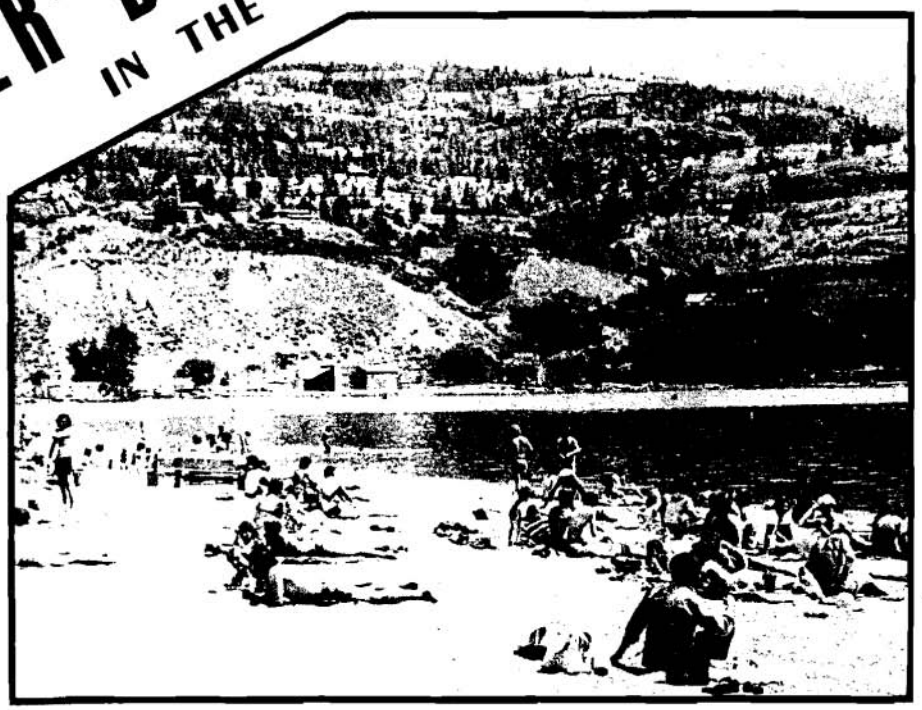
CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT

TECHNICAL SUPPLEMENT VIII



WATER-BASED RECREATION IN THE OKANAGAN BASIN



Recreation is also Re-Creation

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CANADA-BRITISH COLUMBIA OKANAGAN BASIN AGREEMENT

TECHNICAL SUPPLEMENT VIII

TO THE

FINAL REPORT

WATER-BASED RECREATION

IN THE

OKANAGAN BASIN

PUBLISHED BY

OFFICE OF THE STUDY DIRECTOR

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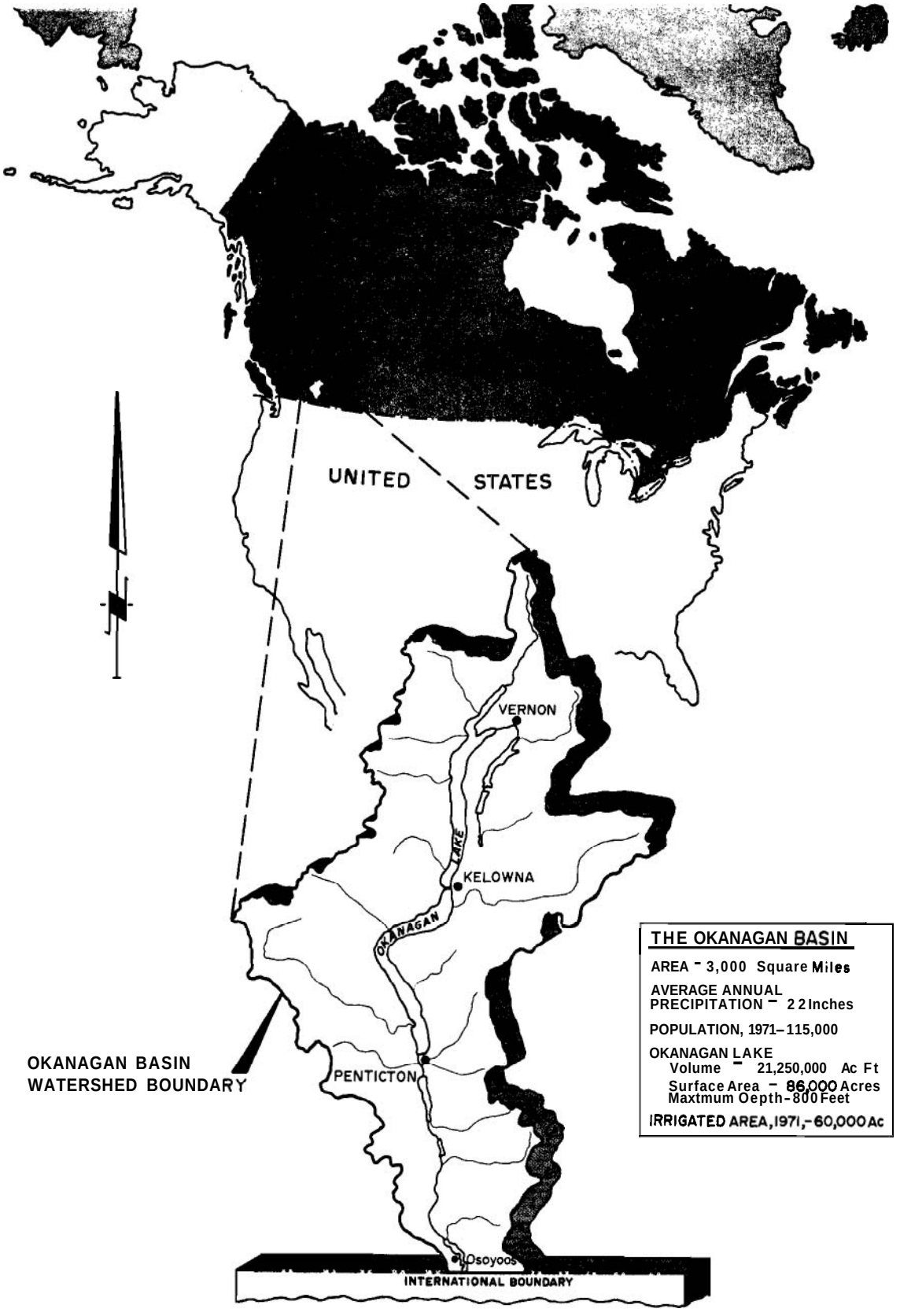
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EDITORIAL REVIEW
BY

STUDY COMMITTEE

A, M. THOMSON



THE OKANAGAN BASIN

IN

BRITISH COLUMBIA – CANADA

Figure A

FOREWORD

This technical supplement describes and presents the results of water based recreation studies carried out under the Okanagan Basin Agreement as part of the Socio-Economic Program. The results of associated studies on water quality, fisheries and economic growth are included in Technical Supplements IV, IX and X respectively.

The survey on resident participation in outdoor recreation, as included in Appendix B, was part of a larger survey on residents' attitudes to water resources and recreation in the Okanagan Valley. That part of the survey pertaining to residents attitudes to water resources is included in Technical Supplement XI, Public Involvement.

The material presented in this supplement supercedes that of all earlier preliminary reports or publications prepared under the Canada-British Columbia Okanagan Basin Agreement.

A. Murray Thomson
Study Director

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CHAPTER 1

Introduction

1.1 THE OBJECTIVES OF THE RECREATION PROGRAM

Availability and accessibility of high quality recreational opportunities and increasing affluence, mobility and leisure time of the rapidly growing population of Western Canada have resulted in an upsurge of participation in a wide variety of recreational activities. The lakes, beaches, and hot, dry summers of the Okanagan Basin attract nearly half a million holiday visitors each summer and are also enjoyed by a resident population of over 100,000 people. Expenditures by summer tourists provide a substantial source of income for Okanagan residents and beach-oriented recreation is valued highly in social terms by visitors and residents. Summer tourism and beach use by both visitors and residents are expected to grow rapidly in the future. These economic and social values could be placed in jeopardy however, if water quality in the main valley lakes continues to decline and beaches become overcrowded. The maintenance of the region as an attractive recreational area is largely dependent on the sound management of its water and shoreline resources.

The purpose of this report is to provide information on the current and future economic and social values associated with the recreational use of beaches in the Okanagan Basin. Knowledge of the present and potential benefits derived from summer tourism and beach-oriented recreation allows the costs of maintaining a high quality recreational environment to be placed in perspective and provides a basis for making decisions on specific water and shoreline management measures.

1.2 THE SCOPE OF THE RECREATION PROGRAM

The major recreational uses of water in the Okanagan Basin are swimming, boating and fishing. Fish resources and fishing are the subject of a separate report (Technical Supplement IX, Fishery Potentials in the Okanagan Basin). Swimming is by far the most important water-based recreational activity in the Okanagan in terms of the number of participants. Since swimming in main valley lakes is closely connected with the enjoyment of other activities such as sun-bathing, the more general term of beach-oriented recreation has been coined to cover swimming and all related activities that are enjoyed at the beach.

Although beach-oriented recreation is highly valued by residents, this does not generate large direct economic benefits. However, important economic

benefits are obtained from tourists[*1] spending while in the Okanagan and this factor is carefully reviewed in this report.

The planning objectives for the shoreline recreation management as set out in Chapter 12 of the Final Report are two-fold:

1. To provide opportunities for a full range of water based recreational activities.
2. To protect and enhance the aesthetic qualities of the Okanagan Basin.

The most important link between beach-oriented recreation and water resource planning is in the field of water quality management. Good water quality conditions in the main valley lakes are of critical importance to both tourists and residents in their enjoyment of beach recreation. Poor water quality may reduce potential participation resulting in important losses in economic and social terms. Consequently, one of the main objectives of recreational studies under the Okanagan Agreement was to determine the relative importance of water quality to beach-oriented recreation, to assess response of recreationists to varying levels of water quality and to predict potential consequences of declining water quality on future participation.

The influence of fluctuations in lake levels on the enjoyment of beach-oriented recreation was also investigated as part of the recreation program. Water resource studies under the Okanagan Agreement indicated that both Okanagan and Osoyoos Lakes are subject to extreme fluctuations during flood and drought years respectively. Since these events could affect summer beach recreation, the scope of recreational studies included an investigation of consequences of high and low water levels on recreational enjoyment. As major flooding occurred around Osoyoos and Okanagan Lakes in the early summer of 1972, impacts of high lake levels could be studied first hand, while effects of low lake levels could only be assessed on a hypothetical basis.

Beach-oriented recreation is so closely tied to shoreline land use considerations however, that the management of water cannot be realistically divorced from the management of the shoreline. An analysis of the land use and tenure of the shoreline and its potential for recreational development was therefore included.

1.3 A FRAMEWORK FOR THE EVALUATION OF TOURISM AND BEACH-ORIENTED RECREATION IN A COMPREHENSIVE WATER MANAGEMENT SURVEY

A framework for analysing relationships between tourism, beach use, water quality and shoreline management was established at the outset of the research

---

[*1] The terms tourism, tourist, and visitor refer only to summer tourism between June and September inclusive because virtually all beach use occurs during these months. A tourist or visitor was defined as anyone who lives outside of the Okanagan Basin and visits the region for recreational purposes. When reference is made to people who visit the Okanagan during the remaining months of the year, or who come for non-recreational purposes, they are clearly differentiated from summer tourists.

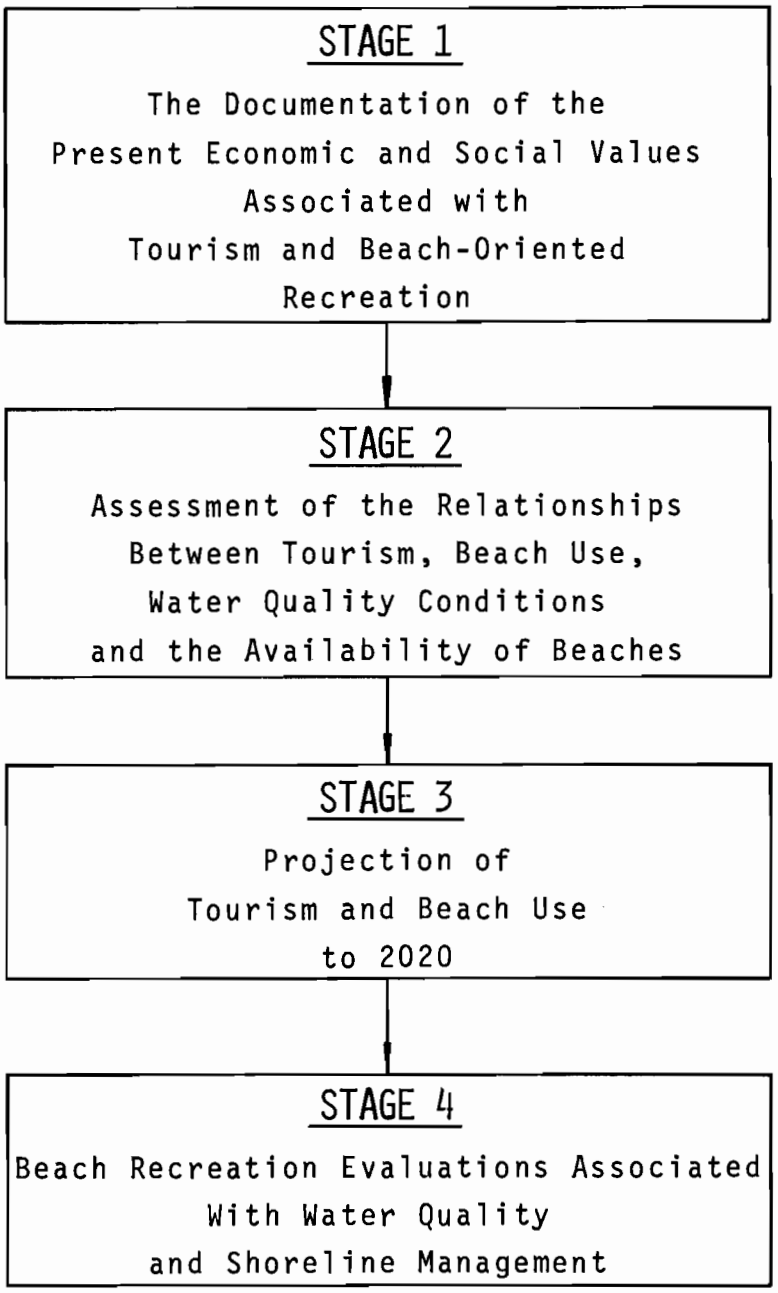
program and provides an overview of the evaluation process (Figure 1.1). The basic approach was to calculate the current economic and social values associated with tourism and beach use, and to specify their relationships with water quality conditions and the availability of beaches. This served as a basis for assessing the potential consequences of implementing, or failing to implement, water quality and shoreline management policies.

The first stage involved the documentation of the current economic value of tourism to the Okanagan Basin, its relationship with beach use, and the social values attached to beach-oriented recreation by visitors and residents.

The second stage consisted of an assessment of the relationshps between tourism and beach use and two important aspects of the recreational environment of the Okanagan Basin; water quality conditions and the availability of beaches. The aim was to gain an understanding of the ways in which these two aspects currently influence tourism and beach use so that predictions on future relationships between them can be undertaken. For example, an understanding of economic losses due to localised water quality problems in the main valley lakes would help the assessment of future costs that might occur in the event of a more widespread deterioration in water quality. Similarly, information on the current availability of beach areas and levels of beach crowding would be useful in the evaluation of possible increases in beach crowding as resident and tourist populations grow.

The third stage involved the calculation of growth rates for tourism and beach-oriented recreation and the economic and social values associated with them. A range of projections were produced so that the minimum and maximum pressures that might be experienced could be evaluated.

In the fourth stage of the evaluation process, information obtained in three previous stages was integrated to evaluate a number of water quality and shoreline management alternatives. The economic and social costs of continued deterioration in water quality were estimated to aid the evaluation of water quality management alternatives. In addition, the impacts of increased crowding on Okanagan beaches as participation in beach-oriented recreation by visitors and residents continues to grow was assessed. This information was used to select the water quality and shoreline recreation management measures that are recommended as part of the framework plan and are reported upon in the Final Report.



A FRAMEWORK FOR THE EVALUATION OF TOURISM AND BEACH ORIENTED RECREATION

Figure 1.1

CHAPTER 2

Approaches to the Evaluation of Tourism and Beach-Oriented Recreation

2.1 AN OUTLINE OF THE COMPONENT SURVEYS OF THE RECREATION PROGRAM

The task of assessing the present and possible future patterns of tourism and beach use in the Okanagan Basin was challenging on two accounts. First, very limited information on tourism and beach-oriented recreation existed so that the recreational program virtually started "from scratch". Second, in spite of recent improvements in recreation research methods, techniques for gathering and evaluating data on recreation for comprehensive water management surveys are still relatively undeveloped so that there were ample opportunities for experimentation.

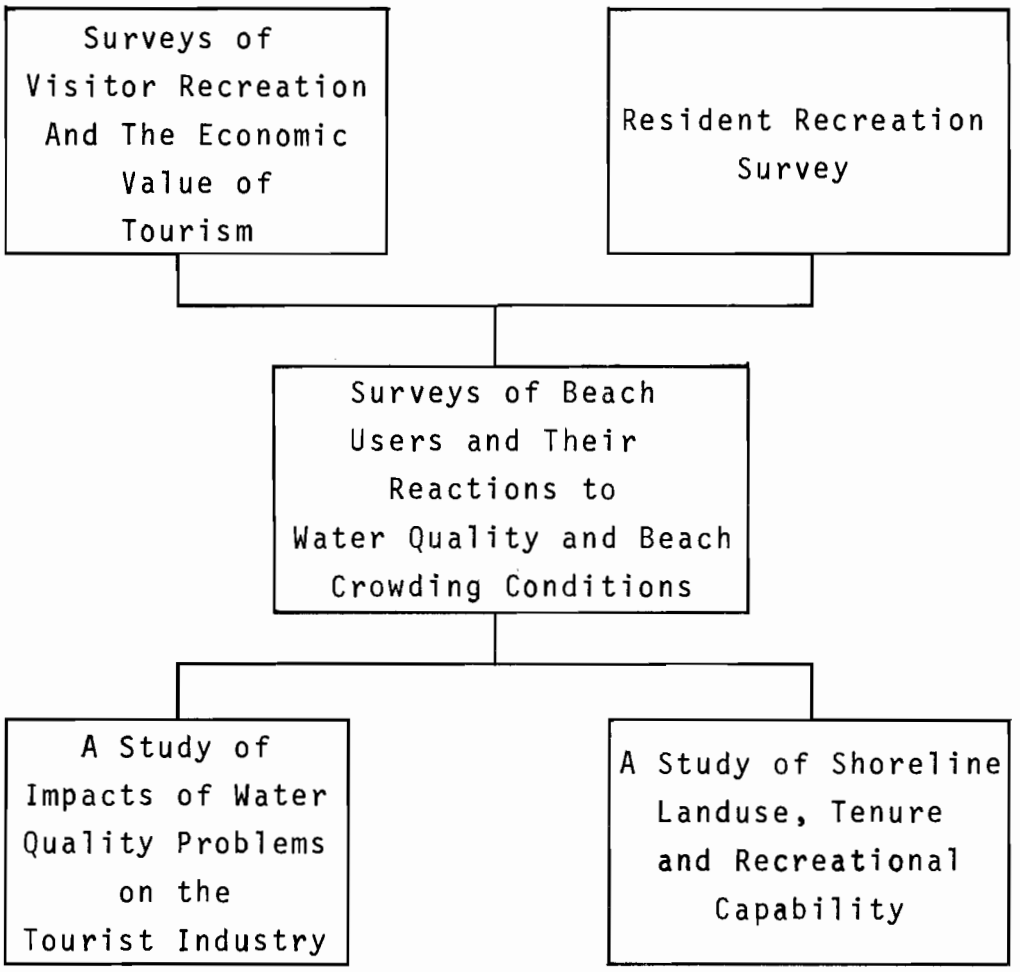
A number of surveys were conducted to provide data for the various aspects of the recreation program. A brief outline of the objectives and scope of each of the surveys is provided so that reference may be made to them in the subsequent discussion (Figure 2.1).

2.1.1 The Tourist Questionnaire Survey

Over 1000 visitors to the Okanagan completed a questionnaire which was designed to provide information on their holiday preferences, travel patterns, recreational pursuits and expenditures while in the Okanagan. Knowledge of the motivations for tourists to visit the Okanagan and their participation in beach-oriented recreation allowed the relative importance of the lakes and beaches in attracting them to the basin to be assessed. Information on length of stay and expenditures allowed estimates of the number of days spent by tourists in the Okanagan and the economic value of tourism to the Okanagan to be made.

2.1.2 Report on Present and Projected Levels of Tourism

An examination of occupancy rates at motels, hotels and campsites was undertaken to assess the number of tourists currently visiting and staying in commercial accomodation. Data on the number of visitors were then converted into visitor days on the basis of average lengths of stay obtained from the Tourist Questionnaire Survey. An analysis was also made of the receipts of a sample of firms (motels, hotels and retail outlets) which provide goods and services to tourists. This information was used in conjunction with knowledge of the average daily expenditures of visitors derived from the Tourist Questionnaire Survey to estimate the present economic value of tourism to the Okanagan. The findings were analysed in an input-output computer model of the Okanagan economy from which the total economic value of tourism was obtained.



SURVEYS IN THE RECREATION RESEARCH PROGRAM

Figure 2.1

2.1.3 The Resident Recreation Survey

A questionnaire was conducted in nearly 400 randomly selected resident households throughout the Okanagan. This survey was designed, in part to discover the relative importance of beach-oriented recreation compared to other recreational activities for Okanagan residents. In addition, the frequency and duration of visits of summer tourists to resident households during the summer were determined. This information allowed the number of visitor days by tourists not staying a commercial accomodation to be assessed.

2.1.4 The Beach User Questionnaire Survey

Approximately 450 people (residents and tourists) were interviewed at public beaches around the main valley lakes to gain a fuller understanding of the preferences and behaviour patterns associated with beach-oriented recreation. Particular attention was devoted to determining the importance of water quality and beach crowding to the enjoyment of this type of recreation.

2.1.5 A Survey of Beach Users at Wood and Kalamalka Lakes

Although Wood and Kalamalka Lakes are adjacent to each other and are connected by a short canal, there is a marked contrast in the quality of their water. Wood Lake is highly eutrophic or rich in nutrients while Kalamalka Lake is oligotrophic or deficient in nutrients. Consequently the water in Kalamalka Lake is much clearer than in Wood Lake. It should be emphasized that in spite of the difference in the appearance of the two lakes, the water in Wood Lake is normally acceptable for swimming and other body contact recreational purposes. During the summer of 1971 major algae blooms occurred on Wood Lake which heightened the contrast between the water quality conditions of the two lakes. These divergent water quality conditions provided an opportunity to test for differences in reactions towards water quality conditions as reported by a sample of 100 tourists staying at lakeshore resorts around the two lakes.

2.1.6 A Study of the Economic and Social Impacts of Water Quality Problems on the Operation of Resorts around Wood Lake

A year after the algae blooms had occurred on Wood Lake, a study was conducted to determine the magnitude and distribution of the economic and social costs experienced by resort owners around the lake on account of the water quality problems and associated publicity. Present and previous owners of Wood Lake resorts were interviewed and a comparative analysis of business trends around Wood Lake and Kalamalka Lake was made. The findings of this study were integrated with those in the beach user survey to complete the assessment of water quality problems on Wood Lake.

2.1.7 Surveys of Shoreline Landuse, Tenure and Capability

A number of interrelated studies were conducted to examine shoreline landuse. The first study focused specifically on the size of the beach areas

at public recreation sites. A second survey documented all shoreline landuse and tenure patterns including existing recreational areas and undeveloped publicly owned land. An assessment was also made of the capability of the lakeshore land to support recreational activities. These studies thus indicated the potential availability of land suitable for beach-oriented recreation around each lake and within each economic region. The beach user questionnaire survey generated information on the perceptions of uses to crowding at beaches throughout the Okanagan Basin and helped the evaluation of shoreline management alternatives.

Details of methods used to gather data in each of these surveys are discussed with the results. The purpose of the remainder of this section is to provide a rationale for examining the main topics of the recreation program and to outline the approaches used to evaluate them so that the results of individual surveys can be viewed within a broader perspective. Three areas of research are examined:

1) The economic and social values associated with tourism and beach use and their relationships with water quality conditions.
2) Current levels and future projections of tourism and beach use.
3) The relationship between availability of beaches, projections of the demands for beach-oriented recreation and beach crowding.

2.2 THE ECONOMIC AND SOCIAL VALUES ASSOCIATED WITH TOURISM AND BEACH USE

2.2.1 Economic Values

The purpose of the Okanagan Study was to prepare a comprehensive framework plan for water and related resource management so as to achieve a desirable balance in the three major goals of economic growth, social betterment and high environmental quality. It is apparent that tourism and beach-oriented recreation are closely connected with each of these goals. For example, regional economic development is stimulated by growth in the tourist industry while the social well-being of residents is enhanced by the enjoyment derived from water-based recreation. Conversely these goals may be thwarted by conflicting uses of the water such as the disposal of waste waters in lakes which are used for recreational purposes. Since the maintenance of a high quality environment for the recreation of visitors and residents and the protection or development of beaches may require substantial expenditures of public funds, knowledge of the economic benefits associated with beach use is extremely important in recreation management evaluations. If the financial benefit safeguarded by specific water management measures exceed the costs of implementing them, the expenditures are usually justified. Since maintenance of a high quality environment is also valued by visitors and residents, these social values should also be taken into account in the decision-making process.

The economic value of tourism was determined through two approaches. First, gross expenditures of tourists while in the Okanagan were determined from the tourist questionnaire survey. Second, receipts of a representative sample of

firms which cater to tourists were analysed in order to discover the value of purchases of goods and services by visitors. The dual approach was valuable because it enabled a check to be made on the consistency of results.

Information obtained in the two surveys was fed into an input-output economic model of the Okanagan economy which analyses the linkages between different economic sectors (Technical Supplement X, Economic Growth Projections for the Okanagan Basin). Given information on tourist purchases in various economic sectors, the model can indicate how much net income is derived directly and indirectly by Okanagan residents and from these purchases. An example of direct income includes the sale of fruit and vegetables to tourists at road-side stands; and example of indirect income involves the sale of food produce by Okanagan Farmers to restaurants which cater to tourists. In addition, the economic model traces the external links of the Okanagan economy and specifies the proportion of tourist expenditures which leave the Basin. This information is particularly valuable because it allows net income accruing to Okanagan residents, as opposed to people outside of the Basin, to be clearly identified. Attention can thus be focused on the implications of water and shoreline management on the economic development of this particular region.

Gross expenditures by tourists while in the Okanagan reflect, indirectly, the value they place on holidaying in the Basin. In fact, these expenditures represent tourists' willingness to pay for services such as accomodation, food and travel rather than the holiday experience itself. Since provision of these services involves investment of capital and labour on the behalf of Okanagan residents, these costs should be subtracted from gross expenditure data to obtain the net economic value of tourism to the Okanagan.

Beach recreation is only one motivation for tourists visiting the Okanagan. Thus, net expenditure data cannot be used as a direct indication of the economic value of shoreline recreation in the valley. It is therefore necessary to determine the relative importance of beach-oriented recreation as an attraction to tourists to the Okanagan and the proportion of tourists that would avoid the valley in the event of an further deterioration of water quality or beach crowding.

Residents only incur minor economic costs in using Okanagan beaches. As this small net expenditure would probably be invested in some other activity in the basin in the absence of beach facilities, it is assumed that there are little or no net economic values associated with resident participation.

2.2.2 Social Values

There is, however, an important unpaid value related to beach recreation,

known as consumer surplus - the net value of recreational opportunities over and above expenditures. Because both visitor and resident access to public beaches is free of charge, neither group is required to express any willingness to pay for these surplus benefits. In the recreational program, attempts were made to measure this consumer surplus through the questionnaire surveys. Respondents were reminded that they pay to participate in certain recreation activities such as skiing and skating and that the fees normally reflect the satisfaction that they obtain from the activity. They were then requested to state how much a day at the beach is worth to them in dollar terms, the money representing an approximate measure of the social value that people place upon this type of recreation.

The frequency and duration of participation in beach-oriented recreation was also determined in the Beach User Questionnaire survey. This information provides an additional indication of the social value placed upon visits to the beach since participants are investing a highly valued "resource" time on this form of recreation rather than other pursuits. It is appreciated that time investment in itself is not a completely satisfactory measure of the social value of recreation. It does, however, suggest the importance of beach-oriented recreation as a component in the holidays of Okanagan visitors and as a feature of the life-style of Okanagan residents.

2.2.3 Water Quality Conditions

The key step in the evaluation process was to assess the relationship between the economic and social values described above and water quality conditions. Beach users may react to poor water quality conditions in two basic ways. They can either visit the beach and tolerate the unpleasant conditions there or they can avoid going to the beach completely. In the first case, the poor water quality conditions may detract from the social value that they derive from their experience at the beach. In the second case, the avoidance of the beach may impose social and economic costs on the beach users in terms of extra time and travel costs as they seek alternative recreation sites. If a tourist leaves the Okanagan or fails to visit it because of dissatisfaction with the condition of the water then his potential net expenditures are a foregone economic benefit i.e. economic loss to the Okanagan economy. If the tourist avoids staying in the area where the water quality problems prevail but he stays elsewhere in the Okanagan, the economic loss should only be ascribed to the local area and not to the Okanagan as a whole. Since a fundamental tenet of the Okanagan Basin Study is that water management should attempt to foster the economic development and social betterment of all Okanagan residents, local as well as regional economic losses due to existing or potential water quality problems are of prime concern.

Considerable attention was therefore devoted to an examination of the attitudinal and behavioural reactions of visiting beach users to existing water quality problems in the Okanagan and the consequent impacts on the tourist industry, particularly in the Wood Lake area.

2.3 PRESENT AND POTENTIAL LEVELS OF TOURISM AND BEACH USE

One of the most important tasks in the recreation program involved the documentation of the number and distribution of tourists and beach users in the Okanagan Basin as a basis for estimating the possible growth in tourism and beach-oriented recreation.

The number of visitors currently coming to the Okanagan was determined from the analysis of occupancy rates for commercial accomodation and estimates of the number of visitors staying in private homes as discovered in the resident recreation survey. The total number of visitor days spent in the Okanagan was then calculated by multiplying the estimated number of visitors staying in commercial and private accomodation respectively by the average duration of their stays as determined in the tourist and resident recreation questionnaire surveys.

The tourists questionnaire survey indicated the origins of visitors and allowed the number of visitors from each of the main tourist market areas to be calculated and expressed as a number of visitors per 1,000 population of the market area. These visitation rates were applied to the projected population of the market areas for each decade from 1970 to 2020 to give an estimate of future numbers of visitors to the Okanagan. This projection thus assumes that the current visitation rates from the source areas will continue in the future and that the number of tourists visiting the Okanagan will not be constrained by the availability of beaches or lack of other services. An alternative projection based on reductions in the rate of tourist growth beyond 1980 was calculated so that implications of relatively low future levels of tourism could be determined. The visitors and visitor days from both projections were apportioned between the four economic regions of the Okanagan Basin according to the number of commercial accomodation units and number of private households in each region. The potential economic benefits associated with the two alternative projections of tourist growth were derived from information on the current direct and indirect income earned by Okanagan residents from tourism and estimates of increases in per capita expenditures.

2.4 THE RELATIONSHIP BETWEEN THE AVAILABILITY OF BEACHES, DEMAND PROJECTIONS AND BEACH CROWDING

Initially projections of tourism and beach use were made with the

assumption that availability of beaches was not a constraint. Then the capability of existing and potential beach areas to cater adequately to the range of future projections of beach use was assessed. This was based on information on the current degree of beach crowding, the projected demands for beach-oriented recreation, and the recreational capability of undeveloped lakeshore land within each economic region.

Whenever recreation demand projections are discussed or presented, it should be borne in mind that demand merely denotes a potential willingness and ability of residents or tourists to recreate in the Okanagan. Whether they actually participate or not will largely depend on the ease of access to the recreational opportunities in this region compared to elsewhere. This report does not urge that the Okanagan Basin should cater to all potential beach-oriented recreation demands, but suggests water quality and shoreline management options, which may be adopted in the face of rising demands, and examines the implications of these management alternatives in terms of the economic and social well-being of present and future Okanagan residents.

2.5 PROBLEMS OF EVALUATION

Difficulties were encountered in each of the main areas of the recreation program; the economic and social values associated with tourism and beach use and their relationships with water quality conditions; projections of tourism and beach use, and potential beach use and the supply of beach areas. Selected examples of the types of difficulties encountered serve to highlight some of the key problems facing research into recreation for comprehensive water management surveys.

Although the most appropriate of a variety of methods was used to obtain a surrogate of substitute financial value that beach users place on their enjoyment of a day at the beach, these values are not entirely satisfactory. Some people find it extremely difficult, if not impossible, to express their satisfaction in financial terms; the experience is often "priceless" and cannot be readily measured. Assuming that the social values attached to recreation could be measured adequately, it would still be difficult to gauge how much these values would be diminished by unpleasand conditions such as low water quality. Further research is required into the measurement of the intangible values associated with recreation, particularly for the purposes of environmental impact analysis.

The central problems of much research into recreation stem in fact from the unpredictability of human behaviour. This was evident in the two other main areas of the recreation research program, projections of tourism and beach use and their relationships with the supply of beaches. For example, demands for beach-oriented recreation by visitors were based on projections of tourism

and beach use and their relationships with the supply of beaches. Demands for beach-oriented recreation by visitors were based on projections of tourism which were tied in turn to a continuation of current visitation rates for the projected population of the tourist market areas. Estimated future demands for beach-oriented recreation by visitors could prove to be conservative if the future visitation rates increase above current visitation rates. This could occur if the three day week-end becomes commonplace and access was improved from the main tourist market areas of the Lower Mainland of British Columbia and Calgary and Edmonton, Alberta, since the Okanagan Basin would be a natural focus for three day excursions from these urban areas.

It is difficult to judge whether the supply of beaches will be sufficient to cater adequately to future demands for beach-oriented recreation for tourists and visitors. The supply of recreational opportunities and recreation demands are linked together in a two-way interrelationship. On the one hand limitations in the supply of recreation sites can suppress the transformation of demand into participation and/or redirect participants to other recreation sites. On the other hand, the provision of additional sites can transform demand into participation and/or encourage participants from other recreation sites. Predicting increases in the supply of beaches is more problematic than predicting increases in demand since the increase in supply is the outcome of a complex decision-making process. Even if there were limitations in the future provision of beaches, it is difficult to assess whether this would necessarily suppress the growth rate of participation in beach-oriented recreation within the region. It is conceivable that people with higher tolerances for crowded beaches would replace those with lower tolerance levels so that the capacity of the beaches would seldom, if ever, be attained in the sense that a maximum number of beach users would be accomodated and additional demands would have to be satisfied outside of the region.

Questionnaires were employed extensively in the recreation program. Their use was necessitated by a lack of existing information and the relatively complex nature of many of the topics that required examination. Although they provided much valuable data, it is important to bear the limitations of questionnaire surveys in mind.

People were selected on the basis of random sampling techniques, questioned and inferences drawn about the total population on the basis of their responses. Although care was taken in selecting the sample it was not always possible to check that the sample was representative of the population as a whole. For example, field surveys of the characteristics of beach user population indicated that the number, age, sex and resident/visitor status of beach users varied considerably both between and within beaches and over time. Information from these field surveys provided broad sampling guidelines for a questionnaire survey of beach users but the success of the guidelines in avoiding bias was difficult to gauge due to the spatial and temporal variability of the population.

Surveys conducted at recreation sites were, in a sense, biased from the outset in that only people who are sufficiently satisfied with their experiences to continue attending are interviewed. For example, those people who are most sensitive to poor water quality conditions may not frequent beaches which have water quality problems. On the basis of interviews conducted at these beaches, it might be incorrectly deduced that beach users were relatively insensitive to poor water quality conditions. Similarly, the full extent of avoidance of crowded beaches could be underestimated because beach users who were particularly sensitive to crowding may not be available on crowded beaches to be interviewed. The inherent biases in on-site questionnaires should be borne in mind when the findings derived from them are interpreted.

A key problem encountered in using the results of questionnaire surveys is the extent to which responses provide a guage to the actual and potential behaviour of recreationists. People interviewed in their homes about their recreational pursuits for example, tend to overestimate the extent and frequency of their participation. Even when reliable information about present recreational behaviour and preferences exists, it may be hazardous to predict future behaviour from this knowledge. For example, beach users may state that good water quality is a very important consideration for them in their enjoyment of the beach and it might be concluded that they would avoid beaches where water quality problems occur. When faced with a deterioration in water quality at local beaches however, they may continue to frequent them. More research is required into the links between attitudes towards environmental quality problems and behavioural reactions to them.

In spite of their limitations, the results of the recreation research program provided an essential data base for guiding decisions on the rational allocation of water and shoreline land resources between recreation and competing uses. One of the most dynamic aspects of life in the last decade has been the growth in outdoor recreation and the desire for high quality environments in which to enjoy it. In view of the rapidly growing economic and social values associated with beach-oriented recreation, particular attention should be given to the recreational implications of any water or shoreline management policies contained within the comprehensive water management plan for the Okanagan Basin.

CHAPTER 3

The Relationships Between Tourism and Beach-Oriented Recreation

3.1 INTRODUCTION

The purpose of this section is to provide background information on summer holiday tourists and to determine the relative importance of Okanagan beaches in attracting people to the Basin. Particular attention is devoted to the economic value of tourism to Okanagan residents. The information was derived from the Tourist Questionnaire Survey and the report on present and projected levels of tourism and associated economic values. A brief outline of the methods used in these studies is provided prior to the presentation of findings.

3.2 METHODS

3.2.1 The Tourist Questionnaire Survey

A draft questionnaire was piloted in late June, 1971 at selected motels and campsites and a final revision was prepared on the basis of replies from 36 respondents. The Okanagan Basin was divided into 11 sub-regions for sampling purposes, each of which contained a known number of motel and campsite units. An overall target sample size of 1200 questionnaires was set and sub-regional traget sample sizes were established on the basis of the number of motels and campsite units within each of the 11 sub-regions. Up to 25 questionnaires were distributed at each selected motel and campsite, chosen at random within each sub-region. Individual questionnaires were given to an adult member of a tourist group to complete. The questionnaires were checked to ensure that all questions were answered when collected half an hour later. These procedures resulted in a relatively low rejection and loss rate of approximately 5%. The questionnaires were distributed throughout July and August, the peak months for tourism and by the end of August, 1055 questionnaires had been completed. The data from each of the 11 sub-regions were subsequently amalgamated into the four economic regions for the purposes of analysis.

Certain groups of tourists were not included in the survey. Hotels provide approximately 10% of the commercial accomodation units rented by visitors each summer but as they mainly cater to business people, they were excluded from the sample. Campsites in Provincial Parks provide 5% of the total number of campsite units in the Okanagan and people staying in them were not approached. An unknown, but probably relatively small number of campers do not always use registered campsites and were not contacted. In addition, people who left campsites and motels in the early morning, or arrived late at night were missed. Since there is little existing information on the characteristics of the

Okanagan tourists, it is impossible to judge the significance of these biases. In view of the carefully designed sampling procedures, the high response rate and relatively large sample size however, respondents were considered to represent a wide cross-section of Okanagan tourists.

3.2.2 Present and Projected Levels of Tourism and its Economic Value

The economic studies associated with the recreational program focused attention primarily on those staying in commercial accomodation, since these visitors are the ones who contribute most to the Okanagan economy.

The following procedures were used to estimate the number of summer holiday visitors staying in commercial accomodation in the Okanagan Basin in 1970.

1) The average occupancy rates of motels, hotels and campsites respectively, between June and September inclusive, were determined from an analysis of the business records of a representative cross-section of 41 commercial accomodation establishments, or approximately 10% of the Okanagan total.
2) The number of units actually rented in each of the three types of accomodation was calculated by multiplying the number of motel, hotel and campsite units in the Okanagan by their respective average summer occupancy rates.
3) The number of units rented by residents and business and convention visitors was determined from an analysis of the business records of commercial accomodation establishments and convention attendance figures. This total was subtracted from the total number of units rented to derive the number rented by summer holiday groups.
4) The number of summer holiday visitors and visitor days was calculated on the basis of information on average party size and duration of stay as determined in the Tourist Questionnaire Survey.
5) Summer holiday visitor days were apportioned between the four economic regions according to the number of commercial accomodation units in each region.

A substantial proportion of the total number of people who holiday in the Okanagan during the summer stay with friends and relations rather than in the commercial accomodation. Since these people also contribute to the Okanagan economy and make use of the beaches, their number and distribution were derived from information collected in the Resident Survey. The total number of visitors and visitor days were then apportioned between the four economic regions according to the number of households in each region.

The expenditures of summer tourists staying in commercial accomodation were determined in the Tourist Questionnaire Survey. The findings were analysed in conjunction with information on purchases made by summer tourists as indicated in a study of the monthly sales patterns of a representative sample of 72 establishments, or approximately 5% of all such establishments in the Okanagan. The results of the two surveys were fed into the input-output model of the

Okanagan economy to determine the direct and indirect income accruing to Okanagan residents from tourist expenditures. Adjustments had to be made to take into account expenditures by, or on behalf of visitors staying with friends and relations as well as those staying in commercial accomodation*2.

3.3 RESULTS

3.3.1 The Number and Distribution of Summer Holiday Visitors

An estimated 334,000 holiday visitors came to the Okanagan in the summer of 1970 and stayed in commercial accomodation. Approximately 45% of them stayed in motels, 45% in campsites and 10% in hotels. Their regional distribution pattern reflects the distribution of commercial accomodation units. The Penticton region received the most tourists with 150,600 or 45% of all visitors to the valley (Figure 3.1). The Kelowna region and the Vernon region attracted approximately a fifth each, while the Oliver-Osoyoos region catered to only 13% of the Okanagan total. An additional 151,400 summer holdiay visitors stayed with friends and relations. The distribution pattern of this latter group reflected that of resident households, with 41% staying in the Kelowna region, 23% and 27% in the Penticton and Vernon regions respectively, and 9% staying in the Oliver-Osoyoos region. There was thus quite a marked contrast between the distribution patterns of those summer holiday visitors staying in commercial accomodation and those staying with friends and relations.

The 334,000 summer holiday visitors staying in commercial tourist accomodation spent 2,141,100 days in the Okanagan in 1970 while the 151,400 people residing with friends and relations stayed for 970,474 days; an average of 6.4 days for both visitor groups. People staying with friends and relations thus constituted 45% of those staying in commercial accomodation or approximately 31% of the total number of summer holiday visitors. The number of visitors staying in private households and the number of days they spend in them may be over-estimated because of a suspected tendency on the part of respondents in the Resident Survey to over-estimate the number of guests staying in their households and their durations of stays.

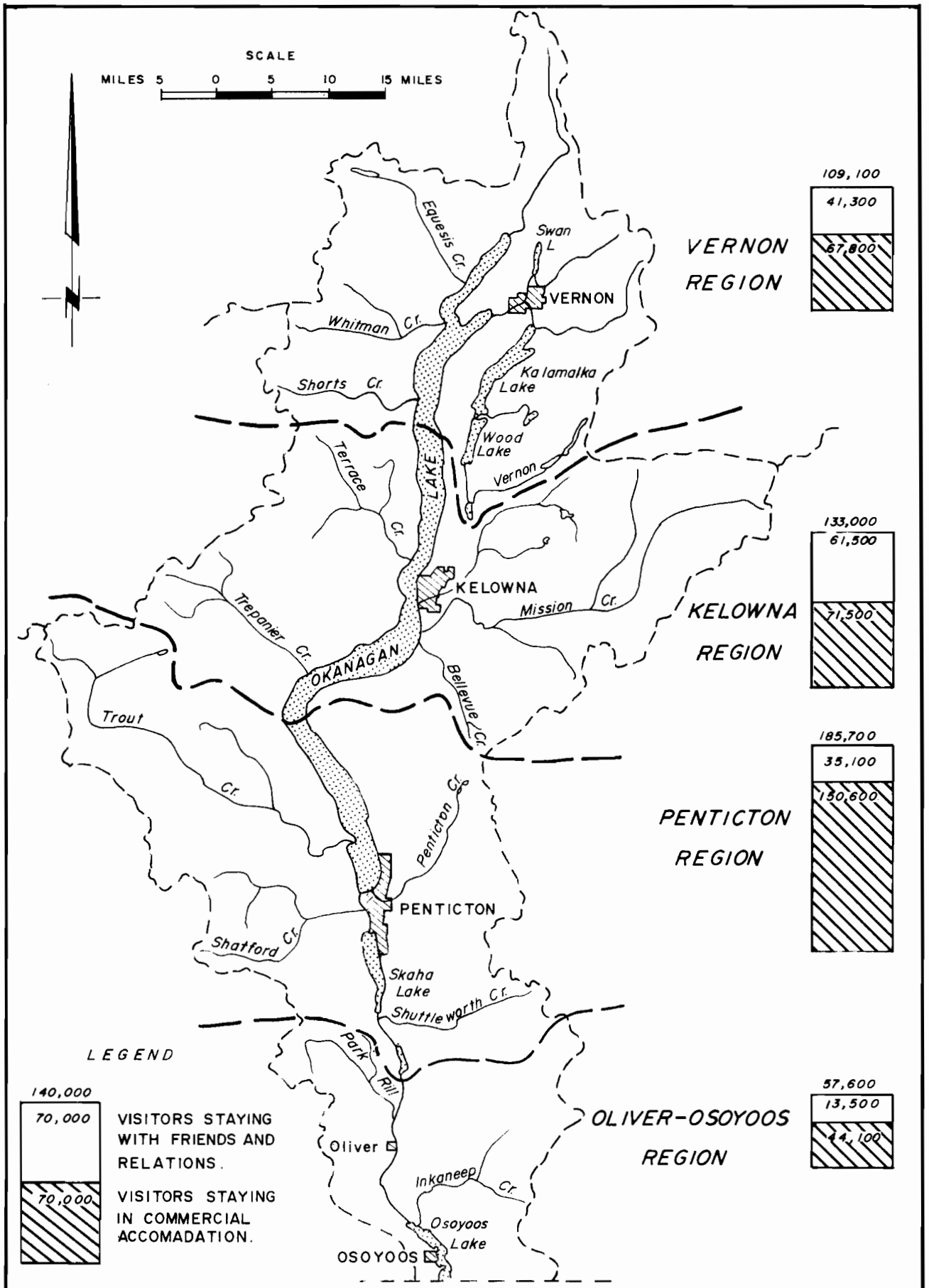
3.3.2 Income Derived from the Expenditures of Summer Holiday Visitors by Okanagan Residents

Summer holiday visitors spent over $11.5 million in the Okanagan in 1970, (Figure 3.2)*3. Of this total, almost $6 million remained in the Okanagan as

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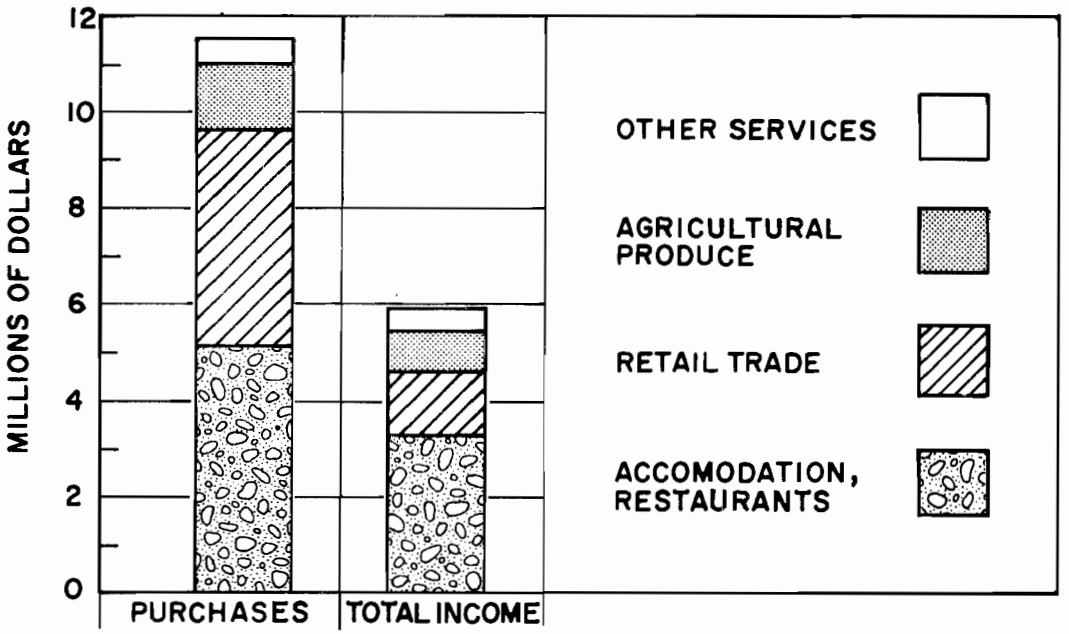
*2 For a more detailed description of the procedures used to calculate tourist purchases and the direct and indirect income as derived from the input-output model, see Technical Supplement X - Economic Growth Projections for the Okanagan Basin.

*3 The financial statistics in Figure 3.2 take into account the estimated expenditures of summer holiday visitors who stayed in private households as well as those who rented commercial accomodation.

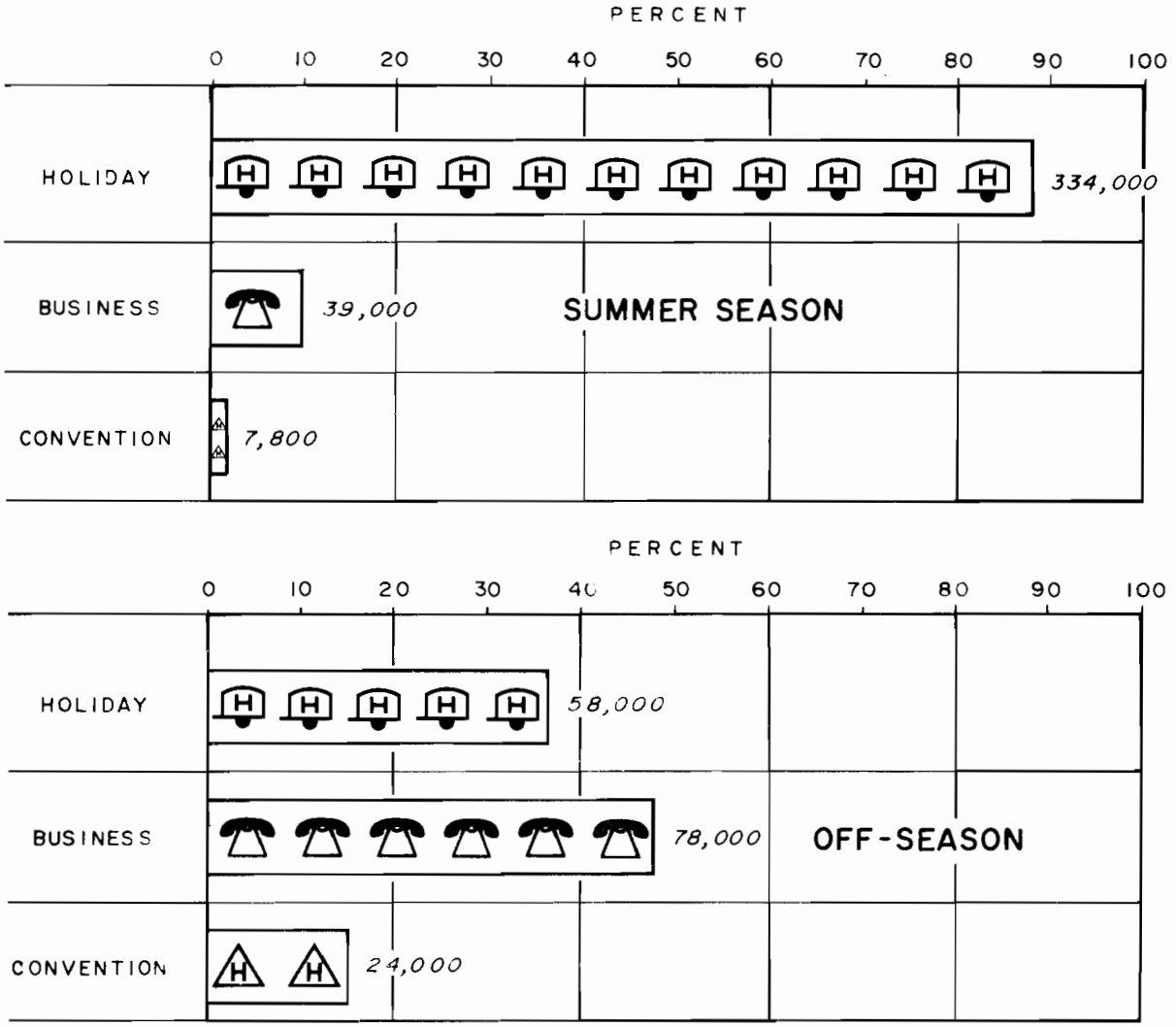


REGIONAL DISTRIBUTION OF SUMMER HOLIDAY VISITORS IN THE OKANAGAN BASIN IN 1971.

Figure 3.1



PURCHASES OF GOODS & SERVICES BY SUMMER TOURISTS AND THE RESULTING INCOME TO OKANAGAN RESIDENTS, 1970. Figure 3.2



TRIP PURPOSES OF VISITORS. Figure 3.3

direct or indirect income from these purchases [*4]. Over half (53%) of the total income was received by hotels, motels, campgrounds and restaurants, while nearly a quarter (24%) was obtained by retail sales outlets. Tourists spent over $1 million on tree fruits, grapes and vegetables at roadside stands or other retail outlets. There is thus quite an important link between the tourist and agricultural sectors of the Okanagan economy.

An indication of the importance of summer tourism to the commercial accomodation sector of the Okanagan economy is provided by Figure 3.3 which portrays the purposes of the trips to the Okanagan during the summer and off-seasons. Of the total numbers of visitors staying in commercial accomodation during the summer months, 89% were on holiday. There were over twice as many visitors staying in commercial accomodation during the summer season as there were during the off season and there were nearly six times as many visitors on holiday during the four summer months as there were during the remaining eight months of the year.

3.3.3 Expenditures by Tourist Groups and their Lengths of Stay and Travel Patterns in the Okanagan

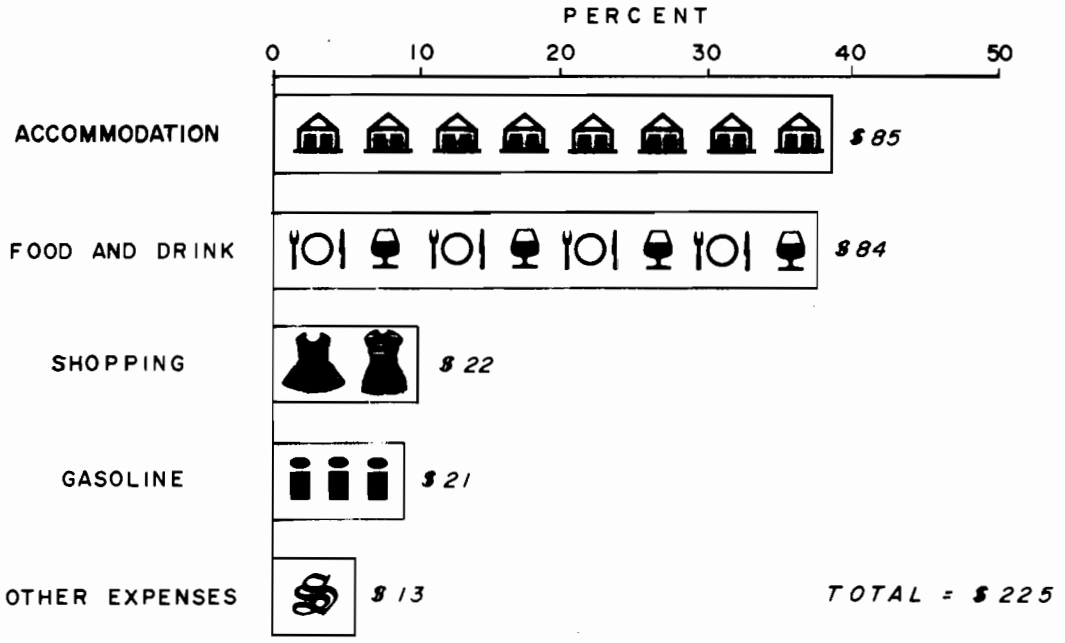
The following results were obtained from the Tourist Questionnaire Survey and therefore apply only to summer holiday visitors staying in commercial accomodation. No adjustments have been made to take into account summer holiday visitors who stay with friends and relations. The average tourist group consisted of 4.5 people. The average expenditures of each group during its stay amounted to $225, the major items being accomodation, food and drink (Figure 3.4). There was a considerable range in the expenditures of individual groups however, as can be seen from Figure 3.5.

Variations in the expenditures of tourist groups while on holiday in the Okanagan were due in part to differences in their lengths of stay in the region. As might be expected, total expenditures per group increased with the length of stay. Expenditures per group per day were higher however, for those groups who stayed for only a short period than for those who stayed longer (Figure 3.6). For example, visitors who stayed 1-3 days spent twice as much per day as people who stayed to 2-3 weeks.

Tourists were requested to indicate how long they spent away from home, and how long they intended to stay at the motel or campsite where they were contacted. The aim of these questions was to discover if the Okanagan is primarily a vacation destination area or a place where holiday makers stop while en route to other vacation destinations and whether visitors tend to stop in one particular area rather than travel within the Okanagan region.

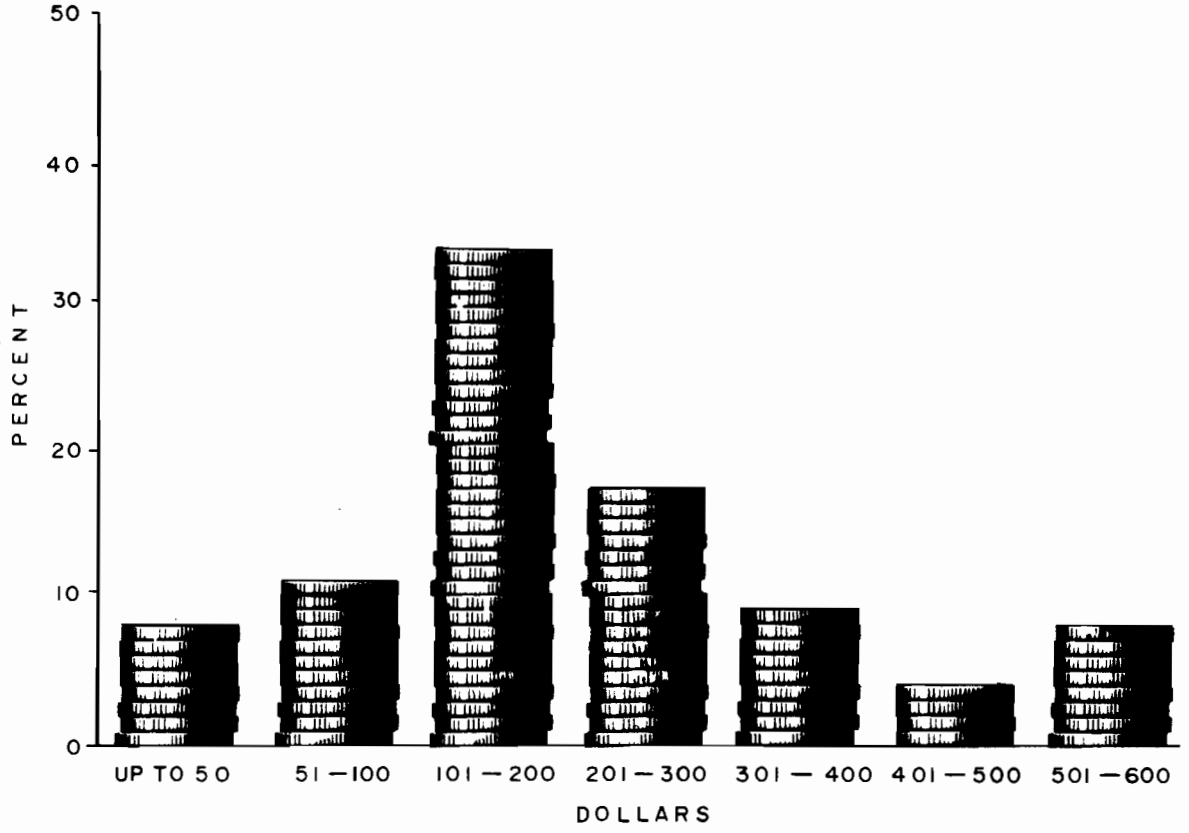
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*4 Direct income consists of wages and salaries paid to Okanagan residents, profits earned by them, rents from equipment, buildings and land, and land taxes.



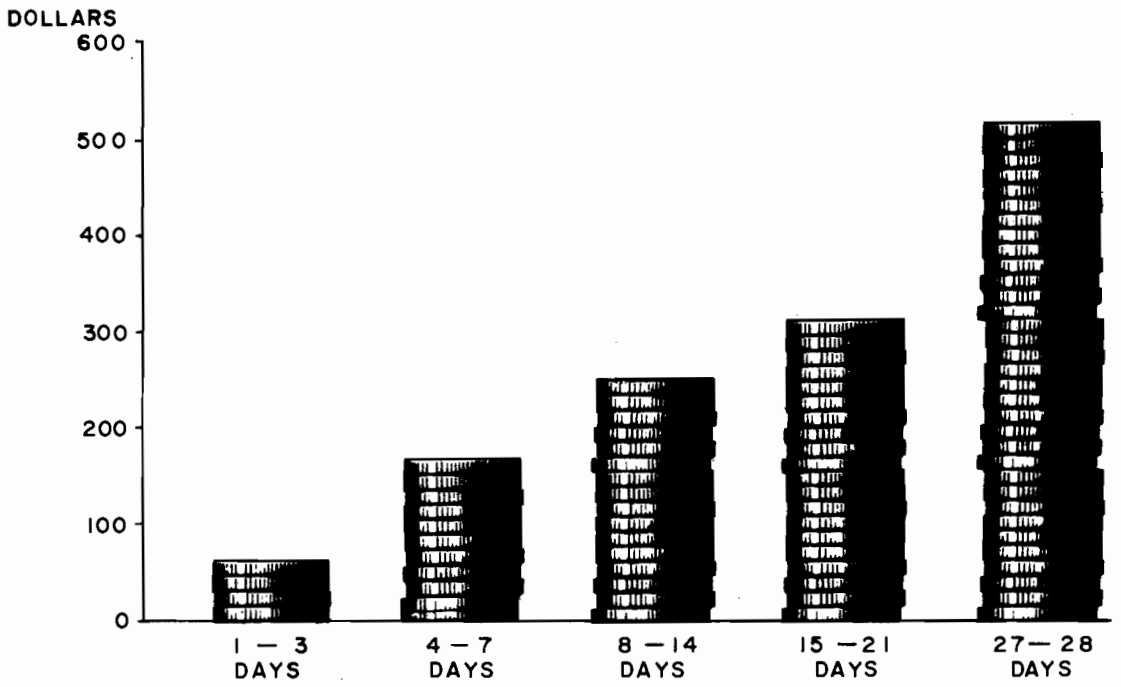
AVERAGE EXPENDITURE PER GROUP

Figure 3.4

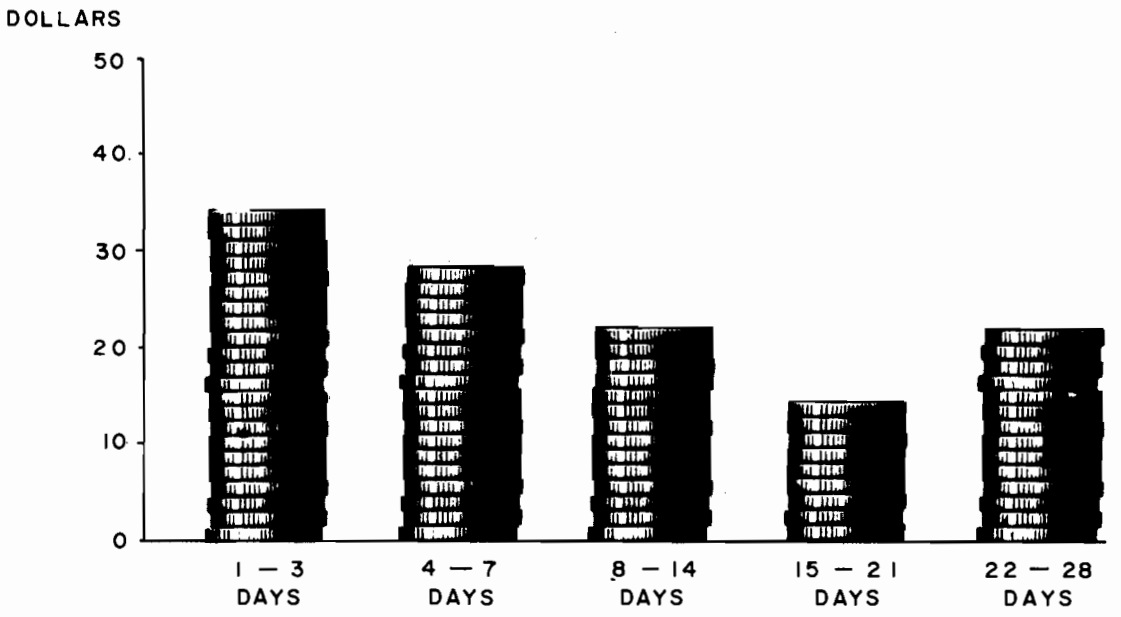


AVERAGE EXPENDITURES BY TOURIST GROUPS PER TRIP

Figure 3.5



AVERAGE TOTAL EXPENDITURES



AVERAGE DAILY EXPENDITURES

AVERAGE AND DAILY EXPENDITURES BY TOURIST GROUPS COMPARED WITH THEIR LENGTHS OF STAY

Figure 3.6

The results are compared on Figure 3.7. The average length of stay in the Okanagan was approximately one week (6.4 days) while the average length of stay away from home was 11 days. The majority of visitors appear to spend most of their vacation actually in the Okanagan rather than en route or in other regions. In fact, only 6% of the tourist groups indicated that they were enroute to an alternative destination. Three quarters of the tourists stayed at only one motel or campsite during their stay in the Okanagan. Thus the majority of tourists not only viewed the Okanagan as their main holiday destination, but also spent much of their time in one particular part of it.

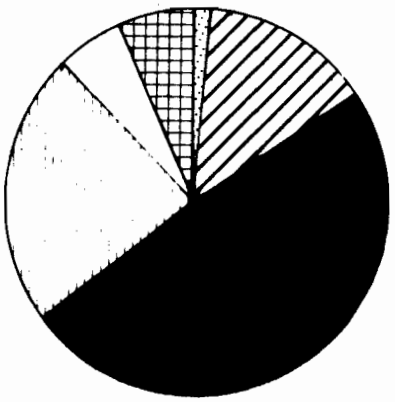
In order to discover more about the travel patterns of tourists within the Okanagan, tourists were asked which of six Okanagan towns they had visited or intended to visit on this trip. Many tourists visited more than one urban centre. Penticton was the most frequented location, attracting over 70% of the visitors, followed by Kelowna with 63% (Figure 3.8). The four centres situated on or near a lake (Osoyoos, Penticton, Kelowna and Vernon) attracted the most visitors.

There were marked variations in the distribution patterns of visitors from each of the main tourist market areas to the Okanagan. Almost 80% of the visitors to the Okanagan came from British Columbia or Alberta, particularly from the major urban centres of the lower Mainland (35%), Calgary (17%) and Edmonton (12%) (Figure 3.9). As can be seen from Figure 3.10, Albertans tended to visit the northern and central, rather than southern portion of the Okanagan. For example, nearly half of the visitors staying in the Vernon region and Kelowna region were from Alberta, compared to less than a fifth of those staying in the Oliver-Osoyoos region. Conversely, visitors from the lower Mainland constituted over half of the visitors in the Oliver-Osoyoos region, but only a fifth of those in the Vernon region.

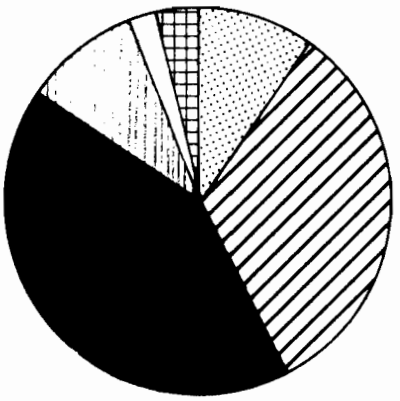
3.3.4 The Characteristics of Tourist Groups, their Reasons for Visiting the Okanagan and Frequency of Return

The Okanagan caters to family groups in particular. Nearly three quarters (73%) of the tourist groups consisted of one or more families with children and 43% of the visitors were, in fact, under 16 years of age.

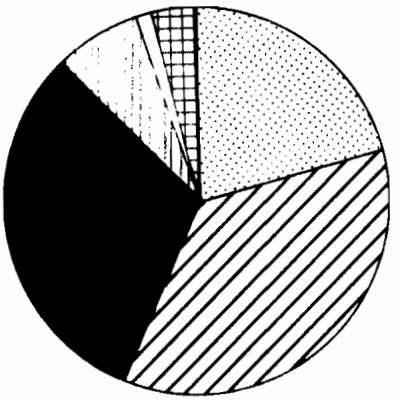
The vast majority of tourists have visited the Okanagan more than once. Nearly 90% had visited the region previously and over a quarter (26%) had returned every year for five years (Figure 3.11). Residents of the Lower Mainland in particular, tended to return each year, a third of them having been every year for five years. In addition, it was discovered that visitors who returned most frequently tended to stay somewhat longer than other visitors. The Okanagan still continues to attract new tourists as well as regular visitors. Twelve per cent of the tourists were visiting the region for the first time.



AWAY FROM HOME



IN THE OKANAGAN



AT THE RESORT

1 – 5 DAYS

4 – 7 DAYS

8 – 14 DAYS

15 – 21 DAYS

22 – 28 DAYS

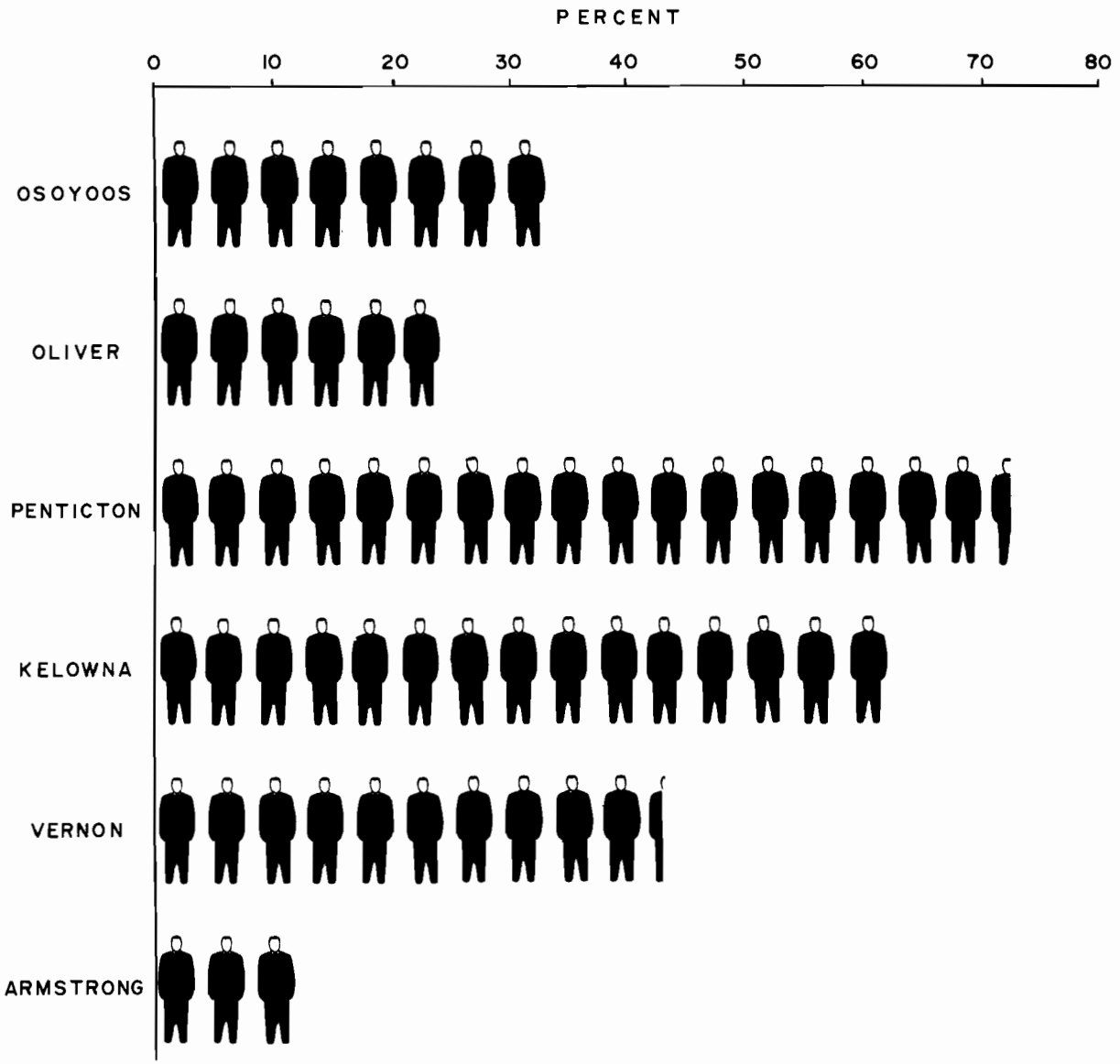
OVER 28 DAYS

TIME PERIOD

THESE STATISTICS ARE CONSIDERED TO BE BIASED TOWARDS LONGER STAYING VISITORS BECAUSE OF THE GREATER LIKELIHOOD OF CONTACTING THEM IN THE TOURIST QUESTIONAIRE SURVEY.

LENGTHS OF STAY OF TOURIST GROUPS

Figure 3.7



TOWNS THAT TOURISTS HAD VISITED
OR INTENDED TO VISIT

Figure 3.8

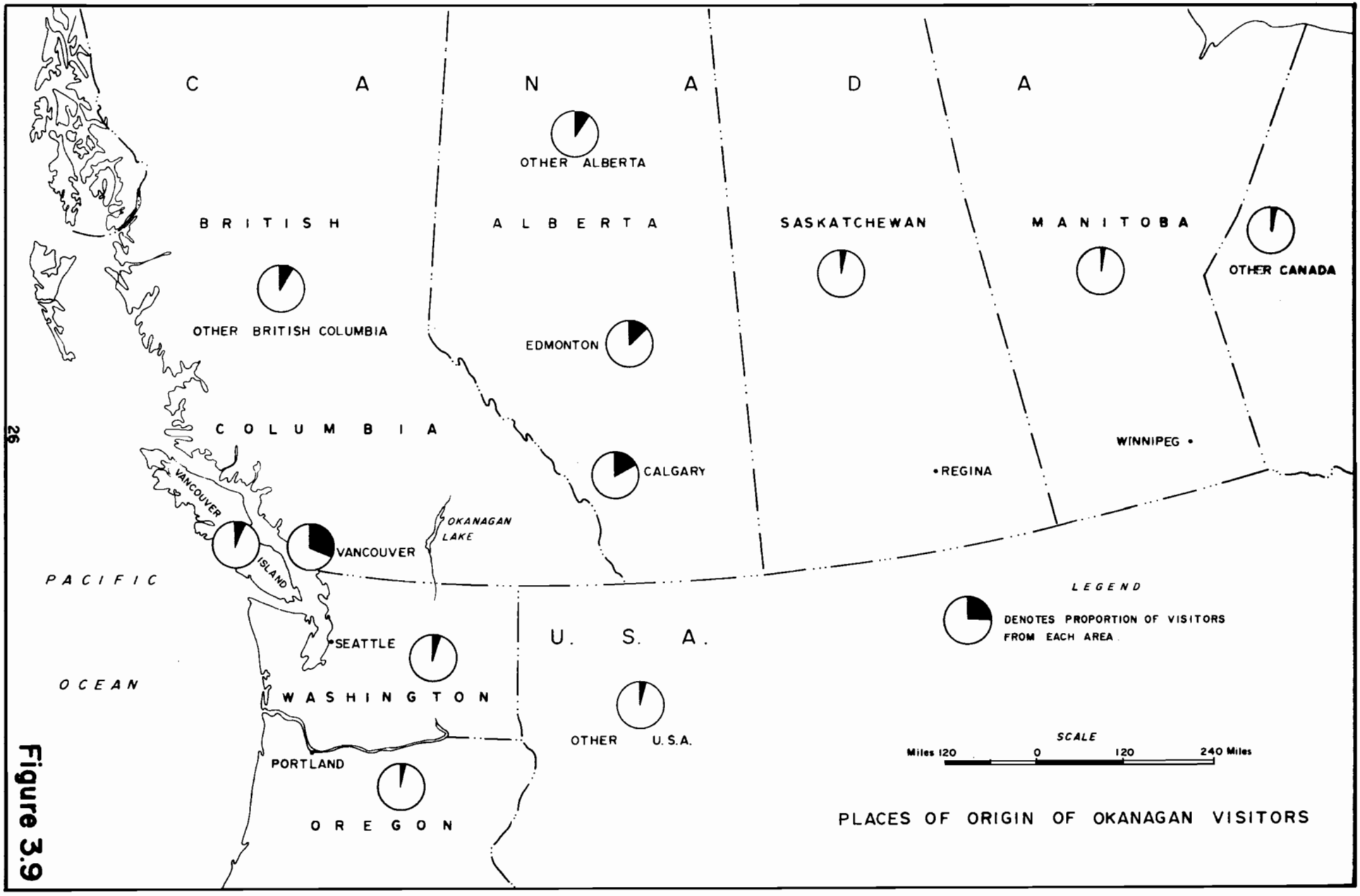
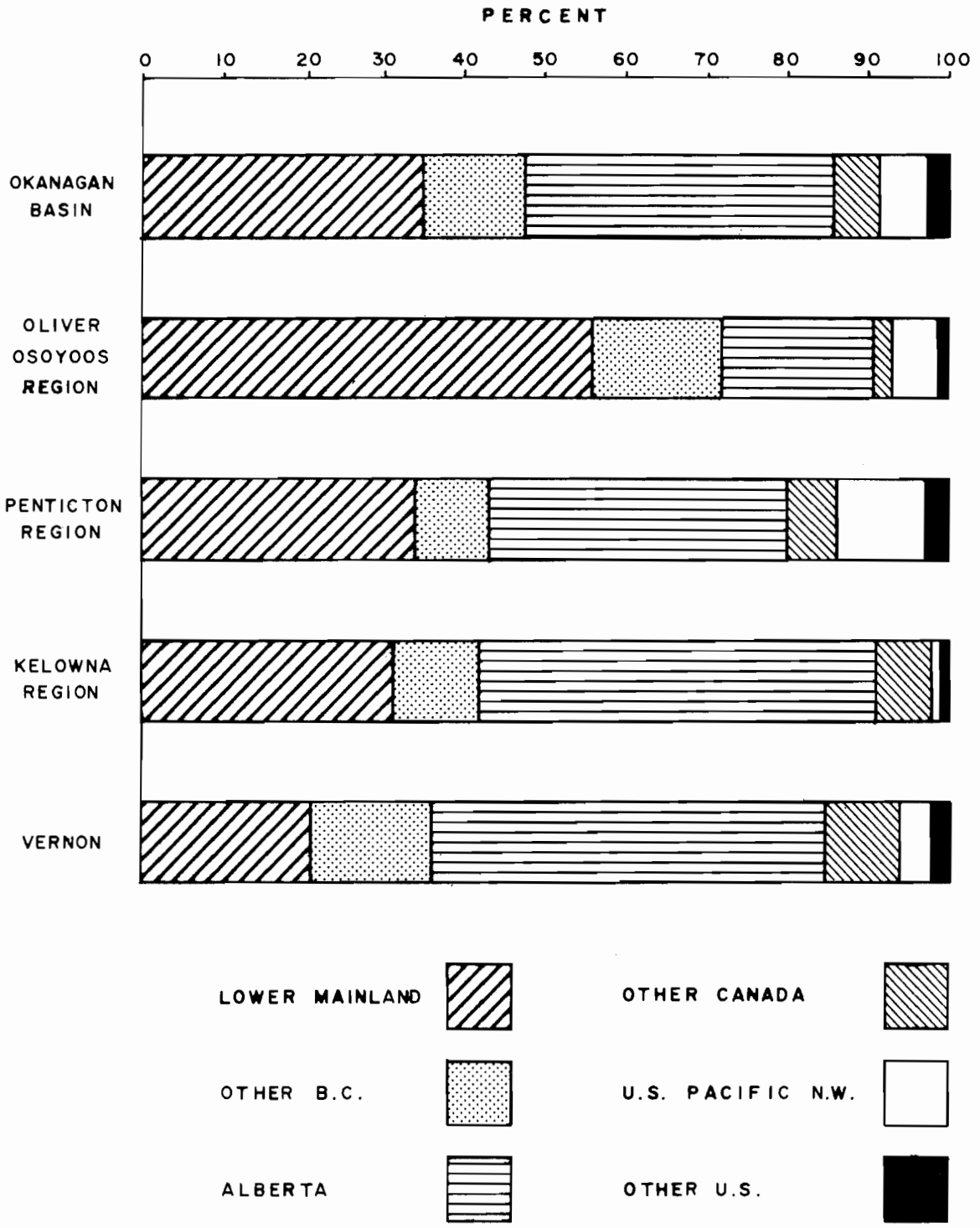


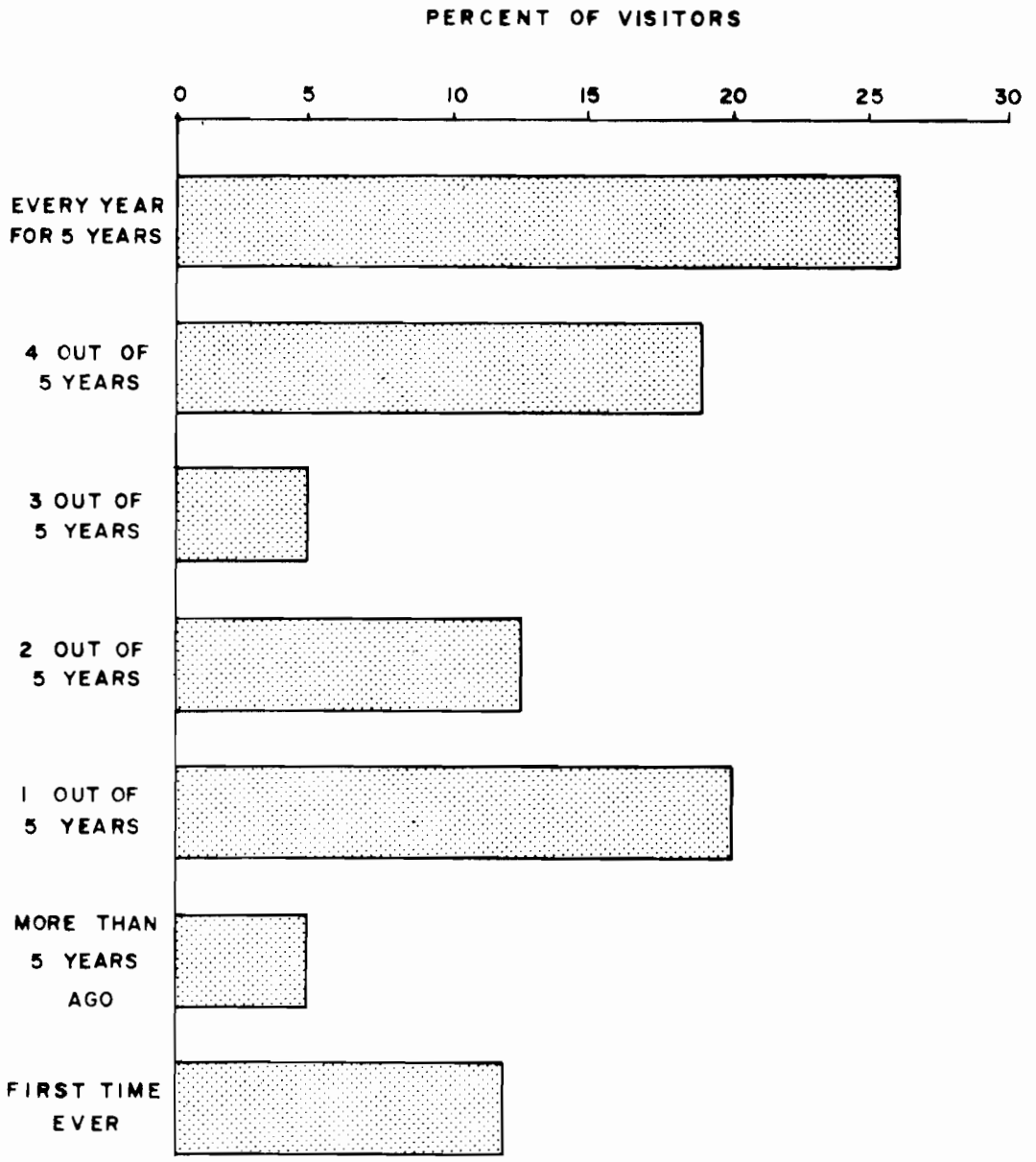
Figure 3.9

PLACES OF ORIGIN OF OKANAGAN VISITORS



PLACES OF ORIGIN OF TOURISTS
WITHIN EACH REGION OF THE OKANAGAN

Figure 3.10



FREQUENCY OF VISITS

TO THE OKANAGAN

Figure 3.11

Over two thirds (68%) of the visitors cited previous experiences in the Okanagan as their main reason for coming back to the region, and a further 14% came on the basis of a friend's recommendation. Over half (55%) of those visiting for the first time considered a friend's recommendation to be their major reason for choosing the Okanagan as a holiday area. Very few tourists mentioned information from brochures as the main influence in their decision to come to the Okanagan, though such information may supplement recommendations made by friends.

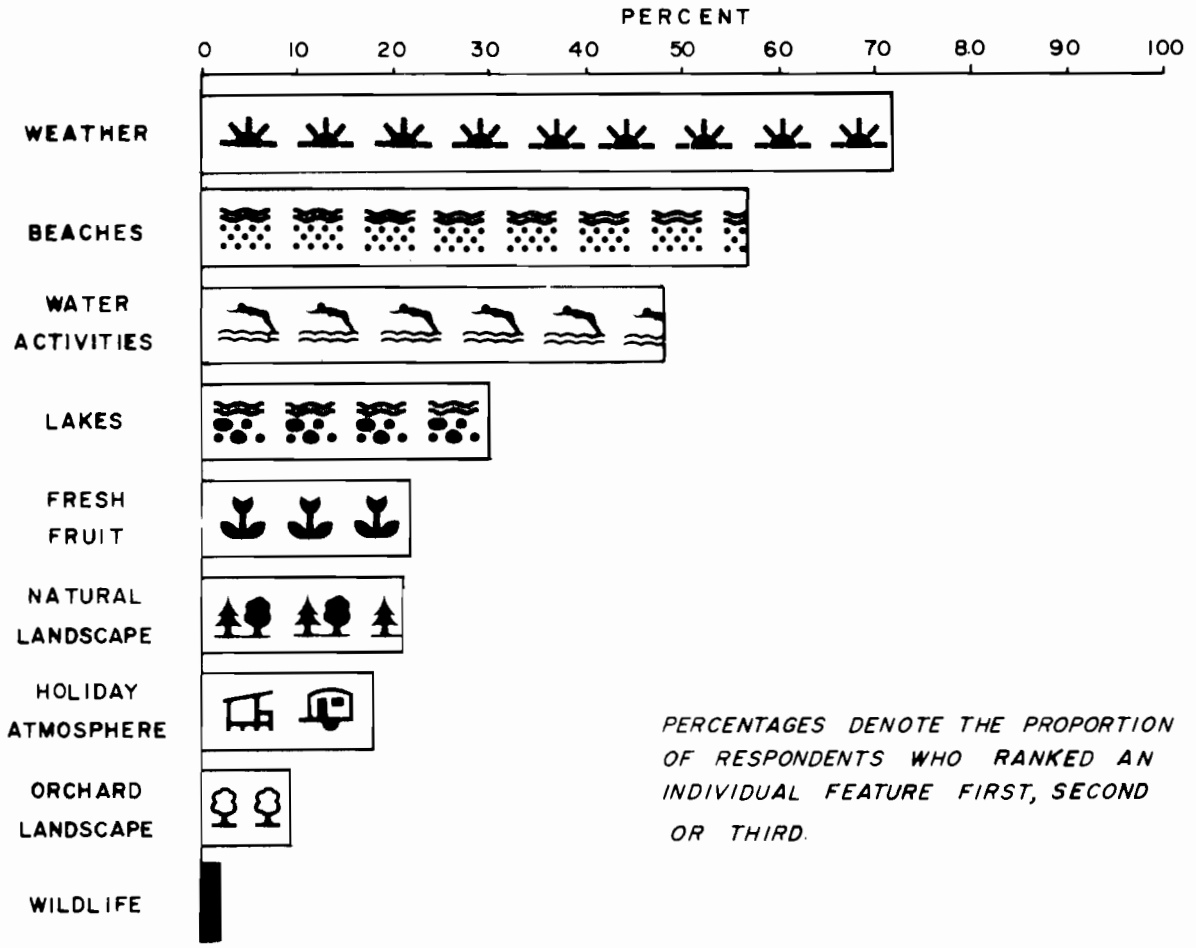
The importance of personal experience in encouraging visitors to return, and their relatively high frequencies of return, suggest that visitors in general are quite satisfied with their holiday experiences in the Okanagan. Visitors were, in fact, asked if there was anything they disliked about the region. Over half (54%) of them did not identify any unpleasant features. The most common complaint received concerned poor water quality conditions, which were mentioned by 10% of the visitors.

3.3.5 The Importance of Beach-Oriented Recreation to Okanagan Visitors

During the piloting of the Tourist Questionnaire Survey, nine attractive features of the Okanagan were identified by means of an open-ended question. Visitors were subsequently requested to rank the features in their order of importance to them. Figure 3.12 portrays the proportion of the visitors who ranked an individual feature first, second, or third, out of nine.

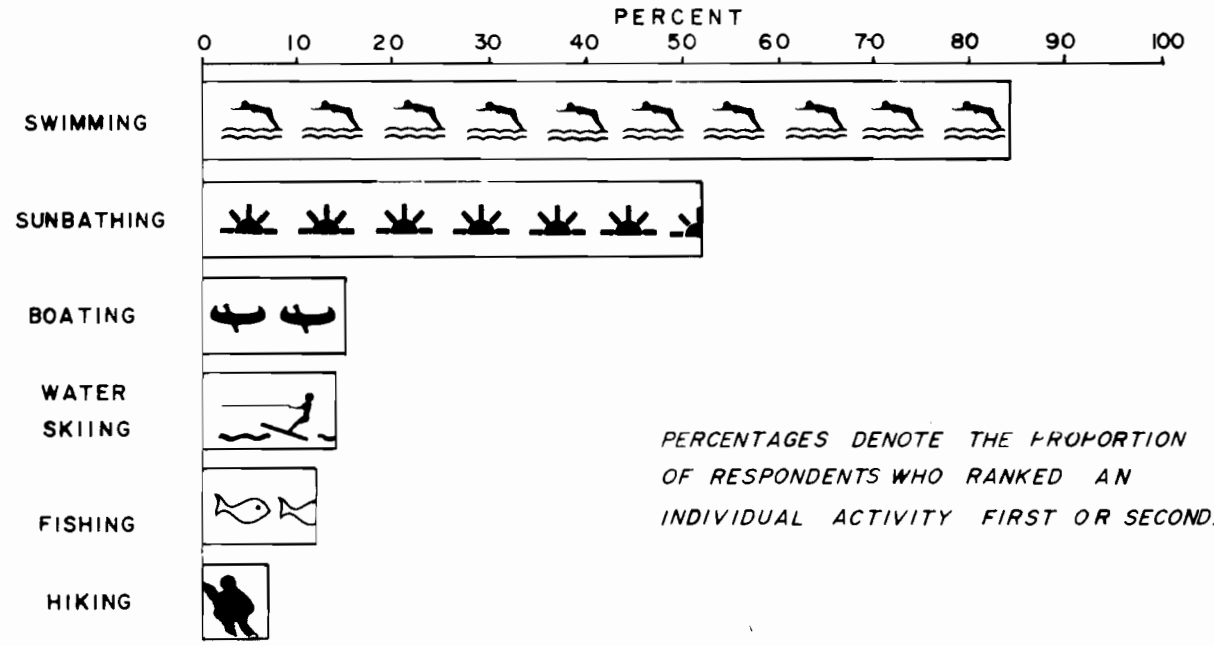
Visitors are attracted by a holiday "package" of good weather, lakes and beaches, rural landscapes and a holiday atmosphere. The most important single attraction of the Okanagan was the weather, followed by the opportunity to participate in beach-oriented recreation as denoted by the responses to beaches, water activities and lakes. The orchard landscape and the chance to obtain fresh fruit were quite important and are indicative of a link between agriculture and tourism.

Tourists were asked to rank beach-oriented recreation (swimming and sunbathing) and four other recreational activities in order of importance for their group while they are on holiday in the Okanagan. Figure 3.13 shows the proportion of the visitors who ranked an individual activity first or second. Swimming was by far the most popular activity, with 84% of the visitors ranking it high. Sunbathing, the complementary activity to swimming, was rated highly by over half (52%) of the visitors. Fishing, boating, waterskiing and hiking were generally far less important than swimming or sun-bathing. It is thus apparent that the opportunity to participate in beach-oriented recreation in good weather conditions is the major attraction of the Okanagan as a tourist area.



RELATIVE IMPORTANCE OF THE ATTRACTIONS OF THE OKANAGAN

Figure 3.12



RELATIVE IMPORTANCE OF VARIOUS RECREATIONAL ACTIVITIES FOR VISITORS

Figure 3.13

3.4 SUMMARY AND DISCUSSION

The Okanagan Basin is a major holiday area which attracted over 485,000 holiday visitors in 1970, Penticton being the most frequented centre. The tourist groups consist mainly of families from the lower Mainland of British Columbia and Alberta. Most of the holiday makers have visited the Okanagan previously and continue to be attracted by a combination of features including good weather, lakes and beaches, the holiday atmosphere, the natural and rural landscape, and fresh fruit. The water resource thus plays a major role in attracting tourists, both directly by presenting opportunities for the enjoyment of beach-oriented recreation and providing an aesthetic appeal, and indirectly through irrigation of orchards which add to the aesthetic appeal and provide fresh fruit.

Tourists spent over $11.5 million in the Okanagan in 1970, over half of which results in a direct or indirect income to Okanagan residents. The economic well-being of the commercial accomodation sector in particular is heavily dependent on tourist expenditures. It is not easy to isolate beach-oriented recreation from the "package" of holiday attractions offered by the Okanagan and ascribe a definite proportion of the economic value of tourism to it. Since beach-oriented recreation is the dominant attraction for tourists however, it is evident that future water management and shoreline management practices will be critical factors in contributing to the maintenance of the satisfaction of tourists and the economic well-being of Okanagan residents.

CHAPTER 4

Beach-Oriented Recreation as an Activity for Okanagan Residents

4.1 INTRODUCTION

There was little existing information on participation by Okanagan residents in outdoor recreation activities at the outset of the Okanagan Study. Since the framework plan for water resource management was prepared primarily for the social betterment of the Okanagan community, it was decided that a sample of Okanagan residents should be interviewed to provide information on their general recreational habits. This information would allow beach-oriented recreation to be placed into perspective as a component of the array of outdoor recreation activities enjoyed by Okanagan residents.

4.2 METHODS

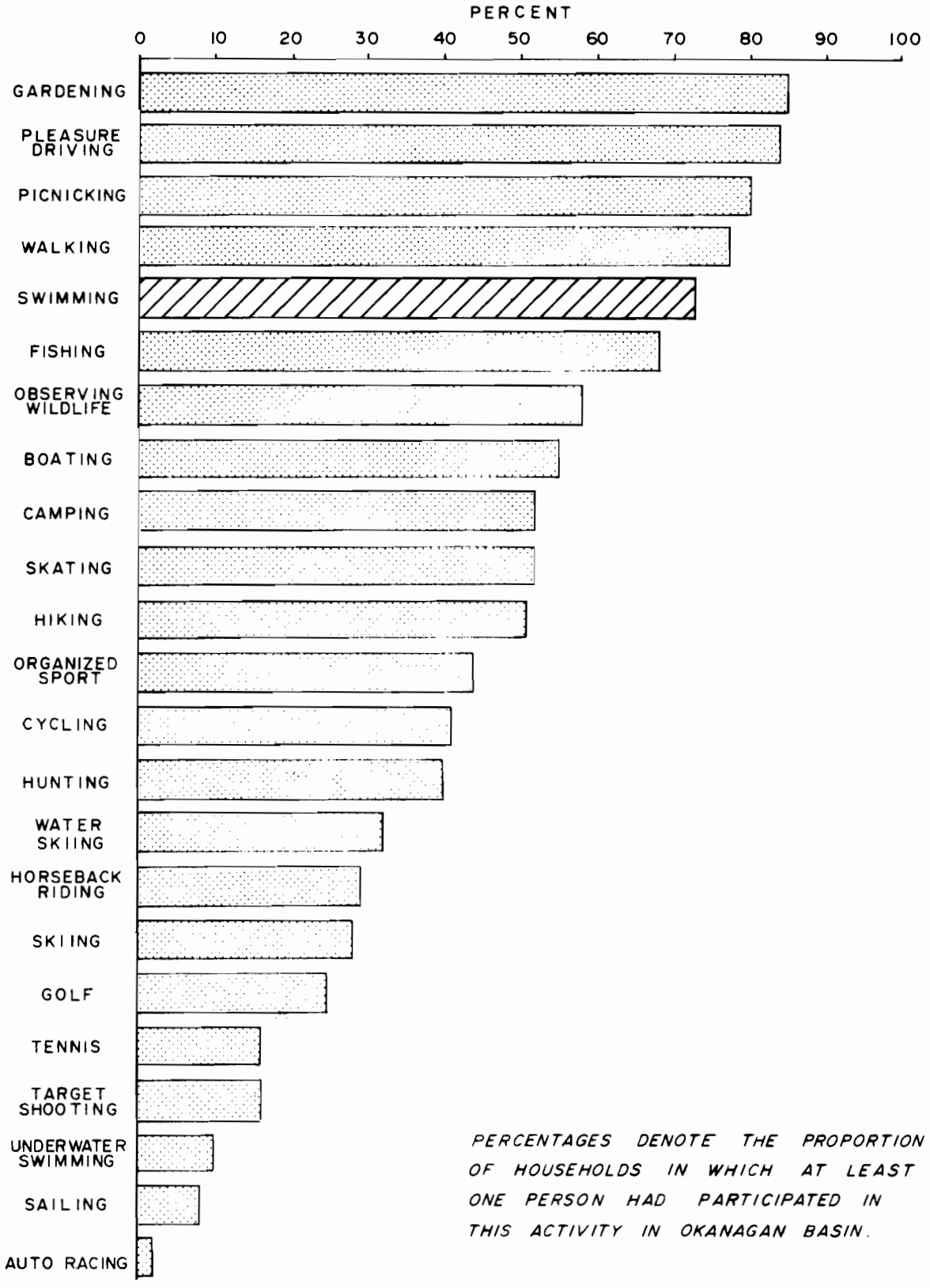
A sample of 384 resident households was selected by means of a stratified random sampling technique. The Okanagan Basin was divided into three regions for sampling purposes; North Okanagan (Armstrong to Oyama), Central Okanagan (Oyama to Peachland) and South Okanagan (Summerland to Osoyoos). Each region consisted of approximately equal number of Census Enumeration Areas, each of which containing 250 to 250 households. The three regions were divided into urban, sub-urban, and rural areas according to population density patterns. Individual households were randomly selected from the Enumeration Areas in proportion to the population of the three regions and in accordance with their urbanization characteristics thus giving a stratified random sample. Questions on the recreational pursuit of residents were included in a questionnaire survey designed to discover the attitudes of residents towards a variety of issues facing the Okanagan community (Technical Supplement XII Public Involvement Program and Results). Interviews were conducted at selected households during the fall of 1971, questions normally being answered by an adult member of the household.

A partial assessment of the degree of possible bias in the sample was made by comparing selected socio-economic characteristics of the sampled households with those for the population of each of the three sampling regions as contained in the 1966 census. Statistical tests indicated that there were no significant differences between the selected characteristics of the samples and the regional populations from which they were drawn. Unfortunately, more detailed information from the 1971 census was not available so that a fuller appraisal could not be conducted. However, in view of the carefully designed sampling procedures and the relatively low rejection rate of less than 5%, the sample is considered to contain a representative cross-section of Okanagan households.

4.3 RESULTS

Respondents were presented with a list of 23 outdoor recreation activities and requested to indicate whether adults or children, or both adults and children in the household participated in them. The aim was to discover the extent of participation in beach-oriented recreation as denoted by swimming, compared to other water-based and non water-based recreation activities. Figure 4.1 indicates the proportion of households in which at least one person had participated in a given activity during the year. Five of the 23 activities, gardening, walking, pleasure driving, picnicking, and swimming were enjoyed by over 70% of the households. Swimming was a more popular pastime than the 18 remaining activities, including the two other major water-based recreational activities, fishing and boating.

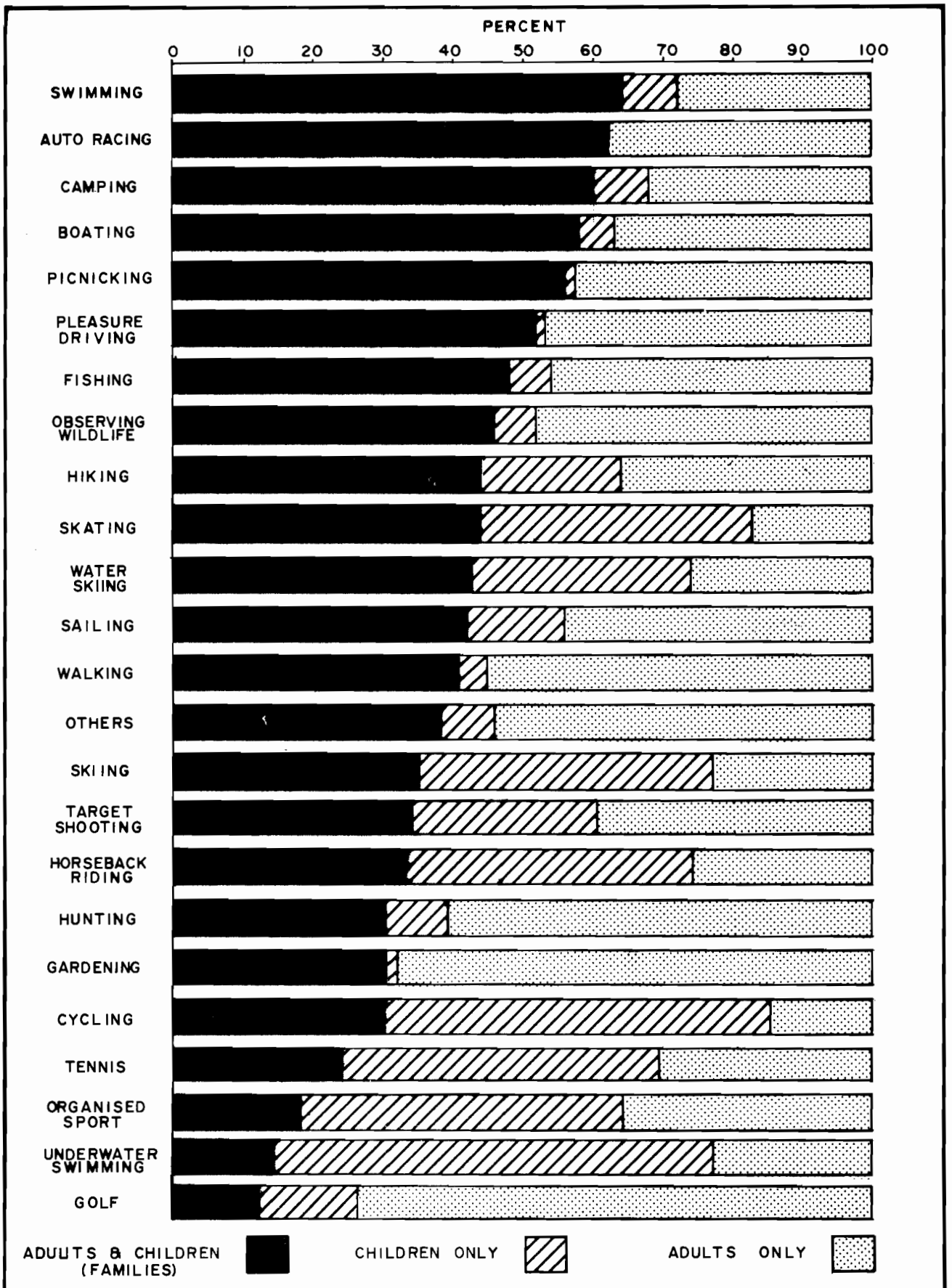
Figure 4.2 denotes the proportion of adults, children, and both adults and children respectively, who participated in each of the outdoor activities (Auto-racing was only actively followed by 2% of the total sample; thus its position in this Figure should be interpreted with care.). The median value of the proportion of all activities in which both children and adults participated was found to be 42%. The median value of family participation for individual activities varies considerably however, though swimming had the highest value. Over 60% of the households contained both adults and children who had swum in the lakes in the Okanagan. The fact that both adults and children in a household enjoy the same recreation activity does not necessarily mean that they participate in the activity together. It does suggest however, that swimming in particular provides families with an opportunity to get together as a group.



PERCENTAGES DENOTE THE PROPORTION OF HOUSEHOLDS IN WHICH AT LEAST ONE PERSON HAD PARTICIPATED IN THIS ACTIVITY IN OKANAGAN BASIN.

PARTICIPATION IN SWIMMING COMPARED WITH OTHER FORMS OF OUTDOOR RECREATIONAL ACTIVITIES BY OKANAGAN RESIDENTS.

Figure 4.1



PARTICIPATION IN OUTDOOR RECREATIONAL ACTIVITIES BY FAMILY GROUPS

Figure 4.2

CHAPTER 5

Participation in Beach-Oriented Recreation by Visitors and Residents

5.1 INTRODUCTION

A questionnaire survey was conducted at beaches throughout the Okanagan during the summer of 1972 to determine preferences, behaviour patterns and social values associated with the use of beaches by visitors and residents. This section discusses the design, implementation and findings of the survey.

5.2 DESIGN & IMPLEMENTATION OF SURVEY

Draft copies of the questionnaire were pre-tested on two occasions with a total of approximately 60 respondents before a final revised version was produced. Approximately two dozen public beaches around the main valley lakes were selected to be included in the survey. It was decided that the number of respondents selected at each beach should be in approximate proportion to the number of people who typically frequented each beach. The distribution pattern of beach users was determined by censusing beach populations over several days. Two low level aircraft flights were undertaken, the first during a holiday weekend and the second on a sunny week-day in the mid-afternoon. Complete sets of photographs were taken on public beaches on the main lakes during these two flights thus enabling the number of people on each beach to be counted. In addition, regular counts were made on the ground of the number of people at major beaches during the mid-afternoon, the peak period of daily use. The sample size or quota of respondents for each beach for the questionnaire survey was then established on the basis of these counts. This procedure minimized the danger of over-sampling certain beaches at the expense of other beaches.

The interviewers selected respondents on a given beach at random until the quota for the beach had been reached. Major beaches were sampled on a number of occasions during July and August in order to obtain a wide variety of respondents from these beaches. A weekly check was kept on the weather conditions during interviewing, and the socio-economic characteristics of respondents. An assessment was then made of the nature and extent of any possible biases contained in the sample on the basis of age, sex, and resident/visitor composition data. In addition to the weekly checks, the preliminary findings from 180 questionnaires were tabulated by computer in early August. These results allowed a more detailed appraisal to be made of possible biases and indicated appropriate sampling adjustments.

In view of the variability of the composition of the population of beach users between and within individual beaches, and over time, it was not possible

to make a rigorous assessment of how successfully the sample represented total beach population. A brief review of the conditions during interviewing, and the characteristics of the sample is presented however, in order to provide an indication of the reliability of the results.

5.3 CHARACTERISTICS OF SAMPLE

Three hundred and forty four interviews were conducted, 230 visitors and 114 residents. The interviewing was fairly evenly distributed throughout most of July and August although relatively few questionnaires were administered in mid-July because of fairly cool, wet conditions. The majority of respondents were contacted on hot, sunny afternoons when most people would be encountered at the beaches. Twenty seven per cent of the respondents were interviewed on weekends and 11% on public holidays in an attempt to "capture" residents who frequent the beaches at these times. Thirty four per cent of the interviews with residents were, in fact, obtained on the weekends compared to 25% of those with visitors.

Half of the interviews were conducted in the Penticton region, 30% in the Kelowna region, and 15% and 5% in the Vernon and Oliver-Osoyoos regions respectively. Almost two-thirds of the respondents were contacted at the five major public beaches - Skaha (28%), Okanagan at Penticton (15%), Sun-Oka near Summerland (8%), Kelowna beach (10%) and Kalamalka beach near Vernon (3%). No more than 5% of the sample was contacted at any other public beach (See Map 8 for location of public beaches around the main valley lakes.)*

The majority (55%) of the resident beach users lived in the Kelowna region mainly in Kelowna itself, the major population centre of the Okanagan. Nearly half (49%) of the visitor beach users were staying in or near Penticton. These distribution patterns reflect the dominant role of Penticton as a tourist centre and the importance of beaches in Kelowna for serving the recreational needs of the large resident population. The origins of the visitor beach users corresponded very closely with the origins of tourists as discovered in the Tourist Questionnaire Survey. Just over a third of the visitor beach users came from the Lower Mainland of British Columbia and Alberta respectively.

A wide cross-section of resident beach users was obtained in terms of the length of time that they had been living in the Okanagan and hence, their experience of the region. Approximately one-third of them had visited to Okanagan in each of the following categories; less than two years, two to ten years, and over ten years. Similarly, the visitor beach-users varied considerably in their lengths of experience in the Okanagan. Fifty five per cent had visited prior to 1967 and two thirds of them had stayed in the Okanagan between 1967 and 1969 and between 1970 and 1971 respectively. Seventeen per cent were on their first trip to the Okanagan compared to 12% of the visitors interviewed in the Tourist Questionnaire Survey.

*Maps 1-8 showing shoreline land use and existing and potential recreational areas are included in the Map Section at the back of this report.

Figure 5.1 indicates the age, income and educational characteristics of the resident and visitor respondents in the Beach User Questionnaire Survey. It is apparent that a wide cross-section of beach users were interviewed in terms of their socio-economic characteristics. In view of the measures taken to contact people at public beaches throughout the Okanagan, a low rejection rate of less than 5%, and the wide variety of respondents obtained, the sample is considered to be broadly representative of both residents and visitors who frequent Okanagan beaches.

5.4 RESULTS

5.4.1 Experience of Okanagan Beaches, Frequency of Visits and Durations of Stay

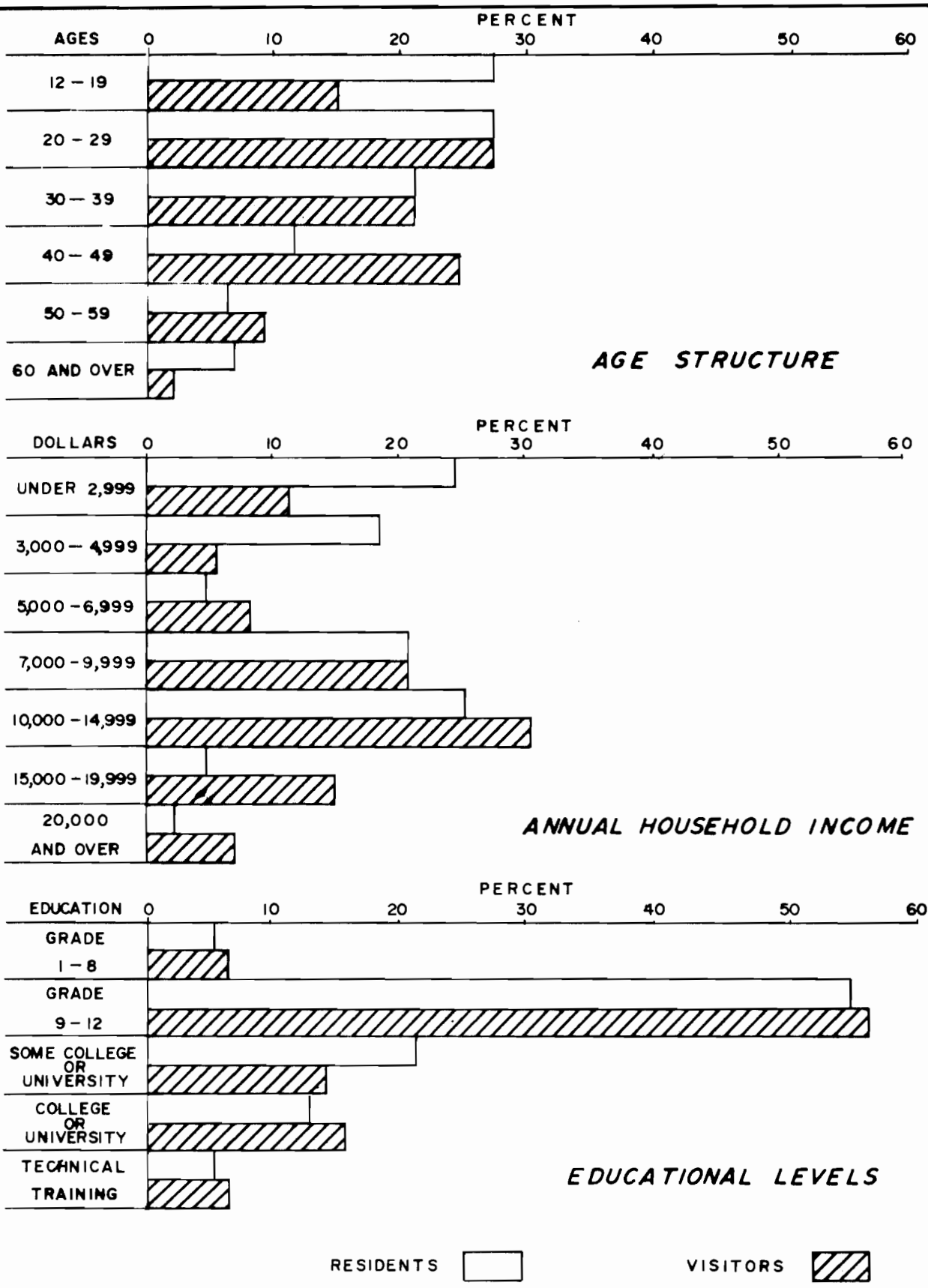
Residents appear to have had longer experience of the beach where they were interviewed than visitors. Whereas 44% of residents had visited the beach prior to 1967, only 30% of visitors had done so in spite of the fact that 55% of them had visited the Okanagan before 1967. Although 17% of the visitors were newcomers to the Okanagan, 39% of them were visiting the beach at which they were interviewed for the first time compared to 15% of the residents. In addition, there was some indication that a greater proportion of the residents were familiar with other beaches in the Okanagan. Ninety six per cent of the residents had visited other Okanagan beaches compared to 80% of the visitors.

As might be expected, visitors use the beaches more frequently during their stay than residents during comparable time periods (Figure 5.2). Two thirds of the visitor beach users went to the beach every day during their stay, while over three quarters of the resident beach users went at least once a week during July and August. These attendance figures are indicative of the importance of trips to the beach as a component of visitors' holidays and the life-styles of residents.

Nearly 80% of both visitors and residents spent over two hours on the beach during each visit (Figure 5.3). Visitors spent somewhat longer on average than residents, 28% of them staying all day at the beach, compared to 17% of the residents. These results are probably biased towards longer staying beach users because they were more likely to be contacted than people who stayed on the beach for shorter periods. Taken in conjunction with the frequency of attendance figures however, they indicate that there is a considerable investment of visitors holiday time and residents' leisure time in beach-oriented recreation.

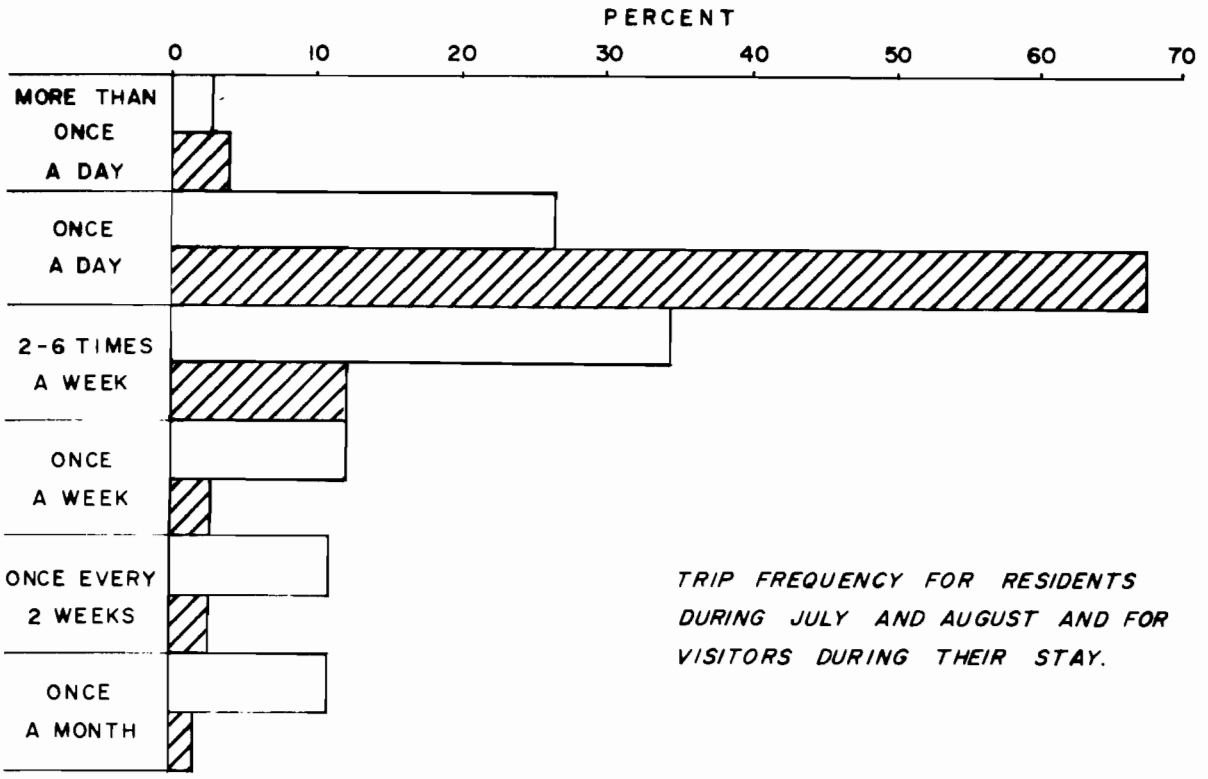
5.4.2 Modes of Travel, Travel Time and the Importance of Short Journeys to the Beach

Both visitors and residents prefer beaches that are easily accessible. Only 5% of the visitors and residents respectively spent more than 30 minutes travelling to the beach where they were interviewed from their respective places of stay. Over half (56%) of the visitors stayed less than five minutes from the beach where they were interviewed, compared with one-third of the

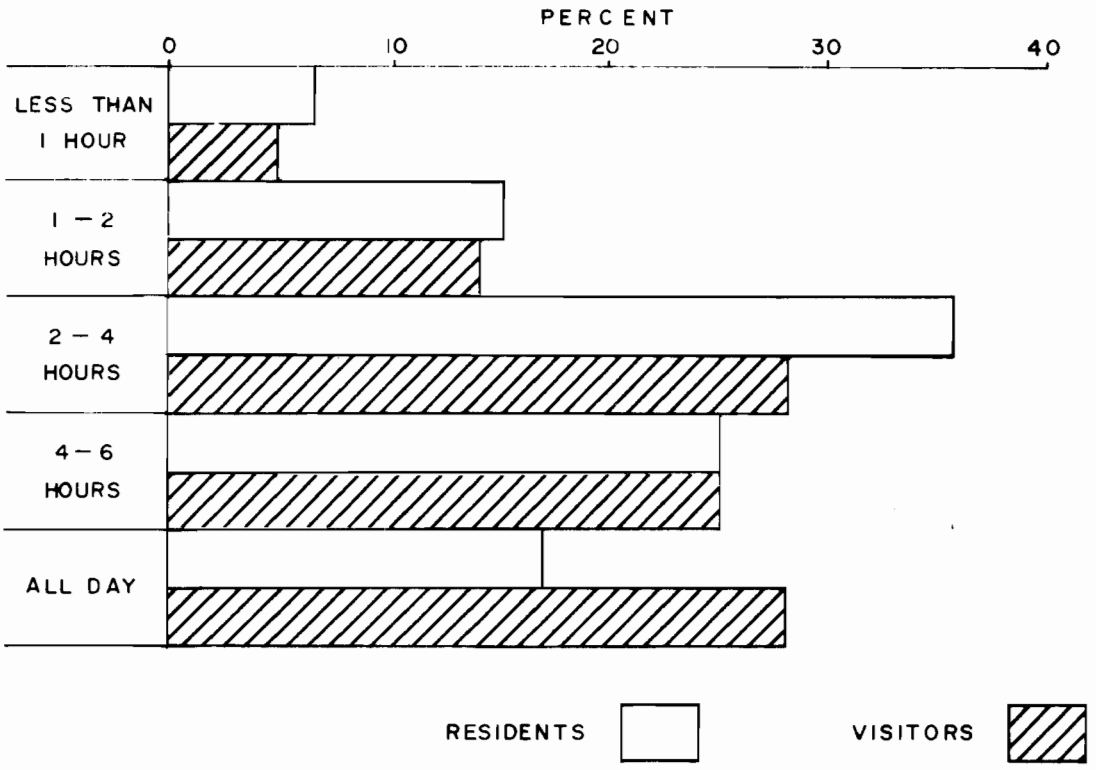


CHARACTERISTICS OF RESPONDENTS
IN THE BEACH USER QUESTIONAIRE SURVEY

Figure 5.1



FREQUENCY OF VISITS TO THE BEACH Figure 5.2



DURATION OF STAYS ON THE BEACH

Figure 5.3

residents, and 39% of visitors walked to beaches compared to a quarter of residents. Seventy per-cent of the residents travelled to the beach by car compared to 56% of the visitors. Visitors were more likely than residents to be found at the nearest beach to the place where they were living. Two thirds of the visitors, but only 53% of the residents were interviewed at the nearest beach to their place of residence. These findings suggest that some residents are more selective in their choice of beach than visitors.

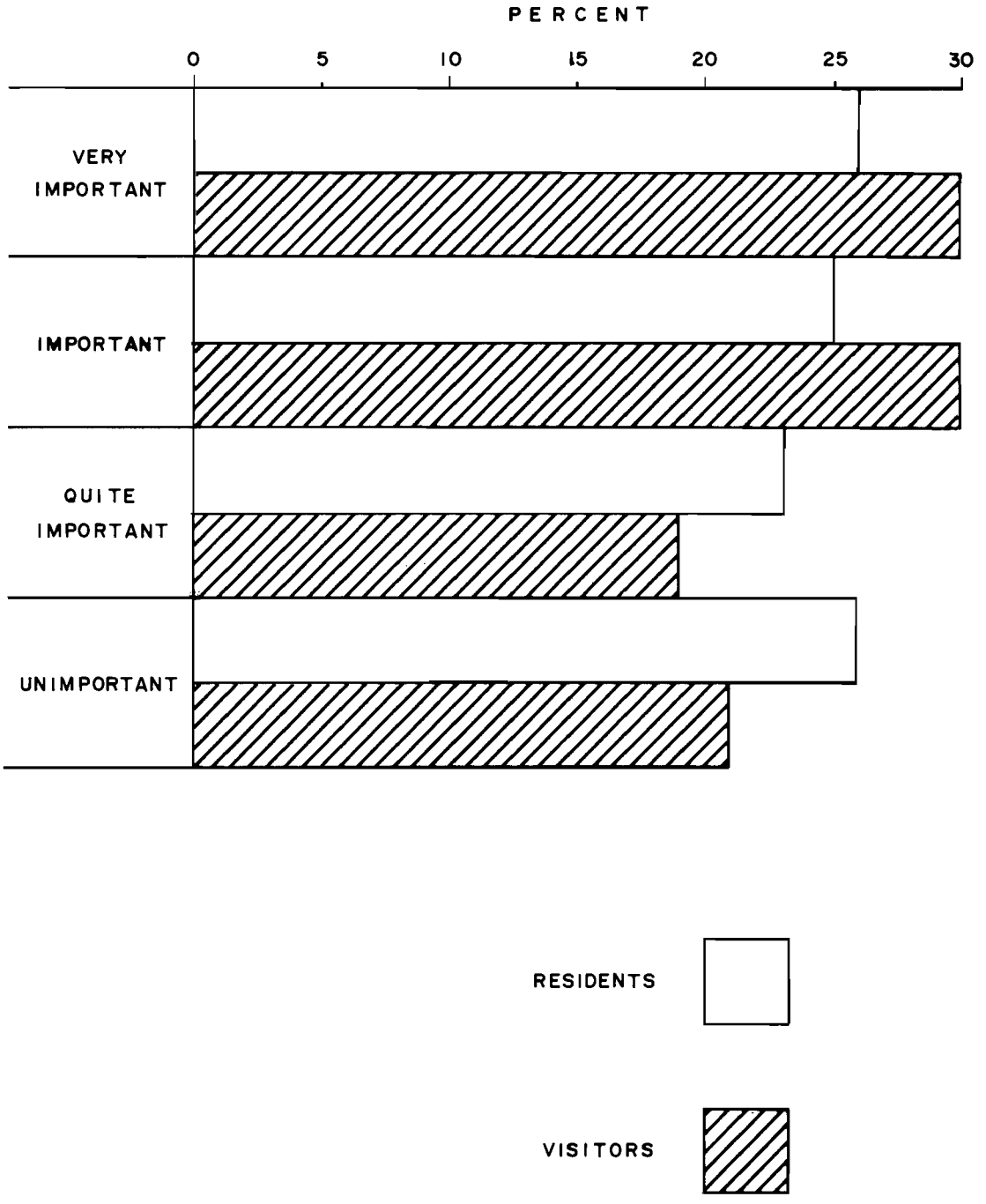
Beach users were requested to indicate the importance of a short journey from their place of stay or residence is in their enjoyment of trips to the beach. As can be seen from Figure 5.4, there was a considerable range of responses to this question from both residents and visitors. Visitors seemed to place somewhat greater importance on a short journey than residents.

There were thus indications that some residents are more familiar with Okanagan Beaches, are more selective in their choice of beach and are more willing to travel further to beaches than visitors.

5.4.3 Attractive and Unattractive Features of Okanagan Beaches

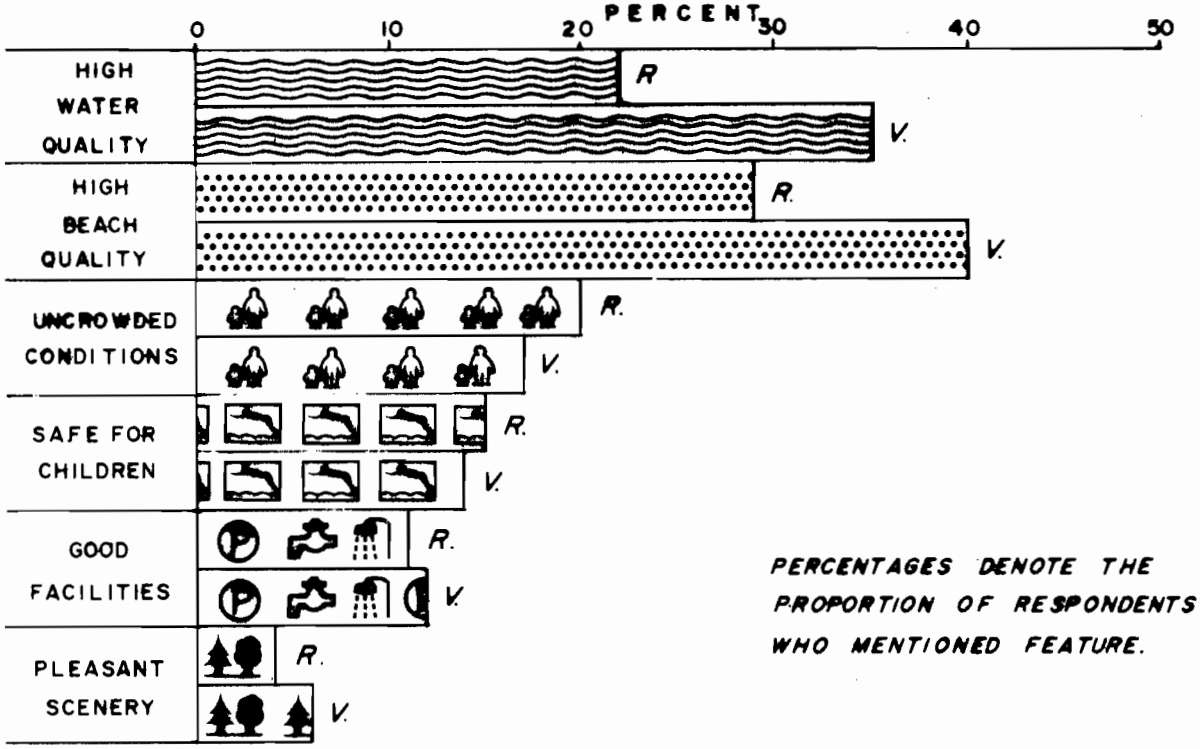
Beach users were asked two questions to identify those feature of Okanagan beaches which were particularly attractive to them and their relative importance. The first was open ended and related to the beach at which they were interviewed. Their responses were immediately classified by the interviewer into various categories determined from the pre-testing of the questionnaire. Figure 5.5 shows the proportions of the resident and visitor beach users who mentioned specific factors. Later in the interview beach users were presented with a list of attractive features that might contribute to their enjoyment of Okanagan beaches in general and were requested to rank them in their order of importance. Figure 5.6 portrays the proportion of the resident and visitor beach users who ranked an individual attribute first or the most important one in contributing to their enjoyment. Although the first question referred to the beach where the interview was conducted, and the second one to the Okanagan beaches in general, the dual approach providing a check on the consistency of responses.

There was agreement between resident and visitor beach users on both the attractive features of individual beachs and Okanagan beaches in general as indicated by the overall similarity of their responses. High beach quality (features such as the cleanliness of the sand and general maintenance of the beach) and high water quality were rated as the two most attractive features of the individual beaches followed by uncrowded conditions. Clean water was the dominant attraction of Okanagan beaches in general. Approximately half of the resident and visitor beach users ranked it as the most important single factor contributing to their enjoyment. It was rated high above the other features of the beaches.

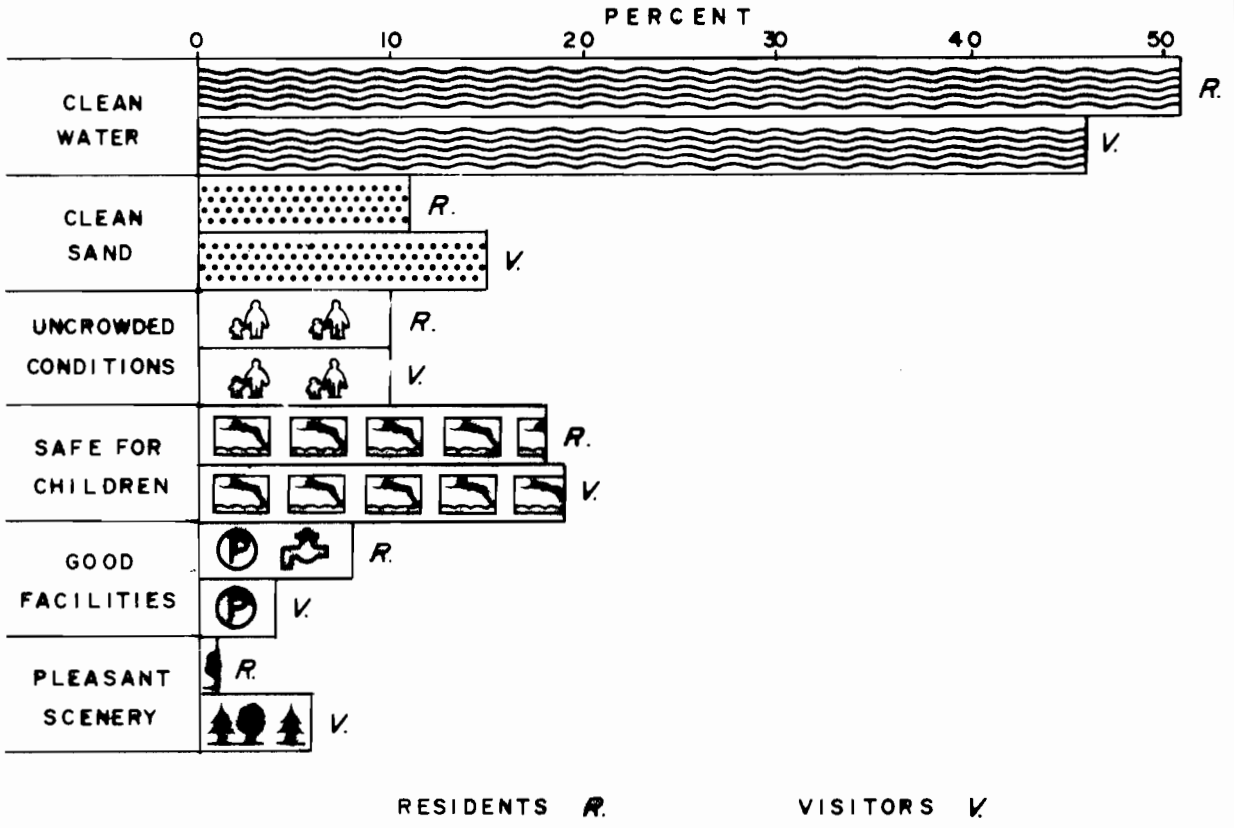


IMPORTANCE OF SHORT JOURNEYS TO THE BEACH

Figure 5.4



ATTRACTIVE FEATURES OF INDIVIDUAL OKANAGAN BEACHES Figure 5.5



ATTRACTIVE FEATURES OF OKANAGAN BEACHES IN GENERAL Figure 5.6

Respondents were also asked if there were any features they disliked about the beach were they were interviewed by means of an open-ended question. Figure 5.7 shows the proportion of the resident and visitor beach users who mentioned individual unpleasant features. Respondents were subsequently presented with a list of features that may have detracted from their enjoyment of Okanagan beaches on previous occasions. They were then requested to rank them in their order of importance as negative features if they had experienced them in the Okanagan. Figure 5.8 portrays the proportion of resident and visitor beach users who ranked an individual problem first in terms of its seriousness as a negative influence. The two sets of responses provide a useful comparison between unprompted and prompted answers to the same question.

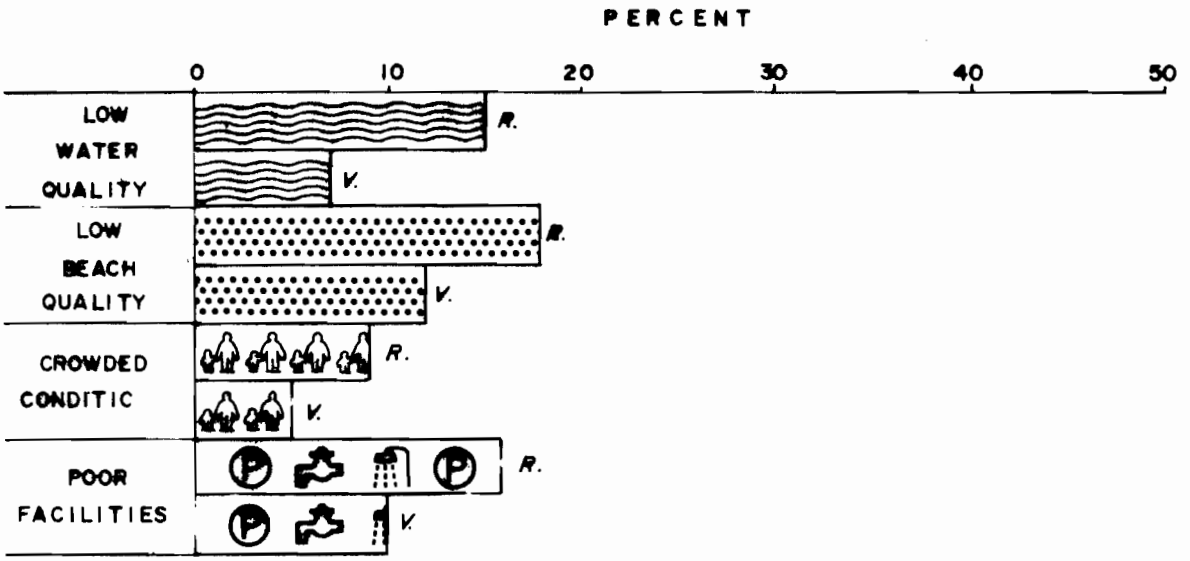
Satisfaction with the individual beaches where people were interviewed was generally quite high, although residents were somewhat more critical than visitors. Half of the visitors had no particular dislikes about the beach compared to 38% of the residents. The most frequent complaints from both residents and visitors concerned low beach quality and poor facilities, closely followed by poor water quality conditions. Poor water quality and crowded conditions were cited as the major problems at Okanagan in general.

Residents were more lidely than visitors to have experienced problems on previous occasions at Okanagan beaches. Eighty-seven per cent of the residents had experienced at least one problem before, compared to 64% of the visitors. Residents appear to have been more adversely affected by both of thos problems. Whereas nearly a quarter (23%) of the residents rated water quality problems as the most important unpleasant feature that they had encountered, the corresponding proportion of visitors was 13%. Similarly, 23% of the residents ranked crowding first compared to 17% of visitors. Since poor water quality and beach crowding were the most frequent complaints, reactions to these factors were examined more closely. Crowding is discussed in the following section, while water quality problems are the subject of the next chapter.

5.4.4 Reactions to Beach Crowding

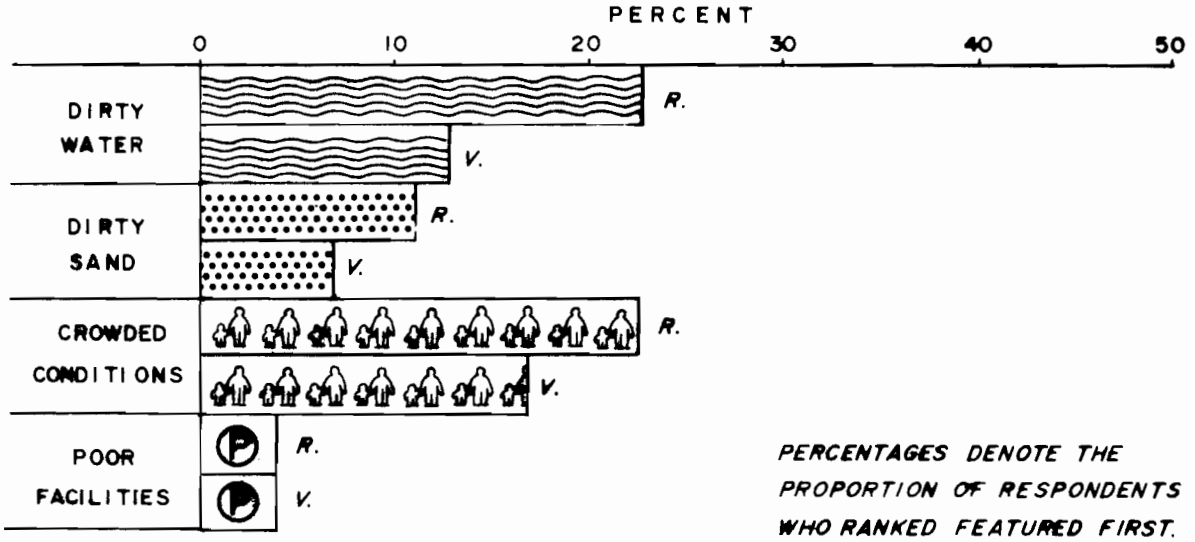
Since crowding is a relative concept in the sense that different individuals have different levels of tolerance to various population densities, an examination of beach users' subjective views on beach crowding was considered to be an important facet of the assessment of the adequacy of existing beach areas. Respondents were therefore questioned in some detail about their assessments of beach crowding conditions and trends and their experience and avoidance of crowded beaches in the Okanagan.

Beach users were requested to rate the degree of crowding at the beaches where they were interviewed at the times they were contacted. Approximately two thirds of both residents and visitors respectively considered crowding to be low or very low (Figure 5.9). Since respondents were contacted at beaches throughout the Okanagan in approximate proportion to their use and at times



PERCENTAGES DENOTE THE PROPORTION OF RESPONDENTS WHO MENTIONED FEATURE.

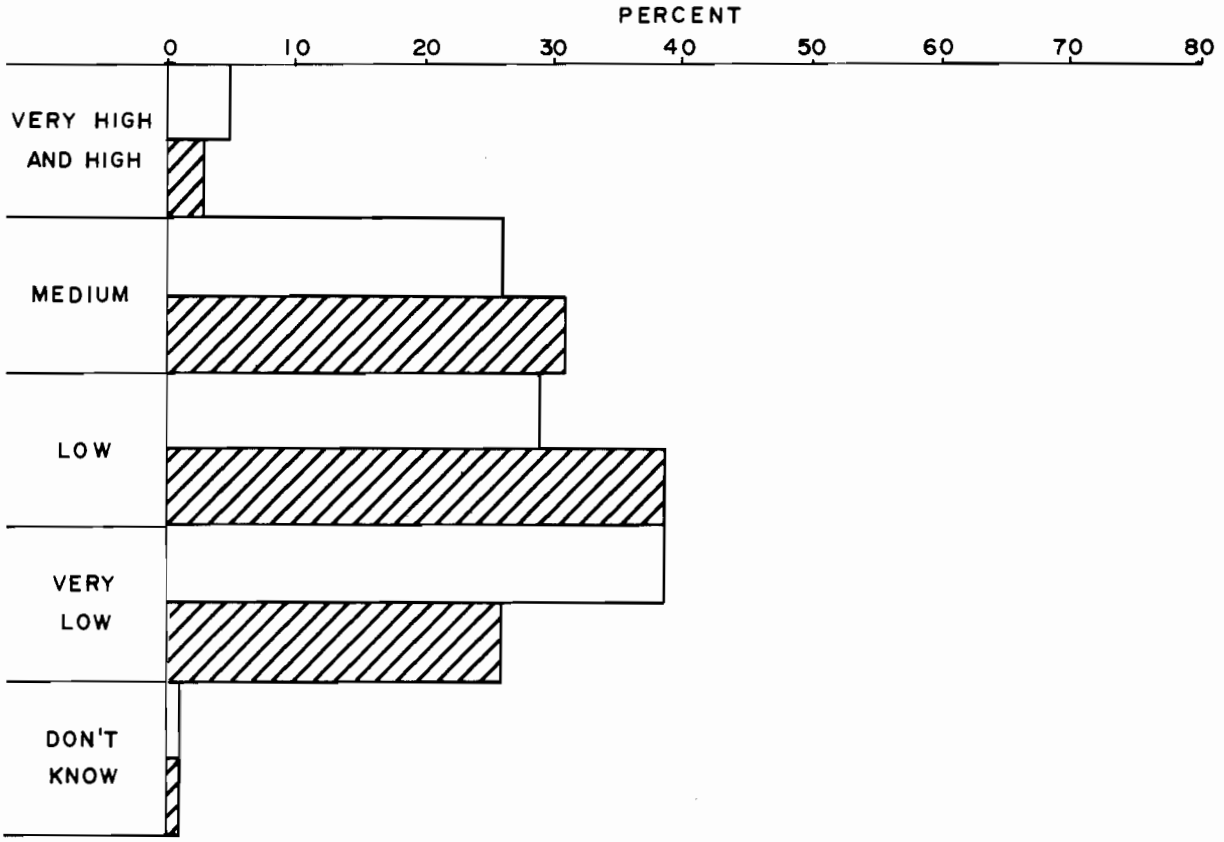
UNATTRACTIVE FEATURES OF INDIVIDUAL OKANAGAN BEACHES **Figure 5.7**



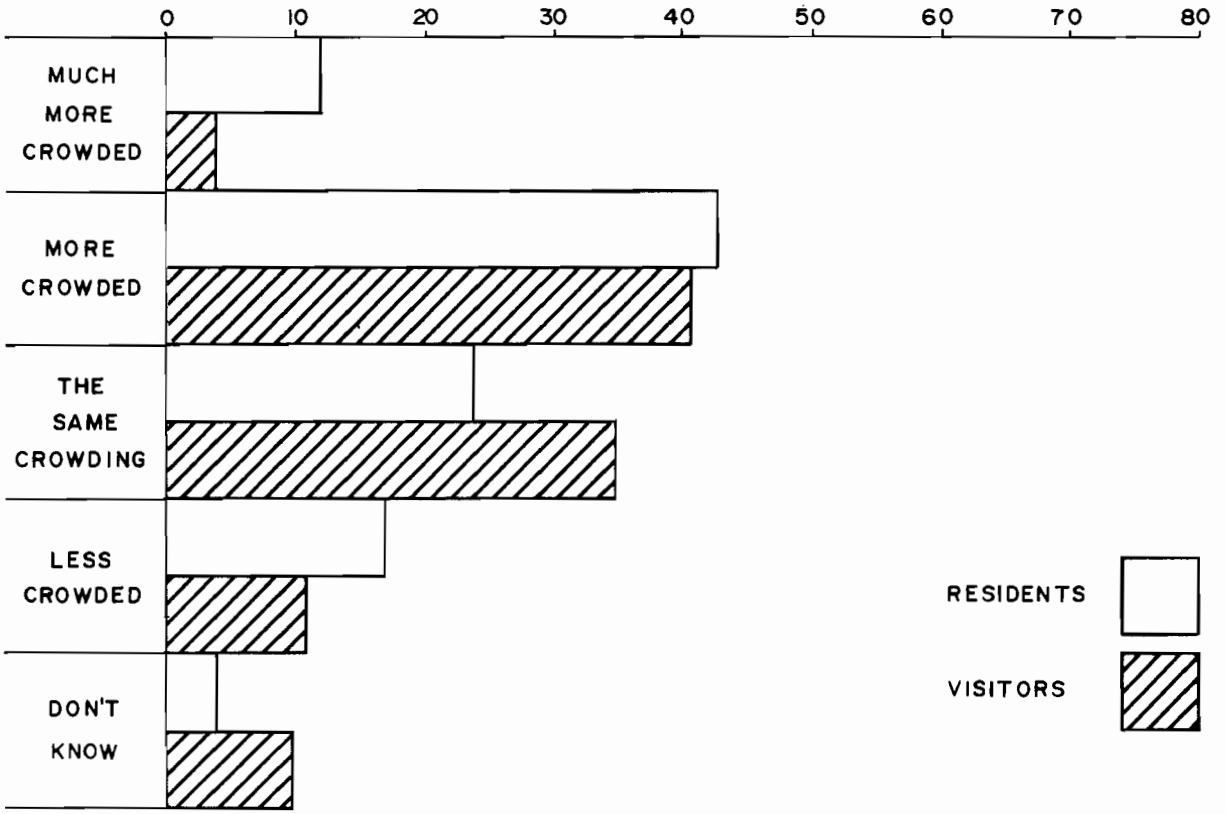
PERCENTAGES DENOTE THE PROPORTION OF RESPONDENTS WHO RANKED FEATURED FIRST.

RESIDENTS *R.* VISITORS *V.*

UNATTRACTIVE FEATURES OF OKANAGAN BEACHES IN GENERAL **Figure 5.8**



ASSESSMENTS OF BEACH CROWDING CONDITIONS Figure 5.9



ASSESSMENTS OF TRENDS IN BEACH CROWDING

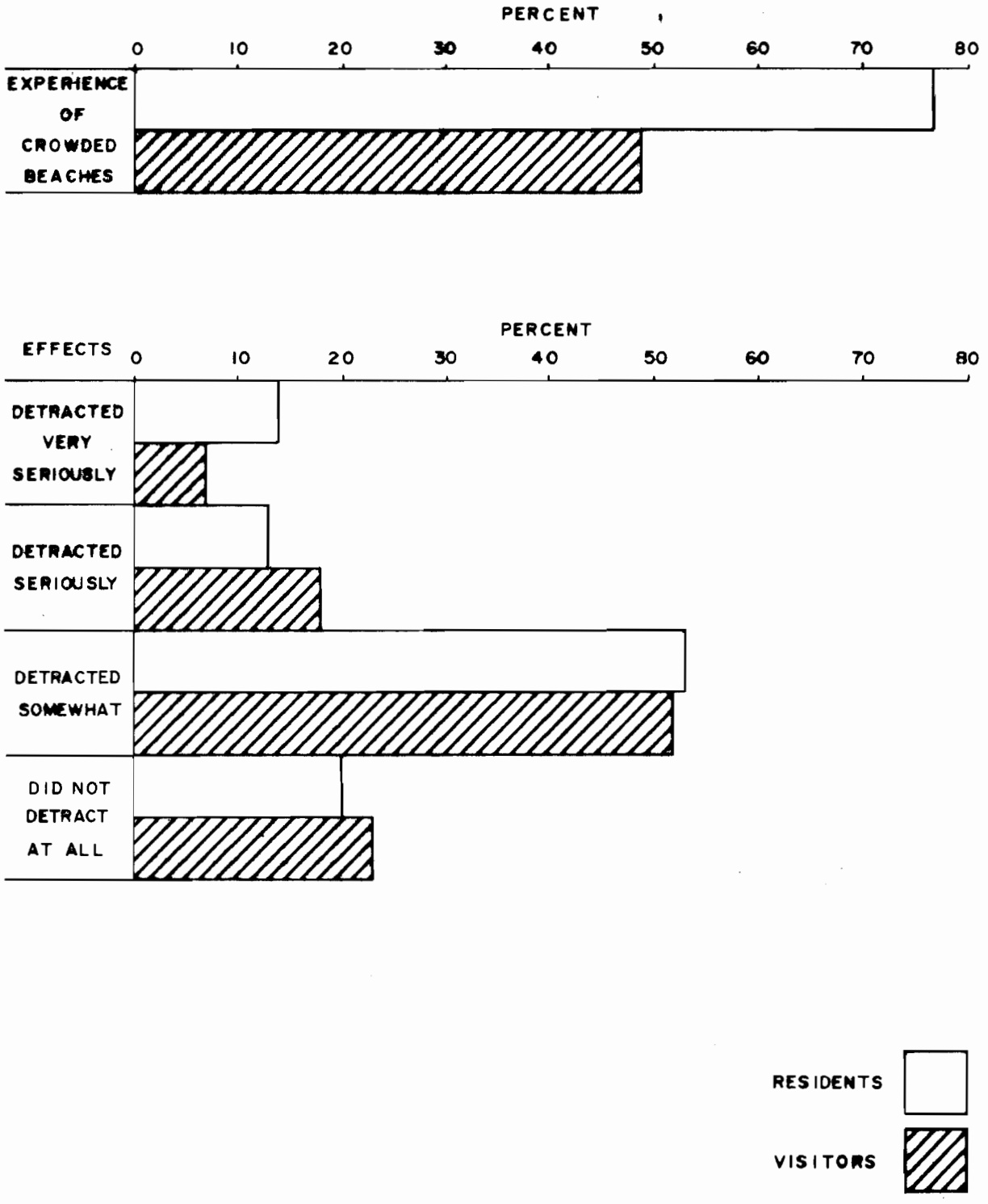
Figure 5.10

when crowding would be quite likely to occur, there are some indications that Okanagan beaches in general are not normally considered to be crowded by either resident or visitor beach users.

Respondents were then requested to assess whether the beach where they were interviewed had become more or less crowded in July and August since they had known it. A substantial proportion (14% of the residents and 37% of the visitors) were not asked for an assessment of trends in crowding because they had only limited experience of the beach. Of the remaining respondents, 55% of the residents and 45% of the visitors considered that the beach had become either more or much more crowded since they had known it (Figure 5.10).

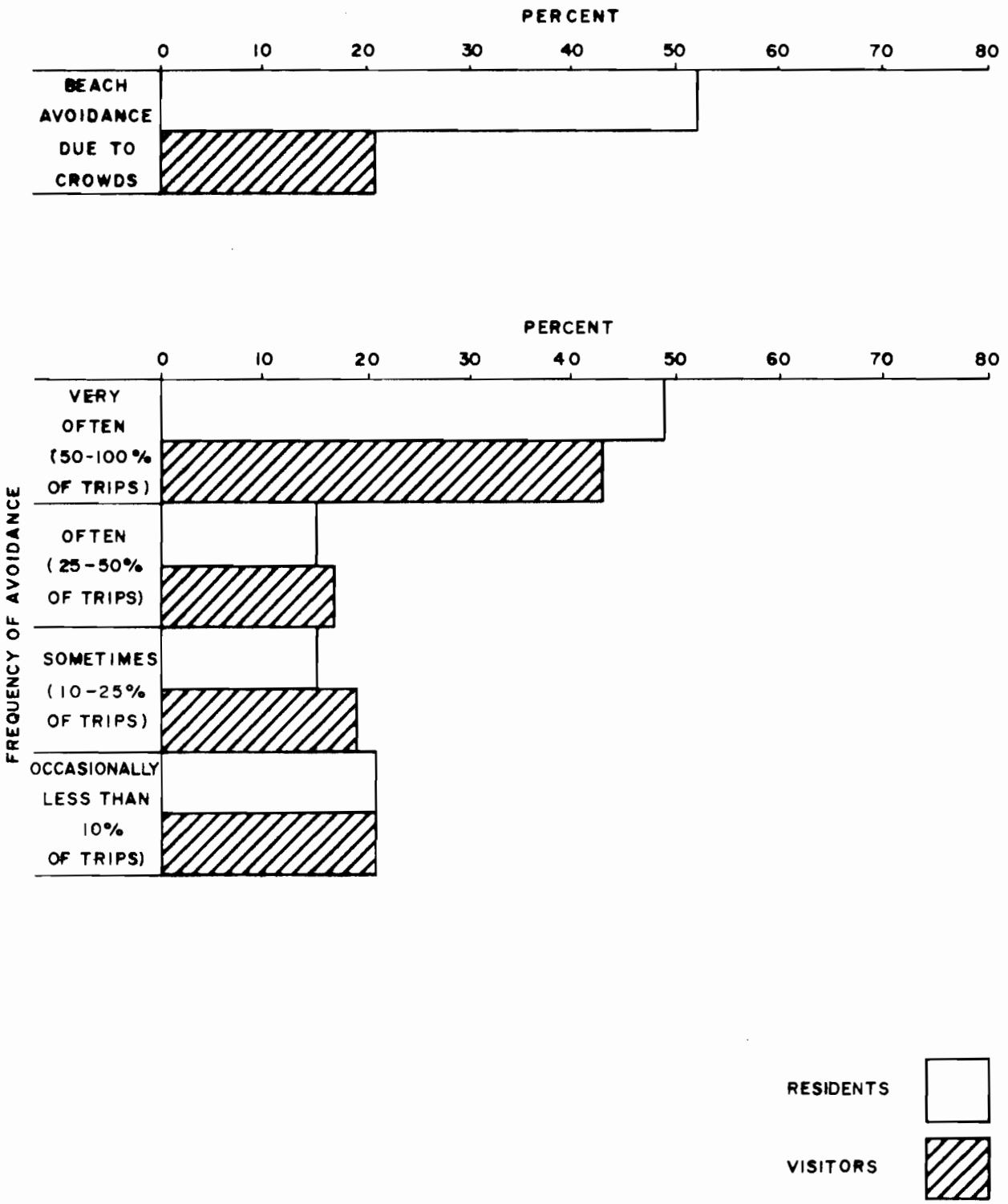
Although most Okanagan beaches are not considered to be crowded, many respondents noted they had experienced crowded conditions (This apparent contradiction is most probably a result of the manner in which the questions were phrased). Residents were more likely than visitors to have experienced crowded conditions at Okanagan beaches, over three quarters of the residents having frequented beaches they considered to be crowded compared to less than half of the visitors (Figure 5.11). Residents seemed to be somewhat more sensitive to crowding than visitors. Fourteen per cent of those residents who had experienced crowded conditions indicated that these conditions detracted very seriously from their enjoyment compared to 7% of the visitors. A substantial proportion of both residents and visitors (20% and 23% respectively) were not bothered by crowded conditions. Some respondents commented that crowds are an attractive feature of certain beaches. Thus while experience of crowding is quite widespread, the majority of beach users do not appear to be greatly concerned by the crowded conditions they have encountered.

Some beach users may rarely encounter crowded conditions because they avoid beaches which they believe will be crowded. The extent and frequency to which people avoid going to crowded beaches provide some measure of the seriousness of crowding since, in many cases, this behavioural adjustment involved inconvenience to beach users in terms of additional travel time or change of scheduling of beach use. A much higher proportion of residents than visitors had avoided going to certain beaches because of crowding. Whereas over half of the residents had avoided crowded beaches, only a fifth of the visitors had done so (Figure 5.12). Many people who avoided going to crowded beaches stayed away from them frequently. Nearly half of the residents and 43% of the visitors who avoided going to crowded beaches did so on over half of their trips to the beach. Thus, approximately a quarter of resident beach users, but less than 10% of visiting beach users frequently avoid going to beaches they believe are crowded. The beaches avoided most frequently were Skaha Beach and Okanagan Beach in Penticton, the major tourist centre in the Okanagan and City Beach in Kelowna, the main population centre.



EFFECTS OF CROWDED CONDITIONS
ON THE ENJOYMENT OF BEACHES

Figure 5.11



EXTENT AND FREQUENCY OF BEACH AVOIDANCE DUE TO CROWDED CONDITIONS

Figure 5.12

A limited number of direct observations of density patterns of beach users provided additional information on crowding at Okanagan beaches. Counts of beach users during the course of a typical summer day indicated that peak daily attendance occurs between 2 P.M. and 4 P.M. Thus a beach may be crowded for only two hours during the day. An analysis of the duration of visits to the beach suggested that many people spend less than half of the day at the beach so that a given area of beach may cater to two or more people during the day.

Maximum numbers of beach users were observed at week-ends during July and August especially on Sundays when residents and week-end visitors frequent Okanagan beaches. Peak attendance figures were obtained on long week-ends when people from major population centres outside of the Okanagan Basin arrived for a short stay. The following figures give an approximate indication of the maximum number of people observed on the sand or in the water at the major beaches at any one time during the summer of 1972;

Osoyoos Community Park	300
Skaha Lake Beach	3,500
Okanagan Beach	1,000
Sun-Oka Beach	800
Kelowna City Park	800
Kalamlka Lake Beach near Vernon	1,500

An indication of the maximum density of beach users found at Okanagan beaches was provided by counts at one of the most intensively used portions of Skaha Beach. The maximum number of people recorded in the 10,000 square foot area was approximately 100, an average of 1 person per 100 square feet of beach. It should be noted that this level of density was particularly high for an Okanagan Beach and that there were less crowded portions of the beach available at that time. Marked variations in the distribution patterns of beach users were, in fact, normally noted, the heaviest concentrations being near parking areas and concession stands.

It became apparent from comments received in the Beach User Questionnaire Survey, discussions with Okanagan residents and visitors and direct observations, that traffic congestion and crowded conditions in places such as campgrounds and beer parlours bothered many people more than crowding at beaches. It is important to note therefore that the future growth of tourism could be constrained by factors other than beach crowding. Certainly current levels of crowding at Okanagan beaches do not appear to present a problem to most beach users except during occasional peak periods of beach use.

5.4.5 Experience of and Attitudes to Extreme Fluctuations in Lake Levels

Under extreme flood or drought conditions, both Okanagan and Osoyoos Lakes may fluctuate above and below their normal ranges of four and two feet

respectively. These extreme fluctuations can have negative impacts on shoreline recreation resources, either through inundation of facilities and beaches, or exposure of unsightly lake bottoms. It was therefore necessary, in the recreation program, to attempt to assess these impacts as part of a comprehensive evaluation of water management alternatives for the main valley lakes.

Impacts of flooding around both lakes could be directly assessed in 1972, as the Okanagan Basin experienced a one in seventy year flood. Okanagan Lake rose to 1124.7 feet, almost one foot above normal maximum, while Osoyoos Lake rose to 915.4 feet, almost five feet above normal levels. Lake levels remained above normal high water levels until the end of July, by which time half of the interviews for the Beach Users Survey had been completed. Very few respondents noted that the high water was a problem. Those that did perceive a problem (10% of resident and 6% of visitor respondents), cited loss of beach area as their main concern. In view of the low or medium crowding conditions found at most beaches during the June-July interviews, this loss of beach at both lakes does not appear to be serious.

Social and environmental consequences associated with extreme low lake levels could only be assessed indirectly, as such events have not yet occurred in the Okanagan. However, water quantity studies have indicated that a recurrence of the prolonged drought which lasted from 1929 to 1932 would result in drawdowns of Okanagan Lake up to 3 feet below normal minimum water elevations of 1119.8 feet.

A significant number of residents indicated that they had experienced Okanagan Lake levels at or close to their normal minimum in spring, when the lake is drawn down to accomodate the spring freshet. Only 10% of residents thought that such levels would cause problems for shoreline recreation, citing exposure of lake bottoms as the most important impact.

Few respondents could react to the hypothetical question regarding the impacts of extreme lake drawdowns on Okanagan Lake, the most commonly cited problems including sharp dropoffs, exposure of lake bottoms and boat launching problems. In fact, a shoreline survey (See Technical Supplement I) around Okanagan Lake indicated that all public boat launching facilities and most private boat docks would be left high and dry when the level of Okanagan Lake fell to 1116.8 feet, and that at some public beaches, notably near Kelowna and Summerland, up to 1000 feet of lake bottom would be exposed. Undoubtedly, such impacts would have very significant repercussions on the tourist industry in general and the quality of shoreline recreation around Okanagan Lake in particular. An attempt to evaluate these impacts is included in the water quantity evaluation section in Technical Supplement III.

Osoyoos Lake is the only other main valley lake where drawdowns during prolonged droughts could create problems. Because of the complicated hydraulic conditions at the outlet of this lake, it is not clear how low the lake level would drop and consequently, no detail shoreline survey of low water elevations was undertaken. However, many of the same problems identified for Okanagan Lake - exposure of lake bottom , inoperable boat docks and launching facilities and sharp drop-offs - would also affect Osoyoos Lake. Again the evaluation of water management alternatives which may reduce such drawdowns is discussed in Technical Supplement III.

5.4.6 The Social Value of a Beach Day

The expenditures of tourists on their holidays in the Okanagan give some indication of how highly they value beach-oriented recreation since it is such an important holiday pursuit for them. Tourists may place social values on their enjoyment of Okanagan beaches as well as the economic values that are reflected in their holiday expenditures. Residents incur only minor direct economic costs while participating in beach-oriented recreation but they may value it highly in social terms. Since social as well as economic values are associated with the use of Okanagan beaches by visitors and residents, an attempt was made to measure these social values using the following procedures. Beach users were reminded that they pay to participate in activities such as skiing or seeing a film, and that the fees reflect their willingness to pay for such activities. They were then requested to state how much a day at the beach was worth to them in financial terms, the money reflecting the enjoyment that they derive from the beach experience. This financial figure thus represents an approximate estimate of the social values that people place upon this type of recreation.

Difficulty was encountered in gaining responses to this question. A fifth of the respondents could not translate their satisfaction into financial terms and an additional 7% could not stipulate an exact amount. Many of these respondents considered the experience to be "priceless". The median value for the remaining resident and visitor beach users was $5.33. When separate computations were conducted for residents and visitors, only very slight differences were discovered between their respective values. There was a considerable range in the responses of both residents and visitors however. For example, 11% of residents and visitors respectively stipulated a figure of $1.00 or less, while 14% of residents and 19% of visitors stipulated over $10.00.

During the questioning, visitors were not specifically reminded about their actual financial expenditures while in the Okanagan. Consequently, some visitors may not have viewed the question in the real sense of 'consumer surplus', namely the additional value over and above actual expenditues. A number did, specifically indicate a zero social value because they felt their expenditures

reflected their willingness to pay for beach recreation. Others estimated the social value as the minimum cost of alternative forms of recreation such as attending movies or taking their children to playgrounds, which they indicated they would do if beaches were not available. The apparent failure to distinguish between expenditures and social values may partly account for the similarity in social values expressed by visitors and residents.

5.5 SUMMARY AND CONCLUSIONS

Participation in beach-oriented recreation is an important facet of the life-style of most Okanagan residents and a major component of the holidays of Okanagan visitors. Both residents and visitors value their visits to the beach highly and prefer beaches that are easily accessible from their homes and places of stay.

Residents generally have frequented beaches for a longer period of time than visitors. Although visitors attend the beaches more often than residents during their stay, residents visit the beaches more frequently during the course of the summer and thus are generally more familiar with them than visitors. Some residents appear to be more selective in their choice of beach than visitors.

Clean water is the major attraction of Okanagan beaches. Satisfaction with the beaches was generally quite high but a small minority of visitors and a somewhat larger minority of resident noted that water quality problems were the most serious negative features that they had encountered at Okanagan beaches. The maintenance and enhancement of water quality in the mainstem lakes appears to be extremely important for the satisfaction of both visitor and resident beach users.

CHAPTER 6

The Role of Water Quality Conditions in the Enjoyment of Beach-Oriented Recreation

6.1 INTRODUCTION

One of the main objectives of the Beach User Questionnaire Survey was to provide information on the relationships between water quality conditions and the enjoyment of beach-oriented recreation. In addition to the 344 respondents questioned at beaches throughout the Okanagan, over 100 people were interviewed at beaches where relatively poor water quality conditions occur so that reactions to different levels of water quality could be determined. Knowledge of differences in attitudinal and behavioural responses to divergent water quality conditions constitutes the first step towards an evaluation of water quality problems on beach use and tourism. This section of the report focuses on the differences in the levels of water quality prevailing at Okanagan beaches and the influence of these conditions on the enjoyment of beach-oriented recreation.

6.2 COMPARISON OF SAMPLES

It is important to check for any significant differences in the socio-economic characteristics of the two samples of respondents located at good and poorer water quality beach sites respectively as such differences could account for variations in responses. The more important characteristics are compared in Table 6.1 and indicate a broad similarity. There were relatively more visitors than residents at the poorer water quality sites, while better water quality sites tended to be younger and have less household income. This was mainly because a higher percentage of students frequent the better quality public beaches, These differences were not tested statistically because of the small sample size of respondents at poor water quality sites (102) and the diviation from the normal statistical distribution in the statistics of both samples. However, the differences do not appear to be significant.

The sample of respondents at the poorer water quality sites was selected in the following manner. Lakes where lower water quality conditions were expected to prevail during the interviewing period of July and August 1972 were identified on the basis of information from surveys conducted by the limnology program (See Technical Supplement V. The Limnology of the Major Okanagan Lakes). One indication of the range of water quality in the five main lakes of the Okanagan Valley was provided by secchi disc readings gathered during a monitoring program in the summer of 1971.

TABLE 6.1

COMPARISON OF SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS AT GOOD AND POOR WATER QUALITY SITES

CHARACTERISTIC	RESPONDENT SAMFLE	
	GOOD QUALITY SITE %	POOR QUALITY SITE %
1. Age		
12-19	19.1	13.6
20-29	27.0	19.5
30-39	21.1	29.1
40-49	19.7	22.3
50-59	8.0	12.6
60 & over	5.1	2.9
2. Household Income		
Under $2,999	15.7	10.7
$3,000-$4,999	9.1	1.9
$5,000-$6.999	6.8	6.8
$7,000-$9,999	21.1	20.4
$10,000-$14,999	28.5	39.8
$15,000-$20,000	11.7	6.8
$20,000 & over	5.1	8.7
No Response	2.0	4.9
3. Education		
Grade 1-8	6.7	3.9
Grade 9-12	55.0	59.2
Some College or University	16.0	13.6
College or University (Completed)	15.1	17.5
Technical Training	6.8	5.8
No Response	0.4	
4. Place of Residence		
Visitors	66.9	78.4
Residents	33.1	21.6

The depth at which the disc pattern can still be seen denotes the clarity of the water. The mean value in metres for each lake was:

Wood - 2.5
Osoyoos - 3.3
Skaha - 4.5
Okanagan - 8.0
Kalamalka - 9.0

It is thus apparent that Wood Lake and Osoyoos Lake were not as clear as the other main lakes, particularly Okanagan Lake and Kalamalka Lake. Thirty four per cent of the sample located on poor water quality sites were interviewed around Wood Lake and 16% at the main public beach on Osoyoos Lake. The

remaining 50% of the respondents were interviewed at Kin Beach on Okanagan Lake near Vernon where extensive weed growth flourished.

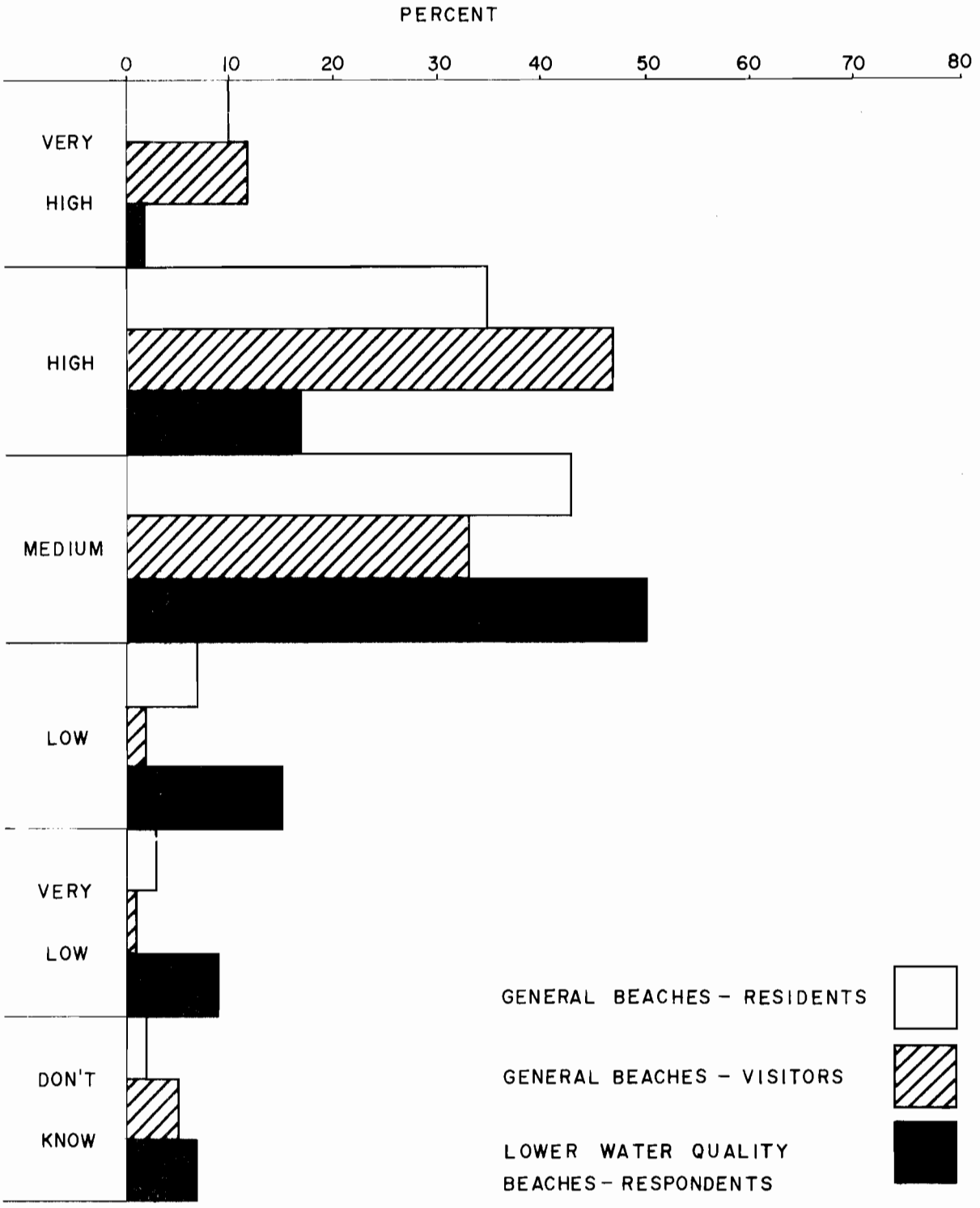
The interviewers were instructed to assess the water quality at individual beaches when people in both samples were interviewed in order to determine any significant difference in water quality between the high and low water quality sites. Five criteria - odor, floating debris, scum, weeds and murkiness were recorded, and murkiness and the prevalence of weeds were found to be particularly useful for differentiating between the two sets of beaches. Whereas only 2% of the interviews in the high quality beach sample were conducted when murkiness was rated as high, 20% of the interviews conducted at lower water quality beaches were taken when the water was considered to be very murky. Only 4% of the interviews at the good water quality sites were conducted when weed growth was rated high, while nearly half (47%) of the interviews at the lower quality beach sites were taken under high or very high weed growth conditions. Although the interviewers generally rated the water quality at the lower quality beaches as actually being lower than those prevailing at the general beaches, half of the lower water quality beach respondents were interviewed under medium, not poor, water quality conditions. The lack of widespread, very poor water quality conditions during the interviewing period made it impossible to attempt a full assessment of beach users' reactions to contrasting levels of water quality in the Beach User Questionnaire Survey.

6.3 RESULTS

6.3.1 Assessments of Current Water Quality Conditions and Trends in Water Quality

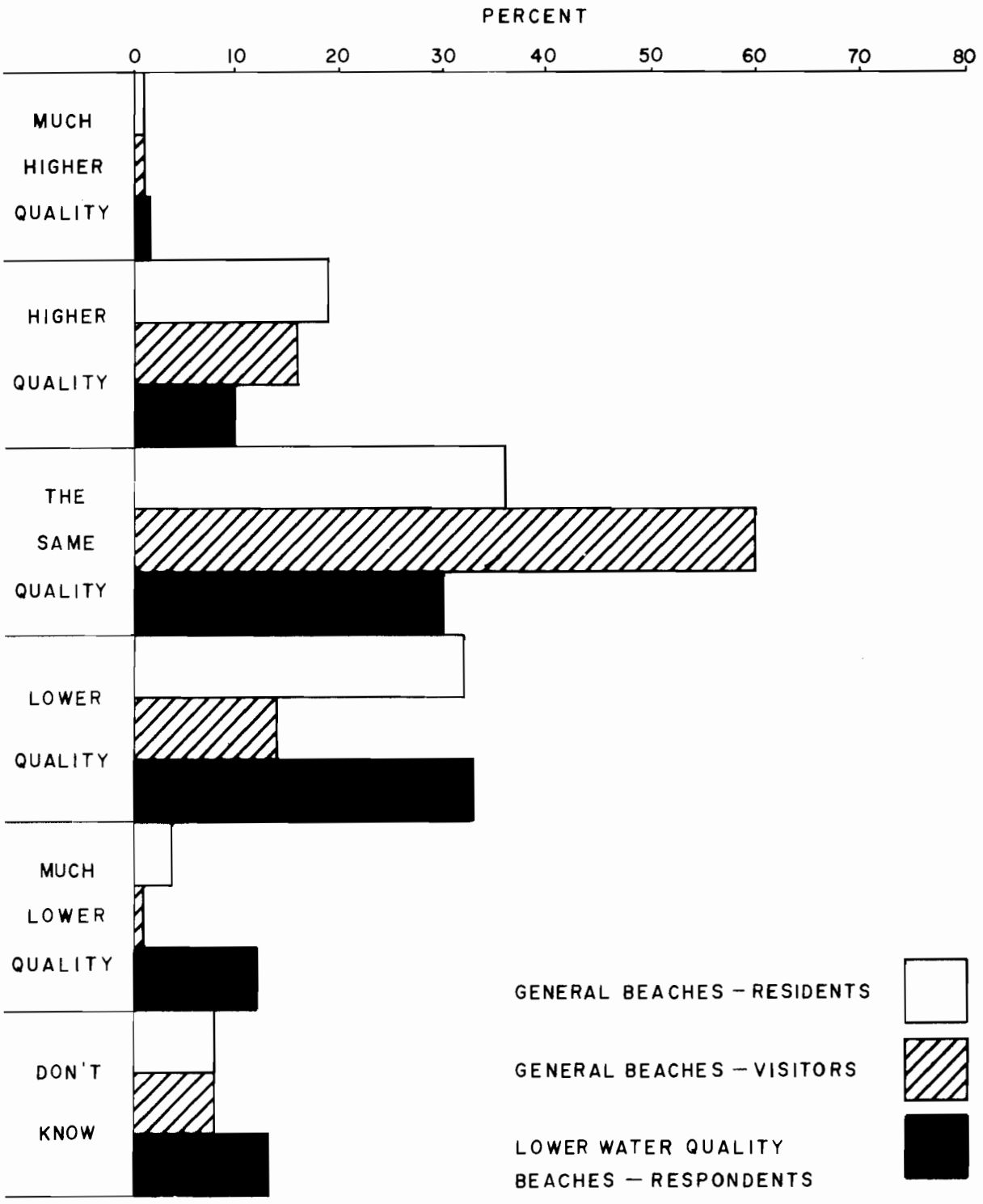
People at most public beaches in the Okanagan during July and August 1972 appear to have been generally content with the prevailing water quality conditions although a small minority of residents were critical of these conditions. Only 3% of the visitors in the sample located at the good water quality sites rated the water as low or very low at the times when they were interviewed compared to 10% of the residents (Figure 6.1). People at lower water quality sites tended to perceive the water there as being relatively low in quality, 24% of them rating it as low or very low.

Fourteen per cent of residents and 37% of visitors questioned at good quality beaches could not make an assessment of trends in water quality at the beach where they were interviewed because of their limited experience of the beach. Of the remaining respondents, residents were more likely than visitors to judge that the water quality had deteriorated. Thirty six per cent of the residents noted that the water quality had become lower or much lower since they had known the beach, compared to 15% of the visitors (Figure 6.2). The majority of the visitors (60%) and a substantial proportion (36%) of the residents had not noticed any changes in the quality of the water. Forty per cent of the respondents interviewed at lower water quality beach sites were not asked to give an assessment because of their limited knowledge of the



ASSESSMENTS OF WATER QUALITY

Figure 6.1



ASSESSMENTS OF TRENDS IN WATER QUALITY

Figure 6.2

beach. Of the remaining respondents, 45% noted that the water had become lower or much lower in quality since they had known the beach. Thus people at poor quality sites were more likely to have noted a deterioration in water quality than people at Okanagan beaches in general.

6.3.2 Experience of Poor Water Quality Conditions and their Effects on the Enjoyment of Beaches

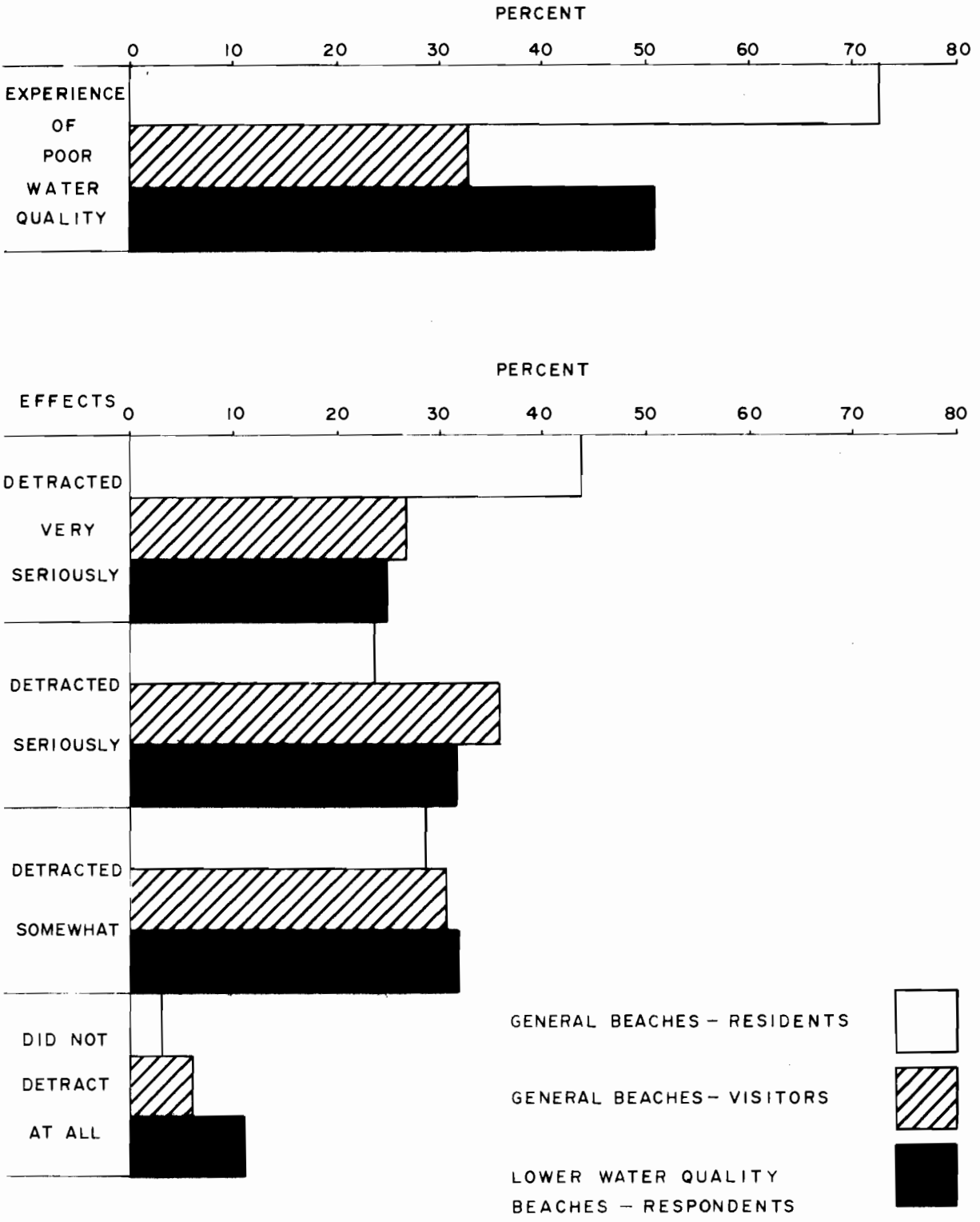
Residents are much more likely than visitors to have had previous experience of poor water quality conditions at Okanagan Beaches. Nearly three quarters of the residents had experienced those conditions compared to a third of the visitors (Figure 6.3). Respondents located at lower water quality sites, (mainly visitors) were more likely than visitors at the good water quality sites to have experienced poor water quality conditions elsewhere in the Okanagan, half of them having done so.

Residents appear to have been more seriously influenced than visitors by poor water quality conditions. Forty-four per cent of those residents who had experienced water quality problems stated that these conditions had detracted very seriously from their enjoyment compared to 27% of visitors. This suggests that residents were somewhat more sensitive than visitors to water quality problems. The respondents located at lower water quality sites were broadly similar to the visitors at the high water quality sites in their responses.

6.3.3 Beach Avoidance Due to Poor Water Quality Conditions

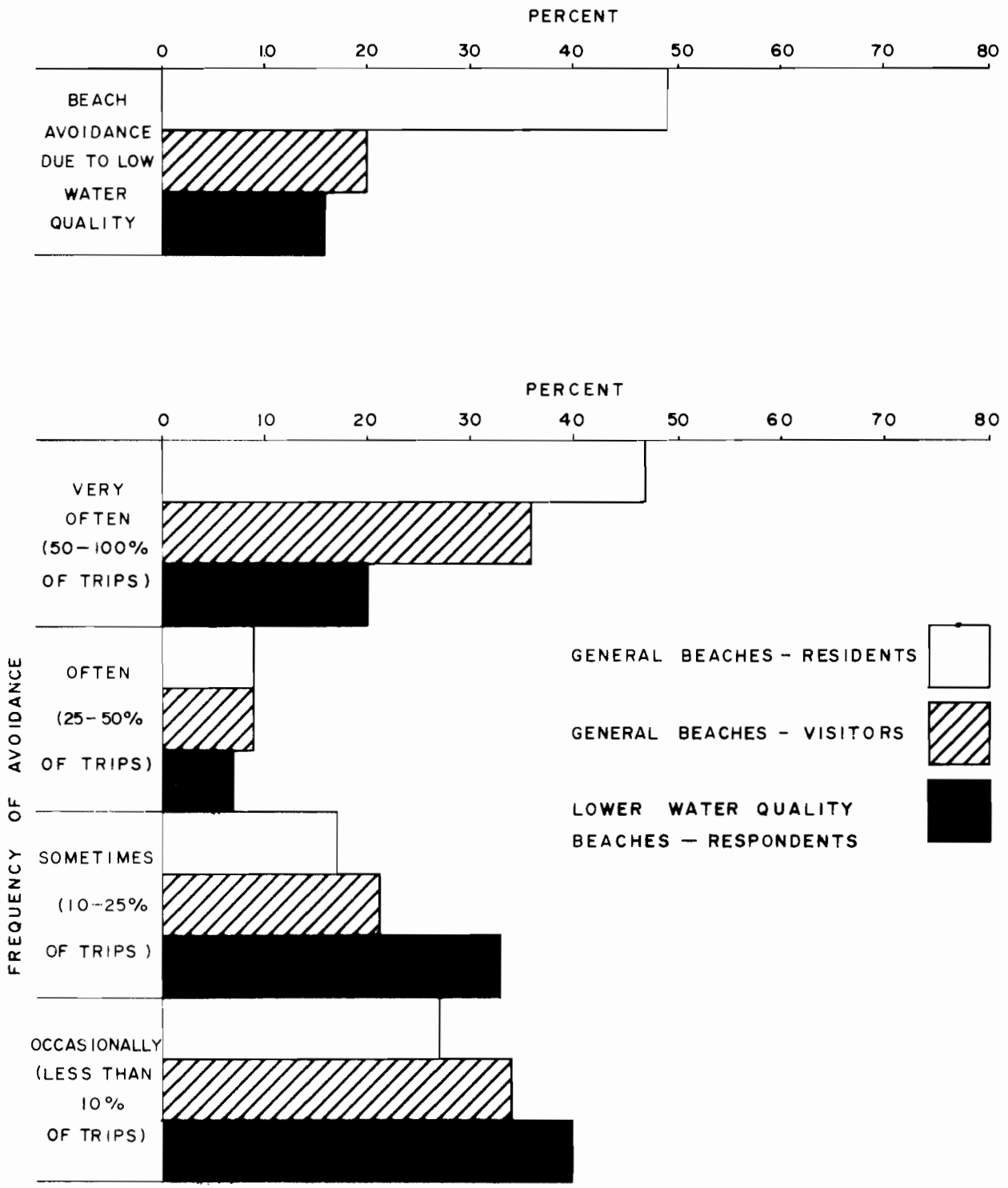
Residents were much more likely than visitors to have avoided going to beaches where they expected poor water quality conditions to prevail. Nearly half of the residents avoided such beaches compared to 21% of the visitors (Figure 6.4). Only 16% of the people located at the lower water quality sites had avoided any Okanagan beach because of water quality problems. Of those respondents who had avoided beaches due to poor water quality conditions, 47% of the residents and 36% of the visitors located at high water quality sites had done so on over half of their trips to the beach compared to only 20% of the respondents at the lower water quality sites. It should be noted however, that some respondents were avoiding individual beaches for a variety of reasons such as crowding, low beach quality and low water quality, rather than only one reason. The results should perhaps be viewed as portraying the extent and frequency of avoidance for a number of reasons, including water quality considerations, rather than simply portraying reactions to poor water quality conditions *per se*.

One public beach - Kin Beach located on Okanagan Lake near Vernon, probably acts as a major deterrent to potential beach users. At a similar distance from Vernon on Kalamlaka Lake is another beach area which is normally frequented by considerably more people (Figure 6.5). Half of the interviews at



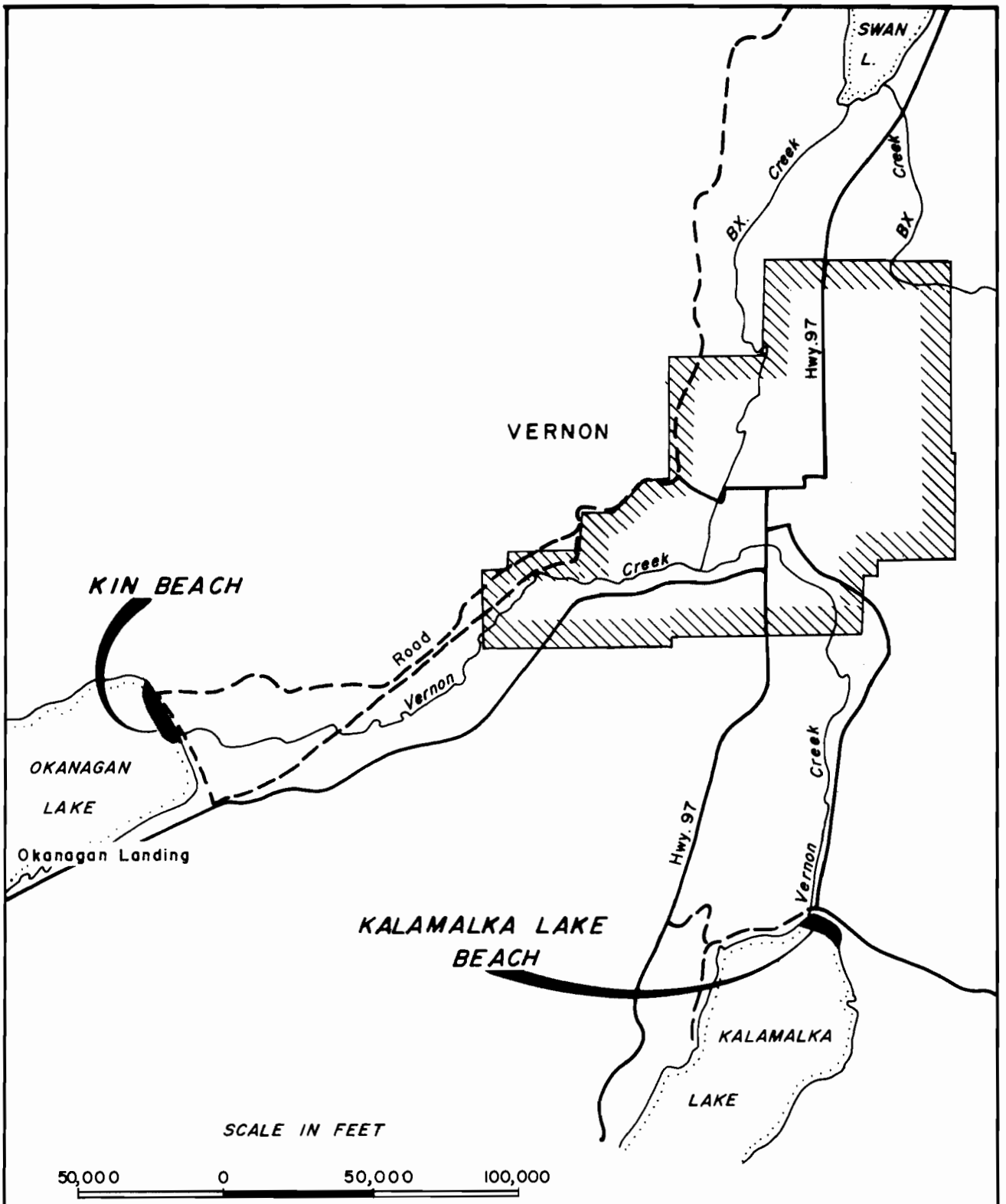
EXPERIENCE OF POOR WATER QUALITY
AND ITS EFFECTS ON THE ENJOYMENT OF BEACHES

Figure 6.3



EXTENT AND FREQUENCY OF BEACH AVOIDANCE DUE TO POOR WATER QUALITY

Figure 6.4



LOCATION MAP OF KIN BEACH AND KALAMALKA LAKE BEACH

Figure 6.5

Kalamalka Lake beach were conducted when crowding was rated as high by the interviewers while three quarters of the interviews at Kin Beach occurred under low or very low density conditions. This discrepancy in attendance is considered to be largely due to the contrasting water quality conditions at the two beaches. Kalamalka Lake is one of the clearest lakes in the Okanagan, while the water at Kin Beach contains heavy concentrations of weeds which tend to wash up onto the beach. The occurrence of aquatic plant growth was rated as high or very high by the interviewers when 80% of the Kin Beach respondents were selected. In view of the marked water quality problem at Kin Beach, it was decided that half of the respondents samples at lower water quality sites should be selected from this beach.

Fifty-one respondents were selected at Kin Beach, two thirds of whom were visitors. Over half (53%) of the respondents at Kin Beach were visiting it for the first time compared to 31% of the respondents visiting other public beaches throughout the Okanagan. Nearly two thirds (64%) of the respondents mentioned low water quality as an unpleasant feature of the beach in response to an open question compared to only 10% of respondents at high water quality sites. When asked to assess the quality of the water, 38% of the Kin Beach respondents rated it as low or very low. The corresponding proportion for those located at high water quality sites was only 5%. Fifteen per cent of the respondents at Kin Beach indicated that they had not been in the water because of its conditions and 8% said that they would not return there to swim or return to the beaches because of the water quality problems.

Discussions with the Kin Beach respondents and an analysis of their responses to other questions indicated that most of the visitors were using it because it is conveniently located near a campsite where they were staying, while the residents were from nearby areas or had travelled from Vernon to find an uncrowded beach. Some of the respondents in fact, appeared to be more tolerant of the low water quality conditions at this beach than of crowding at other beaches. Most respondents were, however, aware of the weed problem prior to visiting the beach and were disconcerted by it. During the interviewing period a weed harvester was employed to cut and dispose of some of the weeds. Many of the beach users were pleased to note these efforts to solve the problem and were keen to see a permanent solution of the excessive weed growth.

6.3.4 General Satisfaction with Water Quality Conditions, the Importance of High Water Quality in the Enjoyment of Okanagan Beaches and the Decision to Return

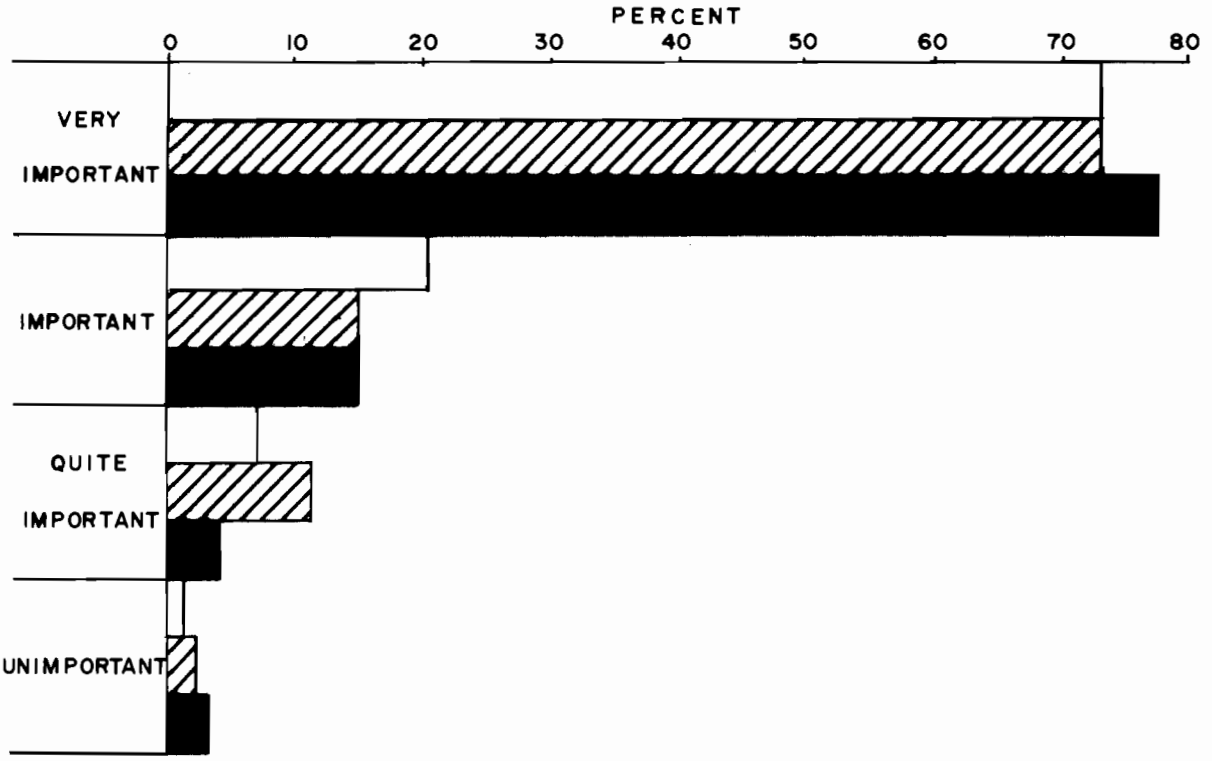
Although avoidance of some beaches appears to have been practised frequently by approximately a quarter of resident beach users and a small proportion of visitor beach users, there were a number of additional indices which suggested that generally recreationists were quite satisfied with the water quality conditions they encountered at most Okanagan beaches in 1972.

Over half (52%) of both residents and visitors samples interviewed at the high water quality sites had been in the water prior to the interview and a further 28% of them stated that they intended to enter the water later in the day. Only 1% of the residents and visitors cited poor water quality conditions as a reason for not going into the water. Even at the lower water quality sites only 6% of the respondents would not swim because of the poor water quality conditions. Thus water quality conditions prevailing at most public beaches in the Okanagan during July and August, 1972 seem to have been acceptable for swimming to the vast majority of beach users.

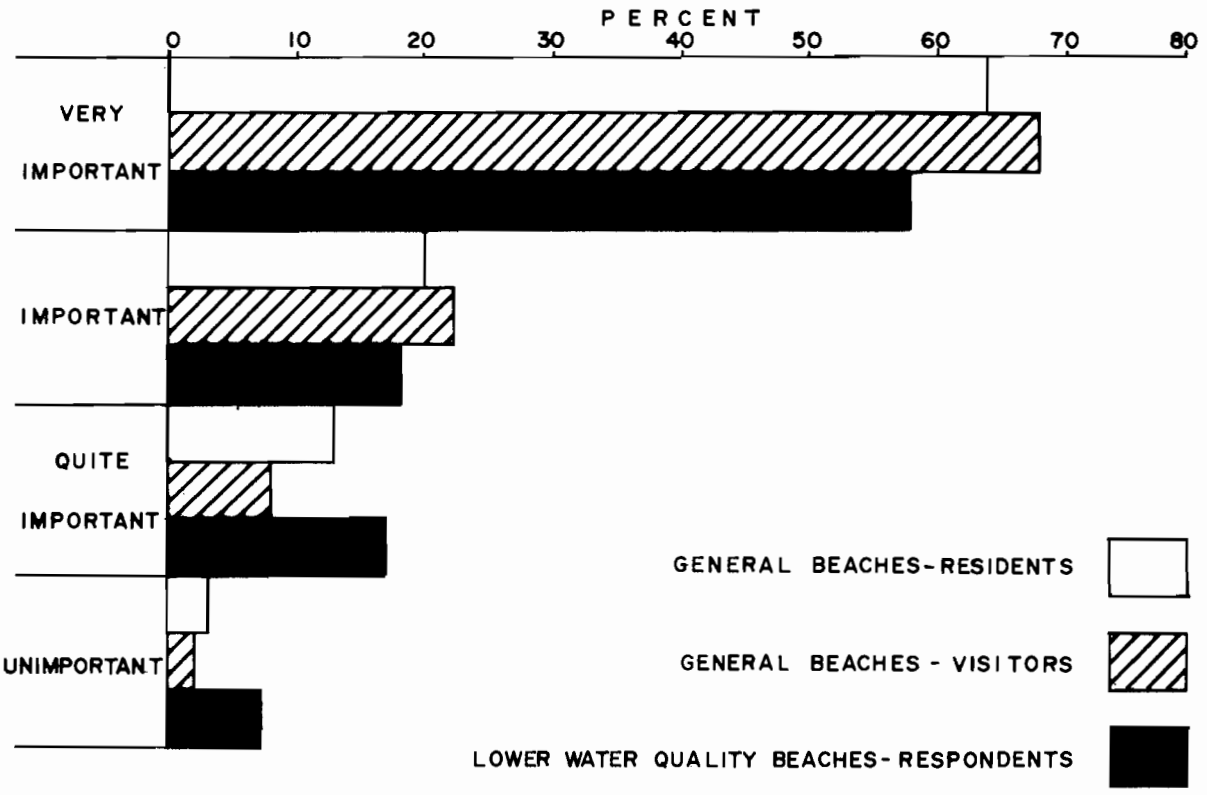
Approximately 85% of all the respondents who were familiar with the beaches had recommended friends to visit the beach where they were interviewed. None of the respondents had failed to recommend the beach specifically because of poor water quality conditions. Only 3% of the respondents located at the high water quality sites thought that they would not return to the beach where they were interviewed in the next few years, and only one or two residents said that they would not return there due to the water quality conditions prevailing at the time of the interview. The vast majority of beach users are sufficiently satisfied with the Okanagan beaches to recommend them to friends and to wish to return to them in the future. The extreme importance of high water quality to the enjoyment of Okanagan beaches and decisions to return to them is indicated in Figure 6.6 and 6.7. The majority of respondents in both samples considered that high water quality was very important to them in their decision to return to the beach and their enjoyment of Okanagan beaches in general. This result should be intrepreted with some care as the question - "how important is water quality in your decision to return" - places some moral obligation on the respondent to answer positively.

6.3.5 Willingness to Pay for Additional Sewage Treatment

Beach users were asked how much they would be willing to pay for improved sewage treatment facilities. Their response could be intrepreted as a measure of the value they place upon high standards of water quality. Respondents were asked to imagine that they were Okanagan taxpayers in households with annual incomes comparable to those of their own. They were presented with a list showing average monthly and annual expenditures of a typical Okanagan household on certain utilities and services in order to place the current costs of sewage treatment into perspective. The list is presented below. They were then requested to stipulate that maximum amount that they would be willing to pay to maintain present levels of water quality if they were informed that higher sewage treatment costs were necessary to achieve this objective. The interviewer was instructed to bid upwards in increments of $1.00 per month ($12.00 per year) and to record the maximum amount that the respondent was willing to pay as a taxpayer (See Table 6.2).



IMPORTANCE OF HIGH WATER QUALITY
IN ENJOYMENT OF BEACHES Figure 6.6



IMPORTANCE OF HIGH WATER QUALITY
IN DECISIONS TO RETURN TO BEACHES Figure 6.7

TABLE 6.2

MONTHLY AND ANNUAL EXPENDITURES OF A TYPICAL OKANAGAN HOUSEHOLD ON SELECTED UTILITIES AND SERVICES

	Per Month ($)	Per Year ($)
Natural Gas	$ 11.50	$ 138.00
Electricity	8.50	102.00
Telephone	5.50	66.00
Water	5.00	60.00
Sewage Treatment	5.00	60.00
Cablevision	5.00	60.00
Fire Protection	3.00	36.00
Garbage Collection	1.25	15.00

The purpose of the question was to gain an indication of the value placed upon high standards of water quality rather than a precise financial statistic. As the visitors and many of the residents were not taxpayers, the question may have been difficult to answer so care should be taken in intrepreting the results. While the financial figure derived does not purport to represent actual amounts taxpayers would be willing to contribute if faced with a referendum on the issue, it does indicate whether people are willing to pay amounts which are in keeping with the costs of necessary improved sewage treatment facilities.

Approximately 15% of the residents and visitors respectively questioned at the high water quality sites were unable to specify how much more they would be willing to pay. Only 4% of the residents and 7% of the visitors indicated that they would not be willing to pay any extra money for sewage treatment. The median value for the combined responses of residents and visitors who answered the question was $5.00 extra per household per month, or $60.00 extra per household per year. Separate computations for residents and visitors located at the high and low water quality sites respectively, indicated that the median value for each group was also approximately $5.00 per month. This constitutes a doubling of the present (1972) average current cost per household and suggests that beach users place a significant value on clean water. It is interesting to note that the estimated costs of necessary improved sewage treatment measures for the major urban centres of the Okanagan Basin fall well within these limits.

6.4 SUMMARY AND DISCUSSION

The levels of water quality prevailing at most Okanagan beaches during the summer of 1972 appear to have been acceptable to the vast majority of resident

and visitor beach users. Previous and current localized water quality problems have given rise to considerable concern on the part of beach users however. Over one third of the residents believe that the water quality has declined at the beach where they were interviewed and nearly three quarters of the residents and one third of the visitors have experienced poor water quality at Okanagan Beaches. These conditions detracted seriously or very seriously from the enjoyment of the beach in approximately two thirds of the cases. Residents were more likely to have avoided beaches because of the water quality problems and did so more frequently than visitors.

The differences between the responses of resident and visitor beach users to water quality questions are probably due in part to the greater familiarity of residents with Okanagan beaches. The results do suggest however, that resident beach users are also somewhat more sensitive to water quality problems than visitor beach users. It appears that people interviewed at the lower water quality sites are generally more tolerant of relatively low water quality conditions than other resident and visitor beach users. All the same, the vast majority of all beach users place a very high value on having good water quality conditions for the enjoyment of beach-oriented recreation.

CHAPTER 7

The Impacts of Water Quality Problems and Publicity on Tourists and the Tourist Industry

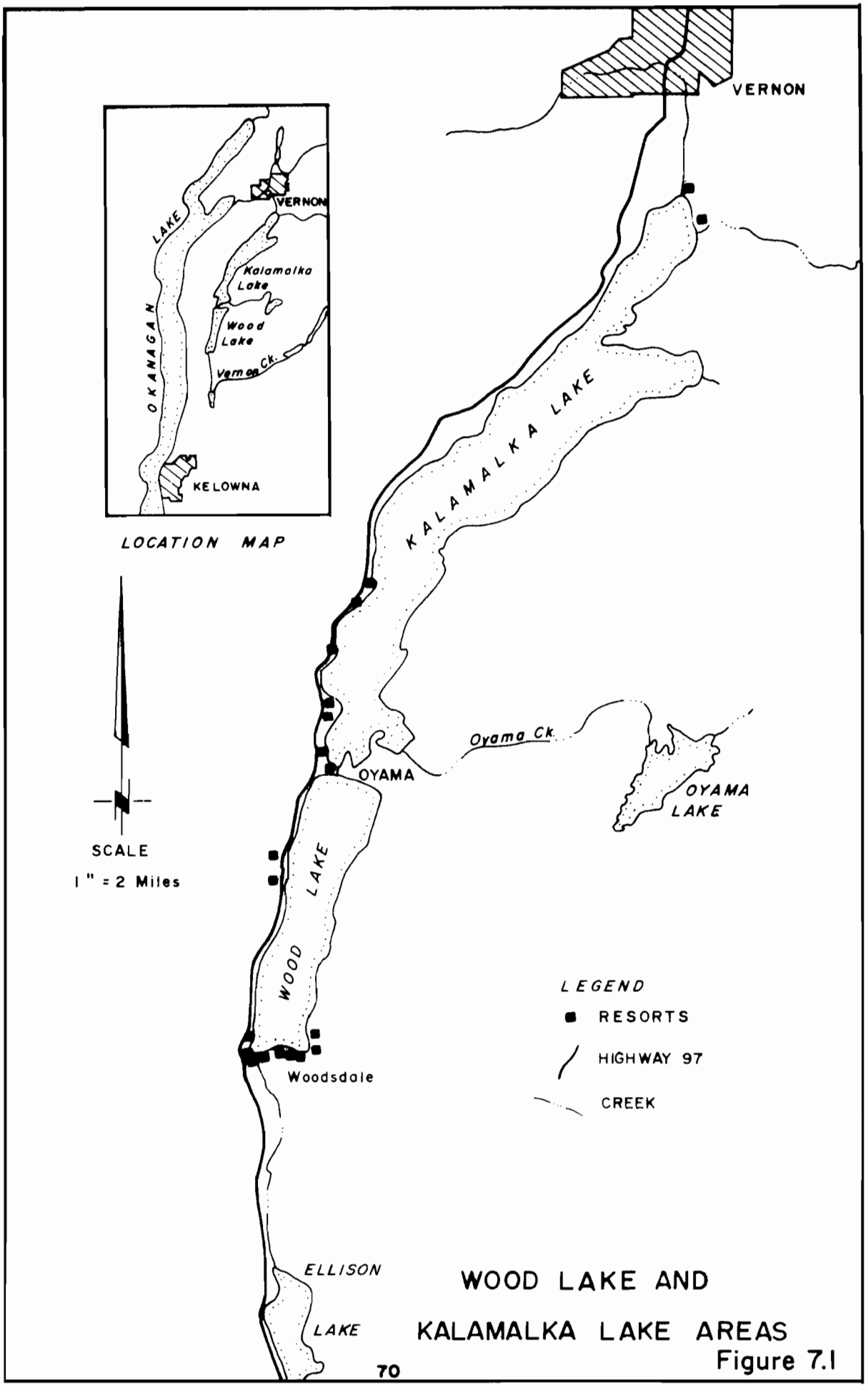
7.1 INTRODUCTION

Three closely interrelated surveys were conducted in order to determine the reactions of tourists to water quality problems in Wood Lake and the resulting economic and social impacts on the owners of local resorts. Background information on the tourist trade of the Wood Lake area and the water quality problems experienced there is provided as an introduction to the individual surveys. The objectives, scope and data gathering techniques of each of the surveys are outlined in the subsequent methodology section which precedes the presentation of the major findings of the surveys.

Wood Lake is situated about 15 miles north of Kelowna, approximately half way between Kelowna and Vernon immediately to the east of Highway 97. It is connected to Kalamalka Lake by a short canal which crosses a narrow strip of land separating the two lakes (Figure 7.1). There are eleven resorts around Wood Lake, nine of them on the lakeshore at the south end. The other two resorts are on the west side of the highway and thus do not have direct access to Wood Lake. In addition, there are two resorts on the narrow strip of land between Wood and Kalamalka Lakes. Both have access to a beach at the north end of Wood Lake and one has a beach on Kalamalka Lake and is thus oriented more towards Kalamalka than Wood Lake. There are seven resorts around Kalamalka Lake, two of which are near Vernon at the northern end of the lake.

Seven of the eleven Wood Lake resorts have motel and cabin units and vary in size from six to fifteen units, to cater exclusively to campers while the remaining two have both motel/cabin and tent/trailer customers. Several of the resorts provide services such as a store and boat rentals but in most cases these are not major sources of revenue. Some of the Wood Lake resorts cater to passing trade, particularly those resorts located on Highway 97. Most of them however, rely heavily on the repeat trade of regular family customers.

Wood Lake is the most eutrophic (high biological production) of the five major main valley lakes. The water in Wood Lake is generally less clear than in the other lakes during the summer months and experiences annual algae blooms and localised weed problems. By way of contrast, neighbouring Kalamalka Lake is the most oligiotrophic (low bilogical production) of the main valley lakes and it is renowned for its clarity and brilliant colours. Wood Lake experienced a series of water quality problems in 1970 and 1971 which received con-



WOOD LAKE AND
KALAMALKA LAKE AREAS
Figure 7.1

siderable publicity. In the summer of 1970, a small public beach at the south end of the lake was posted by the South Okanagan Health Unit as being unfit for swimming because of excessively high coliform counts. In June 1971 it was suggested in the news media that beaches at two resorts and the public beach might be similarly posted. Since high coliform counts are indicative of a potential health hazard, they may generate serious concern not only on the part of recreationists considering swimming at the posted beach, but also on the part of recreationists at nearby lakeshore resorts. In July 1971 a series of algae blooms discoloured the water of Wood Lake. Some of the discoloured water flowed into the extreme southern portion of Kalamalka Lake via the canal. These events received widespread publicity in the news media in the main urban centres of British Columbia and Alberta, from which many of the tourists to the Wood Lake resorts come, as well as in the local news media. The contrast in the conditions of the water in the two lakes lent itself to vivid descriptions by the news media as can be seen in the following excerpt from the major newspaper of British Columbia (The Vancouver Sun. Saturday, July 31, 1971 p. 29. "Case of Sullied Kalamalka Lake. Okanagan Sleuths Probe Ecological Whodunit".):

> "The Wood Lake people watched in dismay as their own shrine turned from a plain but pleasant dark blue to a deathly grey and then murky brown in a series of algae blooms.
> From the air the two lakes look like a double kitchen sink, with Wood Lake holding the dirty dishwater and Kalamalka the sparkling clear rinse water.
> So far, the dishwater has spilled over only into a small bay here at the south end of Kalamalka, leaving the rest of her beauty unblemished."

These divergent water quality conditions provided an opportunity to test for differences in the reactions of tourists staying at resorts around the two lakes to such conditions by means of a questionnaire survey conducted immediately after the algae blooms had occurred. During the summer of 1972, guests staying at lakeshore resorts on Wood Lake were selected as part of the sample in the Beach User Questionnaire survey located at poor water quality sites. Their responses provided a check against the results of the preceding survey and allowed variations in reactions over time and under changing water quality conditions to be noted. In September 1972, an interview survey was conducted among past and present Wood Lake resort owners and an analysis of their business records was undertaken in order to determine the magnitude and distribution of any economic and social costs associated with reductions in the number of customers due to the water quality problems of 1971 and resulting publicity. There were thus strong linkages between each of the three surveys. The exercise was particularly valuable as it formed a basis for evaluating the possible affects should more widespread water quality problems occur in the main valley lakes.

7.2 METHODS

7.2.1 The Questionnaire Surveys Conducted Among Resort Customers

During the peak of the algae blooms in late July 1971, people staying at resorts around Wood Lake were questioned about the impacts of the poor water quality conditions on their enjoyment of the beaches at the resorts. A questionnaire was designed on the basis of these interviews and was pretested on 32 people, staying at resorts around Wood Lake and Kalamalka Lake during early August. The questionnaire was revised in the light of their responses and interviewing commenced in mid-August. The survey was designed to determine the characteristics of tourist who stay at resorts around Wood Lake and to discover whether they held different attitudes from respondents at Kalamalka Lake resorts towards the importance of good water quality in beach-oriented recreation.

A total of 115 interviews were conducted, 63 from nine resorts around Wood Lake and 52 from seven resorts around Kalamalka Lake. If the resorts had been completely full, the samples would constitute 18% of the Wood Lake and 11% of the Kalamalka Lake tourist "unit population", each motel or campsite unit containing an average of four or five people. Since all units, (particularly at Wood Lake resorts) were not full, the samples contained somewhat greater proportions of this tourist "unit population".

Although a broad cross-section of tourists was contacted, there were some important limitations in the survey. Most of the respondents were interviewed when water quality conditions had improved appreciably over those prevailing during the algae blooms. In addition, tourists who stayed only a short time at resorts around Wood Lake and may have been particularly sensitive to the poor water quality conditions, stood relatively less chance of being selected than more tolerant customers who stayed longer. In spite of these limitations, the survey did document differences in the attitudes of tourists towards water quality in Wood Lake and Kalamalka Lake.

Thirty five respondents were selected at random on the beaches of lakeshore resorts around Wood Lake as part of the sample located at poor water quality sites in the Beach User Questionnaire survey. Their responses provided additional information on the reactions of tourists to water quality conditions at Wood Lake and allowed an assessment to be made of the nature of any changes that had occurred in the characteristics of the resort customers because of the water quality problem in the previous summer. In view of the small sample size of 35 respondents, care was exercised in drawing conclusions from the results. The replies of the 230 visitors in the sample at high water quality sites were available for comparative purposes and served as a partial check on the validity of the responses of the smaller sample.

7.2.2 The Questionnaire and Accounting Survey Conducted Among Resort Owners

During and after the algae blooms in the summer of 1971, some resort owners around Wood and Kalamalka Lakes were interviewed informally to gain a preliminary assessment of their feelings about the possible influence of the water quality problems and resulting publicity on their businesses. During June of 1972, several resort owners in the area were questioned in more detail about such effects and from these discussions a more formal questionnaire was devised. This questionnaire was conducted among all present Wood Lake resort owners and the six Wood Lake resort owners who had sold their businesses in 1970 and 1972. In addition, interviews were conducted with five of the seven Kalamalka Lake resort owners for comparative purposes.

The interviews were conducted in September 1972 when some information on revenue from the 1972 tourist season was available and the resort owners had more time to be interviewed. Each interview lasted approximately one hour and a half and was supported by an in-depth analysis of the resort's business records. This involved a study of tourist registers, registration cards, occupancy rate charts and reports by accountants. Resorts which provide motel and/or cabin accomodation are subject to a direct tax on their monthly revenues. A calculation was made of the revenues in July and August 1971 and 1972 for these types of resorts around the two lakes respectively, on the basis of amalgamated tax data for the two groups of resorts to check these data.

The interview and accounting surveys resulted in the compilation of a comprehensive dossier of information on each Wood Lake resort and most of the Kalamalka Lake resorts. Key data were the occupancy rates and tourist revenues over the last five years, especially in 1970, 1971, and 1972, the years in which water quality problems and publicity may have had negative impacts on accomodation. If the business of resorts was stable or increasing around Kalamalka Lake, but declining around Wood Lake, then these differences could be attributed to local conditions rather than provincial or regional trends. The main difficulty was in deciding whether estimated economic losses of resorts around Wood Lake should be attributed solely, or only in part, to the water quality problems. However, the use of in-depth interviewing in conjunction with the accounting survey enabled other influences to be identified and discounted from the analysis.

7.3 THE RESULTS OF THE QUESTIONNAIRE SURVEYS OF RESORT CUSTOMERS

7.3.1 Reactions to Water Quality Conditions

In order to discover the relative importance of water quality conditions as a feature of beach-oriented recreation at Wood Lake and Kalamalka Lake, respondents in the questionnaire survey conducted in 1971 were asked the open-ended question, - "What features do you find particularly attractive about

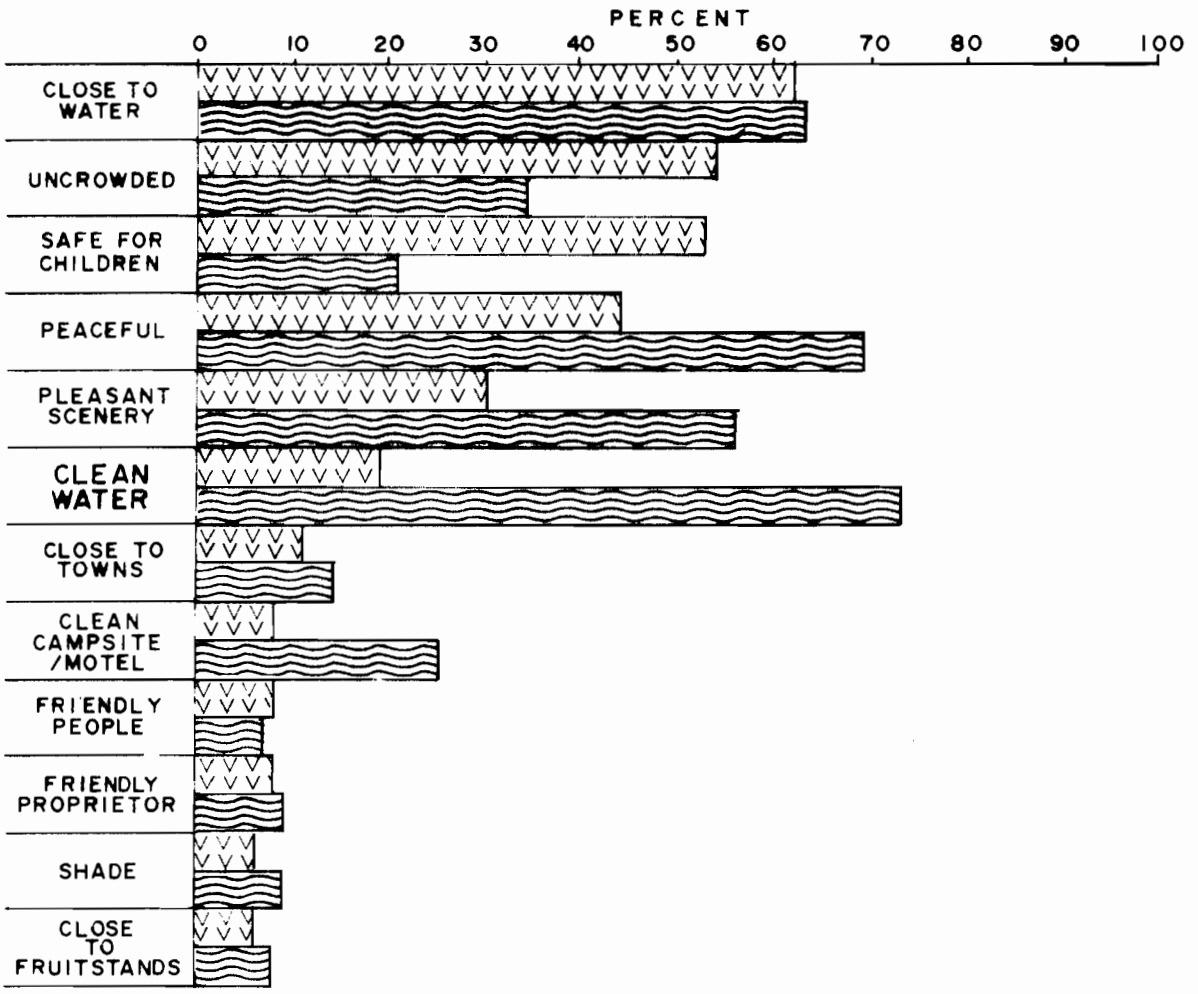
this area?". The proximity of the resorts to the lakes was a major attraction being mentioned by more than 60% of the respondents at both lakes (Figure 7.2). Safe beaches for children were particularly important as an attraction for Wood Lake respondents while pleasant scenery was mentioned by a greater proportion of Kalamalka Lake respondents. Both groups were attracted by uncrowded and peaceful conditions. The greatest divergence in their responses concerned water quality. Whereas nearly three quarters of the Kalamalka Lake respondents mentioned clean water as a particularly attractive attribute, less than one fifth of the Wood Lake respondents mentioned it. In fact, clean water was mentioned more frequently by people at Kalamalka Lake than any other feature.

A year later, visitors staying at resorts around Wood Lake were requested to indicate those features of the resort beach that they considered to be particularly attractive. Only 5% of them mentioned high water quality as an attractive feature compared to 35% of the visitors located a high water quality sites. The fact that water quality conditions did not rate as a notable attraction of Wood Lake in 1971 or 1972 was probably due, in part at least, to the previously low water quality conditions.

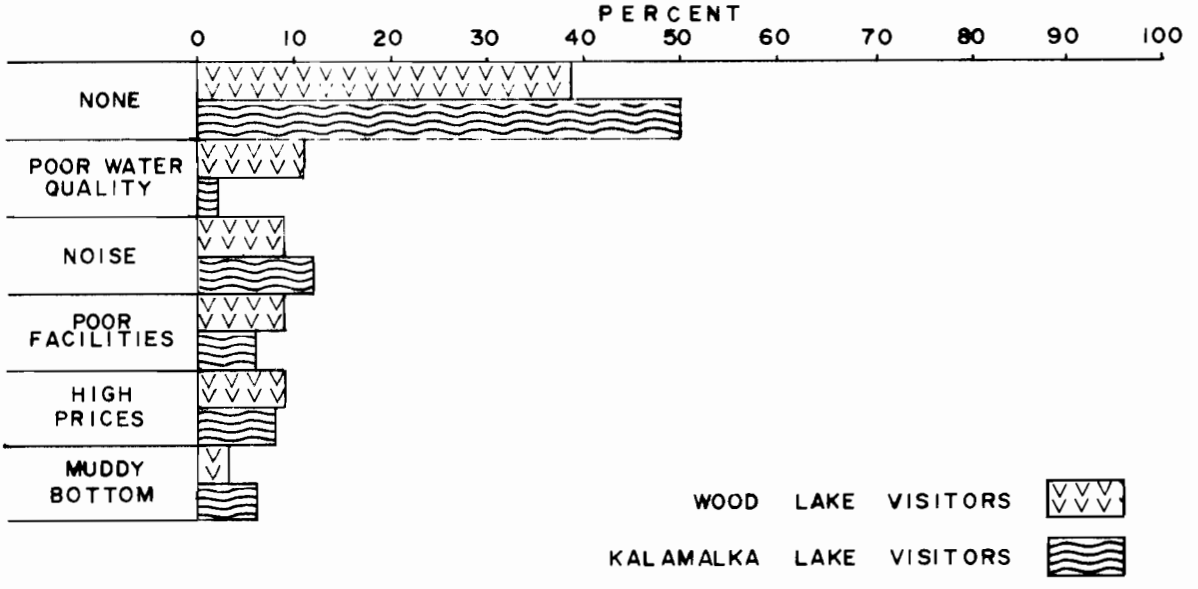
In the 1971 survey tourists were asked if there were any features they disliked about the resort area. General levels of satisfaction were quite high as evidenced by the fact that 40% of the Wood Lake respondents and 50%of the Kalamalka Lake respondents stated that there was nothing they disliked about the area (Figure 7.3). Poor water quality was mentioned by 11% of the Wood Lake respondents but only 3% of the Kalamalka Lake respondents. During the pre-testing of the questionnaire in early August when Wood Lake was highly discoloured, half of the respondents mentioned poor water quality. Thus reactions to water quality appeared to be closely linked to the visual characteristics of the water.

In the Beach User Questionnaire survey, visitors at the Wood Lake resorts were asked if there were any unattractive features of the resort beaches. Eighteen per cent mentioned poor water quality compared to only 7% of the visitors at high water quality sites. Wood Lake respondents were then requested to rate the quality of the water in the lake and their responses were compared to visitors' assessments of the water quality at beaches throughout the valley. The water in Wood Lake was generally rated as being somewhat low in quality compared to elsewhere. Whereas over half (59%) of the visitors considered the water quality to be high, or very high, at public beaches throughout the Okanagan, only a quarter of the Wood Lake visitors rated the water in the lake in these categories (Figure 7.4). However, the majority of the people around Wood Lake rated the water quality as medium, only a small minority considering it low in quality.

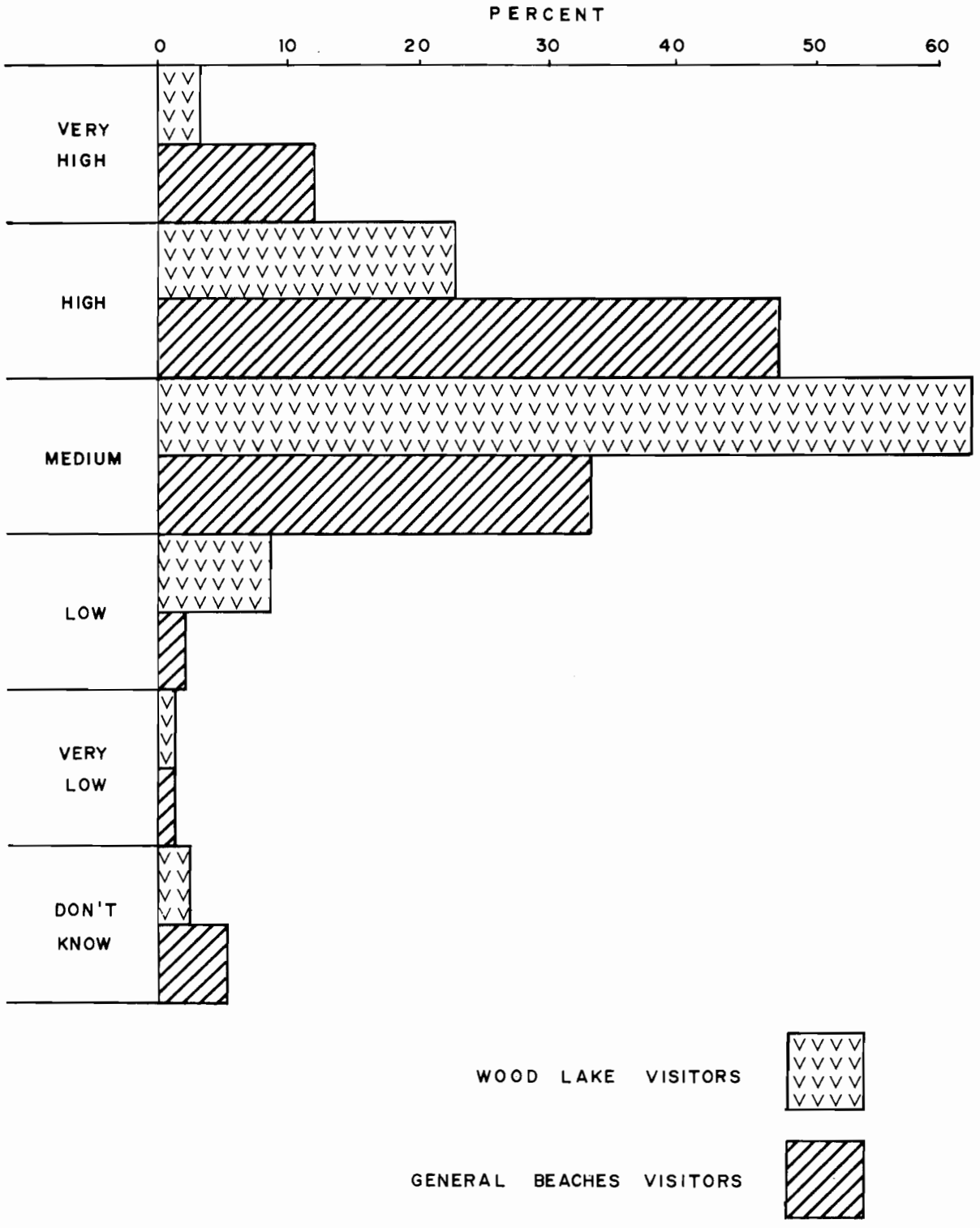
These findings indicate that the water quality in Wood Lake appeared to be acceptable to most people staying at lakeshore resorts during late August



ATTRACTIVE FEATURES OF THE WOOD LAKE AND KALAMALKA LAKE AREAS Figure 7.2



UNATTRACTIVE FEATURES OF THE WOOD LAKE AND KALAMALKA LAKE AREAS Figure 7.3



ASSESSMENTS OF WATER QUALITY

Figure 7.4

1971 and during July and August 1972. It was evident, however, that the water quality conditions immediately after the algae blooms in early August 1971 were unpleasant for resort customers.

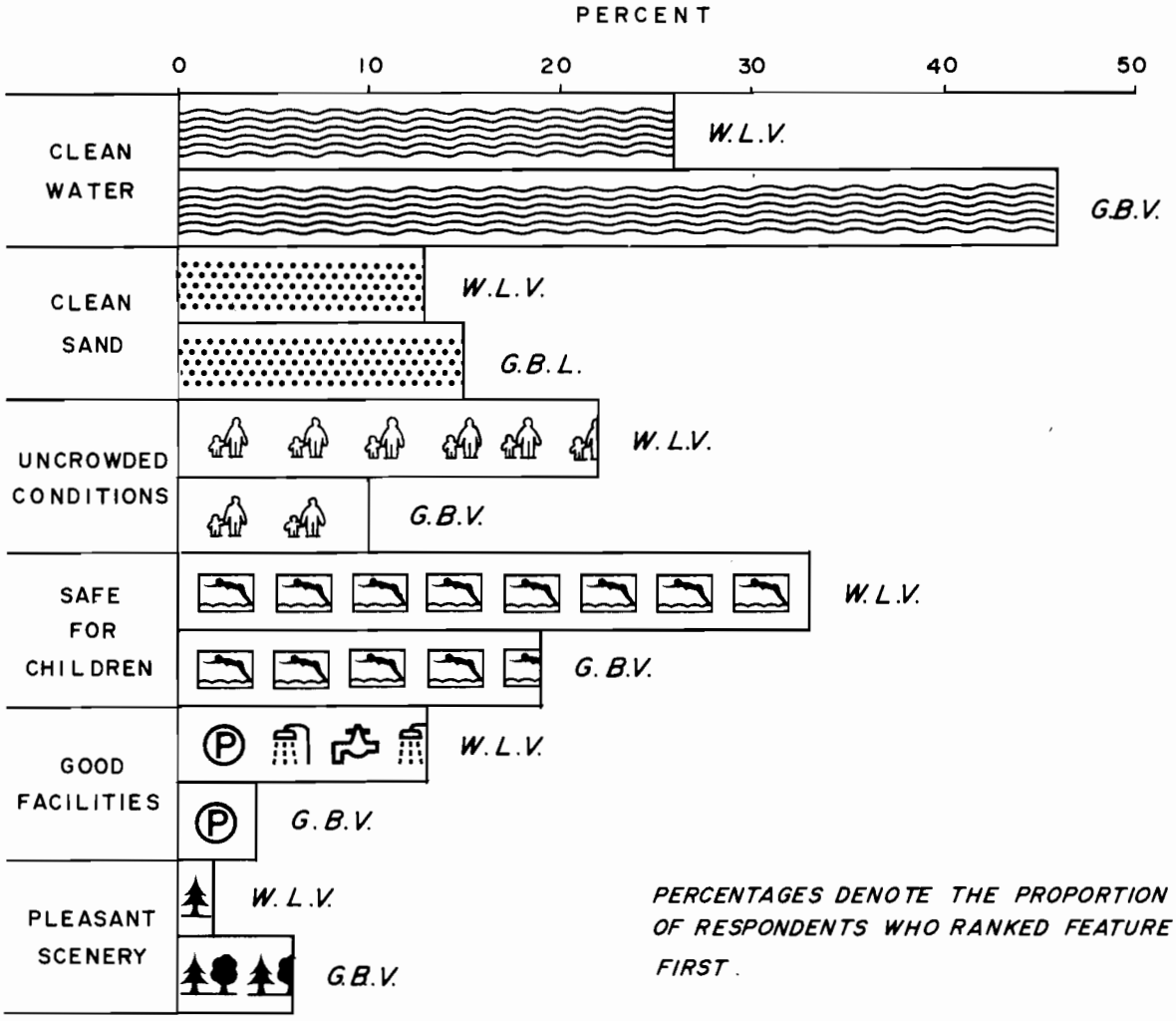
The acceptability of the water quality that generally prevails at Wood Lake was though to be due in part, at least, to a relatively low importance attached to water quality considerations by tourists staying around the lake. In the 1972 questionnaire survey, Wood Lake visitors were requested to indicate the relative importance of various factors which contributed to their enjoyment of Okanagan beaches in general. Whereas nearly half (46%) of the visitors in the sample of respondents located at high water quality sites rated clean water as the most important factor for them, the corresponding proportion of the Wood Lake visitors was 25% (Figure 7.5). Safe beaches for children and uncrowded conditions were more important for the Wood Lake visitors than the general beach visitors.

In the 1971 questionnaire survey, visitors at Wood Lake and Kalamalka Lake were asked to rate the importance of water quality as a factor in their decision to return to the lakes. Water quality considerations were considerably less important for people staying around Wood Lake than for those staying at Kalamalka Lake. Whereas 69% of the Kalamalka Lake respondents indicated that water quality was the most important factor, or of major importance, the corresponding proportion of Wood Lake respondents was only 38% (Figure 7.6). The differences in these responses probably reflect both differences in the attractiveness of the water quality conditions themselves and in the emphasis placed on water quality considerations by the two groups of visitors.

7.3.2 Decisions to Return

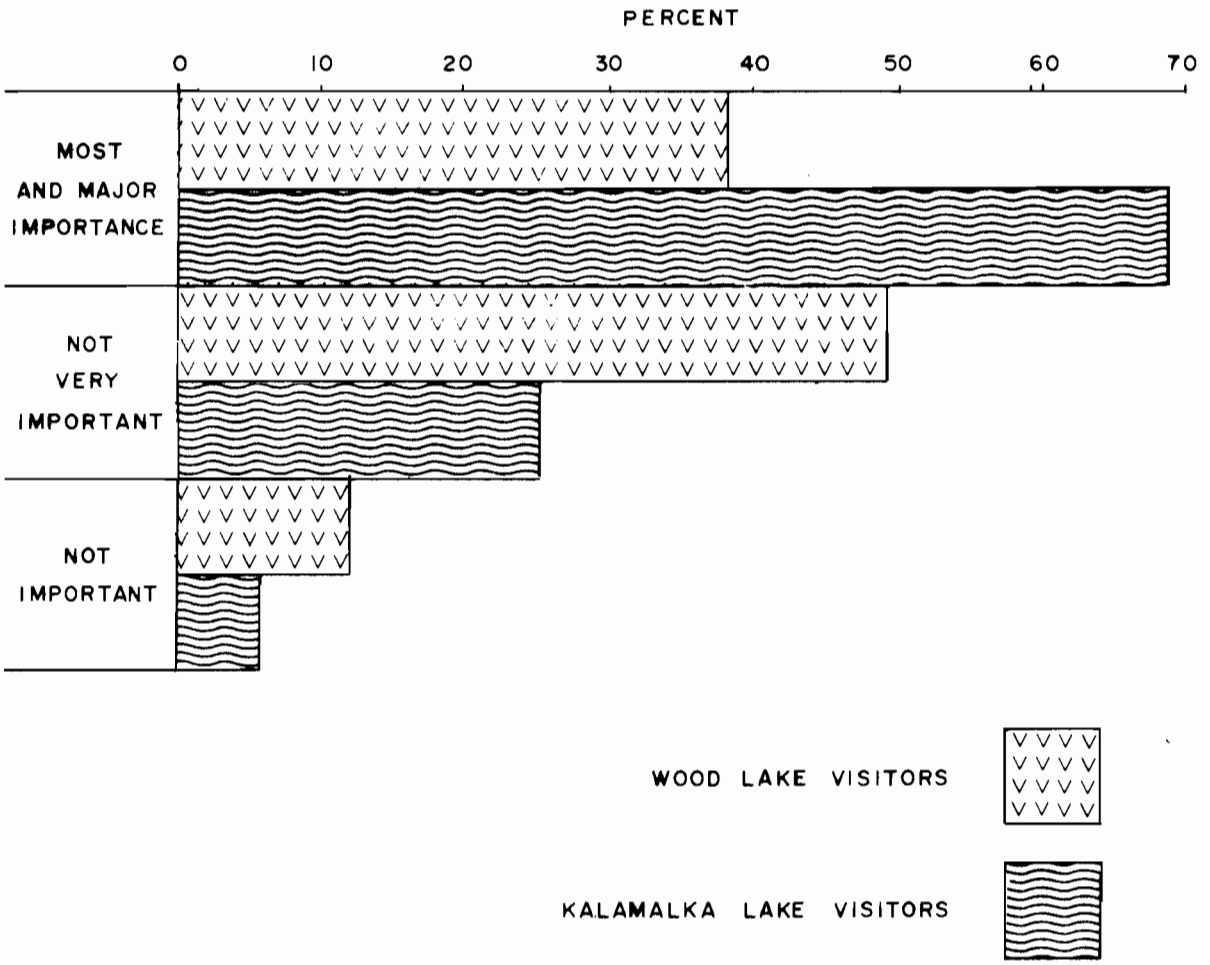
There were two main ways in which people staying at the resorts around Wood Lake in 1971 decided to holiday there. Fifty four per cent of the visitors arrived at Wood Lake "by chance" as they were passing through the area, while 40% came as a result of recommendations by friends. Over half (54%) of the Wood Lake respondents, in fact, stated that they had recommended the area to their friends. Favourable first impressions and enjoyable holiday experiences were obviously very important forms of advertising for the resort.

When asked whether they would be returning to the same resort in 1972, only 22% of the Wood Lake respondents and Kalamalka Lake respondents respectively, stated that they would not be returning which suggested that there were generally high levels of satisfaction among those customers who were staying at the two sets of resorts in late August 1971. During the pre-testing of the questionnaire however, 44% of the Wood Lake respondents said that they would definitly not return if the quality of the water had not improved appreciably over the unpleasant conditions prevailing immediately after the algae blooms. Furthermore, most of these people also atated that if they did not



ATTRACTIVE FEATURES OF OKANAGAN BEACHES IN GENERAL

Figure 7.5



IMPORTANCE OF WATER QUALITY IN DECISIONS TO RETURN TO WOOD LAKE AND KALAMALKA LAKE

Figure 7.6

return to Wood Lake, they would not return to the Okanagan at all. There are thus preliminary indications that adverse water quality conditions may have encouraged people to avoid not only the local problem areas, but also the entire region.

There are indications that Wood Lake respondents with previous experience at resorts have a less strongly developed attitude to the importance of water quality in their decisions to return than their counterparts at Kalamalka Lake. Over 80% of the Kalamalka Lake visitors with previous experience at that lake stated that good water quality was the major factor in their decision to return compared to less than 40% of Wood Lake visitors with previous experience around Wood Lake. Apparently, many of those with strongly developed attitudes towards water quality do not return to Wood Lake.

A comparison of findings on the frequency of return of visitors to the Okanagan and Wood Lake in 1971 and 1972 was undertaken in order to discover whether resorts around the lake had lost regular customers. As can be seen from Table 7.1 , most of the visitors staying at Wood Lake resorts in 1971 and 1972 had come to the Okanagan on previous occasions. Only 22% of the visitors in 1971 and 14% of the visitors in 1972 were visiting the Okanagan for the first time. In 1971, 27% of the visitors were newcomers to the Wood Lake area, compared to 62% in 1972 (Table 7.2). This marked contrast in responses may be due in part to differences in the wording of the questions in the two surveys. All the same, these results do suggest that resorts around Wood Lake lost a substantial proportion of their regular customers in 1972 and that these customers have been replaced, in part at least, by newcomers. Possible reductions in the number of customers and changes in their characteristics were examined in more detail in the survey conducted among the owners of resorts around Wood Lake.

7.4 THE RESULTS OF THE SURVEY OF RESORT OWNERS

7.4.1 History and Characteristics of the Resorts

Background information on the resorts around Wood Lake was obtained so that the negative impacts of the water quality problems and publicity could be placed into perspective.

The present resort owners can be conveniently divided into three groups; long, medium, and short term owners. Of the nine lakeshore resorts at the south end of Wood Lake and the two resorts on the west side of Highway 97, four have been under the same ownership and management since 1965 or earlier. Of the remaining seven resorts, three changed hands in 1969 or 1970 and four changed hands in 1972. Prior to 1970, resort owners could almost exclusively be characterized as long term owners who had built up their resort businesses over a number of years. After 1970 and particularly in 1972, the picture became more

TABLE 7.1

PREVIOUS VISITS TO THE OKANAGAN
BY WOOD LAKE VISITORS

1971 Survey		1972 Survey	
Year	% Visitors	Year	% Visitors
Before 1966	48	Before 1967	59
1966	35		
1967	41	1967 - 1969	70
1968	51		
1969	57	1970 - 1971	70
1970	44		
1st time 1971	22	1st time 1972	14

TABLE 7.2

PREVIOUS VISITS TO WOOD LAKE

1971 Survey		1972 Survey	
Year	% Visitors	Year	% Visitors
Before 1966	21	Before 1967	13
1966	17		
1967	19	1967 - 1969	38
1968	24		
1969	30	1970 - 1971	36
1970	33		
1st time 1971	27	1st time 1972	62

complex as new resort owners continued the tourist businesses developed by their predecessors. Wood Lake resorts thus represent the major, and in many cases, the only apparent source of income for two sets of people; first, families who have developed the resorts over a number of years and second, families who have, in the main, terminated their previous sources of employment in order to buy and operate established resorts. In addition to deriving a livelihood from the resorts, the families have gained a highly valued lifestyle.

Resort owners identified several advantages of a location at Wood Lake. These included i) proximity to a major highway; ii) good access to the lake with safe beaches for children; iii) room for expansion; and iv) good co-operation developed among the nine resort owners at the south end of the lake. In the latter case, for example, excess business from certain resorts during the peak weeks of the tourist season was directed to neighbouring resorts with vacancies. The regular return of customers, who in turn recommended the resorts to friends and relations, was generally felt to be extremely important in contributing to the economic security of the resort owners. This feeling was particularly strong amongst resort owners not directly on the highway, because they believed that it was more difficult for them to capture "passing trade" than for their neighbours who are clearly visible from the highway.

Two major problems were identified by the resort owners: - rising property taxes and water quality problems and publicity. Property taxes have doubled and in some cases tripled during the last five years due, mostly, to increases in the land tax component of the property tax. Many of the resort owners believed that their revenues had declined in recent years due primarily, if not exclusively, to the water quality problems and publicity. Thus they considered they were in the awkward predicament of being squeezed between declining revenues and escalating costs.

7.4.2 Assessments of the Impacts of the Water Quality Problems and Publicity

Most of the resort owners who were familiar with the lake prior to 1972 were able to give a detailed appraisal of the effects of water quality problems and publicity on their businesses. Although the "unfit for swimming" sign at the small public beach at Wood Lake in 1970 was felt to have had some negative influences on their businesses, the major impacts were considered to result from the 1971 algae blooms and associated publicity. Several of the resort owners (particularly those who operate campgrounds), reported that people drove down to the lake in 1971, inspected the condition of the water, and immediately drove off. The considered that some of these people at least represented potential customers who were deterred by algae growth and/or weeds. Other customers were believed to have curtailed their stays because of the unattractive condition of the water. Many of the resort owners indicated that their enquiry rates, advance bookings, and number of customers had declined substantially in 1972 and several of them reported receiving mail and telephone enquiries about

the condition of the water in 1972 as well as in 1971. Most of the resort owners were particularly concerned by the adverse radio, television and press coverage in the lower mainland of B.C., and in Alberta. They felt a substantial proportion of their losses could be attributed to the publicity rather than direct experience of the water quality problem by the tourists.

An analysis of the responses of the resort owners to detailed questioning on the effects of the water quality problems and publicity on the operation of their respective resorts indicated that there were three main factors which influenced the nature and magnitude of the negative impacts on individual resorts. These factors were the nature of the clientele, the accessibiity of the resort and compensating trade from other areas.

(a) The Nature of the Clientele

Roadside motels which rely on short-stay passing trade reported only minor reductions in occupancy rates compared to lakeshore resorts which cater to longer staying visitors.

Operators of resorts which are heavily dependent on repeat trade considered that their immediate losses were minimized because relatively few, if any, of their regular customers curtailed their stays or cancelled their visitors in 1971 in response to the poor water quality conditions. This was attributed to the friendship patterns that exist among customers and between customers and management, and the fact that many groups were booked for a week or longer and would probably have experienced some difficulty in obtaining alternative accomodation. Some of these resort owners did report however, that there were substantial reductions in regular customers in 1972 and that these had not been completely replaced by newcomers. The loss of the regular customers was attributed largely to the water quality problems and publicity in the previous year.

Operators of resorts which rely to some extent on passing trade (which may stay for some length of time if the area is found to be attractive), felt that it was reduced particularly in 1971 due to the unpleasant condition of the water. This belief was most strongly held by campground owners, specializing in this highly mobile market. They also felt that their more regular clientele was reduced somewhat in 1971 and 1972 due to the condition of the water and publicity about it.

(b) The Accessiblity of the Resorts

Resorts located near the highway were able to attract new customers relatively easily, thus making up to some extent for losses in other customers. Conversely, resorts which are located away from the highway found it more difficult to replace lost customers with newcomers. In addition, resorts near

the highway were unable to direct "overflow" customers to resorts off the highway when they were not full up themselves because of the water quality problems and publicity.

(c) Compensating Trade from Other Areas

Several resort owners suggested that their reductions in customers in 1972 were mitigated to some extent by additional trade received from Kelowna during the Regatta and by customers from resorts outside of the Okanagan Basin, such as around Mara Lake, where flooding occurred throughout June and July.

Although mitigating factors have helped to minimize the losses of individual resorts, it appeared that reductions in the number of customers frequenting the Wood Lake resorts as a whole have occurred in the following ways. Firstly, regular customers have been lost because of their personal contact with the water quality problems and publicity about them. Secondly, potential "passing-stopping" customers who were travelling through the area while the water quality problems were occurring did not stay or curtailed their visits. Thirdly, potential Wood Lake resort customers did not stay because of the reports that they had received about the poor water quality conditions.

7.4.3 Economic Losses

The magnitude and distributuion of losses in revenue due to reductions in resort customers on account of the water quality problems and publicity were assessed from the findings of the accounting survey.

The immediate economic impacts of the closure of the small public beach in 1970 on the resorts around Wood Lake appear to have been minor in most cases as judged from a comparison of July and August 1969 and 1970 revenues. The gross revenues of the resorts in July and August 1970 were therefore used as a baseline for comparison with gross revenues for July and August in 1971 and 1972 respectively in order to determine the magnitude of the economic losses experienced by the resorts. Revenues of each resort in July and August 1970, 1971 and 1972 were examined in detail. An assessment was made of the reduction in revenue in 1971 and 1972 which could be attributed to the water quality problems and publicity rather than other factors for each resort. These reductions were then amalgamated to give a total decline in revenue for the group of Wood Lake resorts compared to the base year of 1970. June and September revenues were excluded from the analysis since business in these months was quite variable from year to year for most of the resorts. Since reductions in revenue may also have occurred during these months because of the water quality problems and publicity, the following estimated economic losses are considered to be conservative.

The water quality problems and publicity in 1971 resulted in an estimated total loss of revenue for the eleven Wood Lake resorts of $7,440 in July and August 1971, a decrease of nearly 8% from the total revenue for July and August 1970. The losses were unevenly distributed between the resorts however, due to the differential operation of the mitigating factors identified previously. In terms of their revenues during July and August, the resorts fell into two groups; a group of five resorts which earned less than $4,000 each, and the remaining six resorts which earned between $10,000 and $16,000 each during this period. Three of the six resorts in the larger revenue group accounted for two thirds of the total loss of the eleven resorts. These resorts were the ones in which campground fees were the sole or major source of revenue. The experienced an absolute decline in their number of customers and/or a decline in the average length of stay of the camping groups. The other three resorts in the larger revenue group were not affected as seriously because they were well booked with regular customers who did not curtail their visits and/or were near the highway and therefore able to at least partially fill any vacancies that arose with passing trade. Although the losses of the five resorts in the smaller revenue group did not constitute a large proportion of the total losses, it is important to bear in mind that a relatively small reduction in the revenues of these resorts represented a substantial proportion of their revenues. For example, one resort in the smaller revenue group lost and estimated 14.5% of July and August revenue in 1971. Even though losses of this magnitude were quite small in absolute terms, they could have particularly serious financial implications for the owners of the low revenue resorts.

Owners of resorts around Kalamalka Lake generally noted an increase in revenue in 1971 compared to 1970. For example, one resort reported a increase in gross tourist revenue of $3,000 in 1971 compared to 1970 and another two resorts an increase of $2,200 and $1,200 respectively in revenue from campsite rental fees alone . It is possible that part of this increase in revenue was due to the transfer of Wood Lake campers to Kalamalka Lake because of poor water quality conditions on Wood Lake. None of the Wood Lake resorts experienced an increase in income from tourism in 1971 over 1970.

Unfortunately only six Wood Lake resorts were able to provide complete July and August revenue statistics for 1972. Five of these six resorts were in the larger revenue group however, so that a good indication of the magnitude of revenue losses for Wood Lake resorts in 1972 can be obtained. The six resorts were estimated to have lost $10,525 or 14.5% of their revenues in July and August 1972 compared to 1970 because of the 1971 water quality problems and publicity. Revenue losses at three of these resorts were substantially higher in 1972 than in 1971, probably due to a decline in regular customers who were not completely replaced by newcomers. It appears therefore, that in some cases at least, the longer term economic impacts of water quality problems and publicity were greater than the immediate impacts.

Again the owners of resorts around Kalamalka Lake reported that their revenues were somewhat higher in July and August 1972 than they had been in either 1970 or 1971. For example, the business of one resort increased by 7% in 1972 over 1971.

Additional information received from the Consumer Taxation Board of the Provincial Department of Finance substantiated the decline in revenue for resorts around Wood Lake between 1971 and 1972. Data were obtained on the revenue received during July and August from the rental of motel and cabin accomodation for a group of seven lakeshore resorts on Wood Lake and for a group of four lakeshore resorts on Kalamalka Lake. Unfortunately the statistics were not available for 1970 and did not include revenues for campground or the campground component of resorts offering both camping sites and motel and/or cabin accomodation. The data thus indicated trends in gross earnings from motel and cabin accomodation around the two lakes between 1971 and 1972.

In July and August 1972, the seven Wood Lake resorts earned $43,702; $7,661 or 15% less than in the corresponding period in 1971, an average loss of $1,095 for each resort (Table 7.3). The four Kalamalka Lake resorts experienced a decline of 1.4%, an average decrease in revenue of $150 for each resort. The addition of revenue from camping units at this group of resorts would probably have changed the small deficit into a gain however.

TABLE 7.3

RESORT REVENUE TRENDS

	SEVEN WOOD LAKE RESORTS	FOUR KALAMALKA LAKE RESORTS
Total Revenue July and August 1971 ($)	51,363	43,041
Total Revenue July and August 1972 ($)	43,702	42,438
TREND ($)	-7,661	-603
Average Revenue July and August 1971 ($)	7,338	10,760
Average Revenue July and August 1972 ($)	6,243	10,610
TREND ($)	-1,095	-150
TREND %	-14.9	-1.4

Source: Consumer Taxation Branch
B.C. Department of Finance

It is interesting to compare losses in revenue in 1972 as discovered in the accounting survey and revenue trends between 1971 and 1972 derived from the taxation data. In July and August 1972, the six resorts examined in the accounting survey earned $62,540, a decrease of $6,205 from their revenue in July and August 1972 the seven Wood Lake resorts in the taxation data survey earned an average of $6,243 each and sustained a reduction in revenue of $1,095, a decline of 15% from 1971. This apparent descrepancy was due to differences in the composition of the two samples of resorts and the fact that not all reductions in revenue in the accounting survey were attributed to water quality problems and publicity. Taxation data were particularly valuable because they confirmed that resorts around Wood Lake, unlike those around Kalamalka Lake, have experienced substantial reductions in revenue in 1972.

7.4.4 Sales of Resorts and Property Values

Of the eleven resorts around Wood Lake, two were sold in 1970 to new owners and four changed hands in 1972. The six former owners of the resorts were asked if water quality problems and publicity had affected their decisions to sell of had adversely influenced their selling prices.

The two resort owners who sold their properties in 1970 both considered that they had received good financial returns from the 1969 tourist season and were well booked in 1970. Their main motivations for selling were personal. One owner did express a fear, however, that the algae growth experienced in the off-season months might occur during the tourist season. The other owner was still in business in 1970 and was perturbed by the controversy surrounding the posting of the public beach as being unfit for swimming. These events may have encouraged them to sell their resorts a little earlier than anticipated but the respondents did not feel that they had influenced their selling prices.

One of the four resorts which changed hands in 1972 catered to passing trade in particular and the owner did not consider that his revenue had been substantially reduced in 1970 or 1971. He was selling his property for personal reasons. The other three resort owners definitely considered that the effects of the water quality problems and publicity on their businesses in 1971 and possibly again in the future was a major factor in their selling their resorts in 1972, although all of them were interested in selling their resorts eventually, probably in the mid 1970's. All three resort owners believed that they had received less than their properties were worth because of the negative impacts associated with water quality conditions in Wood Lake and their desire to sell rapidly. Each owner was asked to calculate the difference between the assessed value of his property and the selling price. The total estimated difference was $83,850 (an average difference of $27,950 per resort or 20% of the combined assessed values of the three resorts). In view of the small number resorts involved and the lack of a detailed appraisal of the values of lakeshore resorts in the area, this difference cannot be counted as a loss and

attributed exclusively to water quality problems and publicity. Some indication is given however that these factors may have substantially reduced the values of resorts around Wood Lake.

7.4.5 Future Business Plans

The current owners of resorts around Wood Lake were questioned about the influence of water quality conditions on their future business plans. Most of them stated that they expected their businesses to grow due to increases in population, leisure time, mobility and income. Virtually all of them indicated however, that they considered improvements in their trade to be contingent on the future water quality of the lake. Several of them stressed the importance of attractive water quality conditions in creating favourable impressions and satisfaction among their customers and hence in maintianing and generating trade for their resorts. There was a general belief that a repetition of the conditions and publicity experienced in 1971 would result in even greater losses to their businesses since it would reinforce existing negative feelings about the lake.

Several of the resort owners indicated they had eancelled or postponed expansion or renovation plans because of the uncertainty generated in their businesses by the water quality problems. Other resort owners had considered modifications to the nature of their operations, such as establishing permanent trailer parks because of the problems they have experienced with their tourist trade. A few resort owners even examined the possiblity of constructing swimming pools to help offset the effects of possible future water quality problems but considered the costs prohibitive.

Most of the resort owners were contemplating selling their properties and many already had them on the market, partly because of the effects of the water quality problems and publicity and their concern over possible future water quality conditions. Most of them were pessimistic about receiving a fair price because of the negative image Wood Lake has received and the substantial costs of the resorts, several of which are valued at over $150,000 each. One or two of the resort owners mentioned that prospective buyers had been deterred when they learned of the water quality problems and publicity.

Most of the Wood Lake resort owners felt that if algae growth could be minimized in the future, both their business prospects and opportunities to sell their properties would be improved. The owners were requested to estimate the increases in their property values that might occur if high water quality conditions prevailed in the future. Six of the respondents attempted to estimate these enhancement benefits. Their current combined property values amounted to $893,000, an average of $148,830 a resort. Their estimated combined selling prices under improved water quality conditions amounted to $1,114,485, an average

of $185,800 for each resort. This constituted an average increase of 25% over and above present values. It is difficult to predict whether property values would increase substantially under improved water quality conditions. These figures did however, give some indication of the importance that resort owners placed on assured high water quality conditions.

7.4.6 Social Costs

The assessment of the social costs associated with the water quality problems was more problematic than the measurement of the economic costs. Similar economic costs may have imposed widely varying social costs on different individuals. For example, the reactions of resort owners faced with similar losses in revenue may well have varied due to factors such as differences in their overall financial situation, the magnitude of other problems facing them and their personal dispositions. In spite of problems of assessment, an attempt was made to consider the social as well as the economic implications of the water quality problems by means of the interviews with the Wood Lake resort owners.

Both the longer and shorter term resort owners have substantial social as well as financial stakes in their businesses because the resorts represent a way of life as well as a livelihood to them. It became apparent that the social costs associated with the economic losses they have experienced in recent years were serious for most of the resort owners. These costs included frustration and annoyance over the controversy surrounding possible health hazards to swimmers in the lake; concern over losses in regular customers and revenue and the instability introduced into their businesses; and fear of the potential impacts of future water quality problems. Many of the resort owners felt that they were being squeezed between rising costs (particularly escalating taxes) and declining revenues and were trapped because they could not sell their properties or had to accept reduced prices for them.

7.5 DISCUSSION

People who have stayed at resorts around Wood lake were attracted there by a combination of factors, expecially the proximity of the resorts to the lake and the safe, uncrowded beaches. The resort customers generally put less weight on the water quality considerations than other visitors to the Okanagan and appreciated that the water in the lake was relatively low in quality. They were very concerned however, about the unpleasant conditions that prevailed there during and immediately after the algae blooms occurred in 1971. Nearly half of the visitors questioned at the time indicated that they would not return unless water quality improved appreciably. It appears that a substantial proportion of the regular customers of the resorts did not return in 1972 even though there was a substantial improvement in the water quality conditions.

People who were particularly sensitive to poor water quality conditions and/or publicity about them and may have curtailed their stay at Wood Lake in 1971 or avoided the area entirely in 1971 or 1972 were not contacted in the two questionnaire surveys. The full extent of avoidance of Wood Lake is therefore difficult to gauge. However, it is evident from the results of the interview and accounting survey conducted among the resort owners in 1972 that there have been signficant reductions in the number of customers and hence revenues at individual resorts.

It is not known whether visitors who have avoided the Wood Lake area have also avoided the Okanagan Basin as a whole and should therefore be considered to represent an economic loss to the region as well as the local area. Even if the majority of visitors have simply transferred to other areas within the region, it is apparent the the economic and social effects of the water quality problems and publicity on individual resort owners have been serious.

Although it is difficult to predict the potential economic and social impacts of possible future water quality problems and publicity on the operation of resorts around Wood Lake, certain tentative general statements can be made. Much of the Wood Lake resort business is based on continuous customer satisfaction and good reports from contented customers to their friends and relations. The peak of the tourist season is only a short period extending from the second week in July to the third week in August. The resorts around Wood Lake thus depend on perfect holiday conditions throughout most of July and August for customer satisfaction, a good season financially, and the prospect of a good season in the following year. The intrusion of any negative factors such as water quality problems and publicity can easily change a potentiallly successful tourist season into an unseccessful one, both in terms of immediate revenue and longer term trade. The severity of the impacts of possible future water quality problems would depend in part on the actual conditions of the water and the immediate and long term reaction of both people buying the resorts, and those passing by. In addition, the timing, amount, type, and location of publicity would probably be an important factor, expecially in as far as it may compound the negative image of Wood Lake and thus deter potential customers from going there.

Newcomers now constitute a large proportion of the customers of many Wood Lake resorts. Since new customers are probably less attached to the area than regular ones, more people might be expected to leave if large scale algae blooms were to occur again. In addition, there are indications that the longer term impacts may be greater than the immediate ones as some visitors failed to return even after the water quality conditions improved appreciably. It would appear therefore, that any water quality problems in the near future in Wood Lake might be expected to have even more serious repercussions than recent events since they would probably compound existing negative feelings and continue to operate further into the future. Two or more successive years of widely publicized water quality problems could be extremely detrimental to the Wood Lake resort business.

CHAPTER 8

Lakeshore Land Use and Tenure Patterns and Crowding at Beaches.

8.1 INTRODUCTION

The primary purpose of the recreation studies was to provide information on the relationships between tourism, beach-oriented recreation, and water quality management in the Okanagan Basin. As tourism and beach use are so closely linked to shoreline land use and tenure however, shoreline management aspects were also examined. First, studies were conducted to document current land use and land tenure patterns including the location and size of beach areas at public recreation sites. Secondly, the extent and severity of crowding at public beaches in the Okanagan were examined so that the adequacy of the existing supply of public beaches could be assessed. This section of the report presents information on the existing supply of beaches and current pressures upon them. Projections of the demand for beach-oriented recreation, the recreational capability of the shoreline and the implications of possible future levels of beach use are examined in a subsequent section.

8.2 METHODS

8.2.1 Lakeshore Land Use and Land Tenure Survey

The objective of the study was to document the amount of lakeshore frontage occupied by different types of land use and ownership for each of the main valley lakes in the Okanagan Valley.

The Regional Districts provided maps of the present land use for most of the developed portions of the shoreline. Recent air photos were used to update these maps and fill in gaps in the map coverage. The information was then classified into nine land use categories including recreation and undeveloped land. Information on land ownership was obtained from land status maps on a scale of 1:126,700 and research in Municipal and Provincial Assessment Offices and the Provincial Parks Branch Office. The land tenure was classified into five groups, Indian Reserve, Private, Crown, Municipal and Public access each of which was differentiated into two classes - developed and undeveloped. In addition, road and rail use were distinguished. After the land use and tenure patterns had been checked in the field, all data were transferred to composite base maps of scales of 1" =1,000'or 1" = 800'. The frontage under each type of land use and land tenure was measured from the maps and expressed in linear feet for each lake. This information was then expressed as a proportion of the lakeshore within each of the four economic regions of the Okanagan Basin.

The shoreline was defined as a fairly narrow strip of land adjacent to the lake and this influences the choice of land use category in certain instances. The most notable case concerns the classification of land as undeveloped. Around large tracts of shoreline, agricultural and other land uses are located in the tops of steep, sandy cliffs which are fronted by narrow strips of lakeshore. These strips were classified as undeveloped land even though the areas above and behind them are utilized. The limited width of many of the lakeshore areas classified as undeveloped should be borne in mind when drawing inferences about the recreational potential of the undeveloped portions of the shoreline.

8.2.2 Public Recreation Site Survey

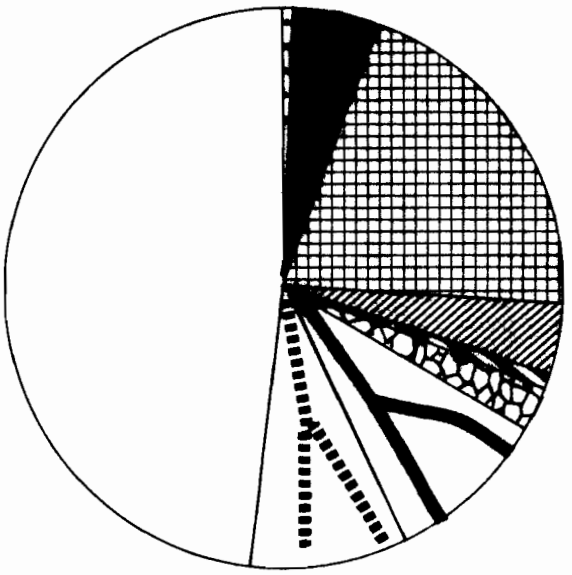
The objective of the survey was to document the distribution and size of public recreation sites and the beach areas contained within them around each of the main valley lakes. This study was restricted to public recreation sites with direct lake frontage. Private lakeshore resorts were excluded from the analysis even though they cater to a portion of the current total demand for beach-oriented recreation by visitors.

The recreation sites were identified from land use maps and field reconnaissance and plotted on air photos at a scale of approximately 1" = 500'. Sand, grass and miscellaneous areas such as parking spaces and roads were distinguished on the air photos and checked in the field. Grass areas were divided into two categories, beach-oriented and other grass areas. Beach-oriented grass areas were those lawns which were used interchangeably with sand areas by beach users. Other grass areas consisted of park areas near the beaches wich were not used for beach-oriented recreation. Beaches thus consisted of sand and beach-oriented grass areas. The length of shoreline developed for recreational purposes and the areas under sand, grass and miscellaneous uses within each public recreation site were measured from the air photographs. The resulting data were then aggregated for each lake and for each of the four economic regions.

8.3 RESULTS

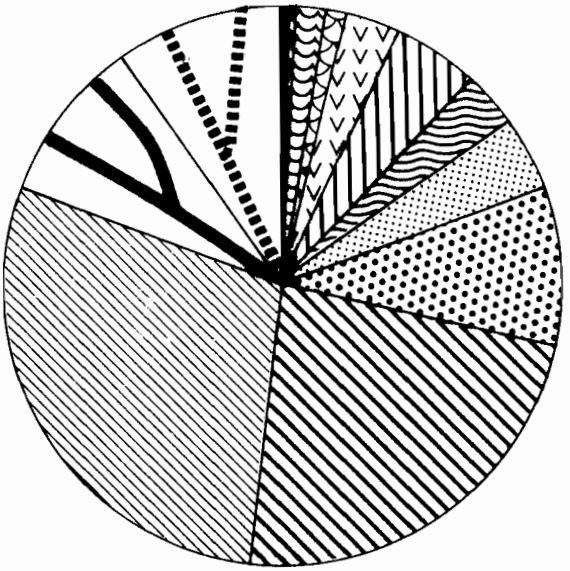
8.3.1 Lakeshore Land Use and Land Tenure

The survey of lakeshore land use and tenure patterns indicated that there are a total of 252.8 miles of shoreline around the main valley lakes in the Okanagan Valley. Almost half of this shoreline is presently undeveloped, the major developed land uses being residential and road and rail which account for approximately 21% and 9% of the total lakeshore frontage respectively (Figure 8.1). Only about 5% of the lakeshore is developed for recreational purposes, mainly for public beaches, while public access points have been designated for less than 1% or 2 miles of the shoreline. Nearly 10 miles of the lakeshore are, in fact, occupied by commercial uses such as campsites and motels



PUBLIC ACCESS – 2 MILES
PUBLIC RECREATION - 14 MILES
RESIDENTIAL 53.8 MILES
COMMERCIAL – 9.6 MILES
INDUSTRIAL – 2.5 MILES
AGRICULTURAL – 6.3 MILES.
ROAD – 23.3 MILES.
RAIL – 22 MILES.
UNDEVELOPED – 119.3 MILES

LAND USE



PUBLIC ACCESS DEVELOPED – 1 MILE
PUBLIC ACCESS UNDEVELOPED – 1 MILE
MUNICIPAL DEVELOPED – 5.6 MILES.
MUNICIPAL UNDEVELOPED – 2.2 MILES
CROWN DEVELOPED – 7.5 MILES
CROWN UNDEVELOPED – 11.2 MILES
CROWN PARK RESERVE – 7.5 MILES
INDIAN RESERVE DEVELOPED – 10.7 MILES
INDIAN RESERVE UNDEVELOPED – 24 MILES.
PRIVATE DEVELOPED – 61.2 MILES
PRIVATE UNDEVELOPED – 75.6 MILES.
ROAD 23.3 MILES
RAIL – 22 MILES.

LAND TENURE

TOTAL LENGTH OF LAKE SHORE - 252.8 MILES

LAND USE AND TENURE AROUND THE MAIN VALLEY LAKES Figure 8.1

compared to 14 miles which are devoted to public recreational uses. Although much of the undeveloped land has limited potential for beach-oriented recreation due to poor access and steep terrain, there is still quite a large portion of the shoreline suitable for beach development.

Over half (54%) of the shoreline is privately owned, and an additional 14% is located on Indian Reserves. The remaining undeveloped public land is mainly held by the Crown (4%) or is under Crown Park Reserve (3%). Less than 1% of the undeveloped land is owned by the municipalities and less than half a per cent of the lakeshore consists of undeveloped public access points. Although publicly-owned land represents only a relatively small proportion of the undeveloped sections of the shoreline, it is important to bear in mind that over 20 miles of undeveloped shoreline are under public ownership compared to the 14 miles which are currently devoted to public recreational uses. Furthermore, all areas below the high water mark are public property and public access to them could be facilitated.

A description of the land use and tenure patterns around the main valley lakes within each region follows and should be read in conjunction with Map 1 to Map 8 at the back of this report.

(a) Oliver-Osoyoos Region

This region contains two main valley lakes; one major lake, Osoyoos, which has over 110,000 feet of shoreline, and Tugulnuit which has only just over 10,000 feet of shoreline.

(i) Osoyoos Lake - Public recreational areas comprise 10% of the lakeshore while public access points account for 1% (Map 1a). A relatively high proportion (7%) of the lakeshore is devoted to commercial uses such as campsites and motels compared to other lakes. Nearly half of the shoreline is as yet undeveloped. The largest area (2,400 feet) of undeveloped public land is municipally owned. The major tracts of undeveloped lakeshore are privately owned (20%) or are on an Indian Reserve (28%). Future land use patterns around Osoyoos Lake will therefore depend to a large extent on whether Indian lands are developed and the types of uses which are adopted.

(ii) Tugulnuit Lake - Over half of the shoreline is used for residential purposes while 10% and 7% are developed for commercial and recreational uses respectively (Map 1b). A fifth of the land around this small lake is undeveloped, virtually all of it being privately owned or on an Indian reserve. There are however, several public access points which are as yet undeveloped.

(b) Penticton Region

There are three main lakes in the Penticton Region; Vaseux with a shoreline length of less than 38,000 feet, Skaha (95,190 feet) and the southern portion of Okanagan Lake (236,082 feet).

(i) Vaseux Lake - Thirty per cent of the land around Vaseux Lake is occupied by the railway which runs along the west side of the lake and 10% by the road which lies on the east side (Map 2a). Six per cent is Crown Land which has been developed for public recreational purposes while 37% is undeveloped land. There are 1,100 feet of undeveloped Crown Land at the south end of the lake and 4,200 feet designated as Crown Park Reserve at the north end.

(ii) Skaha Lake - Over one third (37%) of the shoreline is taken up by the railway which runs along the west side of the lake while over a fifth (22%) is taken up by the road on the east side (Map 2b). An additional fifth is devoted to residential uses while 5% is developed for commercial purposes. Public recreation areas, particularly at the north end of the lake in Penticton, account for 7% of the lakeshore.

Only 7% of the lakeshore remains in an undeveloped state, virtually all of this land being privately owned. The only undeveloped publicly owned land consists of 470 feet of undeveloped public access points and 750 feet of municipally owned land in the north-eastern portion of the lakeshore. It thus appears that opportunities for increasing public beach area around Skaha Lake on publicly owned land are very limited.

(iii) Okanagan Lake - Ten per cent of the shoreline of Okanagan Lake in the Penticton region is developed for public recreational purposes, particularly in the southern portion in Penticton (Map 3). The other two major uses are roads (13%) and residential uses (15%). Over half (57%) of the lakeshore is still undeveloped. It is important to note however, that much of the shoreline classified as undeveloped has limited potential for recreation. For example, only a narrow strip of lakeshore lies below much of the agricultural land on the cliff tops on the east side of the lake between Penticton and Naramata. Thirty eight per cent of the shoreline consists of privately owned, undeveloped land. There are however, quite extensive tracts of undeveloped crown land (12%) and crown park reserve (5%). There are also 3,675 feet of undeveloped municipal land or nearly 2% of the total shoreline. A substantial addition is in fact being made to the municipal beach on Okanagan Lake in Penticton and a new beach has been created at Summerland.

(c) Kelowna Region

This region contains the central portion of Okanagan Lake with its extensive shoreline, covering over 358,000 feet (Map 4a &4b). A large proportion (23%) of this land is, however, taken up by residential areas. Public recreational areas comprise 6% of the lakeshore with an additional 1% designated for public access. Over half (53%) of the land around this portion of the lake is

still undeveloped but 43% of the shoreline consists of undeveloped, privately owned land compared to 8% which is owned by the Crown or Municipalities. This publicly owned land covers over 24,500 feet of the shoreline, however, compared to approximately 21,500 feet which are currently developed for public recreation.

(d) Vernon Region

This region contains a large section of Okanagan Lake with nearly 288,000 feet of shoreline and Kalamalka Lake and Wood Lake with 143,314 and 55,660 feet respectively.

(i) Okanagan Lake - A third of the shoreline is taken up by residential developments while only 3% consists of public recreation areas (Map 5). Fifty five per cent of the shoreline is still undeveloped but nearly all of this land is privately owned or on an Indian Reserve. Twenty eight per cent of the lakeshore is in fact undeveloped Indian Reserve lands so that future land use patterns on this portion of Okanagan Lake will depend to a large extent on whether those Indian lands are developed and the types of uses which are adopted.

(ii) Wood Lake - Three quarters of land around Wood Lake is taken up by road and rail communications (Map 6). Nine percent is developed for commercial enterprises and 6% for residences which are concentrated at the south end of the lake. Apart from public access points, there are no public recreational areas around the lake. Only 8% of the shoreline is undeveloped and only 850 feet are publicly owned as Crown Park Reserve. Opportunities for developing large scale public recreational areas around this lake thus appear to be limited.

(iii) Kalamalka Lake - Twenty nine percent of the lakeshore is occupied by railway lines, 16% by residences and 4% by commercial establishments (Map 7). Only 1% of the shoreline is currently devoted to public recreation at a beach at the north end of the lake. Forty six percent of the shoreline is undeveloped but much of this land is privately owned. Eleven percent is however, undeveloped Crown Land and a public park has been proposed for Cozens Bay on the north eastern arm of the lake.

8.3.2 Public Access Points

One percent (2 miles) of the shoreline around the main valley lakes is designated as public access; 0.2 miles in the Osoyoos region, 0.4 miles in the Penticton region, 0.8 miles in the Kelowna region and 0.6 miles in the Vernon region. Although small in area, these public access points are vital linkages to the foreshore around the lakes, which is public property.

Unfortunately, many of these public access points are partially or totally disguised by adjacent private property owners in an attempt to maintain their privacy and prevent ready access to the beach. In addition, several access points have never been properly developed or maintained by the B.C. Department of Highways. In view of the importance of beach recreation to visitors and residents, it is important that all such access points are clearly marked and maintained in good order to facilitate direct public access to the foreshore of the main valley lakes.

8.3.3 Public Recreation Sites

There is a total of 38 public recreation sites around the mainstem lakes ranging in size from small picnic sites to major campsites and beach areas. These recreational facilities are maintained by either the municipalities or the Parks Branch of the Provincial Government. The location of the sites and the level of government responsible for them are shown in Map 8.

These public recreation sites occupy 349 acres. Only 104 acres or 30% of the sites are directly available for beach-oriented recreation as sand or beach-oriented grass however. Figure 8.2 summarizes the characteristics of the sites within each region. The Penticton region contains the largest area devoted to public recreational uses (161.2 acres) followed by the Kelowna region (86.7 acres), the Vernon region (73.4 acres) and the Oliver-Osoyoos region (29.4 acres). Large areas of the sites in the Penticton and Vernon regions in particular are classified as miscellaneous however, being taken up by such uses as roads, parking lots and campsites.

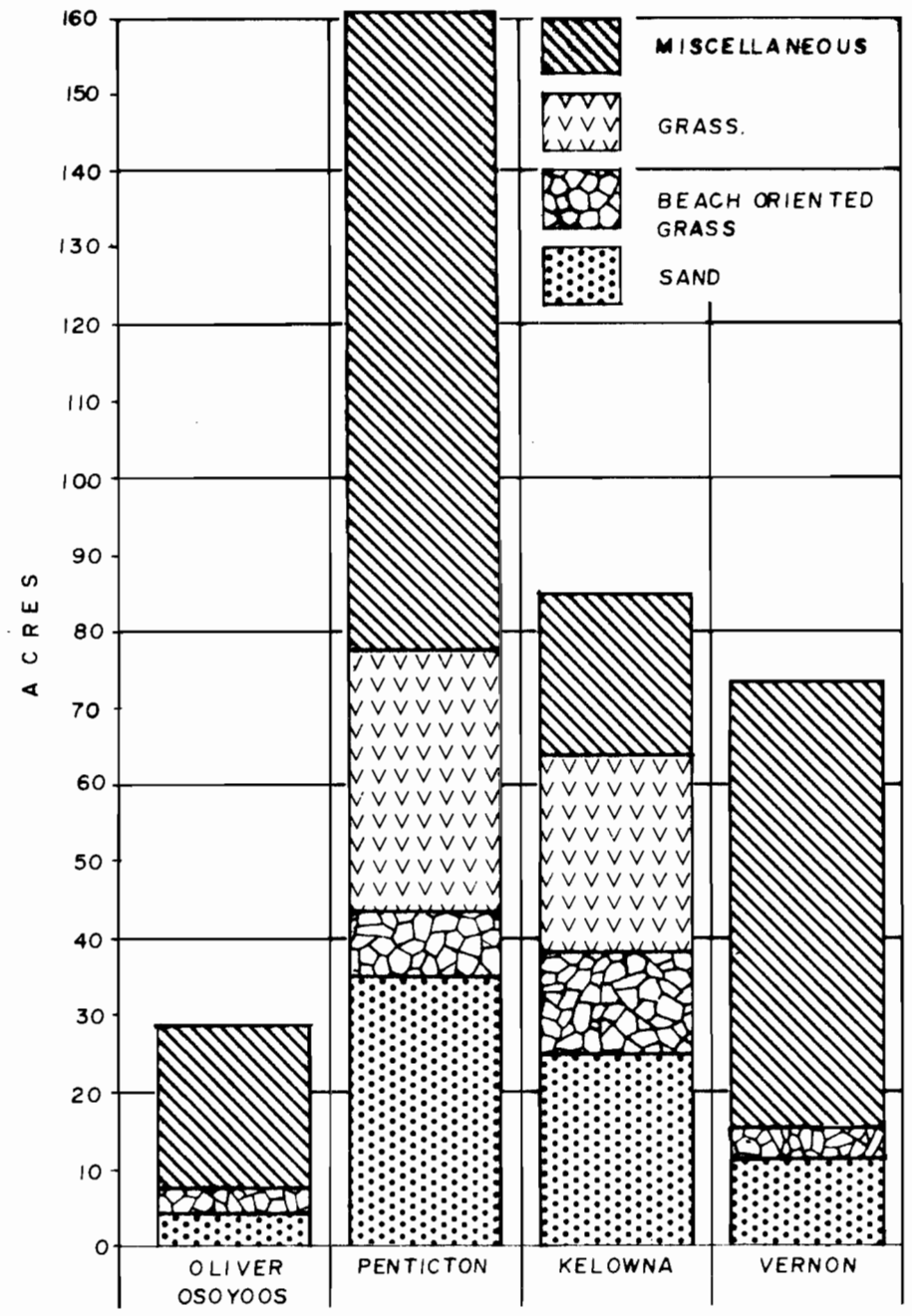
A description of the characteristics of the public recreation sites around the mainstem lakes within each region follows. The map showing the location of the sites (Map 8) and the land use and tenure maps (Maps 1-7) at the back of the report may be useful when reading the description.

(a) Oliver-Osoyoos Region

This region contains three recreation sites on Osoyoos Lake - Haynes Point Provincial park, two portions of Osoyoos Community Park, and one site on Tugulnuit Lake. These recreation sites occupy 29.4 acres, 95% of which are located around Osoyoos Lake (Figure 8.3). Much of the land classified as miscellaneous at the sites around Osoyoos Lake is contained in Haynes Point Provincial Park. This park is primarily a campground located on a spit extending almost across the lake. Approximately a quarter (7 acres) of the recreation area in the region consists of sand and beach-oriented grass, most of which is located in Osoyoos Community Park.

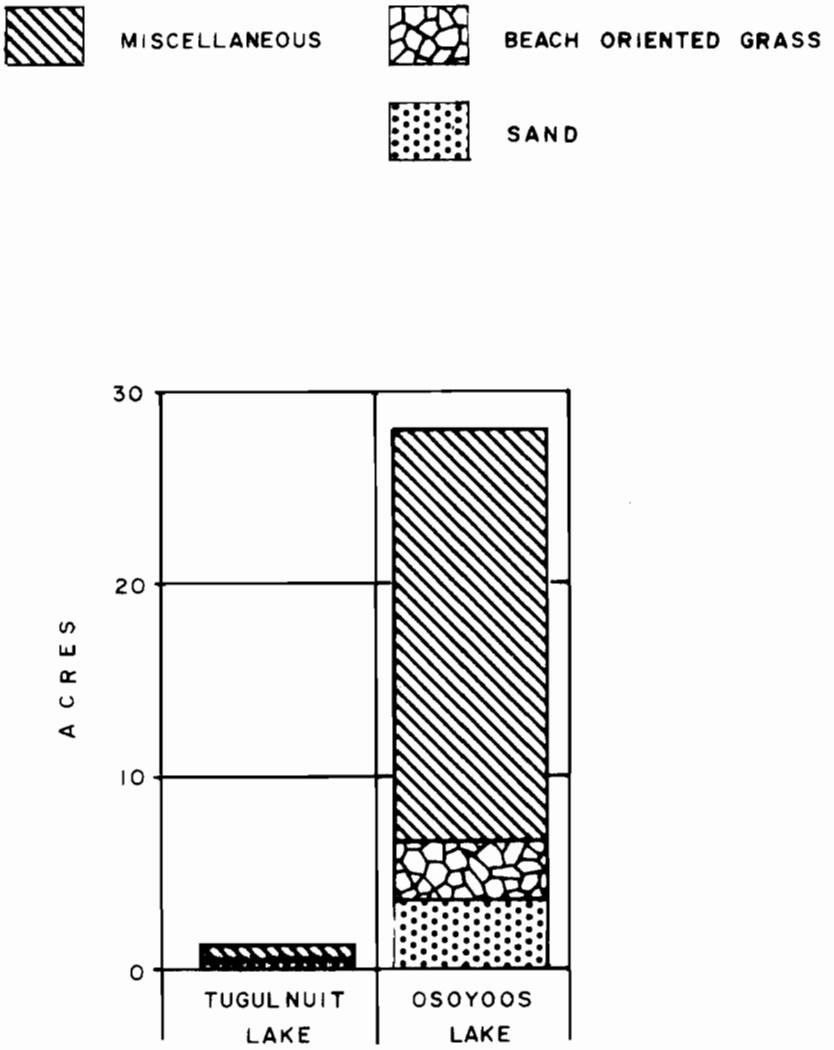
(b) Penticton Region

This region contains fifteen public recreation sites - one on Vaseux Lake, three on Skaha Lake and eleven on Okanagan Lake. Eight of the sites are



CHARACTERISTICS OF PUBLIC RECREATION SITES AROUND MAIN VALLEY LAKES

Figure 8.2



CHARACTERISTICS OF PUBLIC RECREATION SITES IN THE OLIVER-OSOYOOS REGION

Figure 8.3

provincial campgrounds or picnic sites and beach areas and seven are municipal beach areas. These sites cover 161.2 acres, nearly half (46%) of the total public recreation area around all the main valley lakes. The largest acreage is located on Okanagan Lake (114.7 acres), followed by Skaha Lake (43.2 acres) and Vaseux Lake (3.3 acres) (Figure 8.4). Fifty seven acres around Okanagan Lake are contained within one site, Okanagan Lake Provincial campsite, which accounts for a large proportion of the miscellaneous public recreation area around this lake. Forty four acres or 27% of the total acreage in this region are available for beach-oriented recreation. The two major beach areas are on Okanagan Lake and Skaha Lake in Penticton which contain 26 acres of sand and beach-oriented grass.

(c) Kelowna Region

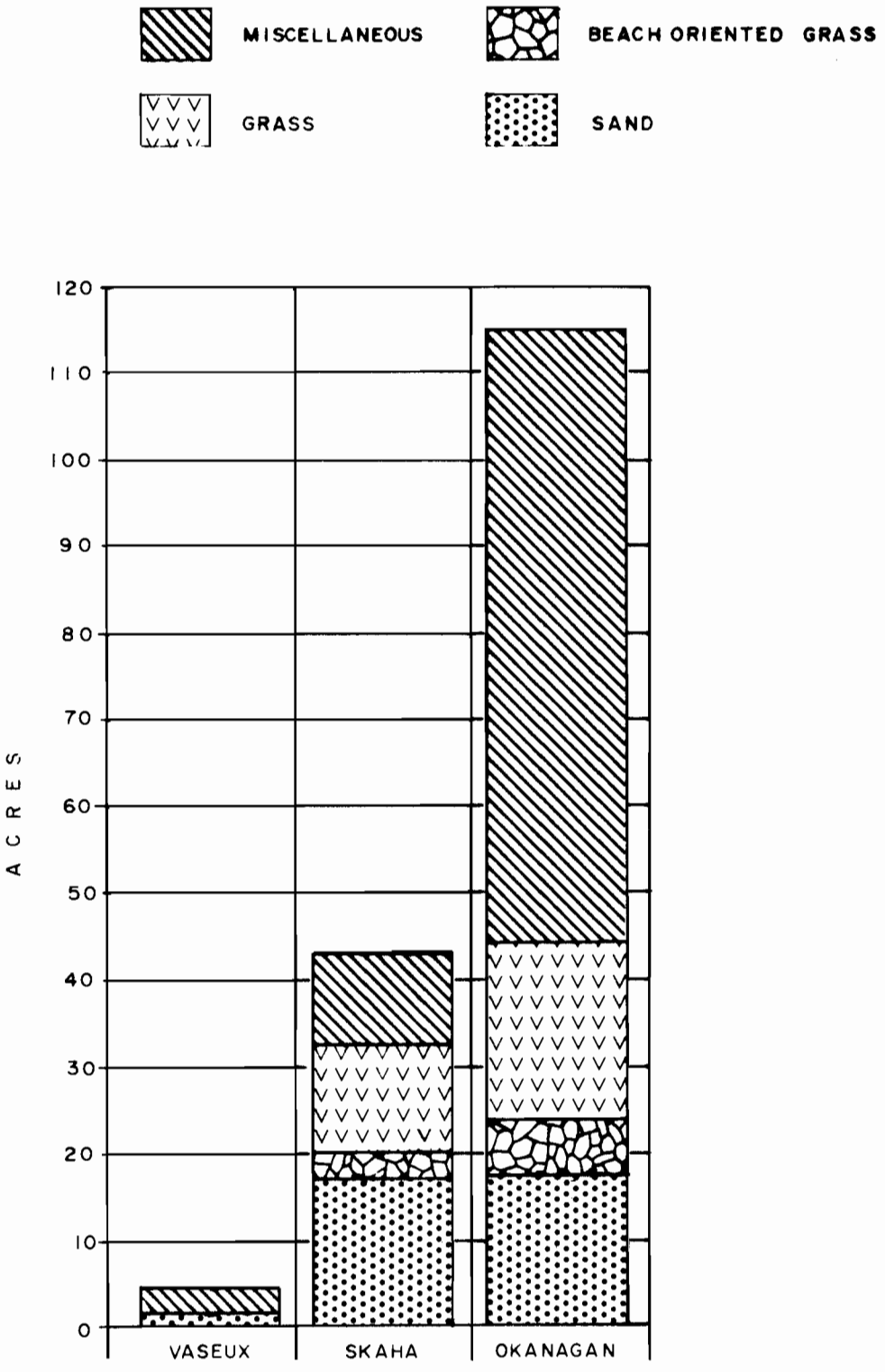
There are fourteen public recreation sites around the portion of Okanagan Lake contained within this region, eleven of which are municipal and three of which are provincial. As can be seen from Figure 8.2, these sites contain 86.7 acres, a large proportion (44%) of which is available for beach-oriented recreation.

(d) Vernon Region

There are five public recreation sites in this region, two on Okanagan Lake, two on Kalamalka Lake and one on Wood Lake. Over three quarters (78%) of the 73.4 acres of recreation sites in the Vernon region are, however, contained in Ellison Provincial Park and Campground, which accounts for a large proportion of the recreation area classified as miscellaneous around the northern portion of Okanagan Lake (Figure 8.5). The main public beach on Kalamalka Lake near Vernon and the small beach nearby contain only 5 acres, although most of this land is devoted to beach-oriented recreation.

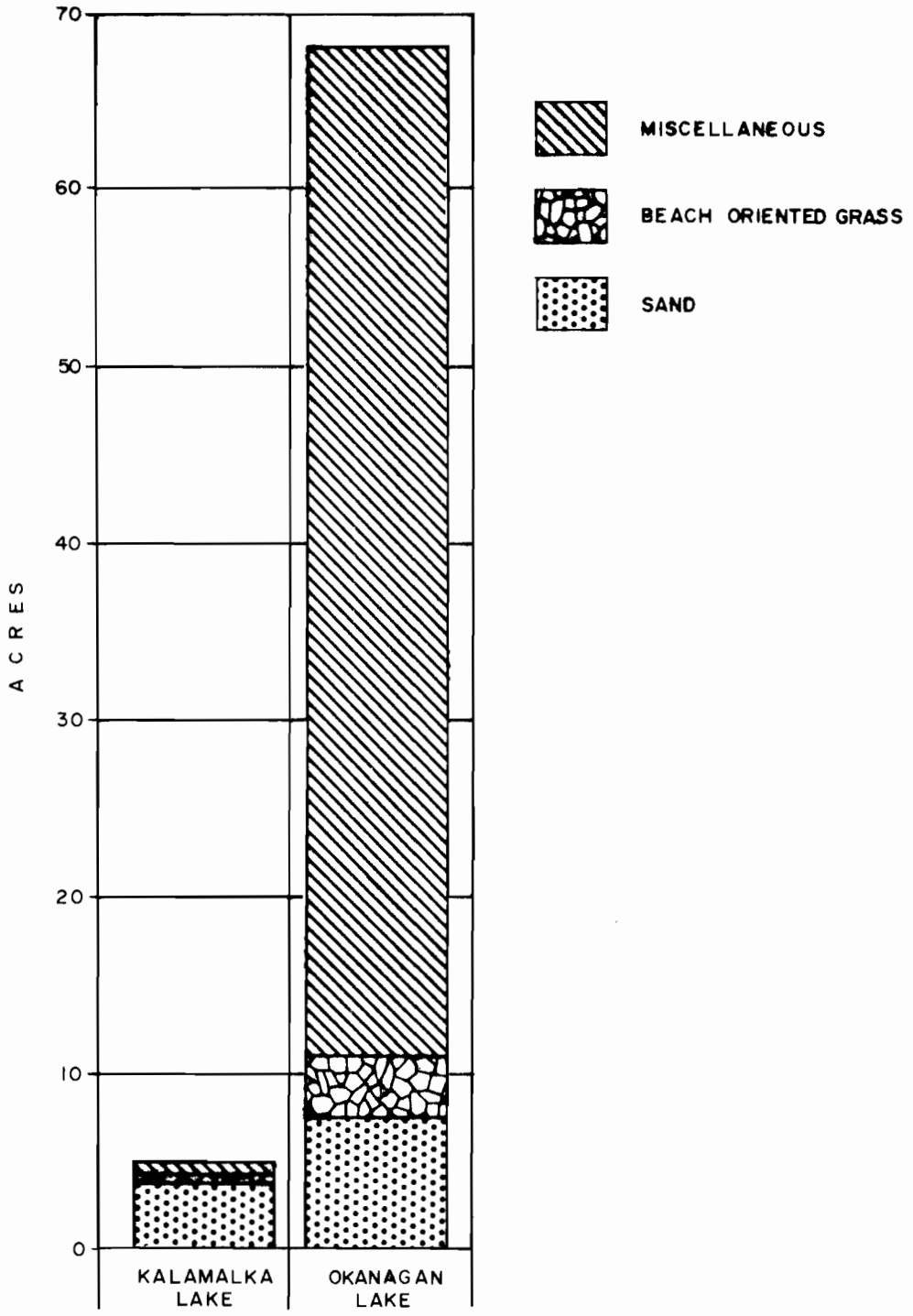
Figure 8.6 portrays the regional distribution of sand and beach-oriented grass areas and participation in beach-oriented recreation by visitors and residents (the methods used to derive estimates of beach days and their regional distribution are described in Chapter 10 of this report). The Penticton region contains the largest share (42%) of the beach areas followed by the Kelowna region (37%), the Vernon region (14%) and the Oliver-Osyoos region (7%). Approximately 35% of the total participation in beach-oriented recreation is estimated to occur in the Kelowna region, 30% in the Penticton region, and 25% and 10% in the Vernon and Oliver-Osoyoos regions respectively.

Although there is some divergence between the regional distribution of the supply of beach areas and beach use, particularly in the case of the Penticton and Vernon regions, there is a broad correspondence between current supply and demand conditions. Participation in beach-oriented recreation within any region varies considerably however, so that inferences about beach crowding cannot be readily drawn from these findings. Judging from responses by visitors



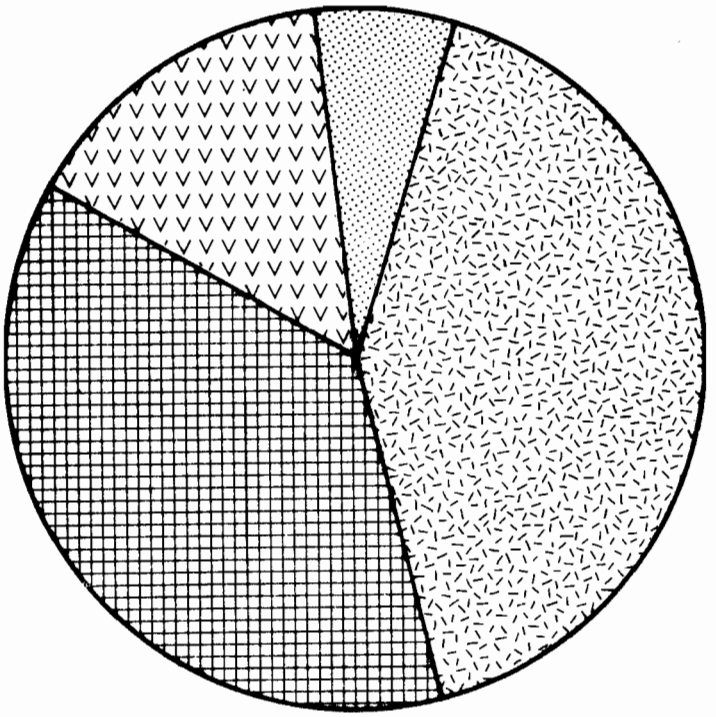
CHARACTERISTICS OF PUBLIC RECREATION SITES IN THE PENTICTON REGION

Figure 8.4

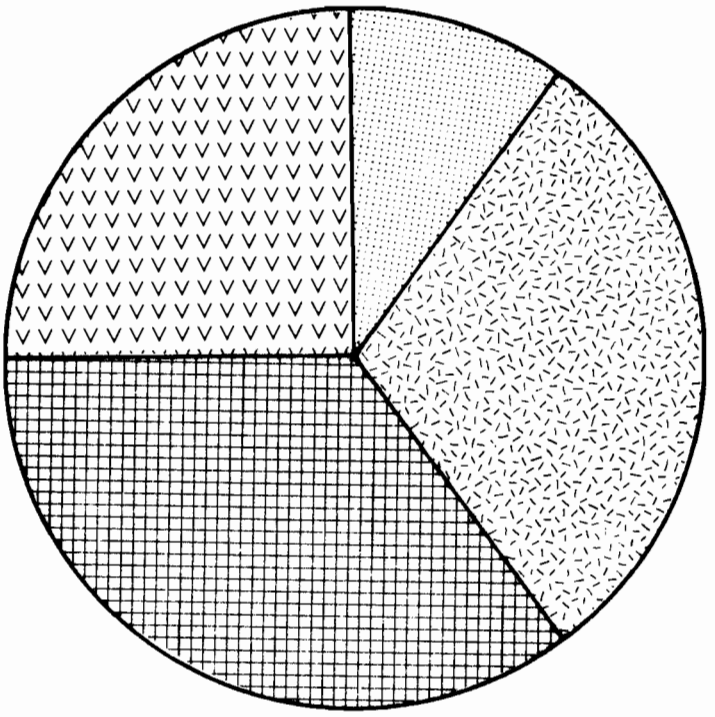


CHARACTERISTICS OF PUBLIC RECREATION SITES IN THE VERNON REGION

Figure 8.5



AREAS



DEMANDS

REGIONAL DISTRIBUTION OF
BEACH-ORIENTED RECREATION AREAS & DEMANDS

Figure 8.6

and residents to beach crowding, this does not appear to be a major problem at present.

8.4 SUMMARY AND DISCUSSION

Approximately 14 miles or 5% of the total shoreline of the main valley lakes are devoted to public recreational uses while less than one per cent or two miles have already been developed as public access points. Public recreation sites with frontage on the main valley lakes cover 349 acres but only 30% of this land is directly available for beach-oriented recreation, the remainder being developed to service the main public beaches. The largest proportions of the total beach area are in the Penticton region (42%) and the Kelowna region (37%). Nearly half (119.3 miles) of the shoreline is as yet undeveloped although much of this land appears to have limited potential for beach development. Approximately 9% or 20 miles of the shoreline consists of undeveloped public land while there is 1 mile of undeveloped public access points. There is thus quite a substantial amount of public land which could be developed for recreational purposes.

CHAPTER 9

Projections of Tourism and its Economic Value to Okanagan Residents

9.1 INTRODUCTION

The planning horizon of the Okanagan Basin Study was 50 years to the year 2020. Projections of tourism and its economic value to 2020 were calculated for two main purposes. The primary objective was to provide an indication of the potential magnitude of economic benefits derived from future levels of tourism by Okanagan residents. This information provided a basis for estimating the possible economic consequences of continued deterioration in water quality in the main valley lakes. The secondary objective was to assess the adequacy of shoreline resources to satisfy future demands for shoreline recreation by both residents and tourists.

In view of the difficulties encountered in making predictions for a 50 year period the following approach was employed. The 50 year time period was viewed in terms of three time scales; the short term to 1980, the medium term from 1980 to the year 2000 and the long term between 2000 and 2020. Considerable attention was devoted to providing a detailed estimate of demands to 1980 based on an analysis of current trends in tourism. Beyond 1980, two projections were calculated. The first projection assumed that substantial reductions in the growth rate of tourism would occur, possibly due to such policies as limiting the amount of available accommodation. The provision of a range in demands not only underlines the uncertainty inherent in longer term predictions, but also allows an assessment of the sensitivity of water quality and shoreline management measures to varying projections of tourism and consequently beach days.

9.2 METHODS

9.2.1 Projections of Summer Holiday Visitors and Visitor Days

An estimated 485,000 summer holiday visitors stayed in the Okanagan Basin in 1970, and of these, 151,400 or 31% stayed with friends and relations rather than in commercial accommodation. Summer holiday visitors were estimated to have spent 3,111,574 days in the Okanagan Basin in 1970, an average of 6.4 days for each visitor.

The number of summer holiday visitors expected to stay in commercial accommodation in 1980 was estimated by the following procedures. The Tourist Questionnaire Survey indicated the origins of tourists staying in commercial accommodation and allowed the number of visitors from each of the tourist market areas to be calculated and expressed as a number of visitors per 1,000 pop-

ulation of market area. For example, the Lower Mainland of British Columbia contained a population of 1,160,000 in 1970 and contributed an estimated 198,400 tourists to the Okanagan Basin in 1970 or 171 tourists per 1,000 population. These visitation rates were applied to projected populations of each of the market areas in 1980 to give an estimated number of tourists from each market area in 1980. The estimated numbers from the various market areas were then amalgamated to give a total number of tourists staying in commercial accommodation in 1980. In the case of visitors staying with friends and relatives, in 1970, there was an average of 1.3 visitor days per Okanagan resident. This visitation rate was applied to the projected resident population for 1980 to determine the number of summer holiday visitors staying in private households in 1980.

The two alternative projections of tourist growth beyond 1980 were derived as follows. Current visitation rates were applied to the projected populations of the market areas for 2000 and 2020 to give an estimate of the number of tourists staying in commercial accommodation. The number of visitors staying with friends and relations was determined by applying their current visitation rates to the resident population projections of 244,000 in 2000 and 391,000 in 2020, based on the assumption of a continuation of current economic growth trends in the valley. An alternative slower rate of growth was postulated on the basis that reductions in the growth rate of the tourist and resident populations might be desired and attained beyond 1980. As an arbitary measure, the projected increments in the number of tourists staying in commercial accommodation between 1980 and 2000 and between 2000 and 2020 were reduced by 50% from those projected above. Reductions in the growth rate of people staying in private households were obtained by applying the current visitation rates of these visitors to the low resident population projection of 237,000 in 2000 and 290,000 in 2020 which is consistent with a relatively slow rate of economic growth (Technical Supplement X). The average length of stay of Okanagan tourists for all future levels of tourism was assumed to remain at 6.4 days. Thus, summer holiday visitor days for both visitors staying in commercial accommodation, and private households, simply represent estimated number of visitors multiplied by 6.4.

9.2.2 Projections of the Economic Value of Summer Tourism

Summer holiday visitors spent an estimated $11.5 million in 1970, resulting in a direct and indirect or total income of $5.9 million in 1970 for Okanagan residents. Purchases by summer holiday visitors in 1980 were calculated by multiplying average per capita purchases in 1970 by the number of visitors projected for 1980 and adding 15% to the figures derived to take into account expected real increases in expenditures per capita over the decade. The per capita purchases by, or on behalf of, visitors staying in commercial accommodation or private homes respectively were estimated for four sectors of the economy; accommodation and restaurants, agricultural products, retail trade and other services. The net economic impacts of these purchases to the Okanagan

economy were analyzed in the input-output model of the Okanagan economy (Technical Supplement X).

Two post-1980 projections of purchase and resulting net income were formulated using the same procedures and assumptions as described above. Both projections took into account increases in expenditures per capita of 30% for each twenty year period. All projected levels of purchases and total income were expressed in constant 1970 dollars so that increases due to inflation were removed.

9.2.3 Problems of Prediction

A number of important points should be borne in mind when examining the projections of future levels of tourism. It is difficult to project the growth of tourism, especially for a relatively small region such as the Okanagan Basin. Tourist growth rates reflect a variety of factors including increases in population, income, leisure time and mobility. However, projections of tourism based on simple assumptions were considered to be adequate for the purposes of the Okanagan Basin Study since the primary objective was to assess water resource and shoreline management alternatives rather than present a complete analysis of recreation and tourism in the Okanagan. The projection to 1980 and the unrestrained projection of tourist growth beyond 1980 rest on the simple assumption that tourism will keep pace with increases in the populations of the current tourist market areas. It is quite conceivable that visitation rates will increase faster than the populations of urban areas such as the Lower Mainland of British Columbia and Calgary and Edmonton, Alberta due to other changes such as increases in leisure time. For example, a widespread adoption of a four-day working week and three-day weekend could increase the popularity of the Okanagan Basin for weekend visits. On the other hand, other regions which have not yet developed as major recreational areas could prove to be more attractive than the Okanagan for many people in the future. The use of projections based on market area population growth is considered to represent a reasonable and perhaps even conservative estimate of future levels of tourism for this region.

Although some of the implications of relatively high growth rates for tourism were investigated, the projections themselves were formulated without detailed analysis to the capability of the region to cater to them. Already the desirability of encouraging tourists has been questioned by some Okanagan residents and it is quite possible that attempts may be made in the future to discourage tourism, at least during the peak of the season. The provision of a relatively low growth rate for tourism beyond 1980 allows some of the consequences of slower growth rates to be appreciated. It should be stressed that the choice of reduced levels for visitors staying in commercial accommodation was quite arbitrary since the restrained tourist growth projection was designed for illustrative, rather than purely predictive purposes. The range between the two alternative post 1980 projections does serve, however, to highlight the uncertainty involved in making predictions of tourist growth.

9.3 RESULTS

9.3.1 Future Levels of Summer Tourism

The increase in the number of holiday visitors staying in the Okanagan Basin during June, July, August, or September is expected to be quite rapid between 1970 and 1980. It is estimated that there will be 683,700 visitors by 1980 compared to 485,400 in 1970 (Figure 9.1). Beyond 1980, under the high growth projection, over 1 million summer holiday visitors are expected by 2000 and over 1.5 million by 2020. Under the lower growth projection, it is anticipated that the Okanagan will receive over 900,000 summer tourists by 2000 and over 1.2 million by 2020.

Figure 9.2 differentiates the total number of summer tourists by the type of accommodation. Approximately two thirds of the total number of summer holiday visitors are expected to continue staying in commercial accommodation. Assuming that the current average lengths of stay of summer tourists continues in the future, 4.4 million days are expected to be spent in the Okanagan Basin in 1980 compared to approximately 3.1 million days in 1970. This could rise to nearly 7 million days by 2000 and over 10 million days by 2020.

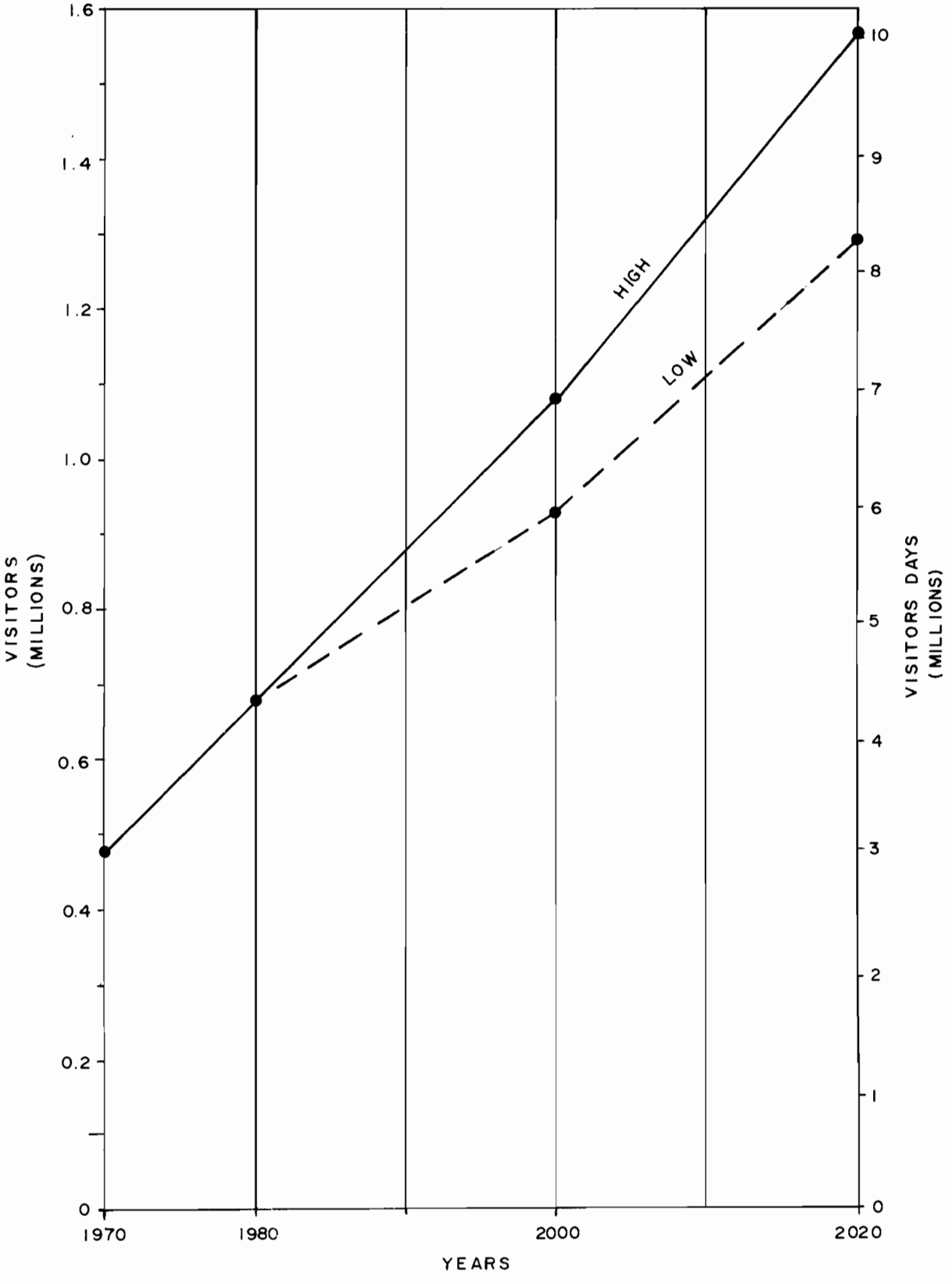
The expected increase in summer holiday visitors and visitor days to 1980 and the two post 1980 projections are perhaps most readily appreciated by reference to the following growth index which uses 1970 as a base year and expresses the number of summer tourists in that year as 100:

1970	1980	2000		2020	
		High	Low	High	Low
100	141	224	192	324	266

Summer tourism is expected to increase by approximately 40% between 1970 and 1980 and could more than double by 2000 and more than triple by 2020. It is thus evident that there will be a very substantial potential demand for beach-oriented recreation on the part of future summer holiday visitors to the Okanagan Basin.

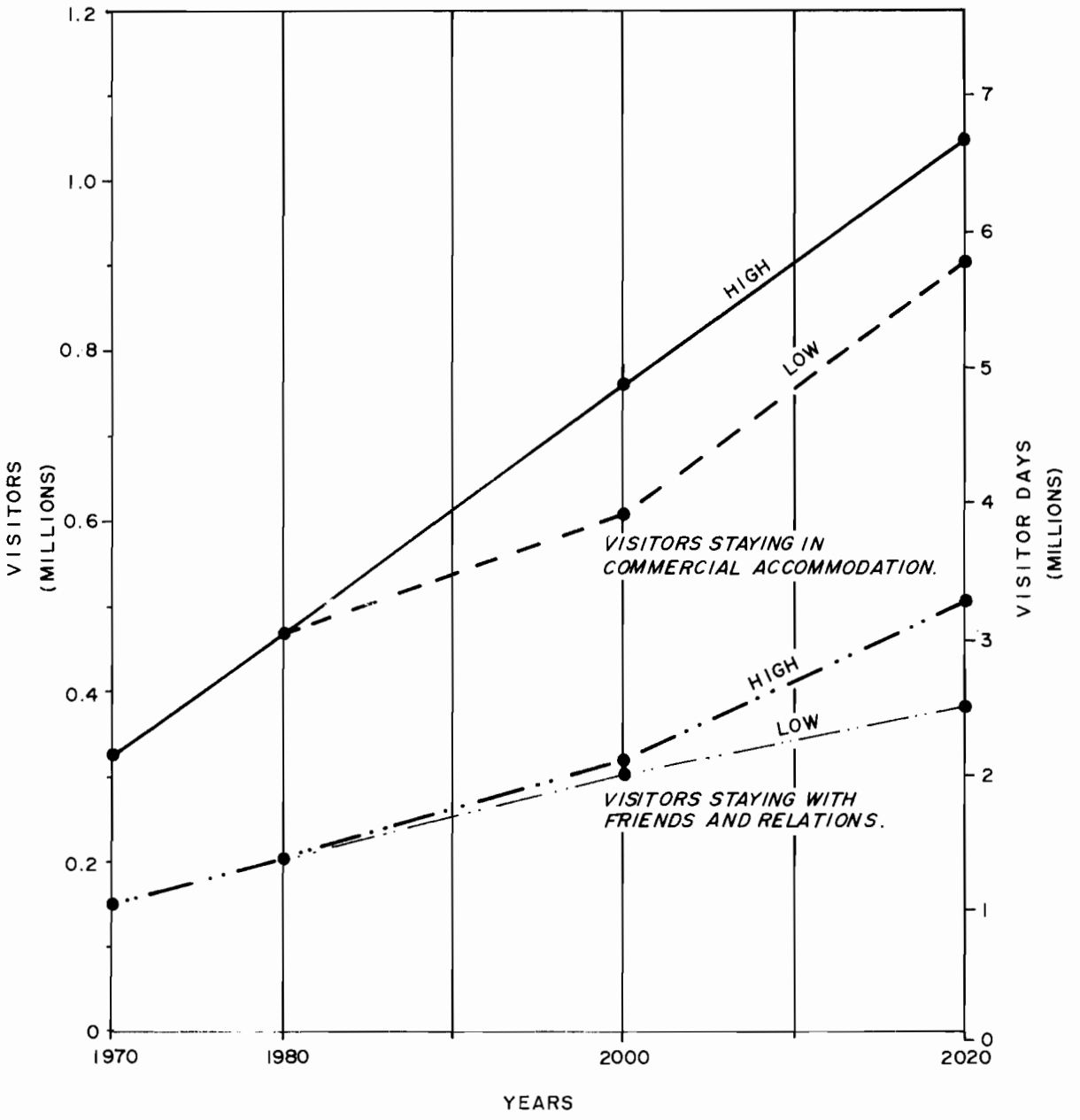
9.3.2 The Economic Value of Future Levels of Tourism

The increase in the value of purchases by summer tourists and the resulting income to Okanagan residents is expected to occur at an even faster rate than the growth in the number of summer tourists because of increases in average per capita expenditures. By 1980 gross purchases of goods and services by summer holiday visitors are expected to rise to approximately $18.9 million from approximately $11.5 million in 1970 (Figure 9.3). Purchases by summer tourists in 2000 are expected to amount to $40 million and $33 million under the high and low growth projections respectively, the corresponding figures in 2020 being $69 and $59 million. The relative share of the total net income derived by Okanagan residents from these expenditures should increase as the share of



PROJECTIONS OF SUMMER HOLIDAY VISITORS AND VISITOR DAYS

Figure 9.1

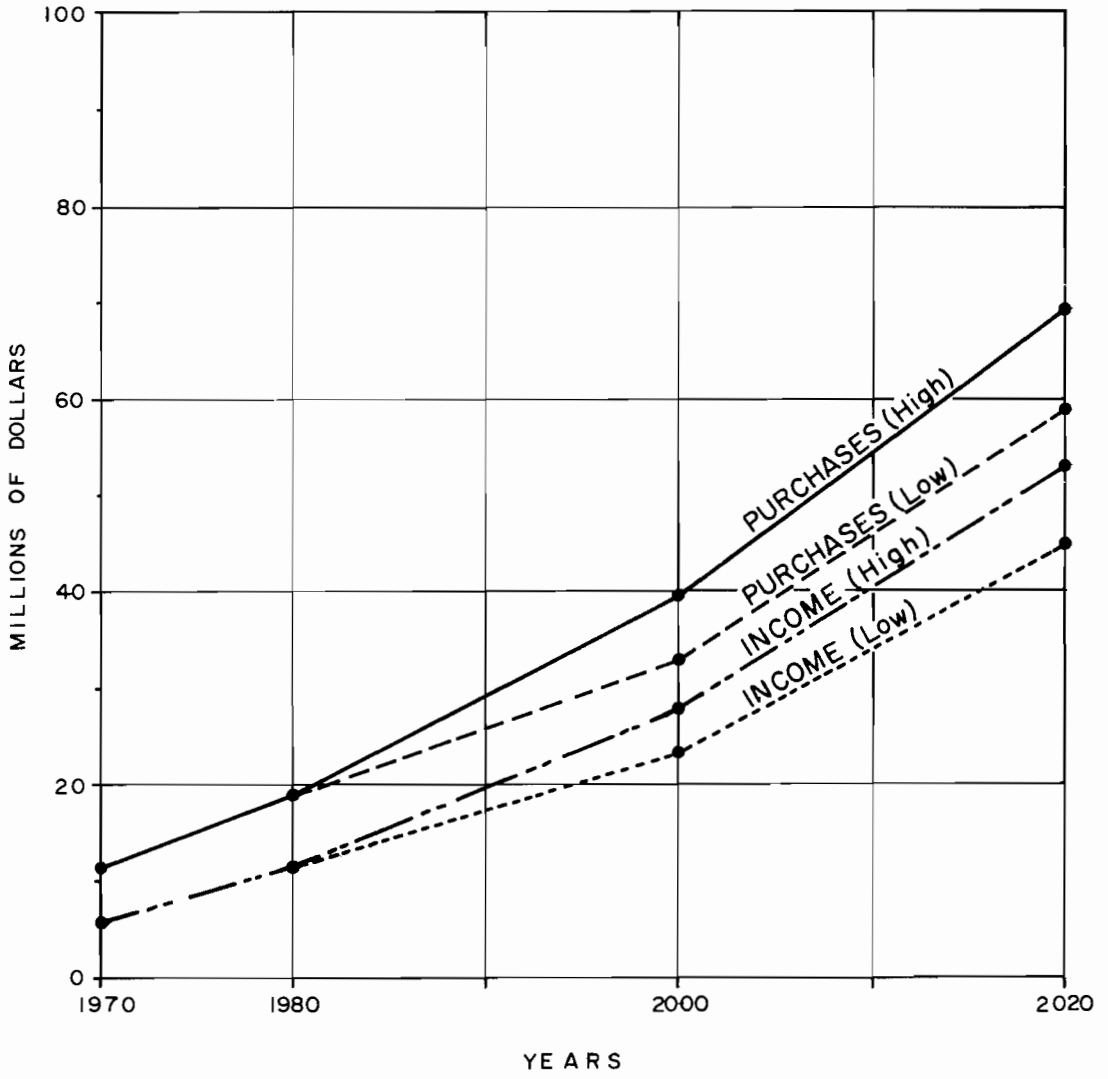


PROJECTIONS OF SUMMER HOLIDAY VISITORS

IN COMMERCIAL ACCOMMODATION

AND PRIVATE HOMES

Figure 9.2



PROJECTIONS OF GROSS PURCHASES AND NET INCOME DERIVED BY OKANAGAN RESIDENTS FROM SUMMER HOLIDAY VISITORS.

Figure 9.3

employment in the service sector increases. Again, the expected increase to 1980 and the two post 1980 projections are perhaps most readily appreciated by reference to a growth index which expresses purchases and income levels in 1970 as 100.

1970	1980	2000		2020	
		High	Low	High	Low
100	163	345	287	607	523

CHAPTER 10

Projections of Demands for Beach-Oriented Recreation and the Beach-Oriented Recreation Capability of the Main Valley Lakes

10.1 INTRODUCTION

Lakeshore land use and tenure patterns and the extent and severity of current levels of crowding at public beaches have been documented in a previous section of the report. Future demands for beach-oriented recreation were estimated from projections of resident and tourist populations, and the capability of shoreline lands around the main valley lakes to cater to these demands was assessed. The results of these analyses are presented in this chapter of the report. The aim of the exercise was to provide an indication of future pressures on shoreline resources around the main valley lakes as a prerequisite for suggesting shoreline management options designed to minimize these pressures.

10.2 METHODS

10.2.1 Projections of Demands for Beach-Oriented Recreation

Participation in beach-oriented recreation was expressed in terms of beach days; the number of days or portion of days spent on Okanagan beaches by visitors and residents from May to September inclusive. Beach use depends on two basic factors; the size of the tourist and resident populations and their respective frequencies of beach attendance. The current frequency of beach attendance by summer holiday visitors was estimated as follows: First an approximate indication of beach use by visitors staying in commercial accommodation was obtained from respondents in the Tourist Questionnaire Survey. Seventy percent of the sample indicated that swimming was the favorite outdoor recreational activity for their group while on holiday in the Okanagan. Thus, 70% of the visitors staying in commercial accommodation were assumed to go to the beach every day they spent in the Okanagan. Approximately 20% ranked swimming as their second most preferred activity and these visitors were assumed to frequent the beach on 50% of their holiday days. The remaining 10% were assumed to attend the beach on 30% of their holiday days. These assumptions resulted in an estimate that approximately 60% of all summer holiday visitors days spent in commercial accommodation constitute beach days. A further indication of beach use by visitors was obtained from the responses of visitors in the Beach User Questionnaire Survey when questioned on their frequency of beach attendance. This data source also verified that 60% of summer holiday visitor days spent in commercial accommodation could be counted as beach days.

The results from the Beach User Questionnaire indicated that visitors staying at private homes visited beaches less frequently than those staying in

commercial accommodation. Indeed only 20% of the visitor respondents in the Beach User Questionnaire Survey were staying with friends compared to an estimated 31% of the total number of summer holiday visitors. Based on these results, it was assumed that visitors staying at private homes spend approximately one third less of their holiday days at the beach than those staying in commercial accommodation. Beach days thus constitute 50% of summer holiday visitor days spent in private homes.

The following procedures were used to derive an estimate of the current frequency of beach attendance by residents. Respondents in the Resident Recreation Survey were asked the number of days they swam in the Okanagan lakes, whether by themselves or with other members of their household. Approximately three-quarters of Okanagan households contained at least one person who had swum in the lakes in 1971. The proportion of households in which only adults (30%) or only children (10%) had participated were assumed to contain 1.5 swimmers respectively while the remaining 60% of the households in which both children and adults had participated were assumed to contain 3.5 swimmers each. These proportions and weightings were used in conjunction with frequency data to arrive at an estimate of an average participation rate of 20 swimming days per resident between June and September.

As an approximation, it was assumed that swimming days were used as an indicator of beach days. It is recognized that some residents visit beaches and do not actually swim and therefore this assumption may lead to an underestimate of beach days. On the other hand, it is suspected that many residents in answering the Resident Survey probably equated a beach day as a swimming day and therefore overestimated their actual participation in swimming. At any rate, the Beach User Questionnaire Survey results backed up a median value of 20 beach days per resident during the summer of 1972.

Participation in beach-oriented recreation by visitors in 1970 and 1980 was simply calculated by applying current frequencies of participation by visitors staying in commercial accommodations and private homes respectively to these two components of the estimated tourist population in 1970 and 1980. Participation by residents was calculated by applying their current frequency of attendance to the estimated resident population in 1970 and 1980.

After 1980, current frequencies of participation by visitors staying in commercial accommodation and private homes respectively were applied to these two components of the high and low tourist growth projections for 2000 and 2020. It was thus assumed that beach-oriented recreation would not take up a greater proportion of the holiday time of visitors in the future since it is already a major part of their vacations. The range of projections of demand by residents however, was based on an increase in annual per capita beach use. The lower projection for resident beach use was derived by applying current

participation rates to low population projection of 237,000 in 2000 and 290,000 in 2020. The high projection for residents was obtained by increasing participation rates by 10% in 2000 and a further 10% in 2020 and applying these to the high population forecasts of 244,000 in 2000 and 391,000 in 2020.

Future regional distribution pattern of beach days was assumed to reflect regional distribution of the tourist and resident populations since most beach-oriented recreation occurs near places of stay and residence. The current regional distribution pattern of visitors staying in commercial accommodation was assumed to continue in the future. The distribution pattern of the resident population and hence resident beach days and beach days for visitors staying in private homes was estimated to change somewhat in the future, as the Kelowna region will assume a somewhat larger share of the future resident population.

10.2.2 Beach-Oriented Recreation Capability

Information on the capability of the shoreline around the main valley lakes to support beach-oriented recreation was derived from Canadan Land Inventory (C.L.I.) maps. Complete map coverage of the capability of the shoreline to support a variety of recreational activities was available at a scale of 1:50,000. Portions of the shoreline capable of supporting beach activities were identified and their capability classes were noted. Around the main valley lakes existing and potential beach areas fell into four classes. Class 1 areas have a capability to sustain very high total annual beach use. Class 2 areas have a capability to sustain high total annual beach use while Class 3 and 4 areas can sustain moderately high and moderate total annual beach use respectively. The designation of a shoreline area into one of these classes is based on an appraisal of the characteristics of the area against a set of criteria[16].

Each of the four highest classes of recreational beach areas around the main valley lakes were identified. In addition to these areas, portions of the shoreline capable of supporting beach use as a subordinate recreational pursuit were also noted. The remaining tracts of shoreline were not considered to have any capability to support even moderate annual beach use, although they do have potential for other recreational activities. The information was transferred from the general outdoor recreation capability maps to base maps. These maps were then analyzed in conjunction with the land use and tenure maps and projected demands for beach-oriented recreation for each region of the Okanagan.

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16 Canada Land Inventory, 1969, Land Capability classifications for outdoor Recreation, Report No. 6, Dept. Regional Economic Expansion, Ottawa.

A number of important points should be borne in mind when interpreting beach-oriented recreation capability maps. First, the C.L.I. classification system on which they are based pertains to the recreational capability of a natural rather than a man-made environment. Landscaping of beaches on parts of the shoreline which have a relatively low natural capability is possible. A shortage of high quality shoreline for beach-oriented recreation does not preclude the development of beach areas although the development costs could be high. For example, a lack of fine beach material on the lakeshore might result in a low rating for beach activities even tough a beach could be produced by transporting sand to the area. Second, the classification system is based on the ability of an area to support intensive recreational uses. The fact that certain portions of the shoreline are rated low in terms of beach-oriented recreation does not signify that they cannot support any beach activities. On the contrary, they may be quite suitable for the beach activities of small numbers of people; for example, those who seek secluded, uncrowded beaches. Although the major concern is the ability of each region in the Okanagan to support potential beach use adequately, the provision of a range of beach-oriented recreation experiences is also important. Areas which rank relatively low in terms of beach-oriented recreation capability should therefore not be dismissed from consideration.

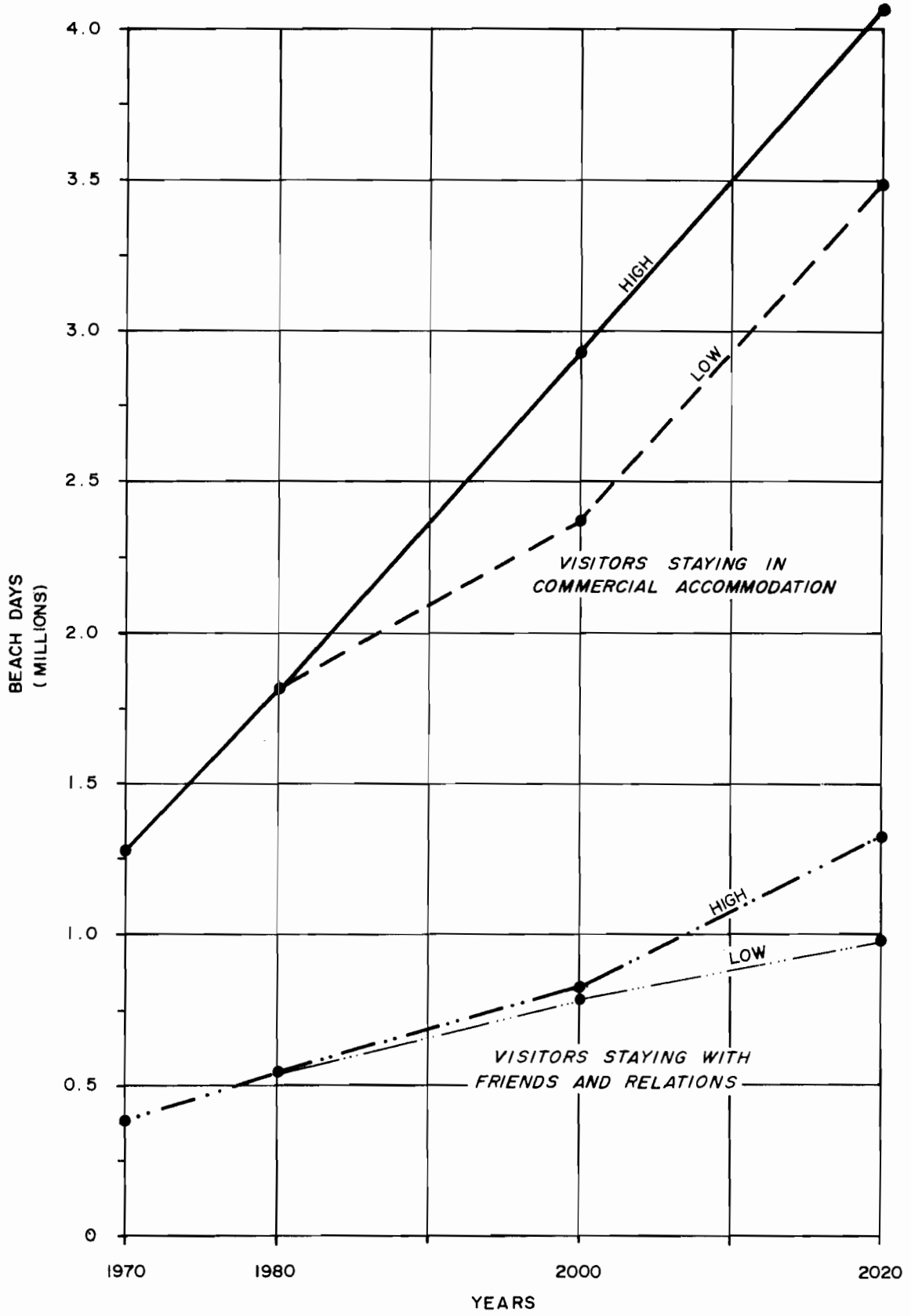
The original C.L.I. capability analysis did not include an assessment of some beaches already developed in the urban centres, for example at Kelowna. An appraisal of these beaches was made, however, on the basis of the C.L.I. criteria. Furthermore, many small beaches located in front of private resorts were also not included in the original C.L.I. maps, nor have all of these been included in the shoreline recreation capability maps contained in the back of this report. Consequently, these maps in reality represent the recreation potential of public recreation areas only.

10.3 RESULTS

10.3.1 Projections of Demands for Beach-Oriented Recreation in the Okanagan Basin

Participation in beach-oriented recreation in 1970 by visitors staying in commercial accommodation and at private homes amounted to nearly 1.3 M days and 0.4 M days respectively (Figure 10.1). The combined beach-day demands of these two types of visitors are estimated to increase by 41% between 1970 and 1980 to give a total of over 2.3 M beach days by 1980. Beyond 1980 under the high projection, total beach day demands by visitors is expected to increase to 3.8 M days by 2000 and over 5.3 M days by 2020, under the low growth projection corresponding figures are 3.1 M days by 2000 and 4.4 M days by 2020. Using 1970 as the base year, the growth in demands by visitors can be expressed as follows using a growth index of 100 for 1970:

1970	1980	2000		2020	
		High	Low	High	Low
100	141	225	190	322	268



PROJECTIONS OF DEMANDS FOR BEACH-ORIENTED RECREATION BY VISITORS IN COMMERCIAL ACCOMMODATION AND PRIVATE HOMES.

Figure 10.1

Demands by visitors could double by 2000 and triple by 2020.

Participation in beach-oriented recreation by residents amounted to over 2.2 M days in 1970 and is estimated to increase by 43% between 1970 and 1980 to over 3.2 M days (Figure 10.2). Beyond 1980, under the high growth projection resident beach day participation is expected to increase to 5.8 M days by 2000 and over 8.6 M days by 2020. Under the low growth projection, resident participation is expected to increase to over 4.7 M days by 2000 and 5.8 M days in 2020. The growth rates are as follows using a growth index of 100 for 1970:

1970	1980	2000		2020	
		High	Low	High	Low
100	143	238	210	415	257

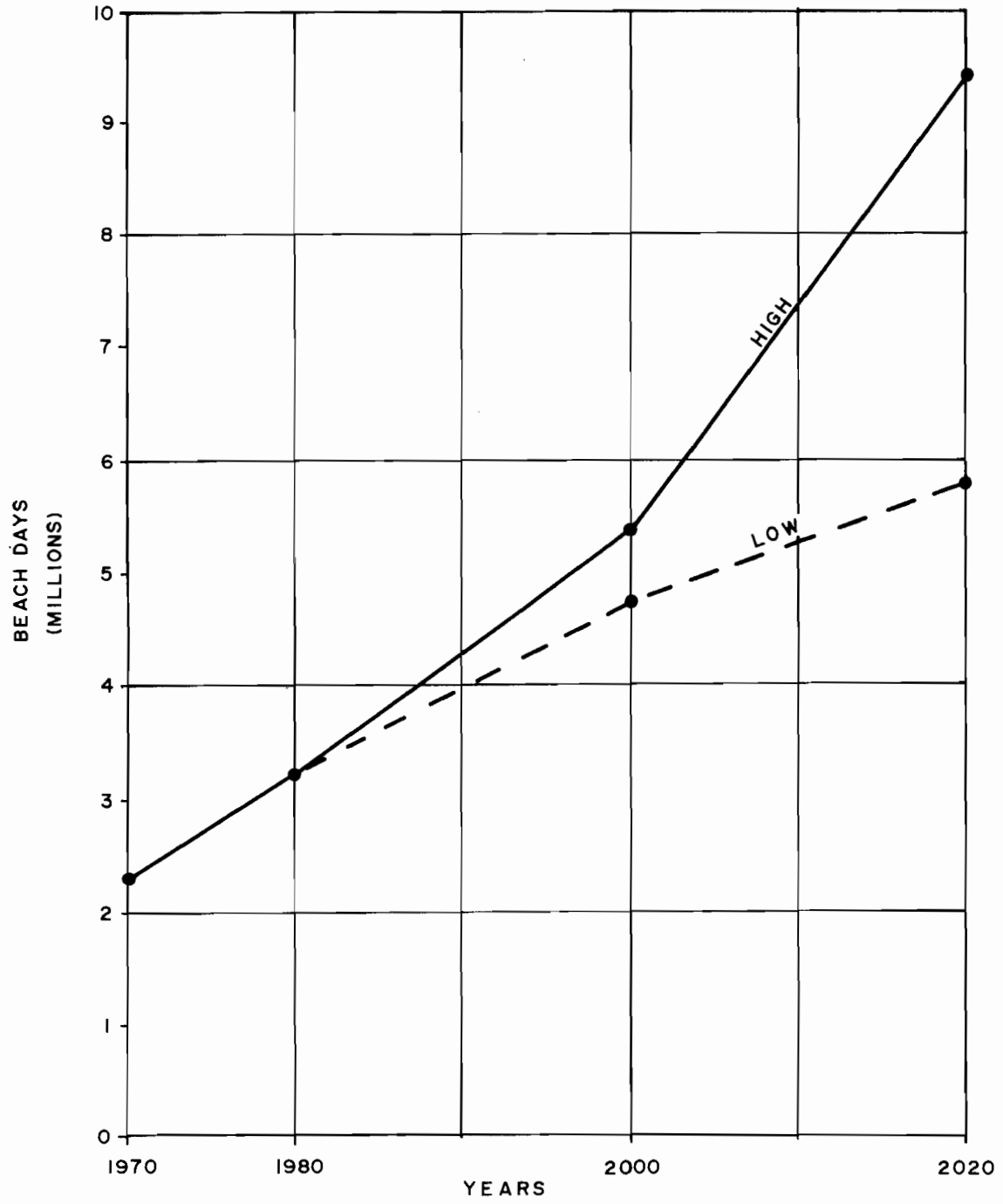
Demands by residents are estimated to at least double by 2000. Beyond 2000 a substantial range of demands could occur depending primarily on the growth rate of the resident population. Demands by residents in 2020 could be as high as four times the present level.

In Figure 10.3 the demands for beach-oriented recreation by visitors and residents are combined. Participation in 1970 is estimated as over 3.9 M days rising to over 5.5 M days by 1980. Beyond 1980 demands could rise to over 9.1 M days by 2000 and nearly 14.8 M days by 2020. The combined growth rate can be expressed as follows:

1970	1980	2000		2020	
		High	Low	High	Low
100	142	232	201	375	261

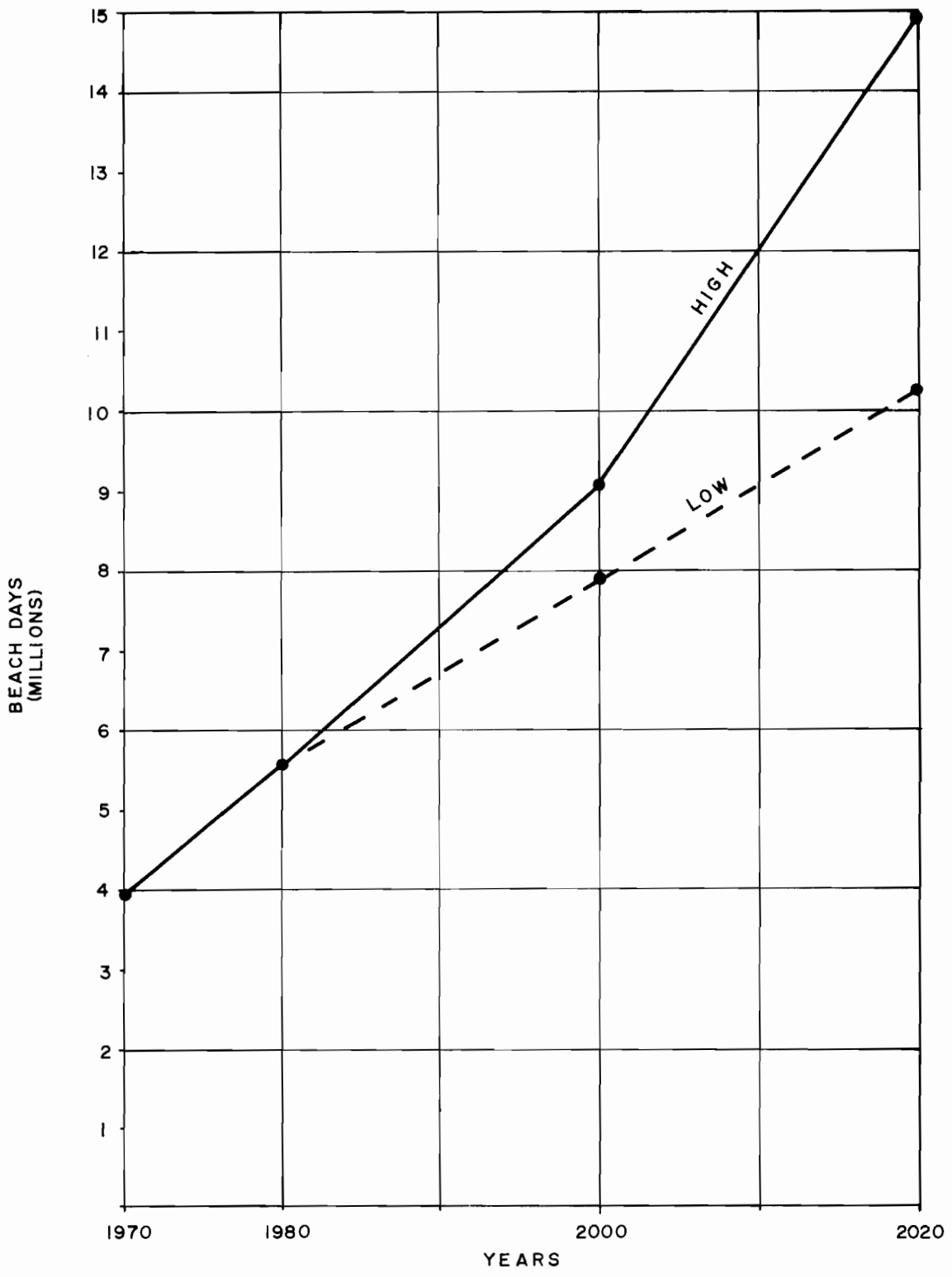
It is thus apparent that total demands for beach-oriented recreation will likely increase quite rapidly. Even under the low projection, demands are expected to double by 2000 and increase by over two and a half times by 2020.

Figure 10.4 simply portrays the proportion of the total demands arising from visitors staying in commercial accommodation or private homes and residents respectively. In 1970 and 1980 approximately one third of the total demands are estimated to arise from visitors staying in commercial accommodation, 10% from visitors staying in private homes and the remaining 57% from residents. Residents could account for nearly two thirds of the total demands by 2020 assuming high resident population growth and increased frequency of attendance. It is thus apparent that the development of additional beach areas in the Okanagan Basin will generally benefit residents as well as visitors. It is important to bear in mind however, that there are marked variations in the relative importance of the resident and visitor components of total demand between the four regions of the Okanagan Basin.



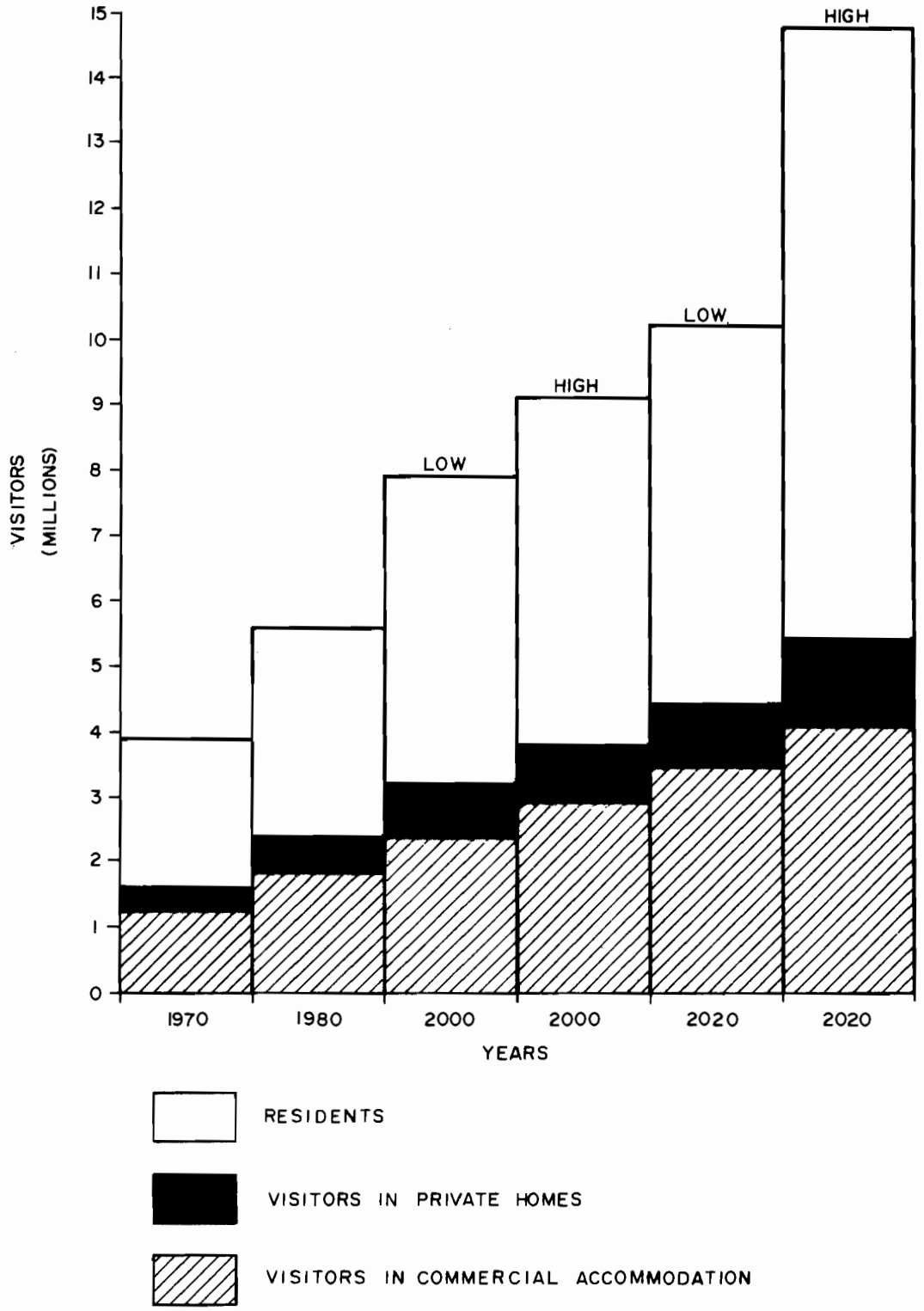
PROJECTIONS OF DEMANDS FOR
BEACH ORIENTED RECREATION BY RESIDENTS

Figure 10.2



PROJECTIONS OF TOTAL DEMANDS
FOR BEACH-ORIENTED RECREATION

Figure 10.3



PROJECTIONS OF DEMANDS FOR BEACH-ORIENTED RECREATION BY VISITORS AND RESIDENTS

Figure 10.4

10.3.2 Regional Distribution of Projections of Demands for Beach-Oriented Recreation

In 1970, beaches in the Kelowna region supported the highest beach use, mainly because Kelowna is the major population centre of the Okanagan. Beaches in the Penticton region were also well used as Penticton is the major tourist centre (Figure 10.5). These two regions accounted for approximately two thirds of total beach use participation while the Vernon region and Oliver-Osoyoos region catered to 25% and 10% respectively. Similar regional distribution patterns are expected to prevail until 1980. Beyond 1980 the share of the Kelowna region could increase quite substantially because of a relatively greater pace of resident population growth. By 2000 and 2020 the Kelowna region is expected to account for 39% and 42% of the total demands compared to 35% in 1970.

10.4 BOATING DAYS

Projections of boating day demands for both the high and low projections are shown in Table 10.1. In absence of any other data, it was assumed that participation in all forms of recreational boating for each region would grow at the same rate as general beach recreation in the region. To the extent that residents and tourists will become relatively more affluent and spend relatively more on boat purchases, these projections may be underestimated. Few tourists bring boats to the valley at present however, and as increasing resident participation rates are built into the high growth projection, this factor should not be significant.

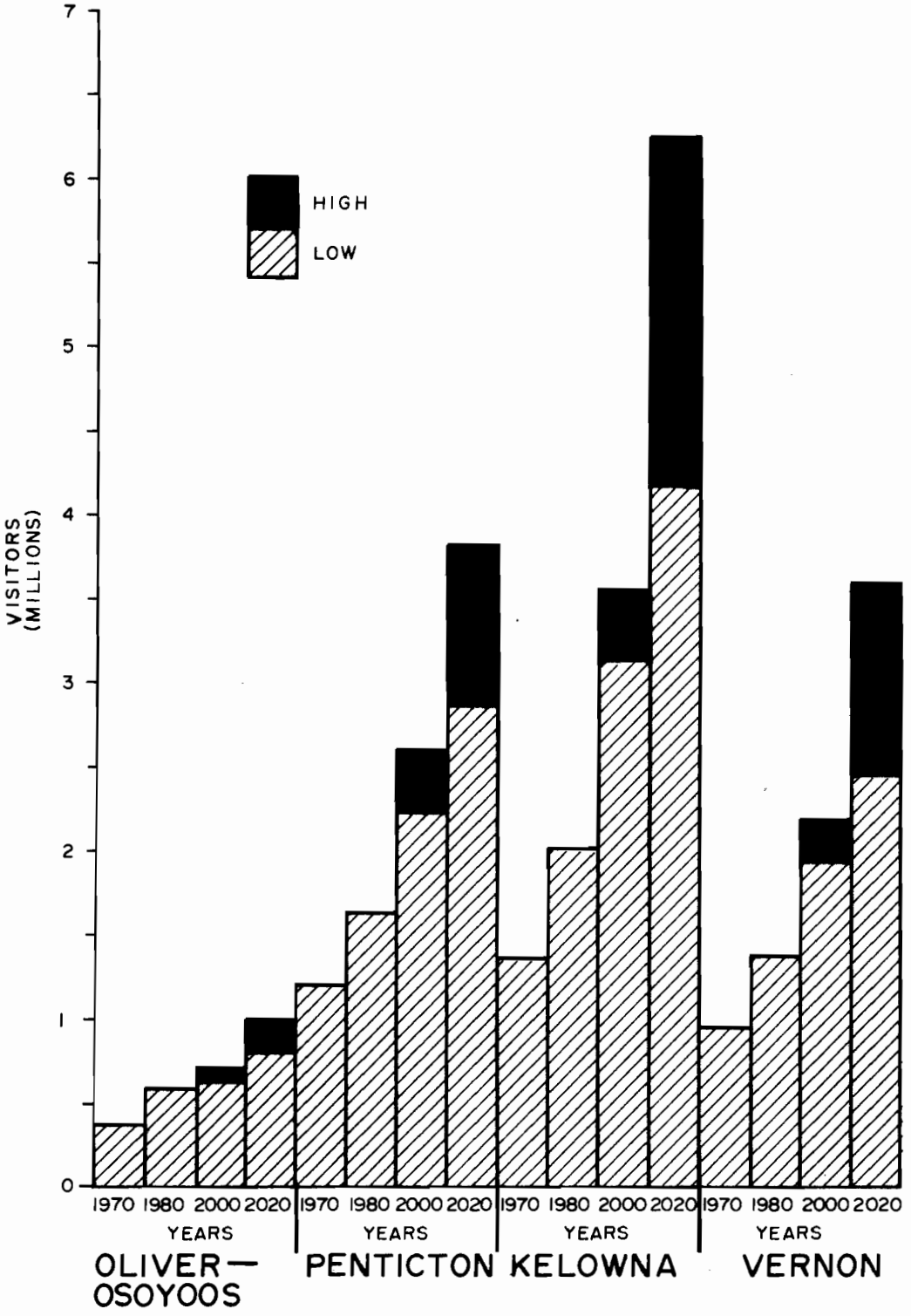
TABLE 10.1

PROJECTIONS OF BOATING DAYS IN THE MAIN VALLEY LAKES

1970 to 2020

Region	1970	1980	High Projection		Low Projection	
			2000	2020	2000	2020
Oliver-Osoyoos	23,500	31,000	48,000	67,000	41,000	52,000
Penticton	77,000	104,000	160,000	231,000	140,000	180,000
Kelowna	85,000	133,000	220,000	350,000	200,000	260,000
Vernon	76,000	104,000	160,000	230,000	140,000	175,000
TOTAL	261,500	372,000	588,000	878,000	521,000	667,000

As growth rates in boating days are based on beach day projections, somewhere between a three and four-fold increase in boating days is anticipated over the next fifty years. The vast majority of this growth will probably



PROJECTIONS OF TOTAL REGIONAL DEMANDS FOR BEACH-ORIENTED RECREATION

Figure 10.5

continue to occur on Okanagan Lake. It is also realistic to assume that the Kelowna region will capture an increasing share of boating days, as it is predicted to contain the most developed economic base in the valley.

Whether these projections of beach days and boating days will actually occur will depend partially on the availability of shoreline recreation facilities and the existence of other constraints such as accommodation and traffic congestion which could affect the tourist industry in the basin. This question is the main subject of the next section.

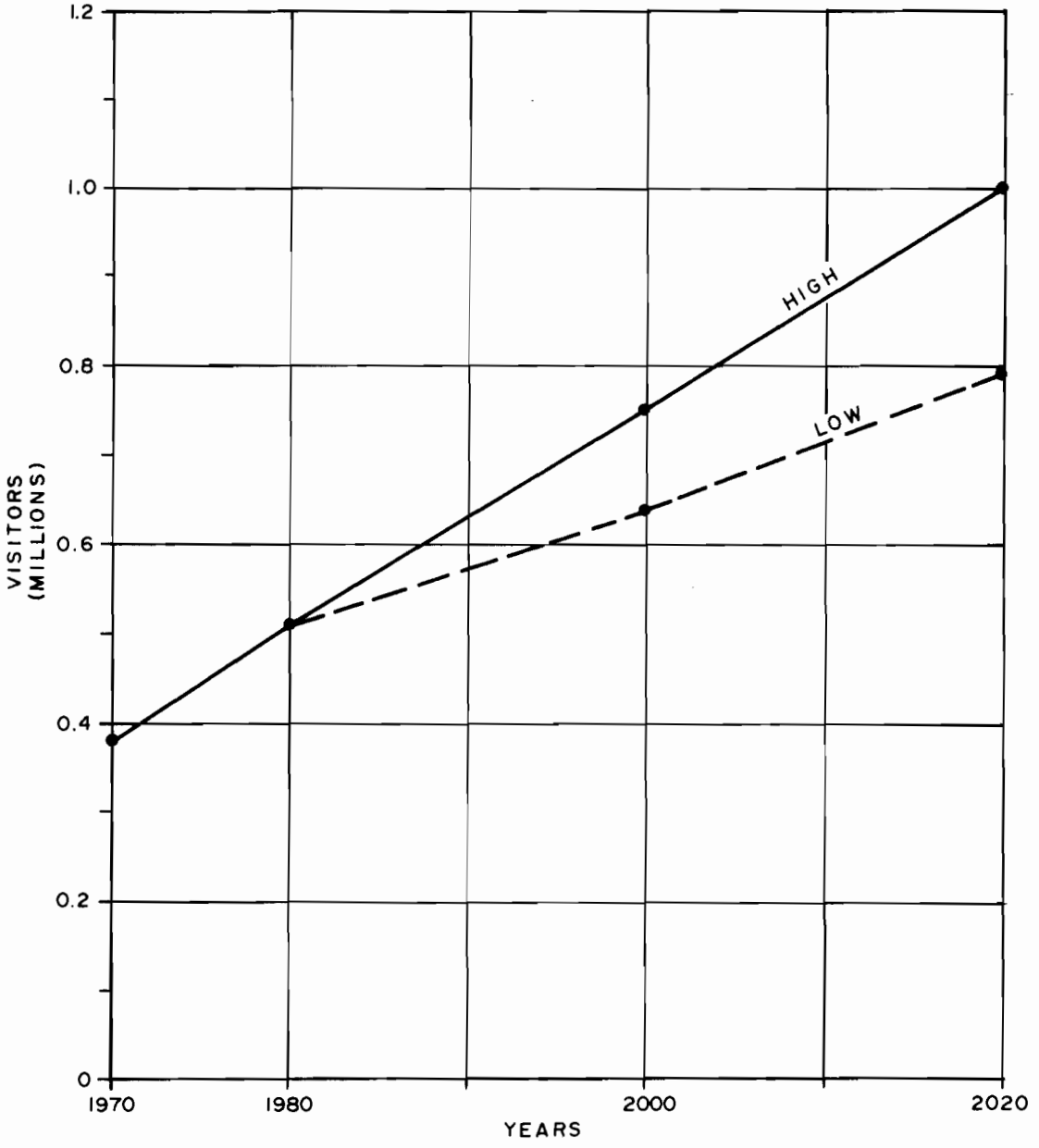
10.5 SHORELINE CAPABILITY TO SUPPORT RECREATION DEMANDS

Detailed analysis of the capability of shoreline resources to support projected beach and boating demands were undertaken for each economic region in the basin. This analysis was supported by the detailed maps contained in the back of this supplement and a summary matrix of shoreline recreation management requirements for each region is presented in Table 10.2.

10.5.1 Oliver-Osoyoos Region

Beach and boating day demands in this region are expected to nearly triple by 2020 rising from 0.4 million to over 1 million beach days and from 23,500 to over 65,000 boating days (Figure 10.6). Approximately half of the current beach use is by visitors, but this proportion is expected to increase in the future as the growth rate of tourism will likely exceed that of residents (Figure 10.7). Under the low projection, nearly two-thirds of the total demands could arise from visitors. As a result, private recreational developments (motels, campsites, marinas) will likely be developed on the better-suited recreational lands such as the north end of Osoyoos Lake, and on Indian Lands on the east side of the lake. Because of flood plain zoning requirements, future such developments should be set back from the lake above elevation 921 feet.

Apart from a tract of 2400 feet of undeveloped municipal land on the north side of the main beach in Osoyoos community park, opportunities for beach development on publicly-owned land are limited (Figure 10.8). Assuming that the Osoyoos community beach is fully committed for recreation and private resorts are developed on Indian lands and other available lands near Osoyoos, it appears that future recreational demands around Osoyoos Lake can be satisfied. At least four new boat ramps may be required to meet increasing demands for power boating and angling, especially as the angling in the lake may be improved in the future due to modifications in the operation of the Okanagan Flood Control system during drought years. All future boat ramps and private docking facilities should be constructed to accommodate the extreme fluctuation of Osoyoos Lake, up to 921 feet and down to 909 feet.



PROJECTIONS OF TOTAL DEMANDS FOR BEACH-ORIENTED RECREATION IN THE OLIVER-OSOYOOS REGION

Figure 10.6

TABLE 10.2

DEVELOPMENT OF SHORELINE RECREATION FACILITIES BY SUB-REGION 1970-2020

OLIVER-OSOYOOS REGION

Year	Projected Demands	Public Beach Access				Public Beach Area		Public Boat Ramps		Comments
		Requirements		Additional to Present		Requirements	Additional to Present	Required	Additional to Present	
		No.	Feet	No.	Feet	Feet	Feet			
1970	371,100 beach days 23,500 boating days	10	250	-	-	12,000	-	2	-	Present Facilities generally adequate to meet demand Boat ramps crowded during summer months
1980	494,100 beach days 31,000 boating days	12	300	2	45	13,500	1,500	3	1	2,400 feet of beach north of Osoyoos Community Beach has high potential capability. Small private developments on Indian Lands also have moderate and high potential. Improved public access required both north and south of Osoyoos.
2000	649,000-759,000 beach days 41,000-48,000 boating days	15	400	4	100	20,000	9,000	4	2	Full development of potential recreation sites on Tugulnuit Lake plus development of 3 public access points Full development of potential recreation sites around Osoyoos. Continued expansion of facilities on Indian Lands.
2020	823,000-1,068,600 beach days 52,000-67,000 boating days	20	600	10	350	20-25,000	14,000 -19,000	4-6	2-4	Full development of recreation sites on private land around North Osoyoos Lake and on Indian Lands Full development of public sites around Osoyoos Maximum potential recreation demands probably sustained through development of existing public and private lands

PENTICTON REGION

Year	Projected Demands	Public Beach Access				Public Beach Area		Public Boat Ramps		Comments
		Requirements		Additional to Present		Requirements	Additional to Present	Required	Additional to Present	
		No.	Feet	No	Feet	Feet	Feet			
1970	1.2 million beach days	20	1150	-	-	31,000	-	6	-	Present range of facilities more than adequate to meet demands. Additional development of Penticton Beach on Okanagan Lake in progress.
1980	1.7 million 104,000 boating days	20	1150	-	-	35,000	4,000	6	-	Continued development of Penticton Beach towards Penticton Marina. Small expansion of private camping facilities around Vaseux Lake Limited availability of public access points
2000	2.2-2.6 million beach days 140,000-160,000 boating days	25 25	1400 1400	5 5	250	45,000	14,000	8	2	Development of public access around Summerland and Naramata Beach development at N-E corner of Skaha Lake and at Naramata Additional Boat Ramps at Summerland and on Skaha Lake as sport fishing improves.
2020	2.8-3.7 million beach days 180,000 to 231,000 boating days	30	1750	10	600	45-55,000	14-24,000	10	4	- Large increase in resident demand will require more public beaches at Summerland, Naramata. Extensions of beach on Skaha Lake, possibly involving shoreline reclamation may be required. Due to increase sport fishing opportunities in S.Okanagan, more launching facilities may be req'd at Penticton, Summerland and Naramata.

TABLE 10.2 cont'd

DEVELOPMENT OF SHORELINE RECREATION FACILITIES BY SUB-REGION. 1970-2020

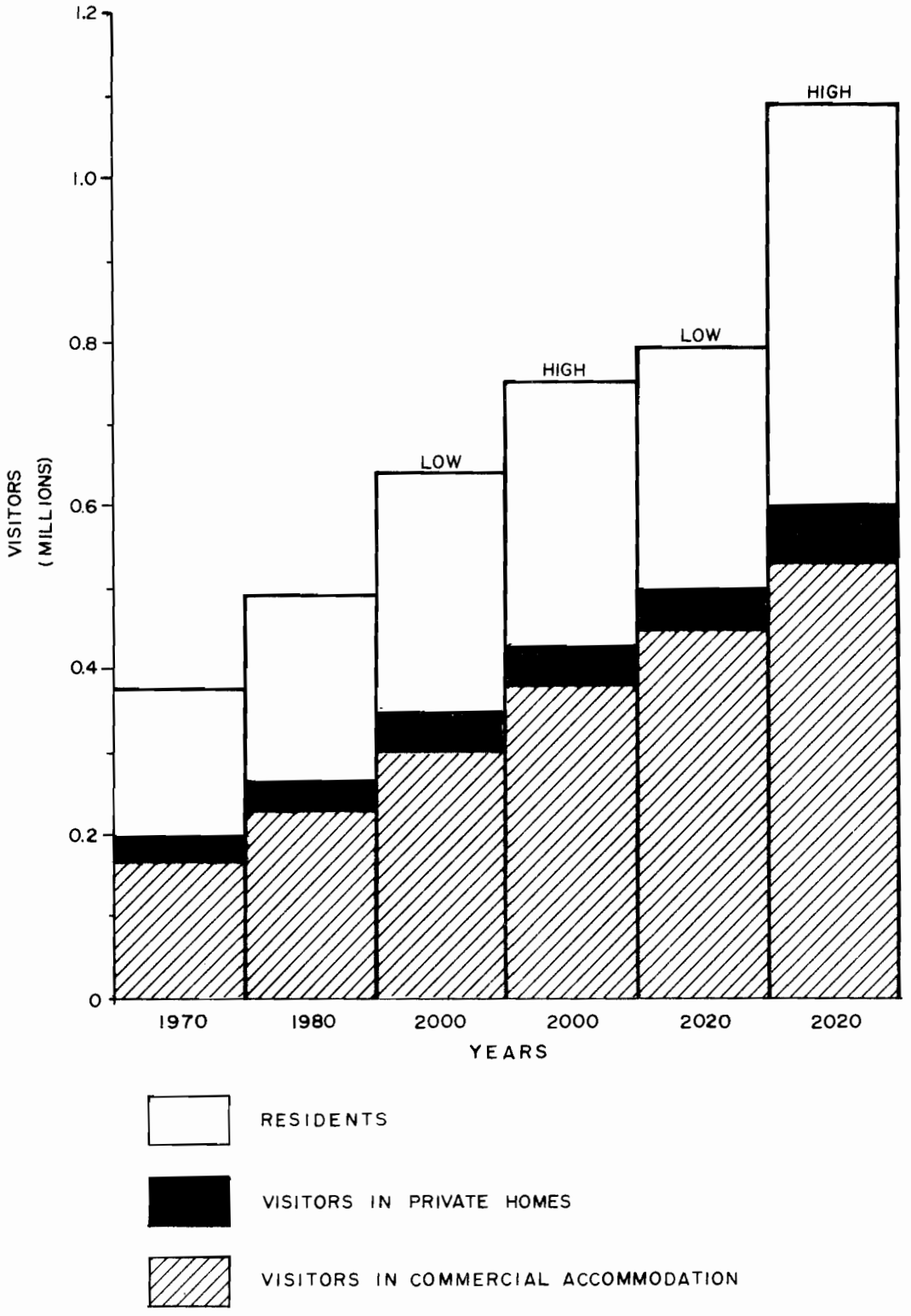
VERNON REGION

Year	Projected Demands	Public Beach Access				Public Beach Area		Public Boat Ramps		Comments
		Requirements		Additional to Present		Requirements	Additional to Present	Required	Additional to Present	
		No.	Feet	No.	Feet	Feet	Feet			
1970	0.9 million beach days 76,000 boating days	22	1800	-	-	10,000	-	10[e]	-	Recreation potential in Vernon Arm inhibited by low water quality and need growth. No public recreation sites on Wood Lake.
1980	1.3 million beach days 104,000 boating days	25	2000	3	200	12,000	2000	10	-	Development of Cozens Bay at N.E. end of Kalamalka Lake. Improvement to Kin Beach on Vernon Arm through weed harvesting and upgrading sewage treatment. Improved beach access.
2000	1.7-1.9 million beach days	30	2500	8	700	14,000	4000	12	2	Full development of Cozen's Bay as a public recreation site. Full development of beach access points to Wood and Kalamalka Lakes (additional 40 and 240 feet respectively). Development of beach access around Vernon Arm.
2020	2.1-2.9 million beach days 175,000 -230,000 boating days	38	2900	15	1100	15-20,000	5-10,000	14	4	Full development of all public access points to all main lakes in the region. Maximum development of public recreation sites in region. Additional launching facilities at Cozen's Bay, Vernon Arm and Ellison Area.

KELOWNA REGION

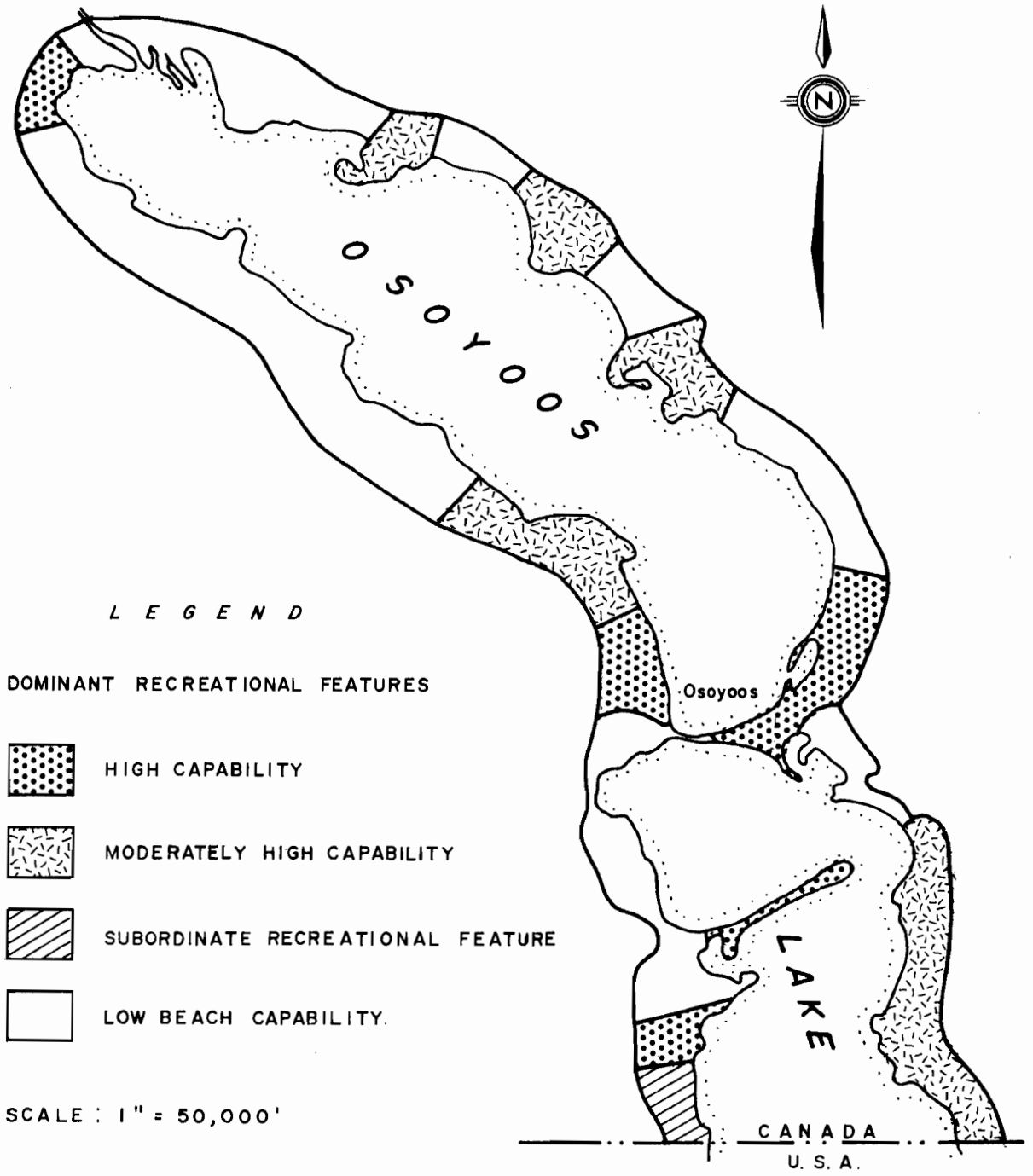
Year	Projected Demands	Public Beach Access				Public Beach Area		Public Boat Ramps		Comments
		Requirements		Additional to Present		Requirements	Additional to Present	Required	Additional to Present	
		No.	Feet	No.	Feet	Feet	Feet			
1970	1.4 million beach days 85,000 boating days	22	2200	- -	- -	21,400	-	10[e]	-	Boat launching facilities in immediate vicinity of Kelowna appear to be inadequate Beach area adequate at present
1980	2.2 million beach days 133,000 boating days	25	2500	5	300	25,000	3,600	11	1	Beach access in Kelowna area developed, improved and clearly identified Additional beach area developed in Kelowna and to support rapid population growth. At least one more boat ramp near Kelowna
2000	3.4-3.7 million 200,000-220,000 boating days	30	3000	10	800	30,000	8,600	12	2	Additional beach area available near Westside on Indian Reserve Lands. Improved access to beaches at Okanagan Center and around Kalamoir Park Additional boat ramp required on West side of lake
2020	4.5-6.3 million	40	4000	10	1800	30-40,000	8-18,000	15	5	Maximum development of public ascess points due to large increases in resident demands. Developmentof all beach potential, both public beaches near urban centres and quiet bays. All potential recreational lands should be reserved for recreation

[e] Estimated



PROJECTIONS OF DEMANDS FOR BEACH-ORIENTED RECREATION IN THE OLIVER-OSOYOOS REGION BY VISITORS AND RESIDENTS

Figure 10.7



BEACH-ORIENTED RECREATION CAPABILITY AROUND OSOYOOS LAKE

Figure 10.8

Beach-oriented recreation capability on Tugulnuit Lake, the only other main-valley lake in the Oliver-Osoyoos Region is low and there are only limited opportunities for the development of additional beach areas, mostly on privately owned sites.

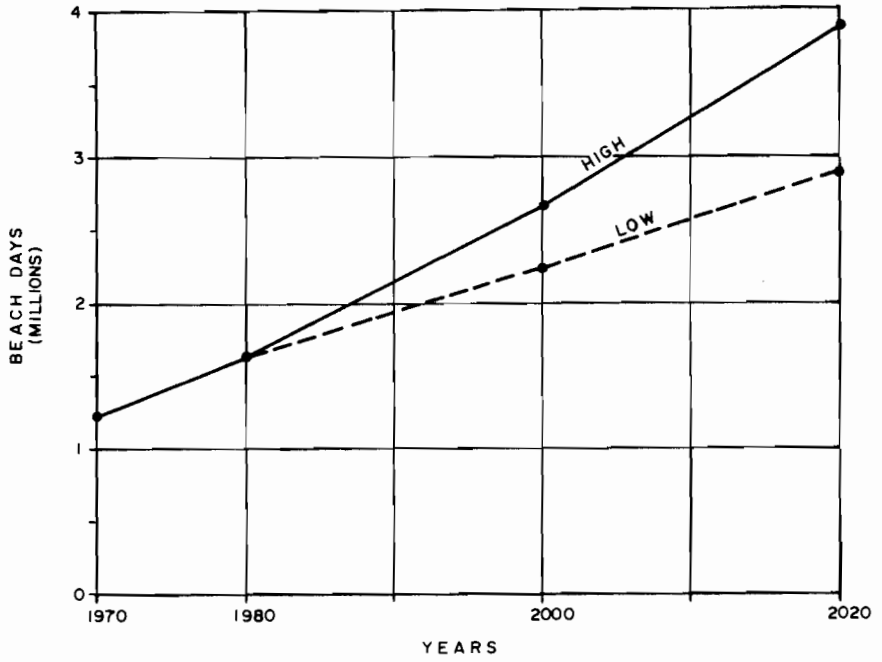
10.5.2 Penticton Region

An estimated 1.2 million beach days were spent in the region in 1970 and this is expected to more than triple to 3.8 million by 2020 under the high growth projection and more than double to 2.8 million under the low growth projection (Figure 10.9). Visitors staying at commercial accommodation account for approximately half of the current (1970) beach use, a feature that should continue over the next 50 years (Figure 10.10).

Of the three main valley lakes in the Penticton region, Vaseux Lake has the lowest capability for beach recreation (Figure 10.11). The southern end of the lake has moderately high capability, but is already fully developed. On the south-west shore there is some undeveloped land with moderate capability, but this land is privately owned. The remainder of the shoreline is rated as having only low capability, including tracts of undeveloped Crown land and park reserve on the east side of the lake. There is presently a small Provincial park on the east side of the lake which supports some beach acitivities and similar developments could be undertaken elsewhere for limited numbers of beach users.

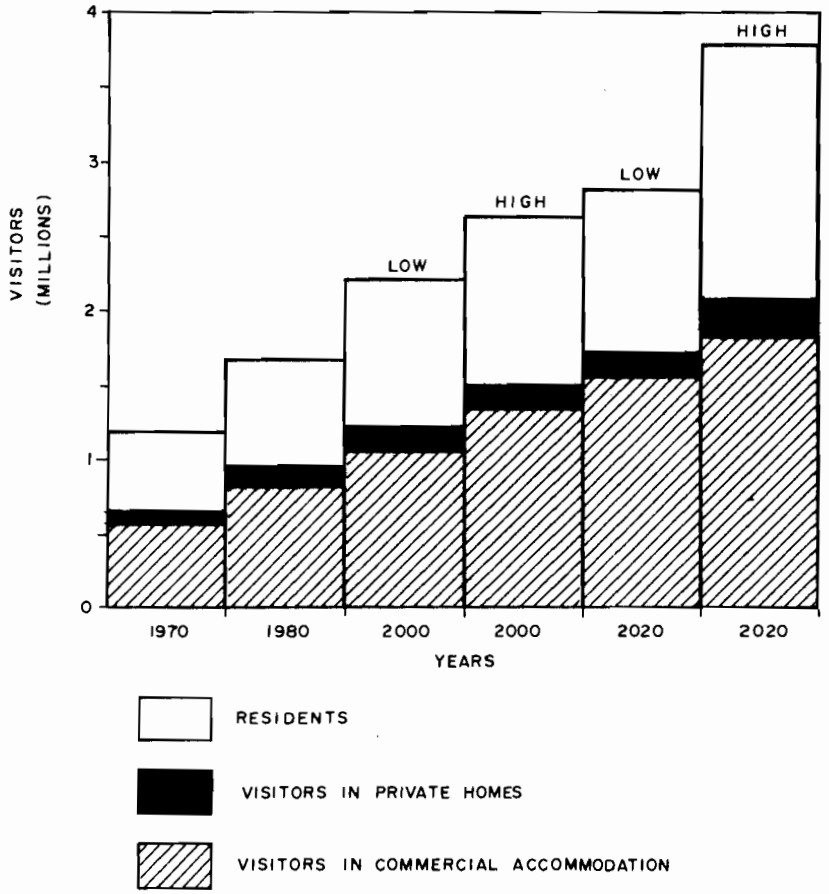
The remaining shoreline areas in the Penticton region are well endowed with high quality recreation beaches, notably at Penticton and Sun-Oka beaches on Okanagan Lake and Skaha and Christie beaches on Skaha Lake. These beaches are expected to accommodate the anticipated doubling of beach demands by 2000, provided both Skaha and Okanagan Lake beaches are fully developed. Skaha Lake has limited future potential for public recreation areas as nearly all remaining areas of high or moderately high capability are privately owned (Figure 10.12).

After 2000, with the increasing urban populations of Summerland and Naramata, beaches and public access points around these areas will have to be improved and expanded (Figure 10.13). Substantial tracts of undeveloped Crown land and Crown Park reserve are located north of Naramata towards Squally Point. However, as this stretch of shoreline consits mainly of steep rocky cliffs, it has limited capability to support large numbers of beach users. Reclamation of shallow bays in the Summerland area could provide high quality recreation and also avoid unsightly exposure of lake bottom in the event of a severe drought. Other portions of the shoreline around the southern portion of Okanagan Lake, presently classified as supporting as secondary uses may have to be developed for more intensive use by grading and clearing. Sun-Oka beach is located on lands originally classified as having relatively low capability for beach recreation, but has since been developed into a popular public beach.



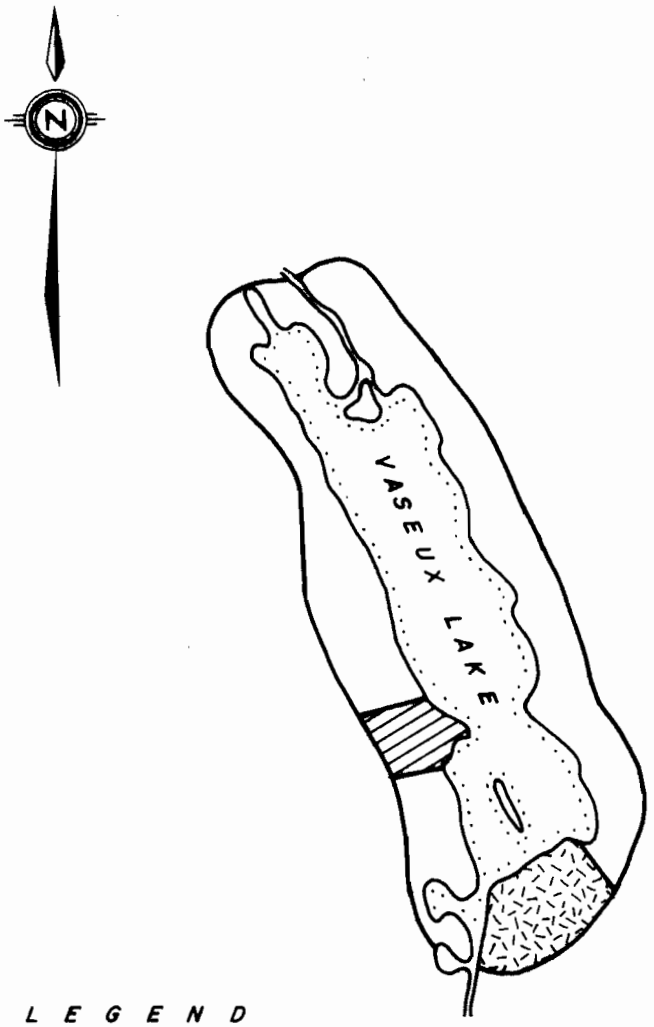
PROJECTIONS OF TOTAL DEMANDS FOR BEACH-ORIENTED RECREATION IN THE PENTICTON REGION

Figure 10.9



PROJECTIONS OF DEMANDS FOR BEACH ORIENTED RECREATION IN THE PENTICTON REGION BY VISITORS & RESIDENTS

Figure 10.10



SCALE: 1" = 50,000 '

LEGEND

DOMINANT RECREATIONAL FEATURES

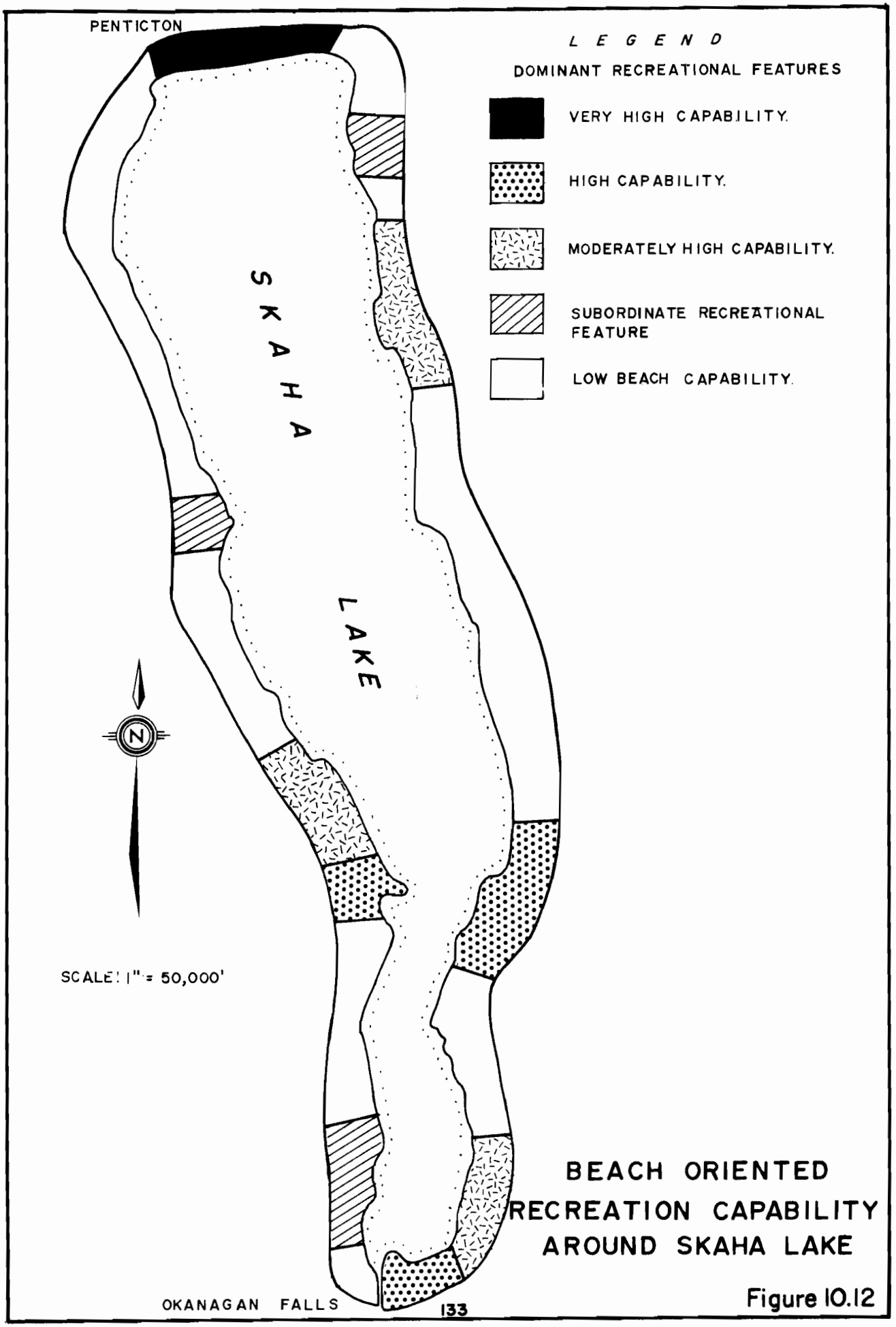
MODERATELY HIGH CAPABILITY

SUBORDINATE RECREATION FEATURE

LOW BEACH CAPABILITY

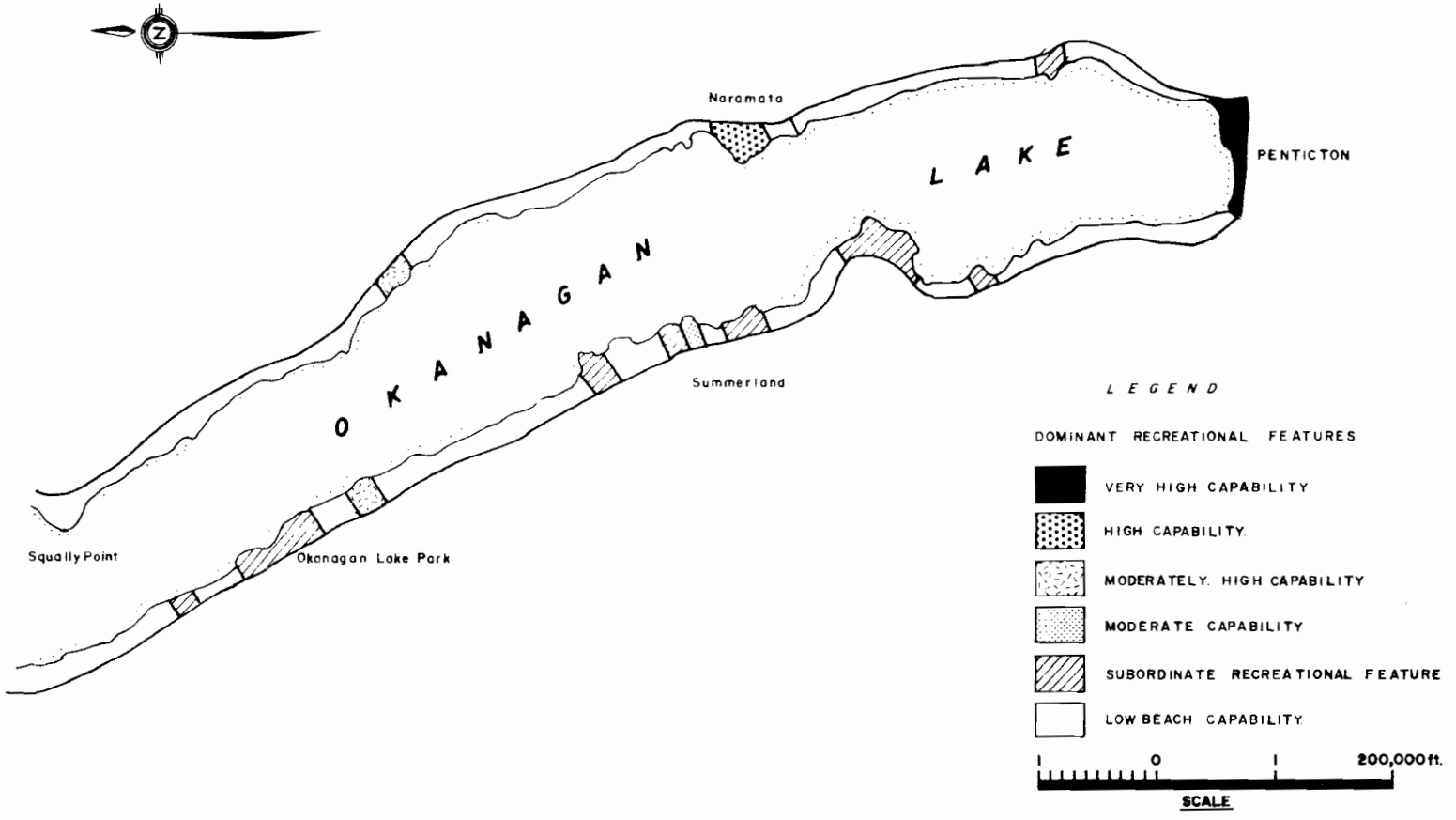
BEACH-ORIENTED RECREATION CAPABILITY AROUND VASEUX LAKE

Figure 10.11



BEACH ORIENTED RECREATION CAPABILITY AROUND SKAHA LAKE

Figure 10.12



BEACH-ORIENTED RECREATION CAPABILITY
AROUND OKANAGAN LAKE IN
THE PENTICTON REGION

Figure 10.13

Assuming that the sport fishery in the southern section of Okanagan Lake will be rehabilitated through the construction of artificial spawning facilities on one of the tributary streams, increased angling demands can be expected in this part of the lake. Additional boat launching facilities may therefore be required around Summerland and Naramata as well as at Skaha Lake, where water skiing, fishing and sailing pursuits appear likely to experience a three-fold increase. Boat ramps around Okanagan Lake should be constructed to accommodate a 9 foot fluctuation in lake levels (1116.8 to 1125.8 feet).

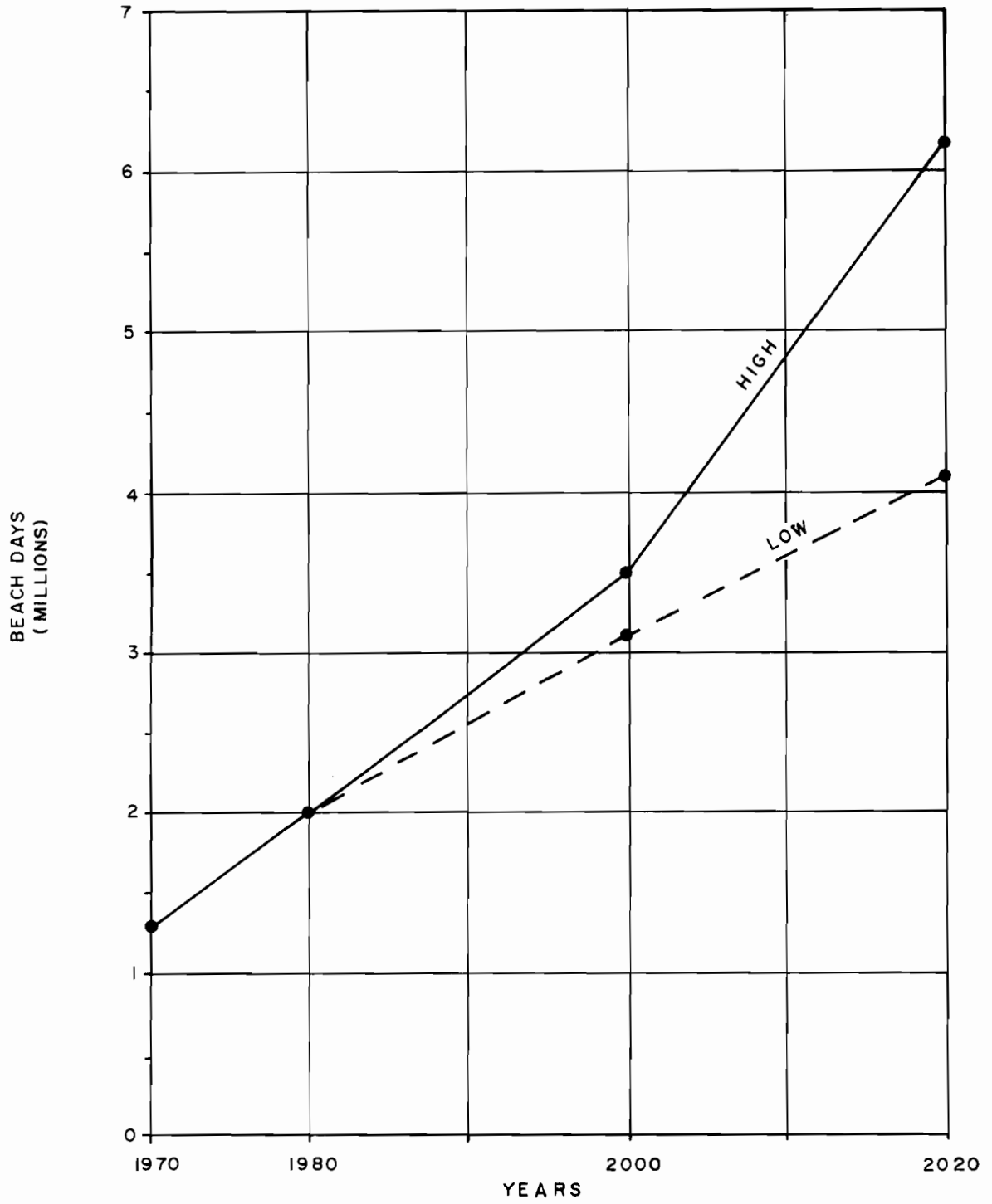
Generally speaking, there appears to be available recreational space to meet anticipated demands in this region, though beach crowding at the major public beaches will amost certainly increase during the summer months. However, other constraints such as traffic, parking, accommodation availability and urban crowding may limit tourist growth in this region, as is already apparent during holiday weekends.

10.5.3 Kelowna Region

Estimated beach use in this region amounted to over 1.3 million days and could rise to between 4.0 and 6.2 million beach days in 2020 under the high and low growth projections respectively (Figure 10.14). These large increases arise primarily from a large and rapidly growing resident population base in the region. Residents accounted for two-thirds of total beach use in 1970 and could constitute as much as three-quarters by 2020 (Figure 10.15).

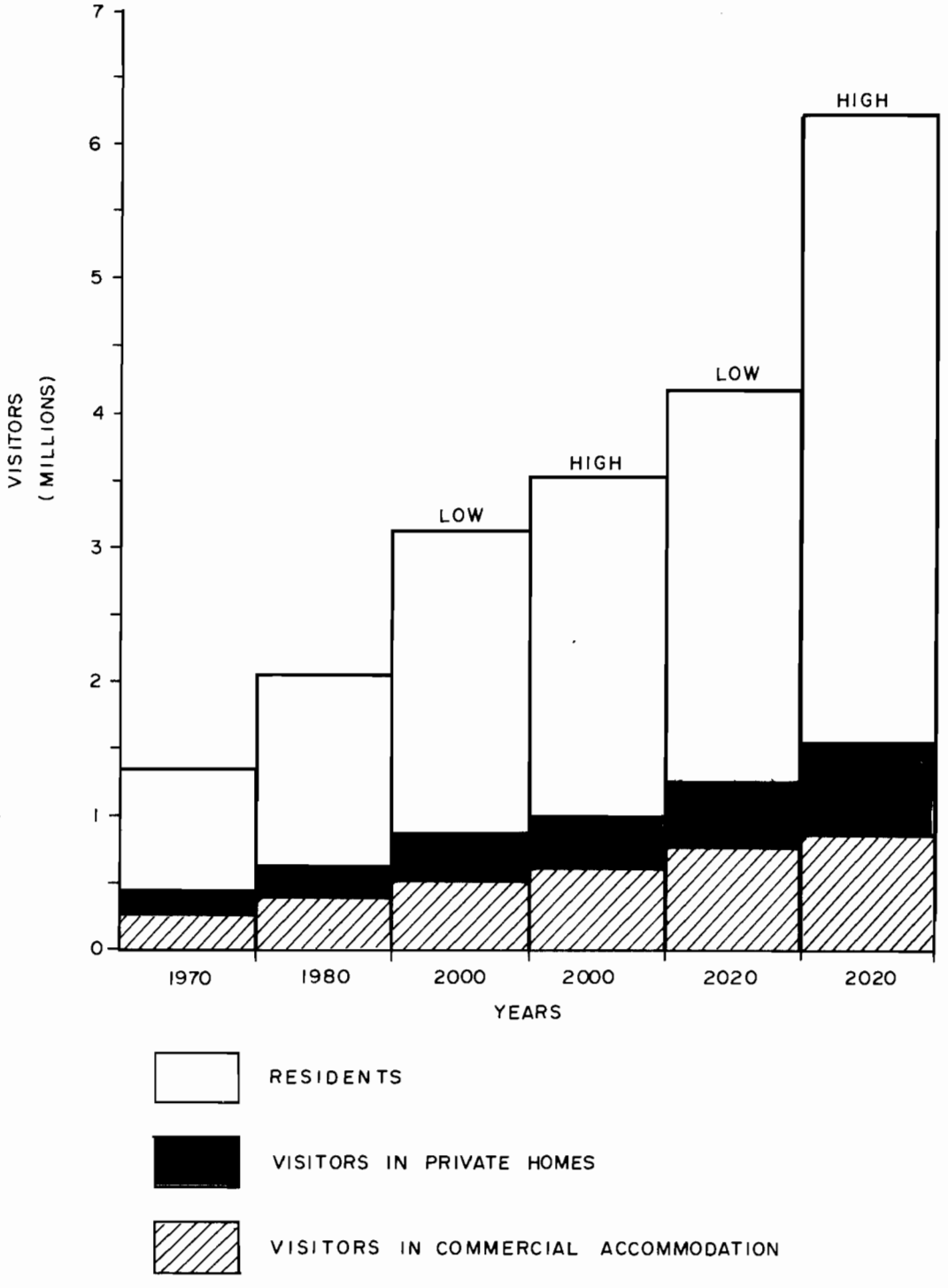
Because of the expected rapid growth, additional beach area and launching facilities will be required in the near future. However, much of the shoreline around Okanagan Lake has relatively low natural capability to support beach recreation, and many of those areas with high capability are already fully developed or are occupied by waterfront homes (Figure 10.16). As there appears to be low natural potential, additional facilities may have to be created by clearing lands or reclaiming shallow areas of foreshore. There are some areas around Kelowna where over 1000 feet of lake bottom could be exposed should Okanagan Lake be drawn down three feet below normal minimum elevation, a possibility in the event of two or more consecutive droughts. Filling in some of these areas and developing them for recreation could produce the dual benefit of meeting recreational demands and reducing potential aesthetic problems associated with lake drawdowns. There are some natural sites that could be developed, notably on Indian lands located on the west side of the lake, north of Kelowna bridge, and in isolated sports near Kalamoir Park in the south-west part of the region and around Okanagan Centre.

Immediate attention should be given to improving public access points, especially near Kelowna. Many are almost hidden by residential developments and should be cleared and plainly identified to provide the growing urban population good access to the foreshore.



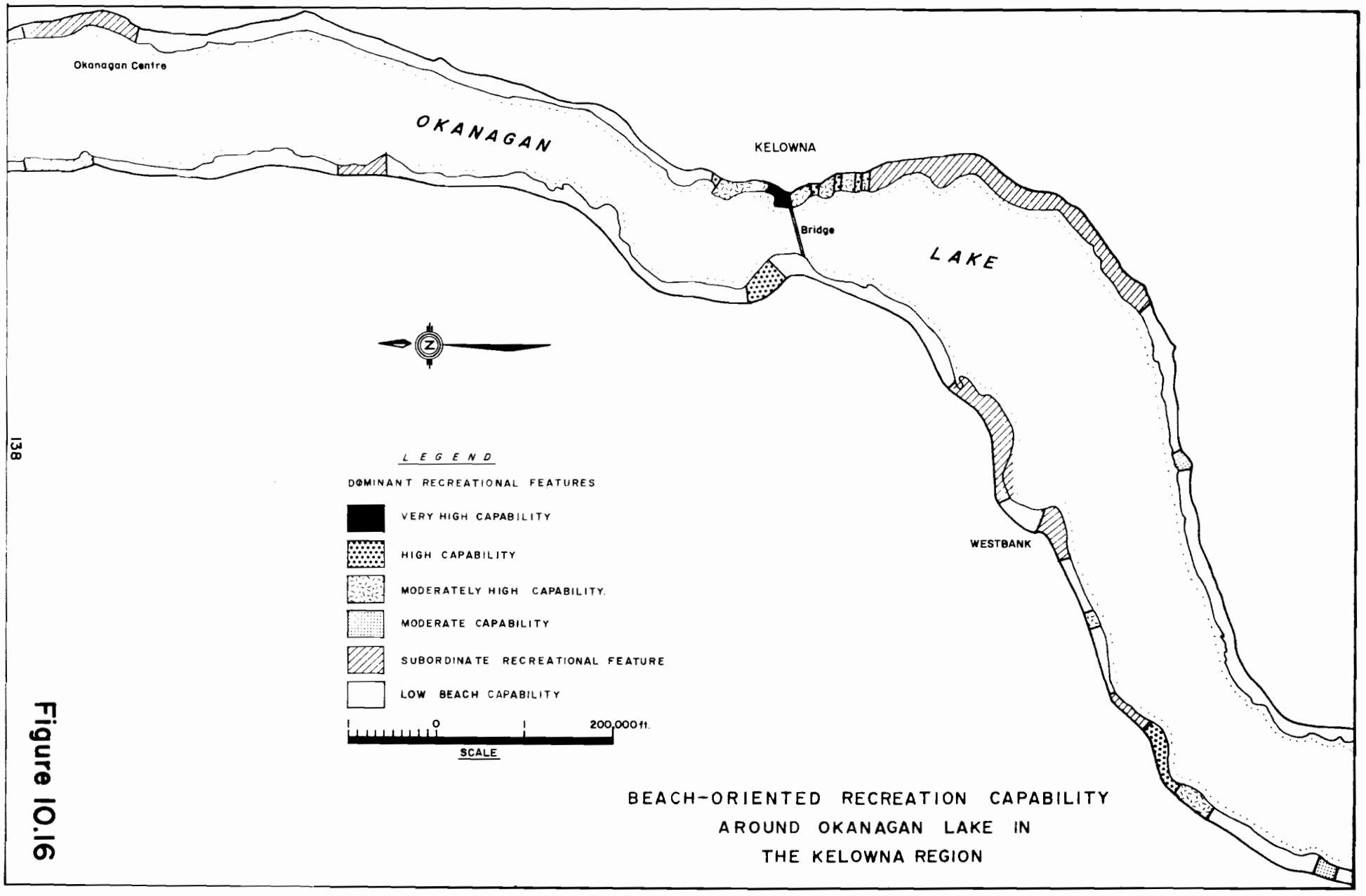
PROJECTIONS OF DEMANDS FOR
BEACH-ORIENTED RECREATION
IN THE KELOWNA REGION

Figure 10.14



PROJECTIONS OF DEMANDS FOR BEACH ORIENTED RECREATION IN THE KELOWNA REGION BY VISITORS & RESIDENTS

Figure 10.15



BEACH-ORIENTED RECREATION CAPABILITY
AROUND OKANAGAN LAKE IN
THE KELOWNA REGION

Figure 10.16

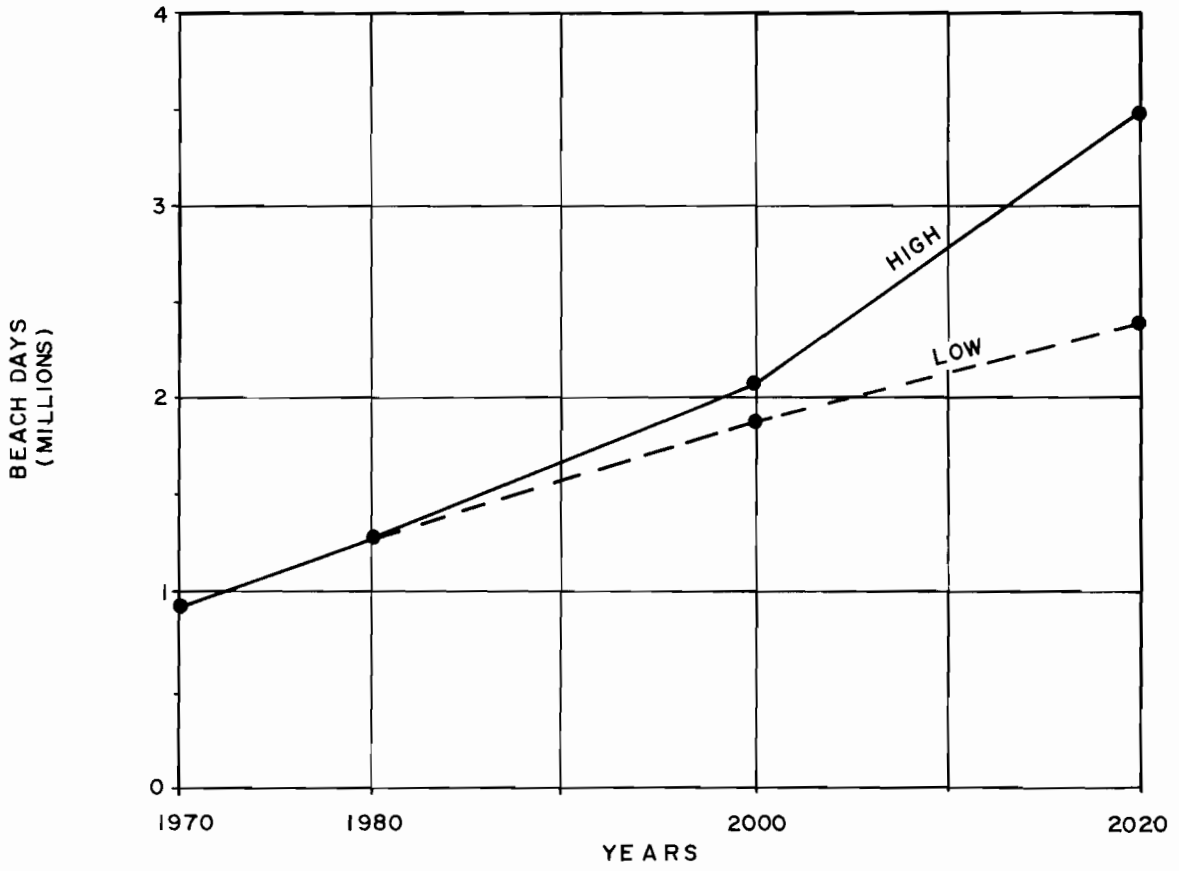
10.5.4 Vernon Region

Participation in beach-oriented recreation amounted to nearly 1 M beach days by 1970 (Figure 10.17). Under the high projection 2.1 M days are forecast for 2000 and over 3.5 M days by 2020. In the low projection, 1.9 M days and 2.4 M days are predicted for 2000 and 2020 respectively. These substantial increases in total demand arise particularly from a relatively large and rapidly growing resident population. Residents accounted for 63% of total beach use in this region in 1970 compared to 26% for visitors staying in commercial accommodation and 11% for visitors staying in private homes (Figure 10.18). Residents are expected to represent a similar proportion of total demands for this region in the future.

Virtually all of the shoreline around Okanagan Lake in the Vernon region is classified as having only low beach-oriented recreation capability (Figure 10.19). The Crown Park reserve south of Short's Point on the west side of the lake has low recreational capability while the land on the south east shore of this portion of the lake has a somewhat higher recreational capability but consists of developed and undeveloped privately owned land. The Indian Reserve land on the north-west arm of the lake has limited potential for beach activities and much of this area has already been developed for summer cottages under lease arrangement. The only section of Okanagan Lake in the Vernon region possessing high capability is Kin Beach at the head of the north-east arm where use is currently restricted by heavy weed growth. Beach development is possible on lower capability land however, as seen at Ellison Provincial park where there are small beaches in an extremely attractive setting.

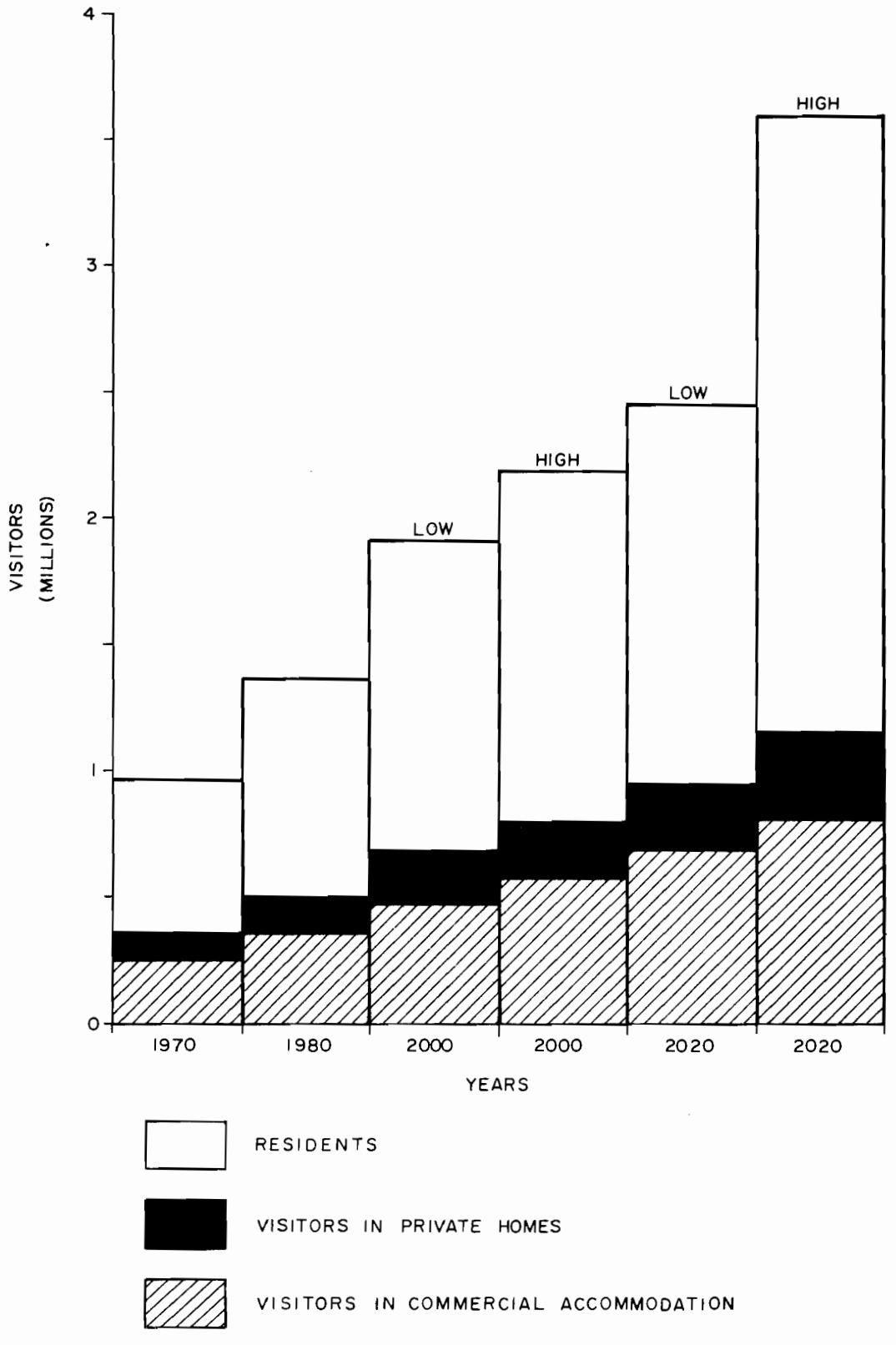
There are no public recreation areas around Wood Lake and the beach-oriented recreation capability of the small piece of land under Crown Park Reserve in the south-west corner is low (Figure 10.20). Resorts and private homes occupy the land at the south end of the lake which has the capability to support beach activities as subordinate recreational pursuits while private development and the railway line inhibit use of the area with moderate beach-oriented recreation capability at the north end of the lake. There are only very limited opportunities for developing public beaches around this lake.

Most of the shoreline of Kalamalka Lake has low capability for beach-oriented recreation, including the extensive tract of undeveloped Crown land on the east side (Figure 10.20). Most of the land with capability for beach activities in a subordinate role located in the south-west corner of the lake is privately owned and developed. The public beach at the north end of the lake is already well used and there are very limited opportunities for beach expansion there. At Cozens Bay however, there is a key area of undeveloped land with very high capability for beach-oriented recreation and in view of the limited opportunities elsewhere, this area should be reserved for public recreation.



PROJECTIONS OF DEMANDS FOR
BEACH-ORIENTED RECREATION
IN THE VERNON REGION

Figure 10.17



PROJECTIONS OF TOTAL DEMANDS FOR BEACH-ORIENTED RECREATION IN THE VERNON REGION BY VISITORS AND RESIDENTS

Figure 10.18

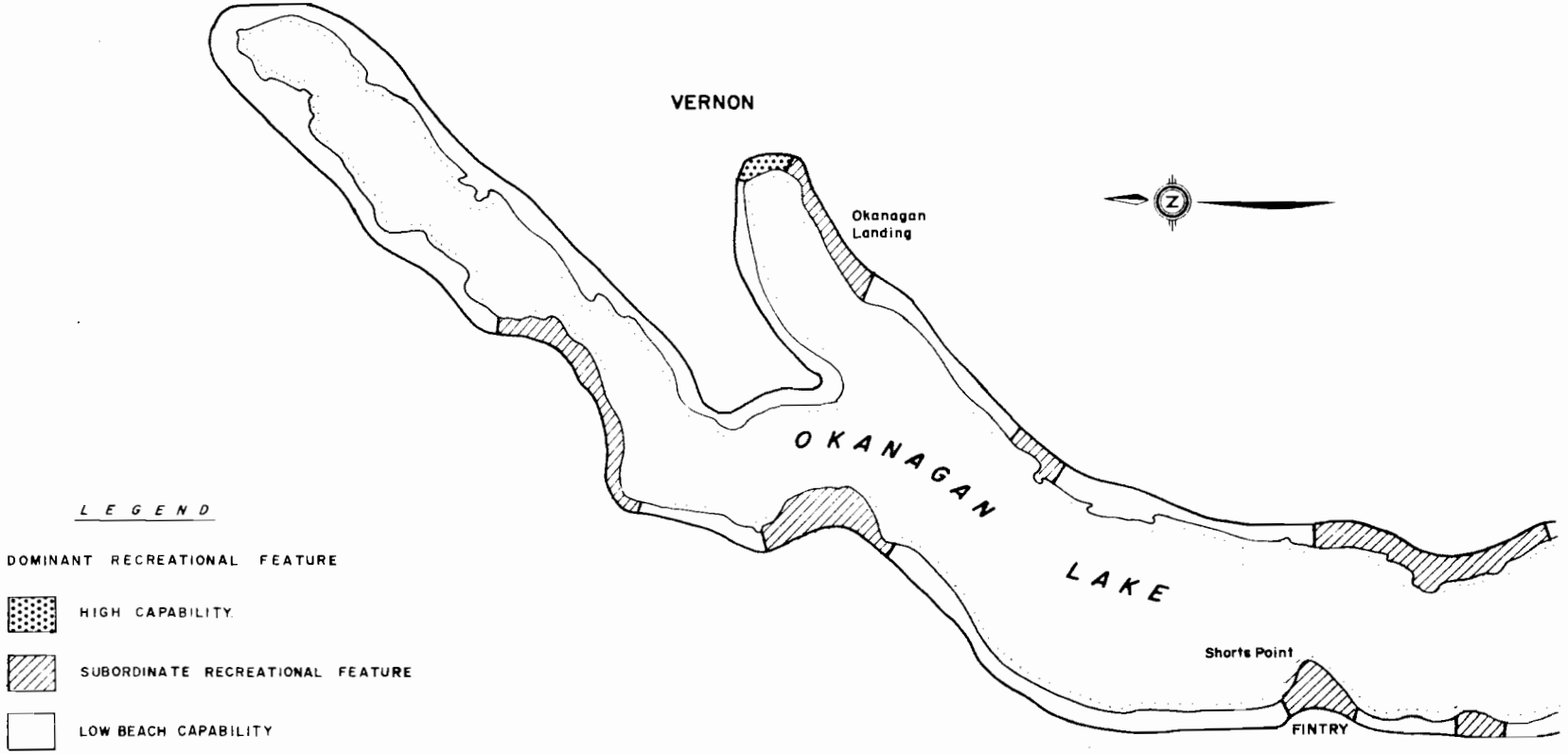
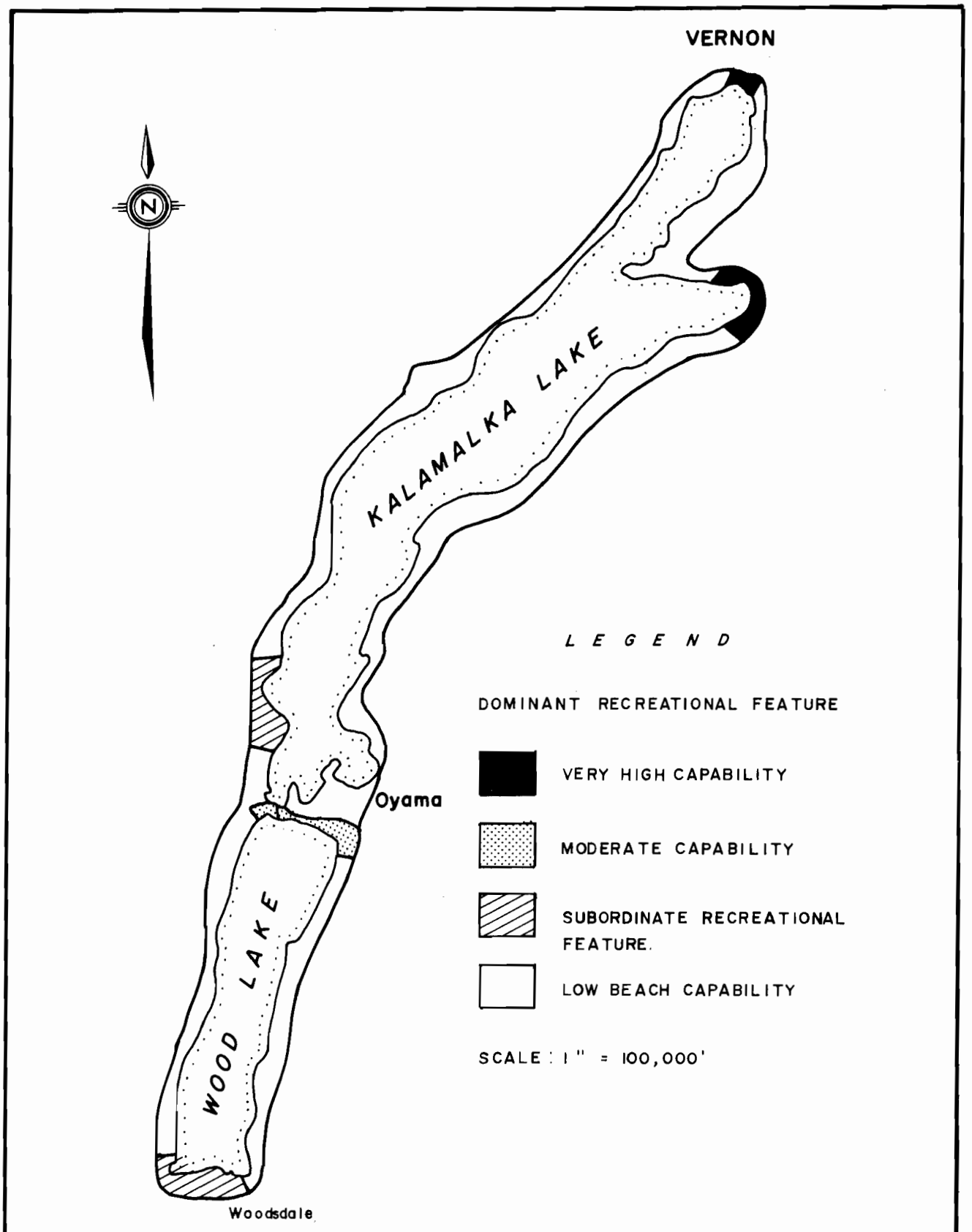


Figure 10.19

BEACH-ORIENTED RECREATION CAPABILITY AROUND OKANAGAN LAKE IN THE VERNON REGION



BEACH-ORIENTED RECREATION CAPABILITY
AROUND WOOD LAKE AND
KALAMALKA LAKE

Figure 10.20

10.6 SUMMARY AND DISCUSSION

A number of tentative conclusions can be drawn from the above section. Beach day demands for both visitors and residents are expected to rise rapidly in the future due primarily to increases in population and leisure time. Between 1970 and 1980 these demands are expected to grow by approximately 40% and could double by 2000 and triple by 2020.

The rates of growth and distribution of demands will vary considerably between the four regions of the Okanagan Basin. Approximately two thirds of total beach use currently occurs in the Kelowna region (35%) and Penticton region (30%) while the Vernon region and Osoyoos region account for 25% and 10% respectively. The Kelowna region is expected to increase its share somewhat, due mainly to its large and rapidly growing population.

At present it is considered that crowding at Okanagan beaches is not a problem except during occasional extreme peaks of beach attendance such as on long weekends during July and August. The existing beaches and additions which are currently being provided can probably cater adequately to projected demands for 1980, although periods of beach crowding will become more intense and may become more frequent. These pressures should be felt in particular at certain beaches around Kelowna.

It is evident that additional beach areas will be required beyond 1980 if future beach crowding is to be minimized and that plans to provide these beaches should commence in the near future if they are to be successful. On the basis of the appraisal of the natural capability of the shoreline around the main valley lakes it is apparent that most of the publicly owned areas which have the highest capability have already been developed as public beaches while nearly all of the undeveloped public land has low capability for beach-oriented recreation. There are however, a few limited opportunities for providing public beach areas on stretches of publicly owned shoreline although there are several areas on privately owned or Indian land which could be developed. In addition, sections of shoreline where use is currently restricted by railway lines may become accessible in the future if some of these lines are closed. In the longer term relatively expensive developments on lower capability land will need to be considered. Given sufficient outlays of capital, it seems likely that even the highest projections of demands for beach-oriented recreation could be adequately served to 2020.

Table 10.2 does not indicate specific areas for beach development as this can be done by the appropriate institutions responsible for recreation planning in the Okanagan. A number of guide lines may be noted however. First, additional beach areas should be developed near urban areas, as both visitors and residents clearly indicated their preferences for quick and easy access. Second, secluded beaches with limited access should be pursued for recreation as a

significant minority of beach users seek such facilities, a feature that will likely become more important as the major public beaches become more crowded. Third, beaches should be developed at least up to an elevation of 1126 feet to avoid complete inundation in the event of major flooding in Okanagan lake.

Attention must be given immediately to clearing public access points around all main valley lakes, especially access points in and around urban centres. In addition, more launching facilities will be required around all major lakes, and in Okanagan and Osoyoos Lakes, such ramps should be constructed to accommodate maximum fluctuations in lake levels.

10.7 EVALUATION OF ALTERNATIVES

A proper evaluation of the shoreline management measures discussed above would require a comparison of the costs of providing the facilities and the benefits associated with the increased number of beach days. The costs of providing recreational facilities involve the investment required to reclaim and develop the shoreline or the net benefits foregone from alternative use of the shoreline land resources. Because of the need for flood plan zoning up to two and six feet above normal high water on Okanagan and Osoyoos Lakes respectively, opportunities for land development apart from recreation would appear to be limited. No cost estimates of shoreline reclaimation are available for this report.

Net economic benefits associated with beach recreation are related mainly to tourist expenditures, as residents spend little money in their pursuit of this from the recreational experience. Estimates of total future net income derived from summer holiday tourism was provided by the economic model presented in Technical Supplement X. As tourists spend approximately 60% of visitor days on the beaches, maximum net economic benefits accruing to beach recreation were obtained by multiplying future net income from tourist expenditures by 0.6. These results are presented on Table 10.3.

TABLE 10.3a

ANNUAL NET ECONOMIC VALUE ATTRIBUTED TO SHORELINE RECREATION 1970-2020*

YEAR	HIGH GROWTH PROJECTION II	LOW GROWTH PROJECTION III
1970	4,500	4,500
1980	7,400	7,400
2000	15,500	12,500
2020	27,400	23,000

* In Thousands of Constant 1970 Dollars.

TABLE 10.3b

SOCIAL VALUES ASSOCIATED WITH SHORELINE RECREATION, 1970-2020*

YEAR	HIGH GROWTH PROJECTION			LOW GROWTH PROJECTION		
	Visitors	Residents	Total	Visitors	Residents	Total
1970	8,500	11,100	19,600	8,500	11,100	19,600
1980	11,800	17,800	29,600	11,800	17,800	29,600
2000	18,800	28,800	47,600	15,900	26,000	41,900
2020	26,900	47,300	74,300	22,400	31,900	54,300

* In Thousands of Constant 1970 Dollars

The economic and social benefits discussed above represent maximum benefits associated with beach recreation and should be discounted to represent present values at a rate of 7% per annum. Thus, the total potential value to the year 2020 of shoreline recreation in 1970 dollars is estimated at 128 million dollars in economic terms and 470 million dollars in social values. Only a portion of these benefits should be compared with costs of shoreline management. This factor would be equivalent to the number of projected beach-days which would not occur because of crowded conditions.

Unfortunately, this proportion is almost impossible to determine because of changing and diverse public attitudes towards beach crowding. There is evidence that users accept increasingly crowded conditions provided these occur gradually and are accompanied by other experiences in crowding - in general urban environments or in traffic. In addition, as some beach users avoid certain beaches or the Okanagan completely due to crowded conditions, their place is taken by others who place less emphasis on crowding as a negative feature of shoreline recreation. Finally, other constraints such as limited accommodation, parking and traffic congestion could be important factors restricting potential demands.

To provide some idea of the value of providing additional shoreline facilities, it was assumed that in their absence there would be a 10% reduction in future demands. Accumulated economic and social values of such a reduction to 2020 would amount to 12.8 million dollars and 47 million dollars respectively. In view of the important values associated with beach recreation, it appears that the costs of providing additional facilties to accommodate future demands is well justified.

CHAPTER 11

Potential Impacts of Continued Decline in Water Quality

11.1 INTRODUCTION

In any rational approach to water resource planning and management, some attempt should be made to compare the benefits and costs of implementing certain alternatives. In the case of water quality management, the costs of building improved and expanded waste treatment facilities for removing phosphorus and other nutrients contributing to the growth of aquatic plants and algae should be weighed against the benefits associated with improved water quality conditions. In the Okanagan Study, some attempt was made to complete such a benefit-cost analysis of the major waste treatment alternatives required for each of the main valley lakes. This chapter examines the approach and assumptions used to generate values of recreation opportunities foregone as a result of not implementing any alternatives for reducing nutrient contributions to the main valley lakes.

There are three major problems in assessing the economic and social benefits associated with maintaining or improving water quality in the main valley lakes. The first is projecting the decline in water quality based on increased nutrient loadings as population increases over the next 50 years. The second involves the relationship between beach use and water quality deterioration - at what point do recreationists avoid beaches? The third problem is concerned with the lack of readily available measures of the value of water-based recreation, so that beach days lost due to reduction in water quality can be evaluated and the results compared with the costs of building additional waste treatment facilities or other measures for managing water quality.

11.2 FUTURE WATER QUALITY

Forecasts of water quality conditions in each of the main valley lakes assuming no additional development of waste treatment facilities were made by the limnology group. These forecasts were based on knowledge of existing conditions in each lake, an estimation of assimilative capacity and projections of nutrient loadings derived from forecasts of population, industrial and agricultural growth. A qualitative review of the assumed relationship between water quality and water based recreation for establishing benefits for waste treatment alternatives is presented in Figure 11.1. Projected conditions in each of the lakes based on a continuation of existing practices is as follows:

Wood Lake

This lake presently experiences algae blooms most summers, and if

ASSUMED RELATIONSHIP BETWEEN WATER QUALITY AND WATER-BASED RECREATION FOR ESTABLISHING BENEFITS FOR WASTE TREATMENT ALTERNATIVES

YEAR	LAKE	WATER QUALITY CONDITIONS	IMPACTS ON WATER-BASED RECREATION DEMANDS
1980	Wood Lake	Annual algae blooms, extensive weed growth around shorelines.	Additional costs involved in harvesting weeds. Annual decline of 10% in tourism to 1975 rising to 25% by 1980
2000	Wood Lake	Annual algae blooms and extensive weed growth around shorelines.	Continued decline in tourism estimated at 50% per annum after 1985
1980	Kalamlka Lake	Localized weed growth at Coldstream Creek spreading towards Kalamalka Beach	Additional costs of weed harvesting. Little impact on recreation due to availability of clean water at Cozen's Bay and at Kalamalka Beach
2000	Kalamalka Lake	Increased weed growth at north end of lake. Uncertainty about occurrence of algae blooms due to the unusual phosphorus ppt. cycle in lake discharge of Wood Lake water will affect resorts at south end of lake	Increased costs of weed harvesting. Estimated 10% decline in recreation after 1980 rising to 50% after 1990 due to adverse publicity from Wood Lake experience.
1980	Okanagan Lake	Continued weed growth in Vernon Arm and around Kelowna shoreline. Infrequent algae blooms in both locations. Weed growth at other local areas such as Westbank outfall and around Summerland.	Additional costs of weed harvesting At least 10% of Vernon area recreation would be reduced each year to 1980; reduction of 10% in Kelowna area after 1975 rising to 20% after
2000	Okanagan Lake	Continued weed growth and frequent algae blooms in Vernon Arm and around Kelowna area. Weed growth will continue to extend around Summerland and Westbank	50% loss of recreation opportunity in Vernon Arm after 1985. Estimated 50% reduction in Kelowna tourism by 1990 - similar reduction in resident beach-days; 10% reduction in recreation demand in south basin
1980	Skaha Lake	Occasional algae blooms in late summer, weed growth increase in south basin	Little reduction in recreation demand forecast provided Penticton attains 80% removal of phosphorus
2000		Frequent algae blooms and extending weed growth.	A 10% reduction in annual recreation demands after 1980 rising to 30% in 1985 and 50% by 1990.
1980	Osoyoos Lake	Occasional algae blooms, increase in weed growth	A 10% reduction in recreation demand after 1975
2000	Osoyoos Lake	Frequent algae blooms and increased weed growth	A 20% reduction in annual recreation demands after 1980 rising to 30% in 1985 and 50% in 1990.

Figure II.1

nutrient loadings continue to increase, mainly from additional septic tank facilities around the lake, regular annual algae blooms can be expected by 1980 with extensive aquatic plant growth around the shoreline.

Kalamalka Lake

A unique chemical cycle in this lake maintains it in oligotrophic condition (nutrient poor) though nutrient loadings are increasing from land runoff and septic tank sources. Weed growth presently occurs at the mouth of Coldstream Creek and this is expected to spread towards Kalamalka beach. By 2000, the outflows from Wood Lake would affect the quality of the water in the southern portion of Kalamalka Lake and perhaps the entire lake could become eutrophic if the chemical cycle which allows precipitation of phosphorus were to break down.

Okanagan Lake

Because of its large assimilative capacity, the main mass of Okanagan Lake would likely remain in relatively good condition, though extensive weed growth would be expected near most of the major public beaches - Vernon Arm, around Kelowna and at Summerland, Westbank and Naramata. Thus water based recreation would be significantly affected.

Skaha Lake

The new phosphorus removal facilities at Penticton will effectively maintain Skaha Lake in good condition until 1980, assuming 80% phosphorus removal is maintained. After 1980 a higher level of phosphorus removal will be required to prevent frequent algae blooms due to increasing nutrient loadings from an increasing population.

Vaseux Lake

This lake will remain eutrophic (nutrient rich) throughout the next 30 years, though weed growth will gradually extend across the lake if Skaha becomes more enriched.

Osoyoos Lake

Presently, Osoyoos Lake experiences occasional algae blooms and weed growth around its shores. These conditions may be expected to deteriorate after 1980 as population growth increases, resulting in annual algae blooms and extensive weed growth by 2000.

In summary, public beaches on Wood, Skaha, Osoyoos Lakes, and on Okanagan Lake near Kelowna and Vernon, would be adversely affected by deteriorated water quality conditions by the turn of the century if no additional waste treatment facilities are developed. The only public beaches that might continue to enjoy reasonable water quality conditions would be around Kalamalka Lake and the southern part of Okanagan Lake.

11.3 IMPACTS OF WATER QUALITY ON WATER-BASED RECREATION

The next step was to estimate the number of beach days lost because of deteriorating water quality conditions, again assuming that present waste treatment facilities will not be improved. The Wood Lake recreation surveys indicated that isolated occurrences of algae blooms and weed growth appear to have limited net economic impact on recreation, as newcomers replace regular customers who left the area because of water quality problems. It can be assumed, however, that if algae blooms occur on a regular annual basis there will be a significant reduction in tourism and resident beach use. The assumptions for determing the proportion of anticipated beach days lost due to deteriorating water quality conditions are described in Figure 11.1, while the actual numbers of beach days lost are presented in Table 11.1. The maximum loss factor was considered to be 50%, as it was assumed even under the worst water quality conditions, at least half the potential users would continue to sunbathe on beaches and some would probably continue to swim.

These lost beach days were evaluated in both economic and social terms. In this study,it has been assumed that the economic values of shoreline recreation are related to tourist expenditures. In 1970, the net income derived from a visitor day amounted to $3.50. As tourists spent approximately 60% of their days in the valley visiting public or private beaches, the estimated economic value of a beach day was $2.10. The real value of this expenditure was expected to grow at 15% per decade due to increasing trends in public spending.

In addition to these net income values, there is the unpaid surplus known as the consumer surplus or 'social' value of a beach day. This was estimated at $5.50 for residents and $5.00 for visitors and was not assumed to increase over time as there were no empirical data available to support real increases in these values. To the extent that such values are actually increasing over time, these social values may be underestimated.

The present worth of the social and economic values associated with lost beach-days are presented for each main valley lake to 2020 for the high growth projection in Table 11.2. It can be readily seen that the costs in terms of lost shoreline recreation opportunities become very high, even by 1985, when present worth of economic losses would total $4.1 million and social losses $9.2 million.

Annual costs of 80% phosphorus removal from all major waste treatment facilties in the valley are compared with annual social and economic benefits to the year 1985 in Table 11.3.

TABLE 11.1

ESTIMATED BEACH DAYS
FOREGONE AT EACH MAIN VALLEY LAKE
ASSUMING NO IMPROVEMENT IN EXISTING WASTE TREATMENT FACILITIES
(High Projection)

LAKE	YEAR	POTENTIAL NUMBER OF BEACH DAYS	% LOSS	NUMBER OF BEACH DAYS LOST
Wood	1970	87,000	10	8,700
	1980	121,800	25	30,420
	1990	157,400	50	78,700
	2000	192,900	50	86,450
	2020	277,500	50	138,750
Kalamalka	1970	192,300	0	0
	1980	271,500	10	27,150
	1990	348,800	50	174,400
	2000	426,200	50	213,100
	2020	614,500	50	307,250
North Okanagan Lake (Vernon Arm)	1970	82,400	0	0
	1980	116,400	10	11,640
	1990	149,500	50	74,750
	2000	182,000	50	91,350
	2020	263,400	50	131,700
Central Okanagan Lake	1970	447,800	0	0
	1980	638,100	20	127,620
	1990	836,000	50	418,000
	2000	1,033,900	50	516,950
	2020	1,554,100	50	777,050
Penticton (South Okanagan Lake)	1970	335,600	0	0
	1980	468,400	0	0
	2000	747,200	10	74,720
	2020	1,038,400	25	259,600
Skaha	1970	335,600	0	0
	1980	468,400	10	46,840
	1990	607,800	30	182,340
	2000	747,300	50	373,600
	2020	1,038,400	50	519,200
Osoyoos	1970	178,300	0	0
	1980	246,700	20	49,340
	1990	320,000	30	96,000
	2000	393,400	50	196,700
	2020	534,100	50	267,050

TABLE 11.2

ESTIMATED PRESENT WORTH OF ECONOMIC AND SOCIAL COSTS
ASSOCIATED WITH DETERIORATING WATER QUALITY
IN THE MAIN VALLEY LAKES TO 2020
(High Projection)
(1970 Dollars)

LAKE	YEAR	ECONOMIC VALUES	SOCIAL VALUES
Wood	1970	$ 18,000	$ 48,000
	1980	230,000	501,000
	1990	861,000	1,538,000
	2000	1,511,000	2,412,000
	2020	2,323,000	3,285,000
Kalamalka	1980	40,000	210,000
	1990	1,187,000	5,304,000
	2000	2,624,000	10,546,000
	2020	4,422,000	15,864,000
North Okanagan Lake (Vernon Arm)	1980	22,000	90,000
	1990	557,000	2,274,000
	2000	1,173,000	4,520,000
	2020	1,910,000	6,799,000
Central Okanagan Lake	1980	0	0
	1990	0	0
	2000	554,000	1,302,000
	2020	1,602,000	3,155,000
South Okanagan Lake	1980	69,000	222,000
	1990	0	0
	2000	554,000	1,302,000
	2020	1,602,000	3,155,000
Skaha	1980	69,000	222,000
	1990	1,383,000	3,822,000
	2000	3,418,000	8,326,000
	2020	6,506,000	13,890,000
Osoyoos	1980	73,000	239,000
	1990	920,000	2,626,000
	2000	1,993,000	5,029,000
	2020	3,601,000	7,966,000

TABLE 11.3

ANNUAL COSTS AND BENEFITS OF PHOSPHORUS REMOVAL TO 1985

LAKE	ANNUAL PHOSPHORUS REMOVAL COSTS RANGE DEPENDING ON TYPE OF TREATMENT	ANNUAL BENEFITS	
		Economic	Social
Wood	$ 10,000 - $ 20,000	$ 36,000	$ 69,000
Kalamalka	5,000 - 13,000	12,000	60,000
Okanagan*	305,000 - 385,000	136,000	710,000
Skaha	84,000 - 99,000	48,000	135,000
Osoyoos	25,000 - 30,000	33,000	95,000
TOTALS	$429,000 - $547,000	$265,000	$1,069,000

* Includes phosphorus removal centres at Vernon, Kelowna and Okanagan Landing only.

The costs shown are for phosphorus removal only which will reduce algae and aquatic weed growth and the lakes to levels that permit maximum recreation and aesthetic benefits. Additional costs for expanding biological treatment facilities and sewage levels are not included as these are required to maintain acceptable community health standards. The 1985 time horizon was selected for this benefit costs analysis as it was considered the limit to which meaningful projections could be made for waste treatment costs based on existing technology and water quality data.

The ratio of annual benefits (social and economic) exceeds costs for all lakes. Total economic benefits derived from water based recreation are not sufficient by themselves to justify the costs of phosphorus removal to 1985, though they would justify such facilities by the end of the century. However, social values must be brought into the evaluation as it was clearly demonstated in the various surveys that clean water is the most important facet of shoreline recreation to both visitor and resident beach users.

11.4 DISCUSSION

Because of the many uncertainties involved in undertaking a benefit-cost analysis of water quality management alternatives, much of the above discussion should be reviewed with care. Hindsight analysis of Wood Lake water quality problems, presented in Chapter 8 clearly indicated the difficulties in determining economic and social impacts of water quality deterioration even in an apparently classical example of the problem. Predicting impacts on the larger scale is obviously more open to error particularly because of the uncertainty of the behavioural reactions of visitors and residents to gradually worsening water quality.

It is possible that many beach users would gradually adapt to and accept weed growth and algae blooms as a feature of Okanagan holidays. Already, many tourists apparently are willing to return year after year to resorts where weed growth is a common occurrence, apparently placing high priority on other factors such as friendships and familiarity with surroundings. At the same time, however, there are indications that the general public is becoming more aware of environmental issues, is demanding higher standards of environmental quality and is more willing and able to seek high quality environments elsewhere in the Province, if the water quality of the Okanagan Lakes continues to deteriorate. The economic analysis discussed in this chapter is based on this latter assumption.

One additional factor should also be discussed. It has been assumed that remedial actions, such as construction of tertiary treatment facilities could reduce the input of nutrients to lakes below the amounts these lakes can assimilate naturally within their biological systems thus removing nuisance weed and algae conditions. Limnologists have indicated that if Okanagan Lake became highly eutrophic (nutrient enriched) in the future, its quality could not be restored for more than half a century because of the relatively small inflows of water compared to its size and volume. Under such conditions, the water quality of the downstream lakes - Skaha, Vaseux and Osoyoos would also deteriorate no matter what waste treatment measures were implemented, because Okanagan River inflows to each lake would contribute excessive amounts of nutrients. As such an event would lead to almost irreversible consequences, it is evident that considerable expenditures or measures required to maintain high water quality in the Okanagan main valley lakes are warranted.

APPENDICES

APPENDIX A

VISITORS SURVEY

A1 - Visitors Survey Questionnaire

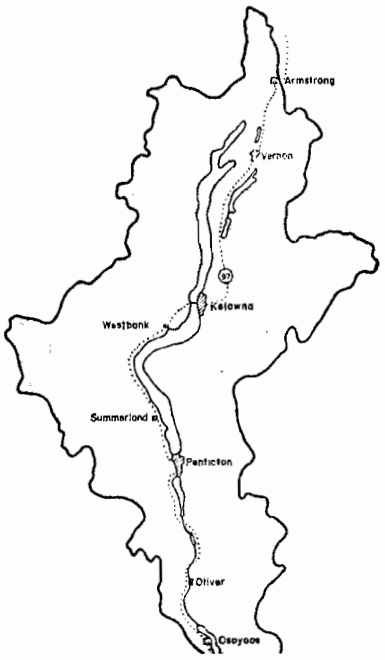
A2 - Results from Visitors Survey

APPENDIX A.1

VISITORS SURVEY QUESTIONNAIRE

CANADA-BRITISH COLUMBIA OKANAGAN BASIN STUDY

VISITORS SURVEY



CANADA - BRITISH COLUMBIA

OKANAGAN BASIN STUDY

VISITORS SURVEY

Your assistance is requested in answering the following questions. The answers you give will contribute toward the planning of this area.

If found or accidentally carried away, please mail to:

Okanagan Basin Study,
264 Westminster Ave. W.,
Penticton, B.C.

THANK YOU

1. How long will you spend altogether in the Okanagan Valley on this trip? _____ days
2. How long will you be away from home on this trip? _____ days
3. Is this your main holiday this year? Yes/No
4. How long do you intend to stay at this hotel/motel/campsite/resort? _____ days
5. Where is your present home?

   _____ (Town) _____ (Province/State)

6. PLEASE RANK the following activities in order of preference as a group (give 1 for most preferred, 2 for second preference, 3 for third preference, and so on)

   ☐ Swimming ☐ Fishing
   ☐ Water Skiing ☐ Sunbathing
   ☐ Boating ☐ Walking & Hiking
   ☐ Other (specify and rank)_____

7. Which features of the Okanagan Valley do you find particularly attractive? (PLEASE RANK in order of attractiveness)

   ☐ Weather ☐ Natural landscape
   ☐ Beaches ☐ Fresh Fruit
   ☐ Holiday atmosphere ☐ Water activities, (fishing, swimming, boating, etc.)
   ☐ Orchard landscape
   ☐ Wildlife ☐ Others (specify & rank
   ☐ Lakes

   _____

8. Which of the following best describes your party? (Please check ONE ONLY)

   ☐ One person alone ☐ One family with children
   ☐ One couple only ☐ Two families with children
   ☐ Two or more couples ☐ Group of _____friends
   ☐ Other _____ (write in)

9. Please write in how many of your group fall into the following age categories:

   0 - 5 years ☐ 26 - 40 years ☐
   6 - 15 years ☐ 41 - 65 years ☐
   16 - 25 years ☐ 66 and over ☐

10. Which areas of the Okanagan Valley have you visited, or do you intend to visit, on this trip?(check each area)

    ☐ Penticton area ☐ Vernon area ☐ Oliver area
    ☐ Kelowna area ☐ Armstrong area ☐ Osoyoos area

11. How many times have you visited the Okanagan Valley for a holiday in the last 5 years (1966-71)?

    ☐ come every year ☐ 2 years out of 5
    ☐ 4 years out of 5 ☐ 1 year out of 5
    ☐ 3 years out of 5 ☐ first time ever
    ☐ Been before more than 5 years ago

12. Why did you come to the Okanagan? (Please check ONE ONLY)

    ☐ Been before and liked it ☐ Travelling through to somewhere else
    ☐ Read about it - tourist brochure ☐ Other (Please specify)
    ☐ Friends recommended it _____

13. Are there any features of the Okanagan Basin you particularly dislike?

    ☐ Yes (Please Specify) No ☐

    _____

14. How much do you estimate you will spend (IN THE OKANAGAN VALLEY on this trip?

Accommodation, Campsite fees	Food, Drink	Rental, launch fees, licenses	Gasoline
$_____	$_____	$_____	$_____

Shopping -clothing, souvenirs, gifts, etc.	Other expenditures (Please specify)	TOTAL
$_____	$_____	$_____

DATE .....

LOCATION .....

TIME .....

APPENDIX A.2

RESULTS FROM VISITORS SURVEY

TABLE 1

REGION OF INTERVIEWS

	NUMBER	PERCENT
OSOYOOS	221	21.0%
PENTICTON	415	39.4
KELOWNA	227	21.0
VERNON	189	18.0
No Response	3	0.6
TOTAL	1055	100.0

TABLE 2

TYPE OF RESORT WHERE INTERVIEWS WERE CONDUCTED

	NUMBER	PERCENT
MOTEL	536	50.9%
CAMPSITE	512	48.5
HOTEL	5	0.5
No Response	2	0.1
TOTAL	1055	100.0

NOTE: A total of 1055 interviews were conducted between June 1 and September 6, 1971. As not all questions were completed by each respondent, totals for 'no response' vary somewhat between questions.

TABLE 3

HOW LONG WILL YOU SPEND IN THE OKANAGAN ON THIS TRIP?
(Question 1)

	TIME SPENT IN OKANAGAN	
	NUMBER	PERCENT
1 to 3 days	108	10.2%
4 to 7 days	348	33.0
8 to 14 days	439	41.6
15 to 21 days	107	10.1
22 to 28 days	16	1.5
Over 28 days	30	2.9
No Response	7	.7
TOTALS	1055	100.0

TABLE 4

HOW LONG DO YOU INTEND TO STAY AT THIS HOTEL, MOTEL, CAMPSITE
(Question 4)

	TIME SPENT IN PLACE OF INTERVIEW	
	NUMBER	PERCENT
1 to 3 days	222	21.0%
4 to 7 days	362	34.4
8 to 14 days	335	31.7
15 to 21 days	80	7.6
22 to 28 days	15	1.4
Over 28 days	25	2.4
No Response	16	1.5
TOTAL	1055	100.0

TABLE 5

HOW LONG WILL YOU BE AWAY FROM HOME ON THIS TRIP?
(Question 2)

	NUMBER	PERCENT
1 to 3 days	107	10.2%
4 to 7 days	348	33.0
8 to 14 days	437	41.4
15 to 21 days	107	10.2
22 to 28 days	16	1.5
Over 28 days	29	2.7
No Response	11	1.0
TOTAL	1055	100.0

TABLE 6

IS THIS YOUR MAIN HOLIDAY?
(Question 3)

	NUMBER	PERCENT
Yes	906	86.0%
No	128	12.0
No Response	21	2.0
TOTAL	1055	100.0

TABLE 7

WHERE IS YOUR PRESENT HOME?
(Question 5)

	NUMBER	PERCENT
Lower Mainland	373	35.4%
Rest of B.C.	129	12.2
Alberta	399	37.8
Rest of Canada	61	5.8
Western U.S.	81	7.7
Rest of World	10	0.9
No Response	2	0.2
TOTAL	1055	100.0

TABLE 8

PLEASE RANK THE FOLLOWING ACTIVITIES IN ORDER OF PREFERENCE
(Question 6)

	RANKING			
	1		2	
	NUMBER	PERCENT	NUMBER	PERCENT
Swimming	676	64.1%	204	19.3%
Fishing	38	3.6	93	8.8
Water Skiing	62	5.9	78	7.4
Sunbathing	131	12.4	413	39.1
Boating	28	2.7	128	12.1
Walking, Hiking	19	1.8	51	4.8
Other	66	6.3	31	2.9
No Response	35	3.2	57	5.6
TOTAL	1055	100.0	1055	100.0

TABLE 9

WHICH FEATURES IN THE OKANAGAN DO YOU FIND PARTICULARLY ATTRACTIVE
(Question 7)

FEATURE	RANKING			
	1		2	
	NUMBER	PERCENT	NUMBER	PERCENT
Weather	479	45.4%	173	16.4%
Beaches	150	14.2	280	26.5
Holiday Atmosphere	42	4.0	50	4.7
Orchard Landscape	14	1.3	36	3.4
Wildlife	4	.4	6	.6
Lakes	71	6.7	108	10.2
Natural Landscape	61	5.8	72	6.8
Fresh Fruit	36	3.4	65	6.2
Water Activities	149	14.1	187	17.7
Others	13	1.2	2	.2
No Response	36	3.6	76	7.3
TOTAL	1055	100.0	1055	100.0

TABLE 10

ARE THERE ANY FEATURES IN THE OKANAGAN BASIN THAT YOUR PARTICULARLY DISLIKE?
(Question 13)

FEATURE	NUMBER	PERCENT
None	664	63.0%
Poor Water Quality	102	9.7
Prices	42	4.0
Bugs	38	3.6
Traffic	36	3.4
Poor Facilities	20	1.9
No Night Life	11	1.0
Crowding	9	0.9
Other	132	12.4
No Response	1	0.1
TOTAL	1055	100.0

TABLE 11

HOW MANY TIMES HAVE YOU VISITED THE OKANAGAN FOR A HOLIDAY IN THE LAST FIVE YEARS
(Question 11)

TIMES	NUMBER	PERCENT
Every Year	275	26.1%
4 out of 5	203	19.3
3 out of 5	55	5.2
2 out of 5	127	12.1
1 out of 5	208	19.7
First Time	128	12.2
Before 1967	47	4.3
No Response	12	1.1
TOTAL	1055	100.0

TABLE 12

WHY DID YOU COME TO THE OKANAGAN
(Question 12)

REASON	NUMBER	PERCENT
Been Before & Liked It	720	68.3
Tourist Brochure	17	1.6
Recommended by Friends	151	14.3
Travelling Through	57	5.4
Other	99	9.4
No Response	11	1.0
TOTAL	1055	100.0

TABLE 13

WHICH AREAS IN THE OKANAGAN VALLEY HAVE YOU VISITED OR DO YOU INTEND TO VISIT ON THIS TRIP?
(Question 10)

AREA	NUMBER	PERCENT
Penticton	753	71.5%
Kelowna	664	63.1
Vernon	452	42.9
Armstrong	123	11.7
Oliver	250	23.7
Osoyoos	359	34.1

TABLE 14

HOW MUCH DO YOU ESTIMATE YOU SPENT IN THE OKANAGAN ON THIS TRIP?
(Question 14)

AMOUNT	NUMBER	PERCENT
Under $50	110	10.4%
$5 to 100	184	17.4
$101 to 200	346	32.8
$201 to 300	189	17.9
$301 to 500	157	14.9
Over $500	68	6.5
No Response	1	0.1
TOTAL	1055	100.0

TABLE 15

DESCRIPTION OF TOURIST GROUP
(Question 8)

DESCRIPTION	NUMBER	PERCENT
Single Person	18	1.7%
Couple (No Children)	126	12.0
Single Family & Children	634	60.0
Two Families & Children	131	12.4
Two or More Couples	45	4.3
Group of Friends	52	4.9
Other	41	3.0
No Response	8	.8
TOTAL	1055	100.0

APPENDIX B

RESIDENT PARTICIPATION IN OUTDOOR RECREATION

B1 - Questionnaire

B2 - Results from Questionnaire

APPENDIX B.1

QUESTIONNAIRE

1. Now I'd like to ask you some questions concerning your outdoor recreation patterns. I'm going to read out a list of activities, and I'd like you to tell me whether adults or children participate in each activity in the Okanagan.

Activity	RESPONSE: Adults only	Children only	Both	None	COLUMN
Swimming	1	2	3	4	39
Boating (inc. canoeing)	1	2	3	4	40
Sailing	1	2	3	4	41
Fishing	1	2	3	4	42
Water Skiing	1	2	3	4	43
Underwater swimming	1	2	3	4	44
Hunting	1	2	3	4	45
Hiking	1	2	3	4	46
Observing wildlife	1	2	3	4	47
Camping	1	2	3	4	48
Skiing	1	2	3	4	49
Skating	1	2	3	4	50
Tennis	1	2	3	4	51
Golf	1	2	3	4	52
Horse riding	1	2	3	4	53
Cycling	1	2	3	4	54
Organized sports	1	2	3	4	55
Walking	1	2	3	4	56
Driving for pleasure	1	2	3	4	57
Picnicking	1	2	3	4	58
Gardening	1	2	3	4	59
Trap & target shooting	1	2	3	4	60
Auto racing	1	2	3	4	61
Other	1	2	3	4	62

2. Can you tell me how many days you spent last year engaged in the following activities?

Activity	RESPONSE: 1-2 days	3-5 days	6-10 days	11-20 days	21-50 days	Over 50 days	COLUMN
Swimming	1	2	3	4	5	6	63
Boating(inc. canoeing)	1	2	3	4	5	6	64
Sailing	1	2	3	4	5	6	65
Fishing	1	2	3	4	5	6	66
Water skiing	1	2	3	4	5	6	67
Underwater swimming	1	2	3	4	5	6	68
Hunting	1	2	3	4	5	6	69
Hiking	1	2	3	4	5	6	70
Observing wildlife	1	2	3	4	5	6	71
Camping	1	2	3	4	5	6	72

3. How long, on average does it take you to get to the place where you normally do these things?

Activity	RESPONSE: Less than 30 mins.	31-60 mins.	61 min. -2 hrs.	3-4 hrs.	Over 4 hrs.	COLUMN START CARD 2
Swimming	1	2	3	4	5	1
Boating(inc.canoeing)	1	2	3	4	5	2
Sailing	1	2	3	4	5	3
Fishing	1	2	3	4	5	4
Water skiing	1	2	3	4	5	5
Underwater swimming	1	2	3	4	5	6
Hunting	1	2	3	4	5	7
Hiking	1	2	3	4	5	8
Observing wildlife	1	2	3	4	5	9
Camping	1	2	3	4	5	10

4. How do you normally get to this place?

Activity	On Foot	Cycle	Motor Cycle	Car	Truck, 4 w.d. Camper	COLUMN
Swimming	1	2	3	4	5	11
Boating(inc. canoeing)	1	2	3	4	5	12
Sailing	1	2	3	4	5	13
Fishing	1	2	3	4	5	14
Water skiing	1	2	3	4	5	15
Underwater swimming	1	2	3	4	5	16
Hunting	1	2	3	4	5	17
Hiking	1	2	3	4	5	18
Observing wildlife	1	2	3	4	5	19
Camping	1	2	3	4	5	20

5. Including those activities which you don't do now, are there any water-based activities that you would like to do more of? What is it that prevents more of these activities now?

ACTIVITIES	REASONS

6. How much money have you spent on water-based activities in the Okanagan during the past year? (include rentals, accommodation, transportation, equipment).

COLUMN 21 — RESPONSE

1. $0 - 50.
2. $51. - 100.
3. $101. - 200.
4. $201. - 500.
5. $501. - 1,000.
6. $1,001. and over (specify)_____

7. Do you own a boat? 1. Yes 2. No — COLUMN 22 — RESPONSE

8. Did you have any friends or relatives staying with you during the summer? (Pause) How many groups?

COLUMN 23 — RESPONSE

None 0
1 1
2 2
3 3
4 4
5 5

9. If yes, ask: (If no, skip to Q.11) How many people were in:

	RESPONSE					COLUMN
Group 1	1	2	3	4	5	24
Group 2	1	2	3	4	5	25
Group 3	1	2	3	4	5	26
Group 4	1	2	3	4	5	27
Group 5	1	2	3	4	5	28

10. (If yes to Q.8) How long did they stay?

	RESPONSE: 1-2 days	3-5 days	6-10 days	11-20 days	21-28 days	Over 28 days	COLUMN
Group 1	1	2	3	4	5	6	29
Group 2	1	2	3	4	5	6	30
Group 3	1	2	3	4	5	6	31
Group 4	1	2	3	4	5	6	32
Group 5	1	2	3	4	5	6	33

11. Do you own a summer cottage in the Okanagan? 1. Yes 2. No — COLUMN 34 — RESPONSE

12. Did you rent out your home and/or cottage during the summer? (Pause). How many groups?

COLUMN 35 — RESPONSE

None 0
1 1
2 2
3 3
4 4
5 5

13. (If yes, ask:) If no, skip to next section. How many people were in:

	RESPONSE						COLUMN
Group 1	1	2	3	4	5	6	36
Group 2	1	2	3	4	5	6	37
Group 3	1	2	3	4	5	6	38
Group 4	1	2	3	4	5	6	39
Group 5	1	2	3	4	5	6	40

14. (If yes to Q.12) How long did they stay?

	RESPONSE: 1-2 days	3-5 days	6-10 days	11-20 days	21-28 days	Over 28 days	COLUMN
Group 1	1	2	3	4	5	6	41
Group 2	1	2	3	4	5	6	42
Group 3	1	2	3	4	5	6	43
Group 4	1	2	3	4	5	6	44
Group 5	1	2	3	4	5	6	45

PERSONAL INFORMATION

I would now like to ask you some personal information, about the ages, education and occupations of the adults living here. As in the other sections, all information is regarded as strictly confidential and used only for statistical purposes.

On Page 10 you see various categories of age, education and occupation. Would you please tell me which of these brackets applies to: The Husband: Age (Col.35) — COLUMN 35 — RESPONSE 1 2 3 4 5 6 7 8

Education (Col.36) — COLUMN 36 — RESPONSE 1 2 3 4 5

Occupation (Col.37) — COLUMN 37 — RESPONSE 1 2 3 4 5 6 7 8

The Wife: Age (Col.38) — COLUMN 38 — RESPONSE 1 2 3 4 5 6 7 8

Education (Col.39) — COLUMN 39 — RESPONSE 1 2 3 4 5

Occupation (Col.40) — COLUMN 40 — RESPONSE 1 2 3 4 5 6 7 8

(Personal Information - cont'd)		COL-UMN	RES-PONSE
	Other Adult: Age (Col.41)	41	1 2 3 4 5 6 7 8
	Education (Col.42)	42	1 2 3 4 5
	Occupation (Col.43)	43	1 2 3 4 5 6 7 8
2. How many children do you have	a) under 10?	44	
	b) over 10?	45	
On Page 11 are several income categories. Please call out the number against the one that describes your family income.		46	1 2 3 4 5 6

END OF INTERVIEW

APPENDIX B.2

RESULTS FROM QUESTIONNAIRE

TABLE 1

HOW OFTEN DID AT LEAST ONE-MEMBER OF YOUR HOUSEHOLD PARTICIPATE IN THE FOLLOWING OUTDOOR RECREATION ACTIVITIES DURING 1971

ACTIVITIES	DID NOT PARTICIPATE	1 - 5 days	6 - 10 days	11 - 20 days	21 - 30 days	31 - 50 days	Over 50 days	TOTAL
a) SWIMMING								
No. of Households	110	10	5	15	27	79	138	384
Percent	28.7	2.6	1.3	3.9	7.0	20.6	35.9	100.0
b) BOATING								
No. of Households	181	17	32	34	42	48	28	384
Percent	47.1	5.0	8.3	8.9	10.9	12.5	7.3	100.0
c) SAILING								
No. of Households	359	3	3	10	6	3	0	384
Percent	93.5	0.8	0.8	2.6	1.5	0.8	0.0	100.0
d) FISHING								
No. of Households	141	29	50	53	53	35	23	384
Percent	36.7	7.6	13.0	13.8	13.8	9.1	6.0	100.0
e) WATER-SKIING								
No. of Households	277	16	18	23	19	19	12	384
Percent	72.1	4.1	4.7	6.0	5.0	5.0	3.1	100.0
f) UNDERWATER SWIMMING								
No. of Households	350	4	9	4	7	4	6	384
Percent	91.2	1.0	2.4	1.0	1.8	1.0	1.6	100.0
g) HUNTING								
No. of Households	247	25	28	42	20	21	1	384
Percent	64.3	6.5	7.3	10.9	5.2	5.5	0.3	100.0
h) HIKING								
No. of Households	200	16	36	53	34	24	21	384
Percent	52.1	4.2	9.4	13.8	8.8	6.2	5.5	100.0
i) OBSERVING WILDLIFE								
No. of Households	184	15	27	32	26	28	72	384
Percent	47.9	3.9	7.0	8.3	6.8	7.3	18.8	100.0
j) CAMPING								
No. of Households	200	14	44	48	46	26	6	384
Percent	52.1	3.6	11.5	12.5	12.0	6.8	1.5	100.0

TABLE 2

HOW MUCH DO YOU ESTIMATE YOUR HOUSEHOLD SPENT ON WATER-BASED RECREATION LAST YEAR (1971)

AMOUNT	NO. OF HOUSEHOLDS	PERCENT
$0 - 50	214	55.7%
$51 - 100	63	16.4
$101 - 200	27	7.0
$201 - 300	30	7.8
$301 - 500	9	2.4
Over $500	17	4.4
No Response	24	6.3
TOTAL	384	100.0

TABLE 3

TIME TAKEN TO REACH RECREATION SITE

(Percentage of Sample)

TIME	ACTIVIT					
	SWIMMING	BOATING	FISHING	WATER-SKIING	HUNTING	HIKING
Under 30 mins.	92.3%	73.9%	38.0%	87.1%	26.8%	56.4%
31 - 60 mins.	5.1	12.2	26.5	7.4	22.1	14.0
1 - 2 hours	1.5	9.3	26.5	3.0	28.3	14.6
3 - 4 hours	1.1	2.7	5.5	2.5	11.7	5.3
Over 4 hours	0.0	1.9	3.5	0.0	11.1	4.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 4

DO YOU OR ANYONE ELSE IN THIS HOUSEHOLD OWN A BOAT?

	No. of Households	Percent
Yes	142	37.0%
No	238	62.0
No Response	4	1.0
TOTAL	384	100.0

TABLE 5

NUMBER OF VISITOR-DAYS BY HOUSEHOLD IN 1971

Visitor-Days	No. of Households	Percent
None	66	17.2%
1 - 5 days	9	2.3
6 - 10 days	11	2.9
11 - 20 days	37	9.6
21 - 30 days	70	18.2
31 - 50 days	59	15.4
51 - 100 days	67	17.5
101 - 150 days	26	6.8
Over 150 days	25	6.5
No Response	14	3.6
TOTAL	384	100.0

NOTE: Tables represent a compilation of data from several questions and table numbers, therefore are not related to Questionnaire number.

APPENDIX C

BEACH USER SURVEY

C1 - Beach User Survey Questionnaire

C2 - Results from Questionnaire

PART 1 CODING

1. START DATA CARD 1 — 1

2. Location of Interview — 6
   6 ☐ Region: 1. Osoyoos 2. Penticton 3. Kelowna 4. Vernon — 7 ☐☐
   Beach Name _____

3. Date of Interview — 9 ☐
   Weeks 1 2 3 4 5 6 7 8

4. Time of Interview — 10 ☐
   1. Morning
   2. Afternoon
   3. Evening

5. Day — 12 ☐
   1. Weekday
   2. Saturday
   3. Sunday
   4. Holiday

6. Water Quality — 14 ☐
   1. Very High Quality
   2. High Quality
   3. Medium Quality
   4. Low Quality
   5. Very Low Quality

7. Water Quality Criteria — 16 ☐☐☐☐☐☐

	None				High
☐ Odour	1	2	3	4	5
☐ Floating Debris	1	2	3	4	5
☐ Weeds	1	2	3	4	5
☐ Murkiness	1	2	3	4	5
☐ Scum	1	2	3	4	5
☐ Coldness	1	2	3	4	5

Comments _____

8. Density of People (around location of interview) — 23 ☐
   1. Very High
   2. High
   3. Medium
   4. Low
   5. Very Low

9. Weather — 25 ☐☐
   ☐ 1. Clear, 2. Scattered Clouds, 3. Half Cloudy, 4. Overcast, 5. Raining
   ☐ 1. Calm, 2. Breezy, 3. Windy

10. Temperature — 27 ☐
    1. 50-60
    2. 60-70
    3. 70-80
    4. 80-90
    5. 90-100
    6. Over 100

11. Location of Respondent — 29 ☐
    1. On Beach
    2. On Grass
    3. At Picnic Table on Beach
    4. At Picnic Table on Grass
    5. On Bench
    6. Other

12. Water Quantity Level — 30 ☐☐

Okanagan Lake	Osoyoos Lake
☐ 1. Under 1123.8	☐ 1. Under 911.0
2. 1123.8 - 1124.3	2. 911.0 - 911.5
3. 1124.4 - 1124.8	3. 911.6 - 912.0
9. Not Applicable	4. 912.1 - 912.5
	5. 912.6 - 913.0
	9. Not Applicable

PART 2

1. Where is your home? _____ Town _____ Province — 32 ☐☐☐
   1. Okanagan Resident
   2. Visitor — 35 ☐

IF RESIDENT

2. How long have you been living in the Okanagan? — 36 ☐
   1. 6 Months or Less
   2. 7 Months to 1 Year
   3. 13 Months to 2 Years
   4. 25 Months to 5 Years
   5. 6 to 10 Years
   6. Over 10 Years
   7. Entire Lifetime

(Skip to Question 7)

IF VISITOR

3. How many years have you been coming to the Okanagan? — 38 ☐☐☐

☐ Before 1967	1. Yes	2. No
☐ 1967-1969	1. Yes	2. No
☐ 1970-1971	1. Yes	2. No
		3. First Time Ever

4. How long will you be staying in the Okanagan on this trip? — 42 ☐
   1. Less than 1 Day
   2. 1-3 Days
   3. 4-7 Days
   4. 7-14 Days
   5. 15-21 Days
   6. 21-30 Days
   7. Over a Month
   8. Don't Know

5. Where are you staying at present in the Okanagan? — 44 ☐☐
   Town _____
   Type of Accommodation — 46 ☐
   1. Motel
   2. Hotel
   3. Campsite
   4. Friends
   5. Travelling Through
   6. Other

6. How long will you be staying in this area (town or resort) — 47 ☐
   1. Less than 1 Day
   2. 1-3 Days
   3. 4-7 Days
   4. 7-14 Days
   5. 15-21 Days
   6. 22-28 Days
   7. Over a Month
   8. Don't Know

RESIDENTS AND VISITORS

7. How many years have you been coming to this beach? — 49 ☐☐☐

☐ Before 1967	1. Yes	2. No
☐ 1967-1969	1. Yes	2. No
☐ 1970-1971	1. Yes	2. No
		3. First Time Ever

8. How often do you visit this beach on average during July and August (during your stay-vacationers) — 53 ☐
   1. More than once a Day
   2. Once a Day
   3. 2-6 Times a Week
   4. Once a Week
   5. Once Every Two Weeks
   6. Once a Month

9. How did you travel to this beach today? — 55 ☐
   1. Walk
   2. Bicycle
   3. Motor Bicycle
   4. Car
   5. Truck
   6. Camper/Trailer

10. How long does it take you to get to this beach from your residence in the Okanagan directly (by the above mode of transportation)? — 57 ☐
    1. Less than 5 Minutes
    2. 6-15 Minutes
    3. 16-30 Minutes
    4. 31-45 Minutes
    5. 46-60 Minutes
    6. Over 1 Hour
    9. Not Applicable

11. Is this the nearest beach to your Okanagan residence? — 59 ☐
    1. Yes
    2. No
    3. Don't Know

12. How important would you say that having a short journey from your place of residence to the beach(s) is to the enjoyment of your trips to the beach? — 61 ☐
    CARD 1. Very Important
    2. Important
    3. Quite Important
    4. Unimportant
    5. Don't Know
    9. Not Applicable

13. How long do you think you will stay at the beach today? — 63 ☐
    1. Less than 30 Minutes
    2. 31-60 Minutes
    3. 1-2 Hours
    4. 2-4 Hours
    5. 4-6 Hours
    6. All Day
    7. Don't Know

14. What do you particularly find attractive about this beach? Tick each response in appropriate box. — 65 ☐☐☐☐☐☐☐☐☐☐☐☐ (1 2 3 4 5 6 7 8 9 10 11 12)
    1 ☐ No Particular Likes
    2 ☐ Short Journey
    3 ☐ Uncrowded
    4 ☐ Good Facilities
    5 ☐ Safe Beach for Children
    6 ☐ Friendly People
    7 ☐ Pleasant Scenery
    8 ☐ High Beach Quality
    9 ☐ High Water Quality
    10 ☐ Sheltered Beach
    11 ☐ Other
    12 ☐ Comments _____

CODING

PART 2

START DATA CARD 2 — 1 ☐☐☐

15. Are there any features you dislike about this beach? Tick each response in appropriate box. — 1 2 3 4 5 6 7 8 9 10 11 — 6 ☐☐☐☐☐☐☐☐☐☐☐

1 ☐ No Dislikes
2 ☐ Parking
3 ☐ Crowding
4 ☐ Poor Facilities
5 ☐ Unsafe for Children
6 ☐ Noise
7 ☐ Low Beach Quality
8 ☐ Low Water Quality
9 ☐ High Lake Levels
10 ☐ Others
11 Comments _____

16. Have you been in the water today? — 17 ☐

1. Yes
2. No
9. Not Applicable

Comments _____

17. IF NO - Why Not? — 19 ☐

1. Poor Quality
2. Water Too Cold
3. Weather Too Cold
4. Just Arrived
5. Other

18. IF NO - Do you think you will go into the water today? — 21 ☐

1. Yes
2. No
3. Don't Know
9. Not Applicable

4. Comments _____

19. IF NO - Why Not? — 23 ☐

1. Too Crowded
2. Poor Water Quality
3. Water Too Cold
4. Weather Too Cold
5. Othsr _____

20. Have you ever recommended a friend to come to this beach? — 25 ●

1. Yes
2. No
9. Not Applicable

21. IF NO - Why Not? — 27 ☐

1. Too Crowded
2. Poor Water Quality
3. High Lake Levels
4. Low Lake Levels
5. Other _____

22. Do you think you will return to this beach in the next few years? — 29 ☐

1. Is.
2. No
3. Don't Know

23. IF NO - Why Not? — 31 ☐

1. Too Crowded
2. Poor Water Quality
3. Other _____

FOR VISITORS

24. IF NO - Do you think you will return to the Okanagan in the next few years? — 33 ☐

1. Is.
2. Yo
3. Don't Know

25. IF NO - Why Not? — 35 ☐

1. Too Crowded
2. Poor Water Quality
3. High Lake Levels
4. Lou Lake Levels
5. Other _____

26. How important a consideration would you say tht water quality is to you in your decision to return to this beach? — 37 ☐

CARD 1. Vary Important
2. Important
3. Quite Important
4. Unimportant
5. Don't Know

CODING

PART 3

27. Have you visited other beaches in the Okanagan? — 39 ☐

1. Yes
2. No

IF YES - Please name or locate them and indicate how frequently you visit them compared to this beach.

Beach Name	Three X Much More	Two X More	Same	Two X Less	Three X Much Less
This Beach					
1.					
2.					
3.					
4.					
5.					
Others					

28. Please examine this list of factor* and indicate h a important each one is to your enjoyment of Okanagan Beaches, in order of importance 1,2,3, etc., 1 being the most important, 2 the next most important and so on. — 1 2 3 4 5 6 7 8 9 — CARD 41 ☐☐☐☐☐☐☐☐☐

1 ☐ Clean Sand
2 ☐ Uncrowded Conditions
3 ☐ Good Facilities
4 ☐ Clean Water
5 ☐ Pleasant Scenery
6 ☐ Safe Beaches for Children
7 ☐ Others
8 ☐ No Particular Likes
9 Comments _____

29. Here is a list of factors which may detract from your enjoyment of beaches. Have you experienced these or other problems in the Okanagan? — 51 a

1. Yes
2. No
3. Not Applicable

30. IF YES - How important are these factors in detracting from your enjoyment of Okanagan beaches? Please rank in order of importance, as above — 1 2 3 4 5 6 7 8 9 10 11 12 13 — CARD 53 ☐☐☐☐☐☐☐☐☐☐☐☐☐

1 ☐ Dirty Sand
2 ☐ Crowded Conditions
3 ☐ Poor Facilities
4 ☐ Poor Parking Facilities
5 ☐ Dirty Water
6 ☐ Litter
7 ☐ Debris
8 ☐ Noise
9 ☐ Problems of Access
10 ☐ Problems Associated with high water levels
11 ☐ Problems Associated with low water levels
12 ☐ Other
13 Comments _____

31. If you had a completely free choice as to when you could take your holidays in the Okanagan which month would you prefer? — 66 ☐

1. Winter Months
2. May
3. June
4. July
5. August
6. September
7. Other _____

32 IF month is not July or August - Why? — 68 ☐

1. Winter Sports
2. Blossoms
3. Uncrowded Conditions
4. Weather
5. Fishing
6. Hunting
7. Fruit
8. Other _____

CODING

men CROWDING

33. Have you ever experienced o d d conditions at Okanagan beaches? 70 ☐

1. Yes
2. No
9. Not Applicable

34. IF YES - How did these crowded conditions detract from your enjoyment of the beaches? 72 ☐

CARD 1. Detracted Very Seriously
2. Detracted Seriously
3. Detracted Somewhat
4. Did Not Detract At All
5. Comments _____

35. How do you rate this section of beach for crowding right now? 74 ☐

1. Very High Crowding
2. High Crowding
3. Medium Crowding
4. Low Crowding
5. Very Low Crowding
6. Don't Know
7. Comments _____

36. Do you think this beach has become more or less crowded during July and August since you have known it? 76 ☐

CARD 1. Much More Crowded
2. More Crowded
3. Remained the Same
4. Less Crowded
5. Much Less Crowded
6. Don't Know
9. lot Applicable

37. START DATA CARD 3 1 ☐☐☐☐

Have you ever avoided going to any beaches in the Okanagan on account of their crowded conditions rather than any other factor such as distance? 6 ☐

1. Yes
2. No
9. Not Applicable

38. IF YES - Name Which Beach? 8 ☐☐☐

i. _____
ii. _____
iii. _____
ir. _____

39. IF YES - What do you normally do when you avoid going to crowded beaches in the Okanagan ? 13 ☐☐☐☐

1. Stay at Home (Place of Stay)
2. Go Outside the Okanagan
3. Go to Quieter Beaches in the Okanagan
Name: i _____
ii _____
iii _____
4. Other _____

40. IF YES - How often do you specifically avoid going to crowded beaches? 18 ☐

CARD 1. Very Often (50-100%)
2. Often (25-50%)
I. Sometimes (10-25%)
4. Occasionally (less than 10%)

WATER QUALITY

41. How important would you say that high water quality it to your enjoyment of Okanagan beaches? 20 ☐

CARD 1. Very Important
2. Important
3. Quite Important
4. Important
5. Don't Know

42. Have you ever experienced poor water quality on Okanagan beaches? 22 ☐

1. Yes
2. No
9. Not Applicable

43. IF YES - How did the poor water quality detract from your enjoyment of the beaches? 24 ☐

CARD 1. Detracted Very Seriously
2. Detracted Seriously
3. Detracted Somewhat
4. Did hot Detract At A11
5. Comments _____

44. How do you rate the quality of the water at this beach today? 26 ☐

CARD 1. Very High Quality
2. High Quality
3. Medium Quality
4. Low Quality
5. Very Lou Quality
6. Don't Know
7. Comments _____

CODINGS

45. Do you think that the water quality has improved or declined at this beach since you have known this beach? 28 ☐

1. Much Higher Quality
2. Higher Quality
3. The Same Quality
4. Lower Quality
5. Much Lower Quality
6. Don't Know
9. Not Applicable

46. Have you ever avoided going to any beaches in the Okanagan on account of lor water quality, rather than any other reason I 30 ☐

1. Yes
2. No
9. Not Applicable

47. If YES - Name the beach(s) 32 ☐☐☐☐

i. _____
ii. _____
iii. _____
ir. _____

48. IF YES - What do you normally do when you avoid going to beaches vlth lor water quality in the Okanagan? 37 ☐☐☐☐

1. Stay at Home (Place of Stay)
2. Go Outside tho Okanagan
3. Go to Beaches vlth Cleaner Water
Name: i _____
ii _____
iii _____
4. Other _____

49. If YES - How often do you specifically avoid going to beaches vlth lor water quality? 39 ☐

CARD 1. Very Often (50-100%)
2. Often (25-50%)
3. Sometimes (10-25%)
4. Occasionally (less than 10%)

WATER QUANTITY

50. Have you ever experienced any problems duo to either high or low lake levels in the Okanagan ? 41 ☐☐

☐ High Levels 1. Yes
2. No
9. Not Applicable

☐ Low Levels . 1. Yes
2. No
9. Not Applicable

51. IF YES - High Levels - What problems did you experience 1 44 ☐☐

1. Loss of Beach
2. Boat Launching
3. Other _____

52. IF YES - Low Levels - What problems did you experience? 47 ☐☐

1. Exposure of Mud, Weeds
2. Sharp Drop-Off
3. Other _____

53. In our studies we have become aware that during extreme drought conditions (once in about 25 years), Okanagan Lake levels could drop to about 3 to 4 feet below its minimum level (7 to 8 feet below present level) lor two successive years. This could expose amounts of shoreline at this beach. How do you feel about this? 1 2 3 4 5 50 ☐☐☐☐☐

☐ 1. Don't Know
2. Not Bothered

2 3 ☐☐
1. More Beach — Positive
2. Less Crowding
3. Others _____

4 5 ☐☐
1. Exposure of Mud & Weeds — Negative
2. Sharp Drop-Off
3. Launching Problems
4. Others _____

PART 3

BACKGROUND INFORMATION:

54. Which of tho following categories best describes your party? 56 ☐

1. On Person Alone
2. One Couple Only
3. Two or More Couples
4. Family and Children
5. Two Families and Children
6. Group of Friends

55. Sex 58 ☐
1. Male
2. Female

56. Age CARD 60 ☐
1. 12-20
2. 20-29
3. 30-39
4. 40-49
5. 50-59
6. 60 and Over

57. What is your approximate household income? 62 ☐

CARD 1. Under $2,999
2. $3,000-$4,999
3. $5,000-$6,999
4. $7,000-$9,900
5. $10,000-$14,999
6. $15,000-$20,000

58. What level of education did you complete? 64 ☐

CARD
1. Grade 1-8
2. Grade 9–12
3. Some College or University
4. College or University
5. Technical Training

59. What is your present occupation? 66 ☐

1. Housewife
2. Labourer(Non Ag.)
3. Tradesman
4. Agriculture
5. Service
6. Clerical
7. Technical
8. Professional/Managerial
9. Student
A. Retired
B Other _____

PART 4

60. The following list shows the monthly and annual expenditures of an average household in the Okanagan on certain utilities and services.

CARD		Per Month	Per Year
	Natural Gas	$11.50	1128.
	Electricity	8.50	102.
	Telephone	5.50	66.
	Water	5.00	60.
	SEWAGE TREATMENT	5.00	60.
	Cablevision	5.00	60.
	Fire Protection	3.00	36.
	Garbage Pickup	1.25	15.

175

Imagine that you are a tax payer and you are informed that in order to maintain the present water quality at the beaches around here in 1980 (ie. to stop the water becoming considerably less pleasant for swimming, and playing around in), it is necessary to spend more money on additional sewage treatment. Imagine now that as a tax payer you are asked in a referendum (poll) whether you will vote YES or NO to tax YOURSELF more money to provide this additional sewage treatment.

I am going to read you a series of dollar figures which represent the MONTHLY and ANNUAL costs of additional sewage treatment. We are interested in finding out the MOST you would be willing to pay for additional sewage treatment to naintain the present water quality at the beaches around here. Bear in mind that you already pay $5. a month or $60. a year for sewage treatment and that you am taxed for other services. Also these other taxes may rise in the in the future as well.

What is the maximum additional monthly/annual tax you would be willing to pay to maintain present rater quality? 68 ☐☐
(Tick Maximum Willingness to Pay ONLY)

	Per Month	Per Year
01	$1	$12
02	$2	$24
03	$3	$36
04	$4	$48
05	$5	$60
06	$6	$72
07	$7	$84

and so on

Enter Maximum Amount $ _____

-1 Nothing
-2 Don't Know

61. We would like to know how much a day at the beach in worth to you in dollar terms. It may help you to think of this amount by comparing your satisfaction on the beach with other recreational activities for which pay, such as going to the cinema or skiing. How much do you think a day at the beach is worth? 71 ☐☐☐

000	Nothing	06.	$6.00
.25	$0.25	07.	$7.00
.50	$0.50	08.	$8.00
01.	$1.00	09.	$9.00
02.	$2.00	010	$10.00
03.	$3.00		
04.	$4.00		
05.	$5.00		

If above $10.00
Enter Exact Amount $ _____

-1. Don't Know
-2. Unable to Respond

62. Do you have any additional comments you wish to make about the Okanagan beaches and/or this survey? 75 ☐

1. Yes
2. Yo

Comments _____

63. If you would like to know some of the results of this survey and/or the Okanagan Basin Study, please give us your name and address and we will be pleased to send you information from time to time.

NAME _____

ADDRESS _____

_____

END OF INTERVIEW

APPENDIX C.1 (CONT'D)

APPENDIX C.2

RESULTS FROM QUESTIONNAIRE*

TABLE 1

BREAKDOWN OF SAMPLE

	VISITORS	RESIDENTS	TOTAL
High Quality Beach Sample	230	114	344
Low Quality Beach Sample	79	23	102
Total Sample	309	137	446

TABLE 2

HOW LONG HAVE YOU BEEN LIVING IN THE OKANAGAN?

	H.Q.	L.Q.
6 Months or Less	15.6	27.3%
7 Months to 1 Year	9.2	4.6
13 Months to 2 Years	9.2	-
25 Months to 5 Years	9.6	9.1
6 to 10 Years	12.7	31.8
Over 10 Years	20.5	4.6
Entire Lifetime	10.8	18.2
No Response	2.4	4.4

TABLE 3

HOW MANY YEARS HAVE YOU BEEN COMING TO THE OKANAGAN?

	H.Q.	L.Q.
Before 1967	54.8%	55.0%
1967-1969	66.5	63.7
1970-1971	67.4	65.0
First Time Ever	16.5	18.7

TABLE 4

HOW LONG WILL YOU BE STAYING IN THE OKANAGAN ON THIS TRIP?

	H.Q.	L.Q.
Less than 1 Day	3.5%	1.2%
1-3 Days	21.8	17.5
4-7 Days	38.7	46.3
7-14 Days	23.0	22.5
15-21 Days	3.0	2.5
21-30 Days	4.8	2.5
Over a Month	2.6	2.5
Don't Know	1.3	2.5
No Response	1.3	2.5

TABLE 5

WHERE ARE YOU STAYING AT PRESENT IN THE OKANAGAN?
Town _____

TYPE OF ACCOMMODATION	H.Q.	L.Q.
Motel	17.8%	31.3%
Hotel	0.5	1.3
Campsite	50.0	48.3
Friends	19.6	15.0
Travelling Through	6.1	1.2
Other	4.8	1.2
No Response	1.7	1.7

TABLE 6

HOW LONG WILL YOU BE STAYING IN THIS AREA (town or resort)?

	H.Q.	L.Q.
Less than 1 Day	4.3%	5.0%)
1-3 Days	26.1	26.5
4-7 Days	35.6	46.2
7-14 Days	23.0	13.7
15-21 Days	3.9	3.8
22-28 Days	3.1	1.2
Over a Month	2.2	1.3
Don't Know	0.4	1.3
No Response	1.4	1.0

H.Q. - High Water Quality Beach Sample
L.Q. - Low Water Quality Beach Sample

*Table numbers do not necessarily correspond to Questionnaire Numbers.

TABLE 7

HOW MANY YEARS HAVE YOU BEEN COMING TO THIS BEACH?

	HIGH WATER QUALITY BEACH SAMPLE			LOU WATER QUALITY BEACH SAMPLE
	RESIDENT	VISITOR	TOTAL	TOTAL
Before 1967 - Yes	43.9%	29.6%	34.5%	24.3%
1967-1969 - Yes	57.9	43.5	48.4	34.0
1970-1971 - Yes	82.5	49.1	60.1	44.7
First Time Ever	14.9	38.7	30.8	45.6

TABLE 8

HOW OFTEN DO YOU VISIT THIS BEACH ON AVERAGE DURING JULY AND AUGUST (during your stay-visitors)?

	HIGH WATER QUALITY BEACH SAMPLE			LOW WATER QUALITY BEACH SAMPLE
	RESIDENT	VISITOR	TOTAL	TOTAL
More than once a Day	2.6%	3.9%	3.4%	2.9%
Once a Day	26.3	67.0	53.0	53.4
2-6 Times a Week	34.2	12.2	19.7	17.5
Once a Week	12.3	2.6	8.0	4.9
Once Every Two Weeks	11.4	2.6	5.4	2.9
Once a Month	10.5	1.7	4.7	6.8
No Response	2.7	10.0	5.8	11.6

TABLE 9

HOW DID YOU TRAVEL TO THIS BEACH TODAY?

	HIGH WATER QUALITY BEACH SAMPLE			LOW WATER QUALITY BEACH SAMPLE
	RESIDENT	VISITOR	TOTAL	TOTAL
Walk	22.8%	39.1%	34.2%	55.3%
Bicycle	4.4	3.0	3.4	3.9
Motor Bicycle	0.9	0.4	0.6	1.0
Car	71.0	53.5	59.0	37.9
Truck	0.9	1.3	1.1	0.0
Camper/Trailer	0.0	1.7	1.1	0.0
No Response	0.0	1.0	0.6	1.9

APPENDIX C.2 (CONT'D)

TABLE 15

ARE THERE ANY FEATURES YOU DISLIKE ABOUT THIS BEACH?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
No Dislikes	37.7%	49.6%	45.6%	36.9%
Parking	0.9	1.7	1.7	0.0
Crowding	8.8	4.8	6.5	1.0
Poor Facilities	15.8	10.0	12.0	4.8
Unsafe for Children	0.0	0.4	0.3	1.0
Noise	1.7	1.7	1.7	1.9
Low Beach Quality	17.5	12.2	14.3	24.5
Low Water Quality	14.9	7.4	10.0	38.8
High Lake Levels	0.0	0.4	0.3	0.0
Others	4.4	5.6	7.6	2.9

TABLE 16

HAVE YOU BEEN IN THE WATER TODAY?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	51.7%	51.3%	52.1%	44.7%
No	48.3	48.3		
Not Applicable	0.0	0.4	47.8	53.4
				1.9

TABLE 17

IF NO - WHY NOT?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Poor Quality	3.5%	0.9%	1.7%	12.5%
Water Too Cold	19.3	12.9	15.0	12.5
Weather Too Cold	22.8	6.9	12.2	10.4
Just Arrived	33.3	44.0	40.5	20.8
Other	21.1	35.3	30.6	43.8

TABLE 18

IF NO - DO YOU THINK YOU WILL GO INTO THE WATER TODAY?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	84.3%	55.2%	54.9%	38.6%
No	35.6	42.2	40.0	56.1
Don't Know	8.5	2.6	4.6	3.6
Not Applicable	1.7	0.0	0.5	1.7

TABLE 19

IF NO - WHY NOT?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Too Crowded	0.0%	0.0%	0.0%	0.0%
Poor Water Quality	9.5	2.1	4.4	18.2
Water Too Cold	9.5	14.9	13.2	9.1
Weather Too Cold	38.1	12.8	20.6	12.1
Other	42.9	70.2	61.8	60.6

TABLE 20

HAVE YOU EVER RECOMMENDED A FRIEND TO COME TO THIS BEACH?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	79.8%	4.4%	62.7%	46.6%
No	16.7	17.8	17.1	15.5
Not Applicable	3.5	27.8	20.2	37.9

TABLE 21

IF NO - WHY NOT?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Too Crowded	5.9%	0.0%	1.9%	8.3%
Poor Water Quality	0.0	0.0	0.0	0.0
High Lake Levels	0.0	0.0	0.0	0.0
Low Lake Levels	0.0	0.0	0.0	0.0
Other	94.1	100.0	98.1	91.7

TABLE 22

DO YOU THINK YOU WILL RETURN TO THIS BEACH IN THE NEXT FEW YEARS?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	92.1%	89.1%	90.0%	77.7%
No	3.5	3.0	3.4	7.8
Don't Know	1.7	5.6	4.3	12.6
No Response	2.7	2.3	2.3	1.9

TABLE 23

IF NO - WHY NOT?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Too Crowded	25.0%	0.0%	9.1%	12.5%
Poor Water Quality	25.0	0.0	9.1	50.0
Other	50.0	100.0	81.8	37.5

TABLE 24

IF NO - DO YOU THINK YOU WILL RETURN TO THE OKANAGAN IN THE NEXT FEW YEARS?

	HIGH QUALITY BEACH SAMPLE	LOW QUALITY BEACH SAMPLE
Yes	84.6%	100.0%
No	15.4	0.0
Don't Know	0.0	0.0

TABLE 25

HOW IMPORTANT A CONSIDERATION WOULD YOU SAY THAT WATER QUALITY IS TO YOU IN YOUR DECISION TO RETURN TO THIS BEACH?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very Important	64.0%	67.8%	166.7%	58.3%
Important	18.4	21.7	20.2	18.5
Quite Important	10.5	7.8	9.1	14.6
Unimportant	2.6	1.3	1.7	6.8
Don't Know	0.9	1.3	1.1	0.0
No Response	3.6	0.1	1.2	1.8

TABLE 26

HAVE YOU VISITED OTHER BEACHES IN THE OKANAGAN?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	84.9%	96.5%	80.0%	82.5%
No	14.5	2.6	19.6	15.5
No Response	0.6	0.9	0.4	2.0

TABLE 27

PLEASE EXAMINE THIS LIST OF FACTORS AND INDICATE HOW IMPORTANT EACH ONE IS TO YOUR ENJOYMENT OF OKANAGAN BEACHES, IN ORDER OF IMPORTANCE, 1,2,3, ETC., 1 BEING THE MOST IMPORTANT, 2 THE NEXT MOST IMPORTANT AND SO ON.

	HIGH WATER QUALITY SITES						LOW WATER QUALITY SITES	
	RESIDENT		VISITOR		TOTAL		TOTAL	
RANKING	1	1 2	1	2	1	2	1	1 2
Clean Sand	10.5%	19.3%	14.8%	24.8%	13.7%	22.8%	11.7%	20.4%
Uncrowded Conditions	9.7	13.2	10.4	12.6	10.3	12.8	22.3	15.5
Good Facilities	7.9	6.1	3.9	9.6	5.3	8.8	9.7	12.6
Clean Water	50.9	18.4	45.7	24.8	47.3	22.5	37.9	15.5
Pleasant Scenery	0.8	6.1	5.6	6.7	4.0	6.8	2.9	5.8
Safe Beaches - Children	18.4	13.2	18.7	11.7	18.5	12.0	20.4	17.5
Others	0.0	0.0	0.9	0.4	0.6	0.6	0.0	0.0
No Particular Likes	1.8	0.0	0.9	0.4	1.1	0.3	2.9	0.0

TABLE 34

HOW DO YOU RATE THIS SECTION OF BEACH FOR CROWDING RIGHT NOW?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very High Crowding	0.9%	0.0%	0.6%	0.0%
High Crowding	3.5	3.5	3.7	0.0
Medium Crowding	26.3	31.3	29.9	14.6
Low Crowding	29.0	p . 7	35.3	41.8
Very Low Crowding	37.7	25.2	28.8	42.7
Don't Know	0.9	0.4	0.6	0.0
No Response	1.7	0.9	1.1	0.9

TABLE 35

DO YOU THINK THIS BEACH HAS BECOME MORE OR LESS CROWDED DURING JULY AND AUGUST SINCE YOU HAVE KNOWN IT?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Much More Crowded	12.4%	4.2%	7.5%	5.2%
More Crowded	43.3	40.6	41.7	24.7
Remained the Same	23.7	34.3	30.0	35.1
Less Crowded	16.5	10.5	12.9	15.8
Much Less Crowded	0.0	0.0	0.0	7.0
Don't Know	4.1	10.4	7.9	12.2

TABLE 36

HAVE YOU EVER AVOIDED GOING TO ANY BEACHES IN THE OKANAGAN ON ACCOUNT OF THEIR CROWDED CONDITIONS RATHER THAN ANY OTHER FACTOR SUCH AS DISTANCE?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	51.8%	20.9%	31.1%	37.9%
No	48.2	71.3	63.5	58.3
Not Applicable	0.0	7.8	5.4	3.8

TABLE 37

IF YES - WHAT DO YOU NORMALLY DO WHEN YOU AVOID GOING TO CROWDED BEACHES IN THE OKANAGAN

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENTS	VISITOR	TOTAL	TOTAL
Stay at Home (Place of Stay	2.6%	0.4%	1.1%	3.9%
Go Outside the Okanagan	0.9	1.3	1.4	0.0
Go to Quieter Beaches in the Okanagan	76.3	91.7	86.3	91.3
Other	7.0	0.0	2.6	4.8
No Response	13.2	6.6	8.6	0.0

TABLE 38

IF YES - HOW OFTEN DO YOU SPECIFICALLY AVOID GOING TO CROWDED BEACHES?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very Often (50-100%)	49.2%	43.7%	46.7%	58.3%
Often (25-50%)	15.3	16.7	15.9	11.1
Sometimes (10-25%)	15.2	18.8	16.8	13.9
Occasionally (less than 10%)	20.3	20.8	20.6	16.7

WATER QUALITY

TABLE 39

HOW IMPORTANT WOULD YOU SAY THAT HIGH WATER QUALITY IS TO YOUR ENJOYMENT OF OKANAGAN BEACHES?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very Important	71.9%	72.1%	71.8%	78.6%
Important	19.3	14.8	18.0	14.6
Quite Important	7.9	11.3	10.5	3.9
Important	0.0	0.9	0.6	1.9
Don't Know	0.0	0.9	0.9	1.0
No Response	0.9	0.0	0.2	0.0

TABLE 40

HAVE YOU EVER EXPERIENCED POOR WATER QUALITY ON OKANAGAN BEACHES?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	72.8%	32.6%	46.2%	51.5%
No	26.3	65.6	52.1	46.6
Not Applicable	0.9	1.8	1.7	1.9

TABLE 41

IF YES - HOW DID THE POOR WATER QUALITY DETRACT FROM YOUR ENJOYMENT OF THE BEACHES?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY
	RESIDENT	VISITOR	TOTAL	TOTAL
Detracted Very Seriously	40.1%	26.1%	35.8%	25.7%
Detracted Seriously	21.7	36.0	30.0	31.8
Detracted Somewhat	26.5	30.8	27.8	31.8
Did Not Detract At All	2.7	5.1	5.0	8.9
No Response	9.6	2.0	0.9	1.0

TABLE 42

HOW DO YOU RATE THE QUALITY OF THE WATER AT THIS BEACH TODAY?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very High Quality	9.6%	12.2%	11.1%	1.9%
High Quality	35.1	47.0	42.5	17.5
Medium Quality	43.0	32.2	36.5	49.5
Low Quality	7.0	2.2	4.0	14.6
Very Low Quality	3.5	0.4	1.4	8.7
Don't Know	1.8	5.2	4.0	6.8
No Response	0.0	0.8	0.5	1.0

TABLE 43

DO YOU THINK THAT THE WATER QUALITY HAS IMPROVED OR DECLINED AT THIS BEACH SINCE YOU HAVE KNOWN THIS BEACH?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Much Higher Quality	0.0%	0.7%	0.4%	1.7%
Higher Quality	18.5	16.4	17.3	10.0
The Same Quality	36.1	58.9	49.8	30.0
Lower Quality	32.0	14.4	21.4	33.3
Much Lower Quality	4.1	1.4	2.5	11.7
Don't Know	9.3	8.2	8.6	13.3

TABLE 44

HAVE YOU EVER AVOIDED GOING TO ANY BEACHES IN THE OKANAGAN ON ACCOUNT OF LOW WATER QUALITY, RATHER THAN ANY OTHER REASON?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Yes	49.1%	19.6%	29.3%	15.3%
No	50.9	72.2	65.0	79.6
Not Applicable	0.0	8.2	5.7	5.1

TABLE 45

IF YES - WHAT DO YOU NORMALLY DO WHEN YOU AVOID GOING TO BEACHES WITH LOW WATER QUALITY IN THE OKANAGAN?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT.	VISITOR	TOTAL	TOTAL
Stay at Home (Place of stay)	12.5%	2.0%	8.3%	15.1
Go Outside the Okanagan	2.1	10.7	5.7	15.1
Go to Beaches with Cleaner Water	67.1	74.3	71.5	69.8
Other	18.3	13.0	15.5	0.0

TABLE 46

IF YES - HOW OFTEN DO YOU SPECIFICALLY AVOID GOING TO BEACHES WITH LOW WATER QUALITY?

	HIGH WATEK QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Very Often (50-100%)	47.3	36.4	42.1	20.0
Often (25-50%)	9.1	9.1	9.0	6.7
Sometimes (10-25%)	16.3	20.4	18.8	33.3
Occasionally (less than 10%)	27.3	34.1	30.1	40.0

WATER QUANTITY

TABLE 47

HAVE YOU EVER EXPERIENCED ANY PROBLEMS DUE TO EITHER HIGH OR LOW LAKE LEVELS IN THE OKANAGAN?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
High Levels				
Yes	23.8%	7.8%	13.1%	10.7%
No	75.4	86.5	82.9	83.5
Not Applicable	0.9	5.7	4.0	5.8
Low Levels				
Yes	9.6	0.4	3.4	1.0
No	86.8	93.5	91.5	92.2
Not Applicable	3.5	6.1	5.1	6.8

TABLE 48

IF YES - HIGH LEVELS - WHAT PROBLEMS DID YOU EXPERIENCE?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Loss of Beach	50.0%	82.4%	64.1%	43.3%
Boat Launching	4.5	0.0	2.6	0.0
Other	45.5	17.6	33.3	56.7

TABLE 49

IN OUR STUDIES WE HAVE BECOME AWARE THAT DURING EXTREME DROUGHT CONDITIONS (ONCE IN ABOUT 25 YEARS), OKANAGAN LAKE LEVELS COULD DROP TO ABOUT 3TO 4 FEET BELOW ITS MINIMUM LEVEL (7 TO 8 FEET BELOW PRESENT LEVEL) FOR TWO SUCCESSIVE YEARS. THIS COULD EXPOSE AMOUNTS OF SHORELINE AT THIS BEACH. HOW DO YOU FEEL ABOUT THIS?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Don't Know	3.5%	5.2%	4.6%	2.9%
Not Bothered	37.7	35.7	36.8	46.6
No Response	58.8	59.1	58.6	50.5
More Beach	6.1	10.9	9.1	7.8
Less Crowding	1.8	1.7	1.7	1.9
Others			1.4	1.9
No Response		86.5	87.8	88.4
Exposure of Weed	12.2	12.1	12.2	22.2
Sharp Drop-Off	15.8	16.5	16.5	6.8
Launching Problems	3.5	2.2	2.6	1.0
Others	8.8	7.0	7.4	4.9
No Response	59.7	62.2	61.3	65.1

BACKGROUND INFORMATION

TABLE 50

WHICH OF THE FOLLOWING CATEGORIES BEST DESCRIBES YOUR PARTY?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
One Person Alone	40.2%	11.7%	21.1%	28.2%
One Couple Only	8.8	19.1	15.7	13.6
Two or More Couples	0.9	1.8	1.4	1.9
Family and Children	23.7	42.6	36.2	42.7
Two Families and Children	3.6	4.8	4.8	2.9
Group of Friends	22.8	20.0	20.8	10.7

TABLE 51

SEX

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Male	47.4%	56.1%	53.0%	44.7%
Female	52.6	43.9	47.0	55.3

TABLE 52

AGE

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
12-20	27.1%	15.2%	19.0%	13.6%
20-29	27.2	27.4	27.1	19.4
30-39	21.1	20.4	21.1	29.1
40-49	12.3	23.9	19.7	22.4
50-59	5.3	9.6	8.0	12.6
60 and Over	7.0	3.5	5.1	2.9

TABLE 53

WHAT IS YOUR APPROXIMATE HOUSEHOLD INCOME?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Under $2,999	21.8%	11.7%	15.7%	10.7%
$3,000-$4,999	18.4	4.8	9.1	1.9
$5,000-$6,999	5.3	7.8	6.8	6.8
$7,000-$9,999	20.2	20.9	21.1	20.4
$10,000-$14,999	24.6	30.9	28.5	39.8
$15,000-$20,000	5.3	14.8	11.7	6.8
$20,000 and Over	1.8	6.5	3.1	8.7
No Response	2.6	2.6	4.0	4.9

TABLE 54

WHAT LEVEL OF EDUCATION DID YOU COMPLETE?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Grade 1-8	6.1%	6.5%	6.7%	3.4%
Grade 9-12	54.3	55.7	55.0	54.2
Some College or University	21.1	13.9	16.0	13.6
College or University	13.2	16.1	15.1	17.5
Technical Training	5.3	7.4	6.8	5.8
No Response	0.0	0.4	0.4	5.5

TABLE 55

WHAT IS YOUR PRESENT OCCUPATION?

	HIGH WATER QUALITY SITES			LOW WATER QUALITY SITES
	RESIDENT	VISITOR	TOTAL	TOTAL
Housewife	17.5%	16.5%	17.1%	33.0%
Labourer (Non Ag.)	7.9	7.0	7.4	7.8
Tradesman	6.1	6.1	6.0	2.9
Agriculture	4.4	0.7	2.0	1.0
Service	5.3	4.8	4.8	6.8
Clerical	7.0	7.8	7.7	1.9
Technical	4.4	7.4	6.6	5.8
Professional/Managerial	14.0	25.7	21.4	24.3
Student	21.1	12.6	15.4	9.7
Retired	5.3	3.0	4.0	2.9
Other	7.0	7.8	7.4	3.9
No Response	0.0	0.6	0.2	0.0

APPENDIX D

WOOD-KALAMALKA
REVENUE AND PROPERTY VALUE
SURVEY QUESTIONNAIRE

(NOTE: Results included in text of supplement)

APPENDIX D

CANADA - BRITISH COLUMBIA OKANAGAN BASIN STUDY

WOOD-KALAMALKA REVENUE

AND

PROPERTY VALUE SURVEY

Name of Establishment _____

Address _____

Phone Number _____

Name of Owner _____ Manager _____

Date Became Owner/Manager _____ - _____

Name of Previous Owner _____

Previous Owner's Present Address _____

Present Phone Number _____

Number of Units in 1972

	Number	Rental/Unit/Day
Motel	_____	_____
Trailer	_____	_____
Camping	_____	_____

Other

Service	Approx. Revenue/Annum	% Total
_____	_____	_____
_____	_____	_____

COMMENTS:

1. Why did you decide to locate your business at Wood Lake? _____

2. What are the advantages of locating your business here? _____

3. Are there any disadvantages to developing your business here? _____

4. How do you think business will be here in 5 years time? (whether or not respondent believes he will be here)

   Don't know _____
   Much Better _____
   Better _____
   The same _____
   Worse _____
   Much Worse _____

   Probe Amount _____

   Reasons _____

5. How long do you think you will remain in this business here?

   Don't know _____
   Date _____

6. If on the move - probe reasons. _____

7. What types of water quality problems do you think have occurred on Wood Lake in recent years?

		When
Algae Blooms		
Weeds		
High coliform counts		
Other (specify)		

8. Do you think that any (or all) of these problems and/or associated publicity have affected your business in any way?

Yes _____
No _____
Don't know _____
Not applicable _____

9. If Yes: What Water Quality problems? _____

How did it (they) affect Business? _____

When: Last Year _____
Previous years _____

10. Do you recall when the algae bloom occurred on Wood Lake last year?

Yes _____
Don't know _____
Not applicable _____

11. What do you think the water quality will be like in 5 years time?

Much better _____
Better _____
The same _____
Worse _____

12. What do you attribute the water quality problems in Wood Lake to?

Natural Sources (in order of importance) 1) _____ 2) _____ 3) _____

Artificial Sources (in order of importance) 1) _____ 2) _____ 3) _____

Comments -

13. Do you think the Okanagan Basin Study or Water Investigations Branch Study will provide solutions to water quality problems in Wood Lake?

Probe. _____

14. We are interested in obtaining occupancy rates at this resort over the past 5 years. Do you think (or know) whether this information is available? _____
Elsewhere? _____

YEAR	NO. OF UNITS	JLINE	JULY	AUGUST	SEPTEMBER
1967					
1968					
1969					
1970					
1971					
1972					
		1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4

Comments: _____

15. Do you think that the water quality problems mentioned above have affected these occupancy rates in recent years?

(or occupancy rates in other months as well)

Yes _____
No _____
Don't know _____
Not Applicable _____

16. If Yes, How?

Year	Month	Week	No.of Vac's	Days Vac't	Cost/ Day	Attributed to water			Revised			
						Completely	Partly	%	Loss	1	2	3
1967												
1968												
1969												
1970												
1971												
1972												

TOTAL _____ $_____ %_____

Check 1. Unfilled - cancellation _____
2. Unfilled - curtailment _____
3. Unfilled - Expected occupancy _____

Comments: _____

17. If Resort Provides other services

Have you suffered any losses in the other services your resort provides as a result of poor water quality?

Yes _____
No _____
Don't know _____
Not Applicable _____
If Yes: What services? _____ Est. Loss in $ _____

18. Have you noticed any other changes in your business due to poor water quality rather than any other factor?

Yes _____
No _____
Don't Know _____
Not Applicable _____

If Yes: Probe _____ Changes in clientele _____
Changes in inquiry rate _____
Changes in Advance Bookings _____
Other _____

19. Have the water quality problems (and/or publicity) influenced investment plans for your business.

Yes _____
No _____
Don't Know _____

If yes - probe _____

20. If the water quality of Wood Lake was to be improved to the level of Okanagan Lake for example, do you think this would influence your future business decisions?

Yes _____
No _____
Don't Know _____
Not Applicable _____

If Yes: probe _____ continue to stay _____
expansion plans _____
provision of services _____

21. We are interested in determining whether present water quality of Wood Lake has affected the value of your property and would appreciate your cooperation in answering the following questions?

Buying price of this resort _____

Date of purchase _____

Estimated selling price now _____

Reasons _____

If applicable: _____

Price offered on property $_____ Date _____

Selling price of property $_____ Date _____

22. If the water quality in Wood Lake was improved to the level of that of Okanagan lake for example, how much do you think your business would be worth today?

Don't know _____

New price $_____

Present price $_____

Difference $_____

23. Have you experienced any problems due to either high or low lake levels in Wood Lake?

Low levels _____ Problems: _____

High levels _____ Problems: _____

Probe: Economic costs of present high levels? _____

Effects of present high levels? _____

24. Are there any other comments you wish to make about water quality on Wood Lake. your business or this survey? _____

APPENDIX E

FISHERMAN'S SURVEY

E1 - Fisherman's Survey Questionnaire

E2 - Results from Questionnaire

Editors Note: The results of this questionnare have been used primarily for Fishery Evaluations, (Technical Supplement IX), but are included in this supplement because of their relationship to the other questionnaires under the Socio-Economic Program.

Date: _____

Area of Interview _____(name of lake, etc.)

1. Where is your present home?

_____ _____
(Town) (Prov/State)

If an Okanagan resident, how long have you lived in the Okanagan?
_____years

2. Are you alone_____or with a party_____on this trip?
If with a party, please indicate the following:

(i) Composition of party _____(family group, etc.)

Sex	Age	Relationship

(ii) Number of unlicensed fishermen (i.e. under age)_____

(iii) Number of non-fishermen _____

(iv) Activities of non-fishermen_____

3. If the interviewee is a resident of the Okanagan Basin:

(i) How many times each year do you go fishing in the Okanzgan Valley (on average)_____times. Are these usually one day trips_____or longer_____? If usually longer, how long on average?_____days. How many days do you spend fishing in the Okanagan in an average year? _____days.

(ii) How many times a year, on average, do you go fishing to places outside the Okanagan? _____times. How many days do you spend fishing outside the Okanagan?_____ days.

4. If the interviewee is not a resident of the Okanagan:

(i) Is fishing the main reason for your trip to the Okanagan Basin?

_____Yes _____ No _____Undecided

(ii) How long will you be staying in the Okanagan on this trip? _____days. During how many of these days do you expect to be rishing?_____Cays.

(iii) How mnny'trips do you make to the Okanagan Valley each year, on average_____trips. How many of these are fishing trips?_____trips. How long, on average, do you stay in the Okanagan on these trips?

Fishing trips_____days Other trips_____days

(iv) Why did you choose the Okanagan Valley for this trip?

_____

_____

_____

5. Can you tell me why you chose this particular site for this fishing trip? (close to home, easy access, good fishing, etc.) (Why this site rather than some other?)

_____

_____

6. How did you travel to the fishing site?

Car_____

Truck_____

4-wheel drive_____.

Camper or trailer _____

How long did it take you to get here from place of residence in Okanagan?_____hours.

7. Cost of Trip:

☐ For non-residents whose primary purpose of trip is fishing -
Total Costs_____

☐ For non-residents for whom fishing is not primary reason for trip, what are your additional costs incurred by going fishing?

Additional costs _____

☐ For residents - how much do you expect this trip will cost you?$_____

Yaw much do you cpend on equipment, mooring fees, etc. on fishing her- in the average year?_____

For all categories. use following cost break-down:
Gas and Oil_____
Accommodation _____
Food _____
Beverage_____
Boat & equipment rental _____
Equipment purchases _____.

8. In which areas do you usually fish, both in and out of the Okanagan Valley?_____

In the Okanagan? (Be specific here getting name of site and usual number of days fished there)

Days	Trips	Site	Time of Year	Type of Fishing (fly fishing, etc. probe)

9. Is this the type of fishing you prefer, or if it was possible, would you like to see more opportunities for certain kinds of fishing in the Okanagan Basin, such as in streams and rivers or high altitude lakes?

Satisfied at present-_____

Would prefer more: High altitude lakes and reservoirs_____
Stream and River Fishing-_____
(rank preference) Valley bottom lake fishing._____
Fly iishing only _____
Lakes with no motor boats_____
Other (specify) _____

10. a) when fishing in the. Okanaqan, what species of fish are you mainly interested in catching?

1. _____ 2. _____ 3. _____

Would you like to see other species available in the Okanagan?

Yes_____ No_____

If yes, which species, end why:

Species	Reason

Have you fished for these species elsewhere? ____Yes N o

10. b) Ate there any species of fish you don't want introduced into the Basin? Yes_____ No_____

If yes, which species and why?

Species	Reason

c) What is your opinion on the introduction of a commercial white fishery into the Okanagan?

d) For how many years have you been fishing? (a) in the Okanagan_____ (b) in all areas_____

11. What is your opinion on the quality and availability of boat launching and other facilities at lakes in the Okanagan?

12. Have you any comments on fishing, especially with regards to the Okanagan area, you'd like to make?

Personal Information:

13. a) Sex _____M _____F

b) Which ege group do you fall in?

_____under 20 _____40–49 _____70 or older
_____20-29 _____50–59
_____30–30 _____60–69

c) What is your epproximate household income?

_____under 52999. _____$7,000.-$9999.
_____$3000-$4999. _____$10,000-$14,999.
_____$5000-$6999. _____$15,000 and over

13. d) What level of education did you complete?

_____Grade 1-8 _____some college or university
_____Grade 9–12 _____college or university grad.
_____technical training - Explain

e) What is your present occupation?_____

Economic Evaluation

14. For Residents of—Okanaqan Valley only

We would like to know how much a day's fishing on this_____ is worth to you. One way of estimating this is for you to indicate how much money you would have to be paid to give up happily your day of fishing here. I am going to read a series of hypothetical payments and I want you to tell me to stop when I reach the minimum amount that would give you the same satisfaction you get from a day's fishing:

$1.00_____	$5.00_____	$14.00 _____
$1.50 _____	$6.00_____	$16.00 _____
$2.00 _____	$8.00_____	$18.00_____
$3.00 _____	510.00 _____	$20.00 _____
54.00 _____	512.00 _____	$22.00_____

etc. in $2.00 increments

$_____ fee indicated.

15. ALTERNATIVE

We would like to know how much a day's fishing on this_____ is worth co you. How much do you think a day's fishing here is worth to you, not counting your expenses $_____

16. For non-residents of Okanagan Valley only

We would like to know how much a day's fishing on this_____ is worth to you. One wsy of estimating this is for you to indicate how much money you would pay for a day of fishing here if daily charges were in effect. Of coursa, charges would never be levied, hut it is important for us to know how much fishermen would be willing to pay. I am going to read you a series of hypothetical daily fees and I want you to tell me to stop when I reach the maximum fee you wuld pay for each day of fishing here.

$0. 50_____	$1.00_____	$1.50 _____
$2.00_____	$2.50_____	$3.00 _____
$5.00_____	$5.50 _____	$6.00_____

Continue upwards in increments of $1.00

$_____fee indicated.

APPENDIX E.2

RESULTS FROM QUESTIONNAIRE

(NOTE: Table Numbers do not necessarily correspond to Questionnaire Numbers).

TABLE 1

DISTRIBUTION OF SAMPLE OF SPORT FISHERMEN

LOCATION	NUMBER SAMPLED	PERCENT
Main Valley Lakes	72	35.0%
Headwater Lakes	134	65.0
TOTAL	206	100.0

TABLE 2

SEASONAL PROPORTION OF RESIDENT AND NON-RESIDENT ANGLERS IN THE OKANAGAN, 1971

PERCENTAGE OF	MONTH						
	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	JUNE-NOVEMBER
Resident	76.4	62.3	50.5	69.0	84.4	98.4	66.8
Non-Resident	23.6	37.7	49.5	31.0	15.6	1.6	33.2

TABLE 3

RESIDENCE OF VALLEY ANGLERS IN OKANAGAN IN 1971

	REGION				TOTAL
	VERNON	KELOWNA	PENTICTON	OLIVER-OSOYOOS	
Number	14	49	28	9	101
Percent Resident Anglers	14.1	48.7	28.4	8.8	100.0

TABLE 4

LOCATION OF KON-RESIDENT ANGLERS VISITING THE OKANAGAN IN 1971

	LOCATION							TOTAL
	LOWER MAINLAND	REST OF B.C.	ALBERTA	SASK-MANITOBA	REST OF CANADA	WESTERN U.S.	REST OF U.S.	
Number	37	20	18	5	1	23	1	105
Percent	35.7	18.8	16.5	4.6	1.0	22.5	0.9	100.0

TABLE 5

COMPOSITION OF PARTY

	RESIDENTS PERCENT	NON-RESIDENTS PERCENT
Couple	11.5	35.3
Family Group	26.9	42.1
Multiple Family Group	7.3	5.6
Single Adult	31.7	5.3
Adults	22.0	10.6
Adults & Children	0.6	1.1

TABLE 6

FREQUENCY OF RESIDENT ANGLER PARTICIPATION IN OKANAGAN IN 1971

	ANGLER-DAYS							
	1-5	6-10	11-15	16-20	21-30	31-60	61-100	OVER 100
PERCENT	10.1	15.7	8.3	10.0	14.9	30.4	8.7	1.9

TABLE 7

LENGTH OF FISHING TRIPS BY NON RESIDENT ANGLERS IN OKANAGAN IN 1971

	LENGTH OF TRIP			
	1-5 days	6-10 days	11-20 days	Over 20 days
PERCENT	73.3	8.6	14.3	3.8

TABLE 8

LENGTH OF FISHING EXPERIENCE IN OKANAGAN

	RESIDENT ANGLERS PERCENT	NON-RESIDENT ANGLERS PERCENT
First Time	7.3	42.3
1-2 years	8.9	16.0
3-5 years	14.8	14.6
6-10 years	22.3	18.1
11-20 years	16.4	6.7
Over 20 years	30.3	2.3

TABLE 9

FCR NON-RESIDENTS

IS FISHING THE MAIN REASON FOR

YOUR TRIP TO THE OKANAGAN

	NUMBER	PERCENT
Yes	32	31.1
No	69	67.0
Undecided	2	1.9
TOTAL	103	100.0

TABLE 10

WHY DID YOU CHOOSETHIS LOCATION FOR FISHING?

	NUMBER	PERCENT
Close to Home	64	31.1
Been Before & Liked it	16	7.8
Good Fishing	35	17.0
Accomodation Available	21	10.2
Recommended by Friend	25	12.1
Good Access	15	7.3
Brochure Information	5	2.4
Other	25	12.1
TOTAL	206	100.0

TABLE 11

TIME TO REACH FISHING SITE IN 1971

TIME	MAIN LAKE ANGLERS PERCENT	HEADWATER ANGLERS PERCENT	GENERAL SAMPLE PERCENT
Stayed Overnight	18.1	44.7	34.3
Less than 15 mins.	61.1	1.5	23.2
15 - 30 mins.	15.2	6.0	10.2
31 - 60 mins	4.2	27.6	18.8
1 - 2 hours	0.1	14.9	9.7
Over 2 hours	1.3	5.3	3.8

TABLE 12

TYPE OF FISH PREFERRED

	NUMBER	PERCENT
Trout	168	81.6
Kokanee	21	10.2
Bass	3	1.5
No Particular Preference	14	6.7
TOTAL	206	100.0

TABLE 13

ARE YOU SATISFIED WITH THE TYPE OF SPORT FISH AVAILABLE IN THE OKANAGAN

	NUMBER	PERCENT
Yes	151	73.3
No	46	22.3
Don't Know	9	4.4
TOTAL	206	100.0

TABLE 14

OTHER SPECIES OF FISH DESIRED

	NUMBER	PERCENT
Whitefish	1	2.2
Bass	2	4.4
Pike	7	15.2
Brown Trout	4	8.7
Eastern Brook Trout	2	4.4
Pickerel	14	30.3
Other	16	34.8

TABLE 15

ARE YOU SATISFIED WITH FISHING OPPORTUNITIES IN THE OKANAGAN

	NUMBER	PERCENT
Yes	126	61.1
No	55	26.7
Don't Know	25	12.2
TOTAL	206	100.0

TABLE 16

PLEASE STATE ANY PARTICULAR PREFERENCE YOU HAVE FOR TYPE OF FISHING IN THE OKANAGAN

	NUMBER	PERCENT
No Particular Preference	75	36.4
Headwater Fishing	73	35.5
Stream Fishing	47	22.8
Main Lake Fishing	11	5.3
TOTAL	206	100.0

TABLE 17

WHAT IS YOUR OPINION ON THE INTRODUCTION OF COMMERCIAL WHITEFISH FISHERY INTO THE OKANAGAN

	RESIDENT PERCENT	NON-RESIDENT PERCENT
Agree	16.3	9.2
Uncertain	5.1	1.7
Disagree	60.6	36.1
No Opinion	18.0	42.9
No Response	0.0	10.1

TABLE 18

WHAT IS YOUR OPINION OF THE QUALITY AND AVAILABILITY OF BOAT LAUNCHING AND OTHER FACILITIES AT LAKES IN THE OKANAGAN

	HEADWATER ANGLERS PERCENT	MAIN VALLEY LAKE ANGLERS PERCENT	GENERAL SAMPLE PERCENT
Excellent	6.2	0.9	3.9
Good	53.4	42.0	48.1
Adequate	22.7	17.6	19.4
Poor	9.6	28.8	15.1
Very Poor	0.0	0.5	0.5
No Opinion	8.1	10.2	13.0

TABLE 19

NON RESIDENT ANGLERS HOW MUCH DID YOU SPEND ON THIS FISHING TRIP?

	NUMBER	PERCENT
$0-10	72	68.6
$11-20	4	3.8
$21-30	13	12.4
$31-50	7	6.7
$51-100	3	2.9
$101-200	6	5.6
TOTAL	105	100.0

APPENDIX E.2 (CONT'D)

TABLE 20

NON-RESIDENT ANGLERS - 'SOCIAL' VALUES PER FISHING DAY

	NUMBER	PERCENT
		17.1
$3-5		37.2
$6-10	23	21.9
$11-20	15	14.3
Over $20	8	7.6
TOTAL	105	100.0

TABLE 21

RESIDENT ANGLERS - 'SOCIAL' VALUE PER FISHING DAY

	NUMBER	PERCENT
$1-2	3	3.0
$3-5	14	13.9
$6-10	28	27.8
$11-20	25	24.7
$21-30	12	11.9
Over $30	19	18.7
TOTAL	101	100.0

TABLE 22

AGE DISTRIBUTION OF RESIDENT AND NON RESIDENT ANGLERS IN 1971

AGE	PERCENTAGE	
	RESIDENT	NON-RESIDENT
Under 20	7.7	4.0
20 - 29	17.2	26.8
30 - 39	25.0	32.6
40 - 49	13.5	19.8
50 - 59	16.5	9.9
Over 60	20.1	6.9

TABLE 23

OCCUPATIONS OF RESIDENT AND NON RESIDENT ANGLERS IN OKANAGAN IN 1971

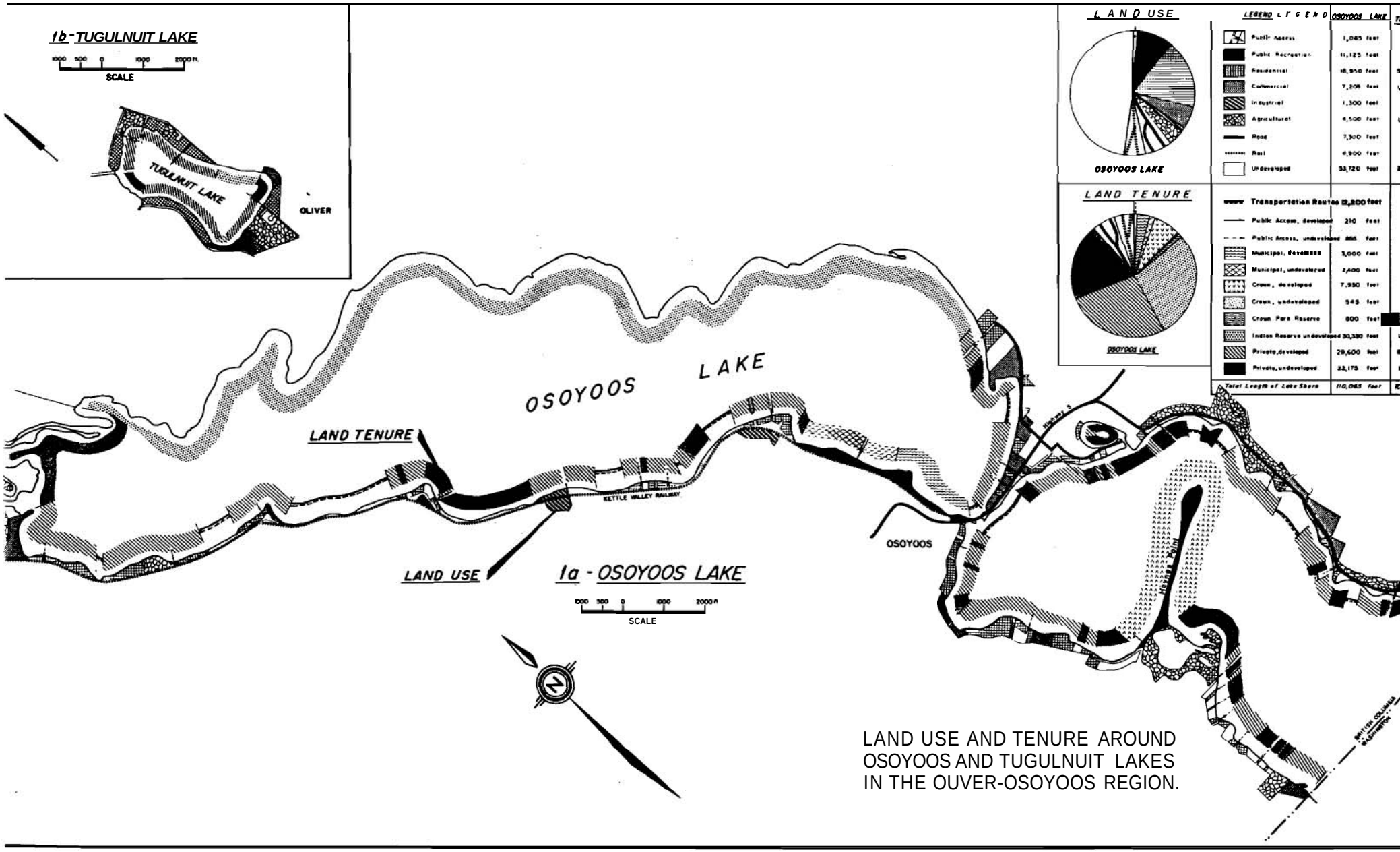
OCCUPATION	RESIDENT PERCENT	/ION-RESIDENT PERCENT
Wage Earners	12.6	38.1
Agriculture	3.9	0.0
Salaried-Professional	40.7	26.9
Technical	5.3	5.0
Student	10.5	6.1
Retired	20.3	13.1
Housewife	6.7	10.8

TABLE 24

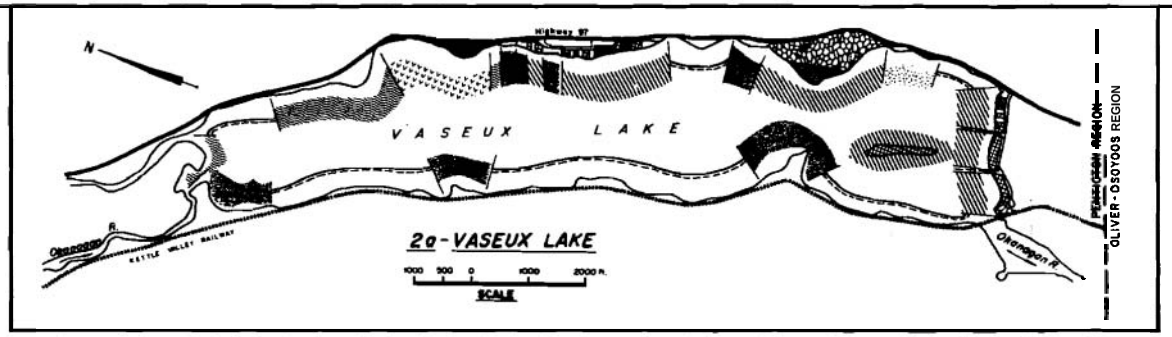
HOUSEHOLD INCOME DISTRIBUTION OF RESIDENT AND NON-RESIDENT ANGLERS IN THE OKANAGAN IN 1971

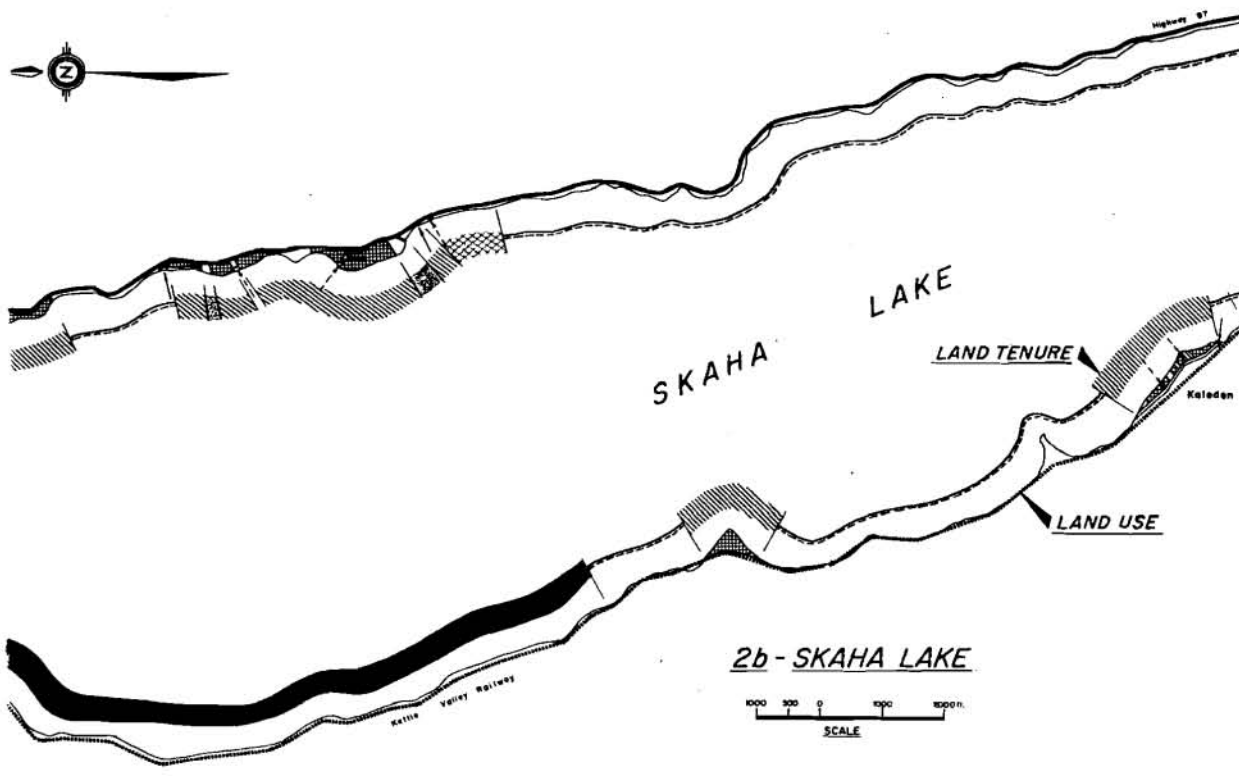
HOUSEHOLD INCOME	PERCENTAGE	
	RESIDENT	NON-RESIDENT
Under $3000	12.1	2.8
$3000-$4,999	12.1	3.8
$5000-$6,999	23.3	8.5
$7000-$9,999	18.7	24.5
$10000-$14,999	20.8	30.2
Over $15,000	13.0	30.2

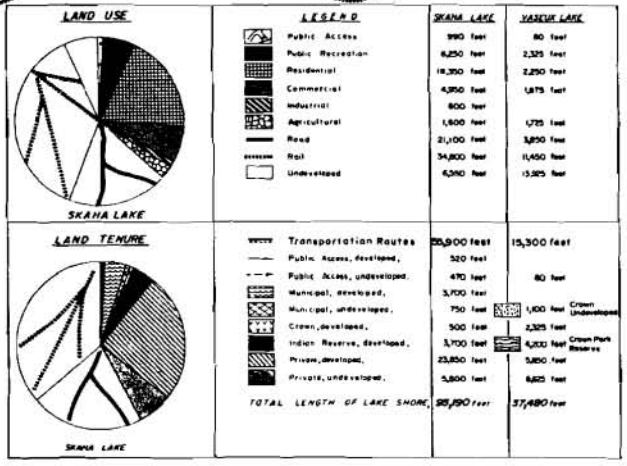
MAP SECTION



LAND USE AND TENURE AROUND OSOYOOS AND TUGULNUIT LAKES IN THE OUVER-OSOYOOS REGION.



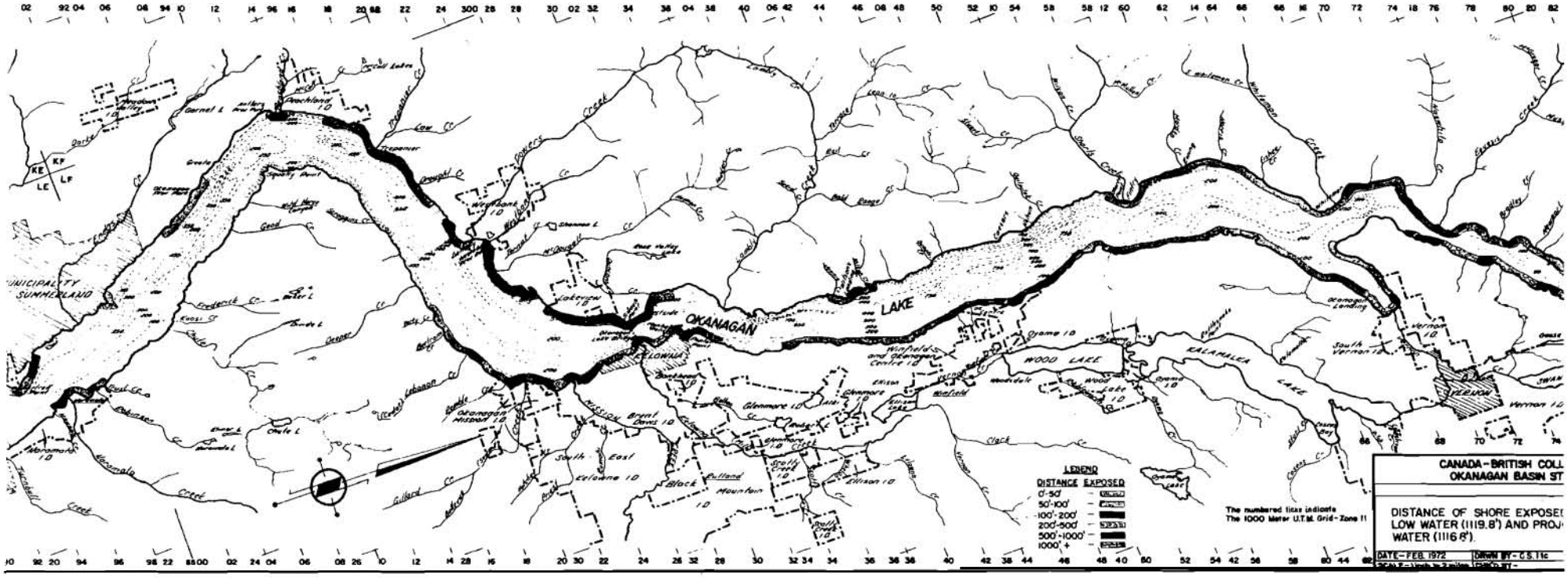


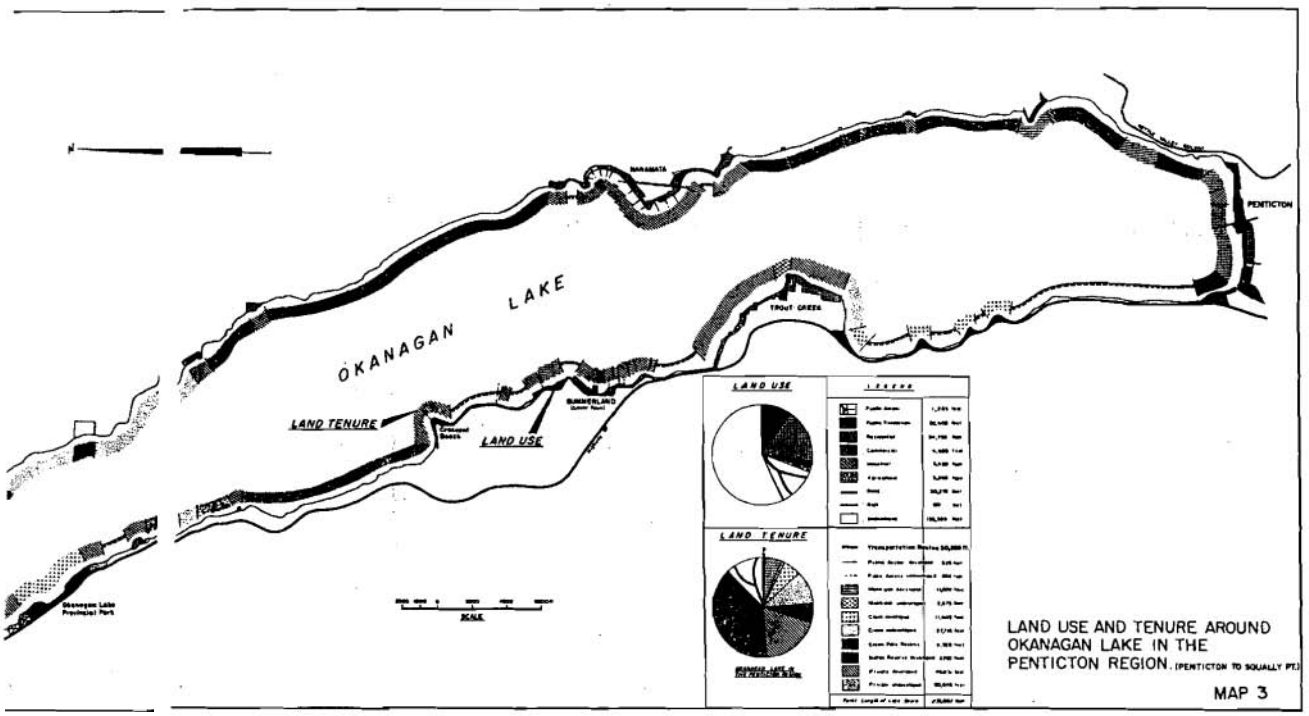


LEGEND	SKAHA LAKE	VASEUX LAKE
Public Access	990 feet	80 feet
Public Recreation	6,250 feet	2,325 feet
Residential	19,350 feet	2,250 feet
Commercial	4,950 feet	1,875 feet
Industrial	800 feet	
Agricultural	1,800 feet	1,725 feet
Road	21,100 feet	3,850 feet
Rail	34,800 feet	11,450 feet
Undeveloped	6,360 feet	13,325 feet

Transportation Routes	20,900 feet	15,300 feet
Public Access, developed,	520 feet	
Public Access, undeveloped,	470 feet	80 feet
Municipal, developed,	3,700 feet	
Municipal, undeveloped,	750 feet	1,100 feet Crown Undeveloped
Crown, developed,	500 feet	2,325 feet
Indian Reserve, developed,	3,700 feet	4,200 feet Crown Park Reserve
Private, developed,	23,850 feet	5,850 feet
Private, undeveloped,	5,800 feet	8,825 feet
TOTAL LENGTH OF LAKE SHORE	95,190 Feet	57,480 feet

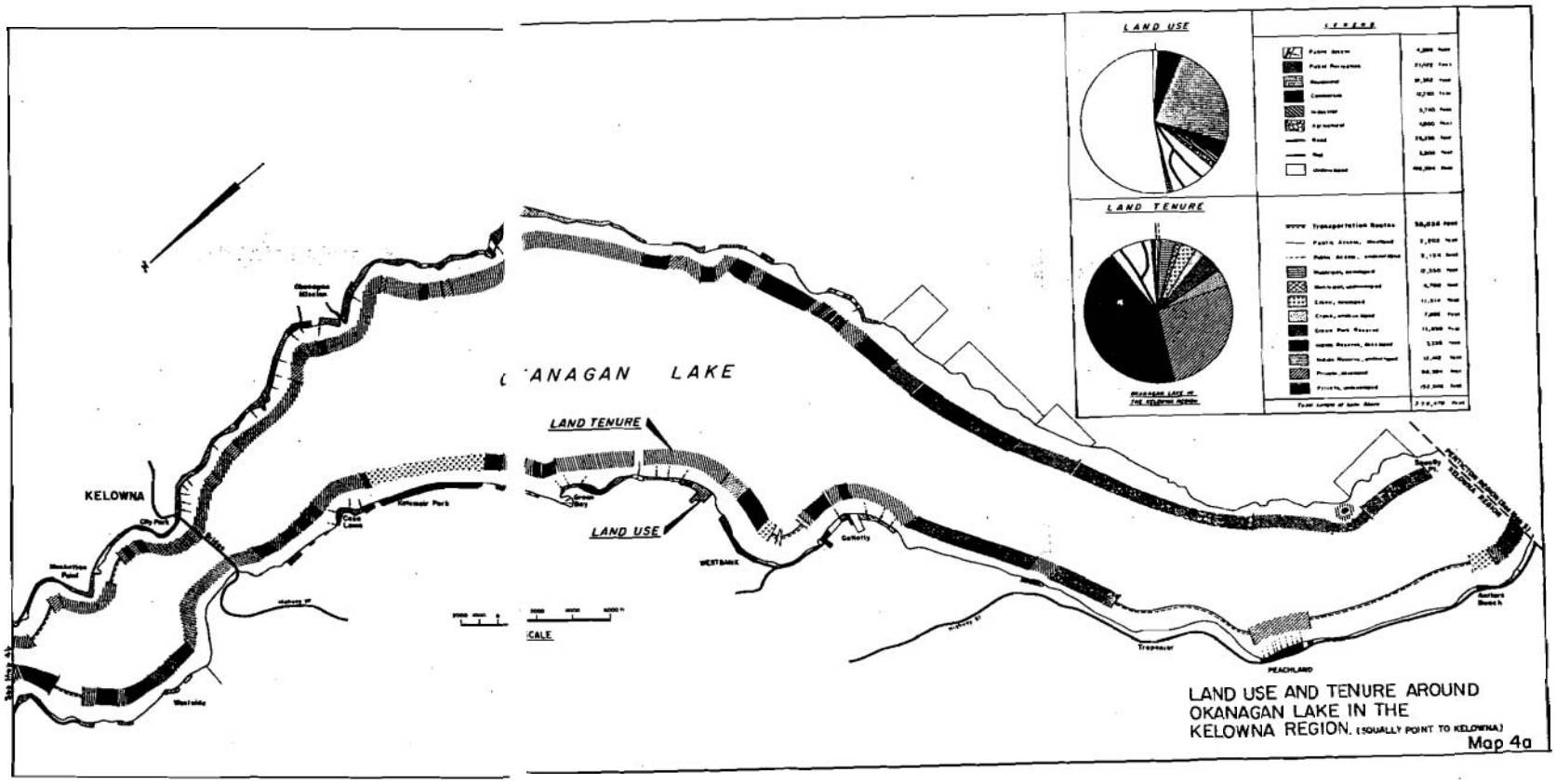
LAND USE
AROUND V
SKAHA LA
PENTICTO


OKANAGAN
LAKE
WOOD LAKE
KELOWNA
VERNON
LEGEND
DISTANCE EXPOSED
0'-50'
50'-100'
100'-200'
200'-500'
500'-1000'
1000' +
The numbered lines indicate
The 1000 Meter U.T.M. Grid - Zone 11
CANADA - BRITISH COL
OKANAGAN BASIN ST
DISTANCE OF SHORE EXPOSE
LOW WATER (1119.8') AND PRO
WATER (1116.8').
DATE - FEB. 1972
DRAWN BY - C.S.T.Ic



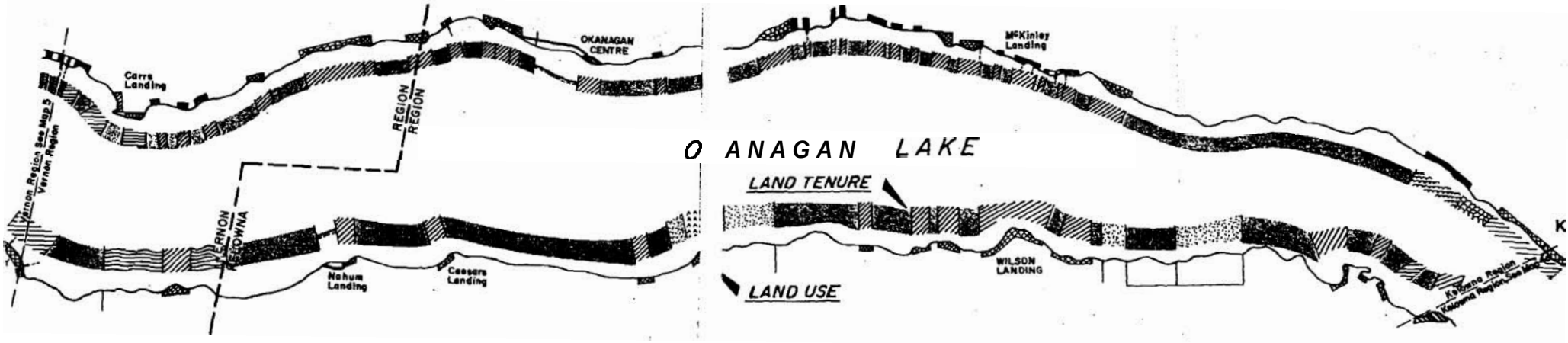
LAND USE AND TENURE AROUND OKANAGAN LAKE IN THE PENTICTON REGION. (PENTICTON TO SQUALLY PT.)

MAP 3



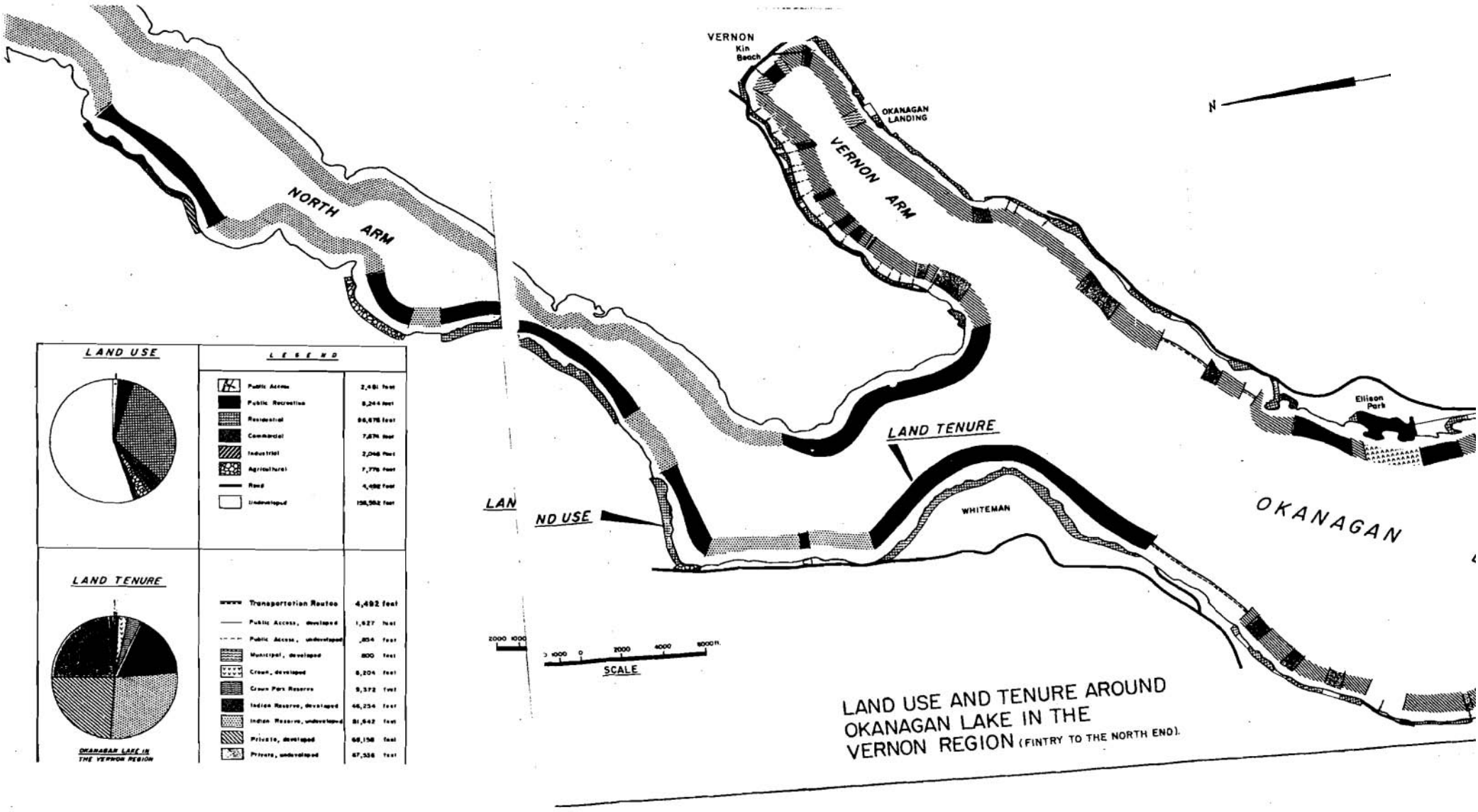
LAND USE AND TENURE AROUND OKANAGAN LAKE IN THE KELOWNA REGION. (EQUALLY POINT TO KELOWNA)

Map 4a

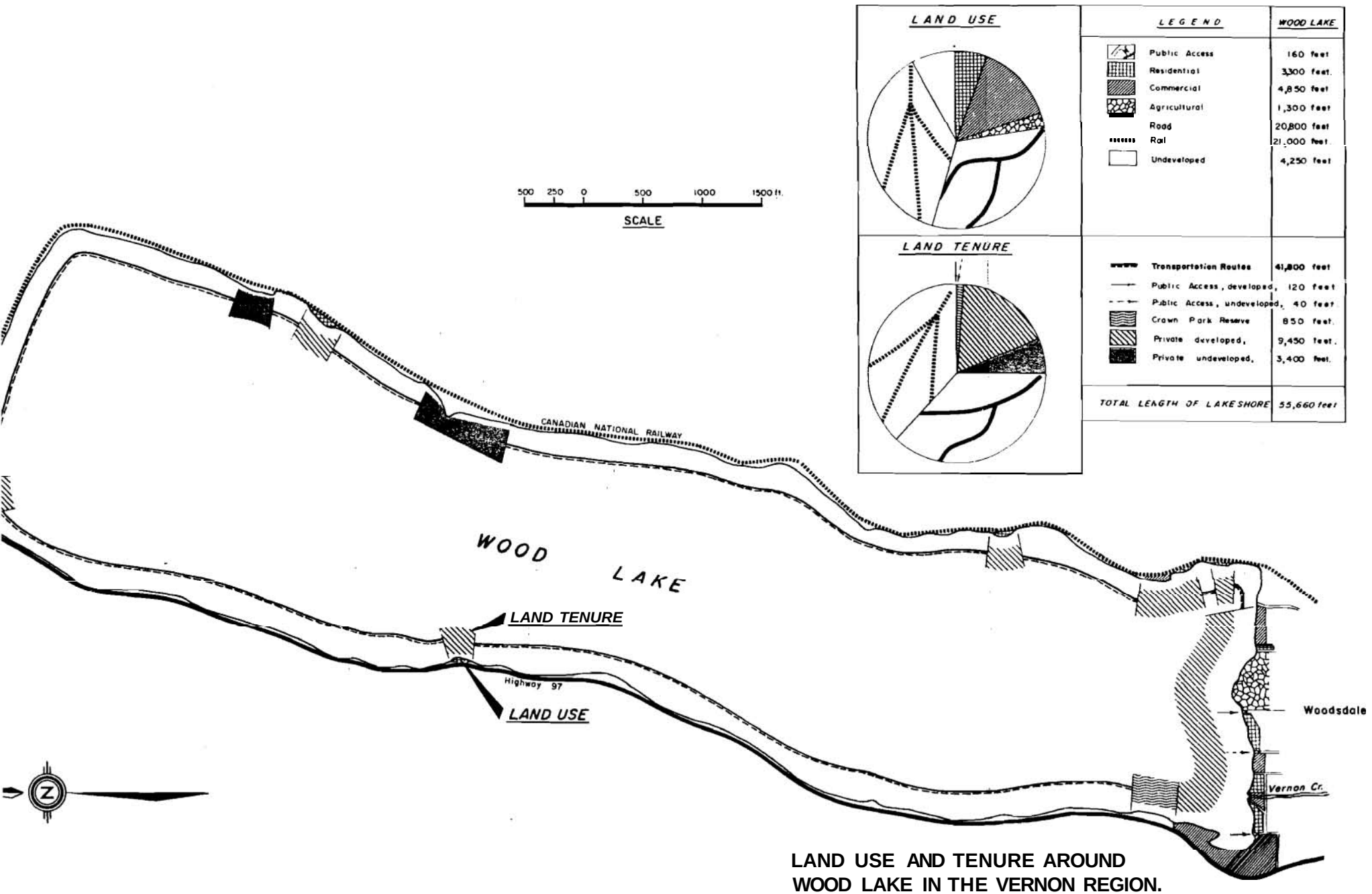


NOTE:
See Map 4a for the Legend and Lakeshore footages in the Kelowna Region and Map 5 in the Vernon Region.

LAND USE AND TENURE AROUND OKANAGAN LAKE IN PART OF THE KELOWNA AND VERNON REGIONS (KELO

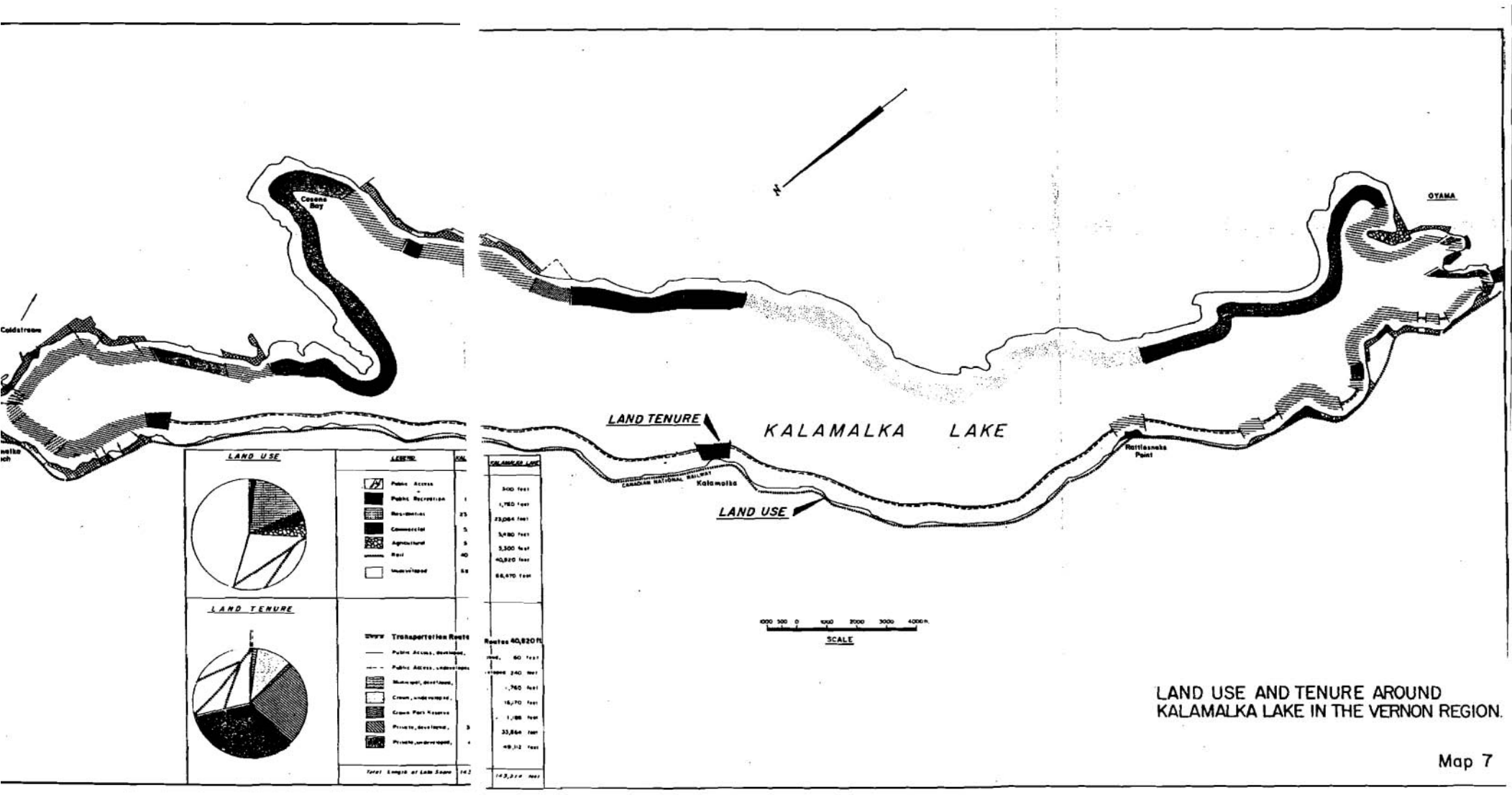


LAND USE AND TENURE AROUND OKANAGAN LAKE IN THE VERNON REGION (FINTRY TO THE NORTH END).



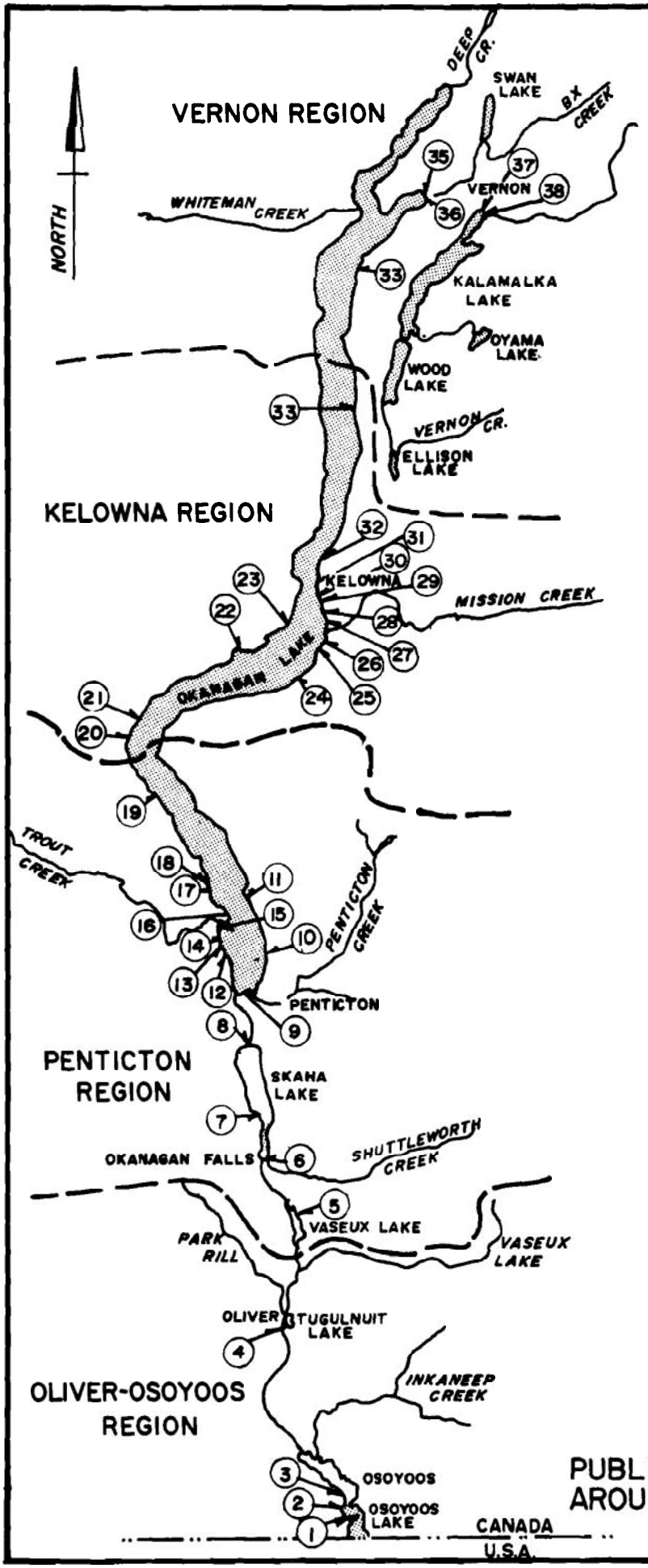
LAND USE AND TENURE AROUND WOOD LAKE IN THE VERNON REGION.

Map 6



LAND USE AND TENURE AROUND KALAMALKA LAKE IN THE VERNON REGION.

Map 7



VERNON REGION

PROVINCIAL
34 Ellison Park
MUNICIPAL
35 Kin Beach
36 Kin Beach (Indian Reserve Section leased by municipality)
37 Kalamalka Beach
38 Small Park

KELOWNA REGION

PROVINCIAL
20 Antlers Beach Park
22 West Bank Park
23 Kalmoir Park
MUNICIPAL
21 Peachland Park
24 Beau Se Jour
25 Small Park
26 Small Park
27 Rotary Park
28 Gyro Park
29 Warlaw Park
30 Strathcona Park
31 Kelowna City Park
32 Sutherland Park
33 Okanagan Centre

PENTICTON REGION

PROVINCIAL
5 Vaseux Prov. Park
6 Christie Memorial Park
11 Manitou Park
12 Kickinee Picnic Ground
13 Soorimpt Picnic Ground
14 Pyramid Picnic Ground
15 Sun-Oka Beach Park
19 Okanagan Lake Prov.Park
MUNICIPAL
7 Kaleden Community Park
8 Skaha Lake Park
9 Okanagan Beach
10 Third Beach
16 Powell Beach
17 Rotary Beach Summerland
18 Kin Beach Summerland

OLIVER-OSOYOOS REGION

PROVINCIAL
Haynes Point Prov.Park
MUNICIPAL
2 Community Park (south of Causeway)
3 Osoyoos Community
4 Tugulnuit Park

PUBLIC RECREATION SITES AROUND THE MAIN VALLEY LAKES.

Map 8