legal and farm management procedures. There are limits to where they can escape to.

Also, the increasing restrictions on transport due to the short supply of motor fuel, the increased cost of transport, and a lack of adequate public transport is confining our population to city boundaries. Unless people can escape their urban environment we might expect increasing discontent; discontent that would cost us dearly.

Perhaps one solution is to allow people to escape from their urban environment through recreation of one sort or another, and, clearly, outdoor 'adventure' type recreation would be the best type of recreation to allow urban pressures to be alleviated. This is only one reason why recreation is important, and we have neither the time nor the expertise to develop this thesis, nor others here. Suffice to say that we believe that recreation is a most important element in maintaining a content urban population.

How important is outdoor recreation, and river-based recreation, as a part of the overall recreation patterns of society? Again, a significant question, and one which we shall not discuss in any depth here. However, given that a prime motivation for recreation is to escape the day-to-day drudgery of earning a living and to escape from the artificiality of urban life, clearly outdoor recreation is important.

The value of rivers as a medium of recreation is that, firstly, here in New Zealand, nobody actually owns the rivers. This means that people are free to travel along them in much the same manner that they may travel along roads. However, rivers have an advantage over roads in that people are not going to be shut in, within a self-contained travelling capsule (the car or bus). To travel by boat is much like travelling by bicycle — the traveller is a participant in the environment, not merely an observer.

The problem with setting aside mountain and bush land as recreational reserves is that you immediately restrict use to people who are fit and capable of travelling within the area. It does require some degree of skill to survive in even the easiest country contained within our National Park system, or State Forest Parks. Some rivers, it is true, require skill in order to negotiate rapids, but most are quiet flowing streams that ask only that floaters can row a boat. No great demands are made on fitness, or the ability to carry even a light pack of gear.

Rivers are a natural path, they leave no sign of habitation as a road does. Rivers enable the average city dweller to float into, through, and out of a wilderness area without his leaving a sign of his passing - not even a footprint!

As we have become a nation of urban dwellers, so there is the need to allow such people to experience the wilderness, and there have been increasing demands by people seeking a wilderness experience. This demand has shown up in the proliferation of tourist ventures taking people into natural areas by jet boat, by raft, and by canoe, and, not least of all, by the increase of trail-bike riding. While we have a system of National Parks, State Forest Parks, Scenic Reserves, and historic places, why do we not have a method of protecting rivers as recreational facilities?

What are the developments threatening river recreational facilities? There are a number:

1 LAND CLEARANCE

There has been, and there is still going on, a rapid destruction of our natural bushland. There seems to be a need to convert native forests into exotic pine forests which have a higher rate of growth and, thence, greater productivity. This has endangered our rivers in three ways:

(a) The initial removal of forest cover has accelerated erosion, leading to rapid silting of our rivers. The first noticeable effect is the reduction of white water rapids in shallow, quiet flowing streams.

(b) Forest management often necessitates restriction of access where formerly there was no such restriction. The fire risk is often the argument used to restrict all access in the summer months which is the very season when people may wish to have access to rivers. Also, pine forests are considered less attractive places to visit than native forests.

(c) It can be shown that pine forest may use up to 25% more water than would the original forest cover. This simple fact can have disastrous effects on water levels in terms of what rivers are boatable, or unboatable.

2 WATER SUPPLY

As urban areas grow, and as New Zealand becomes increasingly industrialised, as agriculture becomes more intensive, so too, the demand for domestic, industrial, and stock water supply increases. Naturally, the demand is for water supplies close to where the water is needed and this has meant that many of our smaller urban streams are rapidly diminishing in size as water is drawn off.

Also, many water supply authorities believe that access into the catchments of domestic water supply areas should be restricted. Consequently, while the needs for recreation are increasing within our urban areas, so, too, our facilities for recreation are decreasing, particularly those close to where the demand is greatest.

Two examples typify this trend. In South Auckland the domestic water supply is drawn off the Hunua Ranges, and the Wellington city supply is drawn from the upper Hutt catchment. Both areas are of increasing recreational importance, and in both areas recreation is being restricted to the very lower, shallow sections of the Wairoa and Hutt Rivers - even the water supply reservoirs have restricted access and residents must only watch while wildlife are the sole recreationalists.

3 IRRIGATION

Irrigation is of considerable economic importance. A farming group has shown that it would have been possible to utilise the whole of the upper Waitaki catchment as irrigation and thus create productivity valued at considerably more than the value of power from the Upper Waitaki Power Scheme. We do not wish to be drawn into the debate as to the best use of the waters of the Waitaki, but merely wish to point out the economic value of irrigation.

As far as recreationalists are concerned, irrigation has two detrimental effects on their activities. Firstly, water is drawn out of the river making the river unusable in most cases. Irrigation canals are not a substitute river, as there is the problem of access to the canals (the canals are owned in a manner quite different from the ownership of riverbeds).

Secondly, the natural hydraulic forces of a river are vastly different from the currents encountered in a smooth-sided irrigation canal. Siphons and intake grids can be potentially extremely hazardous, as are the weirs used to drop water from one level to another.

Another detrimental effect is that the rivers chosen for irrigation are those that lie within rural areas, rather than in the more inaccessible mountainous areas. With the loss of urban streams to domestic water supply or to excessive pollution, often the only other accessible rivers are those in the countryside - and those are the very rivers required for irrigation.

To date, few valuable rivers have been lost to recreation by the construction of irrigation schemes but there are plans. The Manuherikia has been affected, as has the Waiau in North Canterbury.

4 HYDRO-ELECTRICITY

This is, in effect, the greatest danger to the preservation of rivers for recreation. Unfortunately, what is seen to be an ideal river for hydro-electricity generation is also seen to be the best river for recreation. Hydro-electricity requires a reasonable volume of water flowing over a drop in water levels - the very qualities that go to make up a good white water river for rafting, canoeing, and boating generally. As we have discovered, and have pointed out in the previous chapter, we have a surplus of quiet, sheltered water for most forms of boating, but what we do not have is an adequate supply of white water of about the Grade 3 level of difficulty.

The following is a list of proposed hydro sites :—

(a) Large Scale Hydro Development potential:

i Kaituna (Rotorua). Two sites are practical.

ii Motu (East Cape). In the lower reaches there are two schemes, both using 3 dams with possibility for pumped storage.

iii Mohaka (Napier). Several sites show promise. Some are in papa rock that could act as trial embankments for a bigger Wanganui Dam.

iv Ngaruroro (Hawke's Bay).

v Waiau (Waikaremoana). Two small developments downstream of the present hydro site appear possible.

vi Wanganui. At Atene plus various alternatives. Development could be a single or a multi-stage development.

vii Karamea.

viii Mokihinui.

ix Buller. Extra water from the Clarence, Wairau and Rotoiti areas would improve the economics of development.

x Clarence-Waiau-Hurunui. Diversion of the upper Clarence and Acheron water to the Waiau at Hanmer and of the Hurunui below the Mandamus to the Waiau are probably the most promising.

xi Rakaia. Full power development could be associated with irrigation.

xii Waitaki (downstream of Kurow). Output will be determined by the residual flow required in the old river bed.

xiii Clutha. Upper Clutha Scheme F proceeding. A number of possibilities for the lower river.

xiv Grey-Taramakau. A good site at the Brunner Gorge but it would inundate a large amount of land. Diversion of the Taramakau through Lake Brunner and the Arnold River. Also utilise Ahaura and upper Grey by diversion and pumping into Lake Hochstetter.

xv South Westland. The Hollyford is the most promising.

(b) Local Authority Hydro Development:

i Hurunui. North Canterbury EPB.

ii Wairere Falls (Mokau River). Waitomo EPB.

iii Ahuriri. Waitaki EPB.

iv Mangamako (Rangitaiki). Bay of Plenty EPB.

v Ongarue. King Country EPB.

vi Karioi. King Country EPB.

(c) Sites under investigation:

i Otaki.

ii Manganui-A-Te-Ao.

iii Lake Matiri and the river.

iv Awatere.

v Ngaruroro.

vi Kaituna.

vii Taieri Falls.

viii Kaihu.

ix Lake Kaniere.

x Ngakawau.

xi Waitara.

xii Wairoa/Lee.

xiii Waikohu.

xiv Ruakituri.

These lists comprise a total of 35 different schemes. We are not suggesting that all these schemes will go ahead in the near future, but as the bulk electricity rate increases, those schemes once considered to be uneconomic become attractive.

If a local power board can generate electricity at a rate cheaper than the cost of purchasing power from the national grid then it is likely to push ahead with its local scheme. Most of the 35 schemes affect our most valued rivers - compare the above lists with those in the last chapter, or in the summary of results, and it becomes obvious why we regard the introduction of some protective measures as being important.

5 DEVELOPMENT OF NON-MAORI LAND

We have already mentioned the clearing of land, the deforestation and other developments that threaten the interests of river recreationalists. Most of this development is occurring on State-owned property or private land. Farm development is accelerated by the need to expend money on capital development as a means of keeping farm taxes down.

However, there seems to be a slower rate of development on Maori-owned land, possibly because the Maori people have always had more feeling for the natural environment and have not been so keen to exploit it as have their Pakeha neighbours. There is, and will be, a problem in this imbalance of development. When we do come to designate natural areas for protection there will be a great imbalance between Pakeha and Maori lands suitable for designation. The longer it is left, the greater the imbalance.

There is a great deal of sensitivity towards Maori land, a sensitivity that we believe is not likely to lessen, and as conservationists cast their envious eyes increasingly towards Maori land, this matter will become more sensitive.

The whole question of the need for protection of our rivers has been admirably summed up by Derek Leather in the February 1979 issue of *Soil & Water* (Volume 15, Number 1, pages 10 to 13) and also in the Commission for the Environment's discussion paper on wild and scenic rivers.

XIV. Possible methods of protection

Before we begin to discuss possible methods of protecting rivers for their recreational or scenic value, it would be worthwhile to reflect upon exactly why protection is required. The need will determine the method.

In the previous chapter we touched upon some of the issues causing recreationalists and conservationists to lobby for the protection of rivers in their natural state. Briefly, we can point to a psychological need to escape from urban environments. Arnold Toynbee's thesis is that entrapment in an urban environment tends to create civil disturbances; also, many psychologists point out that urban life is a mere 5000 years old and that the human animal has not yet adapted sufficiently to live comfortably in this environment. Hence the occasional need to escape.

Escape is limited, however. The land has been developed and former wilderness areas are now devoted to forestry and farming operations that will not always allow for the casual city visitor to wander at will. To a great degree, the remaining wild areas are restricted unless the visitor is very fit and has a week or two at his/her disposal to get into them. In some areas (national parks, for example) access by motorised vehicles (jet boats, helicopters, and trail bikes) is restricted, leaving the only means of access a good pair of boots.

The river, on the other hand, provides ease of access for the less fit; and because a rafter or canoeist can travel up to 50 kilometres a day on a river the number of campsites, and hence the impact on the environment, is minimal. Rafters do not need as long an apprenticeship in skill building as canoeists do. Then again, aquatic sports are on the increase worldwide and it may well be that in a few years' time river recreationalists will outnumber trampers. The river, by nature of its twisting bed, tends to hide each party from the one behind. In fact, you only need to be one minute behind the party in front and on most rivers you would never see them. Rivers have a tremendous capacity to offer large numbers of people recreation without those large numbers being apparent.

When we come to talk about 'protection' for the recreational and scenic value offered by a river, we consider a number of aspects:

- Right of access.
- Maintenance of a navigable flow.
- Maintenance of a recreationally suitable quality of water.
- Pleasant non-urban surroundings.
- The availability of the resource for both private use and commercial concessions.

Of the factors that need protection, those of water quantity and preservation of the scenic aspects are the most important. Right of access will not often be a problem, and where the top end of a river has no vehicle access, it may be necessary to ensure that recreationalists will be able, if they so desire, to use helicopter or fixed-wing aircraft to drop off their equipment. In many ways, the right of access is something that concerns the management policy of resources once a protection system has been implemented. In a like manner, water quality is something which can be maintained through management methods.

Water quantity, however, has often been translated into terms of 'minimum flow'. The term 'minimum flow' has an unfortunate effect on the water planning authorities who tend to become involved in a problem of measuring the absolute minimum volume of water that will allow a recreationalist to navigate any given section of water, or in calculating the absolute lowest flow that a river could ever drop to, and then setting the minimum flow at that level. If this is to become the practice, then the allocation of minimum flows will not protect recreational interests, nor protect the scenic qualities of the river.

A recreationalist's requirement is not merely that of the physical ability to navigate a given river section; such an idea is far too simple. What is required is a flow that lies somewhere between the minimum navigable level and the flow that provides the optimum flow characteristics sought by the various recreational groups.

Every resource invites a desire on the part of the recreationalist to use the resource, and the strength of that desire depends upon the quality of the water (in relation to the challenge it presents; not quality in terms of pollution) and upon the attractiveness of the scenery. As the river flow drops, the challenge factor in the quality of the recreation offered by the white water (or rapids) diminishes; and as the flow drops even more, shallow and slow moving water provides for a rise in frustration on the part of the recreationalist, just as a lack of fish will frustrate the angler.

What is needed then is not a measurement of minimum navigable flow but a measurement of recreational frustration levels, because if the frustration level of the user exceeds the desire to use the river in the first place, then recreational use will drop off.

It is worth noting here that distance and access are as important in calculating frustration as are the stream bed geometry and flow volume. For example, the cost of transport means that a boater is more likely to use a river closer to home than one further away, unless exceptional conditions are provided. That is, frustration levels are more sensitive the further you move away from urban areas and minimum flows would need to be set very near to the optimum levels on distant rivers if the resource is going to be used.

The exception to this is with rivers of extremely high scenic values, rather than high challenge values, for which the value of the river depends less upon actual flows, and frustration will arise only at the margin of navigability.

At the present time, most of the discussion concerning protection of rivers has centred around the need to protect the flow of the river, or to maintain a minimum flow. John Mackay, a noted rafter, in his article in the October 1979 issue of *Soil & Water*, "Minimum flows - red herrings for recreation", pointed out the problems with such a system, particularly with the way a suitable minimum flow was calculated. However, provided that minimum flow is not seen as being minimum navigable flow, such a procedure would be adequate for those rivers which our survey has ranked as being of high recreational value but with a medium to low scenic value; this would be particularly true of rivers near to large urban areas, as explained above.

The preservation and protection of a river valley's scenic values are, however, more of a problem as there is more than one controlling organisation involved. The National Water and Soil Conservation Organisation is the sole organisation concerned with water flow but it has only limited authority over land areas, and then only for soil erosion control and maintenance of the river ecology.

As we have mentioned, whilst small urban streams could be protected by the setting of a minimum flow at sufficient level for meaningful recreation (remembering that where scenic aspects are low there is a need to set flows of sufficient volume to maintain the 'white water' characteristics), rivers of scenic

value could be protected by a co-ordination of existing legislation.

As an example, if it is desired to protect a given section of river you could:

1 Set a minimum flow for recreation by initiating a water allocation plan with the prime objective of preserving the river in a natural free-flowing state.

2 Water quality would be maintained by a water classification under the Water and Soil Conservation Act.

3 The land along the river banks could maintain its natural scenic qualities if it were Crown land by being gazetted as a 'Wild and Scenic River Reserve' under the Reserves Act. If desired, a board could be appointed to manage the landscape under this Act.

4 If the land were State forest, a 'Wild River Protection Zone' could be set out in the forest management plan.

5 Privately-owned land could be protected either through the covenants organised by the Queen Elizabeth II National Trust, or under the town and country planning procedures, by which the land could be zoned as a 'River Protection Zone' in a district scheme.

However, in order to co-ordinate such designations it would be necessary to make one controlling organisation responsible for initiating the co-ordination of the designations, and also to conduct public discussion that would result in one particular river, rather than another river, becoming the candidate for protection.

It could be the Commission for the Environment, the Queen Elizabeth II National Trust, or perhaps a special authority similar to the National Parks Authority, which promoted the designations. Separate legislation to establish this authority would be required.

Unfortuantely, this proposal to provide protection via a unification of existing legislative procedures would not be sufficient to protect New Zealand's half-dozen or so particularly valuable wild and scenic wilderness rivers. We are thinking here of rivers such as the Motu, Wanganui, and Clarence, which come into our 'category A' rivers. Protection under water allocation plans, under forest management plans, etc., can be reviewed frequently, and those groups promoting a river for protection would find themselves needing to be constantly alert to justify the continued existence of the protection measures when major proposals for development are put forward. For the few uniquely wild and scenic rivers, a more permanent and less easily withdrawn protection would be required; something akin to the way land is protected as a national park. Even here, Parliament could remove protection if it were in the national interest to do so. This is only right and proper.

What we are proposing, therefore, is a three-tier system where:

1 Small, local rivers of recreational value would be protected by the setting of a minimum flow by a water allocation plan.

2 Local scenic rivers would be protected by a minimum flow plus a co-ordination of planning mechanisms such as gazetting as a reserve or zoning under the town and country planning procedures.

3 A few unique rivers would be protected by Act of Parliament in a permanent manner, as are national parks.

The first two tiers could be operated immediately as there is already sufficient legislation in existence to provide this protection. The top level, however, will need a separate Bill to be introduced into Parliament.

What would this new legislation look like? The legislation enacted to set up the New Zealand walkways scheme came initially from overseas examples but had, of course, to be tailored to fit the local scene. The USA concept of wild and scenic river protection is often cited as the model on which we should base our own protection policy. The USA system was developed for investigation of vast areas and the classifications they used may not fit the much smaller resource here in New Zealand. While we can take broad principles from overseas legislation, to take details from it may well be inappropriate.

Provided that we see protection as being in a number of degrees, and here we advocate three levels, then an all-embracing piece of legislation to cover all levels does not seem to be warranted. What New Zealand misses is, firstly, a desire on the part of the resource managers to use existing legislative provisions to protect rivers; and secondly, legislation for the top category of rivers which needs an act very much like the National Parks Act.

Bibliography

The following is a short list of relevant material for further reading. To keep the list brief, only the more important works are included.

The challengers; British and Commonwealth adventure since 1945 / by Ingrid Cranfield — London : Weidenfeld and Nicholson , [1976]. 298 p.

Guidelines for evaluating wild, scenic and recreational river areas proposed for inclusion in the national wild and scenic river system under section 2, Public Law 90–542 — [Washington] : US Department of Interior and US Forest Service , 1970. 11p.

Landscape aesthetics / by Luna B. Leopold *in* Human identity in the urban environment / edited by Gwen Bell and Jaqueline Tyrwhitt — [Harmondsworth] : Penguin , [1972]. 656 p.

Landscape assessment ; values, perceptions and resources / edited by Ervin H. Zube, Robert O. Brush [and] Julius Gy Fabos — Stroudsburg (Pennsylvania) : Dowden, Hutchinson and Ross, [1975]. 367 p. ISBN 0–470–98423–6.

Outdoor-recreation planning; Marlborough pilot planning study / [by] W.A. Robertson, B.A. Tubb, J. Edmonds [and] P.F. Hardy — Wellington : Department of Lands and Survey , 1977. 144 p. Information Series No. 3 ISSN 0110–1226.

Outdoor-recreation planning symposium proceedings — Wellington : NZ Council for Recreation and Sport , 1978. 225 p. ISBN 0–477–06400–0.

64 New Zealand rivers, a scenic evaluation / [by] Graham Egarr, Jan Egarr [and] John Mackay — [Auckland] : NZ Canoeing Association , 1979. 34 p.

Swimming free; on and below the surface of lake, river and sea / by G. F. Dutton — London : Heinemann , [1972]. 154 p.

The Ulysses factor; the exploring instinct in man / by J.R.L. Anderson — [London] : Hodder , [1970]. 352 p.

Visual riverscape classification / by Boyden Evans *in* The Landscape, Journal of the New Zealand Institute of Landscape Architects Inc., No. 2 — [Christchurch] : the Institute , Dec 1976.

Water and landscape, an aesthetic overview of the role of water in the landscape / [by] R. Burton Litton [and others] — Port Washington , NY : Water Information Center , [1974]. 314 p. ISBN 0–912394–10–2.

Wild and scenic rivers / edited by Derek Leather *in* Soil & Water v 15 no. 1 — [Wellington] : MWD for NWASCO , Feb 1979. p9–22.

Wild rivers / by John Mackay — Auckland : Hodder , 1978. 174 p. ISBN 0–340–23664–7.

Wildwater : the Sierra Club guide to kayaking and white water boating — San Francisco : Sierra , 1978. 329 p.

Appendices

Appendix I Submissions of the New Zealand Canoeing Association to the Ministry for Recreation and Sport for a grant to carry out the survey and related work. Both the original and the amended applications are given.

Appendix II The proposed Wild and Scenic Rivers Bill put forward by the canoeing association and which received the support of a number of other recreational groups concerned with river and river environ recreational pursuits. The Bill shows how protection could be achieved within the framework of existing legislation.

Appendix III Survey costs.

Appendix I

Original application

APPLICATION FOR SPECIAL GRANT under the National Projects Scheme of the Recreation and Sport Programme 1976/77

GRANT REQUESTED $7500

PURPOSE OF GRANT To carry out a survey of all New Zealand rivers capable of being used for recreational purposes to set criteria and to identify rivers that should be set aside and reserved in their natural state for such use, and to formulate legislative proposals that would guarantee the preservation of chosen New Zealand rivers.

New Zealand Canoeing Association Inc.
P.O. Box 5125
Auckland
(Signed) R.S. Hawken, *Secretary*

1. Introduction

1.1 The need for the study

New Zealand's rivers are a priceless and irreplaceable resource. Their recreational, ecological, and economic value affects all New Zealanders to some degree and the pressures for their use will no doubt grow as our population increases. The need to assess and determine competing uses of natural water is already recognised under Government legislation (Water and Soil Conservation Act 1967) but it stops short of assessing river use in a national context.

However our waterways are becoming increasingly modified by man's activities and the official encouragement given to local electric power boards to build small schemes on rivers within their boundaries now poses a very real threat to river uses other than those related to electricity production.

This was recognised by Mr Lindsay Poole, the Chairman of the Soil Conservation and Rivers Control Council when he said "There is a tendency for electrical administrations to consider rivers as being solely at their disposal for power purposes. Local electrical authorities must acknowledge the multiple uses of rivers to allow for all interests in their planning."

"The National Water and Soil Conservation Organisation has encouraged regional water boards to prepare allocation plans for the water resources in their areas. This information could be made available to power boards to assist in their investigations."

"Water supplies, recreational uses, metal extraction, the replenishment of underground natural reservoirs, control of floods and bank erosion, the effects of altered flows, and other environmental considerations all demand attention and need to be studied in relation to one another."[1]

Hydro schemes are obviously in direct conflict with other uses of a river and its immediate environment.

Such uses as farming of the surrounding land, irrigation, scenic attractions, recreational value, wildlife refuges, and fishing should clearly be balanced against the advantages of a hydro-electric scheme, preferably within a national context, before a decision is made as to how a river should be used.

The multiple use of rivers is obviously a desirable objective but it should be complemented by the systematic preservation of chosen rivers and waterways in near pristine state. If this is not done it is forseeable that hydro schemes may be installed river by river all around the country until there are, for instance, no canoeable rapids left. While most people would agree that all rapids cannot be preserved for canoeists, some clearly should be.

There is, then, an urgent need to formulate a policy at Government level to preserve rivers for vital national conservation and recreation purposes that would balance the present policy of damming rivers for hydro-electricity purposes.

The proposed study would provide a national survey on the use of rivers for canoeing, boating, or rafting and by setting detailed criteria for evaluating recreational rivers and assessing the rivers in accordance with those guidelines, essential information for setting up any National Waterways System would be produced and made available to interested parties.

1.2 Government actions to date

Both the Department of Lands and Survey and the Commission for the Environment have carried out preliminary work on a pilot study for a National Waterways System. The Minister for the Environment has also recently stated that Government is considering applying the national park concept to waterways. "The idea of providing statutory identity to rivers can be considered complementary to the walkways proposal," he said. The Minister recognised that integrated planning, covering both water use and land use factors, should be carried out so that finite waterway resources can yield maximum benefit to the community as a whole[2].

There is thus Government recognition of the strong need to preserve our rivers and waterways. The in-depth study envisaged in this proposal would be complementary to the Government moves. By assessing detailed local knowledge of rivers gained by canoe clubs and boating clubs throughout New Zealand, the New Zealand Canoeing Association will be performing a service not only to its members, and other recreational users, but to the Government as well.

1.3 The affiliation between New Zealand Canoeing Association (Inc) [NZCA] and the Environmental Defence Society (Inc) [EDS]

Both NZCA and EDS recognise the need to carry out a special study to identify rivers that should be preserved to protect their recreational value. NZCA is a member of EDS and discussions have been held between the respective executives of the two organisations to determine the scope of the study. It has been agreed that a legal analysis is required for the study to achieve maximum effectiveness and that the

[1] "Rivers for Everyone" in *Soil & Water* September 1974

[2] *New Zealand Herald,* Tuesday 27 July, 1976

combining of the special skills of both organisations is essential if an adequate, in-depth report is to be produced. Should the study proceed the legal researcher will be responsible to the NZCA through the EDS Board of Directors. Close co-operation between the two executives will be maintained during the course of the study.

2 Objectives of the proposed study

The Association will carry out a study that will include:

(a) Establishing criteria for assessing the use of rivers within a national framework.

(b) A survey of rivers and waterways that are used or are capable of use by canoeists and boaters. Information gathered from affiliated canoe clubs and other organisations will be used as a basis for the survey.

(c) Assessing the information gathered in the light of the established criteria and identifying rivers or stretches of rivers that should be set aside and preserved in their natural state for canoe use.

(d) Formulating legislative proposals that will guarantee the preservation of chosen rivers and give statutory recognition to the criteria used in **(b)** above.

The study will involve the employment of a researcher with a sound canoeing experience who will, over a period of 6 months, visit all affiliated canoe clubs and other organisations, obtain their advice and assistance in navigating and evaluating all rivers to be covered by the survey, and submit detailed reports to the Association. The reports would include descriptions of historical, physical, and ecological characteristics, and relevant recreational data relating to each area documented by photographs and maps. These would be collated and published in the final report.

A law graduate would also be employed for three months, researching New Zealand and overseas legislation dealing with the creation of a Waterways System, assisting the NZCA researcher to draft the criteria used for assessing the use of rivers on a national scale, and, finally, drafting legislation that would give statutory recognition to the criteria and the means whereby chosen rivers could be preserved.

The Wild and Scenic Rivers Act passed by the U.S. Congress in 1968 would provide an obvious starting point for legal research and the guidelines for evaluating wild, scenic, and recreational river areas attached to that Act should be of great assistance to both researchers (A copy of the Act and the Guidelines are appended to this application). However it will be necessary to analyse existing New Zealand statutes including the National Parks Act 1952, New Zealand Walkways Act 1975, Water and Soil Conservation Act 1967, Land Act 1948, and Forests Act 1949, so that any "Waterways Act" would be complementary to these statutes.

It is envisaged that the researchers would contact clubs and organisations with a similar range of interests such as the N.Z. Waterways Association, N.Z. Anglers' Association, N.Z. Jet Boat Association, and Federated Mountain Clubs to seek their comments. A list of canoe clubs affiliated to this Association is attached.

It may also be possible to work in conjunction with the Department of Lands and Survey and the Commission for the Environment, and this avenue could be explored should the grant be approved. Similarly the criteria could be enlarged to cover other recreational values that may have been included within the pilot study carried out by the Department of Lands and Survey and the Commission for the Environment.

3 Resources available for the study

The value of New Zealand waterways was first recognised by the NZCA over twenty years ago when a major object detailed in its Constitution read: *"It shall maintain an active interest in the preservation of canoeable waterways."*

As a youth-orientated organisation, the Association relies on the waterways of New Zealand to give young people the opportunity to identify with their country through a greater appreciation of its natural assets. To this end, much of the efforts of the Association's Touring Committee has been and is directed towards preparing river guides so that canoeists and the general public can gain detailed information on the recreational facilities of a river.

The Association has been in contact with all Regional Water Boards, the Commission for the Environment, the NZED and the MWD in order to express its concern about recreational rivers. Local canoe clubs have also been encouraged to keep in touch with possible hydro developments. A preliminary list has been prepared detailing rivers and lakes to be investigated for possible inclusion in a National Waterway Scheme. A copy of the list is attached to this application.

This background work carried out by the Association and the expertise that has been built up by members will be used as a base from which the study will proceed. The researcher will work under the guidance of the Executive who will be responsible for publishing the final report.

Background information concerning the Environmental Defence Society Incorporated is appended to this application. The Society's interest in river use has been a longstanding one and it has already called upon the National Water and Soil Conservation Authority to formulate and promote a policy for the national use and conservation of all New Zealand rivers, maintaining that it is a duty implied under the Water and Soil Conservation Act. The Society's Board of Directors will supervise the legal researcher and they will in turn be responsible to the Executive of the NZCA for the formulation and production of the legislative proposals.

4 Nature of the study

The Association concedes that the grant applied for does not come within the general scope of the assistance set out in paragraph 7 of the Criteria for the Consideration of Applications, although it would, no doubt, be included in the exception clause (assistance "will not be limited thereto", i.e., to the criteria outlined in paragraph 7). However, it feels that the grant should be considered for the following reasons:

(1) The study is a matter of urgency and the Association is in a unique position to gather the necessary information that should be of great benefit to any considerations by Government to set up a National Waterways System. Similarly the formulation of legal proposals should make the Government's task much the easier, especially as we believe the Parliamentary legal draughtsmen are already over-burdened with work.

(2) The proposed study comes within the basic criteria set out in paragraph 2 of the Criteria for the Consideration of Applications in that the assistance will facilitate an effective contribution to the development of recreation and sport opportunities for New Zealanders. The preservation of rivers is a matter of national benefit and although it is vital to the interests of canoeists, it extends to other recreational users.

(3) The hundreds of hours of voluntary work already spent on the study and survey of canoeable rivers, if measured in financial terms, would amount to thousands of dollars. This work, which will continue to be carried on during the course of the proposed study, could be considered the basis for making the grant if a subsidy scheme is preferred. The donated labour and expertise would serve in lieu of cash reserves, and the normal subsidy arrangements could then be calculated. While the Association believes that a special grant is appropriate for the study, the Council and the Ministry may wish to consider the grant in terms of such a subsidy arrangement.

5. Budget

Financial support is requested to permit the Association to engage the full-time services for six months of a suitable person to undertake the detailed survey of the rivers, and a law graduate for a period of three months to research and formulate the legislative proposals. The period of research will be concluded within the six month period but the refinement and publication of the report may occupy a full year from the commencement of the field survey.

NZCA Investigator:	
Living expenses	$3000
Travelling expenses	2000
Law Researcher:	1500
Administration, office expenses, and publishing of final report	1000
Total grant requested	$7500

6 Justification of budget

Although a significant contribution will be made to this study by voluntary work carried out by affiliated canoe clubs and members of the Association's Executive (including work carried out to date), the main part of the investigative work will be carried out by the two researchers specifically employed for this study. The study cannot proceed without provision for the salary payments to these researchers and is therefore a key item in this project.

The Association believes that the study cannot be satisfactorily carried out by volunteers who, because of limitations of time and resources, would inevitably work in a piecemeal fashion. A continuous comprehensive survey is required within a set time period by one person who has the main responsibility for producing the detailed information.

An office would be required to act as a base for the two researchers and it will be necessary for them to have access to secretarial assistance in the form of typing and other office facilities such as telephones. It will also be necessary for access to be arranged to a legal library. The most economical way of providing these services would be to rent a single room in central Auckland where supervision of the researchers' work could be carried out by the respective Executives of the two groups.

The researcher surveying the rivers will have to travel throughout New Zealand, and provision has been made for the extensive travel and accommodation expenses arising during the study.

7 Further information

The Association would be most willing to provide any further information that may be required to permit this application to be more fully evaluated. Representatives of the Association and EDS are also prepared to travel to Wellington to discuss the proposal with the Council or other representatives of the Ministry.

Rivers considered worth investigation with a view towards preservation

Regional Water Board	*River*
Northland	Wairua, Mangakahia, Puketona Rivers, Kai-iwi Lakes
Auckland	Wairoa River (Hunua), Lake Pupuke
Waikato	Waipa, Waikato, Tongariro, Waitetuna, Mokau
Hauraki	Kauaeranga, Ohinemuri, Waitawheta
Bay of Plenty	Wairoa River (Tauranga), Kaituna, Tarawera, Rangitaiki, Whirinaki, Whakatane, Waimana Rivers, Rotorua Lakes
Poverty Bay	Waioeka, Koranga, Motu, Ruakituri, Mata, Wairata, Kahanui, Raukokore
Hawkes Bay	Mohaka, Ngaruroro
Taranaki	Waitara, Patea
Rangitikei-Wanganui	Rangitikei, Wanganui, Whangaehu
Manawatu	Manawatu, Otaki, Mangeore, Mangahao
Wairarapa	Akitio, Owahanga, Ruamahanga, Waiohine, Wainuioru, Pahaoa
Wellington	Hutt, Akatarawa
Nelson	Pelorus, Rai, Wakamarina, Aorere, Anatoki, Waingaro, Motueka, Baton, Wangapeka, Wairoa (Nelson)
Marlborough	Clarence, Wairau
Westland	Buller, Matakitaki, Maruia, Gowan, Grey, Landsborough, Haast, Karamea
North Canterbury	Waiau, (Rakaia for flatwater and slalom) Hurunui, Waimakariri
South Canterbury	Rangitata River, Saltwater Creek
Waitaki	Lower Waitaki
Otago	Shotover, Pomahaka, Hollyford
Southland	Mararoa, Mataura, Waiau

CLUBS AFFILIATED TO THE NZCA

1. **Arawa C.C.**, P.O. Box 13177, Armagh, Christchurch
2. **Auckland C.C.**, P.O. Box 3523, Auckland
3. **Auckland Univ. C.C.**, Auck. Univ. Students Assoc. Private Bag, Auckland
4. **Christchurch C.C.**, C/- 36 Linwood Ave, Christchurch
5. **Dunedin C.C.**, P.O. Box 5404, Dunedin
6. **Gisborne C. & T.C.**, P.O. Box 289, Gisborne
7. **Hamilton C.C.**, P.O. Box 9497, Hamilton
8. **Hauraki Kayak Group**, P.O. Box 3580, Auckland
9. **Hawkes Bay C.C.**, P.O. Box 883, Napier
10. **Kaimai C.C.**, P.O. Box 2354, Tauranga
11. **Kupe C.C.**, P.O. Box 3768, Wellington
12. **Nelson C.C.**, P.O. Box 793, Nelson
13. **New Plymouth K.C.**, 34 Whakawhiti St, New Plymouth
14. **Northland C.C.**, 18 Whau Valley Rd, Whangarei
15. **North Shore C. & Y.C.**, 71 Hogans Rd, Glenfield, Auckland
16. **Palmerston North C.C.**, P.O. Box 1126, Palmerston North
17. **Penguin C.C.**, 83 Michaels Ave, Ellerslie, Auckland
18. **Rotorua C.C.**, P.O. Box 1484, Rotorua
19. **Ruahine White Water C.**, 71 Salisbury St, Ashhurst
20. **Southland C.C.**, P.O. Box 1379, Invercargill
21. **Taumarunui C.C.**, P.O. Box 77, Taumarunui
22. **Te Marua C.C.**, P.O. Box 30426, Lower Hutt
23. **Tokoroa C.C.**, P.O. Box 683, Tokoroa
24. **Waiouru A.T.G. C.C.**, Regular Force Cadet School, The Army Training Group, Waiouru

Others

1. **River City C.C.**, 58 Thatcher St, Wanganui
2. **South Taranaki C.C.**, 21 Cambria St, Hawera
3. **Masterton (YMCA) C.C.**, 62 Kuratawhiti St, Greytown
4. **Canterbury Uni.C.C.**, Canterbury Uni. Students Assoc. Private Bag, Christchurch

Environmental Defence Society

The Environmental Defence Society Incorporated was established in March 1971 and is registered under the Incorporated Societies Act 1908. It is a coalition of lawyers, scientists and concerned citizens dedicated to the preservation, restoration and rational use of the environment, and has been approved as a charity by the Inland Revenue Department.

EDS undertakes legal research; presents submissions on environmental matters to appropriate authorities, including New Zealand Parliamentary Committees; assists conservation groups on legal matters; and institutes a number of carefully chosen law suits designed to prevent the degradation of the environment and to set valuable precedents in environmental law.

The Patron of the Society is the New Zealand Ombudsman, Sir Guy Powles, and the Auckland Board of Directors of the Society presently consists of the following persons:

P.G. Horsley	Barrister & solicitor
B.I.J. Cowper	Barrister & solicitor
Dr L.R.B. Mann	Biochemist
Dr G.P. Curry	Barrister & solicitor
Dr A.R. Bellamy	Microbiologist
W.G.C. Templeton	Barrister & solicitor
S. Mills	Law lecturer
Dr M.J. O'Sullivan	Mathematician & engineer
Dr R. Locker	Biochemist
Dr J. Farmer	Barrister & solicitor
Dr W. Silvester	Botanist
J. Fitzsimons	Housewife - Editor *EDS News*

EDS began in Auckland and has branches in Wellington and Christchurch. It has Board members and ordinary dues-paying members from all parts of New Zealand. The Society selects a small number of environmental projects and works on them by means of project committees headed by an EDS lawyer and a scientist from the EDS Scientists' Advisory Committee. This committee consists of highly qualified environmental scientists from all parts of New Zealand who supply scientific information and advice, prepare documentation for legal proceedings and give evidence when the proceedings come on for trial. There are now over 50 members of this Committee.

EDS recognises that initiating legal proceedings is a major step. Procedures have therefore been developed to ensure that this step is not taken lightly. The procedure followed is that a member of the public will bring an environmental problem to the notice of EDS. The Directors will then examine it in a general way and a lawyer and a scientist will be appointed to prepare an initial report on the legal and scientific aspects. The matter will then be discussed in some detail at one of the Directors' meetings. Once the Directors decide to adopt the project and institute proceedings final approval is solicited from the EDS Litigation Review Committee which consists of two members of the Board and the EDS Senior Advisory Counsel, Mr Paul Temm, QC.

New Zealand has almost all of the environmental afflictions of modern industrial society: water pollution, air pollution, noise pollution, misuse of dangerous chemicals, and problems of waste disposal to name only a few. EDS has been presented with a very large number of environmental problems which it could have usefully undertaken. However, because of limitations of manpower and financial resources, it has limited itself to a relatively small number of especially important environmental problems including:

1. Extensive submissions to the Minister of Mines on the Mining Act 1971.
2. Involvement in the matter of coastline protection as it manifested itself in the proposed Waikawau Bay subdivision on the Coromandel Peninsula in 1970.

3. Waikato River pollution, including successful Supreme Court and Court of Appeal litigation against the Huntly Borough Council for discharging raw sewage into the river.
4. Presentation of comprehensive submissions to the Social Services Committee of Parliament on the Clean Air (No. 2) Bill. As a result of the EDS submissions, a number of important amendments were included in the Clean Air Act 1972.
5. **Poor Knights Islands Marine Reserve. EDS filed an application to have the Poor Knights Islands declared a marine reserve.**
6. Dangerous pesticides and herbicides - the 2,4,5-T litigation against the Agricultural Chemicals Board.
7. Protection of the Marlborough Sounds from environmental degradation - the first project undertaken by Christchurch members.
8. Prosecution of two Auckland local authorities under the Water and Soil Conservation Act 1967 for illegal discharge of tip effluent into the Waitemata Harbour.
9. Submissions to the Local Bills Committee concerning the establishment of regional control of solid waste disposal by the Auckland Regional Authority under the Auckland Regional Authority Amendment Bill 1975.
10. Extensive submissions to the Commission for the Environment on various Environmental Impact Reports including an extensive recent study of the implications of the proposed Auckland Thermal No. 1 Power Station.
11. Various objections and appeals under the Town and Country Planning Act 1953 and Water and Soil Conservation Act 1967 where the projects concerned were considered by the Society to constitute a threat to the preservation and rational use of the New Zealand environment.
12. Research and detailed submissions on water pollution and the statutes controlling water resources prepared for the current review of the Water and Soil Conservation Act 1967. This project was funded by a previous Todd Foundation Grant.
13. Submissions to the Commission for the Environment on the 1975 review of the Environment Impact Reporting guidelines.
14. Preparatory work on submissions on the proposed Pesticides Bill.
15. Filing a declaration in the Supreme Court to ensure that the NZED complies with town planning provisions in the building of thermal power stations.

Amended application

APPLICATION FOR SPECIAL GRANT under the National Projects Scheme of the Recreation and Sport Programme 1976/77 (revised).

GRANT REQUESTED $7500.00

PURPOSE OF GRANT To set criteria and carry out a survey of New Zealand waterways used for recreational purposes and to identify waterways that should be reserved in their natural state for such use.

1. In terms of the discussion between representatives of the Ministry and Council for Recreation and Sport, Commission for the Environment, Department of Lands and Survey, and the New Zealand Canoeing Association Inc. in the Bowen State Building, Wellington, on 28 January 1977, this submission amends the proposals set out in the application of the same title, marked "New Zealand Canoeing Association Inc, P.O. Box 5125, Auckland", and signed by R.S. Hawken, Secretary.

2. We respectfully request a grant of $7500.00 to support a member of the N.Z. Canoeing Assn for a period of nine months, to investigate the rivers listed in our earlier application, working in consultation with the above-mentioned agencies, for the purpose of reporting on each river's suitability from the navigational and scenic point of view for inclusion in a system of National Waterways similar in status to the existing National Walkways, or a system of Wild, Scenic, and Recreational Rivers after the American pattern.

3. The investigator proposed is Mr Graham D. Egarr, of 52 South Road, New Plymouth, who attended the discussion referred to above. Mr Egarr has approximately ten years' canoeing experience in various parts of the country, and has a Bachelor of Arts Degree in History. He is a secondary school teacher by profession, has been President of the New Plymouth Kayak Club Inc, and is currently the N.Z. Canoeing Assn's Public Relations Officer. He would be accompanied and assisted by his wife, Mrs Jan Egarr, who is also an experienced canoeist and a school teacher with a BA degree in Sociology. An article by Mr Egarr describing a canoe trip down the Clarence River in Marlborough was published in the "Soil and Water" magazine of the Ministry of Works and Development in October 1976. Mr and Mrs Egarr would be available for nine months from approximately 1 May 1977 to the end of January 1978 and could continue for another month if necessary.

4. It is envisaged that Mr Egarr would spend some time in Wellington at the beginning of the period, working with the Government agencies to establish criteria for evaluating the waterways to be investigated. He would then carry out his survey throughout the country, in consultation with Lands and Survey staff, Regional Water Boards, local canoe clubs, and such agencies as the Outward Bound School. The N.Z. Jet Boat Assn has undertaken to provide jet boat transport wherever possible. When it is necessary for Mr Egarr to canoe a river, he will arrange a trip with the local club. He also proposes to make an extensive photographic record of each river to supplement his written reports.

5. Reports and photographs made in each area would be sent to the Commission for the Environment in Wellington where we understand office space would be available. These would be stored until the field surveys were complete, when Mr Egarr would return to Wellington to prepare his final report and recommendations. These would then be available to the Commission for the Environment, and Lands and Survey Department for use in preparing appropriate legislation for the reservation of selected waterways.

6. The revised budget for the project is as follows:

Living expenses (9 months)	$4000
Travelling expenses	2500
Administration, stationery, photography and preparation of final report	1000
	$7500

7. In conclusion, this project would assist Government in its plans to create National Waterways (or waterways of similar status) by identifying the rivers and lakes which are most valued for their navigational and scenic interest, thereby enabling a balance to be struck between the different, and sometimes conflicting, possible uses of our water resources.

Appendix II

A Wild and Scenic Rivers Bill

The Discussion Paper on Wild and Scenic Rivers published by the Commission for the Environment has enabled wide-ranging views to be expressed. Some of the parties on both sides of the issue will inevitably hold to extreme viewpoints, but otherwise a reasonable concensus seems to be emerging. The remaining disagreements are minor, and may result partly from the lack of a concrete proposal to give a common basis for discussion.

Most reasonable conservationists have accepted the arguments put forward by NWASCO that the existing Water and Soil system should not be over-ridden, that the democratic processes allowed by that system should be used, and that Wild and Scenic Rivers should not be protected in a rigid single-purpose way.

It is also accepted that rivers which are only locally important for scenery or recreation may derive a measure of protection through non-statutory WASRMP (Water & Soil Resource Management Plans) prepared by regional water boards, and through rights of objection to Water Right and Town Planning applications.

It is not accepted, however, that the existing Water and Soil legislation is adequate to protect Wild and Scenic Rivers of national significance. There are two reasons for this: the need for legislative commitment, and the need for some independent advocacy of Wild and Scenic Rivers.

Need for legislation

Legislation, which would affect the administration of a number of statutes, particularly the Water and Soil Conservation Act and the Town and Country Planning Act, is needed for the following reasons:

1 To try and protect Wild and Scenic Rivers through objection to water rights and planning applications would require constant monitoring by recreational groups of the activities of the multiplicity of catchment boards and county councils.

2 The burden of proof in planning and water right hearings tends to fall on the objectors, but where the scenic and recreational qualities of a river are of national significance it ought to fall on the developer to prove the case for development.

3 By the time plans are sufficiently detailed to apply for water rights it is often too late to make significant changes to large-scale developments (e.g. Upper Clutha hydro scheme). It ought to be possible to give advance notice to developers that a particular river has special protection.

4 There is already legislation which allows for the "Reserve" protection of land, mountains, forest, coastline, historic places - even the sea-bed. It is not accepted that these features could have been protected adequately by objection rights under the Water and Soil or Town and Country Planning Acts.

5 In deciding against the appellants in the Rangitaiki-Wheao Hydro Scheme case, the Appeal Board said: "There are no statutory guidelines indicating the relative importance to the community as a whole of the natural resources and wildlife and scenic values which can be affected by hydro proposals".

6 The greatest threat to the recreational use of rivers is from national hydro projects. Public rights of objection to Crown applications are relatively limited and can be over-ridden completely by section 23(7) of the Act.

7 The setting of minimum flows under section 14(3)(o) of the Water and Soil Conservation Act seems a very narrowly based way of trying to protect the scenic and recreational qualities of a river and its environs. Moreover it does not seem to necessarily exclude hydro reservoirs.

8 It clearly was not the intention of Parliament that the original Water and Soil Conservation Act should be used to give binding advance protection to rivers. If the Crown is to feel bound by such protection then it should be able to make the commitment itself, in Parliament.

9 The protection of a river can easily be rescinded if necessary in the future. Development on the other hand is usually irreversible.

10 Many developments of quite minor significance (e.g., changes to local reserves, harbour reclamations) require an empowering Act. If a Wild and Scenic River is of national significance then its destruction should ultimately be authorised by Parliament rather than by a local catchment board or a non-elective statutory body.

Independent advocacy

Unless recreational groups are themselves given the opportunity to apply for special status for the rivers they feel should be protected, there is a need for some body to be appointed as an official "advocate" and promoting agency for Wild and Scenic Rivers, for the following reasons:

1 Regional water boards and the NWASCA are called upon to exercise quasi-judicial functions and it would be unfair to expect them also to actively promote the interests of recreational groups and scenic beauty.

2 The prime criteria for choosing which rivers ought to be protected would be scenic and wilderness qualities. There is no single body or group which could claim to "represent" these interests.

3 The composition of the NWASCO and its relationship with the MWD would make it difficult for it to gain the confidence of recreational groups as the promoting agency of Wild and Scenic Rivers.

4 The constitution and functions of the Queen Elizabeth II National Trust (serviced by the Department of Lands and Survey) equip it ideally to co-ordinate the task of investigating the scenic and recreational values of any particular river and putting them before NWASCA for a decision.

Conclusion

All that is needed for a flexible but effective form of protection for Wild and Scenic Rivers is a relatively simple statute that would lay down a procedure by which existing bodies (NWASCO, regional water boards, county councils, the Queen Elizabeth II National Trust, etc.) would use existing legislation and processes (particularly the Water and Soil Conservation Act and the Town and Country Planning Act) to decide upon and administer those rivers which are of national significance.

WILD AND SCENIC RIVERS: A DRAFT BILL

1. **Purpose of the Act** (1) The purpose of this Act is to protect in their free-flowing state certain rivers which, with their immediate environs, offer scenery or recreational experience of such exceptional quality that their protection is in the national interest.

(2) It is also the purpose of this Act to ensure that the administration of water and land under other statutes does not detract from the scenery, recreational experience, or other specified qualities of the rivers which this Act seeks to protect.

2. **Declaration of Wild and Scenic Rivers** (1) The National Water and Soil Conservation Authority may from time to time declare that any river or any length of a river, shall be a Wild and Scenic River subject to this Act.

(2) In declaring a Wild and Scenic River under this Act the Authority may specify particular qualities of characteristics of that river or its adjacent land which are to be protected in addition to the general qualities outlined in Section 1(1).

(3) An application for the declaration of a Wild and Scenic River may only be made by the Minister of Lands.

(4) Such application will have the same legal status and will be treated in the same way as a Crown application for a water right. Under Section 23 of the Water and Soil Conservation Act 1967, it will be referred to the appropriate regional water board for a report and recommendations, and the final decision of the Authority will be subject to appeal by affected parties to the Planning Tribunal.

(5) Once appeals have been ruled upon, the declaration of a Wild and Scenic River may only be rescinded by Act of Parliament.

3. **Effect of the Act** (1) This Act will not prevent the taking or the diversion of water from, or the discharge of anything into, or the modification of land adjacent to a Wild and Scenic River; provided that such actions are reasonably consistent with the spirit and purpose of the Act.

(2) The Act will prevent the significant impoundment of a Wild and Scenic River.

(3) The Authority and regional water boards, in the exercise of their powers and duties under the Water and Soil Conservation Act 1967 and the Soil Conservation and Rivers Control Act 1941, are required to have regard for the spirit and purpose of this Act.

(4) Local and regional authorities, in the exercise of their powers and duties under the Town and Country Planning Act 1977, and particularly Section 3(1)(c) of that Act are required to have regard for the spirit and purpose of this Act.

(5) The Ministry of Transport, in the exercise of its powers and duties under the Harbours Act 1950 is required to have regard for the spirit and purpose of this Act.

(6) Government departments, State-owned corporations, and other agencies of the Crown, in the administration of lands under their control, are required to have regard for the spirit and purpose of this Act.

4. **Administration of the Act** (1) The Act is to be administered jointly by the Minister of Works and Minister of Lands.

(2) The Queen Elizabeth II National Trust will carry out the following functions relating to Wild and Scenic Rivers:

(a) Advise the Minister of Lands as to applications that it considers he should make for Wild and Scenic Rivers. The Trust is directed initially to consider the rivers listed in the Schedule of the Act.

(b) Periodically review the working of this Act and make appropriate recommendations to the Minister.

(c) Purchase or receive land, rights over land, or facilities in order to enhance the purpose of this Act.

(d) Negotiate conservation covenants, easements, and access agreements with willing land owners.

(e) Make financial grants to other than Government departments to encourage and assist the protection of Wild and Scenic Rivers.

(f) Encourage and assist regional water boards to use the provisions of the Water and Soil Conservation Act 1967 to help protect local scenic and recreational assets.

SCHEDULE

Motu River, from the top of the Motu Falls to the sea.

Wanganui River, from its confluence with the Ongarue River at Taumarunui to the Town Bridge in Wanganui City.

Buller River, from its source, Lake Rotoiti, to the State highway bridge near Westport, and including the Gowan River tributary from its source, Lake Rotoroa, to its confluence with the Buller.

Clarence River, from its confluence with the Acheron River to the Glen Alton suspension bridge.

Appendix III

Survey costs

For the benefit of other persons interested in similar surveys for other recreational groups, we publish some details of costs. The initial estimates of costs, as set out in the original submission, and in the amended submission, were based on the assumption that only some **100** rivers could be investigated.

The survey was extended to cover **all** rivers and this necessitated a total re-ordering of the budget. Because the survey was given a grant of $7500 from the Ministry for Recreation and Sport, it is often assumed that this was the actual cost of the survey. If a private organisation had been employed to carry out the survey, or if someone was employed to do it, the actual cost would have been in the vicinity of $50,000.

We were able to keep costs down because we undertook the survey without pay and accommodation costs were donated, in that jet boaters, canoeists, and interested persons provided us with accommodation and meals without charge.

The grant of $7500 was expended as follows:

Equipment bought (kayaks, dinghy, etc.)	$1400
Travelling expenses	5500
Accommodation (where required)	100
Administration, postage, stationery, printing	150
Photography	200
Reference materials relevant reading not available from libraries, Environmental Impact Reports, etc.	100
Miscellaneous expenses	50
	$7500

All maps were provided without charge by the Department of Lands and Survey. This amounted to a full set of NZMS 18, NZMS 1, and NZMS 242 series maps. We also borrowed aerial photographs where required.

Jet boat transport was provided without charge by members of the New Zealand Jet Boat Association. Helicopters and aircraft were used to observe some of our remote areas where we did not have the time to travel in on foot or which we could not reach by canoes, rafts or jet boats. Over $300 worth of helicopter time was provided by the Department of Lands and Survey mainly because we were assisting various regional offices with land use surveys and similar work and we were able to join their teams in areas we were interested in.

Accommodation costs were minimised, as mentioned, because of the generosity of boaters. We also spent a great deal of time camping along river banks.

Living expenses (food) have not been included in the above list of expenses as the grant was insufficient to cover these expenses. During the actual fieldwork, expenses were around $10 per person per week which was met by our own personal savings. A part of the total cost was recovered when, on completion of the survey, we sold some of the equipment we had originally purchased to undertake the survey.

We used a Datsun 120Y Station Wagon for all the road travelling required.

ERRATUM

Part II (page 121)

In Part II, sections 151.1 and 151.2 on page 121 were not as clear in meaning as the authors had wished. Those sections as printed should be ignored, and the following substituted.

151.1 UPPER TONGARIRO — TO 'PILLARS OF HERCULES'

Location: From the confluence of the Waipakihi and Waikato Streams the river becomes known as the Tongariro and flows in a northerly direction for 10.5km until it reaches the rugged and unboatable 'Tree Trunk Gorge' and a further 3.5 km to the narrow canyon known as 'The Pillars of Hercules'.
Section end location: NZMS1, N112/298818
Maps: NZMS18, Sheet 8 Taupo; NZMS1, Sheet N112 Ngauruhoe, N122 Ruapehu.
Length: 46km (includes Waipakihi Stream).
Average gradient: 1:65 15.3m/km.

Recreational use and scenic description: The Upper Tongariro is used by canoeists, rafters and drift boaters but is far too cold for li-lo trips and too shallow for jet boats; the rapids are also too rough for jet boats. The river is normally only boated from the Waikato Stream confluence by using the Access Road 15 from the Desert Road. The river is freezing cold and flows with some speed over large rocks and boulders. One kilometre below the ford at Access Road 15 is the beginning of the hardest rapids. Rapids are almost continuous down to the Moawhango Tunnel outlet after which the gradient eases slightly down to 'Tree Trunk Gorge' a narrow turbulent gorge more in the nature of a single twisting waterfall. Between this short gorge and the 'Pillars of Hercules' lies a rough bouldery section of river which can be paddled by experienced canoeists. The river flows through alpine scrub and low native forest of beech and manuka that is very attractive in a rugged sort of manner. Most boaters need to concentrate on the difficult rapids so that the scenery is hardly noticed.

Scenic value: Moderate.
Recreational value: High.

151.2 TONGARIRO — 'PILLARS OF HERCULES' TO PRISON FARM

Location: The Tongariro flows through a narrow saw-cut gorge named 'The Pillars of Hercules'. From here the river leaves the bush and flows over an exceptionally rocky bed past the Poutu Intake Dam down to the Prison Farm Bridge.
Section end location: NZMS1, N112/312907
Maps: NZMS18, Sheet 8 Taupo; NZMS1, Sheet N112 Ngauruhoe.
Length: 12km.
Average gradient: 1:50 20m/km.

WATER AND SOIL TECHNICAL PUBLICATIONS

1. Liquid and waterborne wastes research in New Zealand ($1-00) Sally Davis 1977

2. Sampling of surface waters ($1-00)
M Kingsford, J S Nielsen, A D Pritchard, C D Stevenson 1977

3. Water quality research in New Zealand 1976 ($1-00) Sally Davis 1977

4. Shotover River catchment. Report on sediment sources survey and feasibility of control, 1975 (out of stock) 1978

5. Late Quaternary sedimentary processes at Ohiwa Harbour, eastern Bay of Plenty with special reference to property loss on Ohiwa ($1-00) J G Gibb 1978

6. Recorded channel changes of the Upper Waipawa River, Ruahine Range, New Zealand ($1-00) P J Grant 1978

7. Effects of domestic wastewater disposal by land irrigation on groundwater quality of the central Canterbury Plains ($1-00)
G N Martin and M J Noonan 1978

8. Magnitude and frequency of floods in the Northland-Auckland region and their application to urban flood design ($1-00) J R Waugh 1978

9. Research and Survey annual review 1977 (out of stock) 1978

10. The problem of coastal erosion along the 'Gold Coast', western Wellington, New Zealand ($1-50) J G Gibb 1978

11. The Waikato River: A water resources study ($12-00) 1979

12. A review of the habitat requirements of fish in New Zealand rivers ($3-00) compiled by D F Church, S F Davis, and M E U Taylor 1979

13. The Ruahine Range: A situation review and proposals for integrated management of the Ruahine Range and the rivers affected by it ($5-00)
A Cunningham and P W Stribling 1978

14. A Survey of New Zealand peat resources ($10-00) A Davoren 1978

15. Effects of urban land use on water quantity and quality: an annotated bibliography ($5-00) I Simmers 1980

16. Research and Survey annual review 1978 (gratis) 1979

17. Investigations into the use of the bacterial species Bacillus stearothermophilus and Escherichia coli (H_2S positive) as tracers of groundwater movement ($1-50)
L W Sinton 1980

18. A review of some biological methods for the assessment of water quality with special reference to New Zealand. Part 1 ($3-00) 1979

19. The frequency of high intensity rainfalls in New Zealand. Part I (gratis)
A I Tomlinson 1980

20. New Zealand flood study M E Beable and A I McKerchar in press

21. Coastal hazard mapping as a planning technique for Waiapu County, East Coast, North Island, New Zealand ($5-00) J G Gibb 1981

22. A review of some biological methods for the assessment of water quality with special reference to New Zealand Part II 1981

23. Hydrology of the catchments draining to the Pauatahanui Inlet 1981

24. Land and water resource surveys of New Zealand map coverage and reference lists C L Clark in press