DIFFERENCES IN RECREATIONAL BEHAVIOUR BETWEEN SAILBOATERS AND MOTORBOATERS CRUISING NORTHERN GEORGIA STRAIT, B.C.

by

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ABSTRACT

Recreational boating is very popular in British Columbia, a Province endowed with a spectacularly beautiful and accessible coastline. Boat ownership is higher in British Columbia than in any other part of Canada and continues to grow rapidly due to rising population, greater discretionary incomes, increasing leisure time and mobility, and improvements in the boat building industry.

As a result the spatial pattern of recreational boating use in the province is changing. Hitherto little used areas are becoming increasingly popular among cruising boaters, eager to enjoy quiet havens before they become overcrowded. With no diminution of the growth of boat use in sight, important management decisions must be made regarding the amount and type of moorage, land access, shore facilities and shoreline development.

The northern Strait of Georgia is a good example of a region currently underused by boaters yet experiencing a rapid increase in use. The Desolation Sound area was selected for analysis because a variety of important management decisions are pending. The purpose of this study therefore was to analyse the behaviour of recreational boaters in the Desolation Sound area to ascertain what preferences were revealed and to specify the implications of these findings

for future management of moorage, land access, shore facilities and shoreline development.

Several studies of recreational boating in other areas indicate that differences in boating behaviour and in environmental preferences relate to the type of boating experiences sought. So in the context of this study it was proposed that sailboaters and motorboaters would display different patterns of behaviour and enjoy differing environmental preferences - findings which should be of value to recreational managers when developing plans for the Desolation Sound area.

Consequently it was hypothesised that the following behavioural variables and environmental preferences - namely, motivations for visiting the study area; factors important in route planning; activities while cruising; features looked for while ashore; criteria determining good moorage or anchorage; preferences for moorage or anchorage; length of time spent cruising, moored or anchored; and ashore; and the length of time spent in the study area - all these would vary according to the type of boat used, motorboat or sailboat.

To test this hypothesis a questionnaire was distributed to sailboaters and motorboaters in the Desolation Sound area, and responses were arranged into tables and tested by means of simple proportions.

The results showed that there were significant

differences in most phases of the cruising experience between motorboaters and sailboaters. These differences appeared to consist fundamentally of an orientation towards man-made facilities -- stores, restrooms, fuel supplies, floats, and wharves -- favoured by the motorboaters, and the solitude and wilderness aspects of the natural environment, favoured by the sailboaters. Sailboaters appeared to spend as long as possible in the study area, exploring the many coves for secluded, out of the way places to anchor, while motorboaters appeared to spend a relatively brief period in the study area, to take on fuel and water, stores, and use the facilities (including floats and wharves) available.

Several implications for management of boating in the study area were defined. Facilities and wharves appeared to satisfy only immediate, service-oriented demands, while boaters visiting the area for extended periods valued very highly the wilderness aspect of the area. The satisfaction of increased demands for more facilities and wharves, land access, and shoreline development should therefore be so designed as to protect and complement as far as possible the wilderness character of the area.

AUTHOR'S NOTE

This study was carried out in conjunction with W. H. Wolferstan, whose own thesis (1971) was concerned with the compatibility of alternative resource uses in the same area, Desolation Sound. The questionnaire which appends this study was constructed to provide information about marine recreation relevant to both theses.

While the differences in approach and framework of analysis render the two theses separate and complete in themselves, a more complete understanding of resource uses in Desolation Sound can be gained by reading the two theses in conjunction.

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This thesis would not have been possible without the patience, understanding and guidance of many people. The author wishes particularly to thank Timothy O'Riordan, who provided the original idea and guided the study throughout; Shue Tuck Wong, whose advice regarding the conceptualisation and methodology of the thesis was followed; Mary Barker, for her encouragement, availability and assistance at difficult stages in the preparation of the final draft; Bill Wolferstan, who helped to design the study and collect the field data; and most of all my wife, Jennifer Waite, who besides typing and proof-reading the drafts, encouraged and supported me through periods of difficulty.

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CHAPTER I

PERSPECTIVE ON BOATING AS A MARINE RECREATION ACTIVITY IN BRITISH COLUMBIA

1. Introduction

The British Columbia coast is one of the most popular recreational boating areas in Canada. Its spectacular beauty and accessibility encourage boating as a recreational activity in British Columbia, so that recreational boat ownership is higher than in any other province of Canada (see p. 10). With leisure time, mobility, incomes, and population continuing to increase, and with technical advances in the boat building industry, recreational boat ownership continues to grow rapidly in British Columbia (see Table II).

One consequence of the rapid increase in recreational boat ownership is the increased possibility of conflicts in behaviour between boaters seeking contrasting types of experience. The two major types of boater, motorboaters and sailboaters, pursue a variety of activities which reflect their differing preferences for man-made facilities and the natural, "unspoiled", environment. Management policies which have been designed to meet the increasing demand for safe anchorages, shoreline access, and other facilities, have so far failed to incorporate the notion that different types of boater have different behavioural and environmental preferences. The result is that some

boaters may have difficulty finding the kind of experience they seek, leading to a considerable loss of satisfaction.

Overall satisfaction can be maintained if recreation managers take full account of the behavioural and environmental preferences of recreationists when planning facilities. A number of management decisions, notably by the British Columbia Parks Branch, are pending in several areas of the British Columbia coast, notably the northern Strait of Georgia, where hitherto little-used areas are experiencing rapid increases in use by boaters. This study aims to provide some insight into the types of experience sought by boaters in order that recreation planners will be able to maintain overall satisfaction for boaters in these areas.

2. Organisation of the Study

In the following pages, the purpose of the study and hypotheses to be tested are presented. Chapter I provides a perspective for the study of marine recreation behaviour. It outlines the characteristics of boating that distinguish it as a recreational pastime, describes and discusses the growth and pattern of boating in British Columbia, introduces some of the management problems arising out of the increase of boating along the British Columbia coast, and summarises some previous research in outdoor recreation behaviour. The chapter concludes with a brief description of the study

area.

Chapter II describes the methods used to identify boaters' preferences, the questionnaire used, the techniques used to sample boaters and the coverage the survey achieved. The chapter concludes with a brief description of the way in which the data were arranged and the hypothesis tested.

Chapter III presents the analysis of recreation boating behaviour in Desolation Sound, and tests the hypothesis given in Chapter I. A brief summary of the analysis concludes this chapter. The final chapter attempts to relate the implications of the findings of the study to a number of management problems arising out of the increase of recreational boating in the study area.

3. Study Purpose and Hypothesis

This chapter tries to show that (1) the cruising experience is composed of a number of activities which appear to be sought to varying degrees by motorboaters and sailboaters; (2) that there is some evidence that the two groups differ in the kind of recreational experience they are seeking; and (3) that these differences are revealed by distinguishable behavioural patterns. This poses a researchable question, since cruising is increasing in such popularity in the Georgia Strait area (and especially the relatively unused northern portion) that conflict between

users might occur. While some management policies have been initiated by the British Columbia Parks Branch in the Georgia Strait area there is a need to investigate recreational boating behaviour so as to provide some insight for recreation managers when planning additional cruising-related facilities in the region.

The primary purpose of this study is to analyse the recreational behaviour of sailboaters and motorboaters in the Desolation Sound area of Georgia Strait to ascertain what preferences were revealed. The secondary purpose is to specify the implications these findings have for future management of moorage, land access, shore facilities, and shoreline development.

It is hypothesised that the following behavioural variables and environmental preferences will vary according to the type of boat (i.e. motorboat or sailboat): (1) reasons for visiting the study area; (2) factors considered important in route planning; (3) activities while cruising; (4) features looked for while ashore; (5) criteria of a good mooring or anchorage; (6) preferences for mooring or anchoring; (7) the length of time spent cruising, moored or anchored and ashore; and (8) the length of time spent in the study area. These variables were selected because they are critical in determining the type of experience demanded by the boater.

4. Boating as a Recreational Pastime

The term "boating" incorporates a large number of distinct activities, including fishing, cruising, canoeing, dinghy racing, and water skiing. Most of these activities appear to have a prima facie purpose, such as catching fish, winning a race, or enjoying the exhilaration of water skiing. The satisfaction of boating, however, lies not only in the specific opportunities and challenges it presents, such as those mentioned above, but also in the opportunity to escape the frustrations of day-to-day urban living in a totally different setting. Of particular importance to the boater's satisfaction is the notion of the freedom and relaxation that attends life aboard a boat. This is particularly true in the case of cruising, which has no single objective except that of enjoying the pleasure of boating in a land and water setting. The satisfaction of boating is gained in many different ways, but it is broadly dependent on the extent to which the boater's experience lives up to his expectations.

Clawson and Knetsch (1966) have noted that most recreational outings consist of five stages: anticipation, travel to the site, on-site experience, travel from the site, and recollection. In the cruising experience, anticipation consists of a set of expectations about the prospect of spending an extended period aboard a boat. This usually

means the selection of a well-defined route plan, which reflects not only preferences for certain activities, such as fishing, mooring, anchoring, exploring ashore, and viewing scenery, but also the choice of location for cruising. This choice process, particularly the selection of location, is in part determined by the image of alternative settings gained by previous experience, discussions with fellow cruisers, and magazine articles.

The two travel stages really form part of the on-site cruising experience, which includes movement between various locations where specific activities are pursued. These activities include visiting places accessible only by boat, anchoring in some sheltered cove, tying to a wharf, purchasing fuel and supplies, viewing scenery, fishing, shellfish gathering, and exploring the shoreline and the land behind it. The reasons why certain areas are chosen, the factors important in route planning, the activities aboard the boat, the features looked for ashore, and preferences for mooring and anchoring are critical variables indicative of the type of experience sought.

Related to all of these is a time consideration - the amount of time spent in each activity, and the amount of time spent in each area. The time factor is unusually important in the on-site stage of the cruising experience. Once the cruise is under way, money costs are somewhat irrelevant as

indicators of recreational satisfaction, for there is no "willingness to pay" surrogate at this point. There are time costs, however, because there is a variety of opportunities but a fixed time budget. One can cruise or one can moor, one can explore the shoreline or one can fish. Sacrifices must be made, so the amount of time spent in various aspects of the on-site cruising experience provides the most convenient surrogate for measuring satisfaction.

The recollection phase for cruising differs little from this phase for most recreational pastimes. Its role is to reinforce the enjoyment of the cruising experience through memory and by describing it to friends, and it plays a part in determining future route plans by assessing recreational satisfaction, i.e. the degree to which expectations were met by experience.

There are two types of cruising boater - sailboaters and motorboaters. These two groups differ in their cruising habits for a variety of reasons, the two most obvious of which are the greater dependence of motorboaters on the provision of fuel at strategic points, and the role of the actual pursuit of sailing for sailboaters, which tends to limit the amount of time they can devote to the non-movement aspects of cruising. The different experiences sought by motorboaters and sailboaters may extend over the whole range of cruising behaviour and environmental preferences, and will

be discussed fully in the case study that follows.

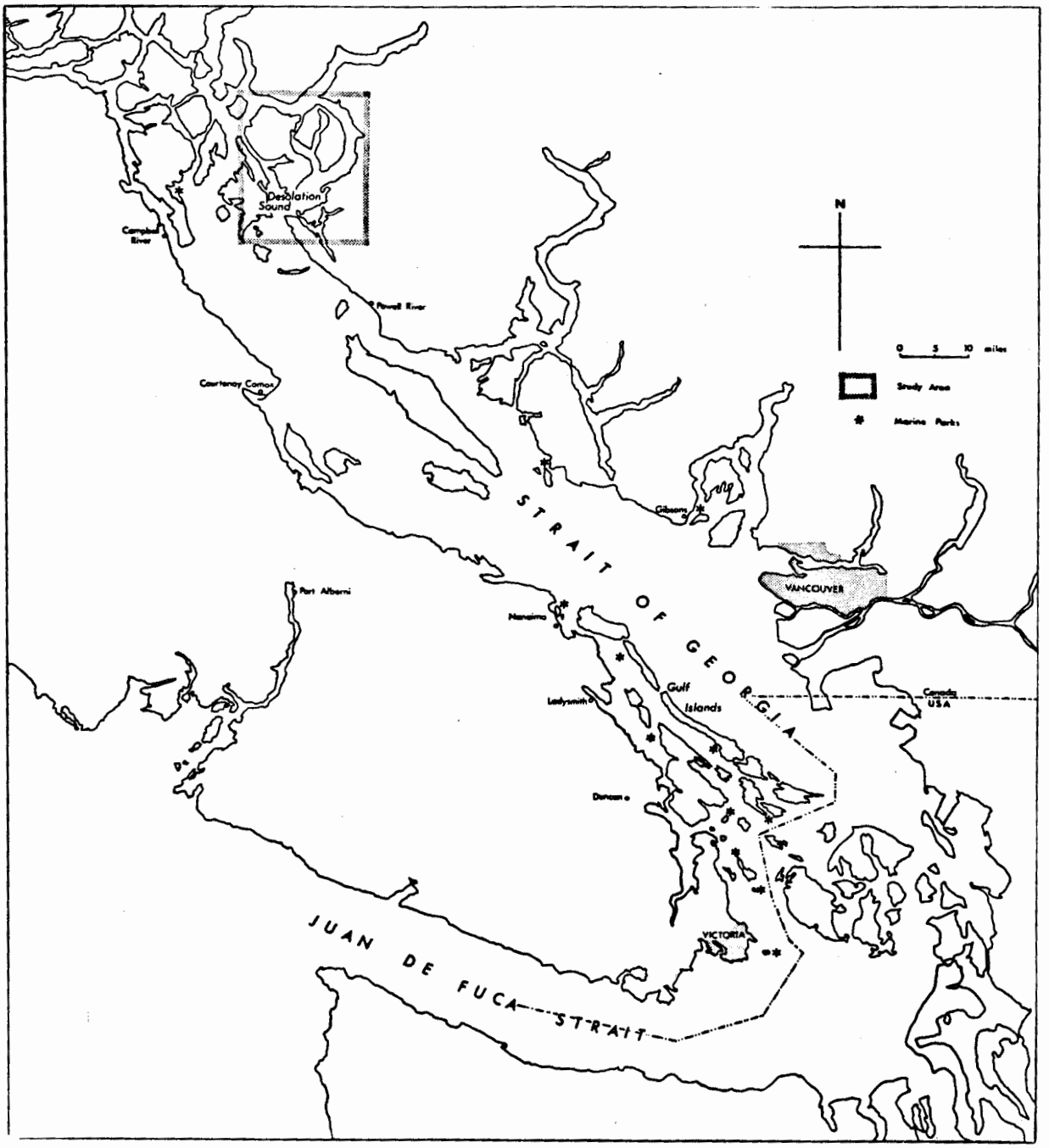
5. Boating in British Columbia

a) The physical resource

The prime area for boating in British Columbia is Georgia Strait, an inland sea almost completely cut off from the Pacific Ocean by Vancouver Island (see Map 1). Its advantages stem from its large size (130 miles by 25 miles) and the fact that it is sheltered from the open ocean by high mountain ranges on Vancouver Island. The greatest asset of Georgia Strait lies in the variety of opportunities it presents for recreational boating. Sport fishing is good, shellfish are abundant, its waters are warm enough in places for comfortable swimming, and there are many places to moor or anchor. In addition, it links the major population centres of British Columbia to scenic areas of an almost wilderness character.

b) Current boating activities in Georgia Strait

Despite the tremendous variety of opportunities provided by Georgia Strait, two categories of activity dominate recreational boating. These are fishing and cruising. Out of an estimated 4 million boat days in 1972, about 50% were spent fishing, and 27% cruising (Paish 1972:242). According to a survey of boat use in Georgia Strait by Lea (1966: Appendix E), fishing trips were primarily day trips aboard small outboard boats in the vicinity of the boater's home.



MAP 1. Georgia Strait

Consequently Howe Sound and the southern Gulf Islands, close to Vancouver and Victoria respectively, received the densest sport fishing use. Vacation trips, on the other hand, were mainly cruising trips ranging over the whole length of Georgia Strait. The most frequently mentioned terminal point of the cruise was north of a line from Campbell River to Powell River (see Map 1). The opportunity for an extended cruise in safe, warm, sheltered waters is unique to the Georgia Strait area, and consequently cruising is much more popular there than in any other part of Canada.

c) The demand for recreational boating in Georgia Strait

Access to suitable boating areas plays a key role in the pattern of boat ownership and use, and in British Columbia, boating is much more important in the spectrum of recreational opportunities than is the case on the national scale. In 1972, no less than 31% of British Columbia's population participated in power boating, and 7% in sailing, 35% and 75% higher than the national figures respectively (Parks Canada 1974:32).

An indication of the relative importance of boating in the Georgia Strait area compared with Canada can be gained by looking at the rate of boat ownership per thousand population. In 1966, there were 23 boats per thousand population in Canada, 46 per thousand in British Columbia

(higher than any other Province) and in the Georgia Strait area, 53 per thousand (Lea 1966:25). Over 80% of British Columbia's recreational boats are located in the Georgia Strait area, an estimated 86,000 boats in 1972 (Paish 1972:226).

Within the Georgia Strait area, boat ownership per thousand population varies tremendously (Table I). In the smaller communities bordering Georgia Strait, boating is the prime recreational activity.

There has been a rapid growth in recreational boating since the Second World War. Lea (1966:2-7) estimated that the number of boats in Canada rose from about 35,000 in 1948 to 455,000 in 1965. At one time, boating was considered the pastime of a small and perhaps eccentric high income group. Increases in population, leisure time, family incomes, and mobility have caused rapid increases in participation in almost all recreational activities, but one further factor which has contributed to the exceptionally high rate of growth of boating arises from technological improvements in the boat building industry since the war (Lea 1966:43).

The use of new materials, particularly fibre glass, has allowed a degree of mass production in the construction of both motorboats and sailboats which was not possible with traditional wood construction, resulting in a dramatic

Table I. Boat ownership in communities bordering Georgia Strait

COMMUNITY	POPULATION	NO. OF BOATS	BOATS PER 1,000 POP.	BOATS PER 100 FAMILIES
Vancouver North Shore	110,000	4,950	45	12.1
Burrard Peninsula	614,000	27,530	45	14.7
South Shore	185,000	5,000	27	9.2
Victoria Area	166,000	11,950	72	24.3
Nanaimo	25,000	2,500	100	34.0
Powell River	12,000	1,500	124	42.2
Campbell River	8,500	850	99	34.0
Comox	8,100	2,430	300	111.0
Gibsons Landing	1,900	330	164	58.7

(Source: Lea 1966:27)

reduction in both labour and material costs per unit. The development of compact, powerful, reliable and economical outboard motors requiring a minimum of servicing has greatly increased the convenience of operation of both motorboats and sailboats. The planing hull design, now widely used for motorboats, coupled with powerful modern marine engines, allows much greater speeds, which make large areas of coastline accessible in a short time. Modern designs of both motorboats and sailboats achieve a high degree of comfort and convenience in a relatively inexpensive boat. New cruising boats, fully equipped, cost in the region of $500 per foot, or about $11,000 for an average sized boat of 25 feet in length. However, small second-hand boats can be acquired for considerably less than this, and those prepared to put up with minimal facilities and comfort may become boat owners for an initial outlay of about $3,000, or about what one would pay for a second car.

Other costs make a significant contribution to the total costs of running a boat, however. While insurance remains fairly reasonable, when compared to car insurance, increasing competition for wet berths (which affects mainly cruising boats) has caused a rapid escalation in the cost of a permanent mooring. Moorage costs in Vancouver average about $1.00 per foot per month ($300 per year for an average 25 foot boat), and about 75 cents a month in Victoria ($225

per year for a 25 foot boat), and can be considered a major component of the annual cost of operating a boat. Maintenance can also be a major expense, both in terms of money and time. Bearing all these factors in mind, it may be said that although the possibility of boat ownership is open to a much wider public nowadays, it is still for the most part restricted to middle and upper income groups.

Despite the expense of boating, participation increased 9% a year in power boating, and 80% a year in sailing, between 1969 and 1972 in British Columbia (Parks Canada 1974:30). The upward trend in boat ownership appears likely to continue for some time to come. Table II shows boat ownership in the Georgia Strait area growing at an annual rate of 4% between 1966 and 1976, and 3% between 1976 and 1986, as forecast by Lea (1966:46-49). The two major factors affecting boat ownership in these projections were assumed to be the growth of population and family income. Expenditures for recreational boating were expected to increase as a result of these two factors. The assumption was made that the range of boat types available and their prices (in constant dollars) would not alter over the projection period, although a trend towards larger and more expensive boats was anticipated. Thus the rate of increase of the number of boats was expected to be somewhat less than the rate of increase of expenditures available

Table II. Projections of recreation boat ownership in the Georgia Strait area, 1966-1986

YEAR	NUMBER OF FAMILIES IN STRAIT OF GEORGIA AREA	SAILBOATS WITH MOTOR	HOUSEHOLDS OWNING OUTBOARD MOTOR BOAT	HOUSEHOLDS OWNING INBOARD MOTOR BOAT	OTHER BOAT*	TOTAL BOATS	NUMBER OF BOATS PER 1000 POPULATION**
1966	400,000	2,350	30,600	6,800	21,150	60,900	53
1976	520,000	4,620	45,730	12,500	27,540	90,390	61
1986	640,000	7,450	61,820	19,520	33,820	122,610	67

(Source: Lea 1966:46-49)

* "other" boats are predominantly small rowing or car-top boats used for fishing and other non-cruising activities.

** in calculating the number of boats per thousand population, the actual number of boats is used, rather than the number of boat owning households; many owners of cruising sailboats and motorboats use a small dinghy as a tender when anchored.

for boating. Increases in leisure time were assumed to be small, and cancelled out by "the decrease in ownership rate with increased population density and the opportunity to participate" (Lea 1966:44).

Paish (1972), using the same techniques as Lea, but with more up-to-date estimates of population and income growth, indicated that the number of boats in the Georgia Strait area would increase at between 4.6% and 5.8% per annum, substantially higher than Lea's estimates.

Neither of these projections, however, appear to predict adequately the rate of growth of boat ownership in the Georgia Strait area. The number of recreation boats built in Canada is increasing at about 6% per annum (D.B.S. Catalogue 42-205, 1962-70). Since annual imports of recreation boats are about five times annual exports, equalling about one half domestic production (D.B.S. Catalogues 65-004 and 65-007, 1962-70), the total annual increase of recreation boats in Canada is about 8.4%. This figure would be on the low side for British Columbia in view of her high rates of population and income growth, but is still 45% higher than Paish's high figure.

The inadequacy of Paish's and Lea's projections may be due to a failure to consider the characteristics of population and income growth. British Columbia's population has been growing at an annual rate of 3.0% between 1961 and

1971 (Statistics Canada 1973, Catalogue 92-702:1-1). The rate of natural increase (births over deaths) is only 0.79% (Statistics Canada 1971, Catalogue 84-201:18), so the majority of population growth is through migration, mainly from other parts of Canada. Almost 50% of migrants fall in the 20-39 age groups, and consequently migrants as a whole tend to have greater earning power than the general population (D.B.S. 1970:153). This indicates that they are more likely to own a boat than the general population. The annual rate of increase of population alone tends to underestimate the potential for boat ownership. The percentage increase in average family income also fails to reflect adequately the increase in boat-buying power. A more useful figure would be the number of families entering the $10,000 - $15,000 income bracket, for whom boat ownership becomes financially possible.

One factor explicitly ignored by Lea (and implicitly by Paish) was the effect of increases in leisure time. The four day working week and more flexible working hours are gaining wider acceptance (Vancouver Sun, 14 April, 1973), and may be of considerable importance in accelerating the annual increase in boat ownership. There may also be other factors which contribute to the demand for recreation boats, associated with status seeking and the pursuit of a particular life style, perhaps moulded by advertising, which increasingly

uses activities like boating to create an image of a desirable life style (Kraus 1971:296).

In the Puget Sound area, adjacent to Georgia Strait and offering similar recreational opportunities, the number of boats per thousand population rose from 63 in 1963 (Northwood, Leik and Reid, 1963) to 94 in 1970 (Columbia - North Pacific Region Inter-Agency Committee, 1970). An increase of this magnitude in the Georgia Strait area would indicate a doubling of the number of boats in the decade 1970-1980, and may be a more realistic forecast than those of Lea and Paish.

It should be added here that all of the above figures relate to the total number of recreation boats. No figures are available relating to the number of boats capable of cruising, but these boats (including motorboats and sailboats) probably consitute about one-fifth of the total, depending on the definition. It should be remembered that there is a trend towards larger boats of the cruising type, which consequently are increasing faster than the average rate of boat increase (Lea 1966:44).

All in all there is reasonable evidence that cruising will become more and more popular in British Columbia over the next decade at least. Moorage and shore access are limited in the Georgia Strait area, so in view of these projected increases in cruising activity, it is necessary

to investigate what management policies have been prepared to accommodate cruising interests in the region.

6. Management Problems

The behavioural demands made by cruising boaters have been outlined in section 4. Some of these activities, particularly the desire to go ashore or anchor in a sheltered cove, conflict with other resource users, namely, those who have waterfront summer or retirement homes in areas which are also popular for cruising. Private ownership of waterfront land, which has been expanding rapidly over the past decade particularly in the Gulf Islands (Clark, 1967) does not of itself restrict the passage or anchoring of boats immediately offshore, or even the right of access to the shoreline below high water; but it does restrict access to the land above high water. When boaters wish to go ashore to explore, or merely to stretch their legs, they frequently intrude upon the privacy of shoreline landowners. Even if the boater does not step ashore, owners of waterfront land may object to the discharge of sewage and disturbances of peace that can occur when boats are moored offshore adjacent to their property. From the boaters' point of view, the presence of cottages, "keep off" signs, and human activity ashore may reduce the aesthetic appeal of cruising or anchoring in a certain area.

As a solution to these conflicts, cruising boaters have

long advocated the idea of setting aside areas for the exclusive use of boaters. As a result of this pressure, a number of marine parks have been established by the Parks Branch of the British Columbia Department of Recreation and Conservation. The Branch obtained information from local yacht clubs to identify the principal areas in which the marine parks should be located, and to determine what facilities should be provided at each location. Marine parks are designed to parallel the system of Provincial campgrounds already existing along the highways of British Columbia. Their specific aim is to "provide shelter for small boats and opportunities for their operators and crews to go ashore to stretch their legs, to picnic, or to rest or to spend a night in camp" (Department of Recreation and Conservation 1963:21). Marine parks are accessible only by water, and usually comprise a safe anchorage (sometimes including mooring buoys) and facilities on land include garbage disposal, restrooms, drinking water, and sometimes picnic tables and campsites. In 1973 there were 16 such parks in the Strait of Georgia (see Map 1) and the Provincial Government is actively pursuing a policy of expanding the number of marine parks throughout the Georgia Strait region. At present all of these marine parks offer little more than moorage. Improved shoreline access to trails, lakes, and viewpoints is presently being considered but does not yet

exist to any extent in the region.

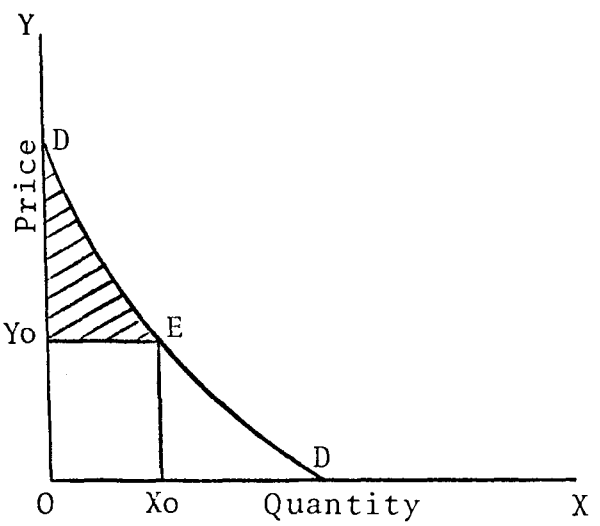
The idea of a standard facility to accommodate all recreationists using an area is no longer tenable, because different types of recreationist often have contrasting behavioural and environmental preferences. This question has already been touched upon above with regard to the different pursuits sought by motorboaters and sailboaters, and is clearly of importance to recreation managers faced with predicted increases in cruising in Georgia Strait.

7. The Measurement of Satisfaction in Outdoor Recreation

a) Early research

Early attempts to evaluate the recreational experience concentrated on deriving appropriate means for estimating benefits of providing outdoor recreational facilities (Knetsch and Davis, 1966). This was necessary because the provision of land and water for public recreation has developed largely as a non-market commodity, where the price paid by the recreationist for the use of a facility is usually zero or nominal. Under these circumstances, the supply of resources and facilities for outdoor recreation is not particularly sensitive to fluctuations in demand, and the increase in demand which has taken place since the war has not been accompanied by a concomitant increase in the supply of facilities and resources for recreation.

Although there is no direct evidence of the value people place on such a recreational facility or opportunity, "all consumers would be prepared to pay some positive price for it, and a declining number can be expected to be prepared to pay successively higher prices." (Pearse 1968:164). The amount that consumers would be willing to pay in the absence of actual payment is called "consumer surplus". A graph of consumer surplus is shown in Figure 1 below.



'Consumer surplus' is the shaded area under the demand curve DD. The surplus is the specified quantity, Xo at price Yo.

Fig. 1. Consumer surplus

The above figure is in effect a demand curve where willingness to pay is substituted for actual payment. In the case of products provided free, such as recreation, the consumer surplus generated is measured by the entire area under the demand curve. When a nominal price is paid for the use of a

facility, as at some campgrounds, the consumer surplus is the area under the demand curve above the actual price paid.

In constructing the demand curve, the cost of travelling to the site, the distance travelled, and interview techniques (to determine the maximum recreationists would be willing to pay to avoid being deprived of an area or facility) have all been used, some quite successfully (Knetsch and Davis 1966: 136-138).

However, there are difficulties in quantifying several important aspects of recreation demand. The first of these is "option demand", which is a form of demand derived by consumers who do not presently utilise the resource, but wish to maintain the availability of the recreation experience. This aspect of demand is never apparent in measured attendance at a site (Davidson, Adams and Seneca 1966:183). The extent to which demand for future use is affected by the improvement of a recreational opportunity either in the quantity of recreation demanded ("learning by doing") or in the quality (through a change in the individual's evaluation of a recreation-day) is also very difficult to measure (Pearse 1968:186).

An implicit assumption of economic methods of benefit estimation is that the amount of satisfaction gained by recreationists paying the same "price" (in terms of travel distance, travel cost, or willingness to pay) is constant.

Willingness to pay, gained from travel cost or by interviews, appears to reflect mainly one's ability to pay, and is therefore income dependent (Knetsch and Davis 1965:134). Similarly, the distance one is prepared to travel is greatly influenced by one's available time (Knetsch and Davis 1965:139). People using the same site may have quite different expectations, and the satisfaction gained depends on the degree to which the experience lives up to the expectations of the recreationist. In other words, economic indices such as those discussed above for measuring recreational satisfaction are imperfect, especially when analysing the on-site experience. In recent years, researchers have turned to behaviour as a more suitable variable for indicating revealed preferences, and it is to this body of research that we now turn.

b) Behavioural studies

The study of outdoor recreational behaviour (by Lucas, O'Riordan, Stankey, and others) has proved to be a valuable tool for evaluating the recreational experience, and for assisting managers to design more appropriate facilities to meet the varied demands of users. One of the most important findings of this type of research has been that recreationists with quite different expectations may visit the same area. Such recreational groups have different perceptions both of the recreational resource and the kind of experience they seek, resulting in contrasting patterns of behaviour in the

same area. This may produce conflicts in behaviour which seriously detract from the overall satisfaction gained by all users.

In the Norfolk Broads region of Britain, O'Riordan (1969) found that boaters had quite different expectations for the kind of recreational experience they sought, depending upon their familiarity with the area. Those who had visited the waterways for many years had developed a noticeable association, or "consciousness", for the area. Those who were visiting for the first or second time treated both the cruising experience and the Broads region merely as a kind of recreation experiment. Consequently, the behavioural patterns of the two groups differed markedly. The "Broadland conscious" group (which consisted primarily of sailboaters) tended to be much more sensitive to crowding, and took various measures to avoid crowded situations (such as mooring in out of the way places and choosing off-peak holiday times). They also generally demanded a more "natural" setting in which to enjoy boating. The newcomer group, on the other hand (primarily motorboaters) were far more tolerant of crowding and noise, and deliberately sought the more congested zones. While the distinction between the two groups was based mainly on their environmental expectations (as outlined above), it should be noted that this difference was also related to the type of boat used in cruising. Preferences which are

reflected in recreational behaviour appear to be linked to the kind of activity pursued.

Similar evidence of this association was found by Lucas (1964) and Stankey (1971) in the Boundary Waters Canoe Area of the Superior National Forest in Minnesota, which is visited by both canoeists and motorboaters. Lucas found that for canoeists, who were interested in travelling and camping in a wilderness setting, any evidence of human activity (such as roads, buildings, and powered craft) was unacceptable. Their wilderness was defined in terms of the absence of human intervention in the landscape. Motorboaters went to the same area intent on fishing, and appeared to be unaffected by other boaters or even by buildings and roads. While canoeists found the presence of motorboats quite intolerable, the reverse was not the case - in fact motorboaters enjoyed the presence of canoeists. Of some significance to both the Lucas and Stankey studies was the finding that the user groups had quite different perceptions of what constituted a wilderness. Indeed there were two "wildernesses" - a peripheral area of semi-developed rural character which met the expectations of motorboaters, and a core area of untrammelled nature and solitude which was sought by the canoeists. Each of the two recreational groups appeared content in their own chosen setting. This finding is of significance for this study, as will be discussed in Chapter IV.

An important conclusion of all these studies was that recreationists made voluntary adjustments in their behaviour to reduce conflict in order to ensure that their experience met with their expectations. This usually took the form of a de facto zoning pattern, with each group tending to spend as short a time as possible in areas that did not meet their goals, and as long as possible in areas that did. As far as possible, users sought to separate themselves from incompatible activities. When use levels increase, however, it appears to become more difficult to maintain such a zoning pattern.

The analysis of the self-imposed zoning pattern not only provides evidence of revealed preferences of the various user types but also assists managers to plan more effectively. Lime and Stankey (1971) discuss a variety of management alternatives, including information and education programmes, controlled access to separate the different users, different kinds of environmental design and ecological protection, all of which aim to reduce visitor conflict, lighten ecological impact, and meet the overall management goal of maximising user satisfaction.

The study of user behaviour is valuable for the management of recreation areas because managers themselves frequently have different perceptions of the recreation resource, and the proper use of the resource, compared with

recreationists. In studies of camping areas, for example, recreational resource managers have tended to be strongly orientated towards the environmental aspects of the camping experience, both in wilderness areas (Hendee and Harris, 1970) and non-wilderness family camping areas (Clark, Hendee and Campbell, 1971). Nowadays, however, over half of campers camp in pick-up campers and trailers, campgrounds are large, heavily used, and have modern conveniences such as flush toilets and paved roads, and modern camping appeals to a much greater range of tastes than before (Clark, Hendee and Campbell 1971:144). Participants in this modern camping culture are not as sensitive about the need for extensive supervision to combat theft, nuisance, noise, litter and other social ills that seem to result from the increasing intensity of use of campgrounds. Managers often failed to realise this, assuming either that all recreationists had the same environmental orientations that they did (Clark, Hendee and Campbell 1971:154), or overestimating the number and feelings of recreationists with strong environmental views (Hendee and Harris 1970:762).

Studies of user behaviour are thus of considerable interest both to the social scientist and the recreation manager. Surprisingly, since water is the focus of most recreation (ORRRC No. 1, 1962), relatively few studies of behaviour in water orientated recreation have been carried

out. These have examined the factors affecting attendance at beaches (Hecock 1970) and swimming areas, including perception of water quality (Barker 1968), and Lucas (1964), Stankey (1971) and O'Riordan (1969), have examined behaviour patterns of people boating on inland waterways. To this author's knowledge no study has yet examined the pattern of behaviour among saltwater cruising boaters.

8. Study Area

The Desolation Sound area was chosen as the study area, partly because it is frequented by a large number of boaters (the guest book at the local store at Refuge Cove recorded almost 800 registrations during 1968, and was the only estimate of the population) and partly because it provides a variety of anchorages and wharves, an important dimension of this study.

Here, the term "wilderness" is used to describe those parts of the study area away from intensive human activity. The term "wilderness" is used rather loosely by recreationists to mean undeveloped areas, rather than areas strictly untouched by man. Thus evidence of man's past activities, such as old orchards and cabins (now overgrown and tumbledown) and even areas which have been logged in the past but where considerable regrowth has taken place are all acceptable in this definition of "wilderness". Because this study uses boaters' responses, the boaters' own definition of "wilderness" is used.

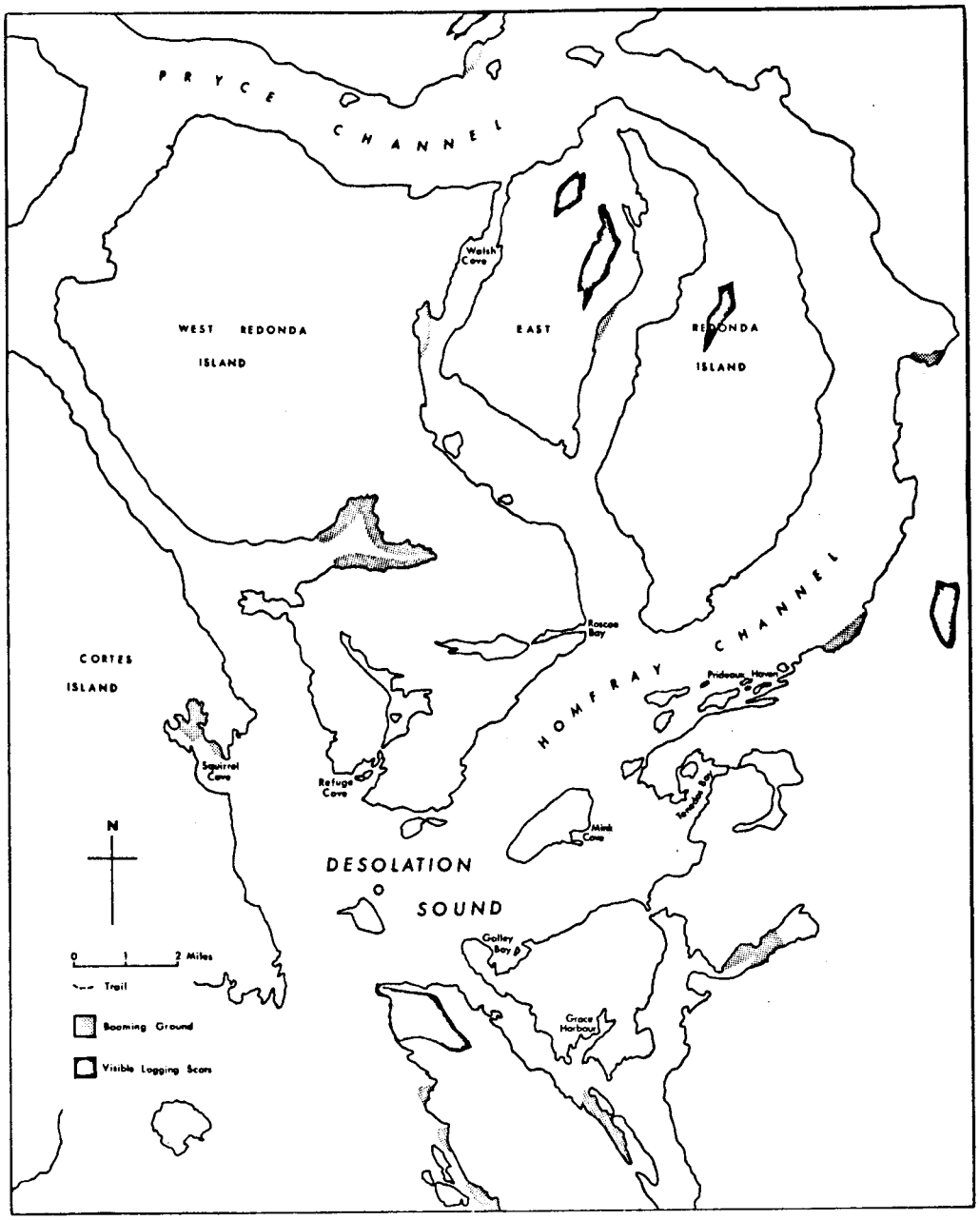
Wolferstan (1971:15-68) gives a comprehensive discussion of the study area. This section attempts to describe briefly the study area from the point of view of the cruising boater. The Desolation Sound area is an ideal area for vacation cruising. Situated 100 miles north-west of Vancouver and 140 miles from Victoria, it is accessible to cruising boaters from these areas in about three days cruising time along the length of Georgia Strait. Georgia Strait enjoys scenic attractiveness, fine weather during the summer season, and a number of anchorages and harbours. Undoubtedly part of the attractiveness of the Desolation Sound area is that the journey to and from it is also pleasant.

Scenically, the Desolation Sound area is rugged and steep. Its highest point, Mt. Addenbrooke on East Redonda Island (5,215 feet) dominates the area. To the east, the mainland peaks rise to over 4,000 feet.

Although there has been settlement in the past, practically none survives, and the study area has almost a wilderness quality. Access is possible only by boat or floatplane, the nearest roads being at Lund ten miles south on the mainland, and on Cortez Island to the west. Practically the whole of the land surface is under rather poor coniferous forest (limited by steep slopes and relatively low rainfall) and over the past 70 years, sporadic

logging activity has taken place with the ebb and flow of the lumber market. Logging in the area has been selective and undertaken by small outfits with limited capital and equipment. The impact of this type of logging on the present landscape is minimal, and substantial regrowth has taken place (both of conifers and deciduous trees). Within the last 20 years, however, more extensive logging has taken place, and some scars are visible from the water. Some sheltered stretches of water are used as booming grounds (see Map 2). Relative to other areas of Georgia Strait, however, the impact of this activity is small.

Various kinds of wildlife are to be seen, including bald eagles, several species of aquatic birds, mink, seals and occasionally blacktail deer, which contribute to the wilderness aspect of the area. Two aspects of marine life are particularly important from the point of view of cruising. Salmon fishing is a popular sport in the study area, and shellfish (both oysters and clams) are abundant. Fishing and shellfish gathering make an important contribution to the overall experience of cruising in the study area. In addition, the summer water temperature at the surface is remarkably warm (65-70^{o} F) due to the fact that the flow of tides around Vancouver Island meet in the study area, and very little mixing of surface and bottom waters takes place. Consequently swimming



MAP 2. Desolation Sound

is very popular, despite the absence of beaches.

Tidal currents in the study area are rarely more than one knot, and waves can only reach a maximum height of three feet, because of the sheltered nature of the entire area. During the peak boating season (July and August), anticyclonic conditions are usually dominant, with light to moderate northwesterly breezes (4-16 knots) prevailing - enough for the sailboaters, but not too much to cause uncomfortable wave conditions to the motorboater.

One of the most important aspects of the study area, from the point of view of a cruising boater, is the large number of indentations in the shoreline which afford a safe, sheltered anchorage with a good holding bottom. Because of the steepness of the shore, the tidal range (up to 15 feet) presents very few problems. The largest anchorage in the study area, Refuge Cove, has been developed into a commercial marina with a general store, fuel, water, showers, flush toilets, and extensive wharfage for a maximum of about 30 boats. By providing supplies of food, fuel, and water, the store allows boaters to extend their length of stay in the study area or to range further north. Boaters can also choose between the security of mooring to a wharf and social contact with other boaters at Refuge Cove, or the more secluded anchorages nearby.

Cruising, as noted above, is in fact a series of

activities, in most of which nearly all boaters participate to a greater or lesser degree. The variety of opportunities offered by the Desolation Sound area is an important component of its attractiveness as a cruising area. Differences in the ways in which sailboaters and motorboaters utilise these opportunities forms the basis of this study.

CHAPTER II

RESEARCH DESIGN

1. Introduction

The research design of this chapter entails the use of a questionnaire, the sampling of boaters and the use of simple descriptive statistics involving proportions.

2. The Questionnaire

The questionnaire, which appears in Appendix 1, was designed to elicit information for both this study and that carried out concurrently by Wolferstan (1971). It was divided into five parts. Part 1 (questions 1-10) sought information about the respondent's origin, and the number and ages of people aboard. Part 2, which contains the questions (11-22) relevant to this study, dealt with the eight categories of boating behaviour: (1) the reasons for visiting the study area; (2) factors considered important in route planning; (3) activities while cruising; (4) features looked for while ashore; (5) criteria of a good mooring or anchorage; (6) preferences for mooring or anchoring; (7) the length of time spent cruising, moored or anchored, and ashore; and (8) the length of time spent in the study area. Part 3 (23-30) asked boaters to describe what they liked and disliked about the study area and marine parks elsewhere in Georgia Strait. Part 4 (questions 31-37) contained questions about the type of boat, the amount of boating experience of boaters, and their socio-economic

status. Finally, in Part 5 (question 38) boaters were asked to roughly draw in their cruising routes on the accompanying map.

The eight categories of boating behaviour in Part 2 of the questionnaire are those considered critical in determining the type of experience demanded, as outlined in Chapter I, and selected to test the hypothesis. In the first six of the eight categories of the boating experience enumerated above, which involve preferences for one activity or feature over another, boaters were asked to express their preferences by ranking a number of alternatives in each category. These alternatives were chosen from the responses to an open-ended pilot questionnaire handed out to 20 respondents during a preliminary reconnaissance of the study area between 28th May and 9th June, 1970.

The alternatives to be ranked in each category of behaviour were as follows:

Category	Alternatives
1. Reasons for visiting the study area	a) it's a "different" area b) been before and liked it c) heard about it from friends d) read about it e) own property here f) get away from "crowded" waters g) other
2. Important factors in route planning	a) winds, tides b) location of marine parks c) quality of fishing d) presence of unspoiled wilderness e) location of shore facilities f) other

Category	Alternatives	
3. Activities while cruising	a) exploring b) sunbathing c) fishing d) relaxing e) photography	f) eating and drinking g) observing wildlife h) viewing scenery i) other
4. Features looked for ashore	a) freshwater lakes b) trails c) oysters and clams d) viewpoints or outlooks e) hotels or taverns f) solitude and wilderness	g) stores h) deserted shacks, homesteads, etc. i) restrooms, garbage disposal facilities j) other
5. Criteria of a mooring or anchorage	a) amount of shelter b) solitude and quiet c) fuel, stores, restrooms d) suitable bottom, depth, tides e) local scenery	f) absence of other boats g) presence of other boats h) adequate floats, wharves i) other

Establishing a scale of preferences for mooring or anchoring proved difficult since the pilot survey showed that boaters invariably tied up to a wharf if one was available. This was because wharves have the most sheltered location in the cove, and had shore access. The question was therefore asked in relation to preferences in the event that no wharfage was available:

Category	Alternative
6. Preferences when no moorage is available	a) move to a less crowded wharf b) anchor out c) anchor in another area d) wait until space is available e) tie alongside another boat f) other

Boaters were also asked to fill in details relating to the final two categories of boating behaviour, the length of time

spent cruising, moored or anchored, and ashore, and the length of time spent in the study area.

3. Sampling

It was difficult to estimate the total population of boaters in the study area. The guest book at the Refuge Cove store recorded almost 800 registrations in 1969, but this could only be used as a guide. Refuge Cove was selected as the major base for distribution of questionnaires so that the maximum number of boaters were contacted. Conversations with boaters during the pilot survey (which was carried out throughout the study area), made it clear that a very high proportion, over 75%, of recreational boaters using Desolation Sound, visited Refuge Cove at some time during their visit. Their purpose was to purchase water, fuel, ice or groceries, use the shower or washing machine facilities, or simply tie up for the night. Refuge Cove is the only location within the study area where such facilities exist, and few boaters could avoid having to replenish their fuel, water tanks or iceboxes every few days.

In addition, major and minor anchorages throughout the study area were periodically visited, to contact boaters who might have been missed at Refuge Cove. In these quieter anchorages, it was often possible to elicit a response from people who were not willing to respond in Refuge Cove because of their preoccupation with purchasing fuel and supplies.

Boaters were asked to fill in a questionnaire as soon as possible after their arrival at a location, usually as they were tieing to a float or anchoring. Out of the total sample of 681, about 85% of the questionnaires were completed and returned to the researcher directly. In the event that boaters were willing to respond but were leaving the area directly, or were engaged in some activity that precluded completion and return of the questionnaire, they were asked to take the questionnaire, complete it at their leisure, and return it to a box set up in the Refuge Cove store. If this was impractical, the boater was encouraged to mail the questionnaire to the Refuge Cove address on his return to "civilisation". In all cases the "skipper" was identified and asked to fill in the questionnaire on behalf of all the persons aboard.

Boaters indicated widespread interest in the study, and of the 845 questionnaires distributed between 21st June and 28th August, 1970, 681 were returned, giving a response rate of 81.7%. Only 10 boaters refused outright to complete a questionnaire (usually out of a lack of interest or as an expression of annoyance at the invasion of their privacy). The 18.3% of the questionnaires not returned must be considered a low figure, since there are many opportunities to lose or misplace a questionnaire on board a boat.

Fifty-seven of the questionnaires were distributed during the last ten days of June, 426 during July, and the remainder,

198, during the first 28 days of August, 1970. This reflects quite accurately the fluctuation of boaters through the season (Wolferstan 1971:74). Boaters were sampled regardless of the time of day, and questionnaires were distributed fairly evenly between 9.00 a.m. and about 9.00 p.m.

A log of field observations noted 1100 different recreational boats using Refuge Cove between 21 June and 29 August, 1970. The sample of 630 taken from Refuge Cove represents 58% of this figure. The remaining 51 respondents were contacted at anchorages in the study area outside Refuge Cove; nearly all of these had either been to Refuge Cove previously or intended to go there later in their trip.

It must be emphasised that every effort was made to reduce bias by eliciting a response from as many boats as possible, from points all through the study area. A certain amount of bias can be expected from the fact that not all boaters were contacted and not all questionnaires were returned. However, the large sample, the very high response rate, and the fact that responses were obtained throughout the study area, all serve to reduce the extent of this bias.

4. Testing

Simple descriptive statistics using proportions will be used to evaluate differences in preferences between sailboaters and motorboaters.

CHAPTER III

ANALYSIS OF RECREATIONAL BOATING BEHAVIOUR IN DESOLATION SOUND

1. Introduction

This chapter analyses and presents the results of the recreational boat survey. It may be recalled that the initial hypothesis posed was that the critical variables of the cruising experience - the reasons for visiting the study area; factors considered important in route planning; activities while cruising; features looked for while ashore; criteria of a good mooring or anchorage; preferences for mooring or anchoring; the length of time spent cruising, moored or anchored, and ashore; and the length of time spent in the study area - would vary according to the type of boat, motorboat or sailboat. In the analysis of the first six of the above variables (in which boaters were asked to rank a series of alternatives in each variable) each individual alternative is tested separately.

2. Reasons For Visiting the Study Area

The seven alternatives to question 22, "Why did you come to this area?" were: (a) it's a "different" area; (b) been before and liked it; (c) heard about it from friends; (d) read about it; (e) own property here; (f) get away from crowded waters; and (e) other. As Table III shows, only one of the alternatives ("been before and liked it") was ranked differently by sailboaters and motorboaters. A greater

proportion of motorboaters ranked this item higher than sailboaters. Since almost identical proportions of sailboaters and motorboaters ranked this item low, however, (27% and 25%) this cannot be regarded as a significant difference between the two boater types. Both groups apparently visited the area for essentially the same reasons, the most important of which were previous experience or the recommendation of a friend, and to a lesser extent, frustration with crowded conditions in other areas.

Table III. Reasons for visiting the study area

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) it's a "different" area	19	54	27	100	21	53	26	100
b) been before and liked it	47	26	27	100	57	18	25	100
c) heard about it from friends	30	49	21	100	32	46	22	100
d) read about it	14	56	30	100	16	55	29	100
e) own property here	1	48	51	100	2	50	48	100
f) get away from "crowded" waters	32	55	13	100	29	54	17	100
g) other	9	47	44	100	7	48	45	100

Note: The ranks given to each alternative are reduced to three categories, High, Medium and Low. In this table, H = ranks 1 and 2, M = ranks 3 and 4, and L = ranks 5, 6 and 7.

3. Important Route Planning Considerations

In question 21, boaters were asked to rank in order of importance in route planning the following six items: (a) winds and tides; (b) location of marine parks; (c) quality of fishing;

(d) presence of unspoiled wilderness; (e) location of shore facilities; and (f) other. Table IV shows the proportions of sailboaters and motorboaters ranking each item high, medium, and low.

Table IV. Important factors in route planning

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) winds, tides	66	27	7	100	64	20	16	100
b) location of marine parks	14	46	40	100	17	39	44	100
c) quality of fishing	10	39	51	100	25	45	30	100
d) presence of unspoiled wilderness	73	23	4	100	53	29	18	100
e) location of shore facilities	24	60	16	100	41	38	21	100
f) other	4	14	82	100	4	12	84	100

Note: In this table, H = ranks 1 and 2, M = ranks 3 and 4, and L = ranks 5 and 6.

It was expected that a greater proportion of sailboaters would rank winds and tides higher than motorboaters. As Table IV shows, there was no difference in the proportions of the two boater groups ranking this item high, although there is a difference in the proportions of sailboaters and motorboaters ranking it medium and low, with a greater proportion of sailboaters ranking it medium, and a greater proportion of motorboaters ranking it low. It was expected that sailboaters would rank winds and tides much higher because of their dependence on the wind. In fact both boater groups are concerned about winds, but for different reasons. For sailboaters, a strong breeze presents an opportunity to sail, but to motorboaters, a

strong breeze can mean uncomfortable wave conditions which inhibit speed. The sailboat's design is dominated by the need to use the wind as efficiently as possible, and as a result sailboats are more complex to operate, less comfortable, and have far less space aboard (dollar for dollar) than motorboaters. The sailboater, however, is willing to accept these inherent disadvantages because the experience of cruising under sail more than compensates the disadvantages.

Calms are frustrating to the sailboater (although nearly all cruising sailboats have an auxilliary motor and can keep moving under adverse conditions), but provide optimum conditions for the motorboater. The tidal rapids common in other parts of Georgia Strait (and Johnstone Strait to the northwest) do not occur in the study area (Wolferstan 1971:45) so tides do not present a hazard.

A much greater proportion of sailboaters ranked the presence of unspoiled wilderness highly, while a much greater proportion of motorboaters ranked the location of shore facilities highly. These two items represent opposite ends of the spectrum as far as environmental expectations are concerned. These results suggest that sailboaters were more interested in experiencing the natural wilderness character of the study area, while motorboaters were more oriented towards the facilities (floats, wharves, fuel, water, store, shower, and washing machine) to be found in the study area.

A greater proportion of motorboaters than sailboaters ranked quality of fishing high. This reflects their greater involvement in this pursuit, which is discussed in the next section. The location of marine parks and "other" alternatives were ranked similarly by both boater groups. Both alternatives were ranked low overall.

4. Boater Activities While Cruising

Boaters were asked to rank in order of importance nine alternatives to question 14, "What activities do you engage in while cruising in your boat?". These alternatives were: (a) exploring; (b) sunbathing; (c) fishing; (d) relaxing; (e) photography; (f) eating and drinking; (g) observing wildlife; (h) viewing scenery; and (i) other. Table V shows the proportions of motorboaters and sailboaters ranking each alternative high, medium, and low. Only two alternatives, exploring and fishing appeared to be ranked differently by sailboaters and motorboaters.

Exploring was ranked low by a smaller proportion of sailboaters. This result may be a reflection of the greater amount of time spent cruising (as opposed to moored, anchored, or ashore) per day by sailboaters as discussed in section 8. On the other hand, motorboaters had more opportunity for exploring by boat, since their boats were faster (enabling them to cover more area) and in general more manoevrable than sailboats. There was no association, however, between the number of hours spent cruising and the rank given to exploring

Table V. Activities while cruising

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) exploring	49	40	11	100	46	30	24	100
b) sunbathing	22	34	44	100	23	36	41	100
c) fishing	25	44	31	100	49	32	19	100
d) relaxing	67	23	10	100	71	21	8	100
e) photography	12	40	48	100	10	38	52	100
f) eating and drinking	14	35	51	100	19	36	45	100
g) observing wildlife	10	38	52	100	12	37	51	100
h) viewing scenery	61	27	12	100	57	33	10	100
i) other	12	12	76	100	13	11	76	100

Note: In this table High = ranks 1, 2 and 3, Medium = ranks 4, 5 and 6, and Low = ranks 7, 8 and 9.

by boat. Sailboaters appeared to indicate greater interest in the boating environment than motorboaters by their tendency to rank exploring higher.

A greater proportion of motorboaters than sailboaters ranked fishing high. This result reflects the earlier finding that motorboaters were more interested in the quality of fishing as a route planning consideration than sailboaters. Fishing, particularly salmon trolling (the principal type of sport fishing in Georgia Strait) is usually impracticable from a sailboat. Some sailboaters were observed fishing from a dinghy (with or without an outboard motor) while their yacht was tied up at a mooring or anchored. Motorboaters on the other hand often had a small outboard motor, mounted on the transom of the cruiser itself specifically for the purpose of

fishing. Those boaters who were more interested in fishing would tend to prefer motorboats because of their advantage in this respect.

There were no significant differences between sailboaters and motorboaters in the proportions ranking each of the other activity alternative high, medium, or low. Two items, relaxing and viewing scenery, were ranked very highly by both groups, indicating their overall importance in the cruising experience. A smaller proportion of sailboaters were expected to rank relaxing high, since the navigation of a sailboat is more vigorous than that of a motorboat, and sailboaters spent more time cruising, and less time moored or anchored, than motorboaters (as discussed in section 8). It appears that boaters as a whole considered relaxing more of a goal of their whole cruising trip than as a specific activity, a goal which underlies all other activities. This implies that boaters gain relaxation from vigorous as well as non-vigorous activities. Viewing scenery was also of great importance both to sailboaters and motorboaters. Like relaxing, viewing scenery can be regarded as a basic activity of cruising in the study area, with the scenery acting as a backdrop to other activities and with no particular group regarding it more important than any other.

The category "sailing", was not included as an activity alternative, since it is the exclusive domain of sailboaters. 24% of sailboaters, however, (6% of the total sample) specified

"sailing" in the category "other" and ranked it first. It was earlier noted that the major factor influencing a prospective boat owner to purchase a sailboat is the opportunity to cruise under sail, despite the drawbacks of sailboats compared with motorboats. This result reflects the importance of sailing to sailboaters, although it is possible that an even greater proportion of sailboaters would have ranked sailing highly had it been included as a stated alternative.

5. Features Looked For Ashore

Boaters were asked in question 16, "What do you look for when you go ashore?" and ranked ten items in order of importance: (a) freshwater lakes; (b) trails; (c) oysters and clams; (d) viewpoints or outlooks; (e) hotels or taverns; (f) solitude and wilderness; (g) stores; (h) deserted shacks, homesteads, etc.; (i) restrooms, garbage disposal facilities; and (j) other. Table VI shows the proportions of sailboaters and motorboaters ranking each item high, medium, and low.

Two items relating to shore facilities were ranked high by a greater proportion of motorboaters, which is consistent with the earlier finding that motorboaters considered the location of shore facilities more important in route planning than sailboaters. These two alternatives were stores and restrooms and garbage disposal facilities.

A greater proportion of sailboaters, however, ranked

Table VI. Features looked for ashore

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) freshwater lakes	17	27	56	100	16	29	55	100
b) trails	31	33	36	100	29	32	39	100
c) oysters and clams	52	25	23	100	54	29	17	100
d) viewpoints or outlooks	30	32	38	100	28	38	34	100
e) hotels or taverns	5	15	80	100	6	13	81	100
f) solitude and wilderness	59	28	13	100	46	29	35	100
g) stores	45	37	18	100	56	32	12	100
h) deserted shacks, homesteads, etc.	12	26	62	100	14	28	58	100
i) restrooms, garbage disposal facilities	26	28	46	100	41	29	30	100
j) other	10	8	82	100	12	9	79	100

Note: In this table, High = ranks 1, 2 and 3, Medium = ranks 4, 5 and 6, Low = ranks 7, 8, 9 and 10.

solitude and wilderness higher than motorboaters, again consistent with the earlier result relating to route planning. The differences in the proportions of sailboaters and motorboaters ranking this and the previous two alternatives reflect a difference in emphasis between the two groups. Sailboaters did not entirely reject shore facilities, and motorboaters did not dislike solitude and wilderness. The results reflect that while both groups liked essentially natural areas, shore facilities played a much greater role in the overall cruising experience for motorboaters, while sailboaters expressed a greater preference for solitude and wilderness. In view of

the clear difference between motorboaters and sailboaters regarding the ranking of wilderness as against shore facilities, it is notable that hotels and taverns, indicating high levels of shoreline development, were universally rejected.

There were no differences in the proportions of motorboaters and sailboaters ranking any of the other alternatives high, medium, or low. One item, oysters and clams, was ranked highly by both groups, indicating the importance of the opportunity to gather shellfish in the overall experience. Trails and viewpoints or outlooks were also ranked fairly highly by both groups, indicating a demand for boaters to get on shore to do some exploring. At the present time there are very few marked trails in the study area, and it is possible that these items would be ranked higher if there were more trails available.

6. Criteria of a Good Mooring or Anchorage

Boaters were asked in question 17, "What do you look for in a good mooring or anchorage?" and ranked nine items in order of importance: (a) amount of shelter; (b) solitude and quiet; (c) fuel, stores, and restrooms; (d) suitable bottom, depth, and tides; (e) local scenery; (f) absence of other boats; (g) presence of other boats; (h) adequate floats and wharves; and (i) other. Table VII shows the proportions of sailboaters and motorboaters ranking each item high, medium, and low.

Table VII. Criteria of a mooring or anchorage

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) amount of shelter	87	10	3	100	74	18	8	100
b) solitude and quiet	61	31	8	100	43	40	17	100
c) fuel, stores, restrooms	14	43	43	100	36	34	30	100
d) suitable bottom, depth, tides	57	32	11	100	58	26	18	100
e) local scenery	39	43	18	100	32	47	21	100
f) absence of other boats	28	42	30	100	18	34	48	100
g) presence of other boats	1	13	86	100	1	16	83	100
h) adequate floats, wharves	13	27	61	100	37	27	36	100
i) other	4	11	85	100	3	8	89	100

Note: In this table, High = ranks 1, 2 and 3, Medium = ranks 4, 5 and 6, and Low = ranks 7, 8 and 9.

The amount of shelter was the most important item for both motorboaters and sailboaters. A greater proportion of sailboaters ranked this alternative higher than motorboaters, however, which indicates their greater appreciation of the physical constraints in a moorage or anchorage. The amount of shelter is of greater importance when anchoring than mooring, and this result may be a reflection of the somewhat greater preference of sailboaters for anchoring rather than mooring, which is discussed later in this section and also in the next. Other physical factors relating to the bottom, depth, and tides, were also considered important but were

ranked equally highly by both boater groups. The fact that the numerous anchorages in the study area which offer good shelter, also have a good holding bottom at a reasonable depth may account for this lack of difference.

Two items relating to man-made facilities were ranked high by a greater proportion of motorboaters than sailboaters. These were stores, fuel supplies and restrooms, and adequate floats and wharves. These two results are consistent with the earlier finding that the location of shore facilities was more important in route planning for motorboaters than sailboaters. In addition, the difference in the proportions of sailboaters and motorboaters ranking floats and wharves highly seems to indicate a preference by motorboaters for mooring to a man-made structure, as opposed to anchoring out. The greater proportion of sailboaters ranking the amount of shelter highly (more important when anchoring than when mooring to a wharf or float) seems to support this.

Besides being less facility-orientated than motorboaters, sailboaters appeared to be more sensitive to the relatively high levels of use and noise that the presence of man-made facilities tends to attract. A greater proportion of sailboaters ranked "solitude and quiet" and a similar item, "absence of other boats" higher than motorboaters.

Both motorboaters and sailboaters ranked "local scenery" fairly highly overall, confirming the universal appreciation

of scenery discussed in section 4. There were no differences in the proportions of the two boater groups ranking any other alternative high, medium, or low.

7. Preferences When No Moorage Was Vacant

Boaters were asked in question 19, "If you find no vacant moorage in an area, do you prefer to:" followed by six alternative courses of action: (a) move to a less crowded wharf; (b) anchor out; (c) anchor in another area; (d) wait until space is available; (e) tie alongside another boat; and (f) other. Table VIII shows the proportions of motorboaters and sailboaters ranking each item high, medium, and low.

Table VIII. Preferences when no moorage is available

Alternatives	Sailboaters (%)				Motorboaters (%)			
	H	M	L	Total	H	M	L	Total
a) move to a less crowded wharf	14	78	8	100	28	66	6	100
b) anchor out	73	25	2	100	65	33	2	100
c) anchor in another area	24	69	7	100	23	67	10	100
d) wait until space is available	5	77	23	100	4	75	21	100
e) tie alongside another boat	30	63	7	100	29	58	11	100
f) other	3	64	33	100	2	62	36	100

Note: In this table, High = ranks 1 and 2, Medium = ranks 3 and 4, and Low = ranks 5 and 6.

Only one of these items showed a different proportion of sailboaters and motorboaters ranking it high, medium and low.

This was "move to a less crowded wharf", which was ranked higher by a greater proportion of motorboaters than sailboaters. This result is the only indication in this section that sailboaters might prefer to anchor rather than tie to a wharf, which would be consistent with their preferences for solitude and wilderness values as opposed to man-made facilities, as described in sections 3 and 6. By far the majority of boaters preferred to anchor out and there were no differences in the proportions of sailboaters and motorboaters ranking this item high, medium or low. This is probably a reflection of the numerous good, well sheltered anchorages (which is a feature of the study area) and the relative paucity of float and wharf space, which only exists to any extent in Refuge Cove. As noted in chapter II, when wharves are provided they invariably occupy the best parts of a cove from the point of view of shelter and shore access. Thus the preference for anchoring is often overridden by the desire for shelter and shore access. This may account for the failure to provide a satisfactory answer to the question of whether sailboaters in fact prefer to anchor rather than moor to a float. One result which is of considerable importance to management (and is fully discussed in chapter IV) is the quite high ranking given by both motorboaters and sailboaters to tying alongside another boat. Boaters using this technique can add considerably to the capacity of both a moorage and an anchorage.

8. Time Spent Cruising, Moored or Anchored, and Ashore

For convenience, the cruising experience is divided into three phases: cruising, where the boat is in transit between moorages or anchorages; moored or anchored, where the boat is tied to a wharf or float or riding at anchor with the occupants aboard; and ashore, where the boat is moored or anchored but the occupants are engaged in activities on the shore.

O'Riordan (1967) found that cruising in general is characterised by a relaxed itinerary. As Figures 2, 3, and 4 show, about four times as much time was spent moored or anchored than cruising in Desolation Sound, and rather less time was spent ashore than cruising.

Sailboaters spent more time cruising, and less time moored or anchored, than motorboaters, as shown in Tables IX and X below.

Table IX. Time spent cruising, by boat type

Time spent cruising (per day)	Boat type (%)	
	Sail	Power
1 - 2 hours	6	18
3 - 4 hours	28	50
5 - 6 hours	38	22
7 - 8 hours	16	6
9 hours or more	12	4
Total	100	100

Fig. 2. Time spent in cruising (%)

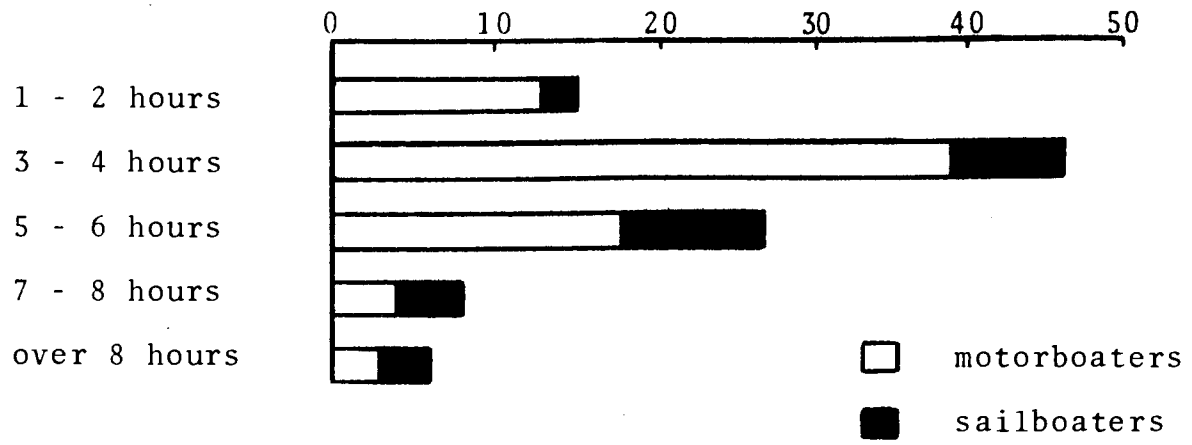


Fig. 3. Time spent moored or anchored (%)

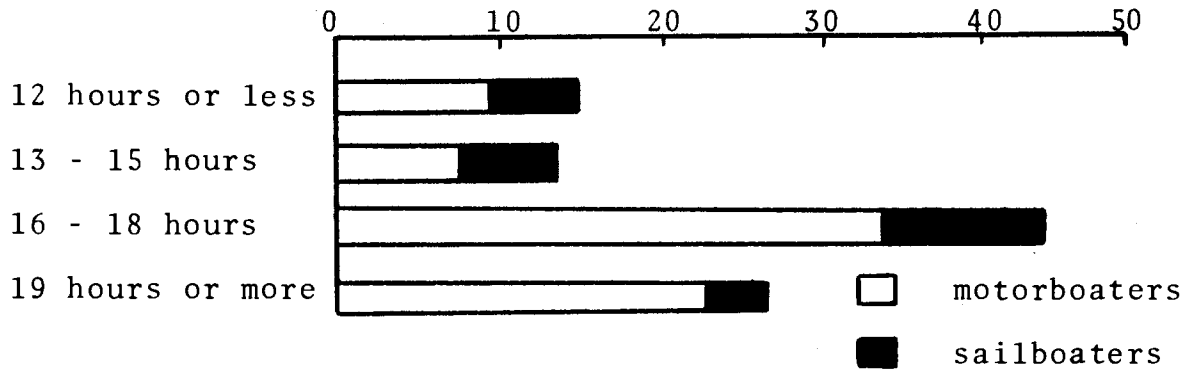


Fig. 4. Time spent ashore (%)

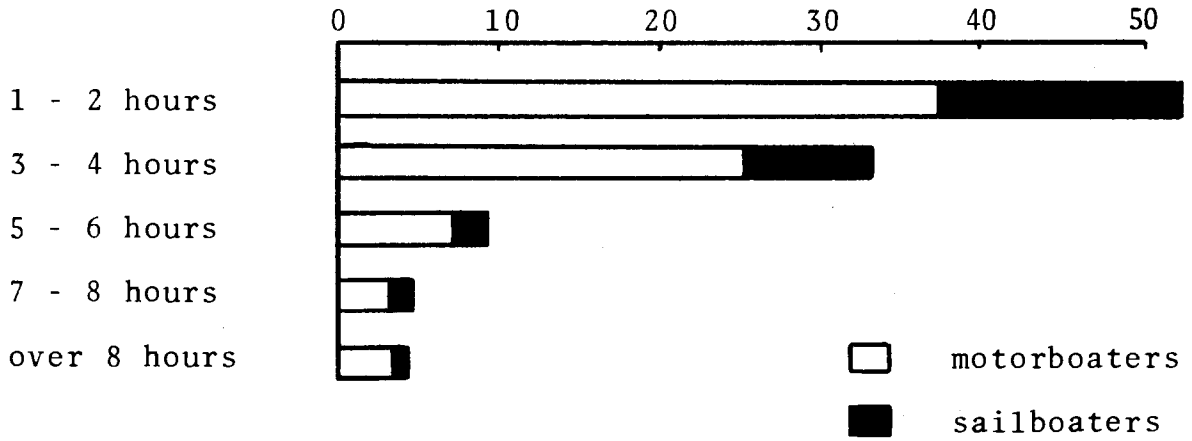


Table X. Time spent moored or anchored, by boat type

Time spent moored or anchored (per day)	Boat type (%)	
	Sail	Power
less than 12 hours	21	13
13 - 15 hours	22	11
16 - 18 hours	40	46
19 or more hours	17	30
Total	100	100

Although this result was to be expected (because sailboats are slower than motorboats) it has three important implications. Firstly, in terms of miles per day, sailboaters probably cover only slightly less distance than motorboaters. Secondly, this difference brings out the importance of sailing itself to the sailboaters, which has already been noted. Thirdly, the fact that so much time is spent in anchorages and moorages emphasises the critical part played by these locations in determining the amount of satisfaction gained by the boater.

There were no differences between sailboaters and motorboaters in the length of time spent ashore, as shown in Table XI below. This may well reflect the lack of trails and access points on the shoreline, for which there appears to be some demand, as discussed in section 5.

9. Length of Time Spent in the Study Area

The length of time boaters spent in the study area is considered in this section together with two other factors

Table XI. Time spent ashore, by boat type

Time spent ashore (per day)	Boat type (%)	
	Sail	Power
1 - 2 hours	59	49
3 - 4 hours	31	33
5 - 6 hours	6	9
7 - 8 hours	2	5
9 hours or more	2	4
Total	100	100

which greatly influence the length of time spent in the study area. These are the total length of time boaters intended to be away from home, and the length of time boaters took to reach the study area. Sailboaters took longer to reach the study area than motorboaters, as shown in Table XII below.

Table XII. Time to reach study area, by boat type

Time to reach study area	Boat type (%)	
	Sail	Power
1 - 2 days	10	20
3 - 5 days	50	42
6 - 9 days	22	23
10 days or more*	18	15
Total	100	100

* Note: the categories "10-19 days" and "20 days or more" have been included together in the category "10 days or more".

The major point of difference between sailboaters and motorboaters in the above table is the much greater proportion of motorboaters who took less than three days. Almost identical proportions of sailboaters and motorboaters (60% and 62%) took five days or less to reach the study area. Although motorboats travel faster, sailboaters tend to cruise for longer periods (as discussed earlier), which tends to compensate for the difference in speeds. An additional factor accounting for the difference in times to reach the study area is the high proportion of motorboaters from distant points (including Oregon and California) who had trailered their boats from home to a launching point close to the study area.

Sailboaters spent longer than motorboaters in the study area, as shown in Table XIII below.

Table XIII. Time spent in study area, by boat type

Time spent in study area	Boat type (%)	
	Sail	Power
1 - 2 days	9	18
3 - 5 days	27	39
6 - 9 days	27	20
10 - 19 days	27	18
20 days or more	10	5
Total	100	100

The total length of time available for the whole trip

can be discounted as a factor contributing to the sailboaters' longer stay in the study area. As Table XIV shows, there were no differences in this respect between the two boater groups.

Table XIV. Total time available for trip, by boat type

Time available	Boat type (%)	
	Sail	Power
Less than 7 days	2	8
8 - 14 days	24	28
15 - 21 days	34	34
22 - 28 days	12	8
29 - 56 days	19	14
57 days or more	9	8
Total	100	100

The median length of time both sailboaters and motorboaters had available for the total trip was in the 15-21 day range. For the sailboaters, Desolation Sound was the terminal area, or focal point of their trip - about one-third of their total time available was spent there. After subtracting time for the return trip, only a few days are left for visiting other areas. Motorboaters, on the other hand, because they spent less time in the study area and less time to reach it, had more time available to visit other areas. For them, Desolation Sound appears to be one of several areas to be visited, rather than a focal point.

10. Summary and Conclusions of the Analysis

There were some significant differences between sailboaters and motorboaters in most phases of the cruising experience. The motorboaters' experience in the area appeared to be more orientated towards man-made facilities - stores, restrooms, garbage disposal facilities, fuel supplies, floats, and wharves, while sailboaters preferred the solitude and wilderness aspects of the natural environment. This conclusion is supported by the responses relating to route planning, activities while cruising, features looked for ashore, criteria of a good mooring or anchorage, preferences when no moorage was available, the length of time spent cruising, moored or anchored, and ashore, and the length of time spent in the study area.

There were no differences between sailboaters and motorboaters in the reasons for visiting the study area, however. The alternatives in this question related to how boaters found out about the area and their previous experience there, rather than their specific environmental preferences, which were dealt with under route planning. There were no differences in this respect between motorboaters and sailboaters.

In route planning, a greater proportion of sailboaters ranked "the presence of unspoiled wilderness" highly, while proportionately more motorboaters ranked "the location of shore facilities" highly. As desirable features of a moorage

or anchorage, a greater proportion of sailboaters than motorboaters ranked the "absence of other boats" and "solitude and quiet" highly, while proportionately more motorboaters than sailboaters ranked "adequate floats and wharves" and "fuel supplies, stores, and restrooms" highly. In the event of there being no vacant moorage, a greater proportion of motorboaters than sailboaters gave a high rank to mooring to another wharf, as opposed to anchoring. As features looked for while ashore, a greater proportion of sailboaters ranked "solitude and wilderness" highly, while proportionately more motorboaters ranked "stores" and "restrooms, garbage disposal facilities" highly. These differences between sailboaters and motorboaters appeared to consist fundamentally of a difference in man-nature orientation. Man-made facilities (stores, restrooms, garbage disposal facilities, fuel supplies, floats, and wharves) were favoured by motorboaters, and the solitude and wilderness aspects of the natural environment were favoured by sailboaters. These findings broadly parallel those of O'Riordan (1967) in the English Norfolk Broads. While cruising, "exploring" was a significantly more important activity for sailboaters, while "fishing" was ranked significantly higher by motorboaters. This difference in ranking broadly parallels the findings of Lucas (1964) and Stankey (1970), who identified a similar distinction in recreational preferences between canoeists and motorboaters using the Boundary Waters Canoe

Area of Minnesota.

Sailboaters also spent more time cruising, and less time moored or anchored, than motorboaters, a result which indicated that the slower speeds of sailboaters tended to be compensated by their desire to spend more time sailing, so that their actual mileage per day was not much less than that of motorboaters. Sailboaters also spent more time in the study area than motorboaters, even though they took more time to reach it and had no more time available in total. Sailboaters seemed to spend as much time as possible in the study area, while motorboaters tended to spend a brief period only, travelling on to other areas before returning home.

There was however some agreement between the two boater types in the kind of experience they were seeking. Scenery was important to both groups both for viewing (as an activity while cruising), and as an attribute of a mooring or anchorage. This probably reflects the dramatic nature of the scenery in the study area, which (as discussed in Chapter I) dominates the cruising experience over the whole study area. Both groups also ranked oysters and clams equally highly as a shore feature. This reflects more than anything the scarcity of the opportunity to collect shellfish. In areas like Desolation Sound, shellfish are abundant, and boaters take the opportunity to stock up on a scarce commodity.

Although motorboaters were more orientated towards shore facilities, they rejected intensive shoreline developments, in the shape of hotels and taverns, along with the sailboaters. Both groups appeared to like essentially natural areas, but motorboaters thought that the presence of some facilities complemented their stay, while sailboaters wanted facilities kept to a minimum. In this scheme of things, intensive developments were undesirable to both groups.

Both groups also appeared amenable to tying alongside another boat when no moorage was available. This result has important implications for management, as is discussed below. The sailboaters desire for solitude and wilderness does not appear to affect their preference for tying alongside.

The apparent difference in man-nature orientation between sailboaters and motorboaters, and the longer time spent in the study area by sailboaters, are the two major findings of this study. Since the study area is not an isolated recreation area, but is accessible to other similar areas of northern Georgia Strait, it appears that Desolation Sound is particularly successful in meeting the needs of sailboaters.

CHAPTER IV

IMPLICATIONS OF THE STUDY

1. Introduction

The identification of differences in behaviour between sailboaters and motorboaters has some important implications for future management of the Desolation Sound area. The quality of the recreational experience depends very much on the amount of use. In view of the projections for boat ownership and boating participation, Desolation Sound will require careful management in order to minimise a deterioration in the overall quality of the recreational experience it presently offers.

Increasing use affects recreational quality in two ways. Firstly, the physical limitations of space results in increased competition, especially for those areas considered most attractive. In the case of boating in Desolation Sound, the critical element is moorage and anchorage space. Secondly, the natural, self-imposed zoning pattern which recreationists often choose to adopt (Lucas 1964; O'Riordan 1967; Stankey 1970) tends to break down. This leads to increasing potential for conflict between recreationists having different expectations and behaviour patterns.

This study has shown that sailboaters and motorboaters differed in their orientation towards man-made facilities on

the one hand, and the natural environment on the other, in most phases of the cruising experience. It has shown also that motorboaters, who were orientated towards man-made facilities, spent a relatively brief period in the study area, while sailboaters, who were orientated towards the natural environment of the area, spent relatively longer periods there. The motorboaters' experience in Desolation Sound appeared to consist of a stop at Refuge Cove to take on fuel, water, ice, stores and possibly use the restrooms, showers, and washing machine facilities, and a relatively fast passage (with stops for fishing and shellfish gathering) through the area. Since there was no difference in the amount of time motorboaters and sailboaters intended to be away from home, it may be surmised that motorboaters considered Desolation Sound one of several areas in Georgia Strait to be visited. Sailboaters, on the other hand, appeared to spend as long as possible in the study area, exploring the many coves and anchorages for secluded, out of the way places to anchor, but also making use of the Refuge Cove facilities during their stay.

The natural, wilderness aspect of the study area (as defined by the boaters themselves) is vulnerable to increased demands for facilities and wharf space. In seeking to satisfy these increased demands, the demands of the boating population as a whole has to be recognised. Facilities and wharves appeared to satisfy relatively short term demands,

while boaters visiting the area for extended periods appeared to value very highly the wilderness aspect of the area. As more of the British Columbia coast becomes developed, these wilderness values will become more and more scarce, and hence more and more prized. The distinct patterns of behaviour which accompany boaters' preferences provide an opportunity to maintain the availability of two types of experience - the one service orientated and the other wilderness orientated - in planning to meet the increased demands in the future.

2. Moorage and Anchorage Space

Rapid increases in the numbers of boaters using Desolation Sound could make it more difficult for both kinds of boater identified here to find the kind of experience they seek. This study showed that boaters moored or anchored their boats for about 20 hours of each 24 hour day. Moorage and anchorage space, therefore, is a critical element of the cruising experience. As the present moorage and anchorage space becomes filled to capacity, boaters will demand that moorage and anchorage space be increased. This study also showed that motorboaters, who outnumbered sail-boaters three to one, preferred to moor to a structure rather than anchor. The demand for more wharves and floats can therefore be expected to be particularly strong in the future.

In deciding the location of these new moorage facilities,

the differences in behaviour between motorboaters and sailboaters should be considered. The motorboaters' experience in Desolation Sound is heavily orientated towards the Refuge Cove facilities, and the study showed that motorboaters spent relatively little time in the study area. New wharf space should therefore be located in Refuge Cove - which is both large enough to accomodate a doubling or even trebling of its present wharf space, and strategically located for visits to other areas of Georgia Strait - or its immediate vicinity.

Increasing the capacity of anchorages away from Refuge Cove is more of a problem. Wharves, floats, or permanently anchored moorage buoys could be used to increase capacity. The presence of man-made structures, however, would conflict with the expectations of the boaters who in the main use these anchorages. These boaters (primarily the sailboaters in the sample) spent as much time as possible in the study area, and a major aspect of their experience appeared to be exploring the area, using quiet natural anchorages. These boaters preferred anchoring to mooring, and man-made facilities ranked low in their experience. Wharves and floats would effectively destroy the values that these boaters were seeking, by increasing the numbers of boaters and attracting a different type of boater to these anchorages. Changing the character of these anchorages might cause their traditional users to seek this experience elsewhere - inevitably, further north, perhaps beyond the cruising range

of the average boater.

Permanent mooring buoys have been successfully used in some of the marine parks under management of the Parks Branch. These might be used with effect in some anchorages which are already heavily used, such as Prideaux Haven. However, their provision in all anchorages is not recommended, since tying alongside another boat seemed acceptable to both motorboaters and sailboaters. When anchoring, this means that, for example, three boats raft together and put out three anchors in different directions. This reduces the area over which a boat swings when only one anchor is used, thus increasing capacity. This practice was observed frequently in many Desolation Sound anchorages, and, in fact, many boaters habitually used this practice for safety reasons in addition to enjoying the social contact with other boaters.

3. Access to Shore

The study showed that sailboaters preferred solitude and wilderness, while motorboaters preferred shore facilities when they went ashore. In the study area, shore facilities are strongly associated with floats and wharves, one of whose major functions is to provide access to these shore facilities. Otherwise, access to the shore for other purposes (trails and exploring inland) is extremely limited; only one well-marked trail exists in the whole study area (in Tenedos Bay - see Map 1) which leads through the forest to Unwin Lake, a popular fresh-water swimming area. Trails ranked fairly high among

the features boaters (of all types) looked for ashore. A network of old, disused and overgrown logging roads cross the area, but are difficult to find and to follow, and few boaters have any knowledge of their existence. Under these circumstances few boaters can find the solitude and wilderness they are seeking while ashore. It must be emphasised that the kind of wilderness these boaters are seeking is not a "pure", wilderness. As discussed in Chapter I, most boaters regarded the kind of natural areas found in Desolation Sound away from centres of activity as wilderness. Evidence of historical human activity, such as abandoned orchards, rather complemented the landscape, so long as it was not too recent. The demand for solitude and wilderness appears to be a demand to get away from a crowded mooring or anchorage, and for variety in the landscape.

One way of providing for this evident demand would be to open up some of the old logging roads as trails, and provide information about them to boaters. A chance to get away from a crowded anchorage might go far to alleviate any feelings of crowding, and the study area abounds in lakes and viewpoints to provide a focus for trail users. One problem observed to be particularly noticeable in Refuge Cove was excrement left by boaters' dogs on the floats; this would be alleviated by the provision of trails in the immediate area.

4. Shellfish Gathering

This was a popular activity with both sailboaters and

motorboaters, but could be threatened by over-exploitation. Conversations with boaters in the study area indicated that some boaters made a practice of canning large numbers of shellfish gathered in the study area. Correspondence in the magazine "Pacific Yachting" (Vol.5, No. 6, 1972 and Vol. 6, Nos. 1-3, 1973) has expressed a fear among British Columbian boaters that American boaters may be seriously depleting shellfish stocks in British Columbia waters, including Desolation Sound, through over-exploitation. No direct evidence of the canning and export of large numbers of shellfish has so far come to light. One finding of this study was that American boaters indicated shellfish gathering was significantly more important to them than to Canadian boaters (see Appendix II). Without becoming involved in the political implications of the exploitation of Canadian resources by non-Canadians, it is clearly in the interest of maintaining the opportunity to gather shellfish as an integral aspect of cruising in the Desolation Sound area that stocks of shellfish should be monitored.

The discharge of sewage by boaters in anchorages where shellfish are to be found presents a threat to the continued availability of shellfish. In Refuge Cove, where oysters are abundant, boaters are advised not to gather oysters because of the danger of pollution, both from minor oil and gasoline spills (from leaky outboard motors and careless filling of tanks) and from sewage discharge. It is beyond the scope of

this study to recommend whether restrictions on sewage discharge and other measures to protect shellfish are necessary. There is a need, however, to monitor the stocks and health of shellfish during the summer season, especially in view of the increased numbers of boaters expected to be using the study area in the near future. It is therefore suggested that a study be established in order to advise whether restrictions on the gathering of shellfish are necessary, through some form of licensing (as in the case of hunting and fishing), and whether sewage discharge should be restricted in anchorages where shellfish are to be found.

5. Scenic Values

Viewing scenery was evidently an integral aspect of cruising for all classes of boater, and, as Wolferstan (1970:85) has shown, the scenic character of the study area was the major component of its attractiveness. The scenic quality of an area is not only important for viewing as a specific activity, but it also plays a dominant role in the feeling of wilderness that many boaters (particularly the sailboaters) were seeking, both as a general goal of cruising in the area, but as a specific attribute of an anchorage.

The visual impact of a view depends not only on the presence of striking topography, but also on the quality of the foreground. From the water, particularly in an anchorage, the character of the immediate shoreline dominates the view. The maintenance of scenic values, and the feeling of wilderness,

therefore depends to a large extent on the quality of the shoreline.

At the present time, practically the whole of the shoreline of the study area, except for parts of Refuge Cove, where service facilities exist for boaters, is natural and undeveloped. This is an important element of the experience sought by the sailboaters, and was related to the long period of time they spent in the area. Protection of scenic values provides an additional reason why wharves and service facilities should adjoin existing facilities, as discussed above.

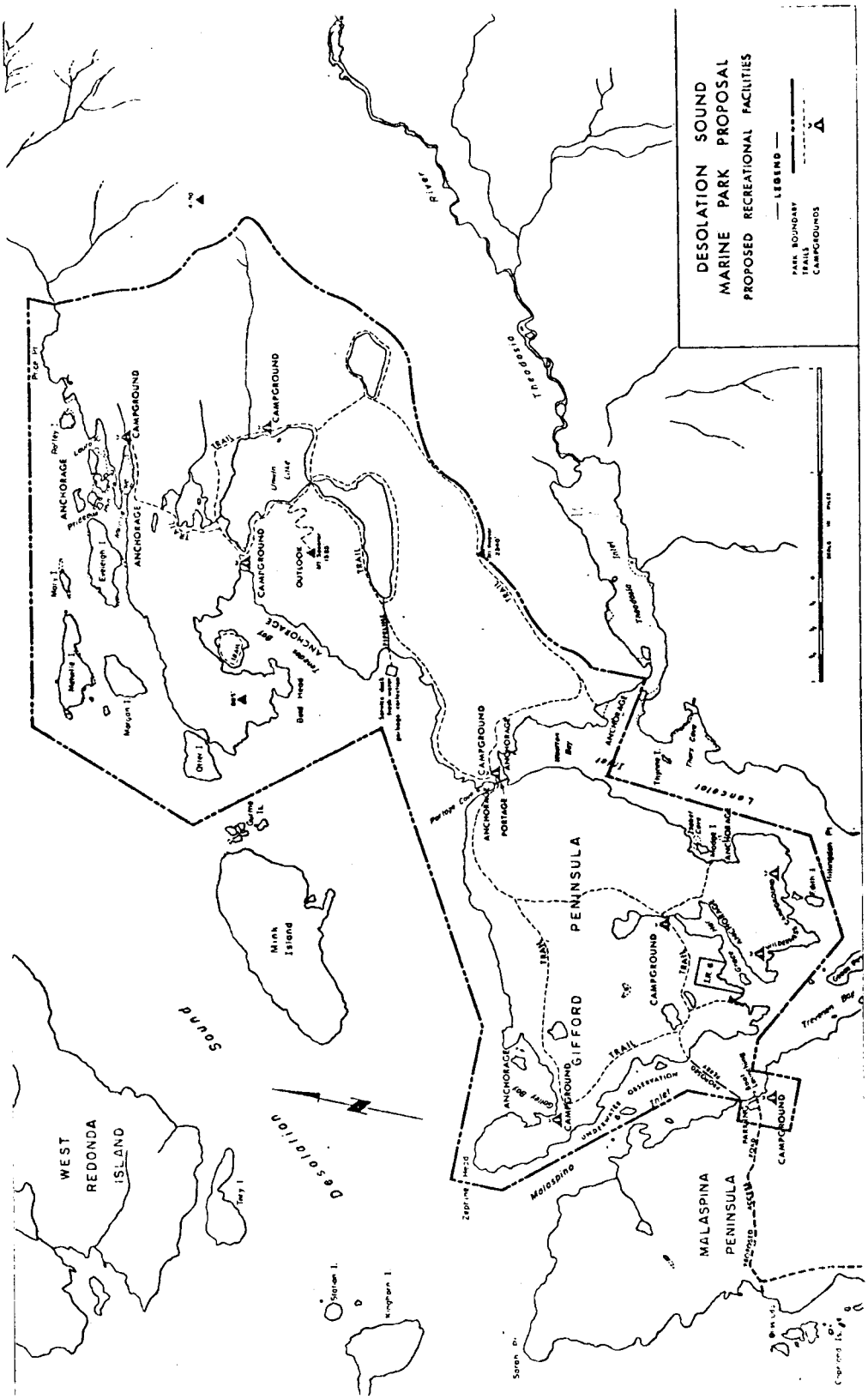
The development of waterfront summer and retirement homes could also be a threat to the wilderness character of the area in the future. At the present time, summer homes are practically non-existent because of the difficulty of access, and the protection of a Crown Reserve on all unalienated waterfront land since 1957. If the demand for waterfront leases for summer homes in the study area were to become great enough to warrant a relaxation of this regulation, ways would have to be found to accomodate them into the existing pattern of recreational use. In the study area, in common with most of Georgia Strait, the land rises steeply from the foreshore, and structures of any kind are therefore extremely visible from the water. The development of summer homes and the wharves that frequently accompany them would seriously detract from the feeling of wilderness sought by an important

sector of the boating population in the study area. If a cluster zoning pattern around nodes of existing development such as Refuge Cove were adopted, their impact would be considerably reduced.

Other resource uses, particularly logging, could also have a damaging effect on the high values placed by boaters on the scenery of the study area. Truly integrated resource use of an area requires that all resource users minimise the impact of their particular resource use for other users. This could be achieved in the study area by restricting logging to those areas not visible from the water. Wolferstan (1971:153-188) has mapped the area of land seen from various anchorages and cruising routes. This could prove to be a valuable tool to enable logging and recreation to continue without conflict.

6. Recent Developments in Desolation Sound

As part of its programme for the acquisition of land for marine parks, the British Columbia Parks Branch published in 1973 a proposal for a Desolation Sound Marine Park, consisting of over 20,000 acres within the study area (see Map 3). The objective of this Marine Park is to open up the Desolation Sound area to small non-cruising car-top boats and canoes, and to land based recreation, by providing road access, boat launching facilities and a ferry service. The proposal envisages a network of trails and campsites within the park, providing the opportunity to engage in both land as well as



MAP 3. Desolation Sound Marine Park Proposal

marine orientated recreational activities.

The new park proposal will change the character of use in the area in two ways: firstly, by introducing new types of recreationist - hikers, canoeists, and boat-campers; and secondly, by substantially increasing the volume of use both by the addition of new types of recreationist and providing road access for those with trailerable cruising boats. At the same time, the proposal expects cruising boaters to continue to use the area.

The findings of this study provide some clues as to the impact of the proposal on the behaviour of present users of the area. The increased volume of use is likely to have a considerable effect on cruising boaters (both sail and power). Those who value solitude, quiet, and the absence of other boats, and who are trying to get away from crowded waters, are likely to find these qualities more difficult to find in the study area, and consequently seek them elsewhere. Boaters tolerant of high levels of use and development will tend to become more predominant among the cruising population. These boaters tended to spend only a short time in the study area, and consequently future cruising use of the Desolation Sound area is likely to be more transient as well as more facility orientated. The provision of trails and better shore access, however, is likely to be welcomed by many cruising boaters.

7. Suggestions For Further Research

The development of the new park will present a good opportunity to examine the impact of the introduction of new types of recreational uses on existing cruising behaviour. Cruising boaters can be expected to react in a variety of ways to a rapid influx of new types of recreationist. Some may actually avoid Desolation Sound, but there may be other ways in which boaters adapt to the new situation. The different behavioural adaptations will probably be associated with the type of boat used. Other factors, such as the amount of previous experience, may also be important.

As this study and others have shown, there appears to be a natural zoning tendency among different types of recreationist. Successful management of the new park should aim to maintain this zoning pattern, based on a behavioural study of all types of recreationists who will be using the area.

One important aspect of boating in Desolation Sound which was not studied was the extent to which recreational use causes environmental degradation, through pollution, over-use of facilities and resources, and crowding. This remains an urgent research task, partcicularly in view of the tremendous increase in use the area will need to sustain in the future.

The changing nature of recreation use in Desolation Sound, brought about both by socio-economic changes and changes in taste, as well as the Parks Branch policies, highlights the fact that recreational habits are constantly in flux right

across Canada. Recreationists today are demanding a greater variety of experiences, and in greater numbers, than ever before. Maintaining the variety of experiences in the face of the increasing use is a challenging task for recreation managers. Research into recreational behaviour, as this study among others has shown, can provide some important clues to the approaches needed to accomodate the changing pattern of outdoor recreation.

APPENDIX I

MARINE RECREATION SURVEY

BOATER'S QUESTIONNAIRE

(1) LOCATION_____ (2) DATE_____ (3) TIME_____

(4) WHERE IS YOUR HOME?_____

(5) HOW MANY PEOPLE ARE ABOARD?_____

(6) ARE YOU: a) a family?_____ or b) a group of friends?_____

(7) WHAT IS THE RANGE OF AGES IN THE CREW?_____years to_____years

(8) IS THIS YOUR MAIN HOLIDAY THIS YEAR?_____

(9) WHERE DID YOU BEGIN THIS TRIP?_____

(10) WHERE WILL YOU FINISH THIS TRIP?_____

(11) HOW LONG WILL YOU BE AWAY FROM HOME?_____days

(12) HOW LONG DID YOU TAKE TO REACH THIS AREA?_____days

(13) HOW LONG WILL YOU BE IN THE AREA MARKED BY THE BOX ON THE ATTACHED MAP_____days

(14) WHAT ACTIVITIES DO YOU ENGAGE IN WHILE CRUISING IN YOUR BOAT? (PLEASE RANK 1,2,3,4 IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) exploring_____ d) relaxing_____ g) observing wildlife_____

b) sunbathing_____ e) photography_____ h) viewing scenery_____

c) fishing_____ f) eating and drinking_____ i) other (please specify and rank)

_____

(15) ON THE AVERAGE, HOW MANY HOURS DO YOU SPEND IN EACH 24-HOUR DAY:

a) cruising_____hrs. b) moored or anchored_____hrs. c) ashore_____hrs.

(16) WHAT DO YOU LOOK FOR WHEN YOU GO ASHORE? (PLEASE RANK 1,2,3,4 IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) freshwater lakes_____ g) stores_____

b) trails_____ h) old deserted shacks, homesteads etc._____

c) oysters and clams_____ i) restrooms, garbage disposal facilities_____

d) viewpoints or outlooks_____ j) other (please specify and rank)_____

e) hotels or taverns_____ _____

f) solitude and wilderness_____

(17) WHAT DO YOU LOOK FOR IN A GOOD MOORING OR ANCHORAGE? (PLEASE RANK, 1,2,3,4 IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) amount of shelter_____ e) fuel supplies, stores, restrooms_____

b) local scenery_____ f) presence of other boats_____

c) solitude and quiet_____ g) suitable bottom, depth, tides_____

d) absence of other boats_____ h) adequate floats and wharves_____

i) other (please specify and rank)_____

_____

(18) WHAT ARE THE MOST IMPORTANT SOURCES YOU CONSULT IN DECIDING ON AN ANCHORAGE OR MOORING? (PLEASE RANK, 1,2,3, IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) charts_____ d) information from friends_____
b) tourist guides and books_____ e) information from local residents_____
c) your own observation_____ f) other (please specify and rank)_____
_____

(19) IF YOU FIND NO VACANT WHARFAGE IN AN AREA, DO YOU PREFER TO:

a) anchor out_____ d) wait until space is available_____
b) tie up alongside another boat_____ e) move to a less crowded wharf_____
c) anchor in another area_____ f) other (please specify)_____
_____

(20) a) DO YOU OBJECT TO PAYING MOORAGE FEES?_____ b) WHAT IS A FAIR FEE?_____

(21) WHAT FACTORS DO YOU CONSIDER MOST IMPORTANT IN PLANNING YOUR ROUTE? (PLEASE RANK, 1,2,3 IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) winds, tides_____ d) presence of unspoiled wilderness_____
b) location of marine parks_____ e) location of shore facilities_____
c) quality of fishing_____ f) other (please specify and rank)_____
_____

(22) WHY DID YOU COME TO THIS AREA?

a) a "different" area_____ d) read about it_____
b) been before and liked it_____ e) own property here_____
c) heard about it from friends_____ f) get away from "crowded" waters_____
g) other (please specify)_____
_____

(23) WHAT DO YOU FIND MOST DELIGHTFUL ABOUT THIS AREA?_____
_____

(24) WHAT DO YOU FIND LEAST DELIGHTFUL ABOUT THIS AREA?_____
_____

(25) NAME TWO AREAS YOU LIKE MOST IN THE STRAIT OF GEORGIA:

a)_____ b)_____

(26) IF YOU HAVE VISITED THE GULF ISLANDS/SAN JUAN ISLANDS, DID YOU FIND IT: (PLEASE RANK, 1,2,3 IN ORDER OF IMPORTANCE. MARK 'X' AGAINST THOSE NOT IMPORTANT.)

a) overcrowded_____ e) too developed_____
b) pleasant_____ f) quiet_____
c) polluted_____ g) other (please specify and rank)_____
d) beautiful_____ _____

(27) HAVE YOU VISITED ANY OF THE MARINE PARKS IN THE STRAIT OF GEORGIA?_____

(28) BRIEFLY LIST YOUR FAVOURABLE (AND OTHERWISE) IMPRESSIONS OF THOSE MARINE PARKS
_____
_____

(29) DO YOU CONSIDER THIS AREA TO HAVE A UNIQUE OR SPECIAL QUALITY?_____

PLEASE BRIEFLY DESCRIBE THIS QUALITY_____

_____

(30) DO YOU HAVE ANY SUGGESTIONS HOW TO MAINTAIN THIS QUALITY?_____

_____

(31) PLEASE NAME TWO PLACES YOU INTEND TO VISIT IN YOUR BOAT OVER THE NEXT TWO YEARS:

a)_____ b)_____

(32) OVER THE NEXT FIVE YEARS, DO YOU INTEND:

a) to buy a larger boat_____ b) to sell your boat altogether_____

(33) HOW LONG HAVE YOU BEEN ASSOCIATED WITH BOATS?_____years

(34) WHAT IS THE TYPE OF YOUR BOAT?

length_____feet H.P. _____

sail_____ Cruiser_____

THE FOLLOWING SECTION, AS WITH THE FOREGOING, WILL BE TREATED AS CONFIDENTIAL

(35) PLEASE MARK 'X' AGAINST YOUR APPROPRIATE "INCOME BRACKET" (TOTAL FAMILY INCOME)

a) under $6,000_____ d) $15,000 - $19,999_____

b) $6,000 - $9,999_____ e) $20,000 and over_____

c) $10,000 - $14,999_____

(36) WHAT IS YOUR OCCUPATION?

a) managerial_____ d) sales_____ g) craftsman_____

b) professional, technical_____ e) services_____ h) retired_____

c) clerical_____ f) transportation & communication_____ i) self-employed_____

j) other_____

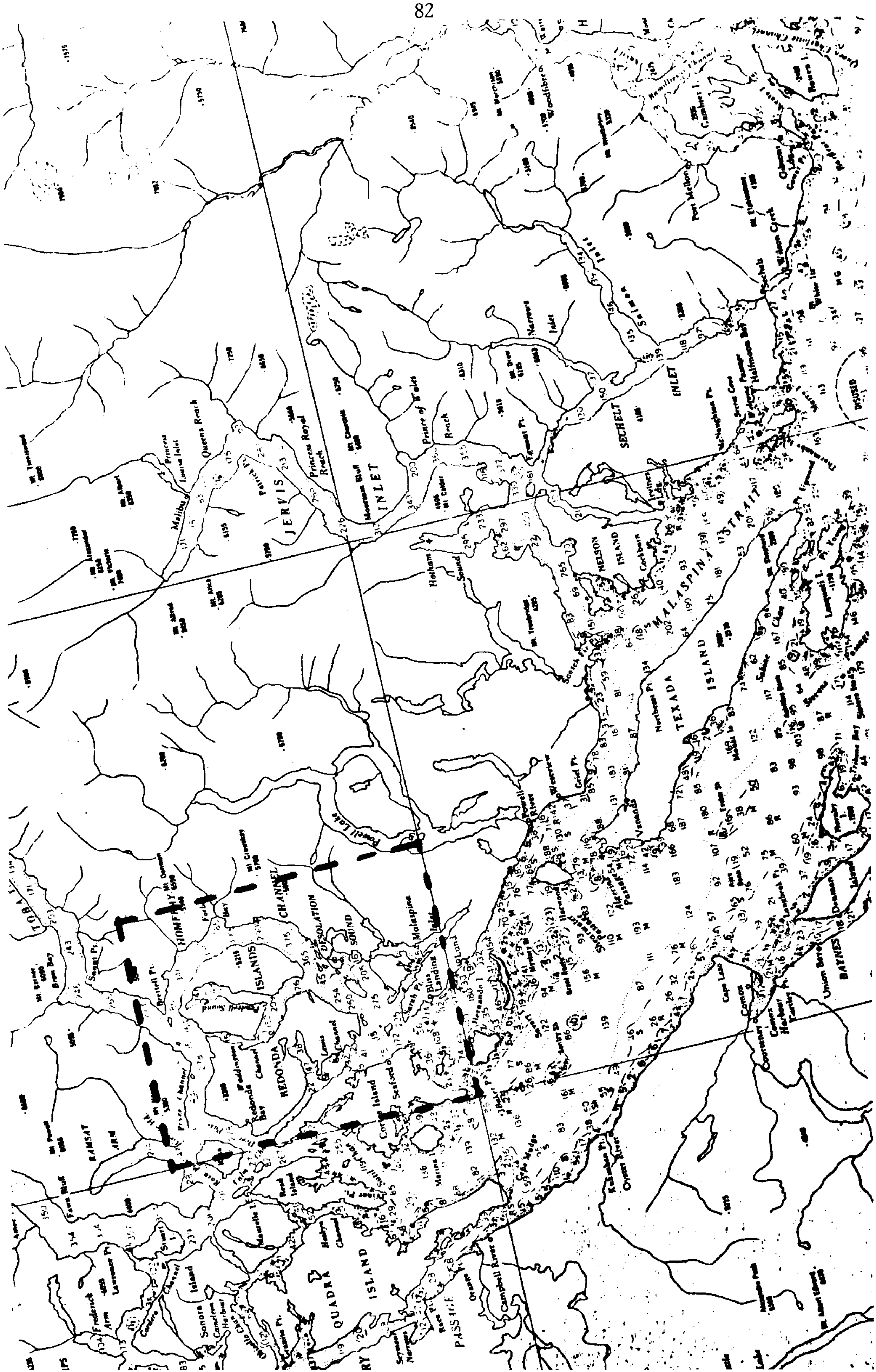
(37) WHAT IS YOUR EDUCATIONAL STATUS?

a) elementary school_____ d) some university or trade training at college_____

b) some high school_____ e) university graduate_____

c) high school graduate_____ f) post graduate_____

(38) ON THE MAP PROVIDED, PLEASE DRAW ROUGHLY YOUR INTENDED ROUTE IN THIS AREA. MARK 'X' THOSE PLACES YOU HAVE STOPPED AT OR DEFINITELY INTEND TO STOP AT. MARK '0' THOSE AREAS YOU CONSIDER MOST BEAUTIFUL OR ATTRACTIVE.


JERVIS INLET
Princess Royal Reach
Prince of Wales Reach
Queens Reach
Princess Louisa Inlet
Hotham Sound
NELSON ISLAND
SECHELT INLET
Salmon Inlet
Narrows Inlet
MALASPINA STRAIT
TEXADA ISLAND
Lasqueti I.
Powell Lake
Powell River
Lund
Malaspina Inlet
DESOLATION SOUND
HOMFRAY CHANNEL
REDONDA ISLANDS
Cortes Island
QUADRA ISLAND
Sonora Island
Campbell River
TOBA INLET
BAYNES SOUND

APPENDIX II

OYSTER AND CLAM GATHERING AS A FEATURE LOOKED FOR ASHORE, BY BOAT ORIGIN

Conversations with boaters during the course of the study indicated that many were concerned with the depletion of shellfish stocks in the study area. Many Canadian boaters complained that American boaters were canning large quantities of shellfish and taking them home. Subsequent to the field questionnaire phase of the study, the same accusation has appeared in the Canadian yachting press. It was decided in view of these developments to see whether the rank given to oyster and clam gathering was associated with boat origin. Table XV shows that a greater proportion of boaters of American origin ranked this alternative higher than boaters of Canadian origin.

Table XV. Origin, by rank given to "oysters and clams" as a feature looked for while ashore

Origin	"Oysters and clams" (%)			Total
	Rank			
	High	Med.	Low	
Lower Mainland	41	37	22	100
Greater Victoria	42	32	26	100
Other Canada	33	22	45	100
Washington	62	24	14	100
Other U.S.A.	62	26	12	100

Note: In this table, High = ranks 1, 2 and 3, Medium = ranks 4, 5 and 6, and Low = ranks 7, 8, 9 and 10.

The reason for the difference in ranking may well be due to the fact that shellfish gathering is restricted in Puget Sound (where most American boaters originated) by private ownership of prime areas of shellfish habitat (Columbia - North Pacific Inter-Agency Committee, 1970, Appendix XIV:407). While Canadians tended to take for granted the opportunity to gather shellfish, Americans took advantage of an opportunity largely denied them at home.

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