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**LA THÈSE A ÉTÉ
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THE PERCEPTION OF CONFLICT AND CROWDING
BY WHITEWATER USERS ON THE OTTAWA RIVER

by

DAVID LEONARD KENNEDY

B.A.(hons), Carleton University

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the ~~degree of~~
Master of Arts
Department of Geography

Carleton University
Ottawa, Ontario

December 1985

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ISBN 0-315-29839-1

The undersigned recommend to the Faculty of Graduate
Studies and Research acceptance of the thesis

"THE PERCEPTION OF CONFLICT AND CROWDING
BY WHITEWATER USERS ON THE OTTAWA RIVER"

submitted by David L. Kennedy, B.A. hon.
in partial fulfilment of the requirements for the
degree of Master of Arts.

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January 1986

ABSTRACT

The Ottawa River's Rocher Fendu Channel contains the most heavily used corridor for whitewater recreation in Canada. The perceptions of commercial rafting patrons at this site have been surveyed since 1979 under the assumption that crowding would be a major concern. However, attempts to establish criteria for a recreational "carrying capacity" were unable to demonstrate perceived crowding, or demonstrate a link between user density and user satisfaction.

A 1984 survey of kayakers and canoeists at this site found that while most did indeed perceive crowding, there was also a significant conflict with meeting rafts on the river, based largely on the perception that they make it less safe for kayakers and canoeists.

The study concluded that there is no significant evidence that restricting the number of users will address the issues of crowding and conflict. There is however a need for greater communication between the activity groups, as well as an approach to management which focuses on facilitating shared use.

ACKNOWLEDGEMENTS

- thanks go first to the Pembroke office of the Ontario Ministry of Natural Resources for the job which in 1981 first introduced me to the background as well as the complexities of recreational use at this site
- many thanks to all the folk at the Carleton University "Geo Grad Service Mart" (as well as the people from downstairs) for their friendship and help
- advice was generously given by professors David Bennett, David Knight, and Suzanne MacKenzie, as well as Steve Prashker and Chris Earl
- Tim Pychyl from psychology helped in designing the questionnaire
- special thanks to professor Ken Torrance and to my advisor Duncan Anderson for his enthusiasm and kindness
- and last thanks to the Bagel Bagel crew and to Mike Hare productions whose contributions allow Gerard Manley Hopkins to feel comfortable at the head of this table

GOD'S GRANDEUR

The world is charged with the grandeur of God.
It will flame out, like shining from shook foil;
It gathers to a greatness, like the ooze of oil
Crushed. Why do men then now not reckon his rod?
Generations have trod, have trod, have trod;
And all is seared with trade; bleared, smeared with toil;
And wears man's smudge, and shares man's smell: the soil
Is bare now, nor can foot feel, being shod.

And for all this, nature is never spent;
There lives the dearest freshness deep down things;
And though the last lights off the black West went
Oh, morning, at the brown brink eastward, springs -
Because the Holy Ghost over the bent
World broods with warm breast and with ah! bright wings.

Gerard Manley Hopkins

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CHAPTER 1

INTRODUCTION

1.1 The First Decade

The year 1985 marked the end of the first decade of whitewater recreational use on the Ottawa River's Rocher Fendu channel; a decade which saw major increases in user participation at this site (Table 1.1). The speed of this expansion, the sheer number of participants, and the diversity of the activities, have all raised questions and concerns. Concerns about the possibility of crowding, of conflict between user groups, and for user safety. There have also been calls for river regulation which would entail some restriction of recreational use.

The purpose of this study was to investigate the role of user perception as a guide to defining problems and establishing possible management criteria for recreational whitewater use on the Rocher Fendu Channel of the Ottawa River. The focus was on investigating if and how the perceived quality of the recreational experience, of both rafters, and kayakers and canoeists, was affected by variations in both the social density, and the type of whitewater craft encountered. This work required data on user

Table 1.1

OTTAWA RIVER: RECREATIONAL USE 1975 TO 1984

Year	Commercial User Days (Rafting)	Approximate Number of Raft trips	Private User Days (Kayak & Canoe)
1975	70	-	N.A.
1976	400	27	N.A.
1977	850	57	N.A.
1978	1 900	127	N.A.
1979	6 000	400	N.A.
1980	10 000	667	144
1981	35 000	2334	211
1982	49 000	3267	509
1983	65 400	4360	581
1984	77 000	5134	558

Kayak and canoe figures are those for that fraction of Ottawa River users surveyed in 1984 (97 respondents). Figures for rafting in 1981, 1983 and 1984 from Anderson (unpublished research, 1984); all others figures from Haycock (1984).

perception of the whitewater experience from all major activity groups, as well as an analysis of the theory and practice of using research into "social carrying capacity" for outdoor recreation management.

This whitewater recreation activity takes place in eastern Canada on the Rocher Fendu Channel of the Ottawa River. The site is on the Québec-Ontario border 110 kms. drive from the city of Ottawa (Figure 1.1). The Rocher Fendu Channel (hereafter also referred to as simply the "Ottawa River") contains approximately 8 kms. of discontinuous whitewater on which major rapids are separated by stretches of flatwater. As a result of hydro electric development the Rocher Fendu is now the only whitewater site on the Ottawa River, south of lake Temiskiming, with significant recreational potential (Figure 1.1).

1.2 Objectives of This Study

The objective of this study was to achieve an understanding of the perceptions of participants in the two major whitewater recreation activities: commercial rafting, and private kayaking and canoeing. The analysis will focus on the reaction to both user density (the question of perceived crowding), and

ROCHER FENDU: SITUATION

shared use of the same site (the question of perceived activity conflicts).

A knowledge of the nature and the degree of user concern, or the lack of it would help in deciding if the calls for river management and use restriction by politicians (Citizen, Jan 28, 1982:62), researchers (Anderspn and Rigby, 1981; McDougall, 1982; Haycock, 1984), and some commercial operators (Citizen, Sept. 16, 1982:41; Haycock, 1984:passim), are justified for this whitewater corridor on the Ottawa River.

This study differed from past research into "social carrying capacity" conducted at this site, (McDougall, 1982; Haycock, 1984), since it has examined private, as well as commercial users, and it has not assumed that a relationship necessarily exists between increased social density and decreased user satisfaction.

1.3 Methology

A review of relevant outdoor recreation research included literature concerned with both trends in use and perceived problems. Extensive research was conducted into the concept of recreational "carrying capacity", conflict between different activity groups,

and the physical and social impacts of outdoor recreation. The many attempts to use recreational "carrying capacity" as a basis for site management necessitated an analysis of its history and use. When focusing on the Rocher Fendu Channel itself sources included the invaluable recent research into commercial rafting at this site, as well as newspaper reports, and promotional material from the rafting industry. The existing studies of commercial recreation on the Ottawa River were examined in depth since this work entailed a re-interpretation of much of their data.

Research also examined the hydrology, physical geography, and history of both the Ottawa River Valley and the Rocher Fendu Channel.

This work was aided by extensive field experience as a kayaker and canoeist at this site from 1977 to 1985, as well as by information, principally on land use, gathered while working for the Ontario Ministry of Natural Resources in the summer of 1981.

A survey of kayakers and canoeists who have used the Ottawa River was conducted in the fall of 1984, it

7

gathered data on user perception of possible impacts from recreational use including crowding, conflicts, between major activity groups, and environmental deterioration.

The data used in this study contains a number of limitations, most significantly the sample of kayakers and canoeists was biased in favour of club members, and it was not possible to gather longitudinal data on the perceptions of this user group.

1.4 Definition of Terms

1) "paddle rafts" or "non-motorized rafts" are inflated multi-chambered rubber rafts which vary slightly in size and design. They are approximately 6 metres long, and carry 12 to 14 passengers and one guide (Plate 1.1). Most are propelled by paddle only, but the guides for one company on the Ottawa River use "a stern mounted oar rig" (Plate 1.2) (Haycock, 1984:108-111);

2) "motorized rafts" refers to inflated multi-chambered rafts rubber powered by an outboard motor, they are 11.5 metres long and carry up to 25 passengers. The use of this type of raft was not relevant to this study. (Anderson & Rigby, 1981);

PLATE 1.1 MOORED PADDLE RAFTS AT THE LORNE
RAPID LUNCH STOP

Photo: D. Anderson

PLATE 1.2 KAYAKERS AND PADDLE RAFTS BELOW
McCOY CHUTE

Photo: W. Illing

3) "whitewater kayak" or "kayak" is a one person decked craft made of fiberglass or rotomoulded plastic which is approximately 4 metres long. It is paddled from a sitting position using a 2 bladed paddle (Plate 1.2);

4) "open canoe" or "canoe" refers to a one or two person craft, without a deck. Those used on the Ottawa, are usually made of plastic and approximately 15 to 17 feet long. The canoe is paddled from a kneeling position using a one bladed paddle;

5) "decked canoe" refers to a one person decked craft made of fiberglass or rotomoulded plastic which is approximately 4 metres long. It is paddled from a kneeling position using a one bladed paddle;

6) "trip" refers to "the passage of a raft or float, or more than one raft or float travelling in company, between one place and another on a river or waterway" ("River Rafting Standards", in the Canada Shipping Act, 1980:2);

7) "user day" means whitewater use by one person for any part of the day. Therefore one raft with 15 passengers running the full whitewater channel in 4 hours generates 15 user days, and two kayaks spending

one hour at one rapid generates two user days;

1.5 Organization of the Thesis

Outdoor recreation and the evolution of whitewater recreational activities are discussed in Chapter 2. The physical and historical situation of the Ottawa River and the Rocher Fendu Channel are presented in Chapter 3. Chapter 4 presents the background and evolution of whitewater recreation. Included are the role of attitudes towards the environment, the growth of wilderness and wildland recreation, and the development of new "technologies of play". Chapter 5 examines the use of "social carrying capacity" in recreation studies. Chapter 6 reviews the three studies of whitewater users on the Ottawa River. Chapter 7 describes the survey, undertaken in the fall of 1984, of kayakers and canoeists who have used the Ottawa River. The thesis concludes with an analysis of these findings, and how they can be used to help evaluate if management of recreational use is needed at this site, as well as the form it should take.

CHAPTER 2

OUTDOOR RECREATION AND WHITEWATER ACTIVITY

2.1 Recreation and Recreation Geography

"Recreation" has been defined in many ways. The focus has tended to be either the physical activity engaged in, or the state of mind that the activity itself produces. Brockman and Merriam defined recreation "... as the pleasurable and constructive use of spare time" (1979:3); while Clawson and Knetsch saw it as "... activity (or planned inactivity) undertaken because one wants to do it" (1966:6). Driver and Tochler focused on the individual's behaviour rather than the activity being engaged in. They concluded that "... recreation itself is a state of mind" (1975:19). In taking a sociological approach, Greek and Burch stated that, "Broadly conceived recreation is rationalized leisure; it is the routinization of enjoyment" (1976:167).

Smith, as a recreation geographer, determined that "No single, acceptable definition [for recreation] is yet in sight ...", and, indeed, that each researcher must develop his or her own "working definition" (1983:xiii-xiv). The definition of recreation

appropriate for the outset of this study would be one which focuses on both the resources being used and the activities which use them. Whitewater use is a form of resource specific outdoor recreation which is focused on those sites containing natural, accessible free flowing rapids. The activity itself is "river running", which usually entails active participation in paddling a variety of craft through the rapids.

"Recreation geography", according to Smith, is the "systematic study of recreation patterns and processes on the landscape" Such a "landscape" is made up not only of physical phenomena but also of "... human values ..."(1983:190). This area of "specialization" has existed in geography for about 70 years, it has been characterized by an increasing diversity of "... theories and methods ..." (Smith, 1982). There is not however an "... overwhelming need to produce a systematic body of knowledge about recreation" (Smith, 1983:183). An eclectic nature seems to suit its requirements.

In this study the phenomenon of concern is the effect on individual perceptions of the physical pattern of outdoor recreation use at a site on the

Ottawa River.

'Perception' refers to the process whereby an individual receives information from the social and physical environment in which he operates, interprets it in the light of his experience and attitudes, and then reacts (Lime and Stankey, 1971).

"Outdoor recreation" describes both an activity which "requires space and resources" (Clawson and Knetsch, 1966:7), as well as those activities in which experiencing the natural environment, be it a forest, a rapid, or a waterfall, is an integral part of creating that desired experience or "state of mind."

Wagar's definitions of "wild lands" and "wildland recreation" stress the human element of use of the natural environment.

Wild lands are non-urban areas that are not intensively managed and manipulated. They include managed forests but not city parks

Wildland recreation is recreation that is characteristic of wild lands and includes activities ranging from typical state park recreation to wilderness travel (1964:3).

2.2 Outdoor Recreation in North America

Outdoor recreation in North America has been largely a response to opportunities created by "...

modern technological society" (Brockman and Merriam, 1979:9). Important factors leading to increasing participation throughout this century have been, a larger population base, more free time for workers (due to increased holiday entitlement and reduced working hours), and greater individual mobility especially through the use of the private automobile (Wagär, 1964:1; Clawson & Knetsch, 1966:16-17; Simmons, 1975:104 & 18; Brockman & Merriam, 1979:10; Nelson, 1982; Smith, 1983:47; Statistics Canada, 1984:117).

The direct application of technological innovation to outdoor activities has resulted in both the creation of new equipment for established activities such as rafting, kayaking, skiing, hiking (White et al., 1980, Nash, 1977), rock climbing (Mitchell, 1983:24), and hot air ballooning (Jackson, 1985), as well as the creation of new outdoor activities such as hang gliding, and sailboarding (White et al., 1980). Whitewater use is an activity made possible, in its present popular recreational forms, by the application of technology, through innovations in craft design and the use of materials such as aluminum, rubber, and fiberglass (Nash, 1977).

The whitewater activity, now engaged in on the Ottawa River, first became popular in the United States in the 1960s, it is therefore a recent phenomenon whose roots are in the larger success story which is North American outdoor recreation in this century.

2.3 Participation in Outdoor Recreation

Participation in outdoor recreation, in Canada and the United States, as measured by visits to National Parks, and other "major outdoor recreation areas", began to increase steadily during World War I. Restrictions on travel during World War II briefly reversed this trend (Clawson & Knetsch, 1966:43-45). The return of affluence and mobility after World War II led to the often cited "outburst of interest in outdoor recreation travel in the period following W.W. II" in North America (Hornback, 1980; Wagar, 1964:2; Tanner, 1971:198, Jubenville, 1978:4; Pigram, 1983:9).

The most dramatic increases in participation in land based outdoor recreation occurred in the 1960s and early 1970s. In 1980 the "folk wisdom" on possible trends in backcountry use in the United States predicted a leveling off in participation. This activity is difficult to measure precisely however,

since, "... year to year trends do not show any consistency from one recreation area to another ..." (Spencer et. al., 1980). There are predictions that decreasing affluence, and an aging population will lead to reductions in participation for some more demanding forms of outdoor recreation (Pigram, 1983:223-227, Burdge, 1983). Burdge has noted "...stable attendance patterns ...[for]... remote recreation facilities", in the United States (1983), yet at the same time overall use of the American National Parks system continues to increase (Dickenson, 1985).

In Canada attendance at National Parks has remained relatively stable in recent years, after having experienced a slight decline in 1982 (Statistics Canada, 1984). Ontario's Provincial Parks experienced a noticable decline in participation in the mid 1970s, however the figures for the 1980s indicate relatively stable use (Ministry of Natural Resources, 1984).

Data on commercial whitewater recreation in 1984 in Canada from Ontario, Quebec, Alberta, and British Columbia, indicate that large increases in participation are the norm, and further increases are anticipated in the future (Anderson, unpublished research, 1984).

It should be noted that while there is no doubt that whitewater recreation has indeed made spectacular advances on the Ottawa River, and other sites, in the last decade the supporting data comes from commercial raft firms for whom expansion is often an important part of the image of success. There may therefore be some exaggeration.

While there are no figures for non-commercial participation by kayakers and canoeists comparable to those for commercial rafting, Statistics Canada has reported that "... growth of enthusiasm for sports and outdoor activities is further reflected in the number of households in which canoes, ... are owned". Between 1976 and 1982 this figure doubled both nationwide and in Ontario, while the increase was 119% in the Province of Quebec (Statistics Canada, 1984:99 & 105).

It is ironic that in Ontario, where the bulk of the Ottawa River's whitewater recreation is based, use levels at Algonquin Provincial Park declined in 1976, just as whitewater use on the nearby Ottawa River was taking off (Simpson, 1979).(Table 1.1).

2.4 Water-Based Recreation

Water is a major focus for a wide variety of outdoor recreation activities (Tanner, 1971; Wall, 1982). It may be a spectacle, as at Niagara Falls (Killan, 1982; Wall, 1979a), but most often it occurs in the form of a lake or river environment where more "active" activities such as swimming, sailing, boating, and of course skating can take place. Whitewater recreation is a form of water-based recreation, most often active, whose expansion beginning in the 1960s was largely based on increased accessibility of wild rivers.

2.5 The Evolution of Intensive Whitewater Recreation

Nash has traced the roots of the explosion in whitewater use in the United States during the 1960s and 1970s to one major event, the defeat of the proposed hydro electric dam on the Grand Canyon of the Colorado River. The publicity and heightened awareness created by the battle and the eventual defeat of this proposal in 1968 helped to encourage a virtual invasion of whitewater recreationists not only on the Colorado but also many other American rivers (Nash, 1977).

The large number of whitewater participants on the

Grand Canyon of the Colorado River (Table 2.1), combined with the wildness and beauty of the site, led to concern about "... how much use is compatible with a quality wilderness recreation experience" (Nielsen & Shelby, 1977). The United States National Park Service, which was responsible for the management of this river corridor, developed the 1972 "River Use Plan" which put restrictions on the number of people per year allowed to run the river. The Park Service also initiated twenty nine studies of the ecological/ biological, economic, and sociological impacts of this recreational use. These studies were completed in 1976 and were then used in the development of a "Draft Management Plan" for Grand Canyon National Park in 1977 (Shelby, 1981).

The various agencies responsible for many rivers in the United States have reacted to increasing use by first imposing immediate restrictions, and then undertaking research to create a management plan (Leatherberry et al., 1980; McDougall, 1982:22). This pattern has been criticized as an example of "...sheer stopgap tactics..." (Mak et al., 1977), but it did represent an attempt by those entrusted with the responsibility for river use management to respond to rapid changes.

Table 2.1

RECREATIONAL USE ON THE GRAND CANYON OF THE COLORADO RIVER			
Year	Total User Days	Year	Total User Days
1965	547	1970	9 935
1966	1 067	1971	10 385
1967	2 099	1972	16 432
1968	3 609	1973	15 219
1969	6 019	1974	14 523

The decrease in 1973 was due to imposition of quota system by the Parks Service.

Source: Nash, 1977.

2.6. Whitewater Use On the Ottawa River

In Annand's study of the Rocher Fendu's recreational potential, in the early 1970s, the rapids were seen as simply a spectacle (1971). The potential for "active" recreational use was not foreseen since the activities suited to them were very little known in Canada, although at that time whitewater recreation was experiencing tremendous growth in the United States.

Current recreational use of the Ottawa River, and other whitewater sites, consists of navigating the rapids and falls in craft designed for that purpose. There are two major groups of activity, the first uses rafts, both paddle powered and motorized, and the second uses kayaks, and canoes. These groups are popularly referred to as "rafting" and "paddling", and the terms will be used in this manner throughout this study.

The Ottawa River today is the most heavily used whitewater recreation site in Canada (Table 2.2). In 1984 approximately 80 000 user days (assuming approximately 3 000 private user days) were spent on the Ottawa River. The Ottawa River is noteworthy not only because of the large numbers who use it, but also

Table 2.2

MOST POPULAR CANADIAN RIVERS: 1984		
Ottawa River	77 000	rafting user days
Thompson River	40 000	rafting user days
Fraser River	15 000	rafting user days
Rouge River (Quebec)	13 300	rafting user days

Based on figures supplied by commercial outfitters.
Source: Anderson, unpublished research, 1984.

because of the diversity of craft which use it. These:

Recreation patterns are strongly conditioned by national attitudes and are, equally, constrained by the particularities of natural resources (Patmore, 1983:1).

Use by a full spectrum of whitewater users is due to the fact that the river offers very few constraints to recreational use.

The amazingly high rate of increase since 1975 (Table 1.1) has led to concern about the possible effects of this invasion on the environment, participant safety, and the quality of the recreational experience, while the diversity of craft used creates the possibility of conflicts between activities. Unlike many similar situations in the United States, there has been no regulation of recreational use on the Ottawa River by any government agency.

2.7 Research in Outdoor Recreation

Accelerated growth in the participation in both water and land-based outdoor recreation activities in the 1960s, led to increased research activity (Burge, 1983; Patmore, 1983:1). One focus for this research has been on the visitors themselves and involves the study

of "...user satisfaction..." and the "...closely related ... attempt to measure sociological 'carrying capacity'" (Hornbačk, 1980). A second focus has been on the issue of conflicts between user groups. User conflict was identified as a factor in the early carrying capacity studies (Lucas, 1964; Stankey, 1972), and is now an important concern in its own right (Knopp and Tyger, 1973; Jacob and Schreyer, 1980; Lindsay, 1980; Devall and Harry, 1981; Jackson and Wong, 1982; Pigram, 1983:79-81).

The concern and the perceived problems caused by the influx of recreational users to river corridors focuses on two issues: first, the potential for damage to the natural environmental and, second, the possible deterioration of the quality of the recreational experience for the user. The early influential work on the evaluation of user experience studied wilderness hikers and canoeists in the United States (Lucas, 1964; Wagar, 1964; Hendee, 1968; Stankey, 1972).

A considerable amount of research into outdoor recreation, including river recreation, has since focused on the problems of perceived crowding (Heberlein, 1977; Lee, 1977; Becker, 1978; Schreyer and

Roggenbuck, 1978; Manning and Cialli, 1980; Vaske et al., 1980; Absher and Lee, 1981; Gaumann and Burdge, 1984), as well as that of conflict between user groups (Knopp and Tyger, 1973; Jacob and Schreyer, 1980; Lindsay, 1980; Devall and Harry, 1981; Jackson and Wong, 1982). Much of the above mentioned research has been directed towards the search for a numerical "carrying capacity", to be used as a management tool for forecasting how much use, and how many users a site can accommodate (Barber, 1977; Hornback, 1980; McDougall, 1982; Haycock, 1984).

The concept of recreational "carrying capacity" has often been used in defining both the perceived problems in outdoor recreation, as well as the research methodology used to investigate them (Heberlein, 1977; Hornback, 1980). It brought to the analysis of recreational use a natural science model which attempted to define the effects of recreational use quantitatively, and to establish acceptable numbers of users for each site (Barber, 1977; Burch, 1981). The "carrying capacity" concept has also had a more general influence on the outlook of paddlers, commercial rafting outfitters, politicians (who have been faced with increasing use levels at an outdoor recreation

site) and even the general public.

The factors which make up "carrying capacity" have usually been "...discussed using two rubrics: those dealing with natural features and those dealing with human components" (Heberlein, 1977). Wagar's pioneering work on the theory behind social carrying capacity in "wild lands", began in fact as an attempt to measure visitor impact through the relationship between trampling and damage to vegetation. In examining the issue "... it soon became obvious that the resource-oriented point of view must be augmented by consideration of human values" (Wagar, 1964:1). This recognition of the possible impact of visitors themselves on the recreational experience in the outdoors led to studies, beginning in the early 1970s, which attempted to establish hard figures based on the effect on user satisfaction and enjoyment of changes in the density and type of use (Hornback, 1980).

There have been three studies of the perceptions of recreationists who have used the Ottawa River (Rigby, 1980; McDougall, 1982; & Haycock, 1984); these researchers have approached the study from viewpoints which are closely linked to the attempt to manage

outdoor recreation using the "carrying capacity" model. Despite their informative work, and a careful re-examination of their sound data, further research was called for at this site: both to gather input from private users (a group which was hitherto unsurveyed and virtually unmentioned in the research), and to look into the issue of possible conflicts between recreational users on the Ottawa River.

CHAPTER 3

THE EVOLUTION OF RIVER AND SITE USE

3.1 The Present Whitewater Site

The Rocher Fendu Channel is a recreational resource because of its physical characteristics (the character of the rapids and the reliability of the water flow), its situation (accessibility to a large population), and to some extent because of the rich history of the Ottawa River.

The study area is that part of the Rocher Fendu Channel of the Ottawa River used by whitewater recreationists (Figures 3.1 and 3.2). This takes in the rapids, the flatwater between them, the access points, and riparian lands used for portage and lunch spots. The main whitewater stretch consists of the 6 kms. from McCoy Chute to the confluence of the main and middle channels, however the complete study area extends 19 kms. from McCoy Chute to Rocher Fendu Lake. The site is located approximately 110 kms. northwest of the city of Ottawa, and 5kms. from the town of Cobden on Ontario Highway #17 (the Trans Canada Highway) (Figure 3.1). The site is accessible by car for day or weekend use to a large population base in Ontario, Quebec and the

OTTAWA RIVER: COMMERCIAL ROUTES & SITUATION

Figure 3.2,

OTTAWA RIVER: KAYAK AND CANOE USE

After Fortin, 1980

Northeastern United States. A study of commercial users in 1982 found that "Between 50% - 60% of rafting patrons travelled over 200 miles [320 kms.] to participate" (Greer Galloway, 1983). The responses by kayakers and canoeists in the user survey, conducted for this study show that they too are willing to travel long distances. This is consistent with the general finding that: "River recreationists often pursue activities far from home" (Leatherberry et al., 1980).

The whitewater used consists of two parallel sub-channels the "Main Channel" and the "Middle Channel". There are five major rapids, and three minor rapids on the Main Channel route (Figure 3.2). The Middle channel has three major and three minor rapids. In this instance a major rapid is defined as one which an experienced paddler, unfamiliar with the Ottawa River, should scout from the shore; a minor rapid is one which can be scouted from the boat while on the river. The whitewater stretch, is 5.5 kms. long, and includes approximately 2 kms. of flatwater.

3.2 Hydrology

The Ottawa River rises in Capimitchigama Lake on the Precambrian shield of western Quebec, 250 kms. north

of Ottawa. It flows approximately 1100 kms. and falls 343 metres before joining the St. Lawrence River at the Lac des Deux Montagnes beside the island of Montreal (Figure 3.3). From its source, the Ottawa River first flows west for 483 kms. through lake-filled precambrian terrain, then abruptly changes direction to flow generally southeast for 694 kms.. With the exception of the last few kilometres this latter section forms the Ontario-Quebec border (Hydro Quebec, 1958:9).

Hydrology influences recreational use. The Ottawa River's large drainage basin, 72,520 kms.² at the Rocher Fendu site (Hydro Quebec, 1958:9), and the regulation of flow for hydro generation, together ensure there is enough water throughout the whitewater season; this security is important to both the kayaker driving from Toronto, and the commercial raft firm booking trips well in advance of the season.

3.3 The Historic Ottawa River

The Ottawa River has, through its role as a major transportation route, played an important part in Canadian history and prehistory. Archaeological studies have shown that this river was an important trade route for Canada's native peoples five thousand years ago

Figure.3.3

DRAINAGE BASIN AND TRAVEL DISTANCES

(Kennedy, 1970:59 & 62).

With the coming of the French to Canada the Ottawa River became the first leg of the journey from Montreal into the interior. The first European known to have travelled the Ottawa was Samuel de Champlain in 1613 (Figure 3.4). Throughout the 17th and 18th centuries it was used by explorers, missionaries, and traders (Greening, 1961; Kennedy, 1970; Leggett, 1975). The Voyageurs used the Ottawa River from the Lake of Two Mountains to the Mattawa River as the first leg in their journey west (Morse, 1979:48).

The era of most intensive activity on the Ottawa River occurred in the 19th century when it was used by traders, travellers and the lumber industry. The "turning-point" for this route came in 1851 when the canals on the St. Lawrence River were completed, after which freight destined for Lake Ontario no longer used the Ottawa River (Leggett, 1975:147). In the late 19th and early 20th centuries the transport of goods and people within the Ottawa valley was taken over by the railway, and the river itself was supplanted by the St. Lawrence as Canada's waterway route into the interior.

OTTAWA RIVER: HISTORIC CANOE ROUTES

3.4 20th Century Development

While the forest industry has continued to use the river for transportation, "resource use" on the Ottawa in the 20th century has been dominated by hydro electric development which began in 1898 at the Chaudiere Falls site (Hydro Quebec, 1958). Development of much of the river's hydro electric potential was delayed by jurisdictional difficulties between Quebec and Ontario. This issue was settled by the Ottawa River Power Act of 1943, and a flurry of dam construction followed in the late 1940s and early 1950s. The most recent project was Quebec Hydro's Carillon dam, completed in 1962, which flooded out the historic Carillon and Long Sault rapids between Montreal and Ottawa (Leggett, 1975:216).

In the stretch from Lake Temiskaming to the St. Lawrence River, the river falls 157 metres, of which 141 metres, including the 20-metre fall within the study area, is utilized by seven hydro electric dams. The remaining 16 metres consists of small drops such as the Paquette Rapids near Pembroke, and the Remic and Deschenes Rapids in Ottawa.

The history of hydro development on the Ottawa

River is the classic tale of a river tamed. What is unusual about this tale however is that a part of the river remained, if not untouched, then certainly still wild. This salvation by omission was a result of local geography, and a fortuitous sequence of development decisions.

Between Lac Coulonge and Lac du Rocher Fendu the Ottawa River divides into two channels and falls 20 metres on either side of the 19 km. long Ile du Grand Calumet which is part of the province of Quebec (Figure 3.4). The Calumet Channel is therefore a Quebec waterway, while the Rocher Fendu Channel forms the Ontario-Quebec border. In the first half of this century jurisdictional difficulties caused by the provincial boundary delayed development of many of the potential hydro electric generation sites on the Ottawa River. The Calumet Channel, being entirely inside Quebec, did not share these problems. When the Bryson Dam was built in 1925 at the Calumet Falls site (Hydro Quebec, 1958:9), the parallel Rocher Fendu Channel retained its rapids (Figure 3.5). The whitewater in the Rocher Fendu Channel downriver from Muskrat Rapids was flooded out in 1950 by the Chenaux Dam built by Ontario Hydro.

OTTAWA RIVER: FLOW CONTROL SITES

The timing and situation of the Bryson dam has served to develop (i.e. dam) one site while preserving the whitewater in another. Quebec retains the right for 999 years, given in the 1943 Ottawa River Powers Act, to dam the Rocher Fendu, however such a development is not an economically viable option for the foreseeable future (B.Hays, Hydro Quebec, personal communication, 1981). The Rocher Fendu is the only major hydro generation site on the Ottawa River that remains unexploited (Hydro Quebec, 1958; Leggett, 1975:217).

3.6 Flow Through the Rocher Fendu

The flow through the Rocher Fendu Channel consists of an unregulated and unmetered flow of approximately 5 000 c.f.s. ($242 \text{ m}^3 \text{ sec.}$) through McCoy Chute, and a regulated flow through the Rocher Fendu dam (Figure 3.5). During the whitewater recreation season, from May to October, the regulated flow ranges between $4\,670 \text{ c.f.s.}$ ($140 \text{ m}^3 \text{ sec.}$) and $111\,412 \text{ c.f.s.}$ ($3\,340 \text{ m}^3 \text{ sec.}$) (Hydro Quebec: 1972 to 1980 data). The Rocher Fendu dam is used to divert water to the Calumet Channel by raising the level of Lac Coulonge. The McCoy Chute flow has been regulated on three occasions in the 1950s, when temporary dams were built across it each summer and dynamited the following fall (B.Hays, Hydro Quebec,

personal communication, 1981).

The bulk of both private and commercial river use, takes place in the high summer, July and August, rather than during the cold "big water" period of the spring, April to June. The Main Channel is the most travelled of the sub-channels of the Rocher Fendu (Figure 3.2).

The Middle Channel provides a lower volume, less intimidating alternative for all users, especially throughout the spring and during any unusually high summer flows. This alternate route is important to all users but especially to the commercial rafting industry since it enables them to run paddle rafts, the workhorses of the business, on the river at any water level. Only one company possesses the large motorized rafts suitable for use on the main channel during high water.

3.7 Landscape

The Rocher Fendu Channel flows through a rugged landscape over a downthrown section of the precambrian shield. This rugged landscape of rock and forest is an integral part of the recreational experience (Plate 3.1). Commercial rafters have indicated that being in what they perceived as a scenic natural area, even a

PLATE 3.1 RAFT PINNED IN THE LORNE RAPID: LOW
WATER LEVEL

Photo: D. Kennedy

PLATE 3.2, RAFT CUSTOMERS AT THE LORNE RAPID
LUNCH STOP

Photo: D. Anderson

wilderness setting, was very important to making the trip enjoyable (Rigby 1980:42, McDougall, 1982:62).

Between the "put in" to the "take out" areas the overall impression is one of being in a forested "natural" area, despite the presence of a few cottages and the visible development at rafting lunch stops. However:

The river, with its turbulent water and forested shore, is generally seen by rafters as more of a wilderness landscape than it actually is (Anderson and Rigby, 1981).

The landscape is important to kayakers and canoeists as well. Fortin's authoritative guide to Quebec rivers gives the Rocher Fendu Channel its highest rating for "panorama" noting that "le paysage est fort joli" (1980:198).

Rock exposures are a powerful aesthetic feature on the Rocher Fendu corridor. Throughout the summer low water levels there are rock islands, flats and sheer walls along the shore (Plate 3.1). The most visually striking geological feature is the solution weathered marble in Butcher Knife rapid (Spek, 1981). A

number of heavily used sites, especially the lunch stops, at the Lorne Rapid and Garvins Chute lunch stops, are made up of large expanses of exposed bedrock (Plates 1.1 and 3.2); this characteristic enables them to better withstand the heavy trampling by raft patrons which they receive each summer.

3.8 Historic Canoe Use

In the past, canoe travellers did not make regular use of the Rocher Fendu Channel, and the route remained largely unknown. When David Thompson surveyed this area in 1837 for a proposed canal, he indicated that the route would have to be either via the "formidable Calumet Falls" or else "the very little known" Chenal du Rocher Fendu (Kennedy, ~~1970~~:132).

Prior to the roads, railroads, and steamboats of the 19th century there were three possible canoe routes from the lac du Rocher Fendu to lac Calumet (see Figure. 3.4). The first two were the existing channels of the Ottawa River, the Calumet and Rocher Fendu, the third is an overland route which follows a series of lakes through an

abandoned channel originally cut by a much larger post-glacial Ottawa River (McKay, 1949:81). For centuries the native peoples, the explorers and the missionaries used both the the Calumet Channel and the overland route; the Voyageurs used only the Calumet route.

The Calumet Channel was the longest route, 77 kms, but it also had the shortest least difficult portage, "... most of the drop being picked up in the single Grande Calumet Portage" (Morse, 1979:53). The overland route is half the length of the Calumet route; it follows a chain of lakes beginning just above "the Chenaux", rejoining the Ottawa River at Pembroke. This route, while half as long as the Calumet Channel, was strictly for the lightly-laden Indian canoes, it was not suitable for the "canots de maitre", the large heavy-laden craft used by the voyageurs (Morse 1979:53).

The Rocher Fendu Channel was a long route with many difficult portages, and as a result it was largely ignored until the whitewater recreation invasion of the 1970s. Yet despite its

relative disuse, in the past the Rocher Fendu remains important as "Une des rares sections de rapides qui a évité le harachement sur la rivière des Outaouais" (Fortin, 1980:198). It allows each participant to experience the power of the Ottawa River which the Voyageurs and the Native Peoples once paddled.

Commercial raft operators have brought the majority of whitewater users to the Ottawa River. The highly successful image created by the industry includes an evocation of the river's heritage.

This historic river - once a vital link to the interior for explorers and fur traders is now a mecca for whitewater enthusiasts from all over the east (Wilderness Tours, brochure, undated, 1980s)

CHAPTER 4

MASS PARTICIPATION

4.1 Mass Participation

An eclectic mixture of factors and forces has led to the present popularity of whitewater recreation on the Ottawa River. Both the evolution of attitudes towards wilderness as a recreational environment, and the heritage of images and ideas drawn from exploration, work and recreation, on rivers in North America and Europe, have helped to create the interest in, and the diversity of, whitewater recreation. The use of modern technology has contributed to making river running more accessible, especially for those without whitewater skills.

4.2 Perception of the Environment

Interest in outdoor recreation in North America has tended to focus on one of two outlooks, the first is conservation oriented, with a philosophy in which:

The whole ethos is of separated areas, publicly owned, where the visitor has no inherent right of entry and is subordinate to the needs and values of conservation (Patmore, 1983:171).

The second is that of the recreationist whose primary interest is play; that fragmented group whom researchers have divided into "leisure worlds such as those of 'neospartan hedonism and 'adult toy aficionados'" (Devall and Harry, 1981). Representatives of these two outlooks can fight as allies, as they did to save the Grand Canyon of the Colorado River (Allin, 1982:178), but having succeeded they to may find their interests put them at odds with one another (Shelby, 1981). As Burch (1981) has noted:

Where prior struggles were between the commodity exploiters and the esthetes and recreationists, the new struggle is between the recreationists and the esthetes.

In McDougall's (1982:62) summer of 1981 survey of rafters on the Ottawa River, 72% indicated that the scenery was either an "important" or the "most important" element in enhancing their satisfaction with the trip. Yet the appreciation of this type of rugged wild landscape is a relatively recent phenomenon in western culture. Wall (1982) has noted that

Some of today's major recreational areas [in Canada] such as the Shield [which surrounds the Rocher Fendu] and the Rockies, did not always entice Canadians for recreation but were viewed with fear, as hostile environments to be conquered.

The change in western attitudes towards nature has its roots in Europe in "... Romanticism and associated changes in landscape art" (Wall, 1982). This led to a more positive appreciation of wild landscapes, beginning in the late 18th century (Lucas, 1964; Patmore, 1983:165). This same tradition found expression in North America as well, for example in the writings of the New England philosopher Henry David Thoreau, and pioneer California conservationist John Muir (Lucas, 1964).

The American experience of the frontier has been seen as "... a natural epic, [one which has] encouraged keeping some wilderness as a symbol of the frontier and as a setting for re-experiencing its challenge" (Lucas, 1964). Canada shares with the United States the concept of the frontier challenge as "... a romantic repository of lost innocence"; as well as a willingness to spend time and money on areas which are not expected to "produce" anything in the traditional sense (Cheek & Burch, 1976:166-167). The philosophy of outdoor recreation is heir to this image of man alone re-creating the frontier challenge (Graber, 1976).

4.3 Perception of Whitewater

The way we view nature has a strong effect on how we play there. Simons has noted that "There is little doubt that the 'frontier heritage' motif looms large in American rural recreation (especially in wilderness)" (1975:6). In this context the whitewater river becomes a piece of the frontier, one which maintains its physical challenge despite having had many thousands of recreational explorers.

The appreciation of whitewater rivers has lagged behind that of "the Shield and the Rockies" perhaps because until recently these areas had few recreational users. A raging river was often perceived as simply a wasted natural resource. Leggett (1975:214), in his fervid support of hydro development on the Ottawa River, described how dams have:

...completely transformed the turbulent river of yesterday into the series of major lakes of today, the power of falling water previously wasted in the raging rapids that were such an impediment to travel on the river being now converted into electrical energy in vast generating plants, true temples of power, examples of modern engineering at its best.

The transformation of whitewater from "wasted" energy to a perceived resource in its own right is a

direct result of the increase in popularity of whitewater recreation. The change in popular perception was sparked largely by the 1968 defeat of the proposed dams on the Grand Canyon, a defeat which affirmed that "...rivers had other values besides spinning turbines" (Nash, 1977).

4.4 Technologies of Play

The recent popularity of whitewater recreation was in large part facilitated by the public's awareness of new ways of using the resource, which made it both safe and accessible.

The roots of the increased participation in whitewater recreation can therefore be traced to "...two different though related sources: innovations with equipment [and] experimentation with participation" (White; et al., 1980). Together the equipment and its use has created new "technologies of play" (Devall & Harry, 1981), the impact of whitewater rafting and kayaking was not experienced in the United States until the 1960s, at that time the capabilities of technology available, in virtually its present form since World War II, were matched by the public's desire to make use of rivers as a recreational resource. The three

principal "technologies of play" on the Ottawa River today are whitewater rafting, canoeing, and kayaking.

4.5 Whitewater Rafting

Whitewater rafting has its roots in the thrill of running the big rivers of the American west (Nash, 1977). The use of inflated rubber rafts was "...pioneered...[by Amos Burg]...on the Snake and Colorado rivers in the 1930s" (Nash, 1977). After World War II "ten man" rafts used in the Pacific, and inflatable pontoons used for constructing temporary bridges in Europe, appeared on the surplus market. These were used by the ever imaginative river users either as found or to construct craft (Nash, 1977).

Whitewater rafting began in Canada in 1972, on the Fraser River in British Columbia, and on the Madawaska River in Ontario (McDougall, 1982:5 & 7). Three years later it came to the Rocher Fendu Channel of the Ottawa River. In both Canada and the United States, whitewater rafting is for the most part a commercially offered experience. The tremendous success of commercial rafting testifies not only to ~~changes~~ in popular attitudes towards the perception of nature and whitewater, but also the skill of an industry in

—selling this product.

4.6 Open Canoeing

In Canada open canoeing is part of an unbroken tradition that stretches back past the days of the early explorers and the fur traders, to the native peoples who preceeded them (Benidickson, 1982). The canoe has played a key role not only in exploration, and trade but also in everyday life for much of eastern Canada.

Through open canoeing, recreational whitewater paddling in Canada has retained a greater emphasis on wilderness travel than in the United States. This comes both from history, the strength and the continuity of our canoeing heritage (Benidickson, 1982), and from geography, the northern frontier which, unlike that of the United States, would not be pushed back (Wall, 1982a). This same Shield landscape, which the "group of seven" helped make popular, was always most accessible through the use of the open canoe.

A development in the 1970s and 1980s has been the advent of "sport canoeing" in which the use of flotation bags, plastic boats, and helmets has led to

regular use by canoeists of much more difficult rivers than was previously possible. One of these rivers was the Ottawa.

4.7 Kayaking

A paddling tradition, emphasizing adventure rather than wilderness use, began in Europe sparked by the river travels and writings of John "Rob Roy" MacGregor in the 1860s (Benidickson, 1982). In his wooden-decked kayak, or "Rob Roy" he sought out challenging whitewater rivers. This form of recreation is distinguished as much by attitude as by craft. Kayaking has attracted the thrill-seeker more so than the Canadian open canoe tradition with its judicious portaging and its stress as much on being in the wilderness as much as getting there. Today strong, light fiberglass and rotomoulded plastic boats have made kayaking the most popular form of private, non-commercial, whitewater use on the Ottawa River.

4.8 Activity Choice and Participation

As Smith (1983:121) has noted "The most important element in recreation is people." The explosive growth of participation in whitewater recreation in less than two decades is largely a function of factors

influencing the choice of individual participants. Christy (1970) defines five "... elements that may be important in stimulating mass-recreation activities" by influencing that choice. They are:

- (1) ease of participation - of developing the ability to participate;
- (2) a desirable image associated with the activity;
- (3) characteristics that permit a strong identification with the image - the proof that one belongs;
- (4) opportunities for demonstrating skills - an audience to appreciate the image; and
- (5) a comfortable and efficient use of leisure time.

These elements can be used to analyze both the general attraction of whitewater activities as well as the factors responsible for differences in participation rates between the major whitewater activities engaged in on the Ottawa River.

Commercial rafting has many thousands of participants each year and the commercial experience is designed so as to rate highly in all elements especially (1) ease, (2) image, and (5) comfort/efficiency. The lower participation rates for kayaking and canoeing than for rafting, the lower potential scores for (1) ease of participation, and (5) comfort/efficiency, since time, effort, and athletic

ability are required to develop the requisite skills.

An important part of the (2) "desirable image" for all these activities is the sense of risk. This element is not unique to whitewater sport. For, in any form of outdoor recreation, "A hazard-free recreational setting would most likely be perceived as sterile" by the visitor (Jubenville, 1978:150).

4.9 Activity Groups and Packaged Recreation

The differences between the whitewater activities on the Ottawa River is a result of not only the craft used but also how the activity is organized; it is a contrast between the self-outfitted private trip, and the commercially "packaged" excursion (Rigby, 1980; Anderson and Rigby, 1981; Anderson, 1983; Anderson, 1985). Anderson (1983) has defined "packaged" recreation as a form which is:

... fully organized by experienced outdoor firms, so that even the inexperienced, non-outdoor urban individual may discover and enjoy in relative safety, a kind of adventurous outdoor recreation or wilderness experience which he or she would not likely experience otherwise.

Whitewater rafting is one of the most popular examples of this phenomenon.

The essence of commercial whitewater rafting is accessibility; most people can take part with no more than their curiosity and the fee for the trip. The Ottawa River raft customer is shepherded down the river on a scheduled, fully planned excursion. By contrast, the private kayaker and canoeist has the freedom to plan and run his or her own trip. This freedom, however, is paid for with equipment acquisition; greater personal responsibility and the time needed to acquire the requisite paddling skills. Thus private and

commercial whitewater activities are very different for those engaged in them on the Ottawa River. Of concern to this thesis is the question of whether or not these distinct activity groups also differ in the way they perceive certain issues, such as the present state of the river as a recreation site, and what volume and type of recreational activities they perceive to be appropriate for this site?

4.10 The River as a Recreation Resource

A portrait of this area's perceived recreational potential, in the era before the whitewater invasion of the late 1970s, is provided by Annand's 1971 study which proposed that the Rocher Fendu whitewater channel

and surrounding lands be designated a national park, stressing low density use and environmental preservation, since the "area does not have a spectacular drawing point" (Annand 1971:47). The proposal outlined a land-based development scheme along a river which was itself perceived as having little natural recreational potential. This assessment shows how much the potential we see in resources is governed by how we perceive them. This approach to resources was set out by Zimmerman (1951), and restated for recreational resources by Clawson and Knetsch:

There is nothing in the physical landscape or features of any particular piece of land or body of water that makes it a recreation resource; it is the combination of the natural qualities and the ability and desire of man to use it, that makes a resource out of what otherwise may be a more or less meaningless combination of rocks, soil, [water] and trees" (1966:7).

The history of the Ottawa River is itself an element in the recreational experience. There is a sense of history in travelling the river, if not the exact route, used by the voyageurs, (Morse, 1979:53; Kennedy, 1970:132). Yet in a nation with thousands of whitewater canoeists, the Ottawa's rapids were until the 1970s, virtually unpaddled.

The "discovery" of the Rocher Fendu, as a whitewater recreation resource is claimed by at least three local "explorers", however it is interesting to note that the first recorded recreational rafting "user day" on the Ottawa River may have come in the 1880s when the Reverend J.C. Fraser recorded his experiences as a passenger on a timber raft:

...running the rapids is the most stirring of all river sports; it is exhilarating in the highest degree, and gives, what is never to be despised in life, a new sensation.

Yet he also recognized that:

This is the grandest sport on the river for the tourist and the hardest work for the "drivers" (in Greening, 1961:107)

Fraser did not record the rate for a raft trip a century ago, but his perceptions and insights into the nature of the experience of both the "tourist" and the "driver" are as valid today as a century ago.

Although today's commercial whitewater rafting did not evolve from the activities of the 19th century lumbermen and their sometime tourist riders, the raft customer of today, even amidst the "party atmosphere"

on the river (Haycock, 1984:125), can experience something of that "new sensation", which is the power of the river.

4.11 Impact of Mass Participation

The most distinctive characteristic of whitewater recreation in the last decade in Canada, as compared to its recreation heritage, of open canoeing, is the advent of "mass participation", which on the Ottawa River is a synonym for rafting. Since the mid 1960s researchers have been attempting to gauge the effect on individual perception of increases in user density, both on the trail and on the river. Is the experience or "new sensation" of the average weekend rafter or paddler diminished by sharing the river with perhaps fifty kayakers and a thousand rafters?

The next chapter will examine the concept of "social carrying capacity", and the attempts to use it as a tool for measuring the possible effects of increasing density on the perceived quality of the recreational experience.

CHAPTER 5

THE IDEA AND USE OF CARRYING CAPACITY

5.1 Motivations for Research

The rapid increase in recreational activity at this site has led to a concern about the possibility of crowding. Researchers have approached this issue on the Ottawa River by attempting to find the site's "carrying capacity". To set such a capacity requires that problems be defined in terms of user density, and that there be a perceived need to manage, and perhaps restrict, recreational use. Both this perceived need and the "carrying capacity" model have been much in evidence on the Ottawa River. It is therefore necessary to examine the use and the limitations of this model.

The study of the impact of recreational use at both water and land based sites has often focused on an attempt to understand how the individual user's perceptions of the social density (the number of people encountered), affects the quality of their recreational experience. Problems have arisen when studies gathering data on "user perception" have as their primary motivation the search for a recreational "carrying capacity", rather than the understanding of these

perceptions.

5.2 Definition

A great deal of interest and research has been focused on attempts to establish a measure of how much recreational use a natural environment can sustain. This search for a method of regulating or restricting recreational use has most often focused on the concept of recreational "carrying capacity". In its most basic formulation this "carrying capacity" can be defined as:

... the largest number of a population [be it in an ecosystem or a human population] that the environment of a particular area can carry or support (Haggett, 1983:52).

In defining recreational "carrying capacity", Lime and Stankey (1971) found it necessary to first note what it is not:

Recreational carrying capacity is not a simple, single, absolute value. There is no fixed figure we can point to for a particular recreational area and say, 'This is the carrying capacity'

They then defined "recreational carrying capacity" as:

... the character of use that can be supported over a specified time by an area developed at a certain level without causing excessive damage to either the physical environment or the experience of the visitor.

5.3 The Roots of Carrying Capacity

The roots of the "carrying capacity" concept, as it has been used in the study of outdoor recreation, are in the physical sciences. Biologists and ecologists have used the "... ecological principle of limiting factors ..." to create "carrying capacity" estimates for animal populations (Barber, 1977:11). Use by ranchers helped to popularize the idea of using "carrying capacity" as a "management tool" in areas other than wildlife studies or rangeland management.

According to Stankey (1982) "carrying capacity" was first used with reference to outdoor recreation by Sumner in 1936. From the 1930s to the 1950s research into recreational carrying capacity focused on the direct impact of human activity on the physical environment (Barber, 1977:13).

Researchers and managers were drawn to the concept of "carrying capacity" not only by the promise of finding the answers to complex and potentially divisive questions, but also by the prospect that these answers would be disinterested, scientific and numerical (Burch, 1981).

5.4 Criteria for Analyzing Carrying Capacity

Theoretical discussions of recreational "carrying capacity" have usually been based on the two general criteria of "natural features" and "human components" (Heberlein, 1977). A set of criteria created specifically for river running recognized:

... three major limiting factors that form a basis for carrying capacity determinations ...:(1) Physical capacity-- actual numbers of people that can be physically accommodated at launch sites, camp grounds, etc.;(2) Sociological capacity-- the number of people that can be on a river at any one time without interacting to the point of degrading each other's experience; and (3) Ecological capacity-- the number of people that a river system can accommodate without impairment of components of the various indigenous ecosystems (Mak et al., 1977).

5.5 Physical Criteria

Physical capacity is in practice most often a function of shore based uses (Mak et al., 1977). On the Ottawa River in 1981 McDougall did find that complaints of congestion by rafters were focused most often on the major lunch stops rather than river based activities (1982:60). This facet of carrying capacity has at times been used as a convenient, if dubious, management tool. Failure to maintain facilities such as access roads, has been used to create or maintain a

limit to a site's capacity (Jubenville, 1978:254). This "... subterfuge of using facilities or biological capacity, although convenient for the manager," does not however address the issue of "social carrying capacity" (Heberlein, 1977). It is easier to turn away people from a site because the parking lot is full than because the manager feels the recreational site is "full".

5.6 Ecological Capacity

The capacity of the natural environment to sustain use has been a major concern in outdoor recreation. Ecological impact on river corridors is, like physical capacity, most often the result of intermittent shore use focused on certain designated or popular sites. The effect of recreational use on the shoreline environment is a function of the type and frequency of use as well as how the shore itself is used and maintained; it will seldom represent an inherent limit on the number of river users (Wagar, 1964:9; Schreyer & Roggenbuck, 1978; Jubenville, 1978:254-256). This has been borne out by the experience with rafting on the Grand Canyon of the Colorado River where the use of "porta-potties" and designated sites has reduced

visitor impact to the point where the present limits are based on a desired level of use rather than ecological constraints (Heberlein, 1977; Becker et al., 1984).

5.7 Social Carrying Capacity

"Social carrying capacity", or "Sociological carrying capacity" (Mak et al., 1977), focuses on the effects of users on one another in the recreational environment. Research in this area began in the 1960s when it was "...recognized that growing use levels would alter the nature of the recreational experience offered by a particular place ..." (Stankey, 1982). Interest in "social carrying capacity" has increased since the mid 1960s, not only as a supplement to the use of physical criteria, but also because at that time wilderness managers in the United States needed a method for gauging the quality of the recreational experience. This type of information was necessary to establish the management criteria required to manage the vast areas regulated under the National Wilderness Preservation System Act, in 1964 usually referred to as the Wilderness Act (Stankey, 1972; Dickenson, 1985)..

5.3 Impact of the United States Wilderness Act

The Wilderness Act which was adopted by the United States Congress in 1964 eventually led to the creation of 80 000 000 acres of "legislative wilderness", almost half within the National Park System, with most of the rest administered by the Forest Service of the Dept. of Agriculture (Dickenson, 1985). The mandate given to these agencies entailed not only protecting the natural environment, but also providing an opportunity for recreational use. The act specified that the type of recreational experience provided must be one characterized by "... outstanding opportunities for solitude or a primitive and unconfined type of recreation" (Wilderness Act, U.S. Code, 1970:4090). The challenge then became translating this mandate into management plans and regulations by defining "solitude" and wilderness recreation in terms of the number of people and the type of activities which would be acceptable.

The conundrum created by the responsibility to both preserve the environment and provide the opportunity for recreation is one familiar to park administrators in both Canada and the United States (Hendee, 1968; Brockman and Merriam, 1979:139; Simmons,

1975:240; Pigram, 1983:153-160), but in 1964 the United States Wilderness Act added that preservation meant maintaining a specific type of wilderness environment, one which was in part perceptually defined. This responsibility, combined with the way it was defined, led to a greater interest in "carrying capacity" research. Stankey (1972) concluded that:

The 'preserve' and 'use' dichotomy in the Wilderness Act has created a situation that leaves virtually no alternatives for the wilderness manager to consider other than establishing some 'carrying capacity' for wilderness.

Because the Wilderness Act defined recreation in terms of solitude and the type of user experience research was conducted concerning "social carrying capacity" and the impact of users on the experience of others.

5.9 Government Sponsored Research

This initial research into "social carrying capacity" was conducted either by, or with the support of the United States Forest Service, and attempted to define the social environment necessary for a high quality wilderness experience, as defined by the Wilderness Act.

The methods used, and the results obtained, by the early studies of "social carrying capacity", by Wagar (1964), Lucas (1964), and Stankey (1972), had a great influence on subsequent outdoor recreation studies conducted in both Canada, and the United States.

5.10 Wagar's Research: 1964

Wagar's speculative work identified problems and directions before a body of research had been established. This work recognized the complexity of "carrying capacity" and produced a number of insights which have been borne out by subsequent research. It argued that the effects of crowding would depend on the activity, and the individual participant; more specifically that satisfaction would decrease if crowding interfered with those "... needs and desires ...[which]... explain the motivation of most wildland recreations" (Wagar, 1964:6). This view of "carrying capacity" stressed the "... administrative nature ..." of the decision making process, as well as the limitations of "... research ...[and]... impersonal equations and formulas ...", which can provide no more than guidance (Wagar, 1964:23). The burden of decision making would remain with the manager.

An important assumption was made concerning the

relationship between user density, and user satisfaction.

...[in regards to the] desire for solitude or escape from people. Obviously this need will be less satisfactorily fulfilled as numbers of people increase (Wagar, 1964:11).

To the surprise and consternation of many researchers this seemingly obvious relationship has proved most difficult to demonstrate in studies of actual use.

5.11 Lucas's Research: 1964

Lucas conducted a study of "Wilderness Perception and Use" by canoeists (paddlers), and boaters (motorized) in the Boundary Waters Canoe Area (Lucas, 1964). This research gathered data on the type of questions which had been raised by Wagar. The survey looked at both the user's perception of wilderness as well as the user's reaction to meeting other people.

The results showed that canoeists were much less likely than boaters to consider an area to be wilderness when it was heavily used. They also had a strong antipathy to meeting boaters, an antipathy which the boaters did not reciprocate (Lucas, 1964). Yet while canoeists perceived a smaller wilderness area

and showed a greater tendency to visit the wilderness areas they were also "... heavily concentrated at one [out of a possible fifty] starting points" This finding was "... not consistent with the objection to crowding" (Lucas, 1964). The opportunities to use this one desirable location seemed to be enough to override the greater density of canoeists experienced.

(5.12 Stankey's Research: 1972

Stankey's study of "wilderness carrying capacity" was designed specifically to gather data which would aid the management of recreational use under the United States Wilderness Act (Stankey, 1972). It examined user perception of wilderness based on a survey conducted in four American wilderness areas. The analysis focused on the responses not of the total sample population, but rather those "purists" whose attitudes "... reflected close agreement with the institutional definition of wilderness" (Stankey, 1972). The goal was to define a form of wilderness management which reflected the particular needs of this target group of recreational users since:

... a wilderness management philosophy consistent with the objectives of the Wilderness Act is impossible under a 'manage for all' approach ... (Stankey, 1972).

The "purists" identified were those who indicated a preference for few contacts with others, for small groups, and objections to those using different modes of travel, especially towards the motorboats in the Boundary Waters Canoe Area. They preferred campsites isolated from others, and showed a strong dislike for any environmental deterioration caused by man, such as littering and site trampling (Stankey, 1972).

This work was an important attempt to formulate "social carrying capacity" guidelines using both participation input, as well as the objectives of the 1964 Wilderness Act. It is important to note however that the data on user attitudes, like Lucas's in 1964, comes from interviews which present actual users with hypothetical situations, it is therefore a measure of "attitude" which indicates "... how a person feels ..." (affective component) ...[but not]... how he might actually behave ... (behavioral component)" (Stankey, 1972).

The search for a managerial definition of "carrying capacity" was guided by the "purist policy" adopted by the United States Forest Service (Allin,

1982:145). In 1968 Hendee conducted the first outdoor recreation research which used attitude scaling techniques. This work attempted to place recreation users in a spectrum ranging from "wilderness purists" to the "urban oriented" (Hendee et al.; 1968:32).

Through the Wilderness Act this research gave those at the purist end of the spectrum considerable potential influence, since the responsibility of the Forest Service was not to cater to all users, but rather to maintain a high quality experience. The nature of the experience was in part defined using input from the purists themselves.

This action by the United States Forest Service in part reflected the outlook of militant conservation organizations, such as the Sierra Club and the Wilderness Society, which had lobbied for this type of legislation since the late 1940s (Brockman, 1979:75). From the outset it had been anticipated that use restrictions would be a part of the management schemes in many designated areas (Stankey, 1972).

5.13 Management and Use Restriction

According to Lee, and other sociologically oriented researchers, the propensity on the part of

many researchers and managers to restrict use by calculating carrying capacities, often comes from a life science background and outlook (Lee, 1977; Burch, 1980; Stankey, 1982). For those with this background, the restriction of use comes more easily since "... much of the biological impact that inevitably accompanies recreation use typically occurs under fairly low use levels" (Stankey, 1982). Many managers and researchers are more comfortable as protectors of the environment than they are as providers of a service to the public (Burch, 1980). Burch, who has been highly critical of "... the notion of carrying capacity ..." has also suggested that "... the universal use of recreation carrying capacity standards may have more to do with coinciding lines of ideology held by the manager and the researcher than by the empirical data" (1981).

5.14 Research in Defining User Satisfaction

Throughout the 1970s and 1980s research into many forms of recreation sought to define the criteria necessary to define a satisfactory experience in other, often non-wilderness, outdoor activities; be it use of an urban winter trails (Jackson & Wong, 1982), cottaging lakes (Barber, 1977), or whitewater rivers

(Heberlein, 1977; Neilsen and Shelby, 1977; Rigby, 1980; McDougall, 1982; & Haycock, 1984).

These studies did indeed find the complexities that Wagar had anticipated in 1964, but at the same time they were unable to find significant evidence of a correlation between increasing user density and decreasing user satisfaction. This has led to some confusion, as will be seen in the Ottawa River studies in chapter 5, since a very different kind of result had been anticipated, at least for wilderness users in search of solitude, by Wagar himself (1964:11), and seemed to be substantiated by the results of the early studies by Lucas (1964), and Stankey (1972).

5.15 Significant Colorado River Research

The studies of user perception for rafters using the Grand Canyon on the Colorado River are important here for two reasons. First because they are part of the most comprehensive study of the impact of recreational use on a whitewater river, and second because the study of "social carrying capacity" by Neilsen and Shelby (1977) was the first real world test of how users in fact react to variations in social density.

The initial "social carrying capacity" studies created a kind of positive feedback loop in which increased expectations of what was possible were based on a misconception of how much had already been achieved. The results from the Colorado River, sponsored by the United States National Park Service, gave the first forceful contradiction of, "The common sense notion that crowding in backcountry settings is a phenomenon dependent upon sheer numbers of people ..." (Absher & Lee, 1981). The work on "social carrying capacity" by Shelby & Neilsen (1977) found that while there was a positive correlation between decreasing satisfaction, and increasing "social density", it was however:

... not large enough to be substantially important ... [moreover] ... there was no relation between [the number of] contacts on the river and perceived crowding.

In this latter association between the perception of crowding and the number of on river contacts, those with "wilderness purist" characteristics were not significantly different from the total sample population. The study concluded that "... contacts show little relation to perceived crowding and perceived

crowding seems to have little to do with user satisfaction" (Neilsen and Shelby, 1977).

The difference between these results and those of earlier studies has proved to be a function of the methodology used rather than user characteristics, or the type of environment studied. Subsequent studies of user perception based on reactions to an actual experience, as on the Colorado, rather than on a hypothetical situation, as was the case with much of the early research into "social carrying capacity" (Hendee, 1968; Stankey, 1972), has been able to replicate the finding that the perception of crowding is not a function of social density, and that increasing user density does not significantly decrease user satisfaction (Lee, 1977; Heberlein, 1977; Becker, 1978; Manning and Ciali, 1980; Absher and Lee, 1981; Burch, 1981).

5.16 Methodological Differences

Variations in the type of response can therefore be largely a function of how the data is gathered; which "component" of attitude -affective, cognitive, or behavioral- is being tapped (Stankey, 1972). Both Hendee (1964), and Stankey (1972) studied the "affective component"; how people "feel" about the

environment (what they predict given a hypothetical situation). Shelby and Neilsen (1977), studied the "cognitive component"; what people know about the environment, (how they respond when questioned about an actual experience). Lee's 1977 study is an attempt to look at the "behavioral component"; how people actually behave while engaged in outdoor recreation.

5.17 The Influence of Survey Techniques

When Stankey (1972) had reported positive correlations between increased social density and decreased user satisfaction, this work had "... relied on evaluations of hypothetical density situations [by users] rather than on actual observed conditions" (Absher and Lee, 1981). This type of study has been popular, since it can be very difficult and time consuming, to either interview or observe people while they are engaged in active participation, often very dispersed in time and space (Barber, 1977:25).

Lee studied the behavioral component of attitude by looking at the response from individual hikers to a survey of "perceived crowding", and comparing with behavior, measured through "greeting intensity" on the hiking trail and "avoidance behavior" at campsites. The

findings indicated that, the amount of "... social interaction with strangers was unrelated to a visitors interpretation of success in achieving a desired degree of privacy" (Lee, 1977). There was no relation between the perception of crowding, and the type of behavior observed. In other words those who found the area crowded were no less sociable on the trail or at the campsite, than those who were happy with the density encountered.

5.18 Disappointing Conclusions

Stankey (1982), in a review of research into "carrying capacity", has compared its disappointing history to "... the search by alchemists of old for a means to transmute base metals to gold." A number of mechanisms have been suggested to explain results which often seem to contradict common sense.

It has been suggested that continued high satisfaction, despite large use increases, may be caused by "displacement", in which participants and activities less tolerant of increased density are replaced by others who enjoy the new environment (Heberlein, 1977; Stankey, 1982). Therefore according to Schreyer and Roggenbuck (1978) "... a

decision not to manage to provide opportunities for specific experiences is in fact a decision to manage for density-independent experiences."

Another theory focuses on newcomers, those with no expectations, who may therefore tend to be satisfied with whatever user density they encounter (Nielsen and Shelby, 1977; Heberlein, 1977; Schreyer and Roggenbuck, 1978; Stankey, 1982). Yet it has also been noted that since recreation "... is freely chosen [although not free], the tendency is for participants to seek consonance between what one did and what one got out of it" (Stankey, 1982). Heberlein (1977) has called this process "product shift", and defined it as one in which participants change their "... normative definition of appropriate contact levels ..." to suit the changing face of the recreational environment (see Manning and Ciali, 1980; Vaske et al., 1980).

5.19 A Sociological View

Tolerance of a wide variety of social densities comes as no surprise to sociologists (Ittelson et al., 1974:148-151; Altman, 1975:176 & 150-151; Burch, 1981). They have found that people are able to adapt to, and even enjoy, situations which involve high social

density, and that outdoor recreation is no exception to this rule. Burch (1981), a strong critic of much of the "social carrying capacity" research, has concluded:

... that social species such as the higher primates are likely to be sociable regardless of their rhetoric and responses to attitude questionnaires.

Many of the concepts which have guided the study of "social carrying capacity" in outdoor recreation have come from "... user attitudes, subjective responses, legal definitions [i.e. The Wilderness Act], and other common sense formulations ..." (Lee, 1977). These guides have proved to be inadequate because they describe a world based largely on the rhetoric and ideology of wilderness purists, which is not necessarily the world as it exists or can be.

5.20 The Popular Metaphor

Despite the problematic results from studies of "social carrying capacity" the "popular metaphor" (Burch, 1981), based perhaps on its early use in ranching and the biological sciences, is still influential. This view has been expressed succinctly by Len Hopkins, the Federal member of Parliament for Renfrew-Nipissing-Pembroke, the Ontario portion of the

study area:

... the amount of water involved here and the distance travelled should be assessed, and a maximum number of rafts be allowed on that basis (Citizen, Jan 28, 1982:62).

This image of "carrying capacity" as a "predictive measure" is based on the idea that an innate capacity exists, one which science can find and express numerically, given enough time and data. However Stankey (1982) has concluded that the problem has "... proved to be largely resistant to a straightforward scientific solution." It would seem that the scientists have lobbed the ball back into the politicians' court.

5.21 The Future of Social Carrying Capacity

The lack of success with the attempts to define a predictive formula for "social carrying capacity" has resulted in either its rejection or the call for a revised formulation. Researchers who reject the concept of "carrying capacity" (Wagar, 1974; Bury, 1976; Burch, 1984) argue that since recreation is a psychological experience this concept focuses undue attention on the physical environment, and away from the individual participant and the decision making process involving management goals, since no site has only one possible

capacity. As Wagar (1974) has stated:

To maintain our focus on managerial decisions designed to achieve selected objectives such terms as "use limits" or "use-intensity-quality relationships seem preferable to "carrying capacity".

Those who argue for a "reformed model" (Stankey and McCool, 1984) see "carrying capacity" not as a predictive measure or a disinterested decision maker, but rather as a tool for implementing management objectives (Stankey, 1982; Lucas, 1977). "Social carrying capacity" would define the level of use appropriate to maintain the desired type of recreational environment, and that desired environment would be defined by management objectives such as the proposed "Limits of Acceptable Change (LAC) process..." (Stankey and McCool, 1984).

The attempts to implement the United States Wilderness Act of 1964 created a situation which used this "reformulated model." The goals were defined by the United States Congress, and government agencies, such as the Forest Service and the Parks Service, were given both the responsibility to provide a specific type of wilderness experience, and the authority to create the regulations needed to maintain it. Yet

despite this initiative and the support for research into "social carrying capacity", no clear link was found between changes in the recreational environment caused by the number of users, and changes in the quality of the recreational experience. The IAC process gets around "... the lack of relationship between density and satisfaction" (Stankey and McCool, 1984), but it would result in a management decision based not on an evaluation of the sites "carrying capacity" but rather on a subjective decision.

A recent review of the problems with campsite management in wilderness areas, while addressing the specific problem of evaluating campsite deterioration, at the same time spoke to the conundrum faced by all attempts to make "social carrying capacity" evaluations.

While our capacity to estimate the amount or magnitude of environmental impact is good, the ability to assess its importance is poor. ... the extent to which these impacts influence visitors' choice and use of sites or their enjoyment of the experience is unclear (Lucas, et al., 1985).

use of attitude scaling techniques designed to place people within a spectrum ranging from "wilderness purist" to "urban oriented" based on their attitudes towards wilderness recreation. Wilderness purists have been defined as those "who share a pro-wilderness ideology and are expected to be more sensitive to crowding than nonpurists" (Neilsen and Shelby, 1977).

The Ottawa River studies in 1980 and 1982 focused on the attitudes of "wilderness purists" (Rigby, 1980:33-34; McDougall, 1982:8). Purists were to be used as expert consultants whose perceptions would serve as a guideline for the establishment of management plans designed to serve a "primary management clientele (PMC)" rather than the "lowest common denominator (LCD)" (Schreyer, in McDougall, 1982:24). Purists might also serve researchers studying the Ottawa River like canaries in a coalmine, by warning of changes in the recreational experience caused by the increasing numbers of people making use of this recreational environment.

The attempt to identify and use the attitudes of "wilderness purists" has created two problems on the Ottawa River. First, it is questionable whether it is

Objective answers to these questions are not in the offing, however in this failure to find the desired "technical solution" there is an important lesson.

Perhaps the greatest contribution social science can make is to remind resource managers that we live in a world of choice and possibility rather than determinism, to provide them with frameworks for improving decision-making and policy formulation when decisions and policies are ultimately based on political and judgmental strategies (Becker et al., 1984).

5.22 Carrying Capacity Summary

The major influence on the study of "social carrying capacity" in outdoor recreation has been research on wilderness use and users in the United States. Much, but certainly not all, of this work has had a less than disinterested outlook since, "...almost all wilderness studies have been ~~conducted~~ by researchers with an interest in wilderness preservation or management ..." and most have been sponsored by the U.S. Forest Service "...either directly ... or indirectly..." (Lee, 1977:5).

Those engaged in outdoor recreation activities, including wilderness users, have been shown to be for the most part social animals with an ability to tolerate and even enjoy variations and increases in the

social density of their environment. This finding has caused problems with attempts to establish "social carrying capacities", which would form the basis for the management and possible restriction of recreational use. Recent studies have either rejected the "carrying capacity" model, or placed a greater emphasis on its more subjective elements.

The next chapter looks at the research into the perceptions of rafters conducted, between 1979 and 1984, on the Rocher Fendu Channel of the Ottawa River. This work was strongly influenced by American studies, and conducted with the purpose of setting a "social carrying capacity" for a river corridor perceived to be in need of regulation.

CHAPTER 6.

THE PERCEPTIONS OF COMMERCIAL USERS ON THE OTTAWA RIVER

6.1 Studies of Commercial Users on the Ottawa River

Beginning in the late 1970s, concern about the rising number of people travelling the whitewater on the Ottawa River's Rocher Fendu Channel helped to motivate studies of commercial whitewater rafting activity at this site. While each study has used a slightly different approach to studying this phenomenon, all relied heavily on the perceptions of whitewater recreation users themselves for much of their data. This body of research gives valuable insights into the character of commercial use, the perceptions of recreational users and also the outlooks of those who have studied them.

The analysis of these previous studies of whitewater recreation on the Ottawa River is made more complex because not only are their research methodologies different, but the period from 1979 to 1984, when they were conducted, saw significant changes in the character of recreational use. Despite these problems an analysis of their methodologies, results,

and conclusions can be useful, if one is mindful of the limitations of comparison.

Because there have been three previous studies over a time span of six years it was possible to examine both the effects of different research techniques on the type of results obtained, and the perceived problems on the "pre invasion" Ottawa River in 1979 as compared to the popular recreation site it had become in 1981 and 1984. A critical evaluation of both the data on the Ottawa River whitewater users and how it has been interpreted, sheds some light both on them and on the viewpoints of the researchers themselves.

Rigby (1980), and McDougall (1982), surveyed whitewater rafters on the Ottawa River in 1979 and 1981 respectively. They used similar questionnaires and similar methods of statistical analysis. Haycock (1984) examined rafting in the 1984 season, and included a brief user survey, but very little statistical analysis. His main focus was on a description of American river regulation schemes which might be applied to the Ottawa, as well as the history and politics of the rafting business on the Ottawa River.

6.2 Rigby and McDougall: A Comparison Methologies

A comparison of the 1980 (Rigby); and 1982 (McDougall) studies is most useful, given their use of similar methologies combined with the great changes in the volume and character of river use in the two year period between them. Both of studies drew their sample from customers of "Wilderness Tours", the first commercial rafting operation on the Ottawa River. In 1979, when the first study was conducted, it was the only company on the Ottawa River, but in 1981 it was one of three companies.

The 1979 study gathered data on rafters both from release forms, and from a questionnaire filled out immediately after the trip. The questionnaire was based on those used by Lucas (1964), Hendee (1968) and Stankey (1972) in the United States (Rigby, 1980:31). The study attempted to establish "A Definition of the Nature of the User of a Structured Form of Wilderness Recreation". (Rigby, 1979). This entailed a comparison of the attitudes of raft company customers with those of "wilderness purists", as presented by Hendee (1968), and Graber (1976), and an investigation of whether

certain socio-economic characteristics predisposed people towards these attitudes. In 1979, use of the Ottawa River was still relatively light, approximately 5 000 rafting user days were spent on the Ottawa River, and no more than a few hundred kayaking user days. This study did not look at the issue of "carrying capacity", nor did it gather data on changes in user perception with increases in user density.

The 1982 study used a mailed questionnaire sent in the fall of 1981 to a random sample of that season's customers. The questionnaire was similar to that used in Rigby's 1979 study. Important additions to the research focus were questions on the user's perception of "crowding" and "congestion" on the Ottawa River. This was all the more significant since 1981 saw the start of commercial competition, and a 350% rise in the number of rafting user days over the previous year (see Table 1.1).

6.3 Changes on the Ottawa River: 1979 to 1981

Between 1979 and 1981 there was a great change in the number of craft and people using the Ottawa River. In 1979 commercial rafting user days totaled 5 000, by 1981, the number had risen to 35 000 user days (Rigby,

1980:28; Haycock, 1984:110). The increased user density also changed the character of river use and, therefore, some of the inputs into the recreational experience. In 1979 with only one rafting firm and relatively few non-commercial users (eg. canoes and kayaks) a commercial operation could exercise considerable control over what their customers did and saw. This was done largely by carefully timing both the start and the progress of each raft "trip". Staggered start times meant a number of trips could share this short stretch of river, as well as the same lunch spot, with little or no visual contact (Citizen, October, 19, 1982). In 1981 commercial competition made scheduling trips to control the number of contacts no longer possible, with numerous trips close enough to see one another, and it became impossible for raft companies to create the illusion of an isolated trip on a wilderness river (personal observation).

6.4 The Concept of the Wilderness Purist

The influence of earlier wilderness perception research can be seen in the methodologies adopted in the studies by both Rigby (1980), and McDougall (1982). One of the principal research tools used in the attempt to understand user perceptions in each study was the

use of attitude scaling techniques designed to place people within a spectrum ranging from "wilderness purist" to "urban oriented" based on their attitudes towards wilderness recreation. Wilderness purists have been defined as those "who share a pro-wilderness ideology and are expected to be more sensitive to crowding than nonpurists" (Neilsen and Shelby, 1977).

The Ottawa River studies in 1980 and 1982 focused on the attitudes of "wilderness purists" (Rigby, 1980:33-34; McDougall, 1982:8). Purists were to be used as expert consultants whose perceptions would serve as a guideline for the establishment of management plans designed to serve a "primary management clientele (PMC)" rather than the "lowest common denominator (LCD)" (Schreyer, in McDougall, 1982:24). Purists might also serve researchers studying the Ottawa River like canaries in a coalmine, by warning of changes in the recreational experience caused by the increasing numbers of people making use of this recreational environment.

The attempt to identify and use the attitudes of "wilderness purists" has created two problems on the Ottawa River. First, it is questionable whether it is

useful to use a wilderness purist outlook with regards to an area which is not a true wilderness area. Rafting, kayaking, and canoeing often do take people into the wilderness, but this is not the case on the Ottawa River where the hydrological regime is controlled by man and the visible shoreline has been, and continues to be, used by cottagers, campers, fishermen, and loggers. The area beyond the often thin veneer of woodland along the shore is used for farming and many other purposes.

A second problem concerns the users themselves, or rather the way these studies attempted to use them. The Ottawa River studies attempted to make correlations focusing on that subset of the total sample which most closely resembles the Wilderness "purist". In short, they attempted to establish a relationship between attitudes and socio-economic characteristics, by first finding those with the desired status and then seeking out the expected attitudes. The attempt to use socio-economic characteristics as a means of predicting user attitudes, is something quite different from what Hendee (1968) or Stankey (1972) had done. It has often been shown that wilderness users stand out as a group.

in some respects within society (Hendee, 1968; Graber, 1976; Lucas, 1977, Neilsen and Shelby, 1977).

Wilderness users tend to be young, active, well educated, environmentally sensitive, and often fairly affluent, urban dwellers. However, these observations for a small group within society (see Burch, 1981) do not mean that these same characteristics can be used to predict the attitudes of certain individuals towards the environment. Stankey (1972) warned that although:

Most outdoor recreationists tend to be atypical in their socioeconomic characteristics ...this... does not in any way suggest that a high income, professional occupation, etc., are sufficient factors to explain recreational behavior.

6.5 Rigby: 1980 User Study

Rigby's (1980) study of whitewater rafters recreation on the Ottawa River had attempted to define them primarily by trying to establish a relationship between attitudes and socio-economic status. This study had hypothesized that well educated, urban dwellers who are active in the outdoors would show stronger wilderness "purist" traits. These would include a preference for small groups and rustic campgrounds, a greater concern for learning about the area, a sensitivity about water quality, and tougher criteria

when deciding whether or not the area was in fact wilderness. However, responses from the potential "purists" were not significantly different from those of the general population (Rigby, 1980:52). The one exception was in the correlation between education level and the degree of perceived development in the 1980 study. With higher levels of education "the response tended towards the natural area classification" and away from "wilderness" classification at the .01 significance level (Rigby, 1980:48). However two things should be noted: first, that this result was achieved after the chi-square table had been reduced in size, and second that the average age was 25 years and many of the customers were still in school. The result may, therefore also reflect age differences. In all other instances the target group of potential wilderness purists was not significantly different from the general population.

This 1980 user study indicated the type of high satisfaction rate which is the usual finding for whitewater rafting customers, in this case on a river which had yet to experience commercial competition and heavy user density. However the 82% return rate was

unexpected for an activity in which a high percent of first time users is the norm (Neilsen and Shelby, 1977; Heberlein, 1977; Leatherberry et al., 1980). It is interesting to note that the return rate for rafting on the Ottawa River has since declined dramatically. More recent studies found it to be 22% in 1981 (McDougall, 1982:32), and 30% in 1984 (Haycock, 1984:124). This may be an indication of a change in the type of user or as well of the undoubted success of the advertizing campaigns of the individual rafting companies.

6.6 McDougall: 1982 User Study

McDougall's study of whitewater rafters (1982) gathered much the same information as Rigby (1980), using a similar questionnaire. The hypotheses put forward reflect an awareness of the results of Rigby's study. The results, as predicted, showed that rafters were "social" rather than "solitary", and that certain socio-economic characteristics were not positively correlated with any particular group of attitudes. In other words, socio-economic characteristics could not be used to predict who was likely to be a "wilderness purist".

An important addition in McDougall's study was an

attempt to investigate the effects of crowding by looking for a correlation between reported satisfaction (the quality of the experience) and the number of contacts with other rafters. This was especially important given the great increase in the number of rafts and rafters on the Ottawa River in the two years since the previous study (Table 1.1). The 1981 season was also a turning point for commercial rafting on the Ottawa River, for with it came the first competition and a fundamental change in the character of commercial river activity. For the rafting patrons it was the end of the wilderness illusion, and the arrival of the present "...party atmosphere..."; for the rafting companies it was the beginning of the "...rat race..." in which the goal became to "...send as many rafts down the river as you can" (Haycock, 1984:125 & 130).

"Social carrying capacity" has for the most part been defined using visitor satisfaction and the "satisfaction model" which was formulated to attempt to describe the perceptions of wilderness users (Heberlein, 1977). The concept, as described by Fisher and Krutilla (1972), seems a straightforward one in which:

...the satisfaction or utility gained from the wilderness experience tends to be

inversely related to the number of other parties he meets on a wilderness outing (1972).

The simplicity and seeming common sense of this model led to attempts to extend its use to outdoor recreation in non-wilderness areas such as the Ottawa River. However, despite changes in the recreational environment, the vast majority of rafters indicated high satisfaction in 1981 as they had in 1979.

The data from McDougall's (1982) study indicated that there was no significant correlation between increasing use and decreasing satisfaction. However the author speculated, that the model might yet work given a higher user density.

Although no statistical significance was indicated, it might prove to be a valuable relationship in the future, especially if crowding becomes more of a problem (McDougall 1982:5).

This suggestion that "crowding" might become "more of a problem", assumed the existence of a problem when the data within the study itself clearly does not support this assumption. At the same time the term "crowding" was often used in the study when "social density" was a

more appropriate term. In any case, subsequent research on raft patrons at this site has produced similar data on an even more peopled Ottawa River (Haycock, 1984:125).

6.7 Crowding and Social Density

Recreation studies have often failed to make a distinction between the concepts of "crowding" and "social density". The former is often assumed to be a direct function of the latter. However "social density" is a physical measure of the number of people per unit area; "crowding" on the other hand, is a psychological state, a subjective evaluation which centres on the individual's feeling of having "too little space" (Altman, 1975:150-151; see also Littleton et al. 1974:148-152).

In short, it seems that the common-sense notion of crowding in recreation settings as a phenomenon dependent upon sheer numbers of other people must be reassessed in favor of more complex formulations that incorporate motivation and individual characteristics (Absher and Lee, 1981).

The Colorado River studies, which compared the perception of "crowding" with a count of the actual number of contacts made, found that there was no correlation between the perception of "crowding" and

the actual number of users encountered throughout the trip (Neilsen and Shelby, 1977).

Such findings presented serious problems for attempts to create a management system based on an assumed need for "solitude" (Carls, 1978). This desire for "solitude" which wilderness users have certainly indicated in surveys of users in true, or traditional, wilderness areas seems to be based on "who" one encounters, rather than "how many" (Stankey, 1972). Cheek and Burch (1976:167) have suggested that "...solitude is a euphemism for keeping one's group together." Thus rafters on the Ottawa River do not appear to object to high "social density" when it consists of fellow rafters.

6.8 Perceived Congestion

The one indication in the 1982 study of a relationship (.05 significance level) between dissatisfaction and the presence of others came in response to a question concerned with the perception of "congestion" during raft trips. This "congestion" was not defined for the respondents, but their responses show that they interpreted it most often as in terms of line ups, both on shore and on the river. One might

argue that most rafting patrons, being inexperienced, lack preconceptions about what to expect from rafting itself, however line ups are familiar from everyday life; they are recognized and often objected to.

In the McDougall study, 36% of those surveyed noted some congestion during the trip, and 61% of this group saw it as a land based (i.e. lunch stop) problem. 13% saw it as a land and a river problem, and 23% indicated there was some congestion above the rapids (McDougall, 1982:60). There is no indication of the actual numbers encountered by those who perceived the river as congested. The congestion perceived in the Ottawa River does indicate some dissatisfaction, but its nature argues as much for better shorefront facilities, and trip scheduling, as for a decrease in the number of users.

6.9 The Gap Between Prediction and Data

In the 1982 study the gap between expected and actual results concerning the perception of crowding appears to stem from the fact that the hypothesis being tested was based on a type of study different from that being used here. Stankey (1972), and Héndee (1968), gathered data on the "affective" component, attitudes

towards hypothetical situations. However this Ottawa River study gathered data on the "cognitive" component, in which attitudes are based on reactions to a real world experience. This type of gap was also apparent at the outset of the 1980 Ottawa River study in which Rigby (1980:31) proposed to compare his results "with the established norms in outdoor recreation behaviour." However, the studies referred to dealt with user attitudes, rather than user behaviour.

It is unfortunate, given the very useful data which these studies contributed, that when discrepancies occurred between expected and actual data both researchers sought flaws in their own methodology, rather than looking at the implications of accepting their data. Rigby (1980:60) suggested that his study might have been conducted too soon after the experience, while McDougall (1982:72) suggested that "recollection may have been a problem" for respondents who might have taken the raft trip up to six months before being surveyed.

The use of similar methodologies to study the "cognitive" component of user attitudes both on other rivers (Heberlein, 1977:71; Vaske et al, 1982) and with

other outdoor recreation activities such as backcountry hikers (Becker, 1978; Manning and Ciali, 1980; Absher and Lee, 1981; Lee, 1977), has produced similar findings.

Lee (1977:5) has suggested that the use of attitude questionnaires has provided an insight into many of the researchers themselves. The Ottawa River studies in 1980 and 1982 were concerned with the effects of increasing recreational use on the Ottawa River. They saw the need for regulations to protect the quality of both the site, and of the visitor's experience. Since the usual route to such regulation begins with studies to establish a numerical "carrying capacity" (Lee, 1977:6), there appears to have been some resistance to accepting results which would cast doubt on the existence of density based problems, and therefore the utility of "social carrying capacity" based on the "satisfaction model".

Sociologists are familiar with the fact that what people say on surveys is sometimes contradicted by their actions (Lee, 1977). In addressing the issue of recreational "carrying capacity", and the perception of crowding, Burch (1981) has noted (in characteristic style):

It would appear that social species such as the higher primates are likely to be sociable regardless of their rhetoric and responses to attitude questionnaires.

The gap between rhetoric and the reality of quantitative results appears to have been in part created by the expectations of researchers (on the Ottawa River as at other sites) and managers whose initial studies and assumptions reflected not only their concern for preservation of the environment, but also their ambivalence towards sharing the outdoors with intensive forms of recreation and those lacking the purists environmental sensitivity.

6.10 Haycock: 1984 User Study

Haycock's 1984 study concentrated on the history and the perceived problems of commercial recreational use (i.e. rafting) on the Ottawa River. Its point of view reflected his position as a raft company employee. It contained a highly informal survey of rafting patrons, but very little statistical analysis of the data. The study's point of view was perhaps most strongly presented in a statement concerning the effects of increased user density on the working environment on the Ottawa River:

... when every company is on the river during the same day, the river is described by many guides as a "rat race" (Haycock, 1984:131).

The 1984 survey asked rafting customers:

Do you interpret any problems with this sport? (overcrowding, etc.)

The response indicated that to Haycock that:

"Overcrowding was not of major concern to the visitors." The study also found that 92% of customers indicated that they would raft again, and only 3% said they would not (1984:124-125, 180). Again, despite continued increases in "social density" with each year (see table 1.1) satisfaction remained high and crowding was not perceived to be a problem. Haycock speculated that this type of response was due to either a "displacement effect", in which those concerned about crowding simply do not return, and/or an "uninitiated newcomer effect", in which the results are influenced by the high proportion of first time users who have no particular expectations and simply accept the user density they find as appropriate (1984:125).

Researchers have suggested that users may be satisfied because they either find whatever density

they first experience to be appropriate, or else they "... readjust their expectations ..." to fit the changing user density (Vaske et al., 1980; Manning and Chiali, 1980). However Absher and Lee (1981) found a "counter-intuitive" result which showed that it was the newer user "... who desires the 'purist' or solitude experience. To measure the true "... impact of 'crowding...' would require longitudinal studies, focusing on individual paddlers (Vaske et al., 1980); such studies have yet to be conducted for this type of outdoor recreation.

Haycock's study gave a portrait of the Rocher Fendu as a working environment, one which those working there sometimes found to be uncomfortably crowded. It was unfortunate however, that the perceptions of the rafting customers were not seriously considered in the analysis. This gap between the researcher and those being studied is similar to the one which has often been found to exist between the perceptions of outdoor recreation users and those who serve them. The public is usually not as demanding as managers imagine them to be, or indeed as demanding as the managers themselves (Hendee and Harris, 1970; Lucas, 1977; Lucas, 1985). Haycock's study, like those

that preceeded it (Rigby, 1980; McDougall, 1982), appears to reflect the outlook of the would-be manager, rather than that of the recreation user. Perhaps a clash between the perceptions of users and would-be managers is responsible for the willingness of these researchers to seriously question their own data.

6.11 Jurisdiction Over Navigation

Germane to the topic of regulation is that of legal jurisdiction over navigation on the Ottawa River. It had been assumed by both past studies (Rigby 1980; McDougall, 1982) and concerned government officials (Citizen, January, 28, 1982), that the joint ownership of this boundary channel by the provinces of Ontario and Quebec would create significant difficulties for any attempt to regulate river use.

The regulation of navigation on inland waterways is under federal jurisdiction. It is usually handled by the Canadian Coast Guard, Ship Safety Branch through a system of "Boating Restriction Regulations" which "... were created in 1972 in order to control the operation of small vessels on specified bodies of water." The one relevant exception to this is in the National Parks where Parks Canada has jurisdiction over boating.

Included in these restrictions is the option for "... prohibition of commercial river rafting operations unless authorized by a permit" (Canadian Coast Guard, Nov. 1:1982). This option was added in 1980 after three rafters were killed in a commercial rafting accident on the Fraser River in British Columbia (Citizen, July 30, 1981). These regulations apply only on portions of six rivers in that province; their sole function is to ensure the safe operation of commercial rafting operations, by enforcing the "River Rafting Standards" created in September 1980. These standards regulate equipment, guide qualifications, and can forbid or regulate use at certain sites or at dangerous water levels. They do not include the regulation of the number of craft or users, or any type of non-commercial activity. These same regulations have been adopted by the "Eastern Canadian Rafting Outfitters Association" (ECRO), a voluntary organization which includes most of the commercial rafting operations on the Ottawa River.

Despite the loss, and presumed death, of a raft customer at Garvins Chute on the Middle Channel of the Ottawa River in the spring of 1983 (Citizen, June 6, 1983), there has not been any regulation of whitewater

use by either Quebec or Ontario. This lack of response is undoubtedly in part a result of the problems in using a federal/provincial system at this interprovincial site. Policing under this system entails the use of local, usually provincial, authorities to enforce regulations created at the request of the province by the Canadian Coast Guard. Quebec, unlike Ontario, is not a party to the "Boating Restriction Regulations" agreement, and has its own provincial regulations, which a Canadian Coast Guard official has described as being "ultra vires", but which remain unchallenged both for political reasons, and because the federal authorities lack the resources to enforce regulations (C. Hayes, Canadian Coast Guard, personal communication, 1983).

Haycock's 1984 study helped to clarify the issue of jurisdiction over river use, and navigation. It notes the existence of an unamended 1870 statute, An Act Respecting Certain Works on the Ottawa River, which states that:

navigation of the River Ottawa, . . . is hereby declared to be subject to the exclusive legislative authority of the Parliament of Canada" (Acts of the Legislatures of the Provinces, 1887:753).

It also notes the establishment of "The Ottawa River Regulation Planning Board" by the federal government in 1983. The mandate of this body, while focused mainly on hydro-electric production and flood control, also includes "recreation" (Haycock, 1984:136-140). Thus it appears that the power to create and enforce regulations concerning commercial and private recreational use on the Ottawa River rests with this federal body.

Haycock's study assumed that management, which would include restricting the number of rafts, is needed on the Ottawa River. The question it investigated was how to regulate and restrict use, not whether or not it should be restricted.

6.12 Input Into Possible Decision making

Each researcher who has studied whitewater recreational use on the Ottawa River appears to have viewed his or her work as input to the decision making process to establish a needed management scheme. The difficulties created by the seemingly recalcitrant data on user perception in all of these studies raises the question of how a decision making process can make use

of very divergent points of view.

This question can surely be dealt with only after all the major players have been considered. The one significant user group which has not yet been consulted is the private, rather than commercial, users who paddle the river in kayaks and canoes. This activity group has shared the recreational use of the river throughout the whole of the rafting era. The number of craft and people engaged in kayaking and canoeing remains much smaller than that for commercial use. The activity itself has the character of a "sport" with some of the overtones of "training" and "skill acquisition" that this term has acquired in the 1980s. Rafting on the other hand, is a "popular" activity, one which stresses both the thrill ride, and its accessibility.

In an attempt to fill this gap a survey was conducted for this study, one which sought the input of kayakers and canoeists. The following chapter will present the methodology used and the results obtained in that survey.

CHAPTER 7

1984 SURVEY OF KAYAKERS AND CANOEISTS

7.1 Purpose: The Need for a Survey

Whitewater recreational use on the Ottawa River is dominated by two activities, commercial rafting, and private kayaking and canoeing. Since the three previous studies of whitewater recreation on the Ottawa River focused solely on the perceptions of commercial rafting customers, there was a need to fill the gap created by the lack of information on private users of this important recreational resource. In order to accomplish this, an integral part of this thesis was a survey, in 1984, of whitewater kayakers and canoeists who have paddled the Ottawa River. The results were examined both on their own, and within the context of existing studies of outdoor, especially whitewater, recreation both on the Ottawa River and elsewhere in North America.

7.2 Perceived Conflicts Between Activity Groups

Given the contrasting nature of the two major activity groups (rafters and paddlers) sharing the Ottawa river, and represented in this study, the investigation of possible conflicts between the two was

made a part of this study. .

The early studies which attempted to define carrying capacities for outdoor recreation had also indicated that there were perceived conflicts between certain activity groups (Lucas, 1964; Lime and Stankey, 1971; Stankey, 1972). This phenomenon is most familiar to Canadians in the conflict between cross-country skiers and snowmobilers (Jackson and Wong, 1980), and hikers versus horseback riders (Parks Canada, 1983).

The anticipated response pattern for paddlers on the Ottawa River was based both on an awareness of the responses of rafters in the previous studies at this site, as well as on an anticipated conflict with paddlers, which was based on personal observation and the evidence of conflict in other recreation activities.

It was therefore expected that paddlers would be slightly more negative than rafters in their responses and would most often perceive the river to be "slightly crowded" and the effect of meeting large numbers of canoes and kayaks to be a "slightly less enjoyable" experience (see Appendix 1). It was therefore expected that their major concern would focus on a perceived

"conflict" with rafting use, and that meeting "large numbers of rafts" would result in a "much less enjoyable" experience.

It has often been found that conflicts between those engaged in outdoor recreation at the same site are often "asymmetrical", for example while the cross-country skiers resented the presence of the snowmobilers, the snowmobilers did not reciprocate (Jackson and Wong, 1982). This same pattern has been found for hikers and horse users (Parks Canada, 1983), paddle rafts and motorized rafts (Neilsen and Shelby, 1977) and canoeists and motorboaters (Lucas, 1964; Stankey, 1972). In each of these cases it was the former activity which resented the latter.

The cause of these one-sided conflicts has often been seen as an activity conflict; a case of "active" versus "passive" or "man powered" versus "motorized" activities (Lucas, 1964). It is the former "active" group which resents the presence of the latter. On the Ottawa River however the two major activities are both active, and human powered; there is no significant contact between paddlers and motorized rafts. If conflict does exist between these activity groups

another explanation will be required.

Conflict may result when the actions of one activity group on a whitewater river violates the "norms" for acceptable behaviour of another (see Heberlein, 1977; Schreyer and Roggenbuck, 1978; Gaamann and Burdge, 1984), or when the activities of one group is perceived as having a detrimental effect on the personal safety of another (Jackson and Wong, 1982).

Lindsay (1980) has defined recreational conflict in terms of the availability of resources:

The conflict problem simply stated, is that recreationists tend to compete for the same physical, social and psychological space during the same time period.

The two major causes of conflict were seen as this diminishing space for outdoor recreation, and "the difference in perception, attitude and behavior between motorized and pedestrian users of recreation environments" (Lindsay, 1980).

The potential for conflict can be heightened in situations such as the Ottawa River, since "Trails, rivers and other constricted linear resources are particularly sensitive to use incompatibility" (Pigram,

1980:79). Shared use, and activity conflict, were to be expected on rivers in eastern Canada because of the scarcity of accessible high quality whitewater sites. Most of the near urban whitewater sites were dammed in the first half of the 20th century, either for hydro electric production, or to regulate flow (Brickman, 1975:25; Faulkner, 1978).

Jacob and Schreyer (1980) have defined four "factors" which contribute to the potential for conflict in outdoor recreation.

- 1) "Activity style-the various personal meanings assigned to an activity." Whitewater paddling may entail serious goals for some, and be a casual pursuit for others.
- 2) "Resource specificity-the significance attached to using a specific recreation resource for a given recreation experience." For example people may acquire a possessive attitude towards a certain site, and perceive others as intruders.
- 3) "Mode of experience-the varying expectations of how the natural environment will be perceived" There may be a perceived contrast between those who for example can "read" whitewater or interpret the natural environment,

and those who cannot. This differences may lead to different expectations, actions and possible conflicts.

4) "Lifestyle tolerance-the tendency to accept or reject lifestyles different from one's own." This implies both the recognition that the activities are different, i.e. snowmobiling and cross-country skiing, and the rejection of both the activity and the lifestyle that it is perceived to represent (Jacob and Schreyer, 1980).

A Canadian study of cross-country skiers and snowmobilers concluded that the conflicts between these two groups:

.... are best understood not simply as an outcome of the choice of activity, but rather as stemming from a fundamental orientation of recreational preferences (Jackson and Wong, 1982).

The activity can also reflect a more general outlook towards how the environment should be used.

7.3 Survey Procedures

Data were gathered using a mailed survey sent out in the fall, October and November, of 1984 to whitewater kayakers and canoeists who had used the Ottawa River. The questionnaire contained questions

utilizing both rating scales, as well as comments by the respondents (Appendix 1).

The survey gathered three types of information on private users of the Ottawa River, first: A profile of the characteristics of each paddler, age, sex, skill level, place of residence; second, information on individual paddling activities, such as racing experience, frequency of participation, rivers paddled regularly, and formal instruction received; and, third, the effect of recreational activity on the Ottawa River, especially the number and type of recreational craft, on the user's perception of "crowding", conflict with others and the shoreline natural environment.

This survey was, for the most part, conducted using membership lists provided by four major whitewater kayaking and canoeing clubs in Toronto, Deep River, and Ottawa (Table 7.1). There are a relatively small number of high quality whitewater sites during the low water of high summer, July and August, in Eastern Canada. It was very likely that many of the active paddlers in all these clubs would have paddled the Ottawa River.

Table 7.1

KAYAKER AND CANOEIST SURVEY: MAILINGS AND RETURNS						
LOCATION	TYPE OF MAILING	CLUB USED	TOTAL FORMS SENT	% OF TOTAL	RETURNS NO. - %	% TOTAL USABLE
Ottawa & area	general & focused	O.R.R. & C. de Bois	113	62%	69 - 53%	48%
Deep River	focused	V.R.R.	20	9.5%	14 - 70%	70%
Toronto	focused	O.V.K.C. & O.W.W.A.	28	14%	20 - 71%	61%
Warrensburg New York	focused	Wildwaters	20	9.5%	2 - 10%	10%
Hanover N.H.	focused	n.a.	10	5%	2 - 20%	20%
Totals	-	-	207	100%	107 - 52%	47%

Source: 1984 paddler survey.

Clubs Used: O.R.R. = The Ottawa River Runners, C. de Bois = Coureur de Bois, V.R.R. = The Valley River Runners, O.V.K.C. = Ontario Voyageur Kayak Club, O.W.W.A. = Ontario White Water Affiliation, Wildwaters = Wildwaters Outdoor Center.

7.4 Sample Population: The Use of Clubs

The use of the data gathered from this sample population to describe Ottawa River paddlers must begin with a caveat concerning the respondents. Since they are virtually all members of a whitewater club, they represent a sub-population which may be made up of individuals more committed to the sport than the average paddler and therefore perhaps likely to participate more frequently than the average whitewater paddler. Past researchers have assumed that the data from this type of sample population would "reflect what was happening in the total community of participants" (White et al., 1980). In the case of user perception, while we cannot know what people's backgrounds and motives are, we can know that all paddlers, members and non-members, share the same experience of the natural environment and the other recreationists. Observation has shown that the concerns addressed in this study - the topics of crowding, and conflict between user groups - are all familiar to regular paddlers on the Ottawa River (personal observation).

It is often difficult to obtain unbiased data from participants in outdoor recreation. Their numbers are relatively small, they are often difficult to find,

and difficult to survey, if engaged in their recreation activity (Knopp and Tyger, 1973).

In this thesis data were gathered using club membership lists since paddlers are very difficult to contact or survey during a trip. In contrast to commercial rafters individual use patterns are very unpredictable both in time and in space. The use of clubs is therefore the most cost effective method of surveying participants, yet it does result in a biased sample made up of whitewater club members and some of their friends. For these reasons club members have been used, as they have been in a number of other recreational studies as a means of contacting participants (Knopp and Tyger, 1973; Lindsay, 1980; White et al., 1980; Jackson and Wong, 1982).

Because of the nature of the activity there is good reason to believe that club members are likely to include a broad spectrum of users. Many whitewater paddlers are connected with a whitewater club since whitewater sport not only benefits from, but indeed requires co-ordination group participation, especially for the necessary car shuttles. When properly organized a group will enhance safety, share the burden of

organizing trips, and provide the participant with the required audience of friends and peers who can appreciate his or her skills and stunts (Christy, 1970). Fortin (1980:87) also notes the important role of club membership in whitewater sport:

Comme en toute chose, l'apprentissage sera accéléré en profitant de l'expérience des autres. Vous vous joindrez donc à un club; vous participerez à leurs stages d'initiations et à leur calendrier de sorties en rivières.

The challenging nature of the whitewater on the Rocher Fendu Channel of the Ottawa River also discourages possible non-group use. The Ottawa is "big water" and therefore treated with respect by paddlers. For example the Madawaska Kanu Camp, a whitewater paddling school near Barrys Bay, takes only its more advanced students to the Ottawa.

A total of 207 questionnaires were mailed out, in the last week of October 1984; 129 to the Ottawa area, 22 to Deep River, 26 to Toronto and 30 to the United States (Table 7.1). Two types of mailings were used, all using the same questionnaire. In the single large "general" mailing 113 forms were sent to virtually all members of the Ottawa River Runners. In the "general"

mailing virtually all club members were contacted, only those known, by a club representative not to have paddled the Ottawa River were left out. If there was any doubt a questionnaire was sent. This mailing included 6 forms sent to club members for a non-member friend or relative.

The "focused" mailing procedure was used to save money, in this case 94 survey forms were mailed to those known to have paddled the Ottawa River. For the Coureurs de Bois, an Ottawa area whitewater canoe club, and the Ontario Voyageurs Kayak Club (O.V.K.C.), a Toronto based club, this method was facilitated by using a club membership list, annotated by a knowledgeable club member, which indicated those who had paddled the Ottawa River. A second form of "focused" mailing made use of a local club official to distribute forms directly to relevant paddlers in their area. This latter method was used for the Valley River Runners in Deep River, the "Wild Waters" outdoor centre in New York State, and an American whitewater racer in New Hampshire. Two questionnaires were also sent to the Ontario White Water Affiliation (O.W.W.A.), the governing body for Ontario whitewater clubs.

7.5 Response

Of the 207 questionnaires mailed out 107 were returned, a return rate of 52%. Of these, 97 forms, or 47%, were used in the analysis (Table 7.1). The 10 unused forms consisted of 8 from respondents who indicated they had not paddled the Ottawa, and 2 incomplete forms. The highest response rates came from the "focused" surveys in Deep River (70%), and Toronto (71%). In Ottawa, where the mailing was a combination 88% "general", and 12% "focused", the response rate was 53%. It is possible that some of the forms sent to Ottawa area paddlers were not returned because those who received them had not in fact paddled the river.

The high (70%) return rate for the "focused" mailings in Deep River and Toronto, in which only those known to have used the Ottawa River were surveyed, indicates that paddlers were highly motivated to respond when the survey was relevant to their experience and interests. This is useful, given the relatively small population of active participants in this sport.

American input consisted of only four forms, the promised membership list for the Adirondack Mountain.

Kayak Club was not received, and thirty forms sent to individuals in New York and New Hampshire generated only three responses, all but one from the households of those distributing the surveys.

7.6 Data Analysis

Analysis of the data was conducted using the programs in the Statistical Program for the Social Sciences (SPSS^x) on the mainframe computer at Carleton University. A number of statistical procedures were used to aid in the analysis and interpretation of the data. These included the calculation of means, standard deviations, minimum and maximum values where relevant, and also the presentation of data in tables, bar graphs, and histograms to aid in interpretation. Measures of association between variables were calculated using chi-square contingency tables and Spearman's Rank correlation Coefficient. Due to the small sample size the data was not able to fulfil all the requirements for the chi-square test, however the contingency tables were an aid to visualizing the pattern of the results (see Appendix 2).

7.7 General Characteristics of Paddlers

The survey results suggested that kayakers and

canoeists were mature paddlers, both in their age and their experience in this activity (Table 7.2). The average age was 33, while the range was from 18 to 53 years. Paddling experience ranged from 1 to 30 years, and the average was 7.4 years. These results are in keeping with the general finding that "whitewater enthusiasts" tend to be mature adults who began participating while in their 20s, which is probably because the "... activity requires considerable investment in equipment and/or commercial services" (Leatherberry et al., 1980). Despite their experience, most paddlers are still relative newcomers to the Ottawa River itself; while only 11% of those surveyed in 1984 had paddled the river before 1980, only 5% were on the Ottawa River for the first time in 1984.

A comparison with the surveys of rafters on the Ottawa River showed that paddlers tended to be an older, male dominated group (Table 7.3), whose members have had a diversity of whitewater experience (Table 7.4). They had used a diversity of craft, and 20% had also rafted on the Ottawa River. In 1984 only 5% of the paddlers surveyed were in their first season on the Ottawa River. In contrast, fully 70% of 1984 rafting customers were taking part for the first time (Haycock,

Table 7.2

KAYAKER AND CANOEIST CHARACTERISTICS: 1984			
-- WHITEWATER EXPERIENCE --			
	Average Age	Average Years Paddling	User Days Per Paddler
Total Pop.	33.4	7.4	7.2
Males	34.6	7.9	7.5
Females	28.4	5.5	5.7
-- WHITEWATER PADDLING SKILL --			
	% with Instruction	Avg. Days Instruction	% who Have Raced
Total Pop.	84.6%	8.2	43.3%
Males	84.5%	8.5	44.9%
Females	88.9%	7.3	38.9%

Source: 1984 survey of kayakers and canoeists.

Table 7.3

COMPARISON: PADDLER AND RAFTER CHARACTERISTICS			
	RAFTERS 1981	RAFTERS 1984	PADDLERS 1984
Male / Female	60% / 40%	40% / 60%	80% / 20%
First Time Users	84%	70%	5%
Age Profile	18 to 25 - 34% 26 to 34 - 43% 35 + - 19%	n.a.	18 to 25 - 15% 26 to 34 - 43% 35 + - 40%

Sources: 1984 kayaker and canoeist survey, 1981 rafter survey (McDougall), and 1984 rafter survey (Haycock).

Table 7.4

CRAFT USED BY RESPONDENTS ON THE OTTAWA RIVER			
	Kayak	Canoe	Raft
Total Population	85%	43%	20%
Males	87%	39%	19%
Females	72%	61%	22%

Source: 1984 kayaker and canoeist survey.

1984:124).

Most respondents (91%) make regular use of at least one other river. The distance people are willing to travel seems largely a function of how far they are forced to travel. Whitewater paddling often resembles North American rock climbing which is:

... not generally a wilderness experience. It is concentrated on accessible crags [or rapids], and may on occasion become an impromptu spectator sport ... (Mitchell, 1983:65-66).

The preference for the most accessible sites can be seen in the data on rivers paddled "regularly" by respondents from the three major centres, Deep River, Ottawa and Toronto. The difference between the travel patterns for each of these centres demonstrates how "the definition of accessibility and the perception of distance varies among users" (Smith, 1983:53). In this case Smith was referring to data which indicated that the distance one is willing to drive is a function of how far one has to drive. Those close to a good recreation site will not drive far for a better one, however those who must drive a number of hours to get to a good site will be more willing to drive further for a better one. Toronto paddlers for example are

willing to drive to the Ottawa River although the Madawaska River is closer, they are also willing to "regularly" visit rivers many hours to the south in the United States (Figure 7.1).

7.8 Craft Used

Private use is dominated by whitewater kayaking, in which 85% have participated (Table 7.4). However, many paddlers have participated in other activities as well; 43% have also paddled an open canoe, 28% have paddled both a canoe and a kayak, and 20% of the respondents have also taken a commercial raft trip. An interesting consequence of this diversity of experiences is the possibility of future investigation of the attitudes of paddlers who have also rafted.

7.9 Frequency of Participation

An average of 7.2 days per paddler were spent on the Ottawa River by those 77 of the 97 respondents who had paddled it in 1984 (Table 7.5). Of these "user days" the majority were spent on weekends days (Table 7.6), and on the Main Channel (Table 7.7). The Ottawa River therefore experiences its highest user densities on the Main Channel, on weekends during the high season in July and August.

WHITEWATER SITES VISITED BY PADDLERS

Table 7.5

OTTAWA RIVER
USE BY KAYAKERS AND CANOEISTS IN 1984

	user days	# active paddlers	user days per user	# new paddlers	# dropouts
1980	144	22	6.5	-	-
1981	211	36	5.8	16	2
1982	509	65	7.8	20	1
1983	581	80	7.2	18	3
1984	558	77	7.2	15	18

Source: 1984 survey of kayakers and canoeists.

* Given the changing makeup of club membership the pre 1984 data are progressively more unreliable with each year.

Table 7.6

OTTAWA RIVER : USER DAYS BY PADDLERS 1984

	Weekend - %	Weekday - %	Weekend & Weekday
USER DAYS	347 - 62%	211 - 38%	558 - 100%
PADDLERS	69 - 90%	37 - 10%	77 - 100%

Source: 1984 survey of kayakers and canoeists.

Table 7.7

OTTAWA RIVER CHANNEL USE AND TOTAL USE:1984				
	User Days 1984 Main - Middle		User Days 1984 Number - % Total	
Total Pop.(77)	335 (61%)	- 213 (39%)	548	- 100%
Males (64)	301 (64%)	- 172 (36%)	473	- 86%
Females (13)	34 (45%)	- 41 (55%)	75	- 14%

Source: 1984 survey of kayakers and canoeists.
Total User Days 558, however 10 are without a
specified channel.

The figures for total user days by the portion of the total paddling population made up of club members, can give an estimate of the changing rate of overall participation. These data indicate that canoeing and kayaking not only had a much slower growth rate than rafting but also, while rafting continued to expand in 1984, the number of paddlers may have decreased. This change in the sample population was due to both a slight decrease in the number of new paddlers, as well as a significant increase in the number of dropouts. Analysis showed that these dropouts were made up of paddlers who continued their connection with whitewater recreation and their whitewater club, but no longer used the Ottawa River.

7.10 Skill Levels and Schooling

Most paddlers gave themselves fairly high marks for skill. The self rated skill level for kayaks peaks at the intermediate level. Which includes 38% of the respondents. The mode for the smaller group of open canoeists is at the "advanced" level and includes 55% of the respondents.

Fully 86% of respondents have had "formal paddling instruction", averaging 8.2 days per paddler (Table 7.2). However, only 8% of these predominantly club

members have received any formal instruction from a club. The most common source of instruction was one of the numerous commercial whitewater schools, which had been attended by 62% of the respondents.

7.11 Perception of Crowding

Responses concerned with the perception of crowding on the Ottawa River at the "present-use level" show that the majority of paddlers surveyed (81%) perceived the river to be "slightly" or "very" crowded (Table 7.8). The modal response was "very crowded" (42%) rather than the expected "slightly crowded".

While the perception that the Ottawa River was crowded had been anticipated, the strength of the response was greater than had been expected. This finding was a striking contrast with the continued satisfaction of rafters for whom "... overcrowding was not a major concern ..." that same summer (Haycock, 1984:125).

A further unexpected result came in the responses of the 19 paddlers who had also participated in a commercial raft trip on the Ottawa River (Table 7.8). With the high satisfaction by rafters it was expected that this group would be less hostile towards rafts.

Table 7.8

PERCEPTION OF CROWDING BY PADDLERS: 1984 USE LEVEL			
	Total Sample (97)		Have Rafted (19)
Under Utilized	3.5%		5.3%
Perfect Level	9.3%		10.5%
Slightly Crowded	39.3%		26.3%
Very Crowded	42.3%		57.9%
No Response	6.2%		-

Source: 1984 survey of kayakers and canoeists.

This group in fact perceived the river to be slightly more crowded than did the total sample population.

7.12 Participation by Females

Females made up only 20% of the sample population of kayakers and canoeists (Table 7.3). Personal observation indicates that this result is representative of the general population of paddlers using the Ottawa River.

In comparison to male paddlers females were younger, had fewer years paddling experience, and were less frequent participants (Tables 7.2), they also tended to perceive the Ottawa River as being slightly more dangerous than did males. Females were more likely to have paddled an open canoe (61%), as compared to males (39%) (Table 7.4).

A lower participation rate for females is not surprising, the most recent survey of Canadian women shows that while they have made strides in recent years they are still "only moderately active", and when compared to men they are less active in sports and less fit (Canada Fitness Survey, 1984).

The picture for commercial rafting is however

radically different. In 1984, 60% of the rafters on the Ottawa River were female, in contrast to the 20% of paddlers (Table 7.3). The participation rate is similarly high by women in a number of forms of commercially "packaged" outdoor recreation activities throughout Canada, and has increased noticeably in recent years. Activities where women at times outnumber men include not only whitewater rafting in Eastern Canada and British Columbia, but also cycle touring, horseback riding, and hiking (Anderson, unpublished research, 1984). This increased participation is, according to one commercial cycle tour operator in Alberta, made up largely of "young independent women" who have the desire to take part, but often lack the experience, skills, and contacts needed due to their background or personal time constraints. (M.J. Barnes, Rocky Mountain Cycle Tours, personal communication, 1984). Given the opportunity created by "packaged" recreation women appear to be taking part in outdoor recreation in greater numbers.

A full examination of the significance of these findings would require an examination of the

research on women's studies, especially the literature concerned with women's socialization, which is beyond the scope of this study. However, this finding is of interest given both the magnitude of the recent changes in participation rates, and the fact that it occurs in a variety of outdoor activities.

7.13 Enjoyment and Social Density

There was a negative reaction to the prospect of meeting "large numbers" of river users of any kind, but the reaction was much more negative at the prospect of meeting rafts than meeting canoes and kayaks (Table 7.9 and 7.10). In this case the modes were at - "slightly less enjoyable" for meeting canoes and kayaks, and "much less enjoyable" for meeting rafts, which was what had been anticipated, however the strength of the negative reaction is still noteworthy.

Tests for association between the "use level" and "enjoyment" indicated that there was a significant positive correlation between the perception of "present use level" and the perception of how "large numbers of rafts" affect the "river experience". There was however no correlation between "present use level" and the

Table 7.9

REACTION BY PADDLERS IN 1984
TO MEETING "LARGE NUMBERS OF CANOES AND KAYAKS"

	Total Sample (97)	Have Rafted (19)
More Enjoyable	16.5%	21.1%
Unaffected	25.8%	26.5%
Slightly Less Enjoyable	40.2%	36.8%
Much Less Enjoyable	15.5%	15.8%
No Response	2.1%	-

Source: 1984 survey of kayakers and canoeists.

Table 7.10

REACTION BY PADDLERS IN 1984
TO MEETING "LARGE NUMBERS OF RAFTS"

	Total Sample (97)	Have Rafted (19)
More Enjoyable	1%	-
Unaffected	7.2%	10.5%
Slightly Less Enjoyable	23.7%	15.8%
Much Less Enjoyable	67%	73.7%
No Response	1%	-

Source: 1984 survey of kayakers and canoeists.

perceived effect of "large numbers of canoes and kayaks" (Table 7.11).

Table 7.11

ASSOCIATION BETWEEN "USE LEVEL" AND "ENJOYMENT"

	Spearman's R	Number of cases	Sig.
USER VOLUME BY MEETING RAFTS	.46	91	.000
USER VOLUME BY MEETING KAYAKS	.10	90	.15

The majority of kayakers and canoeists appear to consider the Ottawa River crowded and they also tend to associate that crowding with rafting rather than their own activity. There was no indication in the studies by either McDougall (1982) or Haycock (1984) that this group did perceive the river as being crowded nor did either give any indication in their study that rafters reciprocated the type of negative perceptions that paddlers often expressed towards them. For example, comments about rafts by paddlers included:

- Way too crowded with rafts.
- Rafts a hazard in great numbers, loud, obnoxious, & insensitive to others.
- Because of the rafts, canoe paddlers must be in complete control at all times and

able to manoeuvre around rafts as well as the river. —

7.14 Safety

The responses concerned with safety had a dual focus, either the physical environment or the traffic on the river. The concern with the physical environment was elicited in response to the question on the survey which asked, "How does the Ottawa River compare to other rivers you paddle in terms of SAFETY?" 77% of the respondents gave a clear usable reply to this question, and 72% of these replies perceived the Ottawa River as "safe, when compared to other rivers paddled". 31% of these usable replies based this conclusion that the river was comparatively safe on physical criteria, noting that being large and deep contributes to making the Ottawa a safer river. The comments included:

- very few places to get pinned - in that sense a safe river.
- Best! least amount of obstructions (i.e. logs, dead heads, rocks
- 10x as safe.

However there were of course dissenting voices:

- Risk of drowning on Ottawa - HIGH
- Risk of injury (cuts etc.) - LOW.

- more dangerous.
- The Ottawa River has more potential hazards.

Four respondents also commented that for paddlers safety is more a function of the skill and judgement of the individual rather than the character of the river itself.

At the same time, comments on the safety issue throughout the survey showed that this issue had a second focus in which safety was viewed not as a function of the physical characteristics of the river, but as something which was affected by the number and type of river users. Using this focus comments included:

- rafts make the river much more unsafe.
- the large amount of rafts are an added hazard.
- fear of being run over by a raft / esp [at] Big McCoy-[rapid].
- It is relatively safe. The greatest hazard is now related to the river traffic

39% of the total sample population indicated that sharing the river with rafts had a detrimental effect on their personal safety, 27% simply stated that the

river is made less safe due to the presence of rafts, while 23% noted the specific problem of collisions between rafts and kayaks and canoes.

There have been other instances where concern for personal safety has contributed to conflict between recreationists sharing the same outdoor environment. Research in Canada into the perceptions of cross country skiers and snowmobilers found the conflict felt by skiers towards snowmobilers was caused in part by a fear of personal injury (Jackson and Wong, 1982).

7.15 Perceived Effects on the Natural Environment

Perception of the effects of use on the natural environment were noted both in a question focused on the "shoreline environment" as well as in comments appended to the questions concerned with user enjoyment. The question of how "the shoreline environment [has] been affected by the presence of large numbers of river users", was responded to by 78% of the sample population. Of these respondents 26% indicated that they perceived unacceptable deterioration. Trampling along trails, and at lunch spots, and access points was noted most often, by 21% of the respondents. Yet there were also many positive

comments. An experienced American paddler wrote; "I feel the shoreline is very well kept on the Ottawa in comparison to other rivers." Another paddler commented that the "Shoreline is remarkably clean, I feel the rafting companies do a great job." In all 22% of the respondents commented that the raft companies do a good job of keeping the shoreline clean. Haycock, as an employee, noted this diligence in site maintenance (1984:129). It is interesting to note that while "garbage" was the most often cited potential environmental problem, of the 30% of respondents who mentioned it, 16% made positive comments, noting how little garbage there was considering the volume of use.

The comments about the condition of the shoreline environment were notable because so many were positive, despite the fact that an overwhelming majority of paddlers perceived the Ottawa River to be crowded. The respondents show an acceptance of the presence of rafters on shore, in contrast to their responses concerning on-river activities. This indicates that the relationship between the user's perceptions and the presence of others on the river, is not based simply on the number of users, it is also a function of the activities engaged in. The objections of paddlers seem

to be based not on the sheer presence of rafters, or the number of contacts, but rather on how their actions affect their recreational activity.

In comparing this survey of private users with the 1982 data on perceived "congestion" (McDougall, 1982), and the comments by rafters in 1984 (Haycock, 1984), it seems evident that while rafters tend to focus their complaints on shore use, paddlers focus their complaints on the use of the whitewater itself.

7.16 Fair Share of Use

When asked to evaluate whether "kayakers and canoeists generally get a fair share of time and space" on the river 75% responded clearly to this subjective question. The responses were equally divided between "yes" and "no". While some respondents made it clear that they were dissatisfied with a "fair share" of use on an overcrowded river, others made a point of noting that paddlers and rafters had no choice but to share the use of this recreational site.

The timing of use can be a factor in creating potential conflicts in outdoor recreation. Most recreationists, both private and commercial, want to

use the river at the same time of the day or week. Weekends not only accounted for 62% of kayaking and canoeing user days on the Ottawa River (Table 7.6), but they were also the busiest days for commercial whitewater rafting (Haycock, 1984:142 & 167). The comments about whether paddlers get a "fair share" of river use showed awareness of this phenomenon. They included:

- ... prime time early in the day is very congested.
- not on the weekends rafts are supreme.
- not at rush hour on the weekends.
- depends on the time.
- not on busy weekends in July and August.

This peaking pattern, at certain times and places, is typical not only of outdoor recreation activities and facilities (Lucas, 1964; Clawson and Knetsch, 1966:157; Patmore, 1983:137-138; Pigram, 1983:75-76; Smith, 1983:33); indeed it is typical of many human activities (Burch, 1981). The effects of peaking were exacerbated on the Ottawa River by the tendency for paddlers and rafters to congregate, and play for long periods at certain spots in and below the rapids, especially McCoy Chute and The Lorne Rapid. This has tended to create a

few pockets of high density use on the river. It is important to remember that the main channel has only five major rapids and 5.5 kms of discontinuous whitewater.

7.17 Paddlers and Rafters: Perceptions

The perceptions of individual paddlers can be examined in the light of their characteristics (i.e. sex, place of residence, age), as well as their recreational background (i.e. whitewater experience, skill level, racing experience).

The results can be viewed against the backdrop of the rafters studies which indicate a high satisfaction level, one which has not been significantly affected by large increases in user density. There was also no evidence of any strong animosity which could be directed towards a particular type of whitewater activity (Rigby, 1980:47; McDougall, 1982:49-50; Haycock, 1984:124).

Despite the high satisfaction there were perceived problems. In 1981 39% of rafters experienced some "congestion" during the trip, but only 15% perceived it as an entirely river based problem. For most rafters it

was a shore based problem, especially at the main "lunch spot" below the Lorne Rapid (McDougall, 1982:50, 60). Haycock's (1984:125) study of rafters indicated no strong perception of crowding, but "some thought there were too many stops" or that there was "too long" a wait above rapids. Again there is a tendency for the perceived problems to focus on shore use.

Of the rafters surveyed in 1981 84% had not previously travelled the Ottawa River, in 1984 the response to this question was 70% (Table 7.3). Therefore, many of these rafters may not have known what to expect during the trip, either in the rapids or on shore. Perhaps, as suggested by Yi-Fu Tuan (Lecture, November 8, 1985) an important part of the experience of outdoor recreation for modern urban dwellers is its "strangeness", hence their objection to crowds when they form the line ups which are a familiar part of everyday life, but not when they are engaged in pandemonium in the rapids.

7.18 Background and Perceptions

Two tests of association, chi-square and Spearman's Rank correlation coefficient, were used to investigate possible associations between user perceptions and characteristics such as age, years

paddling experience, frequency of use, and place of residence. For example, do older or more experienced paddlers perceive more crowding or conflict than those raised as paddlers on the Ottawa River of today? Do paddlers with experience on other popular rivers, especially rivers in the United States, respond differently from those without such experience? Does the serious racer differ from the casual paddler? Do experts differ from beginners? Statistical analysis indicates that variations in these individual characteristics seems to have had no significant little effect on the perceptions of paddlers using the Ottawa River.

There was no indication that the well travelled, the racer, or the more expert paddler had different perceptions, concerning crowding or conflict than the less avid or less skilled. It was not possible to compare the perceptions of those with and without "formal instruction" because those without instruction constituted too small a group, only 14% of the total sample population.

7.19 Characteristics and Perceptions

The characteristics which had a statistically

significant relationship with user perceptions were place of residence, and frequency of participation. Most of the respondents came from three areas, Deep River (13), Ottawa (58), and Toronto (16). There was a strong correlation between living closer to the Rocher, Fendu and more frequent participation on the Ottawa River in 1984 (Table 7.12). Those who lived closer also tended to perceive both less crowding "at the present use level", as well as less conflict. The latter was shown by a less negative effect on "enjoyment" from "meeting large numbers of rafts" (Table 7.12). Distant paddlers may expect a greater reward after a five hour drive, as opposed to a one half hour drive. Or one might speculate that for Local paddlers propinquity has led to familiarity with rafts, and greater skill in paddling among them. On the other hand if one wishes to avoid rafts being close to the whitewater site provides greater opportunity make use of the days of the week and the times of day which are least used by rafts.

More frequent participation was also associated with less perceived conflict and a more positive perception of the effect of "meeting large numbers of rafts" (Table 7.13). User perception appears therefore to be influenced by both place of residence (how far

Table 7.12

ASSOCIATION OF PLACE OF RESIDENCE WITH PARTICIPATION AND PERCEPTION OF CROWDING			
	Spearman's R	N of cases	Sig. level
USER VOLUME BY RESIDENCE	.23	93	.01
MEETING RAFTS BY RESIDENCE	.30	93	.002
MEETING KAYAKS RESIDENCE	.04	93	.33
RESIDENCE BY PARTICIPATION	-.36	93	.000

PARTICIPATION refers to frequency of participation
RESIDENCE refers to place of residence (Deep River,
Ottawa, and Toronto).

Table 7.13

ASSOCIATION BETWEEN FREQUENCY OF PARTICIPATION AND USER PERCEPTIONS (TOTAL SAMPLE POPULATION)			
	Spearman's R	N of cases	Sig. level
USER VOLUME BY PARTICIPATION	-.14	97	.08
MEETING RAFTS BY PARTICIPATION	-.22	97	.01
MEETING KAYAKS PARTICIPATION	-.19	97	.02

PARTICIPATION refers to frequency of participation.

one has to drive), and frequency of participation, which is itself strongly influenced by place of residence. With greater ease of participation paddlers will tend to participate more frequently.

Given that frequency of participation showed no statistically significant correlations with the perceptions of either "crowding" or "conflict" when using the 64% of respondents from the Ottawa area (Table 7.14), it would appear that place of residence, thus the distance travelled to the site, was the more important factor in influencing user perceptions.

Table 7.14

ASSOCIATION BETWEEN FREQUENCY OF PARTICIPATION AND USER PERCEPTIONS (OTTAWA PADDLERS ONLY)			
	Spearman's R	N of cases	Sig. level
USER VOLUME BY PARTICIPATION	-.03	62	.40
MEETING RAFTS BY PARTICIPATION	-.20	62	.05
MEETING KAYAKS PARTICIPATION	-.21	62	.049

7.20 Dropouts and Their Effect

It has been theorized that those most sensitive to

the effects of increased use may indirectly contribute to the persistence of high satisfaction, despite a changing environment, if they leave to become "disappointed dropouts" (Stankey, 1982; Neilsen and Shelby, 1977; Heberlein, 1977; Schreyer and Roggenbuck, 1978; Haycock, 1984:124).

The eighteen responses received from the 1984 dropouts, those respondents who had been on the Ottawa in 1983 but not in 1984 (Table 7.5), provided an opportunity to look for shared characteristics or attitudes which might indicate if these paddlers were in fact "disappointed dropouts". Analysis showed that as a group their characteristics and attitudes did not differ significantly from that of the population as a whole. These respondents were in fact remarkably representative of the total sample population in age, sex ratio, paddling experience and even their perceptions. Only one person stated that his non-participation was a conscious decision because "Rafts make the river much more unsafe." Given the size of this group at least one such response was to be expected. An interesting finding was that this group of "dropouts" was made up of respondents who, while they did not re-visit the

Ottawa River in 1984, still remained active paddlers.

7.21 Summary

The findings from the survey of kayakers and canoeists indicated that whitewater paddlers on the Ottawa River were in general mature (in both age and paddling experience), and both well schooled and well skilled. They were also much more likely to find fault with aspects of their recreational experience than were their rafting counterparts. There was evidence that the majority of paddlers were male, and that the annual rate of increase for this sport, while it has always been less than that for commercial rafting, had decreased to close to 0% in 1984.

Paddlers, in general, perceived the Ottawa River as crowded "at the present use level", and indicated that the activities of commercial rafters did conflict with their own enjoyment while on the river. The problem which paddlers associated most often and most forcefully with this conflict was their personal safety, which they often indicated was being diminished by the presence and the activities of rafts.

There was no evidence that user perceptions of crowding and conflict were influenced by

characteristics such as experience on other rivers, skill level, racing experience or, years of paddling experience. The characteristic which appeared to most influence user perceptions was the place of residence in relation to the whitewater site.

There were 18 "dropouts" in 1984. An analysis of their characteristics and comments provided no evidence that these respondents were a distinctive kind of user, and that they were, or were not, a group of "disappointed dropouts", or indeed if they had dropped out for any other reason.

The low participation rate in paddling by females stands in contrast to their high participation rate in rafting. This is perhaps a function of the relatively recent increases in participation by women in some forms of outdoor recreation, and a preference on their part for "packaged" outdoor recreation which is the most accessible form for those lacking in skill and experience.

Both a perception of crowding, and a perceived conflict with rafters had been the anticipated responses by kayakers and canoeists. However, the

degree to which these negative perceptions were expressed was greater than had been expected. However, at the same time there were many more positive comments about the shoreline environment, and the activities of the raft companies, there than had been anticipated.

The strong objection by paddlers to other users appeared to be focused mainly on the activities of rafters while on the river. Their negative perceptions of "crowding", and rafting activities were clearly based not simply on how many people were encountered (i.e. seen) during the trip, but also on the type of "activity group", especially rafts, with which the paddler shares the whitewater.

CHAPTER 8

SUMMARY AND CONCLUSIONS

8.1 Introduction

This thesis has examined the perceptions concerning the issues of "crowding", and "conflict" for participants in whitewater recreation on the Rocher Fendu Channel of the Ottawa River. A major motivation for this study, as with the preceding research at this site, was the large and increasing number of users, as well as the concerns raised about the possible need for management of this site. The goal was to use the knowledge gained to aid in the formulation and evaluation of management responses to these issues.

8.2 Summary

Whitewater recreation on the Ottawa River is dominated by commercial rafting, and private kayaking/canoeing. The perceptions and characteristics of commercial raft patrons had been studied prior to this thesis. However, further research was needed to gather data on the perceptions of kayakers and canoeists. There was also a need to re-examine the data and conclusions drawn in the existing research on rafters.

Physical geography, hydrology, and historic use have all played a role in making the study area a high quality recreational resource. At the same time, changing perceptions of nature, new craft technologies and new forms of commercially "packaged" outdoor recreation have all helped to encourage "mass participation" in whitewater recreation at this site.

The "carrying capacity" model has been used in attempts to predict and manage user density in outdoor recreation. Two of the studies of raft customers on the Ottawa River reflected the influence of this model, and demonstrated its weaknesses in their inability to demonstrate the expected results (McDougall, 1982; Haycock, 1984).

The 1984 survey of kayakers and canoeists gathered information on the perceptions, and characteristics of this previously unsurveyed group. The concerns addressed in the survey were the perceptions of both crowding, and conflict.

8.3 Findings

Whitewater recreation is a form of resource use in which the quality of that resource is defined not only

by the river, and its surrounding landscape, but also by the history of the site, and the interactions between the participants themselves. Rafters and paddlers have shared the use of the Ottawa River's Rocher Fendu Channel since the mid 1970s, and they will continue to do so. However, each group has a different perception of the present state of the river as a recreation site.

The first question posed by this thesis concerned the proposed use of the "carrying capacity" model as a means of explaining and/or predicting the perceptions of whitewater recreationists. It is clear from this study that the number of people encountered will not by itself serve to predict or explain the nature of the perceptions of either paddlers or rafters.

The research on rafters by McDougall (1982) and Haycock (1984), supplemented by the Rigby's (1980) 1979 data, indicates no support for a proposed relationship between variations in user density and variations in either perceived crowding or degree of satisfaction. Despite increases in user density crowding was not perceived, and satisfaction was always high. Kayakers and canoeists did indeed indicate a strong perception

of crowding, however, this perception was not simply a function of the number of people or craft encountered. Enjoyment of the river was more likely to be affected detrimentally by rafts rather than by other paddlers.

The significant conflict which paddlers directed towards rafters seems to be best understood in the light of the former group's comments concerning the effect of shared use on personal safety while on the river. This is clearly a function of the type of activity which the resource is shared with, rather than the number of participants involved. The fear of collisions undoubtedly can affect the experience of paddling whether or not such an incident in fact occurs.

The data concerning participation by women in whitewater sport reflect the recent findings which show that they are becoming more physically active. There is however a large gap between the participation rates by women in commercial (rafting) and non-commercial (kayaking and canoeing) activities on the Ottawa River. Data from other activities in Canada show similarly high participation rates by women in a number of other "packaged" outdoor recreation activities (Anderson,

1984 unpublished research). "Packaged" recreation is therefore introducing both whitewater recreation and the Rocher Fendu itself to an important user group.

The impact of women's participation in "packaged recreation" could have a significant impact on the future of both outdoor recreation, and the activities of women themselves, especially if there are significant increases in their participation in male dominated activities such as kayaking and canoeing. The implications of these changing patterns in outdoor recreation is a topic deserving of future research.

8.3 Recommendations

At present there is a need for communication between the two user groups, through their representatives in the rafting industry and whitewater paddling clubs, in order to create the opportunity to deal with perceived problems, most of which were identified by private users. The issue of safety for example, is for the most part centred on the private paddler's fear of rafts, a fear based largely on a feeling of insecurity over not knowing when they will appear, or how they will act. The conflict which is thus created could be lessened if communication between

representatives of the two groups could establish informal codes of conduct, especially for the more problematic sites on the river. A schedule of commercial use could inform paddlers when they would be less likely to encounter rafts in the rapids.

A more active approach to management would entail the use of "time zoning" in which a part of one or two of the busy weekend days would be set aside solely for non-commercial use. However, before such regulations could be established, research would be needed into both the feasibility of such a system (which is not certain), as well as when and how long the allotted times should be.

The major recommendation of this study is that there be a fundamental change in the approach to whitewater recreation management on the Ottawa River. The approach which has dominated past discussions and proposals has emphasized reducing the amount of recreational use. The approach needed is one which places the emphasis on the management of this site for the benefit of all those who wish to use it.

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SELECTED PERSONAL COMMUNICATION

Barnes, M.J. (July, 1984). co-owner "Rocky Mountain Cycle tours", Banff, Alberta.

Heyes, C. (February, 1983). Canadian Coast Guard, Ship Safety Branch; Ottawa Ontario.

Hays, B. (August, 1981) Hydro Quebec; Montreal, Quebec.

Appendix 1: Survey form and covering letter.

A SURVEY OF WHITEWATER KAYAKERS AND CANOEISTS CONCERNING THE
UPPER OTTAWA RIVER (ROCHER FENDU CHANNEL)

GENERAL INFORMATION

1. Place of residence (city, town, etc.) _____

2. Age _____ 3. Gender _____ 4. Years of paddling experience _____

5. What types of craft have you used on the Ottawa ?
OPEN CANOE _____ KAYAK _____ DECKED CANOE _____ RAFT _____6. How would you describe your own skill level ?
BEGINNER _____ INTERMEDIATE _____ ADVANCED _____ EXPERT _____7. Have you had any formal paddling instruction ?
HOW MUCH (days or hours) _____

WHERE

8. Have you any canoe or kayak racing experience ? (type of
racing, race sites, serious or casual pursuit) _____

OTTAWA RIVER USE

9. What skill level is required to paddle the Ottawa safely ?
(specify craft)

BEGINNER _____ INTERMEDIATE _____ ADVANCED _____ EXPERT _____

(comments) _____

10. How many times did you paddle the Ottawa River in 1984 ?
(number of times on) WEEKEND DAYS _____ WEEKDAYS _____
(number of times on) MAIN CHANNEL _____ MIDDLE CHANNEL _____11. On average how often did you paddle the Ottawa in past years ?
1983 _____ 1982 _____ 1981 _____ 1980 _____

(other years) _____

12. What other rivers do you paddle regularly ? _____

13. How does the Ottawa river compare to other rivers you paddle in
terms of SAFETY ? (specify sites and situations if relevant)

(13. continued) How does the Ottawa compare in terms of CRAFT ENCOUNTERED? (type and number)

ENJOYMENT AND THE ENVIRONMENT

14. How would you describe the Ottawa, at the present use level ?

UNDER UTILIZED _____ PERFECT LEVEL _____
SLIGHTLY CROWDED _____ VERY CROWDED _____

15. How is your river experience affected by meeting large numbers of canoes and kayaks ?

MORE ENJOYABLE _____ UNAFFECTED _____
SLIGHTLY LESS ENJOYABLE _____ MUCH LESS ENJOYABLE _____

16. How is your river experience affected by meeting large numbers of rafts ?

MORE ENJOYABLE _____ UNAFFECTED _____
SLIGHTLY LESS ENJOYABLE _____ MUCH LESS ENJOYABLE _____

(comments on 15 & 16) _____

17. How has the shoreline environment been affected by the presence of large numbers of river users ? (note types of effects and any significant sites)

18. Do kayakers and canoeists generally get a fair share of time and space on the Ottawa River ?

David Kennedy
c/o Dept. of Geography
Carleton University
Ottawa, Ontario
K1S 5B6

Dear Paddler,

Canoeists and Kayakers have always been active participants in whitewater recreation on the Ottawa River, however they have been largely ignored in the three existing studies of whitewater users. Studies of whitewater use on the Upper Ottawa (the Rocher Fendu Channel near Beachburg Ontario) have all used information gathered from commercial raft customers. As a result, there has not yet been a survey of the experiences and concerns of other paddlers.

I am conducting a survey of whitewater paddlers who are users of the Ottawa River, in co-operation with a number of whitewater clubs in Canada and the U.S.. These clubs will receive a copy of the results. These results will help me in the completion of my masters thesis in geography at Carleton University in Ottawa. They will also be useful in providing a more accurate picture for any future decision-making process.

I hope to receive your responses as soon as possible. The results should clarify the position of private paddlers concerning some of the important issues faced on the Ottawa River today.

Yours Sincerely

David Kennedy

Appendix 2: Selected chi-square contingency tables

Carleton University

Honeywell

CP-6

Crosstabulation of Residence by Present Use Volume

COUNT COLUMN PCT.	under utilized 1	perfect level 2	slightly crowded 3	very crowded 4	ROW TOTAL
Deep River 1	3 100.0	1 16.7	7 18.9	2 4.9	13 14.9
Ottawa 2		3 50.0	26 70.3	29 70.7	58 66.7
Toronto 3		2 33.3	4 10.8	10 24.4	16 18.4
COLUMN TOTAL	3 3.4	6 6.9	37 42.5	41 47.1	87 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
23.37	6	.0007	.44	6 of 12 (50.0%)

NUMBER OF MISSING OBSERVATIONS = 10

Carleton University

Honeywell

CP-6

Crosstabulation of Residence by Effect on Experience of
meeting large numbers of Canoes and Kayaks

COUNT COLUMN PCT.	more enjoyable 1	unaffected 2	slightly less enjoyable 3	much less enjoyable 4	ROW TOTAL
Deep River 1	4 25.0	2 8.7	8 21.6		14 15.4
Ottawa 2	10 62.5	13 56.5	26 70.3	12 80.0	61 67.0
toronto 3	2 12.5	8 34.8	3 8.1	3 20.0	16 17.6
COLUMN TOTAL	16 17.6	23 25.3	37 40.7	15 16.5	91 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
11.77	6	.06	2.30	6 of 12 (50.0%)

NUMBER OF MISSING OBSERVATIONS = 6

Carleton University

Honeywell

CP-6

Crosstabulation of Residence by Number of Weekdays spent
on the Ottawa River

COUNT COLUMN PCT.	1 to 2 days 1	3 to 6 days 2	7 to 11 days 3	12 to 40 days 4	ROW TOTAL
Deep River 1	2 14.3	6 54.5	2 50.0	3 75.0	13 39.4
Ottawa 2	9 64.3	4 36.4	2 50.0	1 25.0	16 48.5
toronto 3	3 21.4	1 9.1			4 12.1
COLUMN TOTAL	14 42.4	11 33.3	4 12.1	4 12.1	33 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
7.84	6	.24	.48	9 of 12 (75%)

NUMBER OF MISSING OBSERVATIONS = 64

Carleton University

Honeywell

CP-6

Crosstabulation of Residence by Number of weekend days use of
Ottawa River

COUNT COLUMN PCT.	1 to 2 days 1	3 to 6 days 2	7 to 11 days 3	12 to 24 days 4	ROW TOTAL
Deep River 1	2 10.0	6 18.8	3 30.0	1 20.0	12 17.9
Ottawa 2	12 60.0	21 65.5	7 70.0	3 60.0	43 64.2
Toronto 3	6 30.0	5 15.6		1 20.0	12 17.9
COLUMN TOTAL	20 29.9	32 47.8	10 14.9	5 7.5	67 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
5.19	6	.51	.89	7 of 12 (58.3%)

NUMBER OF MISSING OBSERVATIONS = 30

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

Carleton University

Honeywell

CP-6

Crosstabulation of Weekdays on the Ottawa River in 1984
with Number of Years Whitewater Paddling Experience

COUNT COLUMN PCT.	1 to 3 Years 1	4 to 6 years 2	5 to 10 years 3	11 to 30 years 4	ROW TOTAL
1 to 2 days 1	1 20.0	6 42.9	4 36.4	3 75.0	14 41.2
3 to 6 days 2	2 40.0	3 21.4	6 54.5	1 25.0	12 35.3
4 to 11 days 3	2 30.0	2 15.6			4 11.8
12 to 42 days 4		3 21.5	1 9.1		4 11.8
COLUMN TOTAL	5 14.7	14 41.2	11 32.4	4 11.8	34 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
11.26	9	.25	.47	15 of 16 (93.8%)

NUMBER OF MISSING OBSERVATIONS = 48

Carleton University

Honeywell

CP-6

Crosstabulation of Perceived Crowding by Effect on
Experience of meeting large numbers of Rafts

COUNT COLUMN PCT:	more enjoyable 1	unaffected 2	slightly less enjoyable 3	much less enjoyable 4	ROW TOTAL
under utilized 1		2 28.6		1 1.7	3 3.3
perfect level 2		3 42.9	3 13.0	3 5.0	6 9.9
slightly crowded 3	1 100.0	2 28.6	15 65.2	20 33.3	38 41.8
very crowded 4			5 21.7	36 60.0	41 45.1
COLUMN TOTAL	1 1.1	7 7.7	23 25.3	60 65.9	91 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN. E.F.	CELLS WITH E.F. < 5
38.82	9	.000	.033	11 of 16 (68.8%)

NUMBER OF MISSING OBSERVATIONS = 6

Carleton University

Honeywell

CP-6

Crosstabulation of Perception of Crowding by Effect on
experience of meeting large numbers of Canoes and Kayaks

COUNT COLUMN PCT.	more enjoyable 1	unaffected 2	slightly less enjoyable 3	much less enjoyable 4	ROW TOTAL
under utilized 1	1 6.7	1 4.2	1 2.8		3 3.3
perfect level 2	2 13.3	3 12.5	3 8.3	1 6.7	9 10.0
slightly crowded 3	7 46.7	9 37.5	15 41.7	7 46.7	38 42.2
very crowded 4	5 33.3	11 45.8	17 47.2	7 46.7	40 44.4
COLUMN TOTAL	15 16.7	24 26.7	36 40.0	15 16.7	90 100.0

CHI-SQUARE D.F. SIGNIFICANCE MIN. E.F. CELLS WITH E.F. < 5
 2.44 9 .98 .50 8 of 16 (50.0%)

NUMBER OF MISSING OBSERVATIONS = 7

END / FIN

30 03 87