

THE UNIVERSITY OF MANITOBA

THE ROLE OF OUTDOOR RECREATION IN REGIONAL DEVELOPMENT:
A STUDY OF HECLA PROVINCIAL PARK

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

by

William Alan Nicholas Brown

DEPARTMENT OF AGRICULTURAL ECONOMICS AND
FARM MANAGEMENT

February 1977

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W.A. NICHOLAS BROWN

A dissertation submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

THE ROLE OF OUTDOOR RECREATION IN REGIONAL DEVELOPMENT: A STUDY OF HECLA PROVINCIAL PARK

by

William Alan Nicholas Brown

With an increasing emphasis being placed on regional programs aimed at reducing the income and employment disparities that exist between and within Provinces of Canada, there is an accompanying interest in the way in which development of outdoor recreation resources can facilitate achievement of Provincial and Federal goals in this area. This requires an understanding of the regional development process and the linkages that connect programs with policy goals. Only with this information can planning and resource allocation be undertaken in a judicious manner.

A review of the literature reveals that there is a lack of appreciation of the types of social and economic impacts generated by development of outdoor recreation resources, and of their probable magnitude. Some researchers suggest that outdoor recreation may provide the panacea for certain depressed rural areas, while others conclude that there is no clear evidence to support such a hypothesis. Furthermore, most studies concentrate on visitor expenditure impacts, neglecting the effects of capital and operational expenditures which may form a large part of the total income and employment generated by an extensive type of outdoor recreation development. Finally data

on the comparative impacts of alternative resource development programs must be available to policy makers so that they can realistically evaluate the options. This background should lead to increased efficiency and equity from public decisions for given cost levels.

The purpose of this research is to provide data on these questions by analyzing the regional impacts generated from the development and operation of Hecla Provincial Park, an extensive Government recreation area in the Interlake region of Manitoba. The period investigated is 1969 to 1977. A general theoretical framework of the social and economic impacts which can result from outdoor recreation developments is established, and from a consideration of the Federal and Provincial Government objectives in regional development, the criteria of income and employment are isolated as being the impact indicators of prime importance. The quantitative method used for evaluation, consistent with impact theory and the sectoral detail required, is a dynamic input-output simulation model constructed for the Interlake region.

While base data was available on the regional sectoral allocations of capital, operations and maintenance, and wage and salary expenditures on the Park, there was no information on visitation levels or sectoral visitor expenditures. This necessitated a visitor survey being conducted at the Park during the summer of 1975 which used a self-administered questionnaire approach. Although the primary aim of the survey was expenditure information, the scope of this phase was expanded to both provide a prototype for further data collection surveys of outdoor recreationists and generate a data base on the Park which would be useful for additional research.

The results of the impact analysis suggest that in terms of the Interlake economy the effects generated by the Park during 1969 to 1977 are small--for instance the increases in both income and employment resulting from the Park in 1976 approximate 0.3 percent of the projected regional totals. In addition, the impacts are low compared with the results from capital expenditures channelled into agricultural development programs. The local impacts on the urban sectors of the local Municipality bordering the Park are, however, more significant due largely to Government expenditures in the town where the District Park office is located--in this case, 1976 income and employment increases approximate 3.1 to 2.6 percent of Municipal totals. The majority of the development impacts are generated by capital formation in the development stages and operational expenditures in the latter stages, with visitor expenditures generating relatively small effects on income and employment. It is concluded, however, that the relative contribution from visitor expenditures will rapidly increase due to the high rates of growth being experienced in outdoor recreation participation.

The conclusions of the study have important implications for policy both in terms of regional development programs and park planning. The criteria which will maximize local income and employment impacts are identified, as are the circumstances in which development of outdoor recreation resources may significantly contribute to offsetting regional imbalances. Furthermore, if certain specific attributes of outdoor recreation enter the planners' objective function, the low priority accorded this type of development may be enhanced.

ACKNOWLEDGEMENTS

I would like to sincerely acknowledge the assistance received from many people while working on this research. Professor James A. MacMillan very capably acted as advisor and provided direction and focus to the thesis. The other members of the Examining Committee also contributed valuable criticism and suggestions: Professor Ralph Harris and Professor Paul Nickel of the University of Manitoba; Mr Neil Nixon, Director, Research and Planning Branch of the Manitoba Department of Tourism, Recreation and Cultural Affairs; and Professor George L. Brinkman, University of Guelph. In particular, Mr Nixon provided valuable background to the study in terms of current research in the field of outdoor recreation.

Mention must also be made of the assistance given by Mr Adam Boyachek, Superintendent of the Hecla Division of Parks Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs, both in the visitor survey and in collating base data on the operation of Hecla Provincial Park. Also, Mrs Shirley Lyon very competently undertook some of the computer analysis and data tabulation involved in the project.

The Manitoba Department of Tourism, Recreation and Cultural Affairs funded the Hecla Provincial Park visitor survey, which was greatly appreciated.

Finally, the credit for the presentation of this thesis is due to Mrs Edna Smiley for typing the tables, and to my wife, Janet, who edited and typed the drafts and final copy of text.

Naturally, the usual disclaimers apply on the responsibility of the above for the content of the thesis!

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CHAPTER 1

INTRODUCTION

With an increasing emphasis being placed on regional programs aimed at reducing the income and employment disparities that exist between and within the Provinces of Canada, there is an accompanying interest in the way in which development of outdoor recreation resources can facilitate achievement of Provincial and Federal goals in this area. There is, however, considerable controversy on this issue. Some researchers go as far as to state that outdoor "recreational demand by urbanites offers a major, if not the major economic opportunity for revitalization of certain rural areas of the country,"¹ while others review the literature and comment that

. . . it is not at all clear that the influence of tourism-recreation on the economies of several of the study areas cited . . . was particularly positive. . . . It would be difficult . . . to argue convincingly that the findings of the studies . . . tend either to confirm or deny the assertion of federal policy planners that tourism-recreation has considerable potential for revitalizing the economies of distressed areas.²

As Craven, Framingham and Capel note, there is "an immediate need to determine the actual impact of . . . recreation . . . on

¹C. Garbacz, "The Ozarks: Recreation and Economic Development," Land Economics, Volume 47, No. 4 (November, 1971), p. 418.

²Gary C. Meyer, "The Role of Tourism-Recreation in Regional Economic Development: A Case Study of Northern Minnesota," (unpublished Doctor's dissertation, Department of Social Geography, University of Minnesota, 1975), p. 42.

stated objectives."³ A study which provides the linkages between outdoor recreation development programs, the regional economy, and local and provincial objectives is critical to provide the base for realistic planning and resource allocation by policy makers.

Definitions

A clear distinction is not generally drawn between travel, tourism and recreation, and this leads to confusion in interpretation of the implications of many research studies. Travel is the most general classification relating to the movement of people, including all trips for purposes such as business, shopping, visiting, entertainment and recreation.⁴ Tourism generally encompasses that aspect of travel which involves trips of greater than a specified duration or distance--to eliminate the regular and repetitive day-to-day movements of people⁵--and includes those who travel for reasons of business, pleasure or personal affairs. Furthermore, tourism relates to the whole group of activities involved in such trips--sleeping; eating and drinking; attending business meetings, conventions, places of entertainment and amusement; and participation in forms of outdoor recreation

³J. Craven, C. F. Framingham and R. E. Capel, "A Model for the Analysis of the Demand for and Socio-Economic Impacts of Recreation in Manitoba," Regional Science Perspectives, Volume 5 (1975), pp. 27-42.

⁴For instance, refer to the definition implicit in the 1971 Canadian Travel Survey--Canadian Department of Industry, Trade and Commerce, Canadian Travel Survey; 1971 Highlights, Research Bulletin No. 1 (Ottawa: Travel Industry Branch, Office of Tourism, 1972).

⁵The 1971 Canadian Travel Survey used a cut-off point of twenty-five miles. Ibid.

and amateur sports.⁶

Recreation can be broadly defined as encompassing voluntary, self-fulfilling and planned actions or pursuits undertaken during the leisure component of free time,⁷ and outdoor recreation is simply recreation that is typically carried on outdoors.⁸ Therefore outdoor recreationists visiting a Provincial Park, for instance, are one type of tourist, but all tourists are not necessarily recreationists.

Scope and Objectives of the Study

Outdoor recreation requires space and natural resources, including land and/or water and as such, is not different from any other use of natural resources. It must then compete with the other users of land; flood control, hydroelectric power production, irrigation water supply and other users of water.⁹ Given that natural resources are in scarce supply and that development is controlled primarily by the public sector, intelligent allocation decisions between these

⁶Statistics Canada, Travel, Tourism and Outdoor Recreation: A Statistical Digest, Catalogue No. 66-202 (Ottawa: Information Canada, 1975), p. 13.

⁷Leisure is an opportunity apart from the obligations of work but is not synonymous with free time. The mood of leisure is affirmative, and is at a time in which activities (or inactivity) consciously decided upon are undertaken. It thus excludes aspects of spare time or idleness. M. Clawson and J. L. Knetsch, Economics of Outdoor Recreation (Baltimore, Maryland: John Hopkins Press Inc., 1966), p. 7; and A. G. Angst, Ontario Leisure Time Budget Analysis, Tourism and Recreation Planning Study (Toronto: Ontario Ministry of Industry and Tourism, 1971), p. 2.

⁸M. Clawson and J. L. Knetsch, op. cit., p. 36.

⁹Ibid., pp. 6-7, 28. Generally alternative land uses are competitive, but other water uses may be complementary with development of outdoor recreation.

competing users must be based on the relative merits of alternative public-sector programs in achieving local, regional, provincial and national policy objectives.

The majority of extensive outdoor recreation sites in Manitoba are developed and operated by the Provincial government but there is no information on the nature, extent and significance of the regional economic impacts resulting from development, operation and usage of these sites.¹⁰ The central research task of this study therefore, is to quantify the impacts of the development and use of an outdoor recreation site on the economy of the Interlake region of Manitoba.¹¹ An extension to this task is to relate these recreation impacts in a comparative analysis to the impacts generated by other sectoral development program investments on the economy of the Interlake.¹²

¹⁰ A review of the literature reveals that there has been minimal research on this topic both in Canada and the United States. The impact analyses that have been conducted have centred on quantification of visitor expenditures and, in a few cases, the multiplied effect of these expenditures on the local economy. No studies were found which incorporated the capital and/or operational expenditures associated with outdoor recreation sites in the impact analysis.

¹¹ Refer to Figure I.1, Appendix I for a map of the Interlake region of Manitoba.

¹²

A number of impact studies have been made on the Interlake economy: G. Douglas and J. A. MacMillan, Simulation of Economic Impacts of Highway Expenditures, Research Report No. 9 (Winnipeg: Center for Transportation Studies, University of Manitoba, 1972); J. A. MacMillan and C. Lu, Projection and Impact Models: Area Manpower Planning in the Interlake Region, Manitoba, Research Bulletin No. 72-5 (Winnipeg: Department of Agricultural Economics, University of Manitoba, 1972); J. A. MacMillan and C. Lu, Urban Impacts of Rural Resource Development Expenditures in the Interlake Area of Manitoba, Research Report No. 7 (Winnipeg: Agassiz Center for Water Studies, University of Manitoba, 1973); P. Molgat and J. A. MacMillan, Education in Area Economic Development, Research Report No. 10 (Winnipeg: Center for Settlement Studies University of Manitoba, 1972); J. A. MacMillan, C. Lu and C. F. Framingham, Manitoba Interlake Area: A Regional Development Evaluation (Ames: Iowa State University Press, 1975); F. L. Tung, "A Dynamic Model for Simulating Resource Development Program Impacts in the Interlake Region of Manitoba," (Doctor's dissertation, Department of Agricultural Economics, University of Manitoba, 1976).

Within this central theme, several specific objectives can be identified as follows:

1. To measure the impact of public-sector expenditures in the development and operation of an outdoor recreation site on the Interlake economy.
2. To measure the economic impacts of outdoor recreation consumption expenditures on the Interlake.
3. To critically compare outdoor recreation investment with other forms of investment as a means of achieving regional development policy goals.
4. To compare and evaluate the methodological tools used for impact analysis with the criteria of assisting policy makers in decisions regarding the future development of scarce natural resources.¹³

The importance of a study such as that outlined above is made more pressing by consideration of the growth characteristics of outdoor recreation, implying an increasing importance of this sector in regional and provincial economies.

Trends in the Tourist/Recreation Sector

The quantity component of the demand for outdoor recreation has been defined as

the amount expected in person days of a given outdoor recreational activity that a given population group would be willing and able to participate in, assuming that there are no limitations due to accessibility, quality or capacity.¹⁴

¹³During the course of the study, a further objective evolved-- To develop and test a survey methodology designed to collect data on outdoor recreationists. This methodology should be a prototype for further data collection programs in the recreation field--refer to Chapter 3.

¹⁴Kates, Peat, Marwick and Co., Tourism and Recreation in Ontario: Concept of a Systems Model Framework (Toronto: Committee on Tourism and Outdoor Recreation Planning, Ontario Ministry of Industry and Tourism, 1970), p. A-2.

Substantial evidence in the United States supports anticipation of continued increase in demand for the quantity of a wide range of outdoor recreation activities for several decades¹⁵ and Canadian evidence suggests similar conclusions. The extent to which Canadians have been taking holiday and vacation trips has been gradually increasing since 1966, and despite the decline in 1973 and 1974, indications are that vacationing will continue on its growth trend.¹⁶

Hudson has identified four principle factors responsible for increasing demand for outdoor recreation--more leisure time, increased population, increased disposable income and greater mobility.¹⁷ With regard to the first of these factors, Angst has analyzed the time budgets for the Ontario population to the year two thousand, and concludes that "at the present time probably about 35 percent of the total time budget is free time. By the turn of the century, this figure will likely be closer to 40 percent," a 14 percent increase.¹⁸ Furthermore, D'Amore and Associates, in a study for the Canadian Government Office of Tourism, predict annual increases of 1.4 percent

¹⁵G. H. Manning and others, Projecting Iowa's Outdoor-Recreation Needs to 1980, Research Bulletin No. 575 (Ames: Agricultural and Home Economics Experiment Station, Iowa State University of Science and Technology, May 1973), p. 598.

¹⁶Canadian Government Office of Tourism, Tourism News (Ottawa: Marketing Research Office, June and August, 1975).

¹⁷J. F. Hudson and C. Stovall, An Economic Analysis of Cotile Recreation Area, D.A.E. Research Report No. 469 (Baton Rouge, Louisiana: Department of Agricultural Economics, Louisiana State University, 1974), p. 2-3.

¹⁸A. G. Angst, op. cit., p. 7. If the four day, forty hour workweek is adopted by a significant segment of the workforce, "substantial increases in the consumption of outdoor recreation will result." Refer to J. McEvoy, "Hours of Work and the Demand for Outdoor Recreation," Journal of Leisure Research, 6 (1974), p. 125.

in population and 3.5 percent in real income over the next decade,¹⁹ so demand for outdoor recreation should continue current growth trends, given no supply or cost constraints.

There have been detailed investigations of how socio-economic characteristics of the population are linked with participation in outdoor recreation both in the U.S.²⁰ and in Canada²¹ which reinforces these conclusions by showing an increase for the majority of activities, not only in the incidence but also the frequency of participation, for all regions, socio-economic levels and both sexes.

Actual visitation data for National and Provincial parks in Canada show long term annual growth rates of between 2.0 and 15.0 percent depending on the type of use (campground or day-use) and the location of the park. Overall, National parks show an annual growth rate of 7.5 percent in visitation and Provincial parks of 3.1 percent since 1966.²² Vehicle attendance at Manitoba Provincial parks

¹⁹E. J. D'Amore and Associates Ltd., Tourism in Canada - 1986, Delphi Survey conducted for the Canadian Government Office of Tourism (Montreal, 1976), pp. 3-5.

²⁰D. Brewer and G. A. Gillespie, Socio-Economic Factors Affecting Participation in Water-Orientated Outdoor Recreation, ERS-403 (Washington: Economic Research Service, U.S. Department of Agriculture, 1969); and P. Owens, Outdoor Recreation: Participation, Characteristics of Users, Distances Travelled and Expenditures, Research Bulletin No. 1033 (Wooster, Ohio: Ohio Agricultural Research and Development Center, 1970).

²¹Canada, Department of Indian Affairs and Northern Development, Trends in Participation in Outdoor Recreation Activities, CORD Technical Note No. 22 (Ottawa: Socio-Economic Research Section, Parks Canada, 1973); Canadian Government Office of Tourism, 1970, Motivations to Travel and Vacation Trends (Ottawa: Research Office, 1972); and Ibid., 1973 Vacation Attitudes and Vacation Trends, (Ottawa: Marketing Branch, 1975).

²²Statistics Canada, Travel, Tourism and Outdoor Recreation: A Statistical Digest, Catalogue No. 66-202 (Ottawa: Information Canada, 1975), pp.174-176.

reflects growth rates above these averages, with annual increases of 8 percent during the last four seasons.²³

Provincial Development Objectives

In its policy statement, the Manitoba Government outlines four general principles for policy direction in natural resource development. These are:²⁴

1. Maximizing the general well-being of Manitobans--maximizing income levels.
2. Achieving greater equality of human condition--achieving an equitable distribution of income.
3. The stay option--providing incentives for localized employment.
4. Widening participation--encouraging public participation in decision-making.

Specific to the Interlake region of Manitoba the Fund for Rural Economic Development (FRED) program has the regional objectives of increasing income and employment opportunities as well as the standard of living.

The Interlake Area has been described as a region having great recreation potential.²⁵ Therefore from a policy viewpoint the crucial

²³Manitoba Department of Tourism, Recreation and Cultural Affairs, Manitoba Park Statistics 1974, Report No. 166 (1975), p. 10.

²⁴Manitoba Cabinet Secretariat, Guidelines Volume 1. Introduction and Economic Analysis, Planning and Priorities Branch (Winnipeg: Queen's Printer, 1973), pp. 98-99, 109-110.

²⁵Canada Department of Forestry and Rural Development, Kal-Miss-Alk (Ottawa: Queen's Printer, 1969); and FRED Administration, Broad Issues of the Role of Economic Development in the Interlake Region, Economic Development Committee (Winnipeg: Unpublished Memorandums, May, 1974), p. 2.

question in regional development is to quantify the extent to which regional impacts from recreation resource developments achieve these stated development objectives, and their relative effectiveness compared with alternative forms of investment. For instance, what has been the impact of Manpower Corps Training during the construction phases of the project, and in the longer term, what are the regional income and employment effects of operation and maintenance and tourist expenditures connected with outdoor recreation facilities? Furthermore, are these impacts as significant as those resulting from investment in agricultural resource development?

The Interlake Development Plan and Recreation

Recreation's share of the development expenditure in the Interlake FRED plan, 1967-1977, approximates \$4.26 million or 5 percent of the total budget of \$85 million.²⁶ This was allocated to enhance and complement the Manitoba recreational areas within one hundred miles of Winnipeg along the west shore of Lake Winnipeg--Winnipeg Beach, Gimli and Hecla Island--and to provide construction, training and service jobs. The areas will serve an existing and increasing recreational demand for day trips, sightseeing, camping and cottage facilities.

The activities planned for the several recreation projects include:

1. Winnipeg Beach. Shoreline protection, landscaping, service facilities and infrastructure.

²⁶FRED Administration, Interlake FRED Plan. Performance Report for Year Nine (Winnipeg: 1976), p. 54.

2. Gimli. Land acquisition and park development.

3. Hecla Island. Land acquisition and development of campsites, access road and causeway, service and maintenance facilities, beach and lagoon.

The majority of recreation development expenditures will be committed to the development of the latter project--Hecla Provincial Park.²⁷

The main thrust of this research is therefore to evaluate the extent to which this particular program will affect the economy of the Interlake region and the extent to which it fulfils regional policy objectives, since the establishment of a Park will exert considerable influence on the economies of nearby areas and the region, and cause many social and economic changes. Relatively little information is, however, available on these effects with the general assumption being made that the net benefits are positive.²⁸

Policy Issues with respect to Recreation

Development of outdoor recreation resources has consistently been cited as a means of achieving regional development policy objectives in income and employment as well as satisfying a rapidly growing

²⁷Low key day-use and camping facilities had existed on Hecla Island for some time. The development program which commenced in 1969 involved the use of FRED monies supplemented by nearly an equal commitment of Provincial funds to construct a causeway linking the island to the mainland, and to substantially upgrade the camping and day-use facilities. The Park was officially opened in August, 1975, at which stage \$5.13 million had been spent on capital projects, \$2.76 million of this being under the FRED program. Capital developments which have occurred after the Park opening are not included in this evaluation--for instance the Gull Harbour Lodge complex which was completed in the fall of 1976. Refer to Appendix I for detail on the background to the establishment of Hecla Provincial Park.

²⁸Some analysis has been conducted on the importance of sales to travellers on the Interlake economy. However, the economics of the travel/tourism industry is significantly different from the outdoor recreation industry, and their regional effects are generally not analagous. Refer to Chapter 6 for an elaboration on this issue.

demand for recreation. From trend analysis, it is apparent that if cost constraints do not occur demand will continue its rapid growth which "calls for a continuous adjustment in resource allocation."²⁹ This implies an understanding of the regional development process and its linkages both with program expenditures and policy goals. It is clear, however, that there has been little progress in overcoming the lack of understanding, noted a decade ago by Clawson and Knetsch, with respect to the actual impact of recreation expenditures both in terms of the local economy and in relation to public investment decision criteria.³⁰

Given favourable demand conditions, outdoor recreation enterprises have the potential to generate a significant stimulus to economic activity in problem rural areas essentially because of the export characteristics of the business in that goods and services are marketed mainly to non-resident consumers.

No meaningful policy decisions can be made at the regional level however, unless the extent and nature of impacts can be evaluated in a framework which links the program, regional economy and development objectives. As Archer concludes, "lack of both adequate data and vigorous research techniques has inhibited clear policy making and

²⁹W. G. Brown, F. H. Nawras and J. B. Stevens, The Oregon Big Game Resource: An Economic Evaluation, Special Report No. 379 (Corvallis: Oregon Agricultural Experiment Station, 1973).

³⁰M. Clawson and J. L. Knetsch, op. cit., p. 230.

development decisions are usually based upon subjective, intuitive, guesswork."³¹

Knetsch and Cheung make similar observations with respect to the Canadian situation noting that

substantial sums of money are devoted to the public provision of outdoor recreation and far larger ones are in prospect over the coming years. If these are to be used wisely, some estimates of the demand for various sites and the value of each would be of considerable utility.³²

Although this view is valid, demand analysis by itself does not provide a useful guide to planning and policy since criteria for public sector expenditures should be based on the relative ability of these expenditures to meet specified goals. As Romm concludes,

improved comparisons between benefits of alternative recreational and non-recreational expenditures, as well as among choices within the recreation field itself, would increase effectiveness of public resource allocation. Higher levels of public welfare at given levels of cost should result."³³

The primary aim of program evaluation in the Interlake FRED plan context is "to determine the impact of FRED programs on aggregate regional income, income distribution, output, employment, consumption, education and capabilities of self-sustaining growth."³⁴ Evaluation

³¹B. Archer, The Impact of Domestic Tourism, Bangor Occasional Papers in Economics No. 2 (Wales: University of Wales Press, 1973), p. 1.

³²J. L. Knetsch and H. K. Cheung, The Economic Value of Parks, CORD Technical Note No. 31 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1973),

³³J. Romm, The Value of Reservoir Recreation, Technical Report No. 19 (Ithaca: Water Resources and Marine Sciences Center, Cornell University, 1969), p. 1.

³⁴J. R. Barnard, J. A. MacMillan and W. R. Maki, "Evaluation Models for Regional Development Planning," Regional Science Association Papers, 23 (November, 1969), p. 126.

studies have been carried out for the Interlake FRED scheme on drainage and land clearing, farm management, land acquisition, manpower services, transportation, local government and education programs.³⁵ It is proposed to measure similar impact parameters for the recreation development program, and then make overall comparisons of their relative effectiveness.

For instance, does the recreation program contribute to the Provincial Policy objective of equitable income distribution? It would appear, a priori, that this will not be the case for studies have shown that although in satisfying their recreation needs the lower income classes receive more than they pay for at the expenses of the upper income classes, their needs are not able to be fulfilled.³⁶ Stoevener investigated this phenomenon at a particular recreation site and concluded that

. . . the extent to which . . . policy considers it meritorious to provide recreational opportunities for the less affluent, a dispersal of national effort to make available recreational services at numerous locations close to the poor (both urban and rural) may be called for . . . in contrast to concentrating . . . effort in a few locations . . . accessible only to the relatively affluent.³⁷

Similar conclusions have been made from recent Canadian research.

³⁵ See footnote 12, page 4.

³⁶ L. A. Shabman and R. J. Kalter, The Effects of New York Administered Outdoor Recreation Expenditures on the Distribution of Personal Income, A.E. Res. No. 298 (Ithaca: Department of Agricultural Economics, Cornell University. 1969).

³⁷ H. H. Stovener, R. B. Retting and S. D. Reiling, "Economic Impact of Outdoor Recreation: What Have We Learned?" Water and Community Development: Social and Economic Perspectives, edited by D. R. Field and others (Ann Arbor: Ann Arbor Science Publishers, 1974), p. 243.

An Ontario survey showed that cost was the major constraint in preventing the low-income group from participating in outdoor recreation,³⁸ and since Hecla Provincial Park is ninety miles from Winnipeg, Manitoba's centre of population, cost may restrict access by low income households.

Another example relates to the income and employment objectives of Manitoba's resource development policy. Sales, income and employment multipliers vary widely between sectors. Different combinations of recreational activity packages will encourage growth in particular sectors, and therefore, for an expansion program to achieve maximum effectiveness, knowledge of the market segmentation of types of outdoor recreational programs and their sectoral linkages is essential.

This project examines questions such as this specific to the outdoor recreation development program at Hecla Provincial Park and the policy objectives laid down for the Interlake FRED development plan. When it is considered that for Canada "over [57 percent] of total provincial travel receipts in 1971 were from residents travelling in their home Province,"³⁹ the policy implications of this information are very significant. Only when such parameters are quantified can realistic assessments and tradeoffs be made at the planning level to maximize the effectiveness of public sector expenditures on resource development programs.

³⁸Ontario Tourism and Outdoor Recreation Planning Study, Progress Report No. 2 (Toronto: Ministry of Industry and Tourism, 1974), pp.61-65.

³⁹Canada, Canadian Government Office of Tourism, Tourism: It's Magnitude and Significance, Research Bulletin No. 2 (Ottawa: Industry Development Branch, 1974), p. 18.

Plan of Study

The program of research in the study, and the format of this thesis, proceeds through sixteen steps. These are:

1. A review of the economic and social aspects of outdoor recreation development,
2. A review of alternative theories of regional economic growth,
3. An introduction to the analytical method to be employed in the analysis, consistent with impact theory and Steps 1. and 2. above--in this case a dynamic input-output simulation model,
4. The tabulation of the primary data requirements consistent with Step 3., and relating to the construction and operation of Hecla Provincial Park, 1969-1977. These are (a) capital costs (including details on the Manpower Training Program), (b) operations and maintenance costs, (c) visitor levels, and (d) visitor expenditure patterns. While data on (a) and (b) were available from Government records, no information on visitation or visitor expenditure patterns existed. This necessitated a data collection program--Step 5.,
5. The design and implementation of a data collection program to establish visitation levels and expenditure patterns of visitors at Hecla Provincial Park,
6. The isolation of the proportion of total capital expenditure directed into Interlake firms categorised by sector,
7. The isolation of the proportion of total manpower training costs that represented additional income in the Interlake economy,
8. The isolation of the proportion of total operations and maintenance expenditure directed into Interlake firms categorised by sector,

9. The tabulation of the salary and wage payments to Interlake households under Steps 6, 7, and 8, above,

10. The projection of visitation levels and visitor expenditures by sector for the operating phase of the Park from the data collected in Step 5.,

11. The estimation of the gross output, income and employment impacts of the development program on the Interlake economy by sector,

12. The estimation of the gross output, income and employment impacts of the development program on the local Municipality by sector,

13. The comparison of the impacts calculated in Steps 11. and 12. with those generated by agricultural resource development programs,

14. The analysis of the visitor expenditure component of total impact and a comparison with that generated from tourist/traveller expenditures,

15. The evaluation of the distributional impact of the outdoor recreation development program, and

16. The derivation of conclusions from the above as to the role of outdoor recreation in regional development.

The remainder of this thesis summarises the results of the research program outlined above, the next chapter developing the theoretical framework for the study (Step 1.), reviewing alternative theories of economic growth (Step 2.), and choosing the analytical method for impact analysis (Step 3.).

CHAPTER 2

THEORETICAL FRAMEWORK

This chapter outlines the theoretical framework for the study by first reviewing the economic and social aspects of outdoor recreation development. A brief discussion of the alternative theories of regional economic growth follows with the linkages being drawn between recreation and regional economies. Conclusions are then made as to the appropriate analytical method for impact analysis in this research program.

The Economic and Social Aspects of Recreation Development

Development and use of an outdoor recreation site generates two types of impacts--one generated by consumer experiences from the beauty, utility or quality of the visit (the primary impact of the resource) and the other generated by the development and consumption expenditures which stimulate economic activity in the local community (the secondary impact of the resource).¹ The components of these impacts are shown in Table 2.1 and it is essential that they be considered in any evaluation to enable meaningful comparison between recreation

¹This distinction follows the commonly used categorization; see, for instance, W. G. Brown, F. H. Nawras and J. B. Stevens, op. cit.; and H. H. Stoevener, R. B. Retting and S. D. Reiling, op. cit. Although the terms primary and secondary can be confusing in this context since they are frequently used to denote 'direct' and 'indirect' effects in input-output models, the terminology is common usage in discussion of the effects of outdoor recreation. For a recent example in Canada, refer to: Canadian Outdoor Recreation Research Committee, The Economic Impact of Parks, Research report No. 2 (Ottawa: Prepared for the Federal Provincial Parks Conference, 1975).

Table 2.1

Impacts of Recreation Site Development
and Use

Impacts	Positive	Negative
Primary	Visitor Experiences Non-visitor Option Demand Preservation	Externalities--congestion, overcrowding, pollution, nuisance
Secondary	Income Employment Land Values Tax Base Local Status and Attitude Investment levels	Opportunity cost of displaced resources, Economic instability, Low rate of return on capital, External Costs

and alternative public investment opportunities.

Primary impacts. Outdoor recreation facilities are normally provided by the public sector as a free good. Since the consumer does not pay directly for use of the facilities, except for a nominal entrance charge in some circumstances, the traditional approach to measure value of equating price with marginal value product is inadequate and the absence of realistic market prices for outdoor recreation complicates value estimation.²

Burton and Fulcher define three components of value for normal goods in these circumstances:³

1. The Appropriated Benefit--what the consumer actually pays for use of the facility.

2. The Consumer Surplus--the difference between what the consumer actually pays (the appropriated cost) and what he would have been willing to pay.

3. The Indirect Benefit to Society--the aspects of option demand and preservation.

The non-monetary benefits from recreation development (Components 2, and 3) may be decisive factors in determining the overall viability of investment in this sector in many cases, and their consideration is essential when balancing alternative projects in a benefit-cost framework.

²Indirectly, of course, consumers and non-consumers pay for the good through rates and taxes.

³T. L. Burton and M. N. Fulcher, "Measurement of Recreation Benefits - A Survey," Journal of Economic Studies, 3 (1968), pp. 35-48.

Most empirical approaches to date have centred on estimation of Component 2--the "willingness to pay" for the recreation experience and the income-compensated demand curve--and therefore estimation of the consumer surplus of the resource.⁴ There are many good reviews of the alternative approaches for estimating consumer surplus by establishing a demand curve.⁵ The methods are either direct by asking recreationists the most they would be willing to pay for use of the facility rather than be excluded,⁶ or indirect by measuring willingness to pay in a simulated market access framework. This usually consists of observing the reaction of recreationists to the costs of using a

⁴Krutilla maintains that "willingness to pay" is the lower bound estimate of consumer surplus. The upper bound is given by the aggregate sum which would be needed to be provided to current users to have them voluntarily relinquish their claims on its use--i.e. "willingness to sell." See J. V. Krutilla, Evaluation of an Aspect of Environmental Quality: Hells Canyon Revisited, Reprint No. 93 (Washington: Resources for the Future Inc., 1971). Alternatively, some economists argue that the relevant criteria is "the maximum revenue obtainable by a discriminating monopolist when faced with this demand curve," rather than the total area under the demand curve (consumer surplus for free good). See, for instance, W. G. Brown, G. A. Singh and E. N. Castle, An Economic Evaluation of the Oregon Salmon and Steelhead Sport Fishery, Technical Bulletin No. 73 (Corvallis: Oregon Agricultural Experiment Station, 1964).

⁵Examples are found in W. G. Brown, F. H. Nawras and J. B. Stevens, op. cit.; T. L. Burton and M. N. Fulcher, op. cit.; J. L. Knetsch and H. K. Cheung, op. cit.; J. V. Krutilla, "Conservation Reconsidered," American Economic Review, 47 (September, 1967), pp. 777-786; J. V. Krutilla, Evaluation of an Aspect of Environmental Quality, op. cit. H. D. Schellenberg and W. J. Craddock, A Preliminary Economic Analysis of Outdoor Recreation in the Souris River Basin, Internal Report No. 2 (Winnipeg: Agassiz Center for Water Studies, University of Manitoba, 1972); and J. Romm, op. cit.

⁶J. L. Knetsch and R. K. Davis, "Comparisons of Methods of Recreation Evaluation," Water Research, edited by A. V. Kneese and S. C. Smith (Baltimore: John Hopkins University Press, 1966), pp. 124-142.

particular site in the manner initially proposed in 1949 by Hotelling⁷ and further refined and generalised by Clawson,⁸ Clawson and Knetsch⁹ and Cicchetti.¹⁰ The major problem with this latter approach is that it assumes travel to be disutility which some recent studies do not confirm.¹¹ A third alternative may be the use of non-monetary methods incorporating weighted user-day estimates,¹² but although theoretically attractive this method has produced many difficulties in formulating objective merit weights.

The third component of value identified by Burton and Fulcher relates to the "Indirect Benefit" to society of development of a recreation resource. This includes the concept of "option demand,"

⁷H. Hotelling, Letter quoted in The Economics of Public Recreation: An Economic Study of the Monetary Value of Recreation in the National Parks, Miscellaneous Paper (Washington, D.C.: National Park Service, U.S. Department of the Interior, 1949).

⁸M. Clawson, Methods of Measuring the Demand for the Value of Outdoor Recreation, Reprint No. 10 (Washington: Resources for the Future Inc., 1959).

⁹M. Clawson and J. Knetsch, op. cit.

¹⁰C. J. Cicchetti, A. C. Fisher and K. V. Smith, "Economic Models and Planning Outdoor Recreation," Operations Research, 21 (1973), pp. 1104-1113.

¹¹J. Beaman, Distance and the "Reaction" to Distance as a Function of Distance, CORD Technical Note No. 14 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1974). In fact, the annual "8M" surveys in Canada show pleasure driving to be the most popular outdoor recreation activity, participated in by 65 percent of the population in 1972. Refer to Canada, Department of Indian Affairs and Northern Development, Trends in Participation in Outdoor Recreation Activities, op. cit., p. 26.

¹²R. P. Mack and S. Meyers, "Outdoor Recreation," Measuring Benefits of Government Investments, edited by R. Dorfman (Washington: Brookings Institution, 1965), pp. 71-101.

first advanced by Weisbrod in 1964.¹³ Weisbrod argued that non-users of a resource may also be willing to pay a price to guarantee the availability of that resource in the future. This aspect of resource value may be becoming very significant for outdoor recreation as increasing quantities of available land are devoted to alternative uses. Few studies have incorporated this aspect in their evaluations, and none quantitatively, although a specially designed interview format could determine the magnitude of this component. Furthermore, the aspects of environmental preservation and the conservation of endangered species of flora and fauna must not be neglected when evaluating some Parks. Many have unique and inestimable aspects to the physical and/or social sciences which deem the establishment of national preserves essential.

The net primary impact from park development may not be positive. Increased visitation can create externalities in the form of congestion, noise, pollution and ecological damage to such an extent that user satisfaction decreases and the value of the resource declines. To offset these effects, either capacity has to be extended or visitation controlled by permit or user charges.

Secondary impacts. The components of the secondary impacts arising from recreation site development and use are shown in Table 2.1. The major items of significance are income and employment generation from direct, indirect and induced sales in the regional economy, which arise from capital and manpower training expenditures in park construction,

¹³B. Weisbrod, "Collective Consumption Services of Individual Consumption Goods," Quarterly Journal of Economics, 78 (1964), pp. 471-477.

expenditures in park operation and maintenance, and consumption expenditures made by visitors to the park.¹⁴

The total magnitude of the impacts generated by these expenditures depends both on the absolute level of these expenditures and their multiplied effects on the rest of the region. The "multiplier" is a measure of this linkage effect enabling quantification of expenditure rounds within the economy, its magnitude depending on the economic structure of the region.

The concept of regional economic leakages as embodied in the value of the multiplier effects of exogenous sector spending is very important from a policy viewpoint, and is the key to meaningful regional planning. Most recreation impact studies measure only direct visitor consumption expenditure effects,¹⁵ and neglect both the multiplier implications and the impacts generated from associated expenditures on capital development and operations and maintenance. In the short run, however, major local impacts can arise from capital and operations

¹⁴Direct impacts generate income in sector *i* from expenditures in one or more final demand categories of sector *i*. These sectoral impacts in turn, generate further income effects in the remaining sectors of the economy--Indirect effects--and when the additional income generated in the household sector is respent (the household sector being made endogenous) induced impacts are generated. Resource and/or capacity constraints can be critical in determining the magnitude of these effects.

¹⁵A list of such U.S. studies is found in R. C. Hinman, The Impact of Reservoir Recreation on the Whitney Point Microregion of New York State, Technical Report No. 18 (Ithaca, New York: Water Resources and Marine Sciences Center, Cornell University, 1969). Canadian examples are provided by R. Gates, Campground Impact Study 1974, (Regina; Saskatchewan Department of Tourism and Renewable Resources, 1975); Manitoba Department of Tourism, Recreation and Cultural Affairs, Campground Impact Study, 1971: Spruce Woods and Grand Valley, and Campground Impact Study: Pinegrove Halt, Norquay Beach and Virden Park, Research Reports No. 87 and 127 (Winnipeg: 1972 and 1973).

and maintenance expenditures. A recently completed study on the proposed Grasslands National Park in Saskatchewan, for example, concluded that construction expenditures provided approximately 78 percent of the local impact in years five and ten of the development program, and even when the park was fully operational in year twenty, operations and maintenance expenditures provided 60 percent of the regional impact, and tourist expenditures 40 percent.¹⁶

It has been noted with regard to recreation development in the Interlake, that "programs should be co-ordinated to ensure the fullest involvement and benefits to Interlakers, for it is possible that returns could accrue mainly to outsiders with little spinoff for the region."¹⁷ Therefore estimation of the nature and magnitude of all impacts is essential to allow this "spinoff" to be quantified with associated implications for policy decisions.

While the expenditures associated with park construction and operation are generally well defined, the magnitude of the total consumption expenditures generated by park visitors depends on a great number of factors--factors which determine firstly the number and type of visitors and secondly the consumption expenditures per party per visit. These factors are shown diagrammatically in Figure 2.1.

¹⁶J. A. MacMillan, S. Lyon and N. Brown, Analysis of Socio-Economic Impacts of the Proposed Grasslands National Park, Report prepared for The Joint Federal-Provincial Committee on the Proposed Grasslands National Park (Winnipeg: Department of Agricultural Economics, University of Manitoba, 1976).

¹⁷FRED Administration, Broad Issues of the Role of Economic Development in the Interlake Region, op. cit.

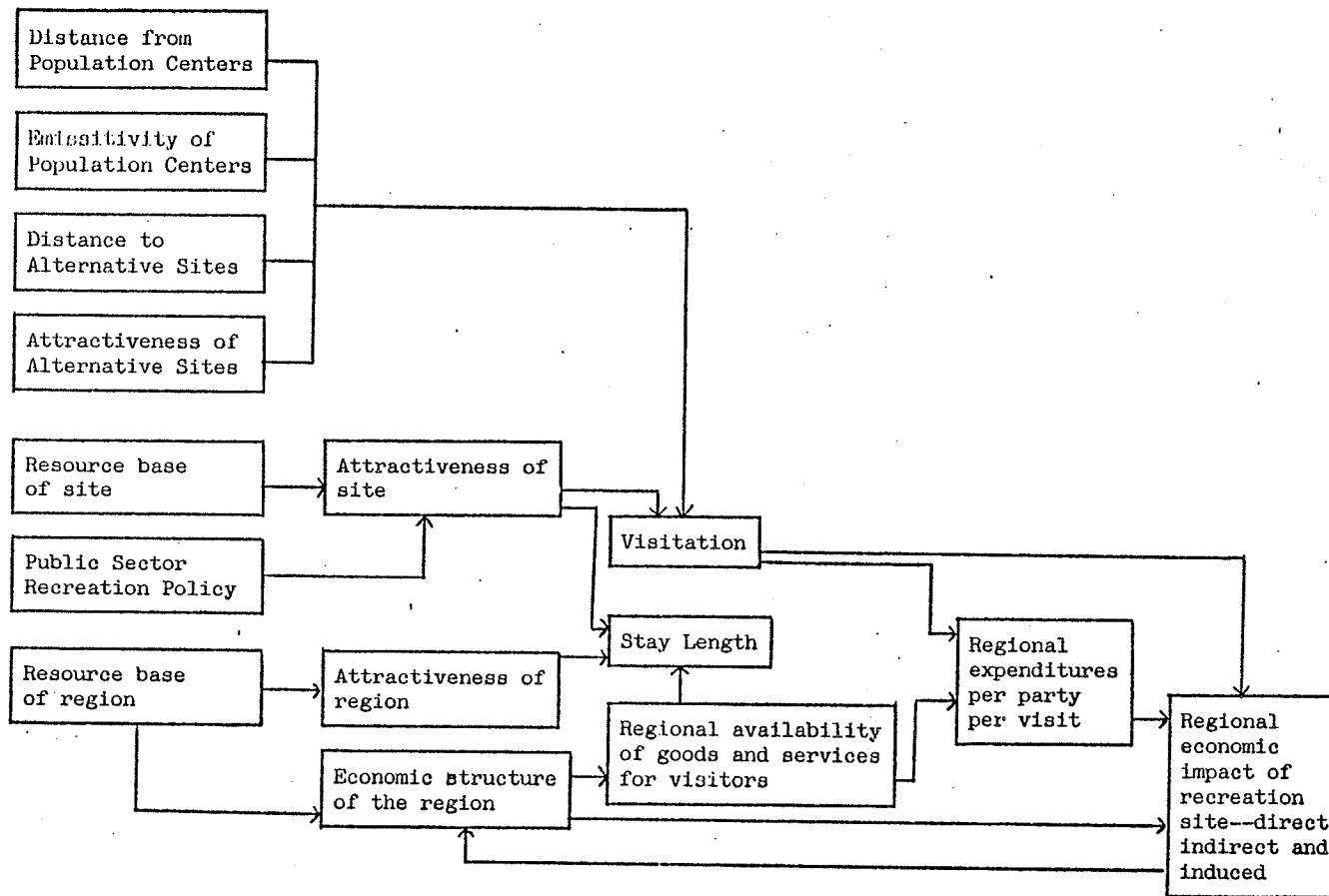


Figure 2.1

Factors which Determine the Use and Regional Economic Impact of a Public Outdoor Recreation Site

A general park visitation model may be specified as:¹⁸

$$V_{ij} = f[O_i, D_{ij}, S_j] \quad (2.1)$$

where V_{ij} = the number of visits from origin i to park j during time t

O_i = a variable denoting the characteristics of origin i

D_{ij} = a variable accounting for the effect of the spatial separation of origin i and park j

S_j = a variable determined by the characteristics of park j .

Extensive analysis has been undertaken by Cesario on the two factors O_i and S_j , termed the "emissiveness" of population origins (determined by such factors as population, income and age) and the "attractiveness" of park sites (related to size, availability of selected facilities and other similar factors).¹⁹ He showed that the ability of origins to send out visitors (emissiveness) varied from origin to origin and similarly the ability of the recreation sites

¹⁸ Refer to H. K. Cheung, A Comparison of the Regression Results of Applying Two Attractiveness Factors to Estimate Park Use, CORD Technical Note No. 28 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1974); and J. L. Knetsch, Outline of Data Analysis Assessing Outdoor Recreation Demands in Canada, CORD Technical Note No. 34 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1974)--The Socio-Economic Research Section of Parks Canada has undertaken detailed research over the past five years on park visitation models. These studies include consideration of attractiveness, participation and distance in determining visitation levels.

¹⁹ F. J. Cesario, Estimating Park Attractiveness, Population Center Emissiveness and the Effect of Distance (Location) on Outdoor Recreation Travel, CORD Technical Note No. 4 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1973), and "A New Method for Analyzing Outdoor Recreation Trip Data," Journal of Leisure Research, 7 (1975), pp. 200-215.

to attract visitors (attractiveness) was different site to site. Many indices of attractiveness have been developed, and whether they are site or area specific, all are significant in determining visitation levels to particular sites.²⁰ In terms of a given recreation site, the emissiveness and distance factors are basically invariant in the short run, so changing visitation levels will be determined primarily by attractiveness--a function of many things including the resource base and characteristics of the site and the region, advertizing and so forth.²¹

Consumption expenditures by recreationists may be divided into three categories--at home, en route and regional area expenditures--but only the regional area expenditures made at or near the recreation site stimulate the regional economy. The magnitude of these latter expenditures depends on four important factors:

1. The type of development--i.e. day use and/or camping,
2. The type of visitor,

²⁰See, for instance, F. J. Cesario, op. cit.; H. K. Cheung, op. cit.; and J. H. Ross, A Measure of Site Attraction, Occasional Paper No. 2 (Ottawa: Lands Directorate, Department of the Environment, 1973). Also for a comparison, refer to J. Beaman, Three Methods for Measuring the Attractiveness of a Park, CORD Technical Note No. 9 (Ottawa: Socio-Economic Research Section, Parks Canada, Department of Indian Affairs and Northern Development, 1974).

²¹The significance of attractiveness indices in predicting visitation levels to outdoor recreation sites suggests that a useful avenue of research would be the application of the Lancaster approach to consumer demand theory in analysis of the demand for outdoor recreation. In the traditional neoclassical theory of demand, the consumer makes a choice between goods which are ordinally ranked in order to maximize utility, subject to a budget constraint. The Lancaster variance is the concentration on a choice between the characteristics provided by the goods, rather than the goods themselves which appears particularly relevant to outdoor recreation demand analysis since visitors to particular outdoor recreation sites are attracted by specific types of facilities (i.e. characteristics) rather than the general recreational experience.

3. The length of stay, and
4. The availability of goods and services.²²

Many research studies have investigated the relationships between market segmentation and expenditure patterns. A recent survey by Strang showed expenditure patterns varying with all socio-economic characteristics (e.g. income, occupation, age), place of residence, type of accomodation and recreational activity. In general "campers were [the more] conservative spenders in all [sector] categories except food stores and government [primarily due to campground fees]."²³

Archer and Shea have empirically investigated the length of stay-expenditure relationship and concluded that an increase in stay length will significantly increase local income since they considered the expenditure effect to be non-linear.²⁴ This is because with increased stay length transportation expenditures to the site do not rise, whereas on and near site travel will increase and secondly, expenditure on food increases more than proportionally. Therefore, provided goods and services are available locally, stay length can be a critical factor in the level of regional consumption expenditures made by each party. A Canadian example of this is Prince Edward

²²A documentation of the results of U.S. Park Visitor studies and their conclusions on the importance of type of visitor, stay length and availability of goods and services on the level of consumption expenditures is contained in W. B. Beyers, An Economic Impact Study of Mt. Rainer and Olympic National Parks (Seattle: Department of Geography, University of Washington, 1972).

²³W. G. Strang, "Recreation and the Local Economy: Implications for Economic and Resource Planning," Marine Technology Society Proceedings (August, 1971), pp. 509-521.

²⁴B. Archer and S. Shea, The Importance of Length of Stay in Tourist Studies, T.U.R. No. 6 (Bangor: Institute of Economic Research, University College of North Wales, 1974).

Island where low spending and short stay length is one of the major problems facing the tourist industry of the Province. Studies are currently underway on methods to overcome this problem.²⁵

The fourth aspect of the magnitude of regional consumption expenditures--the availability of the goods and services--needs little elaboration. The more the region can cater to consumption wants of the visitor and the greater the percentage of goods and services required by the visitor that can be provided locally, the more significant will be the local economic impact of the recreation resource.

Few impact studies on recreation resource developments go beyond quantifying visitor expenditure income and employment effects, and the literature review has revealed only one study which can be regarded as at all comprehensive.²⁶ This observation is especially valid for studies in Canada which have been of limited scope and

²⁵A. S. Harvey and W. S. MacDonald, Evaluation of the Brudenell-Mill River Tourist and Recreation Complexes, Report No. 104 (Halifax: Institute of Public Affairs, Dalhousie University, 1974).

²⁶This was an evaluation of Pawtucky State Park in New Hampshire, where researchers in a series of papers considered income and employment effects, municipal taxes, environmental quality and property values. Refer to G. E. Frick and C. T. K. Ching, Economic Effects of Pawtucky State Park I. Problems, Objectives, Methodology and Scope of Study, Research Report No. 9 (Durham: New Hampshire Agricultural Experiment Station, 1970); E. F. Jansen Jr. and others, Economic Effects of Pawtucky State Park II. Park User Characteristics, Research Report No. 17 (Ibid., 1971); C. T. K. Ching and G. E. Frick, The Economic Effects of Pawtucky State Park V. Effect of Park Use on Environmental Quality, Research Report No. 8 (Ibid., 1972); C. T. K. Ching and G. E. Frick, The Economic Effects of Pawtucky State Park III. Impact on Property Values in the Surrounding Area, Research Report No. 31 (Ibid., 1973); and J. P. Davulis and others, Economic Effects of Pawtucky State Park IV. Effect on Municipal Expenditures and Revenues, Research Report No. 34 (Ibid., 1974). Although broad in scope, this research project has neglected consideration of capital and operational expenditure impacts associated with the Park.

questionable applicability.²⁷ Hildebrant and Young reviewed the "state of the art" relating to the economic impact of National Parks in Canada in 1971,²⁸ and while the discussion of primary benefits is thorough the aspect of secondary impacts is given scant attention. Conversely, Harvey evaluates the income and employment effects of Kejimikujik National Park but neglects primary impacts entirely without discussion.²⁹

As shown in Table 2.1, secondary impacts can occur in areas outside of employment and income. Knetsch was the first to evaluate the significant effect that reservoir development can have on adjacent land values,³⁰ and later studies have confirmed this.³¹ Increase in visitation bids up the demand for land (which in many cases is highly inelastic in supply) both from people wishing to build vacation homes and from businessmen who wish to meet the demand for locally provided

²⁷ See, for instance, a report prepared in 1968 on the proposed Grassland National Park in Saskatchewan--Kaplan Consulting Associates Ltd., Economic Impact Study of Alternative Park Proposals at Val Marie, Saskatchewan, (Ottawa: National and Historic Parks Branch, Canadian Department of Indian Affairs and Northern Development, 1968).

²⁸ Hildebrant-Young and Associates Ltd., The Economic Impact of National Parks in Canada, Vol. II (Ottawa: National and Historic Parks Branch, Canadian Department of Indian Affairs and Northern Development, 1970).

²⁹ A. S. Harvey, M. Foster and T. McNutt, Kejimikujik National Park: Socio-Economic Impact Study (Halifax: Institute of Public Affairs, Dalhousie University, 1974).

³⁰ J. L. Knetsch, "The Influence of Reservoir Projects on Land Values," Journal of Farm Economics, 46 (1964), pp. 231-243.

³¹ J. R. Conner and others, "The Effect of Water Frontage on Recreational Property Values," Journal of Leisure Research, 5 (1973), pp. 26-38; and D. J. Epp, The Economic Impact of Recreational Water Reservoir Development on Land Use, Business Enterprises and Land Values, Bulletin 764 (Pennsylvania: College of Agriculture, Pennsylvania State College, 1970).

goods and services. This effect is probably not significant when considering the establishment of Provincial or National Parks in relatively remote rural areas. Land will not be supply inelastic, and as Ching observed in his study of Pawtucky State Park, there may be "no detectable influence on property values in the surrounding area".³²

Secondly, there is a widespread belief that public land acquisition reduces the local tax base, increasing the burden on other taxpayers.³³ This effect may be offset by park related infrastructure being built in local towns or accelerated private sector development increasing the tax base of the municipality. It is clear that if a park permits the building of private seasonal vacation homes, the tax base can be substantially lowered if the land is withdrawn from municipal taxation, but if it is established in areas with no alternative higher density use or the land is taxed by the municipality, the net tax effects may be negligible or even positive.

Another aspect of recreation development often neglected is the general "status" of the region which is affected both by publicity and the injection of entrepreneurial and management skills into the local economy. Two studies in the United States have investigated this aspect-- Ching conducted an attitudinal survey among residents close to Pawtucky State Park and found the majority of respondents favoured the Park and its users, felt the Park was an asset, and did not perceive any deterioration in the quality of the environment.³⁴ Hinman concluded

³²C. T. K. Ching and G. E. Frick, Economic Effects of Pawtucky State Park III. op. cit., p. 9.

³³D. J. Epp. op. cit.

³⁴C. T. K. Ching and G. E. Frick, The Economic Effects of Pawtucky State Park V. op. cit.

that the majority of people questioned on their reaction to the Whitney Point Reservoir in New York State felt the facility important to their businesses and to their community.³⁵ The only relevant Canadian study revealed in the literature search mirrored these results, with "local residents overwhelmingly in favour of the [Kejimikujik National] Park," and they "would have voted to have the Park in their area."³⁶ One detrimental aspect in this issue which seems common is when prior to park establishment planners forecast high visitation levels and substantial local benefits which are subsequently not realized, and this engenders dissatisfaction in the local population.

The most frequently considered disadvantage (negative secondary impact) of recreation development is the opportunity cost of the displaced resource--the potential net value of the timber, minerals, fisheries, agriculture or other resource use that is foregone--and for a renewable resource, this is a continuing cost. In addition the recreation industry can be vulnerable to economic instability and cyclical fluctuations since it is generally accepted to exhibit high income elasticity. Employment can exhibit high seasonal fluctuation which may mean that the proportional number of full-time jobs that can be filled from regional sources is low, compared with the total positions available at the height of the season.

Low rates of return on capital mainly affect the hotel industry.³⁷ However, in the early stages of outdoor recreation development it is

³⁵R. C. Hinman, op. cit., p. 58.

³⁶A. S. Harvey, M. Foster and T. McNutt, op. cit., p. 51.

³⁷B. Archer, op. cit., p. 12.

unlikely that private enterprise will provide the facilities (both recreational and accomodation) until it is demonstrated that the demand will guarantee an adequate return. Public sector development or capital grants and/or subsidies to private developers are some possible alternatives in the early years of park establishment in order to ensure visitation levels which will generate private sector investment.

Other external costs also occur from outdoor recreation--for instance high visitation levels can imply additional road construction and maintenance costs for the local and provincial authorities. All these effects, both positive and negative, need to be considered in the evaluative framework for studying the impacts of development of outdoor recreation resources.

Recreation and Regional Growth Theory

Tung has provided an extensive review of current regional growth theories in terms of their applicability for evaluation of regional development programs.³⁸ The purpose of this section, therefore, is to highlight the aspects of the theories relevant to this study and the subsequent evaluation of the economic impacts of outdoor recreation using an input-output approach.

Export base theory. The analysis of outdoor recreation impacts using "demand-side" regional models of the ad-hoc Keynesian multiplier, export base or economic base type is initially theoretically attractive because of the predominately export characteristics of the recreation sector--the construction and operation and maintenance expenditures

³⁸F. L. Tung, op. cit., pp. 10-27.

are usually by the Provincial and Federal Governments and local goods and services are usually marketed to out-of-region consumers stimulating the export sector of the local economy.

As an example, the fundamental proposition of export base theory is that regional growth is a function of regional export performance.³⁹

That is:
$$Y_i = f[X_i] \quad (2.2)$$

where Y_i = rate of growth of output in region i, and

X_i = rate of growth of regional exports.

Development and operation of recreation facilities and attraction of out-of-region travellers to these facilities directly increases X_i from the expenditures generated, and therefore regional output (Y_i). The problem with such a simple form of regional income model is that it assumes that exports are the sole autonomous item of expenditure, and all other components of expenditure are functions of income. It neglects both the effects of other possible demand factors--such as autonomous investment-- and, probably more importantly, any capacity constraints that may exist in the supply-side of the economy and the structural differences which affect the input characteristics of different industries and sectors.

Similar types of problems arise with the use of any of these types of multiplier models for impact analysis,⁴⁰ but their application

³⁹H. W. Richardson, Regional Growth Theory, (New York: John Wiley and Sons, 1973), p. 17.

⁴⁰Good discussions of the conceptual and technical difficulties attached to export-base type models are found in W. Isard and others, Methods of Regional Analysis (New York: John Wiley and Sons, 1960), pp. 194-205; P. Sadler, Regional Income Multipliers, Bangor Occasional Papers No. 2 (Bangor: University College of North Wales, 1973), p. 41-66; and J. M. Bryden, Tourism and Development (Cambridge: University Press, 1973), pp. 71-82.

has been reasonably widespread. An example of the use of multipliers derived from economic base models to estimate local impact of recreation is a 1966 study by Nathan.⁴¹ By isolating basic and non-basic employment totals, short run employment impacts resulting from changes in expenditures originating outside local demand servicing sectors were estimated for 376 counties and cities of Appalachia. Other studies of this period have been reported by Clawson and Knetsch,⁴² and a more recent example is provided by Garrison,⁴³ but all suffer from estimation and theoretical problems and the problem of dealing with only one or two parameters in aggregate (for instance, income or employment), which makes interpretation of the results difficult.

Neoclassical models. Applications of neoclassical aggregate growth theory as an interpretation of the process of regional growth, stem largely from the pioneering work of Borts⁴⁴ and Borts and Stein.⁴⁵ This, together with the Harrod-Domar growth model, form the "supply-side" approach and have attracted a large amount of research effort.

The neoclassical model implies a theory of factor mobility in

⁴¹R. R. Nathan and Associates, Recreation as an Industry in Appalachia, Report prepared for the Appalachian Regional Commission (Washington, D.C.: 1966).

⁴²M. Clawson and J. Knetsch, op. cit., pp. 239-244.

⁴³C. B. Garrison, "A Case Study of the Local Economic Impact of Reservoir Recreation," Journal of Leisure Research, 6 (1974), pp. 7-19.

⁴⁴G. H. Borts, "Return Equalization and Economic Growth," American Economic Review, 50 (1960), pp. 319-347.

⁴⁵G. H. Borts and J. L. Stein, "Regional Growth and Maturity in the United States: A Study of Regional Structural Change," Schweizerische Zeitschrift fur Volkswirtschaft und Statistik, 98 (1962), pp. 290-321.

addition to a theory of growth, for the basic assumption of perfect competition means that capital and labour will move in response to differences in factor returns. Such a theory of resource mobility however, may well be inapplicable at the regional level, as may be the other major assumption made--full employment of resources.

Typically, a production function, exhibiting constant returns to scale and of the following form is the basis for the model:⁴⁶

$$Y_i = f_i[K, L, T] \quad (2.3)$$

implying a growth equation of

$$Y_i = a_i k_i + [1 - a_i] n_i + T_i \quad (2.4)$$

where Y_i = rate of growth of output,

a = capital's share of income (or the marginal product of capital) and $[1 - a]$ = labour's income share, assuming constant returns to scale,

k_i = rate of growth of capital,

n_i = rate of growth of labour, and

T_i = rate of growth of technical progress.

Empirical tests of models of this general form at the regional level have been inconclusive and incomplete and, as noted before, the theoretical objections in this type of application are serious.⁴⁷ Furthermore, demand is given a passive role in such models always automatically adjusting to supply, whereas the thrust of development of recreation resources is the reverse mechanism--acting on demand factors to bring about changes in supply conditions and therefore

⁴⁶H. W. Richardson, op. cit., p. 26.

⁴⁷Ibid., p. 27.

regional income and employment. Finally, a disaggregated sectoral approach is difficult and therefore its policy applicability is very limited.

Input-output models. Input-output (and econometric) models are predominately forecasting models "rather than theories of economic growth per se,"⁴⁸ although they do contain precise theoretical elements in terms of production and technical relationships. Regional input-output models require independent forecasts of final demand components--unless the system is completely closed--and, as such, are incomplete theories in themselves. However, as Richardson notes, they are "useful for explaining the repercussions of exogeneously determined growth on the region."⁴⁹

Input-output analysis at the regional level involves a direct application of some form of the standard model:⁵⁰

$$X = AX + F_d \quad (2.5)$$

where X = vector of gross regional output by sectors,

A = matrix of technical coefficients, and

F_d = vector of final demands for the region's products.

From this:

$$X = [I - A]^{-1} F_d = RF_d \quad (2.6)$$

where R = inverse of the Leontief matrix.

⁴⁸H. W. Richardson, op. cit., p. 16.

⁴⁹Ibid.

⁵⁰For discussion of the methodology of input-output analysis, refer to H. B. Chenery and P. B. Clark, Inter Industry Economics (New York: John Wiley and Sons, 1959); W. Isard, op. cit.; and W. H. Miernyk, Elements in Input-Output Analysis (New York: Random House, 1965).

The basic input-output table is a transactions table detailing all inter-industry and final demand linkages. From this table, an input coefficient table is constructed giving the percentages of total economic inputs obtained for each industry from each industry. By inverting this matrix, a table of inverse coefficients representing industry multipliers is prepared. The Keynesian multiplier for the economy as a whole will be the weighted average of the individual sector multipliers. Since recreation expenditures accrue to a number of sectors, the aggregate multiplier will be the multiplier for each sector as described by the Leontief inverse, weighted by the distribution of recreation receipts between the various sectors.

The most common type of input-output model developed for use in regional analysis of recreation impact is the static open model based on current flows only, which assume fixed technical coefficients and no capacity or supply restraints.⁵¹

The main advantage of this type of approach is that inter-industry linkages are specifically traced in determining the disaggregated effects of changes in exogenous demand on regional economic activity. Secondly, and perhaps more importantly, the approach is highly flexible and the limited assumptions of the simple models can be relaxed and the

⁵¹ For instance, see R. C. Kite and W. D. Schutz, The Economic Impact on South Western Wyoming of Recreationists Visiting Flaming Gorge Reservoir, Research Journal No. 11 (Laramie, Wyoming: Agricultural Experiment Station, University of Wyoming, 1967); J. W. Eilert, A Profile and Economic Impact Analysis of Four Cumberland Gap Counties (Memphis: Bureau of Business and Economic Research, Memphis State University, 1968); C. B. Eastwood and others, The Socio-Economic Impacts of the Proposed Potomac National River on the Contiguous Counties, (Ibid. 1969); R. C. Hinman, op. cit.; and W. A. Strang, Recreation and the Local Economy, Technical Report No. 4 (Madison: Graduate School of Business Administration, University of Wisconsin, 1970).

theoretical "realism" enhanced. However, data requirements are extensive, which was instrumental in the use of intersectoral flows analysis in recreation impact analysis by Kalter and Lord in 1968.⁵² No further applications of intersectoral flows analysis have been made, however, in the outdoor recreation field.

Impact Analysis and Recreation Development

As discussed in the previous section, development of outdoor recreation resources stimulates regional growth primarily from the demand side. The majority of stimulus is generated from the exogenous increases in the final demand sector associated with capital and operations and maintenance expenditures by the Government, and visitor expenditures by recreationists attracted to the region. The advantage of analyzing the impacts using input-output analysis, is the detail in which it is possible to follow the linkages involved so that specific effects of the direct, indirect and induced repercussions to the changes in final demand can be identified. In addition, an input-output model can incorporate supply restraints in primary factors of production and provide estimates of the induced capacity effects which result from the expanded demand. These two features have been neglected areas in the analysis of the impact of recreation-tourist facilities.

The analytical method utilized in this study for impact analysis is a dynamic input-output simulation model which has been developed for the Interlake region by MacMillan⁵³ and Tung,⁵⁴ based on regional

⁵²R. J. Kalter and W. B. Lord, "Measurement of the Impact of Recreation Investments on a Local Economy," Journal of Farm Economics, 50 (1968), pp. 243-246.

⁵³J. A. MacMillan, C. Lu and C. F. Framingham, op. cit.

⁵⁴F. L. Tung, op. cit.

accounts built up for the area from 1968 survey data. A description of the model is contained in Chapter 4.

Consistent with this approach, all the annual sectoral changes in the regional final demand vectors associated with the outdoor recreation development program at Hecla Provincial Park need to be established. While this information can be generated for the Government sector, no data on annual visitation or sectoral visitor expenditures--changes in the export vector--had been collected or could be interpolated from secondary data sources. The Hecla Provincial Park Visitor Survey was conducted during the summer of 1975 to fill this primary data gap, and is discussed in the next chapter.

CHAPTER 3

THE HECLA PROVINCIAL PARK VISITOR SURVEY

Income and employment impacts of any regional development program are generated by three components--the initial capital expenditure in infrastructure, any associated on-going expenditure, and the resulting increase in regional sales. Generally, data on capital and operating expenditures of any program are readily available, but information on the third component, increased regional sales, is nearly always non-existent. To calculate the increased agricultural output resulting from a drainage or land clearing program, or the increase in regional exports associated with visitors to a new park, primary data collection surveys are usually required.

The specific rationale for the Hecla data collection program, therefore, was to provide the visitor expenditure data needed for complete evaluation of the FRED and Provincial Government development program at Hecla Provincial Park, in terms of the FRED program objectives and the Manitoba Government's regional development objectives. It was decided, however, in view of the paucity of information available on characteristics of outdoor recreationists, that the scope of the survey could be extended to provide a prototype for further data collection programs in the recreation field, both by the University and the Manitoba Department of Tourism, Recreation and Cultural Affairs. The survey was designed to meet the requirements of being:

1. Relatively inexpensive,

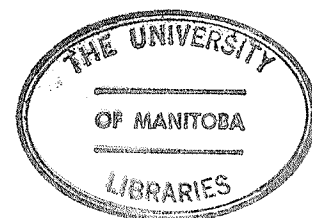
2. Easily administered,
3. Able to provide individual park information as well as regional/provincial averages, and
4. Readily adaptable to other situations in a relatively unmodified form. (This would provide the necessary consistency in provincial-wide data collection programs.)

Furthermore, the information gathered during the survey covered more than the specific data needs of this study, since the data base could then be of benefit to other researchers. For instance, it was developed to:

1. Provide a data baseline for appraisal of the Hecla development prior to the proposed Lodge resort complex due to be completed in the fall of 1976.

2. Provide a data link with recreation demand analysis studies currently being undertaken in the Department of Agricultural Economics at the University of Manitoba and the Manitoba Department of Tourism, Recreation and Cultural Affairs. It therefore specifically relates user patterns with the socio-economic characteristics of users enabling refinement of the sketchy data currently available.

3. Enable integration of the results with other studies in order to extend, strengthen or suggest modifications to previous results. Earlier studies include: The Canadian Travel Survey, 1971; the 1971 Winnipeg Survey by the Manitoba Department of Tourism, Recreation and Cultural Affairs; demand study surveys by Parks Canada; and impact surveys by the Manitoba Department of Tourism, Recreation and Cultural Affairs.



The objective of the survey therefore included a general investigation into survey design for outdoor recreation data collection programs, and the provision of a comprehensive data base on visitors to Hecla Provincial Park, which would be useful in a wide variety of research applications.

This chapter describes the visitor survey that was carried out at Hecla Provincial Park over the summer of 1975 in terms of the survey design and sampling procedure employed, the questionnaire design, survey implementation and results.¹

Survey Design and Sampling Methodology

While there are many acknowledged authorities on survey procedures, design and sampling techniques, the majority of these relate to specifying a sampling frame where the characteristics of the target population are known or can be broadly estimated. Surveys of users of outdoor recreation facilities in Manitoba, however, suffer from the disadvantage that the target population characteristics are generally poorly understood and/or the expected variance in response to particular types of questions is unknown. This influences the data collection technique adopted, and the sampling procedure.

Method of data collection. There are seven commonly employed methods of data collection: use of physical evidence, use of mechanical and electronic devices, use of existing documents, observation, telephone surveys, self-administered surveys and interview surveys.

¹A more detailed exposition is found in N. Brown, S. Lyon, and J. A. MacMillan, Hecla Provincial Park: Data Collection Procedures and Analysis of Recreation Usage. Research Bulletin No. 76-2 (Winnipeg: Department of Agricultural Economics, University of Manitoba, 1976).

Of these seven, only the latter two are considered suitable for the purpose of obtaining park visitor information.²

The personal contact between interviewer and respondent gives the interview survey the advantages of flexibility and a high response rate. The main disadvantage of this technique (other than those of time requirements and cost) lies in the danger of biased results due to a poorly trained interviewer.

The self-administered questionnaire has several advantages. The impersonal nature of the questionnaire ensures uniformity from one situation to another; respondents have confidence in their anonymity and time to consider and discuss a difficult question; administration of the survey need not interfere with the operation of the recreation area; and it requires less skill, manpower and expense to administer than does a personal interview.³ The main disadvantage is the relatively low rates of response that are usual.⁴

The self-administered questionnaire was chosen for the Hecla Provincial Park data collection after consideration of its advantages, disadvantages, and the administrative and financial resources available for this and other similar surveys.

²T. J. Kovacs, Self-Administered Park Visitor Survey Technique: Canadian Outdoor Recreation Demand Study, Technical paper No. 1 (Ottawa: National and Historic Parks Branch, Department of Indian Affairs and Northern Development, 1971).

³D. Crapo and M. Chubb, Recreation Area Day Use Investigation Techniques: Part 1. A Study of Survey Methodology (East Lansing: Recreation Research and Planning Unit, Department of Park and Recreation Resources, Michigan State University, 1969), p. 22.

⁴T. L. Burton and P. A. Noad, Recreation Research Methods: A Review of Recent Studies (Birmingham: Centre for Urban and Regional Studies, University of Birmingham, 1968), p. 18.

Sample size. The sample size is governed by the way in which the responses are to be analyzed. Since information is to be collected on a number of different variables, the sample size must be calculated to yield the desired information (i.e. an adequate number of responses) on those questions which have answers of least reliability and greatest diversity. In order to make this calculation, the variability of the target population must be known. There is little previous research available on which to base a calculation of this kind. The Michigan study of day-use activities and socio-economic characteristics estimated a minimum response of 385, while a similar study in Washington State, which concentrated on expenditure information, required five hundred completed responses per stratum.⁵

Hecla procedure. For the Hecla study, a census approach was adopted due to restriction on time and personnel availability, and lack of a priori response and variance information. The survey was conducted by self-administered questionnaires being handed out to all recreational vehicles at the Park entrance on every day between July 28 and September 1, 1975, inclusive.⁶

Questionnaire Design

There is little information on the design of questionnaires specific to outdoor recreation. Crapo and Chubb found that the proportion of potential respondents replying to a questionnaire depended

⁵D. Crapo and M. Chubb, op. cit.; and W. B. Beyers, op. cit. Refer to Appendix VI for details of the calculations.

⁶The 1975 Park season was from May 14 to September 22. It was estimated that 33 percent of the total seasonal visitation (46,190 visitor days) occurred during the survey period (Appendix IV).

upon the:

1. Population being surveyed,
2. Subject of the survey,
3. Sponsorship of the survey,
4. Questionnaire length,
5. Attractiveness of the questionnaire, and
6. Ease with which the questionnaire can be completed and returned.⁷

Based on the above, the Hecla questionnaire incorporated the following characteristics designed to elicit the highest rate of response:⁸

1. Attractiveness, simplicity and appearance of brevity to stimulate and maintain co-operation and interest of respondent. The Hecla questionnaire was blue and although it consisted of twenty-three questions, the format (9½" x 6¼") did not give an impression of length. Design and order of questions was such that the initial questions were easily and quickly answered, and respondent involvement was maximized before the "sensitive" questions were reached.

2. The questionnaire was on "heavy" card stock so no additional support was required for writing and a pencil was initially handed out with the forms to facilitate completion.⁹

3. The questionnaire was distributed at the entrance to the Park and collected by means of a deposit box at the exit. A return

⁷D. Crapo and M. Chubb, op. cit., p. 85.

⁸A copy of the questionnaire is included in Appendix II.

⁹Pencils were handed out for the first two days of the survey only. Gate attendants reported that most people were indifferent to whether a pencil was included with the form or not, and the completed response rates did not appear to be affected.

mailing address was included on the form in the event that the questionnaire was not deposited at the Park exit.¹⁰

The questionnaire (see Appendix II) was designed to gather information in four major categories which make up the data base.

The four categories were:

- (a) Socio-economic and group description data of visitors,
- (b) Details of total trip,
- (c) Details of Hecla Park visit,
- (d) Expenditure data--relating both to the Interlake and, more specifically, Hecla Provincial Park.

These four categories and their relevant questions are shown in Figure 3.1. Cross linkages between all categories are possible, isolating particular relationships needed as input for analysis in such areas as recreation impact, demand, use projection, and development evaluation.

Category A: Socio-economic and group data. Consistent with other outdoor recreation surveys, such as the Canadian Outdoor Recreation Demand (CORD) studies, details on the socio-economic characteristics of the population were given by sex and age (11), occupation (12), education (13), and income (14).¹¹ This provides the necessary data for grouping and projection analysis. Secondly, details of the party visiting the recreation resort are important, in relation to both planning and economic evaluation objectives. The questionnaire (2 and 3)

¹⁰Note that the provision of pre-paid mailing on the questionnaire tends to reduce the response rate when a voluntary deposit retrieval system is used. (D. Crapo and M. Chubb, op. cit., p. 85.)

¹¹Bracketed numbers refer to specific questions in the questionnaire--see Appendix II.

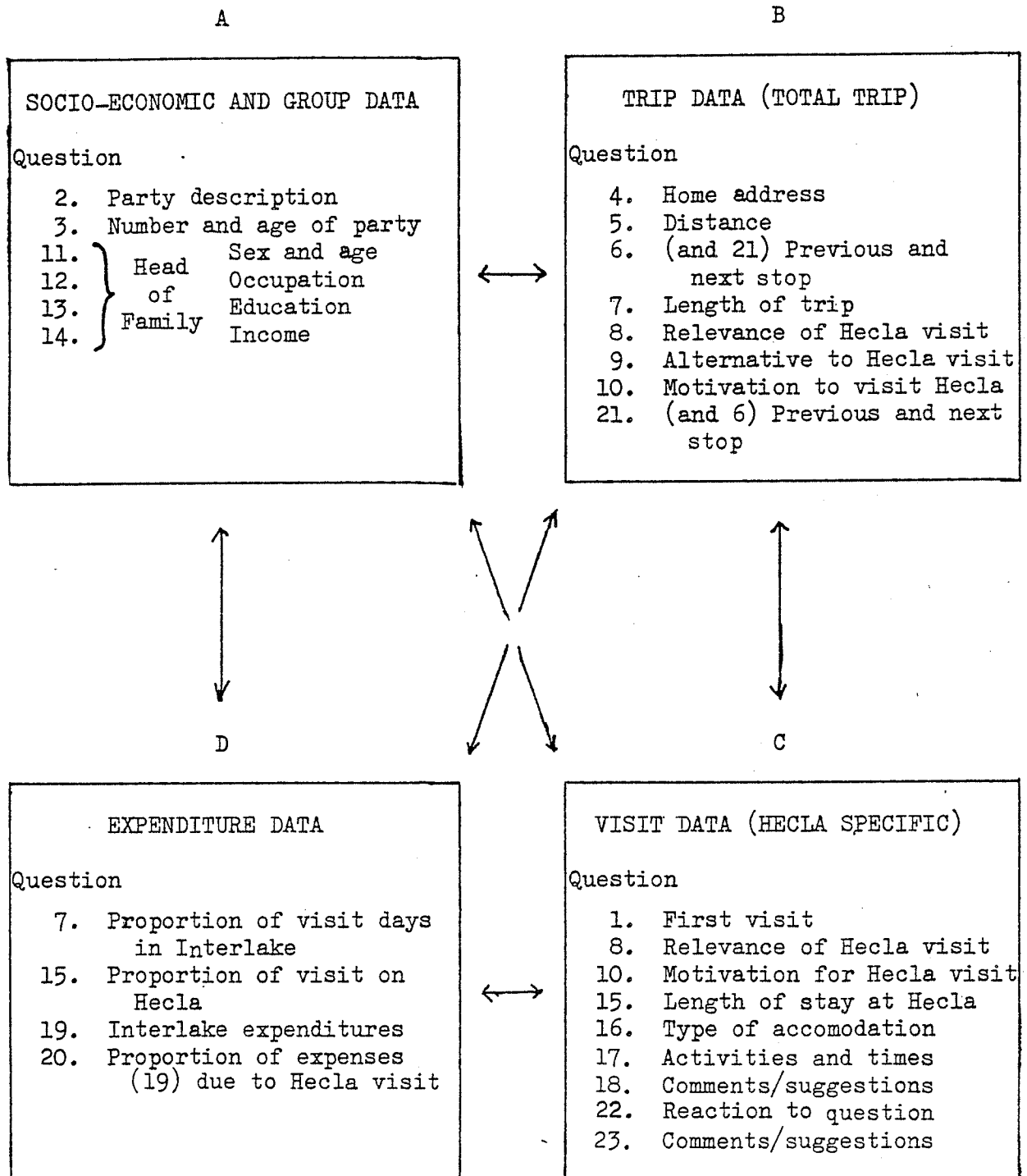


Figure 3.1

Data Categories and Linkages

provided details of the type of party and the number and ages of the members.

Information from CORD surveys at Interlake locations undertaken during 1970, is given in Table 3.1. Parties of one family with children or one couple only, made up approximately 60 percent of site visitation in the Interlake, while two family parties comprised an additional 10 percent. With these two questions therefore, socio-economic data could be obtained from parties which account for approximately 70 percent of the visiting population. The main party groupings for which no information would be provided were "Group of Friends," "Organized Group," and "Other." Even if occupation, income and education data could have been obtained on each individual in such groups--and this would imply an extensive increase in the complexity of the questionnaire and survey procedure--it is doubtful whether any meaningful analysis could result further than that achieved by knowledge of their numbers and ages (3).

Category B: Trip data. Questions in Category B requested information on the type of trip the party was undertaking when it visited Hecla Provincial Park. The prime areas of importance were:

1. Home of visitors (4),
2. Previous overnight stop and subsequent overnight stop before and after visiting the Park (6 and 21),
3. The inducement to visit Hecla Provincial Park (10),
4. The effect of Hecla Provincial Park on visitation at alternative recreation sites (9), and
5. The importance of Hecla Provincial Park in the total trip context (8).

Table 3.1

Group Composition of Parties Visiting
Interlake Recreation Areas—1970

Location	Percent of Total Parties	One Family With Children	Two Families With Children	One Couple Only	Group Of Friends
		.....percent.....			
Hnausa Beach		50.0	16.7	9.7	10.5
Hecla Island		54.3	10.4	14.6	8.5
Lundar Beach		48.3	15.0	16.7	8.3
St. Ambroise		51.8	7.6	16.2	12.2
Watchorn Bay		54.9	14.1	8.7	10.3
Winnipeg Beach		43.3	5.8	21.7	9.2

Source: Manitoba, Department of Tourism, Recreation and Cultural Affairs: Various surveys. No further details of these surveys, such as response rates or comparative analysis of results, are currently available. The main conclusion from this table relates to the dominance of family parties visiting Government Interlake recreation areas in 1970.

Combinations of questions can give information on the distance visitors travelled to Hecla Provincial Park (one form of "benefit" measurement) and the effect of the creation of new recreation sites on alternative existing sites in the Province.

Category C: Visit data. The data base on actual visitation to Hecla Provincial Park included some of the data from Category B (8 and 10) and provides additional sub-category information in the areas of length-of-stay/accomodation (6 and 15) and activity (17). This data is of little importance for itself, but combined with other category base data, can be used in evaluation and projection analysis.

Category D: Expenditure data. Actual party expenditures by type of establishment were requested in Question 19. This identified consumption expenditures made in the Interlake on the trip and estimates of the importance of Hecla Provincial Park could be made from details on the proportion of time in the Interlake which was spent at the Park (7 and 15). Also, a straight percentage estimate of expenditure allocations (20) was requested as a cross-check. This information was vitally important for the impact analysis and evaluation of the Hecla Provincial Park project.

Data category linkages. Many of the study objectives were realized by correlation analysis using data from two or more categories. The linkages between socio-economic and group characteristics, trip data, visit data, and expenditure patterns enabled detailed specification of the situation with regard to Hecla Provincial Park operations in 1975, and could provide the basis for research into other areas such as demand analyses.

Survey Implementation

Method of delivery. The questionnaire was handed out by the gate attendant to all cars at the entrance to Hecla Island Provincial Park from July 28 to September 1, 1975 inclusive. The attendants encouraged participation from the visitors by a general introduction to and explanation of the purpose of the questionnaire.¹² Pencils were initially provided with the questionnaire but this was discontinued after two days as visitors declined them.

Park attendants also date-stamped the cards prior to delivery, and completed a daily "Hecla Gate Report Sheet" (see Figure 3.2). This made it possible to place respondents in strata according to entry day, and to compare the number of questionnaires delivered with traffic counter readings. Questionnaire numbering also allowed a variety of checks to be made on each questionnaire (respondent) as an individual entity.

Method of retrieval. A collection box for questionnaires was provided at the Park exit, bearing the sign: "Please Deposit Park Use Card Here." A warning sign: "Please Deposit Park Use Card at Park Exit in Seven Miles" was also erected on the exit road. The date of retrieval was stamped on the questionnaires by the park gate attendants who cleared the box daily.

¹²A pre-survey meeting was held with all Park staff concerned, to outline objectives and discuss possible operational problems and solutions. Also, a small pilot-survey was conducted during June with cards being handed to approximately one hundred campers over one week. This was of the mail-back type, since no retrieval box had been erected, and elicited a response rate of just under 50 percent.

Figure 3.2

Hecla Gate Report Sheet

Week Commencing Monday / /75

	Opening Time a.m.	Closing Time p.m.	Card Number Start	Card Number Finish	Estimated No. of Non-Commercial Vehicle Refusals	WEATHER CONDITIONS: 12 Noon				Special Events Or Other Comments
						Temperature Low Average High	Cloud Clear Partly Cloudy Overcast	Rain None Light-Mod. Mod.-Heavy	Wind None Light-Mod. Mod.-Strong	
MONDAY										
TUESDAY										
WEDNESDAY										
THURSDAY										
FRIDAY										
SATURDAY										
SUNDAY										

Some questionnaires were returned directly to the park attendants in the camping area, and others were returned by mail. Stamped addressed envelopes were available upon request.¹³

Table 3.2 indicates the number of questionnaires handed out, and the number returned. A total of 2,181 were distributed, 1,051 (48 percent) of which were returned. Table 3.3 identifies the method of retrieval and completeness of the response --74 percent were fully completed and less than one percent were unuseable.

This result compares very favourably with similar surveys conducted in the United States and Canada. The Michigan study experienced return rates of 32.5 percent to 48 percent, and completion rates of 24.5 percent to 31.5 percent. The Canada wide 1969 CORD Study Park Visitor Survey had widely fluctuating response, but Kovacs reports 33 percent to 55 percent in one Province,¹⁴ and the five Manitoba campground surveys had response rates varying from 30.8 percent to 48.7 percent with a mean of 38.3 percent.¹⁵ Furthermore, the Canadian examples quoted used ten question, two-sided card forms, considerably shorter than the questionnaire shown in Appendix II. This confirms the importance of questionnaire appearance, layout and apparent brevity in achieving high overall response rates.

¹³These envelopes used postage stamps rather than reply-paid frank marks, since this has been shown to elicit higher response rates (T. L. Burton and P. A. Noad, op. cit., p. 20).

¹⁴T. J. Kovacs, op. cit., p. 17-18.

¹⁵Manitoba, Department of Tourism, Recreation and Cultural Affairs, Campground Impact Study, 1971: Spruce Woods and Grand Valley, op. cit.; and Campground Impact Study: Pinegrove Halt, Norquay Beach and Virden Park, op. cit.

Table 3.2
Hecla Recreation Survey;
Questionnaire Distribution and Return

Date 1975	Card No. Start	Card No. Finish	Additional Card No.'s Distributed	Total Number Distri- buted	Number Returned	Percent Returned	Traffic Counter Reading
28/7	1513	1594		82	48	59	149
29/7	1601	1681	1595, 1596	83	46	55	160
30/7	1682	1747		66	29	44	140
31/7	1748	1802		55	21	38	134
1/8	1803	1953		151	77	51	246
2/8	1954	2156		203	103	51	330
3/8	2157	2427	6000	272	113	42	412
4/8	2428	2525	1494	99	70	71	197
5/8	2526	2612		87	48	55	182
6/8	2613	2673		61	31	51	167
7/8	2674	2683		10	7	70	137
8/8	2684	2734		51	28	55	158
9/8	2736	2760	6001, 1491	27	19	70	191
10/8	2761	2844		84	50	60	325
11/8	2854	2920		67	33	49	146
12/8	2921	2967		47	23	49	117
13/8	2968	3011		46	28	64	116
14/8	3012	3058		47	30	64	126
15/8	3059	3113		55	26	47	193
16/8	3114	3215		102	32	31	187
17/8	3216	3333		118	43	40	213
18/8	3334	3367		33	6	18	103
19/8	3368	3406		39	4	10	126
20/8	3407	3512	(28 undistributed)	78	36	46	102
21/8	3513	3536		24	11	46	88
22/8	3537	3547		11	4	36	137
23/8	3548	3574		27	12	44	131
24/8	3575	3604		30	16	53	152
25/8	3605	3614		10	7	70	63
26/8	3615	3642		28	12	43	83
27/8	3643	3655		13	--	0	77
28/8	3656	3666		11	1	9	80
29/8	3667	3691		25	16	64	113
30/8	3692	3700		9	4	44	174
31/8	3701	3726		26	17	65	305
1/9	3727	3732		6	--	0	
TOTAL				2181	1051	48	

Table 3.3

Method of Retrieval of Questionnaire
and Completeness of Response

Strata	Number of Completed Responses	Method of Retrieval of Questionnaires				Completeness of Response ^a						
		Deposited in Box at Park Exit	Handed in to Campground Attendant	MAILED		C.1	C.2	C.3	C.4	C.5	C.6	C.7
				Pre-Stamped	Not Pre-Stamped							
1. Day Use, Monday to Thursday	266	254	0	2	10	171	6	1	3	58	27	0
2. Day Use, Friday	20	20	0	0	0	12	0	0	0	6	2	0
3. Day Use, Saturday to Sunday Holiday	340	328	1	0	11	230	18	0	2	50	37	3
4. Overnight, Monday to Thursday	155	125	23	1	6	134	3	0	1	10	7	0
5. Overnight, Friday	104	90	9	0	5	95	1	0	0	7	1	0
6. Overnight, Saturday to Sunday Holiday	156	144	12	0	0	131	4	0	0	16	5	0
7. Unknown Length of Stay	10	10	0	0	0	0	0	0	0	0	5	5
TOTAL	1,051	971	45	3	32	773	32	1	6	147	84	8
Percentage of total returned Questionnaires		92.0	4.0	^b	3.0	74.0	3.0	^b	^b	14.0	8.0	^b

^aCode: C.1--All questions complete.
C.2--Category A, partially complete, otherwise complete, see Figure 3.1.
C.3--Category B, partially complete, otherwise complete, see Figure 3.1.
C.4--Category C, partially complete, otherwise complete, see Figure 3.1.
C.5--Category D, partially complete, otherwise complete, see Figure 3.1.
C.6--Partially complete in more than one category but usable.
C.7--Unusable response.

^bLess than 1.0 percent.

The total number of responses (1,051) also represents the largest data base sample for a single recreation site in Manitoba. It is approximately three times the size of previous samples¹⁶ and thus will give a deeper insight into many aspects of the total visitor population.

Survey Results

In total, the survey collected data from 626 day-use and 415 camping parties.¹⁷ Complete tabulation of the responses to all questions is contained in Appendix III, the percentages calculated reflecting Non-Respondents as one category of response. Appendix V discusses these responses in terms of data stratification, non-response bias and confidence limits for the expenditure data. It was concluded from a comparison of certain aspects of the camping survey data with the total camping population as defined by the camping permits issued by the Manitoba Department of Tourism, Recreation and Cultural Affairs at Hecla Provincial Park during the survey period, that the non-response bias in this stratum is probably minimal. No similar comparison for analysis of non-response in the day-use stratum was possible.

In retrospect, the response rate to the survey was encouraging and reflected a willingness on the part of park users to participate in the research project. However, from the data compilation, it is clear that certain questions on the park use card could have been re-worded or rephrased such that the question was less confusing and

¹⁶Obtained from the surveys listed in the previous footnote.

¹⁷Ten of the respondents could not be classified as either day-use or camping.

response easier (a lower "Non-Response" rate per question), or the information obtained more meaningful. The recommended changes to the form are summarized in Appendix II to enable the appropriate adjustments to be made for further surveys of this type.

Recreation Expenditures in the Interlake Economy

Survey respondents made the following total expenditures in the Interlake area because of their visit to Hecla Provincial Park:¹⁸

Stratum	Number of Respondents Analyzed	Total Expenditures
Day-users	428	\$3,778
Campers	360	\$12,725

This is equivalent to an average daily expenditure of \$8.83 per day-use party (\$2.52 per person) and \$16.07 per camping party night (\$4.73 per person).¹⁹ Extrapolation of this expenditure pattern to the total visitor population (46,190 visitor days; refer Table IV.2) gave an estimate of total Interlake expenditures by recreationists visiting Hecla Provincial Park during 1975 of \$154,000 (Table 3.4).

¹⁸ Overnight recreational parties which stayed elsewhere in the Interlake and made a day-visit to the Park were asked the proportion of their total Interlake expenditures (Question 19) which could be attributed to their Hecla Park visit (Question 20). This proportion is the amount included in the expenditure listed.

¹⁹ Appendix V contains an analysis of the confidence intervals for these two estimates. The per party Interlake expenditures were calculated to be \$8.83 ± \$1.15 for day-users, and \$35.35 ± \$2.97 for campers with a confidence level of 80 percent.

Table 3.4

Estimated Interlake Expenditures by Recreationists
Visiting Hecla Provincial Park, 1975^a

Category	Interlake Sector ^b	Day Users	Campers	Total
		.....dollars.....		
Park Entrance and Camping Fees	19	8,445	20,020	28,465
Motel, Hotel and Other Lodging ^c	19	--	4,545	4,545
Restaurants: Food and Drink	16	15,030	5,610	20,640
Retail: Food and Beverage	10	13,260	20,135	33,395
Clothing and Shoes	13	1,955	2,675	4,630
Outdoor Equipment Purchase	11	5,235	3,365	8,600
Other General Merchandise	11	2,825	2,520	5,345
Fuel and Automobile Services	12	21,180	17,100	38,280
Outdoor Equipment Rental	11	500	1,550	2,050
Other ^d	19	5,190	2,815	8,005
TOTAL^e		73,620	80,335	153,955

^aAverage daily expenditure patterns of the survey respondents (\$8.83 per day use party and \$16.07 per camping party) have been applied to the estimated total visitor population. Refer to Appendix IV for the procedure used to calculate total visitation to Hecla Provincial Park during 1975 using traffic analysis and survey information.

^bSee MacMillan, et.al., op.cit., pp. 140-144. The names of the relevant sectors are as follows: 10--Food Stores; 11--Other Retail; 12--Auto Products, Sales and Service; 13--Apparel and Shoes; 16--Personal Service; 19--Government. The transactions table defined by this study for the Interlake economy measured 26 x 26.

^cSome overnight users who stayed in the Rental Cabins at the Park included their fees in this category.

^dMainly consisted of golf fees. Other types of expenditures were allocated to the appropriate sectors during data compilation. The total expenditures in the Government sector (19), therefore, consist of park entrance, camping and rental cabin fees and charges for use of the golf course and hire of golfing equipment.

^eAppendix V calculates the confidence interval for the per party expenditure data used in this table. Given that the estimate of total visitation in Appendix IV is correct, it can be concluded with a probability of 0.8 that expenditures in the Interlake during 1975 totalled \$73,620 ± \$9,590 by day users and \$80,335 ± \$6,750 by campers.

Comparison of these results with other studies is extremely difficult and of little validity because of the wide range of expenditure categories used by researchers, differing population samples, and the definition of the regions within which the expenditures were made. The tabulation of the percentage distribution of visitor expenditures by category for both United States and Canadian studies (Table 3.5) does, however, show a high degree of consistency even though the surveys were widely variant in nature.

With regard to the actual expenditure levels, camper-expenditures from two other Manitoba impact studies are shown in Table 3.6. The Hecla result of \$16.07 per party-night spent in the Interlake is understandably much higher than these figures due to inflation and the larger regional definition (encompassing around 90 percent of the total trip for a Winnipeg visitor).²⁰ The Hecla data also compare favourably with the results of a visitor expenditure study conducted at five visitor centres in Manitoba in 1971. Total camper expenditure per party per day varied from \$10.16 to \$15.96 (\$3.91 per person to \$4.83 per person) which is in the range of this study's findings.²¹

Expenditure data for day-users is virtually non-existent, and no surveys could be located with which meaningful comparison to this study could be made.

²⁰The 1971/72 results of between \$6.11 and \$11.25 are equivalent to 1975 expenditures of \$8.26 to \$15.22 after adjustment by the consumer price index. The real difference between these estimates and the Hecla survey figure of \$16.07 is therefore small considering the difference in regional definition.

²¹See D. Wang, A Review of Expenditures by Park Visitors, Paper presented to the Canadian Outdoor Recreation Research Committee Meeting, Charlottetown, Prince Edward Island (Winnipeg: Research and Planning Division, Manitoba Department of Tourism, Recreation and Cultural Affairs 1975), p. 14. These 1971 results are equivalent to 1975 daily expenditures of \$14.07 to \$22.10 per party after adjustment by the consumer price index.

Table 3.5

Percentage Distribution of Visitor Expenditures
U.S. and Canadian Surveys

	Food	Lodging	Transportation	Other
Average of 6 U.S. National Parks ^a (1950-1956)	35.4	27.1	20.0	17.5
Average of 13 U.S. State Travel Surveys ^a (1949-1960)	31.6	22.9	22.8	22.7
Average, All U.S. Surveys ^a (1949-1960)	32.8	24.2	21.9	21.1
Average of 16 U.S. State Surveys ^b (1959-1963)	26.6	22.4	23.7	27.3
Quebec Campers ^c	33.2	13.2	36.7	16.9
Ontario Campers ^c	44.0	18.9	19.4	17.7
Manitoba Seasonal Campers ^c	40.0	13.1	35.2	11.7
Manitoba Campers ^d	40.0	21.8	31.0	7.2
Hecla Visitors ^e	34.8	22.2	24.5	18.5

^aSource: M. Clawson and J.L. Knetsch, Economics of Outdoor Recreation, Baltimore, John Hopkins, 1966, p. 235.

^bA.D. Little, Tourism and Recreation, U.S. Department of Commerce, Washington, D.C., 1962, p. 30. (Quoted in B. Archer, The Impact of Domestic Tourism, Occasional Papers No. 2; Bangor, University College of North Wales, 1973).

^cD. Wang, A Review of Expenditures by Park Visitors, Paper presented to the Canadian Outdoor Recreation Research Committee Meeting, Charlottetown, Prince Edward Island, May 14, 1975, p. 22.

^dSee Table 3.6

^eSee Table 3.4

Table 3.6

Camper Expenditures per Party-Night at Five
Manitoba Provincial Campgrounds, 1971-1972

Expenditure	Pinegrove Halt ^a	Norquay Beach ^a	Virden ^b	Spruce Woods ^a	Grand Valley ^a
	.....dollars.....				
Park Entrance	0.99	2.29	1.94	1.58	2.46
Other Accommodation	--	0.06	0.05	0.04	0.04
Restaurants	1.15	0.45	0.80	0.29	0.50
Groceries	1.76	1.51	2.27	1.79	2.67
Transportation	2.63	2.70	3.19	1.42	3.50
Retail Stores	0.51	1.21	0.63	0.38	0.96
Amusement	0.06	0.23	0.36	0.40	0.28
Other	0.07	0.22	0.88	0.21	0.84
TOTAL	7.17	8.67	10.12	6.11	11.25

^aExpenditures within 10 miles of the campground.

^bExpenditures in the town of Virden.

Source: Manitoba Department of Tourism, Recreation and Cultural Affairs, Campground Impact Study 1971: Grand Valley, Spruce Woods, Report No. 87, Winnipeg, 1972, pp. 14-15; Manitoba Department of Tourism, Recreation and Cultural Affairs, Campground Impact Study: Pinegrove Halt, Norquay Beach, Virden Park, Report No. 127, Winnipeg, 1973, pp. 11-14. No details on the quality of the data base have been published.

CHAPTER 4

IMPACT METHODOLOGY

The first section of this chapter briefly describes the dynamic input-output simulation model developed by Fu-Lai Tung for the analysis of program impacts in the Interlake region. This model was the analytical method through which the income and employment impacts of recreation development programs on the Interlake economy were calculated in this study. The second section discusses the direct effect on the regional economy of each of the impact variables and how they were incorporated into the simulation model to estimate the magnitude of total regional impacts.

The Input-Output Model

The dynamic input-output model developed by Fu-Lai Tung for simulating the effect of resource development programs on the Interlake economy is fully described in his thesis¹ and summarized in a published paper.² It is dynamic extension of a static twenty-six sector input-output model (seventeen intermediate sectors with nine payment and eight final demand sectors) developed by MacMillan, Lu and Framingham from a set of regional accounts established for the Interlake region

¹F. L. Tung, op. cit., pp. 52-137.

²F. L. Tung, J. A. MacMillan and C. F. Framingham, "A Dynamic Model for Evaluating Resource Development Programs," American Journal of Agricultural Economics, Volume 58 (August, 1976), pp. 403-414. See also J. A. MacMillan, C. Lu and C. F. Framingham, 1975 op. cit. for a detailed description of the development of the 1968 static model.

based on 1968 survey data. The following brief synopsis of the dynamic model serves to introduce the analytical method for impact analysis.

The normal static input-output model can account for direct, indirect and induced effects in the economy arising from a change in autonomous demand. Direct impacts relate to sales generated in sector i from changes in expenditure in one or more of the final demand categories of sector i . These sectoral impacts in turn generate further sales effects in remaining sectors of the economy--indirect effects--and when the additional income generated in the household sector is respent (the household sector being made endogenous), induced impacts are generated.

Such an analysis however assumes stable technical relationships within and between sectors, and no supply constraints in natural resources or in factor markets. Since the primary purpose of resource development programs is to change the regional production structure, it is the purpose of the dynamic approach to close the system in such a way that the interdependence coefficients and resource constraints are explicitly included within the input-output model framework. For instance, in order to produce the additional goods and services generated from the indirect and induced effects noted above, the producing sectors need to increase their output which either involves better utilization of existing production capacity or expansion of capacity. This effect is termed the induced capacity effect.

The dynamic input-output model consists of seven submodels:-

1. Final Demand. Final demands are projected independently for the government sector, and "other" final demand sectors. The relevant vector is:

$$FD_{it} = HD_{it} + GD_{it} + ED_{it} + UD_{it} + ID_{it} + INV_{it} \quad (4.1)$$

($i = 1, \dots, 17; \quad t = 0, \dots, T$)

where

$FD_t = [FD_{it}]$	the final demand including household, government, exports, net inventory changes, unallocated and investment sectors for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence FD_t is a vector for each t ;
$HD_t = [HD_{it}]$	the household consumption for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence HD_t is a vector for each t ;
$GD_t = [GD_{it}]$	the government expenditure for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence GD_t is a vector for each t ;
$ED_t = [ED_{it}]$	the export demand for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence ED_t is a vector for each t ;
$UD_t = [UD_{it}]$	the unallocated final demand for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence UD_t is a vector for each t ;
$ID_t = [ID_{it}]$	the investment demand for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence ID_t is a vector for each t ;
$INV_t = [INV_{it}]$	the net inventory changes for sector i in year t ($i = 1, \dots, 17; \quad t = 0, \dots, T$), hence INV_t is a vector for each t .

2. Trading Coefficients. The trading coefficients for the agricultural sectors are adjusted over time by predicting changes in the distribution of farm numbers by size class using a modified Markov process, and then utilizing the known input purchasing and sales patterns for each size class. All other sectoral interdependence coefficients are assumed constant.

3. Primary Input Requirement Coefficients. The land and labour requirements for the agricultural sector are adjusted over time to allow

for the influence of technological change. No changes are made to non-agricultural sector coefficients.

4. Capital Coefficients. Firstly capacity and capacity changes are determined consistent with changes in gross output and these are interpreted in terms of the expansionary and replacement capital investment required to meet the realised gross output.

5. Primary Resource Constraint. Conceptually, each of the factors of land, labour and capital should be considered as possible constraints to economic growth. In this model, a land constraint is applied to the agricultural sector, a labour constraint to all sectors consistent with population projections, and capital is assumed to be non-constraining.

6. Realised Gross Output Determination. This involves two steps. Firstly, demand determined gross output by sector consistent with final demand is estimated by solving the system

$$FX_t = (I - A_t^* - BB^* - DD^*)^{-1} FD_t$$

where FX_t = vector of gross regional output by sector in year t ,

$$(t = 0, \dots, T)$$

A_t^* = matrix of trading coefficients and average propensity to consume by sector in year t

FD_t = vector of final demands for the region's products in year t

B = expansion capital coefficient matrix

B^* = diagonal matrix containing the ratios of changes in capacity to gross output

D = replacement capital coefficient matrix

D^* = diagonal matrix containing the ratios of capacity to gross output

Secondly, supply determined maximum output by sector consistent with resource constraints (agricultural land and labour) is estimated. Realised gross output is the minimum of the above summed over each sector.

7. Impact Determination. The impact determination submodel amalgamates the information from submodels 1 through 6 generating estimates of area income; government revenue; land, labour and gross fixed capital requirements; and primary resource utilization rates.

The simulation procedure is to predict the values of the economic indicators in two separate runs of the model (Figure 4.1)--one with no resource development programs included and the second incorporating the direct effects of the programs in the final demand vectors and primary resource constraints. The difference between the two measures the impact of the programs on the development indicators.

In the long run, local investment and government operations may also be considered responsive to a change in local economic activity, the extent of this response depending on the relative magnitude of the changes. These effects are not, however, included in this model.

Tests of the efficacy of the model have been conducted by Tung, who compared aggregate results of projections for 1971 and historical observations for the same year.³ While agricultural output was overestimated by approximately 8 percent, a difference of this magnitude was explained by the government's program to reduce wheat acreage, introduced in 1970, and the poor weather conditions which reduced crop yields in 1971. The estimates for non-agricultural output were "very close to the actual output."⁴ As more data for the

³F. L. Tung, op. cit., pp. 296-300. ⁴Ibid., p. 298.

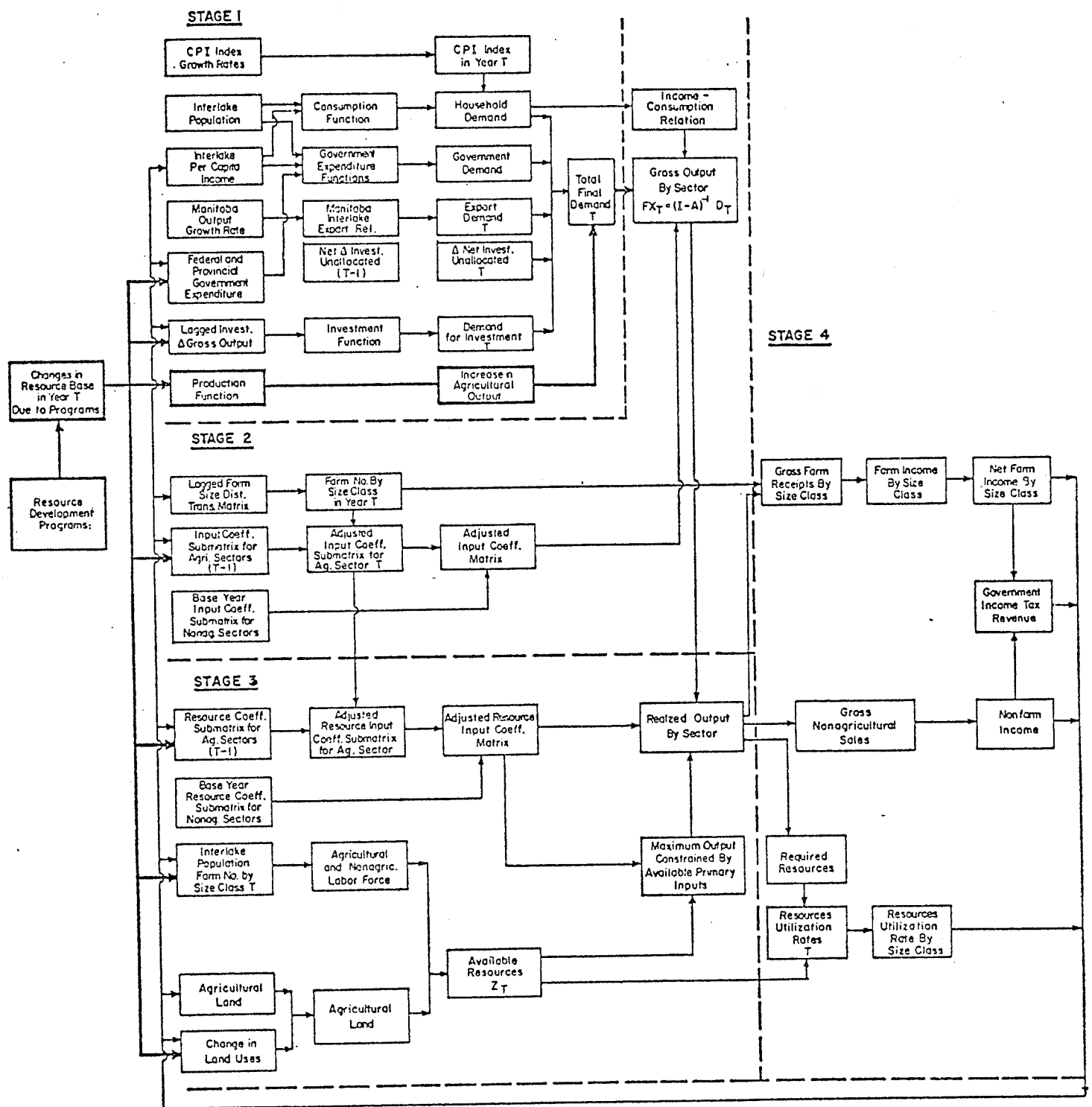


Figure 4.1

A Diagrammatic Presentation of the
Simulation Procedures^a

^aThe light solid line presents the first step of the simulation procedure. The heavy solid line indicates the second step in which the effects of resource development programs are included.

Source: F. L. Tung, op. cit., p. 130.

Interlake become available from the 1971 and 1976 censuses, more comprehensive tests of the validity of the model will be possible.

The Direct Effect of the Outdoor Recreation Development
Program on the Interlake Economy

Five important categories of expenditure associated with the outdoor recreation development program at Hecla Provincial Park can be identified. To the extent that these expenditures are directed into local businesses and households, they affect the components of the final demand vector for Interlake economy, and generate sales, income and employment impacts in the region. The five categories are:

1. Capital Expenditures. This is autonomous expenditure to the area economy and, depending on the type of local firms which are involved, increases regional output directly through the relevant sectors.

2. The Manpower Corps Program. Allowances paid to Interlake trainees under this program affect regional household income and influence household consumption expenditures in the Interlake.

3. Non-Wage Operations and Maintenance Expenditures. Operations expenditure associated with the Park and directed to Interlake firms increases the amount of Government expenditure in the region.

4. Visitor Expenditures. These expenditures add directly to the export vector, reflecting the difference between visitor expenditures in the Interlake region prior to the establishment of the Park, and the new visitor expenditure patterns.

5. Salary and Wage Payments. In a similar fashion to the trainee allowances paid under the Manpower Corps Program, increases in household income from salary and wage payments to Interlake workers

have a direct effect on the Interlake sectors in which consumption expenditures are made by these households.

The recreation program therefore adds four components to the initial final demand vector to create a new final demand vector (FD_t^*).

$$FD_t^* = FD_t + C_t + OM_t + H_t + VE_t \quad (4.3)$$

where C_t = park capital expenditures in the i th sector in year t
($i = 1, \dots, 17; t = 0, \dots, T$)

OM_t = total non-wage operations and maintenance expenditure in the i th sector in year t

H_t = regional household expenditure in the i th sector in year t resulting from wage, salary and allowance payments (y_t) in operations and maintenance and manpower training programs

VE_t = visitor expenditures in the region on the i th sector in year t because of the park.

The elements of H_t are estimated by proportional allocation to sectors of commodity group expenditures estimated by Engel functions in the log form.⁵

$$h_{it} = \sum_{k=1}^m c_{kt} p_{kit} \quad \text{for } k = 1, \dots, m \quad (4.4)$$

$$c_{kt} = a_{kt} y_t^{b_{kt}} \quad (4.5)$$

where c_{kt} = household consumption expenditures on the k th commodity
($k = 1, \dots, m$) from household income of y_t

⁵Engel functions have been estimated for eleven commodity groups in the Interlake region (F. L. Tung, op. cit., pp. 209-218).

- p_{kit} = proportion of total household consumption expenditure
made on the kth commodity in the ith sector
- y_t = wage, salary, and trainee payments in year t
- a_{kt} = constant of the Engel function for the kth commodity
in year t
- b_{kt} = income elasticity of Engel function for the kth commodity
in year t.

The elements of VE_t are estimated by proportional allocations to sector of party expenditures.

$$ve_{it} = vd_t \cdot ed_{it} + vc_t \cdot ec_{it} \quad (4.6)$$

where vd_t and vc_t = total additional day-use and camping expenditures
in the region in year t because of the park⁶

ed_{it} and ec_{it} = proportions of day-use and camping expenditures
in the ith sector in year t.

The primary impacts discussed in Chapter 2, such as the consumer surplus and option demand of the Park, are also impact variables to be considered, but their regional significance is less than the impacts generated from the expenditure variables.

The methodology for estimating each of the above impact variables associated with the recreation development program at Hecla Provincial

⁶This includes expenditures by local households which previously would have visited outside the region. This approach is therefore an empirical simplification since this will, in fact, change the household consumption patterns of Interlake residents, and therefore the HD_t vector. It is unlikely to cause a change in total consumption expenditures through additional recreation expenditures by families (this implies a change in savings), but may well change the recreation travel patterns of residents with reference to Interlake/Non-Interlake destinations and therefore their sectoral allocations of regional consumption expenditures. Rather than change the household vector, however, the impact of this effect can be equally handled by the VE_t change noted.

Park on regional development indicators is discussed below.

Capital expenditures. As at 31 March, 1976, \$5.1 million had been spent in capital development works associated with Hecla Provincial Park--refer Table 4.1. This capital expenditure has three important features:

1. Since the Province has developed facilities at the Park which were not part of the original FRED development plan for the project, not all the capital expenditure is FRED monies. Of the total amount spent to date, \$2.76 million is money funded under the FRED Agreement (split between the Federal and Manitoba Governments in the ratio of 60:40) and the remainder, approximately 46 percent of the total, is solely Provincial money.

2. All the capital expenditure of \$5.1 million has been invested at the Park site. This therefore, represents additional capital infrastructure in the Interlake due to the FRED program since it is unlikely that development would have been undertaken in the foreseeable future at Hecla without the instigation of the FRED Agreement.

3. Construction of the recreational facilities and associated infrastructure has been carried out by the Parks Branch of the Manitoba Department of Tourism, Recreation and Cultural Affairs, with the hiring of local contractors where possible. Since this local involvement is not extensive, only a small proportion of the capital expenditure results in additional jobs and income to the regional economy--that part which is fed into the region via contracts and hirings.

To calculate the direct effect of the capital expenditures shown in Table 4.1 on the Interlake economy, these expenditures need to be subdivided by distribution (i.e. proportion spent in the Interlake)

Table 4.1

Hecla Provincial Park; Park Development
Capital Expenditures

Year ^a									
Source of Monies	1968	1969	1970	1971	1972	1973	1974	1975 ^b	Total ^c
.....\$'000.....									
<u>FRED MONIES</u>									
Park Study	43.6	10.0							
Lake Winnipeg Basin Study		7.2	1.7						
Causeway Study		22.3							
Preliminary Survey		6.4							
Causeway Construction			603.4	816.9	142.3				
Renovation of Buildings			7.0	13.5					
Maintenance Shop and Yard, Staff Complex			15.0		103.7	63.0			
Beach, Lagoon and Day-Use Area			15.0	14.9	21.8	38.3		20.6	
Utilities			6.0	20.0	30.0	2.4		31.3	
Campground			43.8	107.7	165.3	28.3	98.7	22.6	
Roads and Parking Lots			84.1	62.5	57.5			33.5	
Historic Village				2.5	0.3				
TOTAL FRED									2,763.0
<u>PROVINCIAL MONIES</u>									
Hecla Golf Course				332.7	417.6	145.5	68.9		
Tennis Courts							23.6	0.7	
Marina						10.2	224.0	62.0	
Cabins							155.2	56.6	
Staff Complex							141.4		
Beach, Lagoon and Day-Use Area						151.1	131.1	141.1	
Roads and Parking Lots							29.6		
Historic Village						30.9	20.0		
Utilities							137.2	87.0	
TOTAL PROVINCIAL									2,366.4
TOTAL MONIES	43.6	45.9	776.0	1,370.7	938.4	469.8	1,029.6	455.4	5,129.4

^aAlthough the fiscal year ends on March 31, all capital expenditures have been allocated to the previous calendar year.

^bExcludes expenditure of \$444,073 on the first stage of construction of the Gull Harbor Lodge.

^cExcludes cost of Manpower Corps involvement in the construction phase.

Source: Manitoba Department of Tourism, Recreation and Cultural Affairs. Parks Branch personnel.

and sectoral composition and a new component of final demand (C_t) generated,

where $C_t = [C_{it}]$ denotes the capital expenditures made in connection with Hecla Provincial Park in sector i in year t ($i = 1, \dots, 17$; $t = 0, \dots, T$), hence C_t is a vector for each t .

Discussion with the Hecla project engineers of the Parks Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs, revealed that four outside contracts have been let on the project over the past eight years--\$1.6 million for causeway construction to the Winnipeg firm of Paul Braun Construction Ltd., and local Interlake contracts of \$75,000 for gravel crushing, \$55,000 for haulage of sand and gravel and \$2,000 to transport the church. The remainder of the work was carried out by the Parks Branch with hiring of local equipment and drivers where feasible. Expenditures in the Interlake are estimated at \$1.2 million (1968 dollars) and the annual and sectoral allocation of this total is given in Table 4.2.⁷

The Manpower Corps Training Program. The extent of the Manpower Corps Training Program at Hecla Provincial Park during 1971-76 is summarized in Table 4.3. Over this time, \$0.51 million has been paid in trainee allowances, \$0.12 million in instructors' salaries and \$0.11 million in support costs, a total of \$0.85 million.⁸ This represents 17 percent of capital expenditures, and emphasises the labour intensive

⁷This assumes that the import component of non-Interlake capital expenditures has a negligible effect on the regional economy.

⁸The main component of support costs excluding equipment rental is an allowance of \$1.70 per meal paid by Manpower to the Parks Branch in lieu of room and board for the instructors and trainees.

Table 4.2

Allocation of Hecla Capital Expenditures by Sector,
Interlake Area, 1968 to 1975

Sector \ Year	1968	1969	1970	1971	1972	1973	1974	1975
	.....(\$'000 1968).....							
1. Agriculture--Livestock								
2. Agriculture--Crop and Other								
3. Mining			11.9	20.8	13.8	5.1	12.9	--
4. Food and Beverage Manufacturing								
5. Other Manufacturing								
6. Transportation			74.6	274.5	345.4	178.8	218.8	108.0
7. Construction								
8. Petroleum Wholesale								
9. Farm Equipment and Building Material								
10. Food Stores								
11. Other Retail								
12. Auto Product Sales and Service								
13. Apparel and Shoes								
14. Furniture and Appliances								
15. Insurance								
16. Personal Service	0.7	0.7	10.8	18.5	12.1	5.6	11.1	4.9
17. Other Service								
TOTAL	0.7	0.7	97.3	313.8	371.3	189.5	242.8	112.9

Source: Sectoral allocations from Table 4.1 made in discussion with engineers of the Parks Branch, Manitoba Department of Tourism, Recreation and Cultural Affairs. Expenditures deflated by the Construction and Consumers Price Indexes.

Table 4.3

Manpower Corps Training Programs at Hecla Provincial Park
1970-1976

FRED Plan Year	Year Ended March 31	Project Name	Number of Trainees	Instructors			Trainees			Other Expenses
				Salaries	Hourly Rate	Hours	Salaries	Hourly Rate	Hours	
				.....dollars.....			.....dollars.....			.....dollars.....
9	1976	Carpentry Training	7	12,688	3.00	4,229	17,539	3.00	5,846	
8	1975	Carpentry Training	4	16,823	3.00	5,608	35,127	2.75	12,774	
7	1974	Cooks Youth Support					1,890	1.50	1,260	
		Facilities Construction	15	10,631	2.70	3,937	49,803	2.60	19,155	
		Golf Course Development	19	12,337	2.70	4,569	42,014	2.60	16,159	
		Heavy Equipment School	10	2,299	2.70	852	32,644	2.60	12,555	
		TOTAL		25,267			126,351			
6	1973	Hecla Youth Corps	23				15,445	1.75	8,826	
		Facilities Construction	19	10,902	2.45	4,450	59,889	2.35	25,485	
		Golf Course Development	22	18,164	2.45	7,414	50,416	2.40	21,007	
		Heavy Equipment School	10	3,765	2.45	1,537	36,458	2.15	16,957	
		TOTAL		32,831			162,208			
5	1972	Facilities Construction	35	10,408	2.25	4,626	55,656	2.00	27,828	11,095
		Golf Course Development	19	6,850	2.30	2,978	58,604	2.00	29,302	4,297
		Heavy Equipment School	39	7,535	2.25	3,349	26,872	2.00	13,436	86,423 ^a
		TOTAL		24,793			141,132			
4	1971	Facilities Construction	21	3,018	2.25	1,341	29,848	2.00	14,924	4,714
TOTAL			243	115,420		44,890	512,205		225,514	106,529

^aIncludes \$74,512 spent on equipment rental for this project.

Source: Annual Interlake FRED Board Performance Reports and discussions with Manpower personnel.

nature of the construction phase of the recreation site development at Hecla Provincial Park--and of outdoor recreation sites generally--and the complementarity which can exist between such a project and Manpower Corps Training Programs.

There are two aspects of the Manpower Corps Program at Hecla that require investigation to calculate the local income and employment impacts--trainee allowances and instructors salaries.⁹ It is probable that the majority of trainees on the Manpower Corps Program were previously unemployed and not in receipt of unemployment insurance or welfare payments. The trainee allowances paid, therefore, can be regarded as net increases to household income to the region. Conversely, the instructors' salaries can not be considered as additions to regional income because although most of them are Interlake residents, it is generally agreed that if they were not on the Manpower program they would be working in Northern Manitoba for higher salaries, and remitting approximately the same money home to their households.¹⁰ Without further information therefore, it is concluded that the instructors salaries have negligible net direct impact on the Interlake economy.

Operations and maintenance expenditures. Operations and maintenance expenditures for Hecla Provincial Park have rapidly increased since 1971--refer Table 4.4. They are budgeted to reach \$703,000 in

⁹The effects and economic impact of the overall Interlake Manpower Program is currently the subject of a separate research program in the Department of Agricultural Economics at the University of Manitoba. See M. A. Fernandez, "Efficiency and Distribution Considerations in Manpower Training Programs: The Interlake Manpower Corps Case," (draft Doctor's dissertation, Department of Agricultural Economics, University of Manitoba, 1976).

¹⁰Food and accomodation costs are included in the support costs paid to the Parks Branch by the Manpower Corps Program. They are therefore a part of the operating expenses of the Park.

Table 4.4

Operations and Maintenance Expenditures, Hecla Provincial Park,
1969-1977

Year	1969	1970	1971	1972	1973	1974	1975	1976	1977
Class of Expenditure									
	.....(\$'000).....								
Wages and Salaries (including administrative personnel)	--	--	12.0	26.0	93.0	158.6	391.5	478.0	543.0
Operations	--	--	6.0	10.0	60.0	110.1	200.0	225.0	260.0
TOTAL	--	--	18.0	36.0	153.0	268.7	591.5	703.0	803.0

Source: Discussion with Mr. A. Boyachek, Superintendent, Hecla Division. The 1969-1975 figures are actual, 1976 budget and 1977 estimated. Although the fiscal year ends March 31, all expenditures have been allocated to the previous calendar year.

1976, and it is estimated that they could exceed \$1.0 million per annum by 1980. These expenditures can make a significant contribution to the local economy, both through goods and services purchased and local personnel hirings. To estimate their direct effect, therefore, operating expenditures need to be subdivided by distribution (Interlake vs. non-Interlake) and sectoral composition.

Discussions with the Superintendent of Hecla Provincial Park revealed that approximately 60 percent of the total expenditure by the Manitoba Department of Tourism, Recreation and Cultural Affairs on operations and maintenance at the Park generates income and employment impacts in the Interlake regional economy (Table 4.5). Meat and food purchases for the canteen are made locally, as are fuel and general operational supplies and these represent 10 percent of the budget. Wages and salaries to local personnel are the major component, however, being 49 percent of the budgeted expenditure.¹¹

Visitor expenditures. The creation of a new recreational opportunity in the Interlake affects the economy through two reactions:

1. Non-Interlake residents who would not normally visit the region will be diverted into the Interlake. Exports of the Interlake area economy will therefore increase due to consumption expenditures by these people while visiting the region.

2. Consumption patterns of Interlake residents may change-- either because of additional consumption of recreation in total (implying a decrease in savings), or in composition between sectors because of visits to Hecla Provincial Park rather than non-Interlake

¹¹ Approximately half of this local expenditure on wages and salaries is paid to personnel residing in Riverton.

Table 4.5

Sectoral Allocation of Operations and Maintenance
Expenditures at Hecla Provincial Park,
1969-1977

Year Sector	1969	1970	1971	1972	1973	1974	1975	1976	1977
	.....(\$'000 1968).....								
1. Agriculture—Livestock									
2. Agriculture—Crop and Other									
3. Mining									
4. Food and Beverage Manufacturing									
5. Other Manufacturing									
6. Transportation									
7. Construction									
8. Petroleum Wholesale			0.3	0.5	2.6	3.9	6.7	7.4	8.5
9. Farm Equipment and Building Material			1.1	1.7	8.4	12.6	21.7	23.9	27.6
10. Food Stores			0.2	0.4	1.9	2.9	5.0	5.6	6.4
11. Other Retail									
12. Auto Product Sales and Service									
13. Apparel and Shoes									
14. Furniture and Appliances									
15. Insurance									
16. Personal Service			0.2	0.5	1.8	2.9	5.7	6.8	7.8
17. Other Service									
Intermediate Subtotal			1.8	3.1	14.7	22.3	39.1	43.7	50.3
18. Household			6.7	13.4	47.0	72.5	154.4	176.6	200.0
19. Other Interlake Sectors									
TOTAL INTERLAKE EXPENDITURES			8.5	16.5	61.7	94.8	193.5	220.3	250.3

Source: Analysis of data supplied by Mr. A. Boyachek, Superintendent, Hecla Division. All dollar figures deflated to 1968 base by the relevant price and wage indexes.

recreation sites. This will affect the household expenditure patterns of the Interlake area economy.

The causal linkages relating these effects to a new final demand vector in the Interlake input-output model are shown by equations (4.3) and (4.6).

The direct impact of visitor expenditures is calculated following this procedure in Table 4.6. Firstly total attendance at the Park is estimated for each year, and then adjusted to reflect increase in visitation to the Interlake from the alternative destination data summarized in Table 4.7. Then sectoral expenditures are calculated for both day-use and camping parties, using the breakdowns of expenditures summarized in Table 4.8. It is clear from this latter table that separate treatment of both day-use and camping parties is required, because of the markedly different sectoral allocations of their expenditure patterns.

In summary, it is estimated that the creation of the Park will generate additional business sales in the Interlake of \$40,900 (\$1968) in 1975, rising to \$101,200 (\$1968) in 1978, with approximately 55-65 percent of this originating from camping parties.

Salary, wage and trainee payments. Household non-farm income in the Interlake increases directly from the Hecla development program through both wage and salary payments in operations and maintenance expenditures (Table 4.5) and trainee allowances in the Manpower Corps Program (Table 4.3). This increased income will derive additional purchases of goods and services in the region.

The methodology for quantifying this transformation utilizes Engel curves which have been estimated for commodity groups in the

Table 4.6

Projected Visitation and Sectoral Allocation of Expenditures
Hecla Provincial Park, 1975-1978

	1975			1976			1977			1978		
	Day Use	Camping	Total	Day Use	Camping	Total	Day Use	Camping	Total	Day Use	Camping	Total
Park Attendance--Number of Parties ^a	8,340	2,500	10,840	11,100	3,750	14,850	12,945	4,875	17,820	14,075	5,705	19,780
Net Increase in Visitation to Interlake due to Park ^b	3,875	1,585	5,460	6,190	2,715	8,905	7,545	3,710	11,255	8,135	4,385	12,520
Increase in Expenditures in the Interlake (\$'000 1968) ^c	21.8	35.4	57.2	34.8	60.6	95.5	42.5	82.8	125.3	45.8	97.9	143.7
Sectoral Allocation of Expenditures ^d (\$'000 1968)												
Sectors 1-9												
10. Food Stores	3.4	7.9	11.3	5.5	13.5	19.0	6.7	18.4	25.1	7.2	21.7	29.0
11. Other Retail	2.6	3.5	6.0	4.1	5.9	10.0	5.0	8.1	13.1	5.4	9.6	15.0
12. Auto Products and Service	6.7	8.1	14.7	10.6	13.8	24.5	13.0	18.9	31.9	14.0	22.4	36.4
13. Apparel and Shoes	0.6	1.2	1.8	0.9	2.0	3.0	1.1	2.8	3.9	1.2	3.3	4.5
14-15												
16. Personal Service	4.5	2.5	7.0	7.2	4.3	11.5	8.8	5.9	14.7	9.4	7.0	16.4
17.												
Total Intermediate Sectors	17.7	23.1	40.9	28.4	39.6	68.0	34.6	54.1	88.7	37.3	64.0	101.2

^aThe 1975 data on visitation from survey results (refer to Appendix IV). The 1976-1978 projections based on average annual growth rates of 37 percent, 20 percent and 11 percent reflecting rapid increases in visitation which are likely in early years of operation, gradually declining to the Provincial average growth rate by the fourth season. Analysis of preliminary traffic count data from Hecla Provincial Park for the 1976 season suggests an increase in attendance over 1975 of 35 to 40 percent.

Footnotes Continued

Table 4.6 (Footnotes Continued)

^bA proportion of both day-use and camper visitors would have come to the Interlake even in the absence of Hecla Provincial Park. Total visitation is, therefore, adjusted to the net increase in Interlake visitation, using a correction factor derived from the survey data (refer Table 4.7).

^cAnalysis of the survey results (Chapter 3) showed an average expenditure in 1975 of \$35.35 per camping party and \$8.83 per day use party including park fees. These figures are adjusted to 1968 dollars using the relevant consumer price indexes and applied to the visitation levels.

^dRefer to Table 4.8 for the sectoral allocation of visitor expenditures.

Note: Figures may not add due to rounding errors.

Table 4.7

Visit Alternatives by Visitor Origin,
Hecla Provincial Park, 1975

Visit Alternative	Home Outside the Interlake		Home in the Interlake		Total	
	Number	Percent ^a	Number	Percent ^a	Number	Percent ^a
<u>DAY USERS</u>						
Visited elsewhere in the Interlake	44	57.1	256	56.0	300	56.2
Visited elsewhere outside the Interlake	12	15.6	98	21.5	110	20.6
Stayed home	18	23.4	87	19.0	105	19.7
Other	3	3.9	16	3.5	19	3.5
Non-Response	17	--	69	--	86	--
TOTAL	94	100.0	526	100.0	620	100.0
<u>OVERNIGHT USERS</u>						
Visited elsewhere in the Interlake	10	40.0	122	34.7	132	35.0
Visited elsewhere outside the Interlake	11	44.0	211	60.0	222	58.9
Stayed home	4	16.0	17	4.8	21	5.6
Other	0	0	2	0.5	2	0.5
Non-Response	2	--	34	--	36	--
TOTAL	27	100.0	386	100.0	413	100.0
<u>ALL USERS</u>	121		912		1,033	

^aExcludes the non-response (N.R.) category.

Source: Analysis of Hecla Survey data.

Table 4.8

Sectoral Allocation of Hecla Visitor Expenditures,
Interlake Region, 1975

Sector	Type of Party	Day-Use		Overnight	
		Dollars	Percent	Dollars	Percent
1 - 9	--	--	--	--	--
10.	Food Stores	1.59	18.0	8.87	25.1
11.	Other Retail	1.03	11.6	3.29	9.3
12.	Auto Product Sales and Service	2.54	28.8	7.53	21.3
13.	Apparel and Shoes	0.24	2.7	1.17	3.3
14 - 15	--	--	--	--	--
16.	Personal Service	1.80	20.4	2.47	7.0
TOTAL INTERMEDIATE SECTORS		7.20	--	23.33	--
19.	Government	1.63	18.5	12.02	34.0
TOTAL		8.83	100.0	35.35	100.0

Source: Analysis of Hecla Survey Data.

Interlake area, and then converting consumption totals to sectors on the basis of data derived from a survey of household consumption patterns in the Interlake.¹²

The sectoral increases in direct purchases associated with the increase in household non-farm income due to the Hecla program are detailed in Table 4.9.

Summary of direct impacts. The direct increases in sectoral input purchases associated with the Hecla Provincial Park development program in the Interlake economy from 1969-1977 are summarized in Table 4.10.

Value of primary impacts. In the theoretical framework developed in Chapter 2, the primary impacts associated with outdoor recreation development were discussed--namely the consumer surplus and option demand generated by the site.

Many studies in the United States have attempted to quantify the magnitude of the consumer surplus associated with a recreation resource, and some have subdivided this by type of usage. Little analysis has been undertaken however, on the aspects of option demand. Research in Canada has been relatively sparse, and after reviewing the literature, Hilderbrant, Young and Associates conclude "the value [consumer surplus] of the recreational experience enjoyed by visitors . . . tends to vary from \$1 to \$10/visitor day depending on the type

¹²See equations (4.4) and (4.5).

Table 4.9

Estimated Consumption Increases Due to Increases in Non-Farm
Income Through the Hecla Provincial Park Development Program
1968-1977

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
.....(Unit: \$'000 1968).....										
Consumption Increases by Sector										
1. Agriculture--Live- stock			7.3	12.3	12.7	12.8	11.3	13.7	14.1	14.7
2. Agriculture--Crop and Other			1.7	2.6	2.6	2.7	2.4	2.8	2.9	3.0
3. Mining			--	--	--	--	--	--	--	--
4. Food and Beverage Manufacturing			--	--	--	--	--	--	--	--
5. Other Manufacturing			--	--	--	--	--	--	0.1	0.1
6. Transportation			--	--	--	--	--	--	--	--
7. Construction			0.3	1.9	2.1	2.1	1.4	2.7	2.9	3.3
8. Petroleum Whole- sale			1.3	4.9	5.4	5.4	3.9	6.7	7.2	8.1
9. Farm Equipment and Building Material			0.1	0.5	0.6	0.6	0.4	0.7	0.8	0.9
10. Food Stores			17.2	30.0	31.3	31.4	27.3	34.2	35.3	37.2
11. Other Retail			29.3	51.0	53.2	53.2	46.5	58.0	59.8	63.0
12. Auto Products Sales and Service			0.6	2.4	2.7	2.7	1.8	3.4	3.7	4.3
13. Apparel and Shoes			2.3	6.0	6.4	6.4	5.2	7.3	7.6	8.2
14. Furniture and Appliances			0.1	0.5	0.6	0.6	0.4	0.8	0.9	1.0
15. Insurance			--	--	--	--	--	--	--	0.1
16. Personal Service			11.1	14.8	15.2	15.2	14.0	16.0	16.3	16.9
17. Other Service			0.1	0.5	0.6	0.6	0.4	0.8	0.9	1.0
TOTAL			71.4	127.5	133.4	133.6	115.1	147.1	152.3	161.8

Source: Refer to text, Chapter 4.

Table 4.10

Summary of Increments in Final Demand Associated with the Hecla
Development Program, Interlake Area, 1969-1977
(\$'000 1868)

Year	Source	Sector																	
		Agriculture-- Livestock	Agriculture-- Crop	Mining	Food and Beverage Manufacturing	Other Manufacturing	Transportation	Construction	Petroleum Wholesale	Farm Equipment and Buildings	Food Store	Other Retail	Auto Products and Service	Apparel and Shoes	Furniture and Appliances	Insurance	Personal Service	Other Service	Total (1 - 17)
1969	Capital																0.7		0.7
	Operation and Maintenance																		
	Non-Farm Income																		
	Visitors																		
	TOTAL																0.7		0.7
1970	Capital			11.9			74.6										10.8		97.3
	Operation and Maintenance																		
	Non-Farm Income	7.3	1.7					0.3	1.3	0.1	17.2	29.3	0.6	2.3	0.1		11.1	0.1	71.4
	Visitors																		
	TOTAL	7.3	1.7	11.9			74.6	0.3	1.3	0.1	17.2	29.3	0.6	2.3	0.1		21.9	0.1	168.7
1971	Capital			20.8			274.5										18.5		313.8
	Operation and Maintenance																		
	Non-Farm Income	12.3	2.6					1.9	0.3	1.1	0.2	51.0	2.4	6.0	0.5		14.8	0.5	127.5
	Visitors																		
	TOTAL	12.3	2.6	20.8			274.5	1.9	5.2	1.6	30.2	51.0	2.4	6.0	0.5		33.5	0.5	433.0
1972	Capital			13.8			345.4										12.1		371.3
	Operation and Maintenance																		
	Non-Farm Income	12.7	2.6					2.1	0.5	1.7	0.4	53.2	2.7	6.4	0.6		15.2	0.6	133.4
	Visitors																		
	TOTAL	12.7	2.6	13.8			345.4	2.1	5.9	2.3	31.7	53.2	2.7	6.4	0.6		27.8	0.6	507.8
1973	Capital			5.1			178.8										5.6		189.5
	Operation and Maintenance							2.6	8.4	1.9							1.8		14.7
	Non-Farm Income	12.8	2.7					2.1	5.4	0.6	31.4	53.2	2.7	6.4	0.6		15.2	0.6	133.6
	Visitors																		
	TOTAL	12.8	2.7	5.1			178.8	2.1	8.0	9.0	33.3	53.2	2.7	6.4	0.6		22.6	0.6	337.9

(Continued)

Table 4.10 (Continued)

Year	Source	Sector															Total (1 - 17)		
		Agriculture--- Livestock	Agriculture-- Crop	Mining	Food and Beverage Manufacturing	Other Manufacturing	Transportation	Construction	Petroleum Wholesale	Farm Equipment and Buildings	Food Store	Other Retail	Auto Products and Service	Apparel and Shoes	Furniture and Appliances	Insurance		Personal Service	Other Service
1974	Capital Operation and Maintenance			12.9			218.8										11.1		242.8
	Non-Farm Income	11.3	2.4					3.9	12.6	2.9							2.9		22.3
	Visitors	11.3	2.4					1.4	3.9	0.4	27.3	46.5	1.8	5.2	0.4		14.0	0.4	115.1
	TOTAL	11.3	2.4	12.9			218.8	1.4	7.8	13.0	30.2	46.5	1.8	5.2	0.4		28.0	0.4	380.1
1975	Capital Operation and Maintenance						108.0										4.9		112.9
	Non-Farm Income	13.7	2.8					6.7	21.7	5.0							5.7		39.1
	Visitors	13.7	2.8					2.7	6.7	0.7	34.2	58.0	3.4	7.3	0.8		16.0	0.8	147.1
	TOTAL	13.7	2.8				108.0	2.7	13.4	22.4	50.5	64.0	18.1	9.1	0.8		33.6	0.8	339.9
1976	Capital Operation and Maintenance																6.8		43.7
	Non-Farm Income	14.1	2.9					7.4	23.9	5.6							16.3	0.9	152.3
	Visitors	14.1	2.9					2.9	7.2	0.8	35.3	59.8	3.7	7.6	0.9		11.5	0.9	68.0
	TOTAL	14.1	2.9					2.9	14.6	24.7	59.9	69.8	28.2	10.6	0.9		34.6	0.9	264.0
1977	Capital Operation and Maintenance																7.8		50.3
	Non-Farm Income	14.7	3.0					8.5	27.6	6.4							16.9	1.0	161.8
	Visitors	14.7	3.0					3.3	8.1	0.9	37.2	63.0	4.3	8.2	1.0	0.1	14.7	1.0	88.7
	TOTAL	14.7	3.0					3.3	16.6	28.5	68.7	76.1	36.2	12.1	1.0	0.1	39.4	1.0	300.8

Source: Refer to component tables, Chapter 4.

of facility."¹³ Specifically Knetsch and Cheung estimated the consumer surplus associated with Provincial and National parks in Saskatchewan in 1972 in the range of \$120,000 to \$160,000/park,¹⁴ and other studies in the Canadian Outdoor Recreation Demand (CORD) series by Parks Canada have generated figures of between \$3.97 and \$9.33 per party trip.¹⁵ In Manitoba, Schellenberg and Craddock used a similar methodology for quantifying the value of a reservoir, in 1971 at 60c/visitor day.¹⁶

It is probable that although no specific estimate of the consumer surplus associated with visitation to Hecla Provincial Park in 1975 is available, the order of magnitude applicable in this situation is between \$40,000 and \$200,000. It is argued that with this knowledge the components of consumer surplus and option demand can be by-passed from detailed quantitative analysis in this research on the Interlake outdoor recreation program. The reasons for this are:

1. Approximately 86 percent of day-users and 93 percent of campers at Hecla Provincial Park come from outside the region. It is not, therefore, the local people who experience the primary benefit

¹³Hildebrant-Young and Associates Ltd., The Economic Impact of National Parks in Canada. A Summary, op. cit., pp. 20-21, 27. The range for representative features is \$1 to \$5, rising to the \$10 for unique features of interest at distant origins. If the \$1 to \$5 range is applied to the visitation to Hecla Provincial Park, in 1975, the value of the recreational experience varies between \$46,000 and \$230,000.

¹⁴J. L. Knetsch and H. K. Cheung, op. cit., pp. 16-17.

¹⁵Canadian Outdoor Recreation Research Committee, op. cit., pp.IV-5. If these figures are applicable to visitors to Hecla Provincial Park, the consumer surplus in 1975 would lie between \$43,000 and \$101,000.

¹⁶H. D. Schellenberg and W. J. Craddock, op. cit., p. 45. With no allowance for inflation, this figure implies a value of \$28,000 for the Hecla Park recreational experience.

of the development, and the relative regional magnitudes of consumer surplus and secondary impacts are such that the former can be omitted.

2. The high availability of alternative outdoor recreation sites and recreational opportunities within the Province and in the Interlake region, mean that option demand for this park will be small.

3. The other evaluation studies of Interlake development programs have not considered the consumer surplus values attached to the resource, and inclusion of this primary impact for outdoor recreation would not make the results directly comparable.

CHAPTER 5

IMPACT ESTIMATION

The previous chapter introduced the dynamic input-output model which was used for regional impact analysis in this study, and identified the sectoral changes that occur in the final demand of the regional economy during 1969-1977 due to the establishment of Hecla Provincial Park. This chapter summarizes the results of the impact analysis in which the effects of the outdoor recreation program on gross output, income and employment are estimated. Two calculations are made--one for the Interlake region as a whole, using the dynamic input-output model, and one for the local Municipality surrounding the Park, the Rural Municipality of Bifrost, using a static input-output model.

Regional Impacts

The regional economic impacts of the Hecla Island outdoor recreation development program, 1969-1977, are measured in terms of gross output, income and employment opportunities generated using the final demand direct effects summarized in Table 4.10 and the dynamic input-output simulation model. The sectoral results are shown in Tables 5.1, 5.2 and 5.3. Approximately \$4.54 million in gross sales is generated by the program in total, an average of \$504,500 per annum. Household income is increased by \$2.1 million, over half of which originates from payments by Government sector, and employment opportunities are generated for 492 persons with 48 percent of these being in this sector. Generally these impacts are concentrated in the construction phase of

Table 5.1

Simulated Impacts of the Hecla Program on the Realized Gross Output
of the Interlake Area by Sector, 1969-1977
(Unit: \$'000 1968)

Sector	Phase--Year	Construction Phase					Operational Phase			1969-1977	Total Construction Phase	Total Operational Phase
		1969	1970	1971	1972	1973	1974	1975	1976				1977
Agriculture--Livestock		12.0	24.1	25.9	21.6	21.2	22.5	20.8	22.3	170.4	104.8	65.6
Agriculture--Crop and Other		3.0	5.7	6.0	5.2	5.2	5.4	5.0	5.3	40.9	25.2	15.7
Mining		11.9	20.8	13.8	5.1	12.9	--	--	--	64.5	64.5	--
Food and Beverage Manufacturing		2.3	4.6	4.8	3.6	4.0	4.4	4.1	4.7	32.5	19.3	13.2
Other Manufacturing		0.5	1.4	1.6	1.0	1.2	0.9	0.6	0.7	7.9	5.7	2.2
Transportation		76.5	279.2	350.7	182.5	222.9	111.8	3.0	3.4	1,230.0	1,111.8	118.2
Construction		9.2	26.6	30.6	19.1	21.5	16.3	10.3	11.5	145.1	107.0	38.1
Petroleum Wholesale		18.2	58.3	70.2	44.4	51.0	40.3	24.6	27.8	334.8	242.1	92.7
Farm Equipment and Building Material		2.9	8.3	9.9	14.3	18.7	27.4	28.5	32.6	142.6	54.1	88.5
Food Store		26.6	58.1	64.8	52.6	53.1	66.0	67.5	77.3	466.0	255.2	210.8
Other Retail	0.1	47.5	105.3	117.7	90.8	91.0	94.0	84.4	92.6	723.4	452.4	271.0
Auto Products and Service	0.1	37.1	116.0	139.6	80.6	94.4	76.8	51.7	62.6	658.9	467.8	191.1
Apparel and Shoes		4.2	11.8	13.2	10.4	9.9	12.3	12.2	13.9	87.9	49.5	38.4
Furniture and Appliances		0.9	2.8	3.3	2.2	2.3	2.1	1.5	1.7	16.8	11.5	5.3
Insurance		0.7	2.0	2.5	1.4	1.7	1.1	0.5	0.6	10.5	8.3	2.2
Personal Services	0.7	30.2	58.0	56.9	39.6	48.1	47.3	41.4	47.0	369.2	233.5	135.7
Other Services		2.3	6.9	8.2	5.1	5.7	4.6	3.0	3.4	39.2	28.2	11.0
Agriculture Subtotal (Sectors 1-3)	--	26.9	50.6	45.8	31.9	39.3	27.9	25.8	27.6	275.8	194.5	81.3
Non-Agriculture Subtotal (Sectors 4-17)	0.9	259.1	739.3	874.0	547.6	625.5	505.3	333.3	379.8	4,264.8	3,046.4	1,218.4
TOTAL	0.9	286.0	789.9	919.8	579.5	644.8	533.2	359.1	407.4	4,540.6	3,240.9	1,299.7

Table 5.2

Simulated Impacts of the Hecla Program on Household Income by Sector,
Interlake Area, 1969-1977 (Unit: \$'000 1968)

Sector	Phase--Year	Construction Phase					Operational Phase			1969-1977	Total Construction Phase	Total Operational Phase
		1969	1970	1971	1972	1973	1974	1975	1976				1977
Agriculture--Livestock	^a	3.6	7.2	7.7	6.4	6.3	6.7	6.2	6.6	50.7	31.2	19.5
Agriculture--Crop and Other	^a	1.0	1.9	2.0	1.7	1.7	1.7	1.6	1.7	13.3	8.3	5.0
Mining		3.3	5.7	3.8	1.4	3.6	--	--	--	17.8	17.8	--
Food and Beverage Manufacturing		0.3	0.6	0.6	0.5	0.5	0.6	0.6	0.7	4.4	2.5	1.9
Other Manufacturing		0.1	0.4	0.5	0.3	0.3	0.3	0.2	0.2	2.3	1.6	0.7
Transportation		32.6	119.1	149.6	77.8	95.1	47.7	1.3	1.5	524.7	474.2	50.5
Construction	^a	1.7	4.9	5.6	3.5	3.9	3.0	1.9	2.1	26.6	19.6	7.0
Petroleum Wholesale		1.5	4.6	5.6	3.5	4.1	3.2	2.0	2.2	26.7	19.3	7.4
Farm Equipment and Building Material		0.3	0.9	1.0	1.5	2.0	2.9	3.0	3.4	15.0	5.7	9.3
Food Store		2.4	5.3	5.9	4.8	4.9	6.0	6.2	7.1	42.6	23.3	19.3
Other Retail	^a	6.0	13.4	15.0	11.5	11.6	12.0	10.7	11.8	92.0	57.5	34.5
Auto Products and Service	^a	4.8	15.1	18.2	10.5	12.3	10.0	6.7	8.1	85.7	60.9	24.8
Apparel and Shoes		0.6	1.6	1.7	1.4	1.3	1.6	1.6	1.8	11.6	6.6	5.0
Furniture and Appliances		0.2	0.6	0.7	0.4	0.5	0.4	0.3	0.4	3.5	2.4	1.1
Insurance		0.4	1.2	1.5	0.9	1.0	0.7	0.3	0.4	6.4	5.0	1.4
Personal Services	0.2	7.8	15.0	14.7	10.2	12.4	12.2	10.7	12.2	95.4	60.3	35.1
Other Services		0.9	2.52	3.0	1.9	2.1	1.7	1.1	1.2	14.4	10.4	4.0
Agriculture Subtotal (Sectors 1-3)	^a	7.9	14.8	13.5	9.5	11.6	8.4	7.8	8.3	81.8	57.3	24.5
Non-Agriculture Subtotal (Sectors 4-17)		0.3	59.5	185.1	223.5	128.7	151.8	102.2	46.4	53.0	748.9	201.6
TOTAL of INTERMEDIATE SECTORS ^b		0.3	67.4	199.9	237.0	138.2	163.4	110.6	54.2	61.3	1,032.3	226.1
Government:			25.9	119.5	132.6	133.0	94.0	164.0	176.6	200.0	1,045.6	540.6
TOTAL		0.3	93.3	319.4	369.6	271.2	257.4	274.6	230.8	261.3	2,077.9	766.7

^aLess than \$500.00.

^bTotals may not add due to rounding errors.

Table 5.3

Simulated Employment Impact of the Hecla Program
by Sector, Interlake Area, 1969-1977
(Unit: Man-Year)

Phase--Year Sector	Construction Phase					Operational Phase			1969-1977	Total Construction Phase	Total Operational Phase	
	1969	1970	1971	1972	1973	1974	1975	1976				1977
Agriculture--Livestock		1.5	2.8	2.8	2.2	2.0	2.0	1.7	1.7	16.7	11.3	5.4
Agriculture--Crop and Other		0.5	0.8	0.8	0.7	0.6	0.6	0.5	0.5	5.0	3.4	1.6
Mining		0.5	0.8	0.5	0.2	0.5	--	--	--	2.5	2.5	---
Food and Beverage Manufacturing		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.5	0.3
Other Manufacturing		^a	0.1	0.1	0.1	0.1	0.1	^a	^a	0.6	0.4	0.2
Transportation		8.8	31.0	37.4	18.7	21.9	10.6	0.3	0.3	129.0	117.8	11.2
Construction		0.4	1.2	1.3	0.8	0.9	0.6	0.4	0.4	6.0	4.6	1.4
Petroleum Wholesale		0.3	0.9	1.0	0.6	0.7	0.5	0.3	0.4	4.7	3.5	1.2
Farm Equipment and Building Material		0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	2.8	1.2	1.6
Food Store		0.7	1.5	1.6	1.3	1.3	1.6	1.6	1.9	11.5	6.4	5.1
Other Retail		1.6	3.5	3.9	3.0	2.9	3.0	2.7	2.9	23.5	14.9	8.6
Auto Products and Service		0.9	2.7	3.3	1.9	2.2	1.7	1.2	1.4	15.3	11.0	4.3
Apparel and Shoes		0.2	0.5	0.5	0.4	0.4	0.5	0.5	0.5	3.5	2.0	1.5
Furniture and Appliances		^a	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.4	0.3
Insurance		0.1	0.2	0.3	0.1	0.2	0.1	^a	0.1	1.1	0.9	0.2
Personal Services	0.1	2.4	4.6	4.5	3.1	3.8	3.7	3.2	3.6	29.0	18.5	10.5
Other Services		0.3	0.8	0.9	0.6	0.6	0.5	0.3	0.4	4.4	3.2	1.2
Agriculture Subtotal (Sectors 1-3)		2.5	4.4	4.1	3.1	3.1	2.6	2.2	2.2	21.7	14.7	7.0
Non-Agriculture Subtotal (Sectors 4-17)	0.1	15.7	47.3	55.2	30.9	35.4	23.6	11.2	12.6	234.5	187.1	47.4
TOTAL of INTERMEDIATE SECTORS ^b	0.1	18.2	51.7	59.3	34.0	38.5	26.2	13.4	14.8	256.2	201.8	54.4
GOVERNMENT--Manpower Program		8.2	38.8	39.7	27.0	7.0	3.2					
--Park Operation			1.1	2.2	7.8	12.1	25.7	29.4	33.3	235.5	143.9	91.6
TOTAL	0.1	26.4	91.6	101.2	68.8	57.6	55.1	42.8	48.1	491.7	345.7	146.0

^aLess than 0.05.

^bTotals may not add due to rounding errors.

the project, 1969-1974, but increasing operational expenditures and visitation levels in future years will increase the post-development impact levels.

The government expenditures on the project in capital, operations and maintenance and manpower training are autonomous to the area economy and to the extent that they are allocated to local businesses and wage and salary earners have the effect of increasing area output for the related sectors through additional demand for goods and services. To maximize regional impacts from development programs such as this, therefore, it is imperative that local firms be involved up to the practicable limit, and that the complementarity that exists between manpower training and development expenditures be exploited to the full.

The capital and manpower training expenditures constitute the base for the majority of impact in the early years of the program. During the construction phase, a large proportion of the derived demand locally is for goods and services from the transportation sector (Sector 6) because of the hiring of local trucking firms. Changes in output resulting from the program are therefore concentrated in the transportation, other retail, auto product sales and service, and personal service sectors in the 1969-1972 period. Capital expenditures are, however, of limited duration, and after the construction phase this derived demand falls to zero.

From 1975 onwards, it is the operations, maintenance and visitor expenditures which generate the project impact and form the on-going contribution of outdoor recreation to the regional economy, mainly concentrated in the food, other retail and auto product sales and services sectors.

In total, the annual gross output impact peaks at \$919,800 in 1972 at the height of the construction phase, but it is probable that by 1980 annual impact levels of the same gross magnitude will be generated by increasing levels of expenditure by operations, maintenance and visitors to the Park. The importance of the various project phases in this context is presented diagrammatically in Figure 5.1.

The overall impact of the development program at Hecla Provincial Park in terms of the regional economy appears small but the effects are much greater in some sectors than others. This is illustrated in Table 5.4. The program contributes around \$790,000 or 0.5 percent to a projected gross output of \$160 million in 1971 and \$360,000 or 0.2 percent to a gross output of \$185 million in 1976, with greatest impact in the non-agricultural service sectors of the economy. Similarly, income and employment effects are concentrated in the non-farm sectors with the construction phase providing the bulk of the employment impact early in the project (ninety-two man-years or 0.6 percent of projected employment of 15,729 in 1971) and the government operations and maintenance expenditures and visitor expenditures providing the basis for most employment at later stages in the government and service sectors (forty-three man-years or 0.3 percent of projected employment of 15,374 in 1976). While these impact levels may appear low, much of the direct expenditure is concentrated in one Municipality within the region, the Rural Municipality of Bifrost. The magnitude of this Municipal impact is discussed in the next section.

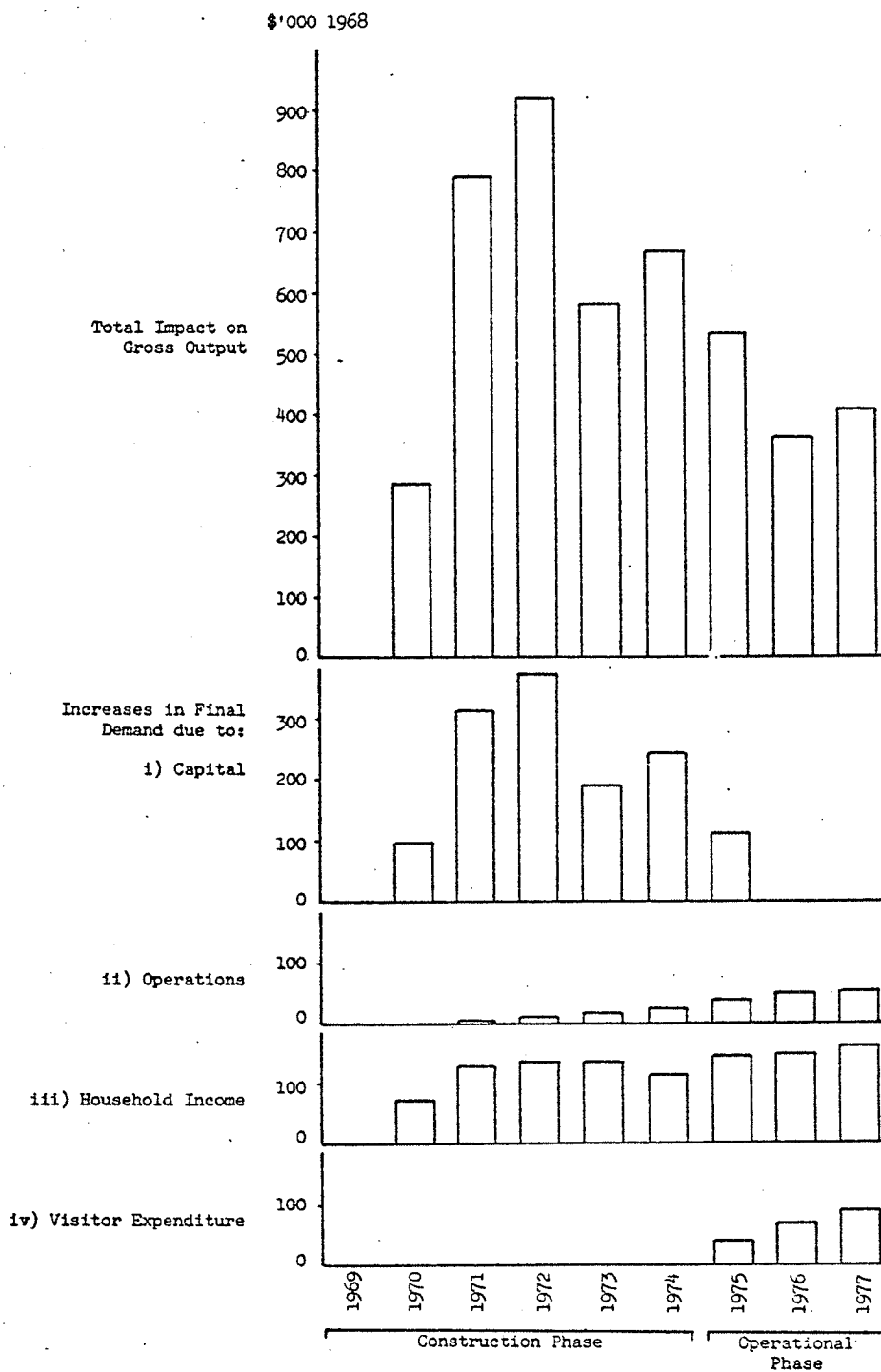


Figure 5.1

Annual Impacts on Gross Output in the Interlake Economy Generated by the Hecla Program, 1969-1977, compared with Components of the New Final Demand Vector

Table 5.4

Impact of the Hecla Program on Output, Income
and Employment in the Interlake Region,
1971 and 1976

Variable	1971			1976		
	Projection without Resource Development Program ^a	Impact of Hecla Program ^b	Percent	Projection without Resource Development Program ^a	Impact of Hecla Program ^b	Percent
	...\$'000 1968...			...\$'000 1968...		
Output: Agriculture and Mining Sectors	50,184.0	50.6	0.1	58,840.1	25.8	^c
Non-Agriculture Sectors	110,077.0	739.3	0.7	125,818.8	333.3	0.3
TOTAL	160,261.0	789.9	0.5	184,658.9	359.1	0.2
Income: Farm	22,575.2	9.1	^c	26,375.4	7.8	^c
Non-Farm	58,393.3	310.3	0.5	67,840.5	223.0	0.3
	.....Numbers.....			.....Numbers.....		
Employment: Agriculture and Mining Sectors	6,086.6	4.4	0.1	5,112.9	2.2	^c
Non-Agriculture Sectors	4,346.3	47.3	1.1	4,639.8	11.2	0.2
Government	4,204.0	39.9	0.9	4,529.0	29.4	0.6
Commuting	1,092.3	--	--	1,092.3	--	--
TOTAL	15,729.2	91.6	0.6	15,374.0	42.8	0.3

^aSee Fu-Lai Tung, op.cit., pp. 442-443.

^bSee Tables 5.1, 5.2, 5.3.

^cLess than 0.05.

Municipal Impact

In a study in 1973 on the urban impacts of rural resource development expenditures in the Interlake region, MacMillan and Lu developed an input-output model of the Rural Municipality of Bifrost which is the Municipality bordering on the entrance to Hecla Provincial Park and containing the two towns nearest to the Park, Riverton and Arborg.¹ This input-output table is reproduced in Table 5.5. It can be seen that the municipal area economy is dependent primarily on the agricultural and trade sectors, these accounting for 83 percent of total sales in 1968. The MacMillan and Lu study also identified that 20 percent of households in the Municipality had an average income of less than \$3,000 in 1968, and that the labour force decreased by 22.6 percent during the 1961 to 1968 period.² Therefore, although the average household in the Municipality is better off than the average household in the Interlake region, the potential for employment creation and income expansion programs is obvious, and because many of the personnel now employed at the Park reside in the Municipality, the impact of the creation of the Park on this local economy could be very significant.

Table 5.6 shows that the direct annual sales impact of the Hecla development program on the Municipality is estimated to average \$96,300 over the construction phase and \$143,800 over the operational phase. The majority of this impact derives from the local hiring of trucking firms during the construction phase, and from local

¹J. A. MacMillan and C. M. Lu, Urban Impacts of Rural Resource Development Expenditures in the Interlake Area of Manitoba, op. cit.

²Ibid., pp. 15.

Table 5.5

Input-Output Table, R.M. of Bifrost, 1968

Producing Sector ↓	Purchasing Sector →	Agri-	Mfg.	Non-	Whole-	Retail	Service	Total Intermediate	Household	Government	Inventory Addition	Sales to Investment	Unallocated	Export to Interlake	Export to Manitoba	Export Canada	Total Final Demand	Total Output	
		(1)	(2)	(3)	(4)	(5)	(6)												
	\$1,000.....					\$1,000.....					\$1,000.....					
Intermediate Sector																			
1. Agriculture		144.1	395.5	0.0	134.5	0.0	2.7	676.8	230.8	7.1 ^a	638.0	0.0	0.0	477.5	2,673.6	0.0	4,027.0	4,703.8	
2. Manufacturing		34.0	0.0	21.3	14.2	68.0	103.4	240.9	21.6	0.0	4.9	0.0	127.3	19.7	267.2	0.0	440.7	681.6	
3. Non-Manufacturing		50.5	7.6	13.3	10.8	21.0	7.0	110.2	220.8	65.0	0.0	222.9	0.0	216.7	202.5	0.0	927.9	1,038.1	
4. Wholesale		738.0	6.3	35.7	6.3	8.0	3.1	797.4	535.3	84.8	0.0	1,099.5	0.0	724.8	0.0	0.0	2,444.4	3,241.8	
5. Retail		227.0	13.7	26.1	14.9	25.9	17.0	324.6	1,389.8	137.8	67.9	18.2	80.6	1,354.9	151.2	0.0	3,200.4	3,525.0	
6. Service		1.9	0.1	0.3	0.5	1.9	0.4	5.1	232.9	7.1	0.0	0.0	0.0	228.2	99.9	0.0	568.1	573.2	
Sub-Total		1,195.5	432.2	96.7	181.2	124.8	133.6	2,155.0	2,631.2	301.8	710.8	1,340.6	207.9	3,021.8	3,394.4	0.0	11,608.5	13,763.5	
Payment Sector																			
7. Household		1,577.0	111.3	327.6	328.9	692.0	170.7	3,207.5	0.0	516.0 ^f	0.0	0.0	1,051.3 ^g	0.0	130.3 ^h	0.0	1,697.6	4,905.1	
8. Government		177.2	2.6	12.8	17.4	46.8	10.2	267.0	659.7 ^b										
9. Inventory Depl.		71.8	0.0	5.0	0.0	0.5	0.0	77.3	0.0										
10. Depreciation & Earnings		640.1	74.5	135.0	38.6	107.0	10.9	1,006.1	505.9 ^c										
11. Rent		15.4	0.0	0.0	0.0	1.2	2.5	19.1	35.3 ^d										
12. Interest		39.4	0.3	2.7	32.5	10.5	6.7	92.1	0.0										
13. Unallocated		16.5	3.2	4.8	5.9	22.6	10.3	63.3	320.8 ^e										
14. Import (R.O.I.) ^j		192.6	2.4	13.5	120.4	14.2	7.1	350.2	77.3										
15. Import (R.O.M.)		778.3	61.7	420.0	2,090.5	2,504.0	221.2	6,075.7	674.9										
16. Import (R.O.C.)		0.0	2.4	20.0	426.4	1.4	0.0	450.2	0.0										
TOTAL PAYMENT		3,508.3	258.4	941.4	3,060.6	3,400.2	439.6	11,608.5	2,273.9										
TOTAL INPUT		4,703.8	681.6	1,038.1	3,241.8	3,525.0	573.2	13,763.5	4,905.1										

^a Subsidies paid by government for land clearing.

^b Government income tax, property tax, licences, medical and tuition payments to government.

^c Saving plus house depreciation.

^d Housing rent paid.

^e Room and board expenses and perquisites produced by non-farm households.

^f Transfer payments by government; wages paid by government to households in the R.M. of Bifrost are excluded because of lack of information.

^g Rental income, interest and dividends, plus wage earnings in finance institutions and government.

^h Non-local earnings received by households in the R.M. of Bifrost.

ⁱ Total expenditures of households in the R.M. of Bifrost.

^j Imports from other municipalities in the Interlake Area are for business services which do not exist in the R.M. of Bifrost, such as printing and publishing, personal services, accountants, lawyers, doctors, machinery and equipment, etc. (R.O.I. = Rest of Interlake; R.O.M. = Rest of Manitoba; R.O.C. = Rest of Canada.)

Table 5.6

Increments in Final Demand Associated with the Hecla Development Program,
Rural Municipality of Bifrost, 1970-1977
(\$'000 1968)

Sector	Year-- Source	Construction Phase: 1970-1974				Operation Phase: 1975-1977				
		Capital ^a	Operation and Maintenance ^b	Non-Farm Income ^c	Visitors	Total per Annum	Capital ^a	Operation and Maintenance ^b	Non-Farm Income ^d	Visitors ^e	Total per Annum
Agriculture and Mining		32.3		9.0		6.9		17.7		5.9
Manufacturing				1.0		0.2		1.8		0.6
Non-Manufacturing		364.0		8.5		59.8	108.8	16.8		17.6
Wholesale			31.1	20.5		10.2		95.8	40.8	45.5
Retail			5.4	53.5		11.5		17.0	49.3	57.4
Service		29.1	5.4	9.0		7.7	4.9	20.3	10.0	16.8
TOTAL						96.3				143.8

^aFrom Table 4.2--Estimated proportion of capital expenditures in Interlake made to firms in the Rural Municipality of Bifrost is 50 percent of sector 3, 33.3 percent of sector 6, and 50 percent of sector 16.

^bFrom Table 4.5--All Operation and Maintenance expenditures for goods and service made in the Rural Municipality of Bifrost.

^cAllocation of estimated payments in Bifrost to manpower trainees (\$86,000) and employed staff (\$97,700) across sectors according to the consumption patterns of Bifrost households. Refer to J.A. MacMillan and Chang-Mei Lu, 1973, op.cit., pp. 43-44.

^dAllocation of estimated payments in Bifrost to manpower trainees (\$7,800) and employed staff (\$371,700) across sectors. See footnote c.

^eFrom Table 4.6--It is estimated that 30 percent of all visitor expenditures are made in the Rural Municipality of Bifrost.

purchases and wage and salary payments during the operational phase.

In total, the Hecla project is estimated to generate average annual total sales in the Municipality of \$153,900, increase household income by \$77,200 and provide employment opportunities for 15.4 persons over the 1970 to 1974 period. These annual impacts should increase to average \$182,700 in sales, \$163,500 in income and employment opportunities for 29.3 persons each year thereafter, as shown in Table 5.7.

These impacts are significant in terms of the local economy. Although the effect on gross output is small, 1.1 percent in 1976, the income and employment generated is more substantial (Table 5.8). Income in the Municipality is estimated at \$5.36 million in 1976 to which the program will add \$163,500 or 3.1 percent concentrated in the government sector. Similarly, employment generation in 1976 of approximately twenty-nine man years adds 2.6 percent to 1968 Municipal employment levels of 1,109.

The impacts of the recreation development program on the Interlake region relative to those generated by other resource development programs, are discussed in the next chapter, and policy implications are drawn from the analysis.

Table 5.7

Annual Impacts Associated with the Construction Phase and Operational Phase of
Hecla Provincial Park, Rural Municipality of Bifrost,
Interlake Region, 1970-1977

	Construction Phase: 1970-1974				Operation Phase: 1975-1977			
	Direct Impact ^a	Total Sales and Income Generated ^b	Sectoral Allocation of Income ^c	Non-Agricultural Jobs Created ^d	Direct Impact	Total Sales and Income Generated	Sectoral Allocation of Income	Non-Agricultural Jobs Created
	.....\$'000 1968.....	.....\$'000 1968.....	.....Number.....	.....Number.....	.....\$'000 1968.....	.....\$'000 1968.....	.....Number.....	.....Number.....
1. Agriculture	8.3	14.2	4.8	1.9	5.9	14.0	4.7	1.9
2. Manufacturing	0.2	4.6	0.8	0.2	0.6	6.2	1.0	0.3
3. Non-Manufacturing	74.5	77.9	24.6	5.0	17.6	20.6	6.5	1.3
4. Wholesale	10.3	19.9	2.0	0.4	45.5	52.9	5.3	1.0
5. Retail	11.8	26.6	5.2	0.7	57.4	70.5	13.8	2.0
6. Service	8.7	10.7	3.2	0.9	16.8	18.6	5.5	1.6
7. Household	--	40.5	--	--	--	37.0	--	--
TOTAL ^e	113.8	194.4	40.5	9.3	143.8	219.7	37.0	8.2
Government ^f			36.7	6.1			126.5	21.1
TOTAL			77.2	15.4			163.5	29.3

^aSee Table 5.6.

^bMultiplication of the direct impact by the Interdependence Coefficients for the Rural Municipality of Bifrost. Refer to J.A. MacMillan and Chang-Mei Lu, 1973, op.cit., p. 68.

^cCalculated by multiplying the sales generated by the income coefficients. Refer to the trading coefficient matrix in J.A. MacMillan and Chang-Mei Lu, 1973, op.cit., p. 66.

^dCalculated using output/employee coefficients for the Interlake area by sector from J.A. MacMillan, Chang-Mei Lu and C.F. Framingham, op.cit., p. 156. Coefficients recalculated for six-sector model.

^eColumns may not add due to rounding errors.

^fFrom Tables 5.2, 5.3 and 5.6.

Table 5.8

Impact of the Hecla Program on Output, Income
and Employment in the Rural Municipality
of Bifrost, 1971 and 1976

	1971			1976		
	Projection without Resource Development Program ^a	Impact of Hecla Program ^b	Percent	Projection without Resource Development Program ^a	Impact of Hecla Program ^c	Percent
	..\$'000 1968...			..\$'000 1968...		
Output: Agriculture and Mining Sectors	4,909.8	14.2	0.3	5,757.0	14.0	0.2
Non-Agriculture Sectors	<u>9,642.3</u>	<u>139.7</u>	<u>1.5</u>	<u>11,011.1</u>	<u>168.7</u>	<u>1.5</u>
TOTAL	14,552.1	153.9	1.1	16,768.1	182.7	1.1
Income: Household ^d	3,488.2	40.5	1.2	4,019.3	37.0	0.9
Government ^d	<u>1,114.7</u>	<u>36.7</u>	<u>3.3</u>	<u>1,336.2</u>	<u>126.5</u>	<u>9.5</u>
TOTAL	4,602.9	77.2	1.7	5,355.5	163.5	3.1
	....Numbers....			....Numbers....		
Employment: 1968 ^e						
Agriculture and Mining Sectors	568	1.9	0.3	568	1.9	0.3
Non-Agriculture Sectors	479	7.4	1.5	479	6.3	1.3
Public Sector	<u>62</u>	<u>6.1</u>	<u>9.8</u>	<u>62</u>	<u>21.1</u>	<u>34.0</u>
TOTAL	1,109	15.4	1.4	1,109	29.3	2.6

^aAverage projected Interlake growth rates for output and income from dynamic input-output model (see Fu-Lai Tung, op.cit., pp. 442 and 269) applied to Bifrost data from Table 5.5.

^bAverage per annum for construction phase, 1970-1974. Refer to Table 5.7.

^cAverage per annum for operation phase, 1975-1977, Refer to Table 5.7.

^dIncludes rental income, interest and dividends, plus wage earnings in financial institutions and government.

^eThe 1968 employment data from C.F. Framingham, J.A. MacMillan and D.J. Sandell, op.cit., pp. 138-140, 158-160.

CHAPTER 6

RECREATION AND REGIONAL DEVELOPMENT

This chapter discusses the role that development of outdoor recreation resources has to play in regional development. It first compares outdoor recreation and agricultural resource development programs in terms of their effectiveness in meeting specified regional development goals. The relative contributions of park operations and maintenance and visitor expenditures to regional impacts are discussed in the second section, and then the sensitivity of visitor expenditures to such parameters as stay length and availability of goods and services is analyzed. Tourism is compared with outdoor recreation in the fourth section, and distributional considerations analyzed in section five. The last part of this chapter summarizes the role of outdoor recreation in regional development policy.

The Relative Effectiveness of Resource Development Programs

Chapter 5 provides detailed analysis of the impact of the outdoor recreation development program at Hecla Provincial Park on the Interlake economy in terms of development indicators such as gross output, household income and employment. Since a similar evaluation has been undertaken for agricultural development programs involving drainage, land clearing and farm management training, it is now possible to compare these and make conclusions as to their relative effectiveness in achieving both provincial policy objectives and the evaluation criteria identified for the FRED program. Approximate capital costs

for the Interlake drainage, land clearing and farm management training programs were \$6.8 million, \$4.4 million and \$0.9 million respectively (1968 dollars).¹

The objective of the drainage program was to increase agricultural production by increasing the quality and quantity of agricultural land, and the capital expenditure over the 1968 to 1973 period resulted in the reclamation of 123,885 acres, 75 percent of this being on livestock farms. The land clearing and demonstration program was designed to stimulate the expansion of cultivated acreage in the Interlake by subsidizing clearing costs incurred by farmers. Over the 1967 to 1973 period 126,346 acres of land had been cleared, with an estimated 114,027 acres being in production in 1977. The farm management training program was specifically aimed at increasing the management skills of farmers in the Interlake region through attendance at five-month courses. During 1967 to 1973, 466 trainees graduated from the program, the majority being farmers with low gross receipts.

It is essential in any comparison of these programs that the capital development and operational phases of the program impacts be separated, so that both the short and long term implications for policy can be studied. It is, for instance, very likely that some types of development expenditures have high initial regional impacts but minimal continuing effect on the local economy, and although average impacts may exceed those of an alternative program, the latter may well be preferable due to capacity constraints in the economy and for long-term stability reasons. Average annual program impacts per million dollars

¹Refer to F. L. Tung, op. cit., pp. 376-421 for detailed discussion of these agricultural resource development programs. A summary is provided in F. L. Tung, J. A. MacMillan and C. F. Framingham, op. cit.

of capital expenditure on regional economic development indicators are shown in Table 6.1 under the two classifications "capital phase" and "on-going phase", all figures being in 1968 dollars.

Consideration of Table 6.1 clearly demonstrates that there is no "best" program to achieve all regional development policy objectives, and that each type of resource development has particular advantages depending on the priority assigned to target variables. For instance, drainage has the highest initial impact on household income, but farm management has a larger on-going effect. The latter also generates the largest impact on employment. Both the land clearing and outdoor recreation development programs appear to have relatively smaller impact on the indicators listed than drainage or farm management, but outdoor recreation has larger impact than land clearing on non-agricultural household income and employment.

But what of the longer term impacts, over a ten and twenty year horizon? There has been no analysis on this aspect, but a few preliminary observations can be made. Table 6.2 illustrates the relative growth rates of development indicators for each of the last two years analyzed for the four resource development programs. The 1975 to 1976 data is not strictly comparable since outdoor recreation was still experiencing the effects of some delayed capital formation in 1975, and the 1975 to 1976 changes are negative. The drainage and farm management programs have minimal growth in output, and decreasing employment impact, and the land clearing has minimal employment growth. Between 1976 and 1977 however, when all programs are strictly comparable, outdoor recreation exhibits substantial growth on all impact indicators, while the other three have minimal (output and income) or decreasing (employment) impacts. This reflects the growth displayed by the outdoor

Table 6.1

Average Annual Impacts of Resource Development Programs
per \$1 Million Capital Expenditure,
Interlake Region, 1969-1977
(1968 Dollars)

Program	Average Annual Impacts per \$1 Million Capital Expenditure							
	Drainage ^a		Land Clearing ^b		Farm Management ^c		Outdoor Recreation ^d	
	Capital Phase 1969-1973	On-going Phase 1974-1977	Capital Phase 1969-1973	On-going Phase 1974-1977	Capital Phase 1969-1973	On-going Phase 1974-1977	Capital Phase 1970-1974	On-going Phase 1975-1977
Realized gross output (\$1,000)	2,271.5	3,085.1	571.7	791.9	2,211.6	3,182.1	146.9	98.2
Agriculture ^e	1,482.0	2,087.4	296.6	548.4	1,392.5	2,100.7	8.8	6.1
Non-agriculture	789.5	997.7	275.1	243.5	819.1	1,081.2	138.1	92.0
Household income (\$1,000)	557.7	763.8	129.3	197.8	531.7	778.4	59.4	57.9
Agriculture ^e	449.3	630.8	90.0	165.9	422.5	635.3	2.6	1.9
Non-agriculture	108.4	133.0	39.3	31.9	109.2	143.1	56.8	56.1
Employment (man-years)	153.8	137.2	42.8	55.5	185.8	215.8	15.7	11.0
Agriculture ^e	129.5	109.9	33.8	46.8	160.3	185.3	0.7	0.5
Non-agriculture	24.3	27.3	9.0	6.7	20.5	30.5	15.0	10.5
Government tax revenue (\$1,000)	56.4	76.9	13.1	20.0	54.8	79.2	4.2	2.1
Agriculture ^e	43.0	60.0	8.5	15.8	40.5	60.7	0.3	0.2
Non-agriculture	13.4	16.9	4.6	4.1	14.3	18.5	3.8	1.9

^aCapital expenditure on the drainage program totalled \$6.79 million during 1968-1973, all incurred by the Government (Fu-Lai Tung, op.cit., p. 379).

^bCapital expenditure on the land clearing program totalled \$4.39 million during 1967-1973, \$0.707 million of which was government expenditure and \$3.68 million was clearing costs incurred by farmers (Fu-Lai Tung, op.cit., pp. 392 and 394).

^cCosts of the farm management training program totalled \$0.88 million of government expenditure during 1967-1973 (Fu-Lai Tung, op.cit., p. 409).

^dCapital costs of the outdoor recreation development program at Hecla Provincial Park totalled \$4.413 million of government expenditure during 1968-1975. The majority of this was incurred over the 1970-1974 period, the Park opening in 1975.

^e"Agriculture" is defined as sectors 1-2 for the Drainage, Land Clearing and Farm Management Programs, and sectors 1-3 for the Outdoor Recreation Program. The difference in classification has negligible effect on the analysis.

Source: Analysis of data from Chapter 4 and from Fu-Lai Tung, op.cit., pp. 459-470.

Table 6.2

Growth Rates in Program Impacts,
Interlake Region, 1975-1977

Economic Indicator-- Program	Year	1975 Absolute Level	1975-1976 Percent Change	1976-1977 Percent Change
Realized Gross Output (\$'000 1968)				
--Drainage		20,939.3	0.1	0.1
--Land Clearing		3,378.9	8.1	0.9
--Farm Management		2,799.1	0.1	0.1
--Outdoor Recreation		533.2	-23.6	13.5
Household Income (\$'000 1968)				
--Drainage		5,186.2	a	a
--Land Clearing		844.9	7.6 _a	0.5 _a
--Farm Management		685.2		
--Outdoor Recreation		274.6	-16.0	13.2
Employment (Man-Years)				
--Drainage		952.3	-4.6	-4.4
--Land Clearing		235.5	0.8	-5.1
--Farm Management		195.5	-6.0	-5.7
--Outdoor Recreation		55.1	-22.3	12.4

^aLess than ± 0.05

Source: Drainage, land clearing and farm management programs from Fu-Lai Tung, op.cit., pp. 459-470, outdoor recreation from Chapter 5.

recreation industry, with substantial increases in both operations expenditures and visitation (and therefore visitor expenditures). Outdoor recreation impacts will, therefore, increase markedly over time, and while an evaluation of alternative programs over a five year period may reject outdoor recreation as a means of achieving certain policy goals, if the evaluation were longer term, the positions and rankings may be more comparable or even reversed.²

Recreation Impact Components

The on-going regional impact of any outdoor recreation development program arises from two components; operations and maintenance expenditures at the Park and local expenditures by visitors to the Park. It was noted in Chapter 2 that the major source of regional impact was probably the first component, operations and maintenance expenditures, and this hypothesis is confirmed by the impact data tabulated in Chapter 5. In the two operational years of Hecla Provincial Park, 1976 and 1977, the operational expenditures generate 74 percent, 94 percent and 92 percent of the impacts in regional gross output, household income and employment opportunities respectively. This is

²For instance, if outdoor recreation visitor expenditures increase at an average of 10 percent/annum the magnitude of impacts from this source will be fourfold the initial level in fifteen years. Conversely, drains in an agricultural program may well have silted up over a similar time span and drainage program impacts become negligible. A logical extension of this research would be to investigate the relative merits of alternative resource development programs over the long term by projecting expenditures and discounting the impacts generated. While the trend in outdoor recreation expenditures could be estimated from available data, agricultural production and input information over the long term from drainage and land clearing programs is not available, and would necessitate time series analysis of primary data collected from the farms involved.

because a large proportion of these expenditures are for salaried staff and wage earners, and these payments represent direct inputs into the household sector. Clearly, the proportion of impact attributable to operational expenditures will decline over time given that average visitor growth rates of approximately 10 percent per annum exceed projected annual increases of 4 to 6 percent in these expenditures. However, if operational expenditures grow at 5 percent per annum, it would not be until 1997 that the magnitude of regional impacts would be equally attributable to both operations expenditures and visitor expenditures.

An important implication of this analysis is the extent to which the local economy will be affected by the high degree of seasonality in visitor expenditure patterns. When the majority of regional impacts are generated from operations expenditures, seasonal visitor expenditures will have little destabilizing effect, and this is certainly the case for the early years of operation of Hecla Provincial Park. In addition, where total impacts are small relative to aggregates of the regional economy, the seasonality effects are further reduced. However, it is clear that while the overall implication of seasonality of visitor expenditures on the regional economy is probably small, the effect on particular establishments may be very significant.

Visitor Expenditure Impacts

The magnitude of regional income and employment impacts generated by visitor expenditures is highly dependent on four factors. These are:

1. The number of visitors,
2. The type of visitor,
3. The length of stay, and

4. The availability of goods and services.

Participation in outdoor recreation is rapidly increasing in Manitoba with vehicle counts in Provincial Parks increasing at 10 percent per annum over the past twelve years and campground use rising by 13 percent per annum over the same period. This growth in visitation will be reflected in the associated regional impacts from expanding demand for goods and services, and establishments serving the outdoor recreation market form a high-growth industry. For example, the impact of visitor expenditures by all visitors to Hecla Provincial Park on the realized gross output of the Interlake economy is projected to rise from \$97,200 to \$191,500 between 1975 and 1978, an increase of 97 percent in three years (Table 6.3).

The socio-economic characteristics of visitor parties is also an important consideration for impact analyses--especially ex-ante project evaluations. The type of party attracted to a park (which is determined by the recreation experience supplied) determines the expenditure pattern of visitors while travelling to and from the site, and while at the site. Little analysis has been undertaken attempting to link these two variables, but on theoretical grounds higher income family groups will have potentially greater party expenditures on consumption items than lower income families or single person parties. Since visitors to Hecla Provincial Park are concentrated in the higher income bracket (over 78 percent of visitors in 1975 came from families with 1974 incomes exceeding \$10,000), expansion of average party expenditures is probably more constrained by the availability of goods and services locally than by the socio-economic level or expenditure potential of the park clientele.

Table 6.3

Estimated Impacts of Hecla Visitor Expenditures on
Gross Output, Household Income and Employment,
Interlake Region, 1975-1978

Year	Assumption	Indicator	Realized Gross Output (\$'000 1968)	Employment (man-years)	Household Income (\$'000 1968)
1975	TOT ^a	- Gross Impact	97.2	3.6	14.4
	DTO ^b	- Gross Impact-- Expenditures doubled	161.5	6.2	24.4
	HTO ^c	- Net Impact	53.1	1.9	7.8
	DHT ^d	- Net Impact-- Expenditures doubled	88.0	3.4	13.1
1976	TOT	- Gross Impact	137.1	4.9	20.3
	DTO	- Gross Impact-- Expenditures doubled	227.7	8.6	34.2
	HTO	- Net Impact	88.3	3.1	12.9
	DHT	- Net Impact-- Expenditures doubled	146.6	5.5	21.8
1977	TOT	- Gross Impact	169.2	5.9	25.0
	DTO	- Gross Impact-- Expenditures doubled	281.0	10.5	42.0
	HTO	- Net Impact	115.0	4.0	16.8
	DHT	- Net Impact-- Expenditures doubled	190.4	7.0	28.2
1978	TOT	- Gross Impact	191.5	6.7	28.2
	DTO	- Gross Impact-- Expenditures doubled	318.1	11.7	47.4
	HTO	- Net Impact	131.4	4.5	19.1
	DHT	- Net Impact-- Expenditures doubled	217.4	7.8	32.1

^aTOT--Gross impact on the Interlake region from expenditures by all visitors to Hecla Provincial Park. Expenditures per party at 1975 levels.

^bDTO--Gross impact on the Interlake region from expenditures by all visitors to Hecla Provincial Park. Expenditures per party in Sectors 10, 11, 13 and 16 at 100 percent above 1975 levels.

^cHTO--Net impact on the Interlake region from expenditures by visitors to Hecla Provincial Park, i.e., TOT adjusted for those parties who would have visited the Interlake even in the absence of the new park.

^dDHT--Net impact on the Interlake region from expenditures by visitors to Hecla Provincial Park, where these expenditures in Sectors 10, 11, 13 and 16 are at 100 percent above 1975 levels, i.e., DTO adjusted for those parties who would have visited the Interlake even in the absence of the new park.

The two remaining factors, length of stay and availability of goods and services, are closely linked. It is essential that goods and services be available to meet projected consumption demands by visitors for otherwise, even if stay length increases, local impacts will remain unchanged when expenditure opportunities are limiting.³ This latter constraint, the availability of goods and services, appears to be the major factor which constrains additional expenditures by outdoor recreationists visiting Hecla Provincial Park.

The 1975 Hecla survey asked visitors for their comments or suggestions on the Park and its facilities, and it is clear from the responses that many considered the availability of goods and services to be inadequate. To illustrate this conclusion, the relevant responses are listed in Table 6.4, classified according to expenditure sector. Considering that some of the requests are complementary, the demand for additional provision of goods and services in all sectors is evident and it is probable that if the appropriate facilities were available, substantially increased expenditures would be made and this could have significant effect on the local economy and visitor expenditure impacts. As an example, Table 6.3 illustrates the effect of a doubling of visitor expenditures in sectors 10, 11, 13 and 16 (i.e. doubling of food, other retail and restaurant expenditures) on the impact indicator variables. The average per party Interlake expenditures are increased from \$8.83 to \$13.49 for day-users and \$35.35 to \$51.15 for

³When a park, such as Hecla Provincial Park, is located within reasonable proximity to a major urban centre, camping activity is dominated by weekend visitors and stay length invariably averages around 2.0 nights. The potential to extend this is very limited in these situations.

Table 6.4

Analysis of Requests for Additional Outlets for
Goods and Services, Hecla Park Survey, 1975

Supply Sector	Request	Number of Requests	Ranking amongst all comments ^a
10. Food Stores	Campground Store	56	11
	Concession Stand	26	18
	Liquor Outlet	17	27
11. Other Retail	Canoe/Boat Rental	64	5
	Shopping Facilities/ Fishing Supplies	8	36
	Souvenir/Craft Shop	3	-
12. Auto Product Sales and Service	Gas Station	7	40
13. Apparel and Shoes	-	-	-
14. Personal Service	Restaurant	61	6
	Eating Places	4	-
Other Recreational Facilities	Boat Cruises	28	15
	Laundromat	25	19
	Minature Golf	23	20

^aIn total, over one hundred request categories were tabulated, but many of these were comments on the Park operation.

Source: Analysis of Hecla Survey responses.

campers (\$1975) and substantial increases in regional economic impact are generated--realized gross output by 66 percent, employment by 72 percent and household income by 69 percent.

A final critical factor in determining the magnitude of regional income and employment impacts generated by visitors to a newly established park is the substitutability between the park and other recreational sites in the region. If the park diverts visitors from nearby recreation areas by providing a similar recreation experience, the net economic impact to the region may be small since this regional impact is dependent upon additional visitors being attracted to the region, and is not affected by a redistribution of current visitor levels within the region. The 1975 Hecla survey found that nearly 50 percent of the Park visitors would have come to the Interlake even in the absence of the new Park. Therefore, although the gross impact on the regional economy from expenditures by all visitors to the Park may be significant, the net impact from the development of the new site will be much reduced. To illustrate this, Table 6.3 demonstrates that in 1978 the gross impact of expenditures by visitors to the Park on realized gross output is estimated at \$191,500, but the net impact is 31 percent less than this at \$131,400 (\$1968), with similar reductions in employment and household income impacts. It is essential for maximum regional impacts, therefore, that new parks be designed so as to attract the maximum number of additional visitors to the region rather than provide similar facilities to those already available locally.

Tourism and Outdoor Recreation

The distinction between tourism and outdoor recreation was discussed in Chapter 1--briefly, tourism involves all travel for whatever reason when the trip made is not part of a daily routine, whereas outdoor recreation at parks relates solely to those trips made voluntarily during leisure time. It is essential that this dichotomy is kept in perspective for analysis of the impacts of the tourism industry are not transferable to evaluations of outdoor recreation, and vice versa.

The differing regional impacts of tourism and outdoor recreation can be illustrated with reference to Interlake data. The survey of Interlake businesses by MacMillan, Lu and Framingham estimated the total and sectoral composition of sales to travellers in the region for 1968, the results of which are shown in Table 6.5.⁴ Total expenditures of \$5.2 million were concentrated in the personal service (including hotels and restaurants) and auto products sales and service sectors, and represented approximately 4 percent of total final demand sales in the economy. Table 6.5 also details the multiplier (indirect and induced) effect of this expenditure on regional sales and income, implying a total sales multiplier of 1.25 and an income multiplier of 0.26 for this component of final demand.⁵

⁴"Travellers" were defined as Non-Interlake households and included recreation visitors, government administrators and travelling salesmen.

⁵\$1 expenditure by travellers generates sales of \$1.25 and 26 cents in household income. Substantial import to Winnipeg, leakages and investment multiplier effects are omitted,

Table 6.5

The Direct, Indirect, and Induced Effects of Expenditure by
Travellers on Interlake Area Economy, 1968^a (\$'000)

Sector	Sales to Traveller ^b	Direct, Indirect, and Induced Effects due to Traveller Purchases										Total Sales and Income Generated (11)	Total Income Generated (12)
		Constr. (1)	Farm Equip. (2)	Food Stores (3)	Other Retail (4)	Auto Product Sales and Serv. (5)	Apparel and Shoes (6)	Furn. and Appl. (7)	Ins. (8)	Pera. Serv. (9)	Oth. Serv. (10)		
1. Agriculture Livestock	0	1.203	1.997	7.140	1.964	4.847	0.104	0.005	0.676	104.934	3.536	126,406	34.623
2. Agriculture Crops and Other	0	0.358	0.854	1.922	0.334	1.332	0.025	0.001	0.156	24.738	0.816	30.535	9.191
3. Mining	0	0.005	0.000	0.001	0.002	0.016	0.001	0.000	0.002	0.038	0.014	0.080	0.022
4. Food and Beverage Manufacturing	0	0.177	0.037	8.357	1.542	1.017	0.021	0.001	0.142	122.459	0.859	134.611	16.678
5. Other Manufacturing	0	0.886	0.080	0.426	0.426	2.840	0.198	0.001	0.304	6.818	2.515	14.197	4.074
6. Transportation	0	1.606	0.828	0.739	4.535	5.499	0.213	0.006	2.757	20.545	6.618	43.348	18.468
7. Construction	137.800	142.493	0.169	1.380	1.975	5.320	0.107	0.009	0.628	42.581	8.370	203.030	37.154
8. Petroleum Wholesale	0.900	2.705	0.621	3.730	4.066	15.025	0.347	0.018	2.166	80.710	9.669	119.336	9.487
9. Farm Equipment, Building Material	37.700	7.948	37.918	0.833	0.506	1.774	0.090	0.002	0.240	15.519	1.502	66.332	6.971
10. Food Stores	297.400	2.312	0.425	289.871	3.161	13.498	0.283	0.014	1.885	64.530	9.559	385.538	35.277
11. Other Retail	282.800	4.764	0.847	4.713	289.175	27.417	0.550	0.026	3.819	132.726	30.285	494.324	62.581
12. Auto Product Sales and Service	1,242.700	6.800	1.462	6.762	8.229	1,279.121	0.739	0.039	4.771	169.281	24.781	1,501.985	194.807
13. Apparel and Shoes	25.500	0.478	0.098	0.519	0.654	2.792	25.559	0.003	0.390	13.293	1.977	45.743	5.919
14. Furniture and Appliances	0.800	0.185	0.034	0.197	0.377	1.078	0.023	0.801	0.151	5.135	0.768	8.749	1.749
15. Insurance	35.500	0.227	0.039	0.300	0.353	0.921	0.026	0.001	35.723	5.145	0.622	43.358	26.349
16. Personal Service	2,802.800	2.064	0.371	2.166	2.951	11.854	0.248	0.012	1.658	2,861.907	10.514	2,893.745	748.033
17. Other Service	299.800	1.478	0.105	0.784	1.123	5.471	0.099	0.012	1.098	24.509	305.031	339.710	124.368
18. Household	0	31.544	5.779	33.675	43.134	184.190	3.862	0.186	25.722	877.108	130.438	1,335.637	0
TOTAL	5,152.797	207.315	51.853	363.208	364.507	1,564.010	32.494	1.136	82.286	4,571.973	547.875	7,786.656	1,335.637

^aEntries in the table are equal to: $r_j c_{ij}$.

where:

r_j = sales to travellers by the j^{th} sector; and

c_{ij} = an element of the inverse matrix including households. All zero entries that appeared in the column are omitted in the table because no sales are made to travellers.

^bThe sales to travellers or tourists are part of the exports sales to the rest of Manitoba by Interlake businesses.

Source: MacMillan, James A., C. Lu and C.F. Framingham, Manitoba Interlake Area: A Regional Development Evaluation, Iowa, Ames, The Iowa State University Press, 1975 pp. 84-85.

A comparison between the sectoral allocation of tourism (traveller) expenditures and recreation expenditures is given in Table 6.6. Sales to recreationists are more heavily concentrated in the food and retail rather than personal service sectors of the economy, commensurate with a reduced usage of hotels, motels and restaurants which are patronized more by travelling salesmen and businessmen. Since the sectoral multipliers differ markedly, this difference will reflect in the income and employment generation effects of outdoor recreation development programs vis-a-vis other programs within the tourist sector.

Table 6.7 compares the impacts of \$1 million in expenditures by "travellers" and "outdoor recreationists" in the Interlake region of Manitoba, using base year 1968 statistics of the local economy. Regional sales, income and employment effects generated are substantially less from "outdoor recreationists" than from "travellers", although the out-of-region spinoffs are provisionally estimated to be of the same magnitude and significance.

Compared with the traveller sales and income regional multipliers of 1.25 and 0.26, the figures for outdoor recreationists are 1.16 and 0.17. These differences are due to the sectoral composition of expenditures by the two types of visitors (Table 6.6) and emphasize the importance of precise definition of policy targets in making a decision on the type of development to be undertaken in this field. For instance, the data in Table 6.8 demonstrate that if income and employment are to be stimulated on the personal service sector tourism should be expanded, but if the retail sectors are underutilized, expansion of outdoor recreation is a preferable policy.

Table 6.6
Sectoral Allocation of Sales to
Travellers and Recreationists

Sector	Travellers ^a	Recreationists ^b
	.....percent.....	
7. Construction	2.7	--
9. Farm Equipment, Building Material	0.7	--
10. Food Stores	5.6	30.2
11. Other Retail	5.5	14.2
12. Auto Product Sales and Service	24.1	33.8
13. Apparel and Shoes	0.5	4.2
14. Furniture and Appliance	--	--
15. Insurance	0.7	--
16. Personal Service	54.4	17.6
17. Other Service	5.8	--
	100.0	100.0

^aRefer Table 6.5 From 1968 survey data, Interlake region.

^bRefer Table 3.4 From 1975 survey data, Hecla Provincial Park. For comparative purposes it is assumed that inflation increases all sectoral expenditures uniformly, and therefore that the sectoral distribution of expenditures does not change over time.

Table 6.7

Economic Impacts Resulting from \$1 Million
in Sales to Recreationists and Travellers
-- The Interlake Region

Impact	Sales to Travellers	Sales to Outdoor Recreationists
Direct Employment	64	37
Direct Income	\$218,400	\$140,300
Total Regional Direct, Indirect and Induced Sales	\$1,251,400	\$1,162,500
Total Regional Employment	76	45
Total Non-Agricultural Regional Employment	72	42
Total Regional Household Income	\$259,200	\$168,700
Regional Imports Generated	\$792,400	\$852,000
External Sales Generated ^a	\$1,115,400	\$1,127,400

^aProvisional estimates.

Source: The calculation procedure is as outlined in J. Craven, C. F. Framingham and R. E. Capel, "A Model for the Analysis of the Demand for and Economic Impacts of Summer Recreation in Manitoba," Regional Science Perspectives, Volume 5 (1975), pp. 27-42, using sectoral expenditure proportions (Table 6.6) from J. A. MacMillan, C. M. Lu and C. F. Framingham, op. cit., (travellers), and the Hecla Survey (recreationists). The inter-industry coefficients for the impact calculations were derived from 1968 survey data--J. A. MacMillan, C. M. Lu and C. F. Framingham, op. cit., pp. 61, 68-69, 156.

Table 6.8

Sectoral Impacts Resulting from One Million Dollars in Sales
to Travellers and Recreationists, Interlake Region

Sector	Impact	Total Regional Sales		Regional Employment		Regional Income	
		Travellers	Recreationists	Travellers	Recreationists	Travellers	Recreationists
		.....\$'000.....		.....Number.....		.....\$'000.....	
Agriculture--Livestock		24.5	16.5	3.1	2.1	6.7	4.5
Agriculture--Crops and Others		5.9	4.2	1.0	0.7	1.8	1.3
Mining		--	--	--	--	--	--
Food and Beverage Manufacturing		26.1	17.6	0.8	0.5	3.2	2.2
Other Manufacturing		2.7	1.8	0.1	0.1	0.8	0.5
Transportation		8.4	6.2	1.0	0.8	3.6	2.6
Construction		39.7	6.7	2.0	0.3	7.3	1.2
Petroleum Wholesale		22.8	15.7	0.4	0.3	1.8	1.2
Farm Equipment and Building Material		12.5	2.7	0.3	0.1	1.3	0.3
Food Stores		75.0	314.4	1.9	8.1	6.9	28.8
Other Retail		96.1	166.9	3.3	5.7	12.2	21.1
Auto Product Sales and Service		291.3	371.0	7.0	8.9	37.8	48.1
Apparel and Shoes		8.9	44.5	0.4	1.8	1.2	5.8
Furniture and Appliances		1.5	1.2	0.1	^a	0.3	0.2
Insurance		8.5	1.2	1.0	0.1	5.2	0.8
Personal Service		561.6	187.4	45.7	15.2	145.2	48.4
Other Service		65.7	4.4	7.6	0.5	2.4	1.6
TOTAL		1,251.4	1,162.5	75.7	45.2	259.2	168.7

^aLess than 0.05.

Source: Refer to Table 6.7.

Distributional Considerations

There are three important components in distributional analysis of public good investments. These are:

1. The beneficiaries from the project output,
2. The beneficiaries from the economic impact of the project, and
3. The source of the capital and operational funds needed for the project.

Each of these topics is discussed in the following subsections in order to evaluate the distributional impact of the outdoor recreation development program at Hecla Provincial Park.

Beneficiaries from project output. As outlined in Chapter 2, a public park generates two types of primary impact benefit--the consumer surplus to recreationists from the recreation experience in visiting the park, and the option demand that may exist for that specific type of resource use. If it can be assumed in the case of Hecla Provincial Park that the magnitude of consumer surplus benefits is the same for each visiting party, the distribution of consumer surplus benefits among income classes will parallel the distribution pattern of visitors to the Park by income class.⁶ Data on this aspect are provided in Table 6.9 which shows that for all party types from Manitoba visiting Hecla Provincial Park in 1975, 77.1 percent had 1974 family incomes in excess

⁶This implies, using the Hotelling-Clawson-Knetsch approach to the measurement of consumer surplus of recreation, that the costs of visiting the Park are the same for each party, independent of their home location. Although this is a strong assumption, it is tempered by the facts that over 76 percent of the main-destination users of the Park from Manitoba live in Winnipeg and there is a uniform park entrance fee. The argument also assumes that the marginal utility of money is invariant between income groups.

Table 6.9

Income of Parties Visiting Hecla Provincial Park, and Income
and Taxation Statistics for the Manitoba Population,
1970 and 1974

Category	Income Group Unit	Less Than	\$3,000-	\$6,000-	\$8,000-	\$10,000-	\$15,000-	\$20,000-	\$25,000	Total	Total \$10,000 and Over
		\$3,000	\$5,999	\$7,999	\$9,999	\$14,999	\$19,999	\$24,999	and Over		
1. Hecla Visitors from Manitoba: Family Income in 1974 ^a											
All Party Types	Number	15	43	35	80	249	171	85	78	756	77.1
	Percent	2.0	5.7	4.6	10.6	32.9	22.7	11.2	10.3	100.0	
One Family Parties	Number	2	5	16	28	114	83	38	30	316	83.8
	Percent	0.6	1.6	5.1	8.9	36.1	26.2	12.0	9.5	100.0	
Two or More Family Parties	Number	--	4	1	3	31	22	12	15	68	91.0
	Percent	--	4.5	1.1	3.4	35.2	25.0	13.7	17.1	100.0	
One Couple	Number	7	18	11	28	64	42	23	20	213	69.9
	Percent	3.3	8.5	5.2	13.1	30.0	19.7	10.8	9.4	100.0	
2. Manitoba: Family Income in 1970 ^b											
	Number	34,760	48,030	37,675	37,555	52,495	15,055	4,495	4,990	235,055	32.8
	Percent	14.8	20.4	16.0	16.0	22.4	6.4	1.9	2.1	100.0	
3. Winnipeg: Family Income in 1970 ^c											
	Number	10,075	20,975	22,145	24,755	36,510	10,735	3,290	3,730	132,215	41.0
	Percent	7.7	15.9	16.7	18.7	27.6	8.1	2.5	2.8	100.0	
4. Manitoba: Individual Income in 1974 ^d											
	Number	160,351	127,685	64,562	54,440	89,904	29,060	10,180	11,106	547,288	25.6
	Percent	29.3	23.3	11.8	10.0	16.4	5.3	1.9	2.0	100.0	
5. Manitoba: Federal and Provincial Tax Paid by Individuals in 1974 ^e											
	\$ Million	854	35,275	54,042	73,542	190,098	101,671	51,437	129,012	635,931	74.3
	Percent	0.1	5.5	8.5	11.6	29.9	16.0	8.1	20.3	100.0	

^aAnalysis of Hecla Survey Data. Note that 90 percent of total visitors lived in Manitoba and 68 percent in Winnipeg. Family parties and the "one couple" classification make up 79 percent of the types of parties from Manitoba visiting the Park in 1975.

^bStatistics Canada, Families, 1971 Census of Canada, CS 93-724, Vol. 11, Part 2 (Ottawa, Queen's Printer, March 1975), pp. 81-1 to 81-2.

^cIbid., pp. 89-3 and 89-4.

^dCanada, Department of National Revenue, Taxation Statistics (Ottawa, Queen's Printer, 1976). Analysis of data on page 117. It is assumed that all returns are taxable for incomes over \$7,000. This assumption excludes incorporation of 953 or 0.17 percent of returns.

^eIbid.

of \$10,000.⁷ The most recent data on family income in Manitoba is also included in this table. This shows that in 1970, 32.8 percent of Manitoba families and 41 percent of Winnipeg families had incomes in excess of \$10,000 which, even with the growth of incomes in the intervening period, demonstrates that the visitors to Hecla Park, and the beneficiaries of the primary impact, are concentrated in the higher income brackets of the population.⁸

Beneficiaries from regional economic impact. One of the primary goals of the FRED development program in the Interlake area is to increase income opportunities and the standard of living for the local people. The Interlake is a predominately agricultural region with 40 percent of households classified as "rural farm", 24 percent as "rural non-farm" and 36 percent as "urban" in 1968.⁹ The low income households in the region are concentrated in the farm sector which in 1968 contained 53 percent of Interlake households with family income under \$1,500.

The outdoor recreation development program at Hecla Provincial Park has generated impacts on money income and employment both at the regional and municipal levels, but these have been concentrated in the

⁷To ensure that there was no bias in the respondents according to type of party, the data for family parties are also included in Table 6.9. This shows that for these groups, over 85 percent had family incomes exceeding \$10,000, and thus the overall average is probably biased downward because of responses relating to individuals rather than families.

⁸Personal income per capita in Manitoba has increased from \$2,906 in 1970 to \$4,862 in 1974, a change of 67 percent. Even with allowance for this growth, the conclusion is still valid. Source: Statistics Canada, Cansim printout.

⁹C. F. Framingham, J. A. MacMillan and D. J. Sandell, op. cit., p. 59.

non-agricultural sectors with negligible spillovers into agriculture. In addition, the jobs which are created tend to be in the higher income occupation categories. For instance, average 1968 household income in Bifrost was \$5,666, and those with occupations in the management, professional, labourer and craftsman category (the people employed in the Hecla project) had above average incomes.¹⁰ Furthermore, during 1961 to 1968 when the labour force in Bifrost decreased from 1,475 to 1,142 (23 percent) the public administration sector was one of the two that showed an increase in employment.¹¹

The jobs that are created by the recreation program are not therefore in the industries from which outmigration is occurring. It is clear that such development programs, compared with agricultural resource development programs, do not directly affect the primary target population in agriculture in the Interlake but can markedly affect the rural non-farm and urban populations.¹² From a policy viewpoint it is critical that this division is understood since few trickle down effects occur, and that decision makers are clear that the main beneficiaries from the economic impact will be the non-farm population. To the extent therefore that money income and employment opportunities are to be generated in urban centres, the development of this type of outdoor recreation will have significant impact, primarily concentrated in the local service centres close to the Park.

¹⁰C. F. Framingham, J. A. MacMillan and D. J. Sandell, op. cit., p. 147.

¹¹J. A. MacMillan and C. M. Lu, 1973, op. cit., p. 17.

¹²It is assumed that relative prices do not change.

Payments for costs based on benefits received. If it is assumed that the capital and operational costs of the Park are financed in a way equivalent to the average of all Government expenditures which are funded from general revenue monies raised by Federal and Provincial taxation on individuals, the majority of these costs are borne by the higher income groups in the population. From consideration of Table 6.9, for example, 25.6 percent of individuals in Manitoba earned in excess of \$10,000 in 1974 but contributed 74.3 percent of individual tax revenue. Furthermore, the similarity between the proportion of tax paid in each income group and the percentage of Park visitors is striking, and suggests that those who receive the primary benefit from the Park are those who pay for its costs--the benefit taxation principle of Erik Lindahl.¹³

Redistribution. Two conclusions can be drawn from the above discussion regarding the redistributational effects of the development of outdoor recreation resources such as Hecla Provincial Park. Firstly, those who experience the primary benefits of the recreation experience are those who contribute to its expense, and if redistribution in this context were a policy goal, the monies would be better spent providing recreation facilities close to centres of low-income populations where site access was not inhibited by cost.¹⁴ Secondly, the economic impacts in terms of income and employment generation are concentrated

¹³This assumes that individual income parallels household income distribution, and therefore includes a downward bias in the former proportions.

¹⁴This confirms the a-priori hypothesis on redistributational effects contained in Chapter 1.

in the urban sectors of the regional economy. To the extent therefore, that rural-urban income disparities exist within a region, this type of investment will not, by itself alleviate the problem. Its main advantage in this context is the inter-regional perspective, in that development of outdoor recreation will generate income and employment opportunities within a region and therefore mitigate against inter-regional migration (the stay option) and increasing inter-regional income differentials.

Recreation and Regional Development Policy

This research has identified six factors as being of critical importance in maximizing the regional income and employment impacts generated from the development of outdoor recreation facilities. These are, in approximate rank order, as follows:

1. Maximum involvement of local personnel in construction and operation,
2. Use of the construction phase to provide training opportunities for local people under a Manpower Corps Program,
3. Channelling of capital and operations and maintenance expenditures into local firms,
4. Provision of recreation facilities which will attract additional visitors to the region--non-duplication of existing facilities,
5. Encouragement of local businesses to provide the range of goods and services desired by recreationists, and
6. Provision of facilities to encourage increased stay length by visitors to the region.

Even with many of these attributes, however, this study suggests that with development such as is occurring with Hecla Provincial Park and

the Interlake region, the majority of regional impacts generated are tied to local park service centres and, given that capital constraints exist, the overall regional effects may not be as significant in terms of achieving income and employment policy goals in the short run as investment in certain types of agricultural resource programs.¹⁵ On efficiency grounds therefore, expansion of the existing agricultural base of the region may yield more immediate pay-off than developing an extensive provincial outdoor recreation park,¹⁶ and suggests that in these circumstances recreation development may only generate significant localized effects.

There are certain specific advantages that outdoor recreation does bring to a regional economy which are not duplicated in other resource development programs. These are as follows:

1. A high potential for linking manpower training programs with the capital construction and operational phases,
2. Generation of significant local urban impacts on income and employment,
3. Establishment of a stable, rapid-growth industry which is not subject to the fluctuations found in agriculture,
4. Provision of a non-agricultural development program which

¹⁵As noted previously in this chapter, the implications from a comparison of the long run discounted impacts from alternative resource development programs may be different. Such information would be useful to policy makers for rational planning, and is a logical extension of this research.

¹⁶This is as opposed to an intensive type of recreation development, the impacts of which will differ markedly from the situation at Hecla Provincial Park. For instance, the conclusions made here are not directly transferable to an evaluation of establishing 5,000 cottage sites at Grindstone Provincial Recreation Park.

can complement development in the rural sector, especially when rural-urban linkages are small,

5. Inducement of improvement in the regional transportation system through increase in inter-regional vehicle traffic,

6. Preservation of natural resources and aspects of cultural heritage, and

7. Promotion of social integration between regions.

If any of these parameters enter into the objective function of public decision makers, then the priorities accorded to the development of outdoor recreation in the Hecla Provincial Park manner will be greatly enhanced.

CHAPTER 7

CONCLUSIONS

This concluding chapter provides a summary of this study in terms of its objectives, the research program undertaken and the results. The limitations of the data and quantitative methods employed are then discussed, followed by suggestions as to profitable lines of further research.

Summary

This study was initiated due to the lack of information on the effects that development of outdoor recreation resources has on regional economies. It was clear that the relationships between this type of resource development, the economy and policy goals were poorly researched and understood, and secondly that no quantitative data, except some analysis of visitor expenditures, were available on the topic. If public policy is to encourage expansion of outdoor recreation facilities in a judicious manner, the program-economy-policy goals linkages must be identified and quantified so that the probable impacts of alternative programs can be estimated and priorities established.

The basic methodology employed in the study was input-output analysis through which the impacts of capital formation, operations and maintenance expenditures, visitor expenditures and induced household consumption effects associated with establishment and operation of Hecla Provincial Park on the Interlake economy of Manitoba during 1969 to 1977 were analyzed. Policy goals were used to identify three relevant

development indicators--gross output, household income and employment.

Regional accounts for the Interlake economy had been developed from a 1968 survey so the regional input-output model was already available. However, since no data on visitor expenditure patterns were available, a primary data collection program was designed and visitor survey implemented during the summer of 1975. This provided the only new data input required for the study.

With reference to the data collected and analysis conducted, the following results emerged:

The visitor survey. Important features of the self-administered questionnaire technique used included pretesting and the design parameters of apparent brevity, layout, attractiveness and simplicity. Consistent with other studies, distribution of the self-administered questionnaire forms at the Park entrance and the provision of a voluntary deposit retrieval box at the Park exit contributed to the high response rate of 48 percent. This gave a total data base of 1,051 responses, 60 percent of which were from day-users.

Recreation use results include:

1. An estimated 46,000 visitor days were spent at Hecla Provincial Park during May to September 1975, 63 percent of these from day visitors.
2. Sixty-eight percent of visitors came from Winnipeg, 22 percent from other Manitoba locations, 5 percent from out-of-province Canada and 5 percent from the U.S.A.
3. Average party size was 3.5 for day-users and 3.4 for campers, the latter having an average stay length of approximately 2.0 days.

4. Forty-six percent of visitor parties earned in excess of \$15,000 during 1974.

5. Interlake expenditures in 1975 averaged \$8.83 per day-use party and \$16.07 per camping party per night (\$2.52 and \$4.73 per person per day respectively). Total Interlake expenditures in 1975 were estimated at \$154,000--\$113,000 to local businesses and \$41,000 to the government sector in park entrance, camping and rental cabin fees and charges for use of the golf course and hire of golfing equipment.

The impact analysis. During 1968 to 1977, the outdoor recreation development program at Hecla Provincial Park involved the following expenditures (\$1968): \$4.413 million in capital construction, \$0.4 million in manpower corps training, and \$1.2 million in operations and maintenance; and generated \$299,000 in additional spending by recreationists visiting the Interlake region. The effects of this expenditure on the Interlake economy were analyzed using a dynamic twenty-four sector input-output simulation model, and the following conclusions were drawn:

1. During 1969 to 1977, realized gross output in the economy is increased by \$4.5 million, household income by \$2.1 million, and employment opportunities of 492 man years created. This represents annual additions of less than 0.5 percent in each of these indicators.

2. The majority of impact is localized into the non-farm sectors of the Rural Municipality of Bifrost, the area bordering the Park. In 1976, for instance, output in this Municipality is projected to increase from \$16.8 million to \$17.0 million (1.1 percent), household income from \$5.4 million to \$5.5 million (3.1 percent), and employment opportunities from 1,109 to 1,138 man years (2.6 percent), due largely

to the extent of government expenditures in the town of Riverton.

3. The capital formation generates the majority of impact early in the program, but as the derived demand for goods and services falls from this source, operations and maintenance expenditures increase substantially and form the basis for the continuing impact from 1975. Expenditures by recreationists attracted to the Interlake by the Park contribute less than 5 percent of the derived demand in 1976, but since growth rates in participation are high, this proportion will gradually increase.

4. Compared with three agricultural resource development programs--drainage, land clearing and farm management training--which have been analyzed in a similar fashion, outdoor recreation generates substantially less immediate impact on development indicators on average over the regional economy per dollar of total capital expenditure. Local urban impacts are, however, relatively greater by comparison.

The above results of the study have implications both for regional development programs and for park planners. It was demonstrated that in the short term, the overall regional impacts of the outdoor recreation development program were small when compared with those generated by agricultural resource development programs (although the urban impacts in local service centres to the Park were significant). One reason for this is the relatively low proportion of total capital expenditure on the program that was channelled into Interlake firms. All the capital costs of three agricultural resource development programs represented derived demand for goods and services from Interlake sectors, but only 30 percent of the outdoor recreation program expenditure was similarly allocated. The returns to this \$1.3 million (\$1968) were substantial and highlight the importance of maximum involvement of

local businesses in the construction phase.

In addition, the economy is dominated by agriculture, with strong trickle linkages up into the urban sectors, but small dollar flows in the reverse direction. Agriculture resource development programs therefore, directly affect the economic base of the region with resulting implications for the urban sectors, whereas outdoor recreation impacts are generated only in certain locations and non-farm sectors, with little trickle down implications for the primary target population in agriculture.

In circumstances where the opportunities for expansion of the agricultural or industrial base of a region are limited, the development of outdoor recreation may provide a growth industry which would compensate for a declining rural economy, and provide a major opportunity both in job training and job creation. In the case of the Interlake economy, however, regional development policy objectives may be better achieved through capital investment to expand the existing agricultural base of the region. The potential in the short-term for increasing income, raising the standard of living of low-income families, and providing employment for those who alternatively would migrate out of the region is greater in this sector than from developing outdoor recreation resources.

With regard to park planning, several important factors were identified as essential in maximizing the regional spin-offs from park development. While the involvement of local personnel and firms in the capital and operational phases was highlighted as of prime importance, it was also apparent that non-duplication of facilities already in the region and provision of establishments to service the visitor population were essential to realize the potential from visitor

expenditures. Furthermore, if the distributional effects of establishing a park enter the planners' objective function, much heavier weight should be given to proposals creating outdoor recreation facilities close to urban centres, where access costs are low. Finally, it was clearly demonstrated that the data collection techniques adopted in this study provide a comprehensive yet inexpensive way of obtaining data about park visitors, and thus providing the feedback which is essential to park planners.

Limitations

The limitations of this study can be classified as either related to the data or methodological, and each of these types is discussed separately.

Data limitations. When this program of research was conceptualized, one of the initial constraints was the lack of adequate data on the characteristics and expenditure patterns of outdoor recreationists and, in particular, on visitors to Hecla Provincial Park. This problem was overcome by the 1975 Hecla survey which produced the most comprehensive data records regarding visitors to any outdoor recreation site in Manitoba.

Since the regional accounts for the Interlake economy were generated from a 1968 survey and visitor expenditure patterns from a 1975 survey the major data shortcoming in this study is the static nature of the data base and the lack of statistics which could have been used for validity tests on the model. Time period analysis is very difficult in this situation since broad assumptions need to be made regarding the growth pattern of crucial parameters. The implications

of this are linked with the analytical method employed, and are discussed in the next subsection.

Methodological limitations. The theoretical limitations to input-output analysis are well documented and only the aspects of particular relevance to this study are discussed here. Although the dynamic simulation model used for impact analysis does incorporate the effects of technological change in the agricultural sectors, the Leontief-type production function assumed for the non-agriculture sectors places severe limitations on its applicability for long term projection. While it is true that agriculture is the major industry in the Interlake economy, the importance of neglecting technological change in non-agricultural sectors becomes more important over time and, in the case of this model, projections of impacts to 1977 based on 1968 data can be seriously questioned. Given that the Interlake economy is, however, probably undergoing structural change at a very slow rate, the general nature of the conclusions from the impact analysis are probably valid although a detailed investigation using sensitivity analysis is needed to test the significance of this and other assumptions.

The second major shortcoming of the quantitative analysis is the concentration on money income and the lack of attention to relative price movements. This can be a major restriction on any analysis which evaluates programs in terms of distributional objectives such as "achieving an equitable distribution of income" or "increasing the standard of living." It may be true, as is assumed, that relative price movements are negligible because of the scale of some of the project outputs, but it is difficult to evaluate the implications of the assumption without further data.

The analysis assumes "average" base data in that the regional accounts for 1968 reflect a typical year as do the visitor expenditure characteristics established by the 1975 survey. This is an important assumption, and limitation, when the Interlake economy is dominated by agriculture which is liable to marked variations in output due to climatic conditions and cyclical fluctuations in price for certain commodities. Further data is therefore needed to establish "typical" base period parameters.

Finally, the research covers only the first four years of the development program, and the results and conclusions are biased in favour of programs which have immediate impact. Discounting of long-term impact projections would overcome this problem, but there are many data and methodological difficulties in making such projections.

Areas for Further Study

The limitations section of this study implicitly pointed to areas of further study for improvement of the dynamic input-output simulation model used for the impact analysis and the lack of available data which could have been used for validity tests. In addition, however, several important extensions to this study could be made to further understand the place of outdoor recreation in the regional development process. These are:

1. An investigation into the provincial and national impacts from development of outdoor recreation resources. Data is urgently needed in this area so as to guide national priorities in parks' planning,
2. Analysis of the long-term regional implications of establish-

ment of provincial and national parks. As was suggested in Chapter 6, outdoor recreation is a growth industry and the longer term approach to evaluations may change the priorities which have been accorded to this type of development,

3. Projection of the demand for outdoor recreation, possibly using the Lancaster approach to the theory of demand, as suggested in Chapter 2. This demand analysis could then be linked with the supply-side data available to plan development of resources both to meet specific demand and to achieve provincial and regional policy objectives, and

4. Relating the magnitude of economic impacts to the type of development in the tourist-recreation sector. This would enable policy makers to effectively cater to the various types of markets in this sector, and to evaluate alternative proposals for intensive or extensive resource development within a program-goal framework.

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APPENDICES

APPENDIX I

HECLA PROVINCIAL PARK

In 1967 an agreement was signed between the Government of Canada and the Province of Manitoba to develop the Interlake region of Manitoba (Figure I.1). This program, known as the Fund for Rural Economic Development (FRED), was designed to work closely with area development boards comprised of local residents to promote economic development, increase income and employment opportunities, and raise the standard of living in general. Recreation's share of the development in the Interlake FRED plan, 1966-1977, was five percent of the total budget of \$85 million--approximately \$4 million. This was allocated to develop three recreational areas within one hundred miles of Winnipeg along the west shore of Lake Winnipeg and to provide construction, training and service jobs. The majority of this money was earmarked for a substantial upgrading of the access to, and recreational facilities on, Hecla Island; an island covering approximately seventy-five square miles and situated ninety miles north of Winnipeg, on Lake Winnipeg.

The Hecla Island community was founded in 1876 by Icelandic immigrants as a fishing industry base on Lake Winnipeg. In 1955, the population had reached five hundred, but thereafter, because of flooding of agricultural land by high lake levels and poor fishing, the island experienced outmigration to the extent that only eighty people were left in 1969. For many years the island had provided low-key day use and camping facilities at Gull Harbour, but since access was only by ferry from Riverton, usage was restricted. Under the FRED plan, it was decided to realize the recreational potential of the island by converting the

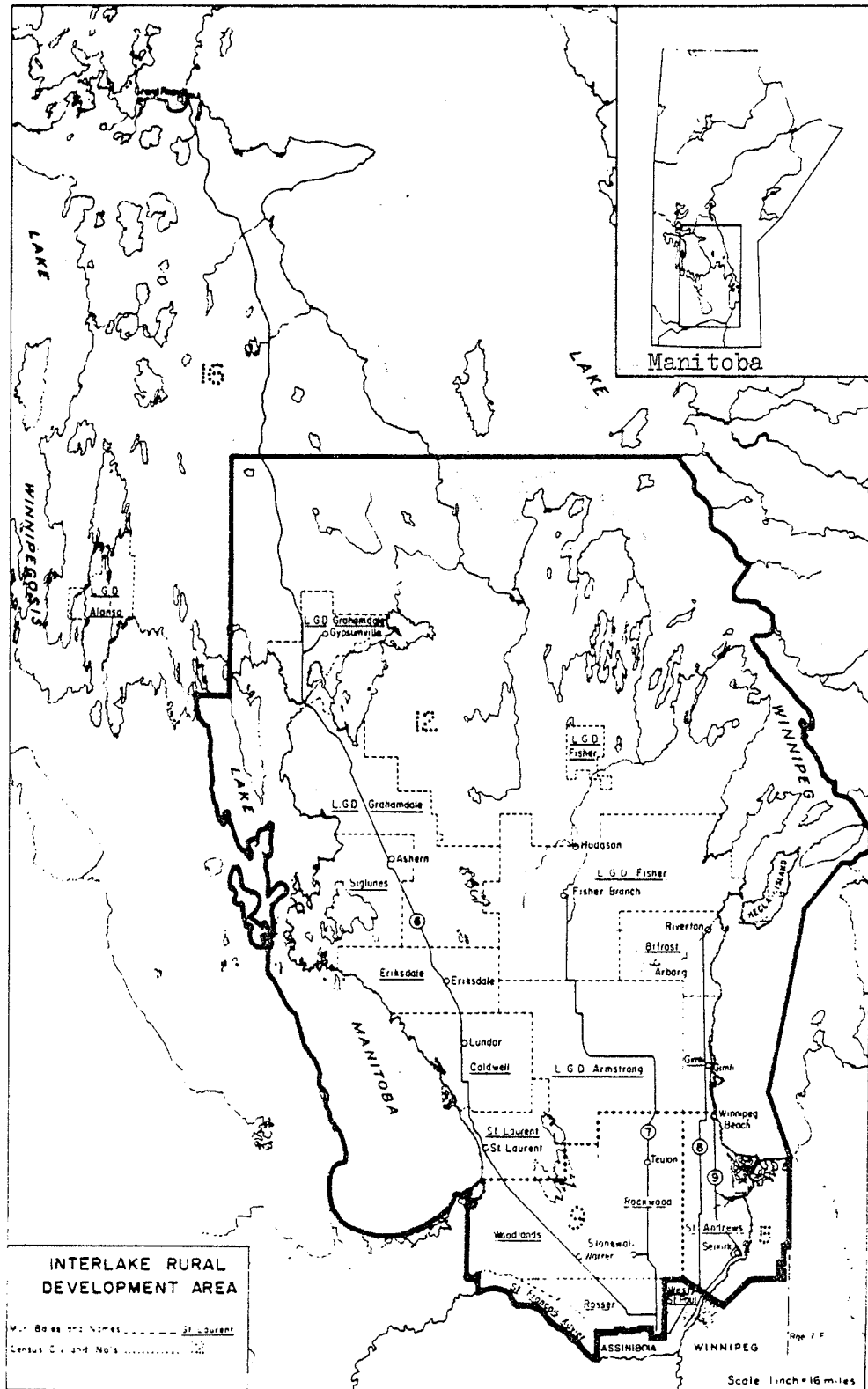


Figure I.1

Interlake Rural Development Area

area to a Provincial Park. The Manitoba Department of Tourism, Recreation and Cultural Affairs also decided to contribute to the capital cost of the project, enabling greater development of facilities than would have been possible under the FRED program allocation. Development commenced in 1968 and involved the purchase of all lands on the island,¹ the construction of a causeway linking the island to the mainland, and the building of extensive day-use and camping facilities.

The Park was officially opened in June, 1975 and covers an area of approximately 430 square miles, over fifty percent of which is water (Figure I.2). The entire park, including the islands, has been broken up into five different zoning areas which include "special areas," "primitive environment areas," "natural recreation areas," "general outdoor recreation areas" and "intensive use areas." Access to the special areas will only be allowed by means that will not be detrimental to the site or its character, and the primitive environment areas, such as the completely undeveloped islands of Deer, Little Punk, Punk and Goose, will be used exclusively for nature study.

The natural recreation areas, including the northeast shore and southern section of Hecla Island, the north and east shore of Grindstone Point and the north and south end of Black Island, will emphasize natural recreational activities including low density camping, interpretive walks, picnicking, boating, swimming and fishing.

In the vicinity of Gull Harbour (Figures I.3 and I.4), the

¹For an analysis of the Land Acquisition program see: Bruce C. Friesen, The Interlake Land Acquisition Program: An Analysis of Benefits and Costs (Winnipeg: Natural Resource Institute, University of Manitoba, 1974). As of 1975, four of the original families remain on the island.

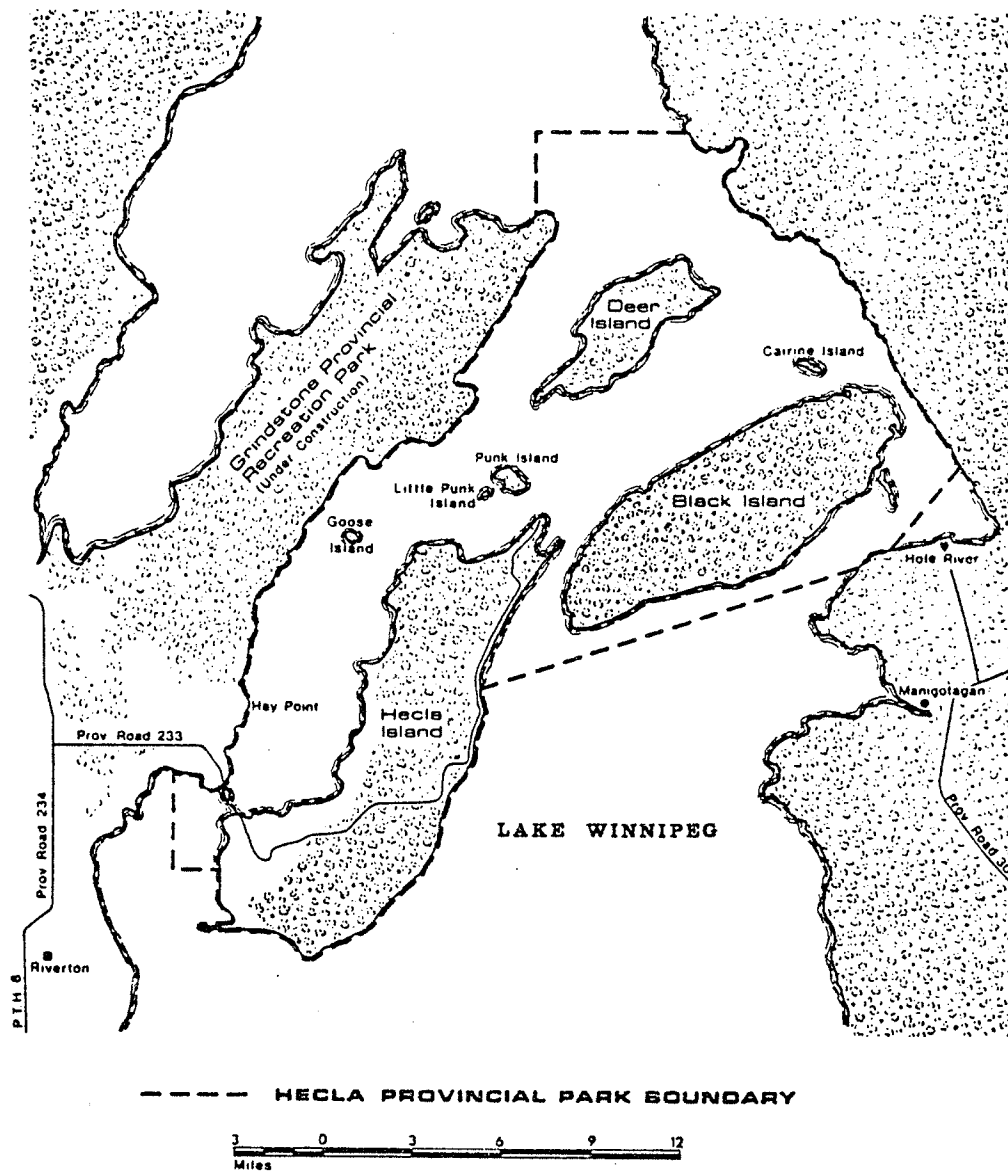


Figure I.2

Hecla Provincial Park

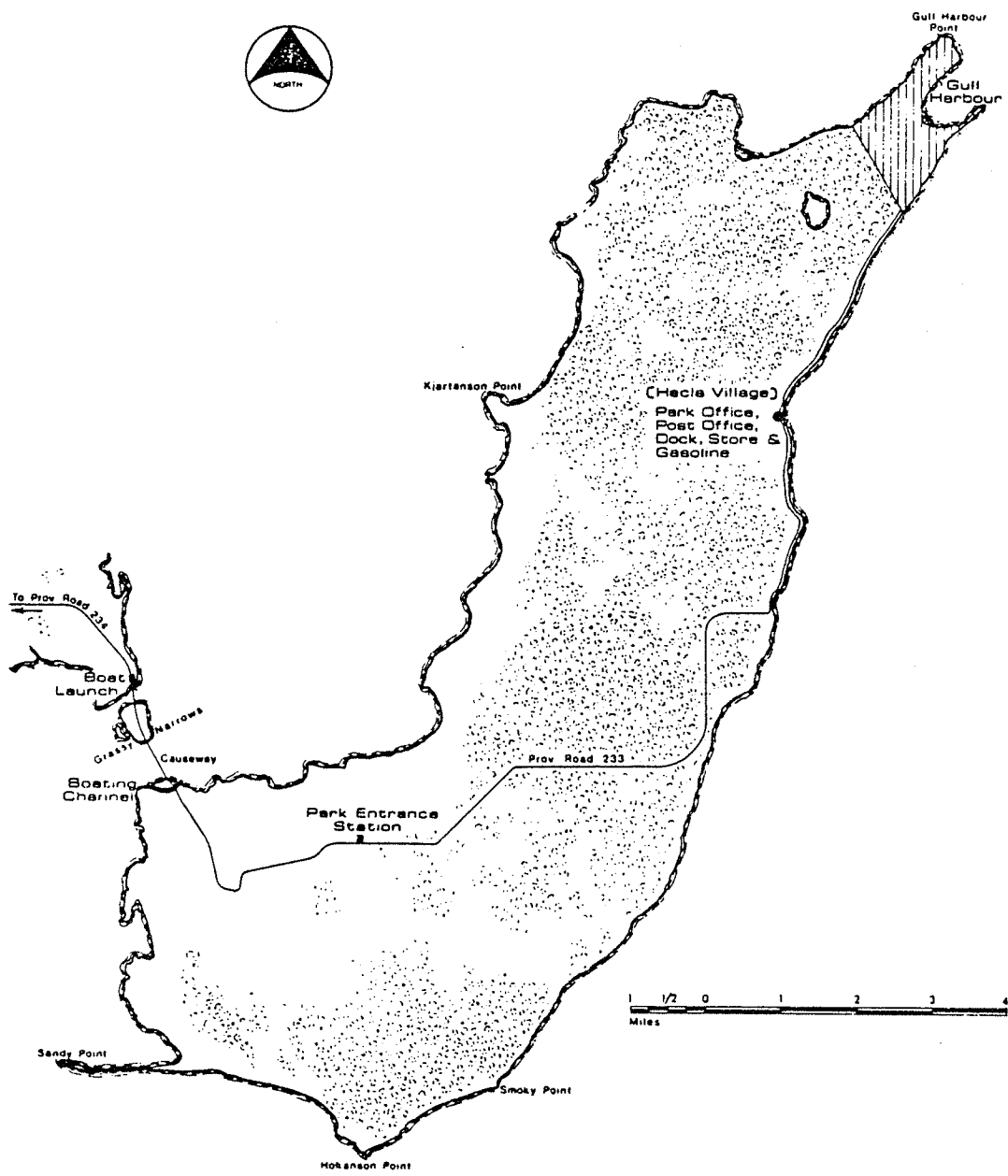


Figure I.3

Hecla Island

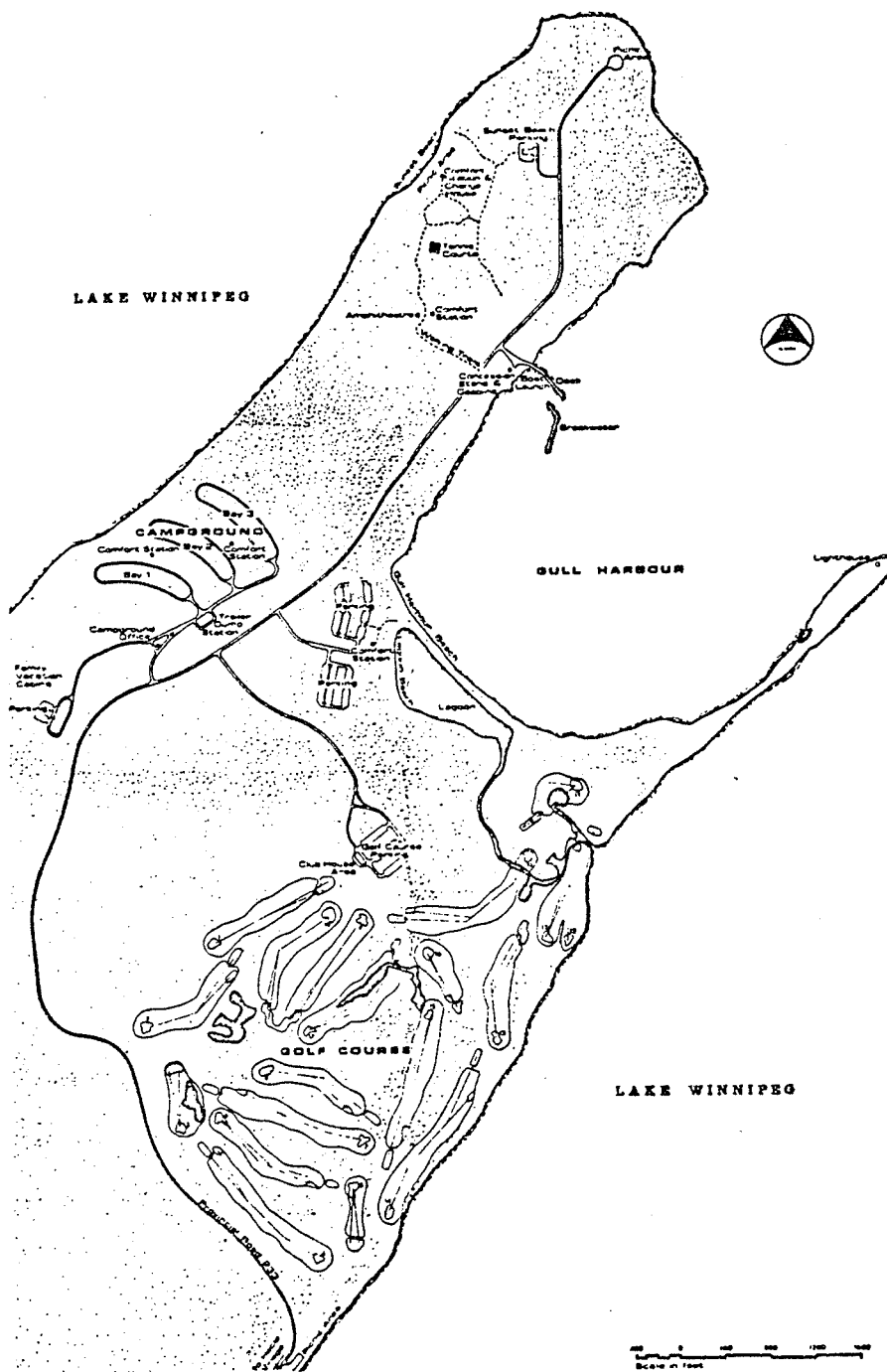


Figure I.4

Hecla Provincial Park-Intensive Use Area

general outdoor recreational area will be the most intensively developed with an eighteen hole golf course, tennis courts, amphitheatre, lodge, bootel, marina, patrolled beaches, camping facilities, vacation units and hiking trails. This intensive use area, mainly in the vicinity of the present Hecla Village, will provide a concentration of service facilities necessary to support recreational activities.²

²Dan McMillan, Hecla (Winnipeg: Manitoba Department of Tourism, Recreation and Cultural Affairs, 1975).

APPENDIX II THE HECLA PARK-USE QUESTIONNAIRE^a

HELP PLAN YOUR PARKS
PLEASE FILL OUT THIS PARK-USE CARD

You are now about to enter one of Manitoba's new Provincial Recreation Areas, and we hope you will enjoy your visit. So that we may continue to improve our Park system and provide the activities you enjoy, we need to find out certain information about Park users and we ask your cooperation in filling out this short questionnaire. It will only take a few minutes, and as the answers cannot identify you, the responses will be anonymous.

Please fill out the questions carefully. It is important to complete all sections. The study is being conducted by the Department of Agricultural Economics at the University of Manitoba in cooperation with the Manitoba Department of Tourism, Recreation and Cultural Affairs.

**PLEASE FILL OUT EVERY QUESTION AND LEAVE THE CARD
IN THE BOX NEAR THE PARK EXIT**

(If you have completed this questionnaire on a previous visit, please tick this box and answer questions 2, 4, and 15 only).

1. Is this the first visit to Hecla Park for most of your party (the people in this vehicle)? Check one.
 Yes No

2. Which of the following best describes your party? Check one.

<input type="checkbox"/> One family with children <input type="checkbox"/> Two or more families with children <input type="checkbox"/> One couple only <input type="checkbox"/> Two or more couples	<input type="checkbox"/> Group of Friends <input type="checkbox"/> Organized group (team, club, etc.) <input type="checkbox"/> One person alone <input type="checkbox"/> Other _____ <div style="text-align: right; font-size: small;">(write in)</div>
--	---

3. Please write in the number of people in your party in each age category.

Age Category:	0-4	5-9	10-14	15-19	20-29	30-39	40-49	50-59	60 & over
Male:									
Female:									

The INTERLAKE region is the area to the north of Winnipeg stretching between Lakes Winnipeg and Manitoba and, of course, includes Hecla Park. Some of the following questions refer to this region.

4. Where is your present home? (Exact street address not required. If farming, please note nearest town.)

Town or City _____ Province or State _____

Is your home in the INTERLAKE region? Check one. Yes No

5. What is the approximate driving distance from Hecla Park to your home?

_____ miles
(write in)

6. What was the location of your last overnight stop before arriving at Hecla Park? Check one.

At home OR (not at home) At _____

(write in town)

Please turn page

1041			
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^a Actual size was 9 1/2" x 6 1/4". Printed in 70 pound plain field offset (blue) with sequential numbering on bottom corner.

Appendix II continued

7. How many days will you be away from home on this trip? Check one.

Days:	less than 1	1-2	3-4	5-7	8-10	11-14	15 or more

How much of this time will you spend in the INTERLAKE region? Check one.

All, or nearly all the time OR _____ days
(write in)

8. Is this visit to Hecla Park Check one.

The main destination of your trip A stopover on a vacation/pleasure trip
 A stopover on a combined business/pleasure trip

9. If Hecla Park had not been developed as a recreation site, what would you have done? Check one.

Visited elsewhere in the INTERLAKE; probably at _____
(write in location)

Visited elsewhere outside the INTERLAKE; probably at _____
(write in location)

Stayed home.

Other _____
(please specify)

10. What made you decide to visit Hecla Park rather than go elsewhere? Check any boxes which apply.

<input type="checkbox"/> Radio commercial on Hecla	<input type="checkbox"/> Looking for alternative recreation site
<input type="checkbox"/> Newspaper report/ad.	<input type="checkbox"/> Friends' recommendation
<input type="checkbox"/> T.V. report/ad.	<input type="checkbox"/> Favourable previous visit
<input type="checkbox"/> Travel brochure/pamphlet	<input type="checkbox"/> Special event/attraction at Hecla
<input type="checkbox"/> Outdoor magazine/guide	<input type="checkbox"/> Never visited Hecla Park before
<input type="checkbox"/> Road sign/outdoor ad.	<input type="checkbox"/> No particular reason
<input type="checkbox"/> Other _____ (write in)	

The following four questions are to be answered by the driver of the vehicle. They relate to the usual "Head of your Family" whether he/she is now in your party or not.

11. What is the sex and age of the "Head of your Family"? Check the appropriate boxes.

Sex Male AND Age 17-25 36-45 56-65
 Female 26-35 46-55 66 or over

12. What is the occupation of the "Head of your Family"?

(write in; please be as specific as possible)

13. Which of the boxes below best indicates the highest level of education completed by the "Head of your Family"? Check one.

<input type="checkbox"/> Elementary/Grade School	<input type="checkbox"/> Some University
<input type="checkbox"/> Some Secondary /High School	<input type="checkbox"/> University graduate
<input type="checkbox"/> Completed Secondary/High School	<input type="checkbox"/> Other _____ (write in)

14. Which of the following best describes the total income of your family last year (1974)? Check one.

<input type="checkbox"/> under \$3,000	<input type="checkbox"/> \$8,000 - \$9,999	<input type="checkbox"/> \$20,000 - \$24,999
<input type="checkbox"/> \$3,000 - \$5,999	<input type="checkbox"/> \$10,000 - \$14,999	<input type="checkbox"/> \$25,000 and over
<input type="checkbox"/> \$6,000 - \$7,999	<input type="checkbox"/> \$15,000 - \$19,999	

Appendix II continued

DO NOT FILL IN THE REMAINING QUESTIONS UNTIL JUST BEFORE YOU LEAVE THE PARK. ENJOY YOUR VISIT AND DON'T FORGET TO LEAVE THIS CARD IN THE BOX PROVIDED AT THE PARK EXIT.

15. How long did you spend at Hecla Park on this visit? Check one.

- | | | |
|--|----|--|
| DAY TRIP | OR | OVERNIGHT STAY |
| <input type="checkbox"/> 2 hours or less | | <input type="checkbox"/> 1 night |
| <input type="checkbox"/> 2 - 4 hours | | <input type="checkbox"/> 2 - 3 nights |
| <input type="checkbox"/> 4 - 8 hours | | <input type="checkbox"/> 4 - 7 nights |
| <input type="checkbox"/> 8 hours or more but not overnight | | <input type="checkbox"/> 8 - 14 nights |
| | | <input type="checkbox"/> 15 nights or more |

16. If you stayed overnight in Hecla Park, what type of accommodation did you use? Check one.

- | | |
|--|---|
| <input type="checkbox"/> Tent | <input type="checkbox"/> Mobile home |
| <input type="checkbox"/> Tent Trailer | <input type="checkbox"/> Rental cabin |
| <input type="checkbox"/> House Trailer | <input type="checkbox"/> Other accommodation _____ (write in) |
| | <input type="checkbox"/> Did not stay overnight |

17. Which of the activities listed below did your party participate in while at Hecla Park? Check all boxes which apply.

- | | |
|--|---|
| 1. <input type="checkbox"/> Pleasure driving & sightseeing | 10. <input type="checkbox"/> Boat fishing |
| 2. <input type="checkbox"/> Picnicking | 11. <input type="checkbox"/> Water skiing |
| 3. <input type="checkbox"/> Walking/Hiking | 12. <input type="checkbox"/> Skin or Scuba Diving |
| 4. <input type="checkbox"/> Swimming/Sunbathing | 13. <input type="checkbox"/> Playing golf |
| 5. <input type="checkbox"/> Bird watching | 14. <input type="checkbox"/> Playing Tennis |
| 6. <input type="checkbox"/> Other nature study | 15. <input type="checkbox"/> Playing other game or team sports |
| 7. <input type="checkbox"/> Power boating | 16. <input type="checkbox"/> Watching tournaments, exhibitions, etc. |
| 8. <input type="checkbox"/> Canoeing/Rowing/Sailing | 17. <input type="checkbox"/> Visiting museum &/or other Park displays |
| 9. <input type="checkbox"/> Shore fishing | 18. <input type="checkbox"/> Other _____ (write in) |

In the space below, please write in the numbers of the four activities from those you noted above which your party spent most time doing. Also note the average number of hours spent on each by checking the appropriate box.

Activity Number	Time spent - hours per day			
	Less than 2	2-4	4-8	More than 8
(i) _____				
(ii) _____				
(iii) _____				
(iv) _____				

18. What additional recreation opportunity or facilities would you like to see added to this Park?

Please turn page

Appendix II continued

19. Please estimate the amounts your party will spend in the INTERLAKE region of Manitoba while on this trip.

Park entrance and camping fees \$ _____
 Motel, hotel and other lodging costs \$ _____
 Restaurants: food and drink \$ _____
 Retail: Food and beverage \$ _____
 Clothing and shoes \$ _____
 Outdoor equipment purchase \$ _____
 Other general merchandise \$ _____
 Fuel and automobile services \$ _____
 Outdoor equipment rental \$ _____
 Other expenditures: (please write in)
 _____ \$ _____
 _____ \$ _____
 _____ \$ _____
 _____ \$ _____

20. If you stayed overnight at locations other than Hecla Park while in the INTERLAKE on this trip, what share of the costs which you have noted above would you estimate was because of your visit to Hecla Park? (note \$ or %)

\$ _____ (write in) OR _____ % (write in)

21. What will be the location of your next overnight stop after you leave Hecla Park? Check one.

At home OR (not at home) At _____ (write in town)

22. How many more times do you think you will visit this park during 1975? Check one.

Not again this year Two or three times
 Once Four or more times

23. What would you recommend most to people about Hecla Park? Have you any comments or suggestions to make about this Park?

THANK YOU FOR YOUR HELP. HAVE AN ENJOYABLE TRIP HOME!

If you have accidentally carried this card away from the Park, please mail to:

Recreation Research Study
 Department of Agricultural Economics
 The University of Manitoba
 Winnipeg, Manitoba
 R3T 2N2

Appendix II continued

Recommended Questionnaire Modifications

Question Number	Problem	Suggested Modification
3.	Confusing and difficult to answer. Complex to key-punch.	Do not categorize age. Ask for actual age in the two sex categories, e.g., Male ___ , ___ , ___ , ___ , Female ___ , ___ , ___ , ___ ,
4.	Confusing - Some people responded "Town" and "Province."	Change to "Name of Town or City"; "Name of Province or State."
7.	Simpler format would give more information.	Ask for actual days away from home on the trip.
12.	Not enough information given to enable Occupational Coding.	While most respondents gave type of occupation, it is necessary to also know type of industry in many cases for coding under the Statistics Canada 1971 Format. It is suggested that a "census type" occupation question be included, with an example.
15.	Simpler format would give more information.	Ask for actual hours or days spent on the visit.
19.	Many left Question 19 blank, while some indicated no expenditure. Some blanks could have been meant to signify no expenditures.	Include nil expenditure as one response option.

APPENDIX III

ANALYSIS OF SURVEY RESPONSES^a

Question Number	Question	Response	Stratum I Day Users	Overnight Users						
				Total	Stratum II Monday-Thursday		Stratum III Friday, Saturday, Sunday, Holiday			
		Number of Respondents	626	415	155	260				
		Average Party Size	3.51	3.47	3.61	3.38				
				.....percent.....						
1.	First Visit	First Visit	16.5	60.2	76.8	80.2				
		Repeat Visit	20.8	18.1	21.3	18.1				
		Non-Response (N.R.)	2.7	1.7	1.9	1.7				
2.	Type of Party	One Family	36.7	46.7	56.1	41.2				
		2 or more Families	13.9	8.7	7.7	9.2				
		One Couple	22.0	31.8	29.7	33.1				
		2 or more Couples	8.6	5.5	2.6	7.3				
		Group of Friends	14.4	3.9	1.9	5.0				
		Organized Group	0.2	0	0	0				
		One Person	1.4	2.2	0.6	3.8				
		Other Party Types	1.3	1.0	0.6	1.2				
		N.R.	1.4	0.2	0.6	0				
3.	Age and Sex	Age	M	F	M	F	M	F		
		0 - 4	3.0	2.8	4.1	4.8	3.6	4.5	4.4	5.0
		5 - 9	4.2	4.1	6.2	5.1	5.5	5.4	6.6	5.0
		10 - 14	5.8	5.2	6.3	5.6	9.6	7.5	4.2	4.4
		15 - 19	4.0	3.8	3.0	3.5	3.8	3.2	2.5	3.9
		20 - 29	6.6	7.9	10.9	13.1	7.0	8.8	13.4	15.9
		30 - 39	8.3	7.9	8.7	8.2	8.4	8.4	9.0	8.1
		40 - 49	8.2	6.7	6.0	5.7	7.3	7.1	4.1	4.8
		50 - 59	6.6	6.0	3.8	2.6	5.2	3.4	2.8	2.2
		60 and Over	5.0	3.9	1.3	0.9	1.4	1.6	1.2	0.5
3.	Age and Sex	N.R. to Question 3	7.3	5.1	3.9		3.9		5.8	
4.	Home Location	Manitoba/South East	3.2		3.4		1.9		3.5	
		Interlake	13.7		6.5		4.5		7.7	
		N. Central	1.6		3.3		3.9		3.1	
		S. Central	1.4		3.1		3.2		2.3	
		S. West	1.1		1.2		2.6		0.4	
		Parklands	0.5		1.0		1.9		0.4	
		Winnipeg	65.3		68.4		62.6		71.9	
		Northern	0.6		0.5		0		0.8	
		N.E.C.	0.2		0.7		0		1.2	
		Other Canada	4.8		5.1		7.1		3.8	
		U.S.A.	4.4		6.0		9.0		4.2	
		Other	0		0		0		0	
		N.R.	2.9		0.5		0		0.8	
5.	Driving Distance	Driving Distance to Home								
		Less than 51 miles	5.8		0.5		0.6		0.4	
		51 - 75	5.4		1.2		0		1.9	
		76 - 150	73.0		76.6		70.3		80.4	
		151 - 300	4.8		8.7		11.0		7.3	
		301 - 500	2.6		3.1		5.8		1.5	
		501 - 1,000	3.7		5.1		7.7		3.5	
		1,001 - 2,000	2.2		2.2		2.6		1.9	
		Over 2,001	0.5		0.5		0		0.8	
		N.R.	2.1		2.2		1.9		2.3	
6.	Previous Over-Night Stop	At Home	63.1		74.9		65.2		80.8	
		Not at Home	34.8		23.4		33.5		17.3	
		N.R.	2.1		1.7		1.3		1.9	
		If Not at Home:								
		Manitoba/South East	0.5		3.9		7.1		1.9	
		Interlake	28.4		10.8		15.5		8.1	
		N. Central	0.2		0.2		0		0.4	
		S. Central	0		0.2		0		0.4	
		S. West	0		0.2		0.6		0	
		Parklands	0.8		1.0		0		1.5	
		Winnipeg	2.9		5.3		8.4		3.5	
		Northern	0.2		0.7		2.0		0	
		N.E.C.	0.4		0		0		0	
		Other Canada	0		1.0		0		1.5	
		U.S.A.	0.5		0.2		0		0.4	
		Other	0		0		0		0	
		N.R.	9.6		0		0		0	

(Continued)

Appendix III continued

Question Number	Question	Response	Stratum I Day Users	Overnight Users			
				Total	Stratum II Monday-Thursday	Stratum III Friday, Saturday, Sunday, Holiday	
				percent.....			
7.	Trip Days	Less than 1 day	59.1	0.7	0.6	0.8	
		1 - 2 days	7.7	27.2	8.4	38.5	
		3 - 4 days	7.2	39.3	36.1	41.2	
		5 - 7 days	5.6	12.8	24.5	5.8	
		8 - 10 days	3.2	5.1	8.4	3.1	
		11 - 14 days	3.4	6.0	10.3	3.5	
		15 or more	6.4	6.0	6.5	5.8	
		N.R.	7.5	2.9	5.5	1.6	
		Time in Interlake	All or nearly all	82.9	77.3	64.5	85.0
			Less than Total Trip Length	12.3	18.6	29.0	12.3
N.R.	4.8		4.1	6.5	2.7		
8.	Purpose of Trip	Main Destination	59.6	75.2	63.2	82.3	
		Stopover on Business/ Pleasure	2.1	1.4	1.3	1.5	
		Stopover on Vacation trip	35.3	21.0	33.5	13.6	
		N.R.	3.0	2.4	1.9	2.7	
9.	Alternative Site	Visited Elsewhere in Interlake	47.9	32.0	32.3	31.9	
		Visited Elsewhere Outside Interlake	17.7	53.5	56.8	51.5	
		Stayed Home	16.8	5.3	3.9	6.1	
		Other Alternative	3.2	0.5	0.6	0.4	
		N.R.	14.4	8.7	6.5	10.0	
		If visited another rec. site, locn:					
		Manitoba/South East		12.0	20.6	14.5	24.4
		Interlake		58.2	28.2	29.0	27.6
		N. Central		1.0	1.7	0.7	2.3
		S. Central		0.25	0.8	0.7	0.9
		S. West		1.0	4.8	8.7	2.3
		Parkland		2.0	9.3	13.0	6.9
		Winnipeg		0.25	0.8	0	1.4
		Northern		0.25	0.6	1.4	0
		N.E.C.		0	0.8	0.7	0.9
		Other Canada/W. Ont.		1.5	4.8	5.1	4.6
		Other		0.25	1.1	0.7	1.4
		U.S.A.		0.5	1.1	2.8	0
		Other		0	0	0	0
		N.R.		19.2	24.8	22.5	26.3
10.	Decision to Visit Necla	Radio Commercial	6.7	11.1	11.0	11.2	
		Newspaper Report or Ad	12.0	16.6	17.4	16.2	
		TV Report or Ad	3.3	4.8	5.2	4.6	
		Travel Brochure	5.4	10.1	10.3	10.0	
		Outdoor Magazine	0.5	0.5	1.3	0	
		Road Sign	1.0	0.2	0.6	0	
		Looking for Alternate Recreation Site	12.9	26.3	23.2	28.1	
		Friends Recommendation	13.6	25.8	23.9	26.9	
		Favorable Previous Visit	16.0	15.4	19.4	13.1	
		Special Event or Attraction	5.6	2.2	3.2	1.5	
		Never Visited Necla Before	47.3	50.4	47.1	52.3	
		No Particular Reason	9.3	3.6	3.2	3.8	
		Other Reason	4.6	3.6	3.2	3.8	
		N.R.	4.3	2.9	3.2	2.7	
11.	Sex, Age of Head of Family	Age 17 - 25	M 6.9 F 0.6	M 15.4 F 1.0	M 9.0 F 1.3	M 19.2 F 0.8	
		26 - 35	M 20.1 F 1.6	M 30.6 F 1.0	M 29.0 F 1.3	M 31.5 F 0.8	
		36 - 45	M 24.1 F 1.4	M 21.4 F 0.7	M 23.2 F 0.6	M 20.4 F 0.8	
		46 - 55	M 18.5 F 0.5	M 14.0 F 0.2	M 19.4 F 0.6	M 10.8 F 0	
		56 - 65	M 10.4 F 0.3	M 3.9 F 0.2	M 3.9 F 0	M 3.8 F 0.4	
		66 and Over	M 2.7 F 0	M 1.2 F 0.2	M 1.3 F 0	M 1.2 F 0.4	
		N.R.	M 12.8 F	M 10.1 F	M 10.3 F	M 10.0 F	

(Continued)

Appendix III continued

Question Number	Question	Response	Stratum I Day Users	Overnight Users		
				Total	Stratum II Monday-Thursday	Stratum III Friday, Saturday, Sunday, Holiday
						percent.....
12.	Occupation of Head of Family	Managerial, Admin. Technology, Social & Cultural Occupations Clerical & Sales Service Farming, Horticulture Other Primary Processing Machinery Product Fabrication Construction Transport Equipment Materials Handling Other Crafts and Equipment Students, Retired, Not Classifiable, N.R.	11.7 18.5 11.8 2.6 6.4 2.1 2.4 14.4 2.1 28.1	13.5 22.4 9.9 2.7 3.6 3.1 1.9 17.1 3.1 22.7	9.0 21.3 9.7 2.6 5.2 2.6 1.9 21.3 3.9 21.9	13.5 23.4 10.0 2.7 2.7 3.5 1.9 14.2 2.7 23.1
13.	Education	Elementary/Grade School Secondary/High Completed High School Some University University Graduate Other Education N.R.	6.9 16.9 29.4 11.7 24.6 0 10.5	4.1 17.3 29.6 15.7 26.7 0.2 6.3	1.9 16.8 40.0 11.0 23.2 0 7.1	9.2 17.7 23.5 18.5 28.8 0.4 5.8
14.	Income of Family	Under \$3,000 \$3,000 - \$5,999 \$6,000 - \$7,999 \$8,000 - \$9,999 \$10,000 - \$14,999 \$15,000 - \$19,999 \$20,000 - \$24,999 \$25,000 and Over N.R.	1.8 4.5 3.2 8.2 24.8 15.7 9.4 9.9 22.0	1.4 4.1 3.6 8.0 28.4 22.9 9.6 9.2 12.8	0.6 3.2 3.2 9.7 28.4 21.3 8.4 12.3 12.9	1.9 4.6 3.8 6.9 28.5 23.8 10.4 7.3 12.7
15.	Length of Visit	2 hours or less 2 - 4 hours 4 - 8 hours 8 hours or more but not overnight 1 night 2 - 3 nights 4 - 7 nights 8 - 14 nights 15 nights or more N.R.	11.3 32.6 36.9 14.1	28.9 57.3 11.1 1.7 0 0.2	25.8 51.0 20.0 1.9 0 0.6	30.8 61.2 5.8 1.5 0 0
16.	Accommodation	Tent Tent Trailer House Trailer Mobile Home Rental Cabin Other Type N.R.	31.8 28.2 12.0 5.1 10.4 9.6	31.8 28.2 12.0 5.1 10.4 9.6	25.8 25.8 18.7 3.9 16.1 6.5	35.4 29.6 8.1 5.8 6.9 11.5
17.	Activities	Pleasure driving/ Sightseeing Picnicking Walking/Hiking Swimming/Sunbathing Bird Watching Other Nature Study Power Boating Canoeing/Rowing/Sailing Shore Fishing Boat Fishing Water Skiing Skin or Scuba Diving Playing Golf Playing Tennis Playing Other Games Watching Tournament/ Exhibition Visiting Museum Other Activities, N.E.C. N.R.	78.0 54.7 43.8 18.2 19.8 13.4 0.6 1.1 12.3 0.8 0.2 0.5 9.1 1.1 1.8 0.6 3.7 2.2 6.4	86.0 35.2 74.0 55.2 32.3 20.2 4.6 9.9 38.1 5.5 1.4 1.0 20.5 11.3 6.0 1.0 8.9 7.0 2.9	93.5 36.1 72.9 67.8 32.3 16.1 2.6 9.0 41.9 6.5 0.6 1.3 22.6 9.7 4.5 0.6 7.7 7.1 2.6	81.5 34.6 74.6 47.7 32.3 22.7 5.8 10.4 35.8 5.0 1.9 0.8 19.2 12.3 6.9 1.2 9.6 6.9 3.1

(Continued)

Appendix III continued

Question Number	Question	Response	Stratum I Day Users	Overnight Users		
				Total	Stratum II Monday-Thursday	Stratum III Friday, Saturday, Sunday, Holiday
					percent.....	
19.	Expenditures	Park Entrance/Camping	11.5	24.9	22.73	27.2
		Motel, Hotel, Other	0	5.7	9.7	2.1
		Lodging				
		Restaurants	20.4	7.0	3.8	5.4
		Retail--Food & Bev.	18.0	25.1	25.1	24.9
		Retail--Clothing & Shoes	2.7	3.3	3.8	2.9
		Retail--Outdoor Equip.	7.1	4.2	5.2	3.3
		Other General Merchandise	3.8	3.1	2.9	3.4
		Fuel & Auto. Services	28.8	21.3	18.5	23.7
		Outdoor Equip. Rental	0.7	1.9	0.2	3.4
		Other Expenditures	7.1	3.5	3.4	3.6
19.	Expenditures	N.R. to Question 19	28.1	12.3	11.6	12.3
21.	Next Overnight Stop	At Home	62.5	71.6	59.4	78.8
		Not at Home	29.4	23.9	36.8	16.2
		N.R.	8.1	4.6	3.9	5.0
		If not at Home:				
		Manitoba/South East	0.6	2.2	1.9	2.3
		Interlake	23.0	8.0	12.3	5.4
		N. Central	0	0	0	0
		S. Central	0	0	0	0
		S. West	0.2	0.7	0.6	0.8
		Parklands	0.2	4.3	8.4	2.0
		Winnipeg	2.6	3.1	6.5	1.2
		Northern	0.2	0	0	0.8
		N.E.C.	0.6	0	0	0
		Other Canada	0.2	1.4	0.6	2.0
		U.S.A.	0.2	0.2	0.6	0
		Other	0	0	0	0
		N.R.	1.8	3.4	5.8	2.0
22.	Possible Revisit	Not Again	37.3	57.8	67.1	52.3
		Once	20.3	21.0	16.8	23.5
		2 or 3 Times	9.6	13.2	9.7	15.4
		4 or more Times	4.0	2.2	3.2	1.5
		N.R.	8.8	5.8	3.2	7.3

^aPercentages may not total due to rounding errors.

APPENDIX IV

TOTAL VISITATION--1975

This appendix outlines the methodology used to estimate visitation at Hecla Provincial Park during 1975, both over the survey period and for the May-September season.

Traffic Flow Analysis

Hourly "double-axle" counts for entering traffic were mechanically recorded on a traffic meter situated on the Grassy Narrows Causeway, approximately four miles before the Gate Entrance to Hecla Provincial Park.

For the survey period, July 28-September 1, 5,865 counts were recorded (refer Table IV.1(a)), but because of multi-axle vehicles, this does not represent the actual volume of vehicles crossing the causeway. The necessary adjustment factor can be derived from a comparison of a visual record of entering traffic and the traffic counter readings for specified periods.¹

Traffic counter correction factors were estimated by completing the Hecla Traffic Counter/Axle Survey forms (Figure IV.1) on various randomly selected days during the survey period, and these factors were applied to the counts to give an estimate of the number of vehicles crossing the causeway (Table IV.1(b)). The survey form also enabled a record to be kept of the average daily flows of commercial and other non-recreational vehicles, which, when applied to the traffic flows,

¹ Refer to Raymond J. Saurette, 1974 Traffic Counter Correction Study, Research Report No. 159 (Winnipeg: Manitoba Department of Tourism, Recreation and Cultural Affairs, 1974).

Table IV.1

Hecla Park Survey 1975 Traffic Analysis

Date 1975	Traffic Counter Reading	No. of entering vehicles	No. of entering recreational vehicles - unadjusted	No. of Park Use Cards distributed	c - d	No. of entering recreational vehicles - adjusted	No. of camping parties registering	No. of Park Use Cards to Campers
	a	b	c	d	e	f	g	h
28/7	149	130	95	82	13	82	30	30
29/7	160	140	105	83	22	90	34	32
30/7	140	122	87	66	21	72	13	12
31/7	134	117	82	55	27	67	22	18
1/8	246	202	167	151	16	152	98	97
2/8	330	314	289	203	86	274	71	53
3/8	412	391	366	272	94	351	38	29
4/8	197	187	162	99	63	147	23	15
5/8	182	158	123	87	36	108	23	19
6/8	167	145	110	61	49	95	16	10
7/8	137	120	85	10	75	70	22	3
8/8	158	130	95	51	44	80	55	35
9/8	191	181	156	27	129	141	43	8
10/8	325	309	284	84	200	269	13	4
11/8	146	127	92	67	25	77	23	20
12/8	117	102	67	47	20	52	17	15
13/8	116	101	66	46	20	51	12	11
14/8	126	110	75	47	28	60	13	10
15/8	193	158	123	55	68	108	64	33
16/8	187	178	153	102	51	138	41	30
17/8	213	202	177	118	59	162	12	9
18/8	103	90	55	33	22	40	13	11
19/8	126	110	65	39	26	60	20	13
20/8	102	89	54	78	-24	39	11	11
21/8	88	77	42	24	18	27	8	7
22/8	137	112	77	11	66	62	27	5
23/8	131	125	100	27	73	85	29	9
24/8	152	144	119	30	93	104	7	2
25/8	63	55	20	10	10	10	4	4
26/8	83	72	37	28	9	28	3	3
27/8	77	67	32	13	19	17	5	4
28/8	80	70	35	11	24	20	4	2
29/8	113	93	58	25	33	43	32	18
30/8	174	165	140	9	131	125	48	3
31/8	305	290	265	26	239	250	20	2
1/9	105	100	75	6	69	60	1	1
TOTAL	5,865	5,283	4,133	2,181		3,616	915	588

^a"Double-axle" counts of entering traffic for a 24-hour period from 12 p.m. midnight. Source: Traffic Volume Tally Sheets.

^b"Double-axle" counts adjusted for multi-axle vehicles. Correction factors of 0.87, 0.82, and 0.95 applied to Monday-Thursday, Friday, and Weekend (including public holiday) traffic respectively. Source: Analysis of Hecla Traffic Counter/Axle Survey Sheets (Figure 5).

^c(b) less 35 for weekday traffic and 25 for weekend traffic as non-recreational vehicle estimates. Source: Analysis of Hecla Traffic Counter/Axle Survey Sheets and discussions with Park personnel.

^dSee Table 3.2.

^eDifference due to traffic passing the counter but not continuing as far as the Park Station (four miles), and traffic which did not stop at the Park Station.

^f(c) less 15, an estimate of the base load recreational traffic by-passing the Park Station because they stopped before it, live on the Island, or are already camping there (return campers). The difference between (f) and (d) is due to traffic with season tickets by-passing the Park Station at busy periods - mainly weekends and public holidays. Source: Discussion with Park Gate Attendants.

^gAnalysis of Hecla Camping Permits.

^hPark Use Cards distributed to Campers = $\frac{(d) \times (g)}{(f)}$.

Figure IV.1

Hecla Traffic Counter/Axle Survey

DATE: _____/_____/75

TIME PERIOD OF SURVEY

From _____ a.m. To _____ a.m.
 _____ p.m. To _____ p.m.

In traffic only at site of mechanized traffic counter (Type: 6--volt, wet cell, reading hourly "double-axle" counts).

Traffic Counter Reading for Above Period: _____

Vehicle Type \ Axle Class	1	2	3	4	5	6	More than 6 (Specify Axle Number)	Total Traffic By Vehicle Type
Persons								
Recreational Traffic								
Commercial Traffic								
Total Traffic by Axle Class								

gave an estimate of 4,133 recreational vehicles passing the counter during the period. As noted in Table IV.1 however, further adjustment was necessary since some of this traffic represented fishermen who did not continue as far as the Park Station (defined here as not entering the Park since they could not be included in the survey), campers registered in the Park who had temporarily left, and people who live on the island. Allowances for these factors gave an estimate of 3,616 recreational vehicles first entering the Park during the survey period (Table IV.1(f)). Application of this ratio to the total traffic counter reading during the 1975 season--May 14 to September 22--generated an estimate of 10,840 first-entry recreational vehicles entering the Park over the season. This extrapolation uses the questionable assumption that traffic flow composition is constant over the season. However, in the absence of more complete data, it does indicate the probable magnitude of total recreational traffic.

Visitation

Campers and day-users are discussed separately.

Campers. The number of non-renewal camping permits issued during the survey period was 915 which is equivalent to the number of camping parties entering the Park (Table IV.1(g)).² Analysis of the monthly Campground Use Report forms gave a total of 1,776 unit nights sold over the period, indicating an average stay length of approximately

²Analysis of the data in Table IV.1 indicates an estimated response rate of 70.6 percent from campers (588 cards distributed, 418 returned) and 39.3 percent from day-users (1,593 cards distributed, 626 returned).

2.0 nights.³ Unit nights sold over the regulated camping period (June 6 to September 31) totalled 3,945, which were generated by 1,973 camping parties, assuming a constant stay length. However, the Park was unofficially open for three weeks prior to this when campers did visit the Island, and secondly, some camping permits were not issued to "overflow" campers. It is therefore estimated that approximately 2,500 camping parties visited the Park during the season.

The average party size was estimated, from the Survey and Campground Permits, at 3.4 persons which, together with an average stay length of 2.0 days per party, generates an estimate of 17,000 camper visitor days at the Park over the season.

Day-users. In the previous section on Traffic Flow Analysis, it was estimated that 10,840 recreational vehicles entered the Park during the 1975 season and some 2,500 of those have been estimated to be campers. The remaining 8,340 vehicles were assumed to have comprised day-use parties, which, with an average party size of 3.5 (Chapter 3) gave an estimate of 29,190 day visitors entering the Park.

The total visitor population for 1975 can thus be described as approximating the distribution shown in Table IV.2.

³A "unit night" is one camping party occupying one camping space for one night. Note that the 1,776 unit nights included some from pre-survey entrants. The Hecla Park Use Survey (Chapter 3), revealed an average stay length from camper respondents of approximately 2.2 nights per party, the apparent difference probably being due to a higher response rate from longer-stay parties.

Table IV.2
 Visitor Population - 1975

	Number of Vehicles Entering the Park	Average Party Size	Average Stay Length	Total Visitor Days
Day Users	8,340	3.5	1.0	29,190
Campers	2,500	3.4	2.0	17,000
TOTAL	10,840			46,190

APPENDIX V

STATISTICAL ANALYSIS OF SURVEY RESULTS

This appendix discusses the results of the Hecla Survey in terms of data stratification, non-response bias, and confidence limits for the expenditure data.

Stratification of Data

The data from the survey are coded in six strata. The primary subdivision was between day-users and overnight-users, each of which was further divided into three subdivisions dependent upon the day of entrance to the Park. The six strata are:

- Day-Users: (a) entered the Park Monday-Thursday (excluding public holidays)
- (b) entered Friday
- (c) entered Saturday, Sunday or on a public holiday
- Overnight-Users: (d) entered Monday-Thursday (excluding public holidays)
- (e) entered Friday
- (f) entered Saturday, Sunday or on a public holiday.

The actual strata used in any analysis incorporating this data depend on the purpose of the research and the actual parameters of interest. For instance, certain questions may have little variation in response between strata and all six could be combined, while responses to other questions may represent marked individuality between strata and require separate analysis.

For the purpose of tabulating the data in Appendix III, data were collated according to the degree of similarity between the home location of Manitoba parties visiting the Park, one of the major variables in recreation research. Using a chi-square test it was concluded that there was little difference between the three strata for day-users on this question, and therefore, information on all day-users was collated into one stratum, Stratum I. Differences did occur, however, in the home location of camper party types between those who entered on Monday to Thursday, and those entering on a Friday, Saturday, Sunday or public holiday (this probably coincides with "vacation" as against "weekend" camping parties). The original strata of overnight-users were thus collated into two groups: Stratum II, Monday to Thursday entries, and Stratum III, Friday, Saturday, Sunday and public holiday entries.

The data are detailed in Table V.1 and actual chi-square results were as follows. Visitors from Manitoba were classified according to the Manitoba Statistical Division in which their home was located, with a grouping of those Divisions with five observations or less. For analysis of the day-use strata, strata (a) and (b) were combined and compared with stratum (c) to determine if any significant difference existed between the distributions of the home locations of day visitors represented by weekday and weekend traffic. The calculated chi-square is 5.06 [$\chi^2_{.05,3} = 7.82$] indicating no significant difference at a 95 percent confidence level. For campers, the distribution of stratum (d) was compared with that of strata (e) and (f), since many "weekend" camping parties enter the Park on a Friday. The calculated chi-square is 11.8 [$\chi^2_{.05,3} = 7.82$] indicating a significant difference between the distribution of home locations of these two

Table V.1
Home Location of Survey Respondents from
Manitoba by Strata

Statistical Division Strata ^b	South East	Interlake	Winnipeg	Other ^a	Total
	.....number of respondents.....				
Day Users--A	10	29	168	16	223
B	--	4	12	2	18
C	10	53	229	15	307
Campers-- D	5	7	97	20	129
E	2	7	82	6	97
F	7	13	105	13	138

^aIncludes the statistical divisions of North Central, South Central, South West, Parkland and Northern.

^bStrata defined by type of user and day-of-entry into the Park:
A and D--entered the Park Monday-Thursday (excluding public holidays);
B and E--entered Friday;
C and F--entered Saturday, Sunday or on a public holiday.

groups.

Complete tabulation of the responses to all questions in the three grouped strata is contained in Appendix III, the percentages calculated reflecting Non-Respondents as one category of response.

Non-Response Bias

The most comprehensive check on non-response bias possible with this survey is to compare those aspects of the data that are recorded on the Park Campground Permits--a census of all campers--against similar questions on the survey form. No equivalent bias check for the day-use population is possible.

Analysis of individual camping permits issued over the survey period indicates that the survey sample corresponds in many respects with the total camping population. Average party size was 3.38 (close to the survey result of 3.47), and average stay length approximated 2.0 days (slightly lower than the 2.2 calculated from the survey, probably due to a higher response rate from longer stay parties). Furthermore, average data derived from these permits conform closely with the survey results with respect to both equipment used and origin of parties. Table V.2 summarizes these comparisons.

A chi-square test was conducted using the data contained in Table V.2 to test the null hypothesis that the non-response bias in the survey data is negligible. The two distributions compared were that of the survey respondents with the non-respondents. The latter group is defined as the difference between the permit or population data and the survey response data.

Two comparative tests are possible--one to evaluate the non-response bias during the survey period, August 1975, and the other to

Table V.2
 Comparison of Survey Results and
 Camping Permit Data

	From Permits ^a	From Survey ^b
<u>Equipment by Type for August, 1975</u>		
Number of Observations	1,380	372
Tent	471	137
Tent Trailer	470	121
House Trailer	216	51
Other	1,380	63
<u>Equipment by Type, 1975</u>		
Number of Observations	2,720	372
Tent	982	137
Tent Trailer	870	121
House Trailer	392	51
Other	476	63
<u>Origin of Camping Parties, August 1975</u>		
Number of Parties	926	405
Manitoba - South East	44	14
Interlake	66	27
North Central	43	14
Winnipeg	650	284
N.E.C. ^c	40	25
Other Canada	38	21
U.S.A.	45	25
<u>Origin of Camping Parties, 1975</u>		
Number of Observations	2,720	405
Manitoba	2,502	364
Other Canada	109	21
U.S.A.	109	25
<u>Party Size, August 1975</u>		
Sample Size	913	393
Mean Party Size	3.38	3.47
<u>Analysis of Mean Party Size Estimates</u>		
Standard Error	0.052	0.09
Standard Deviation	1.558	1.79
Variance	2.427	3.203

^a Manitoba Department of Tourism, Recreation and Cultural Affairs, Manitoba Park Statistics, 1975, Winnipeg: Queen's Printer, 1976, pp. 70-73, and analysis of individual camping permits issued over the survey period.

^b Analysis of Hecla Survey Data.

^c Composite grouping of South Central, South West, Parkland and Northern Statistical Divisions.

evaluate the bias for the whole Park season, May to September, 1975. The calculated chi-square for the equipment tabulations are 4.0 for August, 1975 and 0.33 for the 1975 season [$\chi^2_{0.05,3} = 7.82$] and for party origin tabulations are 31.0 for August, 1975 [$\chi^2_{0.05,6} = 12.59$] and 8.8 for the 1975 season [$\chi^2_{0.05,2} = 5.99$]. It can be concluded from the above tests at a 95 percent confidence level that while non-response bias is negligible with the data on equipment type, there is a degree of bias with respect to data on home location, due to higher response rates from out-of-Province visitors. Since this category made up less than 9 percent of total visitors to the Park in 1975 however, the bias introduced into the average survey data is probably small. For instance, analysis of the party size variable suggests that the difference in the survey and population means is not significant. The following test was applied to the data in Table V.2 to test this hypothesis, given that $\sigma_1 \neq \sigma_2$:¹

$$t' = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}}}$$

The calculated t value is 0.87 [$t_{0.05,00} = 1.96$] which suggests that the difference between the two means is not significant at a confidence level of 95 percent.

The above analysis indicates that the non-response bias in the camper population visiting Hecla Park during the summer of 1975 is minimal.

¹George W. Snedecor and W. G. Cochran, Statistical Methods (Ames: Iowa State University Press, 1967), pp. 114-116. Since the degrees of freedom for n_1 and n_2 exceed 100, $t' = t$.

Expenditure Data

The per party expenditure data derived from the survey is shown in Table V.3, together with the associated statistical criteria. Day-users have an average expenditure of \$8.83 per party, with a standard deviation of \$17.5 and variance of \$309.9, and overnight-users spent \$35.35 per party, with a standard deviation of \$42.0 and variance of \$1756.9.

The high standard deviation and variances associated with each mean is due to the extreme expenditures noted by some respondents-- in fact the range for day-users (\$0-\$276.00) exceeds the range for overnight-users (\$0-\$248.00). These extreme values can be considered outlier observations.²

If it is assumed that the per party expenditures will approximate a normal distribution (a realistic assumption to eliminate the outlier values), the confidence interval for each of the two expenditure categories can be calculated as follows: For the expenditure observations to be correct with a probability of 0.8, the following relationship

must hold-- $P[\bar{x} - t_{.20} s_{\bar{x}} < \mu < \bar{x} + t_{.20} s_{\bar{x}}] = 0.80$

For day-users: $\bar{x} \pm t_{.20} s_{\bar{x}} = 8.83 \pm [1.282][0.898]$
 $= 8.83 \pm 1.15$

For campers: $\bar{x} \pm t_{.20} s_{\bar{x}} = 35.35 \pm [1.282][2.317]$
 $= 35.35 \pm 2.97$

Therefore, it is possible to conclude that, in 80 percent of cases on

²The criterion of the value of the "studentised extreme deviate" is used for rejection of outliers in data sets exhibiting normal distribution--refer to Maurice G. Kendall and A. Stuart, The Advanced Theory of Statistics, Volume 2 (New York: Hafner Publishing Company, 1967), p. 529.

Table V.3

Statistical Information on Total per Party Expenditures -
Hecla Provincial Park Survey

Variable	Type of Respondent	Day Users	Campers
Number of Observations	N	428	360
Mean Expenditure (\$)	\bar{x}	8.83	35.35
Standard Error	$S\bar{x}$	0.898	2.317
Standard Deviation	S	17.462	42.023
Variance	σ^2	304.923	1,765.945
Range	R	0 - 276.0	0 - 248.0

Source: Analysis of survey data.

the average, per party expenditures in the Interlake by visitors to Hecla Provincial Park will lie between \$7.68 and \$9.98 for day-users and between \$32.38 and \$38.32 for campers.

As noted in Chapter 3, if information such as that contained in Table V.3 had been available prior to the visitor survey, sample size estimates could have been made consistent with given error values and confidence limits. Future surveys which collect expenditure data from recreationists can now, therefore, be designed much more precisely.

APPENDIX VI

SAMPLE SIZE FOR OUTDOOR RECREATION SURVEYS

This appendix summarizes the two methods cited in the text which have been used to calculate sample size in outdoor recreation surveys.

The Michigan Study¹

With the Michigan study of day-use activities and socio-economic characteristics, the maximum possible variance of any normally distributed population is used in the sample size calculation due to lack of a priori information. Using an absolute error, and maximum possible variance calculation technique, the sample size is estimated at a minimum of 385 responses.

The sample size formulation recommended is

$$n = pq \left[\frac{z_{\frac{\alpha}{2}}}{Er} \right]^2$$

where

n = minimum sample size for the subpopulation being studied

p = proportion of the subpopulation which possesses the characteristic of interest

q = 1 - p

$z_{\frac{\alpha}{2}}$ = value of the double Alpha tailed error for the particular level of confidence being used. At a 95 percent confidence level,

$z_{\frac{\alpha}{2}} = 1.96$

Er = estimation error.

¹Crapo and Chubb, op. cit., pp. 48-51, 100-107, 117-118.

With unknown variance, p and q are unknown but the maximum pq value is $\frac{1}{4}$. For 95 percent confidence, $z_{\frac{\alpha}{2}}$ is 1.96, and if no lower bound for p is known, E_r must be set by Absolute Error, which does not depend on p . If the Absolute Error is given at .05, a 95 percent significant level for parameter estimation,

$$n = \frac{1}{4} \left[\frac{1.96}{.05} \right]^2 = 384.$$

Based on other research, and the experience quoted, a sample size set is recommended that ensures an estimation error no greater than .05 at 95 percent confidence.

The Washington Study²

With the Washington study the sample size was determined by estimating the probable variance in per-trip expenditures for sampling units in the population, and standard errors of estimates derived from samples of various sizes at various levels of confidence. Five-hundred returned questionnaires in each stratum were selected as the response target, visitors being stratified according to place of origin. No details of the calculations are included in the report cited.

²Beyers, op. cit., p. A-2.