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AN ECONOMIC EVALUATION OF RECREATION IN ALBERTA PROVINCIAL PARKS IN THE SOUTH SASKATCHEWAN RIVER BASIN

by

© PETER GOUINLOCK WHITING

A THESIS SUBMITTED TO
THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read and recommend to the Faculty of Graduate Studies and Research for acceptance a thesis entitled "An Economic Evaluation of Recreation in Alberta Provincial Parks in the South Saskatchewan River Basin," submitted by Peter Gouinlock Whiting in partial fulfilment of the requirements for the degree of Master of Science.

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Date October 11, 1972

ABSTRACT

During the last few years there has been a rapid increase in the number of persons using the resources of the Provincial Parks in the South Saskatchewan River Basin in Alberta for the purpose of recreation. The land and water resources of these parks could be used for alternate activities. Costs of supporting the recreation activity include not only the expense of operation, maintenance, and repair, but also the costs that arise from the preclusion of benefits from the alternate resource uses. The optimum allocation of resources among alternate uses necessitates the determination of net social benefits from each of the alternatives in order that the economic benefits from these alternatives may be compared.

Measures of net social benefits were derived from Provincial Park recreation activity, as well as, the economic impact of this activity upon the South Saskatchewan River Basin.

Primary social net benefits were estimated to be approximately 4000,000 dollars or less than half of direct social costs. Secondary benefits less secondary costs measuring regional impact combined with direct social benefits and costs incident upon the region, however, gave a net benefit of about 12,000,000 dollars for 1970.

The capability of the provincial parks to absorb

further activity such that the annual primary net social cost is reduced or erased was examined. Public park policy results should include a change in fee structure, a change in the temporal distribution of park users, a change in recreation activity mix, and an increase in annual visitation. These changes will shift resource use in the direction of maximizing social net benefits.

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CHAPTER I

INTRODUCTION

Problem Situation

A central goal of public policy is to maximize social or public welfare. By implication, all those facts which are pertinent to this goal must be known. Implementation of this goal in part depends upon measurement of social benefits and costs.

In the past, policy decisions regarding recreational land and water resources have tended to be made without all the relevant benefit-cost information which would assist in policy implementation. Frequently, a sound economic criterion was lacking. The purpose of this study is to establish a basis upon which an economic evaluation of land and water resources for recreational use can be made. Reference is made to a specific area of the Province of Alberta and, although the results, therefore, are specific in nature, the principles are of a general nature and by no means limited to this one particular problem area.

A need has arisen to value those resources already in use for recreation purposes in Southern Alberta. The demand for recreation areas has risen at a rapid rate and the Provincial Government has responded to this increased demand by providing added facilities over time. In order that public investment decision-making be facilitated and

that investment flow in appropriate directions, an economic evaluation is required, the central objective being maximization of the present value of social net benefits and the evaluation framework being benefit-cost.

Objectives and Plan of Study

The study has three major objectives: 1. to determine the extramarket component of benefits that accrue to provincial park recreationists; 2. to evaluate the economic impact of the expenditures made by recreationists to society in general and to the South Saskatchewan River Basin in Alberta in particular; and 3. to determine the direction of the future utilization of the provincial park resources. The plan of the study follows from these objectives.

The economic rationale and conceptual framework required to meet these objectives are encompassed in Chapter II, while Chapter III shows the empirical procedures used to collect and analyze the required information. Data are also presented in this chapter. The economic evaluation of the provincial parks is carried out in Chapter IV. Potentials and policy implications for the parks are examined in Chapter V, and a final summary and conclusion complete the study.

Recent Trends

The demand for areas that are strictly for

recreational use is increasing at a rapid rate. Activities such as camping, boating, hiking, etcetera have grown in popularity and, as a result, areas where these activities can be pursued at low cost and relative ease have increased. In the United States, for example, there has been a drastic rise in the number of persons visiting the national parks. In 1930, there were 2.26 visits per 100 persons to these parks, whereas thirty years later, in 1960, there were 13.4 visits per 100 persons[1] --an increase of over 585 percent. This phenomenon is by no means peculiar to the United States. It is also apparent in Canada's national parks, particularly those lying in Alberta. Between 1958 and 1968, Banff National Park had an increase in visitors of almost 160 percent. Jasper and Waterton Lakes National Parks had increases of 96.4 percent and 66.3 percent respectively, over the same period.

In 1960, there were forty provincial parks in Alberta. There are now forty-eight. Table 1 shows the visitation patterns to the parks included in this study. In 1960, the total expenditure on all parks in the province was $367,724.89[2], whereas the total expenditure for the

---

[1] See Table 1 of Appendix A.

[2] Alberta Department of Lands and Forests, Tenth Annual Report (Edmonton: Alberta Department of Lands and Forests, 1960), p.57.

TABLE 1

NUMBERS OF VISITORS TO PROVINCIAL PARKS IN THE STUDY AREA, 1960 - 1969

Park	1960	1961	1962	1963	1964
Beauvais Lake	20,540	16,540	20,135	29,840	20,421
Big Hill Springs	9,420	9,750	12,173	12,350	14,063
Bow Valley	-	-	35,500	124,042	48,860
Bragg Creek	-	-	-	-	-
Chain Lakes	-	-	-	-	-
Cypress Hills	160,500	196,000	221,000	457,000	289,900
Dinosaur	6,731	5,917	8,190	12,000	15,292
Kinbrook Island	32,670	35,040	33,400	38,290	54,039
Little Bow	23,300	26,160	27,945	42,830	48,440
Park Lake	90,910	106,440	113,130	159,210	128,662
Taber	32,230	36,120	32,875	34,840	29,231
Willow Creek	3,400	4,400	3,550	3,450	4,660
Woolford	10,100	10,850	14,040	15,430	4,850
Writing-on-Stone	8,280	15,070	19,789	16,830	15,552
Total	398,081	462,287	541,727	946,112	673,970
Percentage Change		+16.3	+17.18	+74.65	-28.76

. . . continued

TABLE 1

(continued)

Park	1965	1966	1967	1968	1969
Beauvais Lake	30,756	52,434	57,751	62,084	48,564
Big Hill Springs	30,452	32,414	50,386	48,758	55,907
Bow Valley	83,108	159,087	218,111	246,012	165,239
Bragg Creek	6,988	28,854	37,658	58,906	79,813
Chain Lakes	-	-	-	18,361	145,098
Cypress Hills	588,770	690,489	559,812	603,858	685,723
Dinosaur	17,400	29,049	35,824	50,769	53,089
Kinbrook Island	77,782	90,170	84,276	86,484	114,620
Little Bow	41,320	50,128	57,377	60,328	69,484
Park Lake	160,532	191,075	214,707	122,710	284,428
Taber	31,169	39,038	48,404	54,872	73,322
Willow Creek	11,094	19,935	32,884	35,291	42,764
Woolford	6,062	13,541	23,216	20,628	14,935
Writing-on-Stone	21,458	18,462	21,434	23,890	24,040
Total	1,106,891	1,414,676	1,431,840	1,492,951	1,857,026
Percentage Change	+64.23	+27.81	+1.21	+4.27	+24.39

fiscal year ending March 31, 1969 was $2,104,310.42[1]. In 1960, only one provincial park (Cypress Hills) provided facilities for trailers -- most other parks permitted trailer parking but had no areas designed for their exclusive use. This situation has changed considerably.

Study Region

This study was concerned only with the South Saskatchewan River Basin that lies within the Province of Alberta (Figure 1). This includes close to one-half of that portion of the province south of Edmonton. The provincial limits form the regional boundary on three sides -- Saskatchewan to the east; Montana to the south; and British Columbia and Banff National Park to the west. The northern boundary runs just south of the Red Deer River until Dinosaur Provincial Park, where it heads directly eastward until meeting the South Saskatchewan River near the Saskatchewan border (Figure 1).

The South Saskatchewan River itself is formed by the meeting of two other rivers -- the Oldman and the Bow. Both of these originate in the Rocky Mountains in the west of the province and join approximately two-thirds of the distance across the province at a point north-west of the town of Bow Island (Figure 1). The Bow River flows in a south-easterly direction from its origin in the mountains and the Oldman River flows generally to the east from its source in the southern foothills. A third river, the Milk

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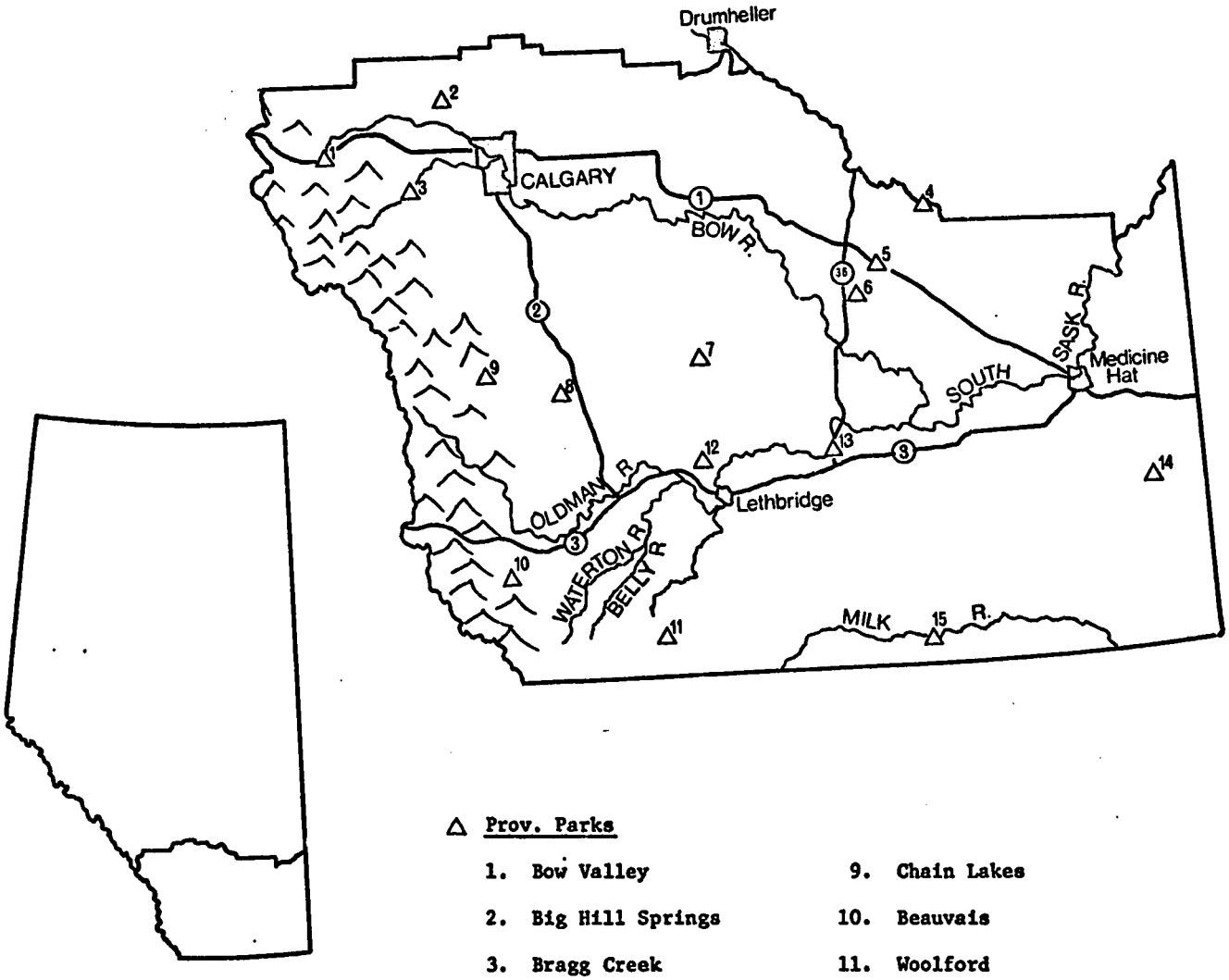
[1] Alberta Department of Lands and Forests, Twenty-First Annual Report (Edmonton: Alberta Department of Lands and Forests, 1970), p. 63.

FIGURE 1

THE SOUTH SASKATCHEWAN RIVER BASIN



△ Prov. Parks

1. Bow Valley
2. Big Hill Springs
3. Bragg Creek
4. Dinosaur
5. Tillebrook
6. Kinbrook Island
7. Little Bow
8. Willow Creek
9. Chain Lakes
10. Beauvais
11. Woolford
12. Park Lake
13. Taber
14. Cypress Hills
15. Writing-On-Stone

River, flows into Montana from the southwest corner of Alberta and a small portion of its basin lies in the study region.

Three major urban areas are located in the study region[1]: Calgary (population 369,025) in the northwest corner; Lethbridge (population 38,749) in the southwest central part; and Medicine Hat (population 25,713) in the east central part of the region (Figure 1). These centres account for roughly seventy-five percent of the total population of the South Saskatchewan River Basin. The population in the basin is approximately 580,000 persons. Most of this population is concentrated in the western section of the basin near the foothills. Two of the three major urban centres, Calgary and Lethbridge, lie in this area.

The region has an extremely varied topography. The eastern two-thirds is prairie bounded by Highway No. Two on the western edge. West of this highway, rolling foothills begin and eventually give way to the Rocky Mountains near the British Columbia-Alberta border.

The vegetative cover varies considerably over the region as well. Parts of the prairie are relatively lush, primarily due to the effect of irrigation, while other areas are desert-like. Even the relatively narrow band of foothills varies: the brush in the lower hills on the eastern edge of this band gives way to thick forests in the hills closer to the mountains. The climate explains most of the variation. The relatively low precipitation, which ranges from eleven

[1] Population figures are for 1966.

inches annually in the southeast portion of the region to twenty-eight inches annually in the mountainous portion, is due to the fact that the whole region is in the rain shadow of the Rocky Mountains. The climate is predominantly continental and as such is subject to significant extremes in weather conditions.[1] The temperature extremes are moderated somewhat, however, by the low relative humidity throughout the area.

Mean July temperatures range from a maximum of seventy-eight degrees and a minimum of forty-one degrees at Lundbreck in the foothills to a maximum of eighty-three degrees and a minimum of fifty-five degrees at Medicine Hat in the east. Winter temperatures for these same places range from thirty-eight degrees to minus seventeen degrees and from forty-five degrees to minus nine degrees.

A significant portion of the study region (approximately thirteen percent) located along the western boundary is made up of provincial land and is identified as the Rocky Mountain Forest Reserve. Federal lands, largely Indian Reservation land and a Military Experimental Range constitute approximately ten percent of the total land area of the study region. The reservations are located in the northwest and the southwest

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[1] The Chinook is an unusual wind common in this part of the province. These are strong warm winds which blow eastward out of the mountain valleys, their greatest frequency being in the fall, winter and spring. They can vary the temperature in the area as much as fifty degrees in a very short period of time.

areas of the region, while the Military Experimental Range is in the opposite side of the basin, north and west of the city of Medicine Hat.

The remainder of the land is largely privately owned and activities on this land have provided the South Saskatchewan River Basin with a diverse economy. Industries are largely primary in nature, but with a growing secondary sector. The primary industries are virtually all extractive (gas, oil, coal, and salt) and agricultural (grain, livestock, and vegetables). Industrial concentrations are located at Calgary (refining, manufacturing, and service industries), Medicine Hat (refining, and service industries), Lethbridge (manufacturing, brewing, service industries), Taber (sugar refinery), and Pincher Creek (service industries). The foothills area provides excellent grazing for cattle and the area east of the foothills is excellent for grain production. The eastern arid sections rely to a great extent upon irrigation to support the growth of such crops as sugar beets and grain.

Due to the diversity of natural conditions within the study region, there is also a great diversity in recreation opportunity, from indoor to outdoor, and from urban to rural. In this study, only outdoor-rural recreation in the Provincial Parks located in the region is considered (Figure 1). Activities such as camping, fishing, hiking, swimming, picnicing, and boating are usually provided for within most

of these Provincial Parks.

Recreation is a heterogeneous product-mix that varies according to the quantity and quality among different locations. A combination of activities makes up a unique mixture for each individual. This unique combination is determined by the individual's tastes and wants, as well as by location, weather, and time.

An evaluation of the worth of the Provincial Parks to society and to Southern Alberta is prerequisite to an evaluation for further investment in recreational resources in these parks. All benefits and costs associated with the parks and their uses must be analysed if government is to have effective policy formulation and implementation.

CHAPTER II

CONCEPTUAL FRAMEWORK

Introduction

The economic public policy objective dealing with natural resource use adopted here is the maximization over time of net social benefits (monetary and non-monetary) that accrue to the members of its society as a whole. Natural resources may be considered as inputs into the government production process. However, the term 'resources' is taken frequently to apply to those objects which are physical and rudimentary in nature, such as bodies of mineral ore. Similar to other concepts, the term 'resources' may be used on different levels of conceptualization. According to S.V. Ciriacy-Wantrup[1], three logical levels exist : the descriptive, the functional, and the theoretical. He goes further to warn that "confusion results if this distinction is ignored." Resources are highly relative and are dependent upon at least two factors in concept. These two factors are: 1. the planning agent with a specific purpose; and 2. appraisal. In other words, the concept of a resource depends upon the definition of means and the definition of end. More specifically, it depends upon the planning agent, the objective, the state of technology, and the social institutional

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[1] S.V. Ciriacy-Wantrup, Resource Conservation Economics and Policies (3rd ed.; Berkeley: University of California Press, 1968), p.29.

framework. This study will focus upon those resources which exist at the functional level of conceptualization, such as rocks, land, trees, wood and other tangible resources which are used for public outdoor recreation purposes.

Since governments are responsible for allocating public resources in an efficient and rational manner that attempts to bring about the highest net social benefits over time, they must attempt to determine all facts regarding inputs and outputs and associated values. Frequently, however, this is not the case. At least two factors are responsible for this situation. First, government may consider questions of equity amongst its citizens to be more important than economic efficiency. Consequently, the efficiency and rationality criteria are constrained by equity considerations. Second, publicly owned natural resources sometimes create evaluation problems. For example, it is extremely difficult to evaluate certain scenic or naturally extraordinary phenomena. Consequently, efficient allocation of resources by the public sector is sometimes frustrated and the direction of the flow of public funds may not be the socially most efficient. This study is concerned with a public resource use that is difficult to evaluate -- outdoor recreation in specific provincial parks.

Outdoor Recreation and Natural Resources

Recreation is usually defined as any activity

undertaken primarily for purposes of personal enjoyment. Most definitions include an element of self-betterment or improvement as one of the underlying forces behind recreation. Thus, recreation can be seen to include an extremely large number of activities, everything from reading to skydiving.

The term 'outdoor recreation' does little to limit the number of activities for consideration; many recreational activities remain encompassed in the term. The primary outdoor activities of most recreationists involved in this study are camping, swimming, fishing, boating, and hiking. However, this limited array by no means exhausts the possible activities that recreationists enjoy in a provincial park.

Recreational resources include land, water, or other natural features actually used for recreation. This includes, then, an area of land with or without tree cover; a flowing stream or a body of water; or other natural features which may or may not have been modified or improved by man. Further, it should be noted that " it is the use or the possibility of early use which determines that natural features are actual or potential recreational resources, not any physical characteristics of the land or water area itself."[1]

Some of the recreation activities undertaken in provincial parks are divisible in consumption, while others

---

[1] M. Clawson and J.L. Knetch, Economics of Outdoor Recreation (Baltimore:The Johns Hopkins Press, 1966), p.145.

are not. The viewing of scenery is a recreation activity which is indivisible in consumption: the amount consumed by one person does not affect the amount consumed by others. The catching of a fish, on the other hand, is divisible: the value obtained is attributable to only one individual.

The setting of each park determines the nature of resources used for recreation. Several parks located in the foothills have particularly high scenic value, while others situated on or near water bodies have value for fishing and other water-oriented activities. Within each park, however, certain resources are common. Each park has specific areas set aside exclusively as occupancy sites (camping areas for trailers, tent trailers and tents[1]). Certain resources have been converted to satisfy a particular need or demand made by the recreationists. Other resources associated with the occupancy sites have been converted into forms more easily used by the park visitors: firewood is chopped into manageable lengths ans is provided free of charge, and water is made more accessible by means of taps or pumps situated in convenient locations throughout the parks.

Aside from the occupancy sites, most of the provincial park resources in the study region have been left largely undeveloped to preserve scenic phenomena. In some cases,

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[1] House-keeping cabins and other similar types of permanent accomodation structures, common in some parks, do not exist in the parks studied here.

nature has been altered by man (planting trees or building reservoirs, for example). In several situations where comparatively large bodies of water occur, the Provincial Government has stocked these waters with different species of fish to augment the existing stock, to ensure that fish populations remain above certain levels, and to allow more fishing activity and increased total catch.

Historically, the provincial parks were created in response to the wishes of certain municipal districts that wanted areas set aside for recreation use by local residents. In other words, the parks were created in response to local requests and not through any preplanned Provincial Government action. These parks are public by ownership. Elsewhere in the region, a few privately owned recreation areas exist, providing similar opportunities. Virtually all remaining privately owned land is 'posted', prohibiting access to picnicers, hikers, and general nature lovers, whose use of the land may interfere with its commercial use.[1] Provision of provincial parks and other controlled land use areas appears to have been in response to these access restrictions. However, attempts to determine the best use of recreational land invariably raises larger issues that deal with relationships among different kinds

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[1] A discussion of this general phenomenon is given in R.T. Ely and G.S. Wehrwein, Land Economics (Madison: University of Wisconsin Press, 1964), p.318.

of recreation and between public and private enterprise. These are considerations which are determined on an economic and social basis, although they have a clear bearing upon the nature of the use of the recreational resources.

Classification of Natural Resources

Natural resources fall into one of two classes: nonrenewable or 'stock' resources and renewable or 'flow' resources. A resource is considered to be a stock if its total physical quantity does not increase significantly with time. The total stock is limited and any rate of use diminishes any future use of the resource. Flow resources, on the other hand, are those in which different units of the resource become available for use in different time periods. As a result, the rate of use in one time period may not affect the rate of use in some future period. Use may be maintained indefinitely, provided that the flow continues. Natural resources used for outdoor recreation are generally renewable.[1]

Some flow resources have an additional characteristic termed a 'critical zone' -- a more or less clearly defined range of use rates below which a decrease in flow cannot be reversed 'economically' under present and

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[1] S.V. Ciriacy-Wantrup, "Philosophy and Objectives of Watershed Policy" in Economics of Watershed Planning, ed. by G.S. Tolley and F.E. Riggs (Ames: Iowa State University Press, 1961), p.6.

forseeable conditions. Flow resources with this critical zone are the only group of resources that tend to create economic problems of depletion. Some of these resources serve mainly for food, clothing, aesthetic enjoyment, and recreation.

Outdoor recreation resources are often characterized by a critical zone. For any particular site, a critical level, or zone of feasible use, exists. There is a point of recreational resource use above which deterioration results. Overuse may be brought about by overcrowding or by two or more uses of the resource occurring simultaneously. Crowding increases the hazard of fire -- an occurrence that could well jeopardize the renewability of the resources for some purposes, although it may well assist the renewability for some other uses. Conservation policies are those which are brought to bear in order to help determine optimal rates of utilization.

Conservation

The term 'conservation' appears to have a particular emotional element to it. Consequently, different people and/or groups attach different meanings to the word. To some the term infers a nebulous 'wise use'; to others it means non-use. A workable definition is required, one which forseeably includes all interpretations and yet remains articulate. There are several such definitions available.

A.D. Scott maintaines that "a conservation is public policy which seeks to increase future usable supplies of a natural resource by present action."[1] In other words, conservation involves the when of resource use.[2] When considering the current need for the use of resources, the three primary purposes of conservation policies are : 1. orderly and efficient resource use; 2. the elimination of economic and social waste; and 3. the maximization of social net returns over time.[3] Any conservation policy must embody these three elements when affecting current use.

The use of resources for recreation does not conflict with the objectives of a conservation policy. Through area management or the application of safe maximum levels of use, the activity of recreation can have a positive influence on the renewability of resources. If the situation exists where all facts and values are known concerning the

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1 A.D. Scott, Natural Resources: The Economics of Conservation(Toronto: University of Toronto Press, 1955), p.18. See also, S.V. Ciriacy-Wantrup, Resource Conservation Economics and Policies, p.51.

2 R. Barlowe, Land Resource Economics (Englewood Cliffs: Prentice-Hall,Inc., 1958), p.284 defined conservation as "the wise use of resources over time." Notwithstanding the nebulous term 'wise use', Barlowe goes on to say that wise use is the best term since it "deals with public and private decisions concerning the allocation of resources between the present and future and with policies and actions that are designed to increase the future usable supplies of particular resources."

3 Ibid., Chapter 10

resource use, then the public policy conservation objective of maximizing net social benefits is relatively easily defined. However, since incomplete knowledge always exists, then an alternate objective is the determining of safe minimum standards of resource use. Safe minimum standards are those established levels of use which, in allowing for error in the estimation of the critical zone of use, have been set to ensure the renewability of the resources. Such standards must be determined if long run use of the resources is of greater value than intensive short term use. Good management practices are necessary if all applicable flow resources are to remain above their critical zone range of use. Consequently, there is no reason to presume that conservation and recreation are mutually exclusive resource uses.

Resource Valuation Criteria

Since the resources used for recreation are public by ownership and since the primary objective of conservation policy is to maximize the social net returns over time, then the responsible public agency must determine the stream of benefits and costs that are associated with those particular resources. That is, the present value of the net social benefits must be calculated. Decisions regarding the use of the resources should ideally be based upon this objective.

In deciding the best resource use, gross social benefits must be at least as great as the gross social costs, if a rational decision is to be made. If more than one use meets this criterion, then the best use must be determined, one that is consistent with the objective of attaining an optimum state of conservation. In an ideal situation, with complete knowledge, the optimum state of conservation will be attained when the value of the total marginal social costs outlaid is just equal to the total marginal social benefits received. In other words, as long as added benefits are greater than added costs discounted, it pays to alter resource use over time. There are many problems associated with this procedure -- quantification of values, for example. Budgetary and equity constraints have an additional bearing on the value of benefits and costs.

Consideration of equity among the populace may have a higher value to a government than any other sector of the economy and, thus, a recreation resource might be designated solely to allow a recreation opportunity. Similarly, the constraints of a budget may deem a resource allocation to recreation too expensive in terms of monetary outlay and income foregone. Although the benefits and costs can be conceived to include these constraints, they frequently are excluded, resulting in what would appear to be illogical resource uses.

These benefits and costs often provide problems of

evaluation for public policy makers. Often there is an intrusive or extra-market value that is difficult to assess. Recreation is an activity which has such an extra-market component.

There is no competitive market for recreation, since the recreational resources of the provincial parks are public goods. There are social influences brought to bear upon the policies governing the administration of the parks. This would include the park location, layout, and operation, as well as the pricing system of the goods involved.

The values associated with provincial park use are not easily determined. A competitive market for recreational facilities has never existed. Governments have tended to provide these facilities free of charge or at prices lower than might otherwise exist in a competitive market. Consequently, user fees have not been adequate reflections of value. The result has been the existence of extra-market benefits accruing to the recreationist.

Each individual values his recreational experience in a manner different from others. Some are willing to pay more than others for the same recreational opportunities. The difference may be, in part, not only a reflection of personal preferences, but also due to income differences.

There are several needs that tend to evoke the provision of goods and services to the general public

from the government.[1] Among these needs is the situation where public policy makes an allocation of resources that deviates from that reflected by common sovereignty. In other words, particular wants are satisfied. These wants could have been satisfied through the market, but the consumer chose to spend his money on other things. The reason for public policy intervention, then, is to provide the individual with an additional choice which the government feels should be available.

Evaluation of Provincial Parks

Economic evaluation requires the enumeration of benefits and costs, both primary and secondary. Even though estimations are prone to biases and inaccuracies, they must be undertaken if a move toward the optimum state of conservation is to be realized for the recreational resources in the provincial parks in the basin. It is necessary to differentiate between resident and non-resident park users as well. For the purposes of this study, residents will be considered as those who live within the boundaries of the South Saskatchewan River Basin study area, and non-residents as those who live beyond these boundaries.

Benefits of Recreation Activity

Primary benefits - The primary benefits are those

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[1] Earl Rolph, The Theory of Fiscal Economics (Berkeley: University of California Press, 1956), p.17.

which accrue to the recreationist. These benefits are measured by his willingness to pay for park use including any entrance fee and extra-market benefits which he feels exist. Two factors cause difficulty when determining these values. First, the recreationist who uses the parks for recreation is 'buying' a varied mix of activities. That is, he is buying the right to recreate in a particular area at a particular time, whereby he may use all the facilities but must remain subject to the pertinent regulations. Second, a competitive market does not exist whereby the price charged for entrance to the park reflects all primary benefits incident upon the user. A competitive market has not existed because of government policy to charge less than the amount required to cover all its pertinent costs.

The price being charged, if any, is set by criteria unrelated to optimum use. The two value components (market fees and extra-market benefits) operate concurrently, yet only market fees are measurable. Consequently, the 'worth' or value of the resource is not known since the recreationist has no mechanism whereby he can register his own estimation of worth.

There are at least two components of extra-market benefits. First, there is the value that participating recreationists gain over and above the market fee, and second, there is the value gained by non-participating individuals

from the knowledge that such a resource exists. The knowledge that at some time in the future when and/or if they decide to use the resource, they may do so, has value.[1] This value is not reflected in any market pricing mechanism.

The absence of a competitive market is not the only problem, however. By the assumption of economic rationality, a recreationist will leave when his marginal costs become greater than his added utility. Often the recreationist has a constraint on the amount of leisure time available to him. As a result, the recreationist may not lengthen his stay to the point where marginal utility gained equals the marginal cost of staying.

The problem remains, however, as to the real value that the recreationist places on the right to use the provided recreational resource. In this study, a direct method of estimating this value is used -- the 'willingness to pay' method.[2] Recreationists are asked directly through personal interviews to estimate how much they would be willing to pay for the recreation opportunity

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[1] This concept is known as option demand; John V. Krutilla, "Conservation Reconsidered," American Economic Review, LIX (1967), pp. 777-786.

[2] An indirect method was also applied to the data for primarily comparative purposes. See Appendix C for an outline and example of this method of evaluation.

rather than forego it.

At least four assumptions are made in this method.[1] First, different persons responding to the same question identically will indicate identical levels of recreational benefits. If dollar responses differ, than the real benefits differ proportionally. Second, the interviewees' responses are not influenced by opinions about government policies in outdoor recreation. Third, the predominant benefits procured by a recreation site are those directly consumed by the users of the site. The site's capacity as a producer of external effects in time and space must be considered insignificant. Fourth, the surveyor and the survey techniques have no effect on the interviewee's response.

In addition to these four general assumptions, there are certain assumptions made concerning the particular questionnaire used in the study.[2] These include:

1. That the value to the recreationist of his total recreational experience at least equals or exceeds the cost of the complete 'mix' of goods and services he purchases for recreation. This mix includes travel costs to and from the site as well as the recreation opportunity itself.

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[1] Jeff Romm, The Value of Reservoir Recreation, Technical Report 19 (Ithaca: Cornell University Water Resources and Marine Sciences Centre).

[2] W.S. Pattison, "Moose Hunting Activity in Northern Alberta: A Case Study in Wildlife Economics"(unpublished M.Sc. thesis, University of Alberta, Department of Agricultural Economics and Rural Sociology, 1970), p.21 uses the same assumptions in his moose hunting study.

2. That all but one component of this total product-mix is purchased in a competitive market. Their cost is considered equal to their utility to the recreationist. The single missing component is the recreational resource and its associated particular product-mix, that is, the opportunity of recreating in a certain area at a certain time. For this resource, the recreationist either pays a standard fee or gains entrance free of charge, depending upon the park visited.

3. That each recreationist received at least as much utility from his experience as it cost him. Additionally some recreationists received benefits in excess of their costs.

4. That all extra-market benefits may be attributed to the recreation resource, since they are the only components not subject to market pricing.

Secondary benefits - Secondary benefits stem from or are induced by the expenditures made by the recreationists. The effects of the expenditures constitute a genuine increase in the net income of the community and must not merely constitute a transfer of production from one place to another. When evaluating the recreational resources for society in general, no additional secondary benefits are assumed to occur, since this is merely a transfer of income, although total welfare may change as the income distribution changes. If

the recreationist would have spent his money elsewhere had he not spent it using the provincial parks, the expenditures are assumed to represent a regional and/or sectoral transfer of income with no net social change taking place.

The evaluation from the point of view of the study region includes secondary benefits in the analyses. The sale of goods and services to the non-residents provides an indication of the economic impact on the income of the Basin. Information concerning the expenditures of non-residents is obtained through personal interviews and, thus, an estimate of the increase in sales within the Basin can be determined.

Due to the given pattern of production, however, two factors should be considered. Some goods sold may be imported and therefore constitute no increase in output in the study region. And, even though the final product is made within the region, the inputs are imported. The value added from such production should be included in secondary benefit quantification. Second, indirect increases in sales may be brought about by firms within the region increasing their purchases from other firms within the region. This would have a multiplier effect on the regional expenditures of the recreationists. These two factors must be taken into consideration when determining the full

economic impact on the regional industries. The results of an input-output study for Alberta will be used to determine an impact multiplier.

Costs of Recreation Activity

Primary costs - The direct costs which come about through operation of the provincial parks are entitled primary costs. These include the costs of operating, maintaining, and repairing the facilities on an annual basis.

Secondary costs - The costs involved in the production of goods and services which bring about secondary benefits constitute the indirect, secondary costs. Also included are the costs incurred by agencies in selling these goods and services to the non-resident recreationists. These expenses include imported inputs made into final goods, imported final goods for resale, and purchased inputs from other industries within the region.

Summary of Benefits and Costs

Two types of consumers of the recreational opportunity are distinguished : resident and non-resident. From the viewpoint of society, no distinction is necessary concerning place of residence for evaluation purposes since the whole of society is concerned. In such an evaluation, the net social benefits of a provincial park are estimated

as being the sum of the fee revenue and extra-market benefits of the recreationist less the primary costs.

The net social benefits of a provincial park to the South Saskatchewan River Basin in Alberta uses the distinction of resident and non-resident recreationists. The benefits are the sum of three factors : 1. market entrance fees; 2. extra-market benefits received by all resident users; and 3. the total impact on the regional economy of the non-resident recreational expenditures. The costs are the sum of two factors : 1. the operating, repairing, and maintaining of the facilities costs; and 2. the cost to the regional economy of providing the goods and services purchased by the non-resident recreationists.

CHAPTER III

EMPIRICAL PROCEDURES

The problem situation and the theoretical framework of problem analysis formed the bases for empirical procedures and required information and data essential to meet the study objectives. Selection of the sample was the first step.

Determination of Sample

Fourteen of the fifteen provincial parks within the boundaries of the South Saskatchewan River Basin were sampled: Big Hill Springs, Bragg Creek, Bow Valley, Chain Lakes, Willow Creek, Beauvais Lake, Park Lake, Woolford, Little Bow, Taber, Writing-on-Stone, Cypress Hills,[1] Kinbrook Island, and Dinosaur Provincial Parks. The total number of visitors to all fourteen of these provincial parks during 1969 for the time period May to September inclusive was 1,511,440.[2]

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[1] Tillebrook, the fifteenth, was not completed at the time of the survey. The two National Parks -- Banff and Waterton Lakes, and the numerous roadside campsites administered by the Alberta Department of Highways were not included in the survey.

[2] All figures were supplied by C.N. Harvie, Parks Planning Branch, Alberta Department of Lands and Forests.

Both spatial and temporal distributions of these visitors were determined (Tables 2 and 3). The survey sample of 380 park users (approximately 0.03 percent) was chosen to determine the actual number of questionnaires for allocation to each park both spatially and temporally. Personal interviews of park users were used as the means of questionnaire completion. Both time and limited research funds were major factors in determining sample size. The distance between parks ranged from thirty miles to one hundred miles. Each questionnaire took approximately thirty minutes for the interviewer to complete. The number of questionnaires to be completed in the distribution outlined in Tables 2 and 3 was considered sufficiently large to avoid problems associated with small sample properties. The spatial distribution resulted in each park being allocated the number of questionnaires shown in Table 2. This table also shows the temporal distribution of these questionnaires allotted to each summer month for each park. The temporal distribution was broken down on a daily basis so that a distinction was made between weekday and weekend visitors. This distribution appears in Table 3.

Under ideal conditions, a completely random ordering of parks and of all 'within-park' visitors would have been the most empirically desirable way to collect the data. However, to minimize travel costs associated

TABLE 2

DISTRIBUTION OF QUESTIONNAIRES BY PARK AND BY MONTHS

Park	Percentage Allocation	May	June	July	Aug.	Sept.	Total
Beauvais Lake	2.11	2	1	2	2	1	8
Big Hill Springs	3.16	2	2	3	4	1	12
Bow Valley	7.63	3	6	9	9	2	29
Bragg Creek	3.68	4	3	3	4	0	14
Chain Lakes	6.84	5	4	7	7	3	26
Cypress Hills	37.11	16	22	43	49	11	141
Dinosaur	2.89	1	2	4	3	1	11
Kinbrook Island	6.58	4	4	7	8	2	25
Little Bow	3.95	3	4	3	4	1	15
Park Lake	17.37	7	12	23	20	4	66
Taber	4.20	3	4	4	4	1	16
Willow Creek	2.37	1	2	3	3	0	9
Woolford	.79	0	0	2	1	0	3
Writing-on-Stone	1.32	1	2	1	1	0	5
	100%	52	68	114	119	27	380

TABLE 3

DISTRIBUTION OF WEEKEND/WEEKDAY QUESTIONNAIRES BY PARK AND BY MONTH

Park	May		June		July		August		September	
	w/d[a]	w/e[b]	w/d	w/e	w/d	w/e	w/d	w/e	w/d	w/e
Beauvais Lake	0	2	1	0	1	1	1	1	1	0
Big Hill Springs	0	2	1	1	1	2	1	3	0	1
Bow Valley	1	2	3	3	6	3	4	5	1	1
Bragg Creek	1	3	1	2	1	2	1	3	0	0
Chain Lakes	2	3	2	2	4	3	3	4	2	1
Cypress Hills	8	8	13	9	30	13	28	21	7	4
Dinosaur	0	1	1	1	2	2	2	1	0	1
Kinbrook Island	2	2	2	2	3	4	4	4	1	1
Little Bow	1	2	1	3	1	2	1	3	0	1
Park Lake	2	5	8	4	11	12	7	13	2	2
Taber	1	2	2	2	2	2	2	2	0	1
Willow Creek	0	1	1	1	1	2	1	2	0	0
Woolford	0	0	0	0	1	1	0	1	0	0
Writing-on-Stone	1	0	1	1	0	1	0	1	0	0
	19	33	37	31	64	50	55	64	14	13

[a] w/d = weekday

[b] w/e = weekend

with the survey, the parks were grouped into four zones on the basis of relative proximity and approximately equal interview numbers. In other words, parks with a great number of interviews allocated to them were grouped with parks allocated a lesser number of interviews in order that each group of parks would have a reasonably equal number of interviews to be completed. The next step was to determine the order in which the areas were to be covered, and in which area the survey was to begin. This was done by numbering each of the areas and selecting one at random.[1] Once the first area was determined, the first park to be surveyed was selected in the same manner. Starting from this park, the least-cost travel route of surveying the remaining parks was taken.

Samples were taken in each park on weekdays and on weekends. This was done so that day users, weekend users, and vacationers were included in the sample. No attempt was made to distinguish among those recreationists on vacations, trips, and outings.

The following method was used to determine the actual dates of the sample-taking. Due to the number of questionnaires allotted to each park, and the resulting interview time required, as well as travel time between parks,

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[1] John E. Freund, Modern Elementary Statistics (New Jersey: Prentice-Hall, 1967), pp.393-396.

at least one weekend and three or four weekdays were required for each interview trip. Consequently, two weekends (including statutary holidays) were randomly selected for each month from May to September, inclusive. A random method was used to determine whether weekday interviews should precede or follow the weekend interviews. The number of weekdays chosen depended largely upon the number and distribution of interviews required for each area and each month. This was the procedure used for the months of May, June, and September. The July and August interviews, however, were grouped into one, due to a budgetary constraint. Interviewers had to travel between Edmonton and the study region for each interview trip. The assumption was made that during the months of July and August, with public and high school students on vacation, an almost uniform population would be using the park facilities. These two months form the prime vacation time for most people. Further, once the May trip had been undertaken, and a better idea of the survey costs was known, the possibility of combining any two months was restricted to either June-September or July-August. Since it was by no means certain that there was any similarity betwwen the park users in June and those in September, the latter combination was chosen.

The actual dates of the interviews were:

May - 16,17,18,19,20

June - 10,11,12,13,14

July-August - 31 July, August 1,2,3,4,5,6,7,8,9

Se.tember - 17,18,19,20[1]

In the park area, an attempt was made to select recreationists for interviews at random, with the aim of including day users, such as picnicers, as well as campers with well equipped house trailers. No attempt was made to interview one particular type of recreationist more than another. The proportion of day users to overnight campers at any one time in the park was roughly estimated and a sample was drawn along the lines of this proportion.

Data Requirements

The personal interview method used to gather the pertinent data was the only method available for questionnaire completion, since no record was kept of park users' names and addresses. A copy of the questionnaire appears in Appendix B.

The questionnaire consisted of five major areas of emphasis: residence, personal characteristics, visitation information, motivation, and willingness to pay. The first section had as its primary question the residence of the interviewee, to distinguish between residents (those living

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[1] It should be noted that the September interviews were scheduled for the 10-12, but due to inclement weather, the dates were changed.

within the South Saskatchewan River Basin) and non-residents (those living outside the Basin). This information was necessary for obtaining a description of the park users and for determining regional economic impact information.

The second section entitle 'personal characteristics' was intended to determine socio-economic user patterns and included details such as age, income, family size, occupation, and education. The resulting information was important primarily from a sociological viewpoint, but provided some use for subsequent economic analysis. The data provided useful information for cross-sectional analysis of final data.

The 'visitation information' section was intended to determine such things as the mode of transportation, type of accomodation, type of trip, the number of hours, days, or nights spent in the park, as well as important data concerning the family trip expenditures. The expenditure data were important for purposes of using alternate methods of evaluating the resource. The data were divided into two categories -- trip expenditures made on the total trip, and those made in the South Saskatchewan River Basin area. In this manner, the value of expenditures made in the study area was determined, providing the basis for the determination of secondary benefits and costs to the region. This information was used in the primary method of evaluation

of the recreational resources.

'Motivation' was designed to determine the degree of user experience in recreational activities, user intentions to visit other areas on their trip, and rating of their satisfaction with the park. This is important partly for descriptive purposes and partly for determining the attitude of park users. The attitude of the recreationists to the resource should be consistent with other data obtained from the questionnaire.

Answers to the first four sections of the questionnaire were fairly straightforward and generally replies were given readily to most questions, including those regarding age, income, and education. Income and age were determined by the use of cards. For income, no absolute dollar figures were asked. The card had the letters A to J on it, each letter corresponding to an income category (Appendix B). The interviewee was asked to pick that letter which best described his total family income. The same system was used to determine the age of the interviewee and his or her spouse, where applicable. A second card had the letters A to J on it with corresponding age groups (Appendix B), and the interviewee was asked to give the appropriate letter.

The final section of the questionnaire was concerned with the willingness of the park user to pay for park recreational opportunities. This value was obtained from

the recreationist's responses to questions about the monetary value he placed on his park experiences. In the questionnaire, the recreationist was first asked whether or not he considered the park to be worth more per trip than he currently spent to come. If the answer was affirmative or non-committal, then he was asked to quantify the amount, either as a proportion of what he was currently spending or in absolute dollar terms. The final question asked for a further breakdown of the recreationist's willingness to pay for each activity. The interviewee was asked how much more he would be willing to pay for such activities as camping, boating, fishing, picnicing, swimming, etcetera. Most recreationists had a fairly difficult time in answering this final section of the questionnaire. Usually the interviewee could answer whether or not the recreation experience was worth more to him than he was currently spending, but he had difficulty in actually quantifying the additional amount. The interviewer in no case attempted to help the interviewee by over-encouragement. It was felt that the interviewee should struggle for an answer by himself rather than risk the introduction of an answer biased towards the views of the interviewer. Only in the case where the interviewee did not understand the question was there any elaboration on the part of the interviewer.

The preface remarks of the interviewer were thought to be extremely important to the manner in which this last question was answered. In each interview undertaken, the interviewee was told that an attempt was being made to determine how much people valued the opportunity of visiting that particular park and that, in order to determine this value, he was being asked to say how much he would be willing to pay to take advantage of the recreational opportunities as they stood at that time. A fair amount of leeway was given to the interviewee in responding to the question. He could answer on either a trip basis or a day basis. As stated above, he could also answer in terms of what he was currently spending (in percentage or fractional terms) or he could answer with an absolute dollar value. Most respondents replied on a per day basis (91.4 percent) and in dollar terms (97.6 percent). The actual answers were between $0.00 per day and $90.00 per trip.

From the responses obtained, it appeared that most interviewees were considering the cost of an overnight stay only; that is, they were considering only one component of the product-mix. In other cases, the interviewees were thought to be considering only an entrance fee which they would be willing to pay in relation to the one that was being paid at that time. In an attempt to check on the existence of these problems and to circumvent them, the interviewer asked that same final question in two other

ways to determine the existence of any change in the answers. One question allowed the interviewee to suppose that he was the owner of the park area. He was asked what he thought would be a fair charge for the use of the resources for recreation in the park area. In particular, he was asked the amount he considered a fair fee to be charged to users of the area. The other way was more straightforward : he was asked the amount of charge that would be prohibitive to him for the use of the park facilities. That is, how high would the price (fee) have to rise before he would cease coming to the park.

No accurate record was kept of these responses to the supplemental questions since they were introduced after many interviews had already been completed. However, they were never lower in value than the original reply, and, for the most part, were substantially higher in value. The method of asking the questions clearly had a considerable bearing on the results. It can be concluded reasonably then, that the responses were conservative, or underevaluations of willingness to pay (extra-market benefits).

In most instances, the greatest proportion of the park users were weekend visitors (approximately 50 percent), the next highest proportion consisted of those on vacation (approximately 38 percent), and the lowest proportion those at the park for day use only (approximately 12 percent). These proportions varied among parks. Those parks which

were located closest to major highways had the highest proportion of vacationers: for example, Bow Valley, 62 percent; Taber 60 percent; and Cypress Hills, 72 percent. The parks located at some distance from urban centres and major highways had relatively low numbers of day users: for example, Little Bow, 7 percent; and Dinosaur, 6 percent (Table 4).

Data Reliability

Several types of biases may have been introduced through the sampling procedures and from the interviewee responses. The biases tended to reduce the reliability of the statistical analysis undertaken. They may have arisen from a number of factors such as described below.

Sampling

The visitation information provided by the Provincial Parks Branch was based on the use of traffic counter devices. The daily totals as recorded were multiplied by a factor of four. These figures give estimates of the numbers of visitors per day per park. Since the factor four applies to all provincial parks, no relative problem arose. However, the counting devices themselves created difficulty since they determine only the number of axles entering the park each day. Thus, if an automobile is pulling any kind of trailer, a total of

TABLE 4

PROPORTION OF PARK USERS BY TYPE OF TRIP AND BY PARK

Park	Type of Trip		
	Vacation (percent)	Weekend (percent)	Day (percent)
Beauvais Lake	36[a]	60	4
Big Hill Springs	35	52	13
Bow Valley	62	32	6
Bragg Creek	15	70	15
Chain Lakes	--[b]	--	-
Cypress Hills	72	23	5
Dinosaur	49	45	6
Kinbrook Island	29	61	10
Little Bow	14	79	7
Park Lake	29	51	20
Taber	60	22	18
Willow Creek	42	49	9
Woolford	25	41	34
Writing-on-Stone	22	66	12
Simple Mean	37.7%	50.0%	12.2%

SOURCE: Surveys undertaken by the Provincial Parks Branch, Alberta Department of Lands and Forests, 1967.

[a] These figures are approximates and do not represent 100 percent sample selection.

[b] Chain Lakes Provincial Park did not exist at the time of the survey, 1967.

three axles have entered the park. For every two trailers entering a park, an overestimate of four park visitors results. In order to take this discrepancy into account, park wardens were instructed to adjust their daily figures by the number of trailers within the park. Since no check was conducted to ensure that this was in fact done, and since there seemed to be some prestige in having a large number of visitors in any park, there was no assurance that this adjustment practice was followed. There was no way of knowing which wardens, if any, adjusted their figures and hence the reliability of visitation figures was questionable. A problem of proportionality also arose. Those parks which have extensive facilities for all kinds of trailers tended to have overestimated figures, whereas those with little attraction for trailers tended to be relatively understated. Consequently, the data may not have been strictly representative of the visitation.

A second source of bias resulted from the actual locations of the traffic counters in and around the parks. In the cases of two parks, Big Hill Springs and Beauvais Lake, local thoroughfares run through the parks and act as access roads to the parks. Traffic counters are located at both entrances. As a result, all the traffic which passes through the park, including the local traffic without

any intention of using the recreational facilities were counted as park users. An overestimate of the number of park users obviously results, and consequently, the proportion of the sample allocated to these parks has been overestimated.

Another situation of this type led to a disproportionate sample estimate. Within the boundaries of Cypress Hills Provincial Park is situated the town of Elkwater (population approximately 100). The town provides only a few services including a small cafe, garage, and motel. The local population and park users alike, therefore, must travel outside the park area to obtain basic goods and services. Multi-counting results from this travelling back and forth.

Another problem at Cypress Hills was the location of the counter between the townsite and the community golf course. As a result, whenever anyone played a round of golf, he was counted again when coming back into the town or camping area.

A third major cause of overestimation in the case of at least two parks (Park Lake and Kinbrook Island) was the fact that local youths derived great enjoyment from driving through the park several times before deciding to stay or leave. On one occasion at Park Lake at least three

cars were observed, each circling the park area seven or eight times. It would be safe to assume that these were not the only vehicles to go over the traffic counter many times in one day since numerous other cars were noticed touring the park a minimum of three times.

The remaining parks presented few problems for visitation estimation from the traffic counters. Subject to the restrictions mentioned previously, one can safely assume that the number of park visitors was reasonably well represented by the traffic counters. However, in light of the overestimation made at parks where the counters were poorly placed, the visitation figures from these remaining parks were relatively understated.

In retrospect, the sample weights given each park regarding the number of questionnaires can be doubted. However, the figures provided by the Parks Branch had to be taken at face value. Only through actual observation and experience could adjustment factors be determined. Time did not permit this modification.

Questionnaire[1]

One assumption made in the interview situation was that the interviewer had no effect upon the answers volunteered by the park user. This assumption may not have

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[1] For a more generalized and critical analysis of this method of data collection see Jeff Romm, The Value of Reservoir Recreation, pp.27-51, and T.L. Burton and P.A. Nond, Recreation Research Methods, Occasional Paper No. 3 (Birmingham: University of Birminghman Press, 1967), pp.24-36.

been strictly applicable since, as noted earlier, in cases when the final question was asked in a slightly different manner, there was often a change in response. Since three different interviewers were used throughout the summer, there is a strong possibility that the interviewers had, in fact, an unconscious effect on the respondents.

The interviewers attempted to interview both male and female recreationists in the proportion in which they appeared in each park. However, the percentage of males interviewed was 82.9 percent compared with the female percentage of 17.1 percent. It is not known if this would have any bearing upon the reliability of the data, although it conceivably could have some influence.

Some difficulty was encountered in determining the amount expended by interviewees both within the study region and throughout their entire trip. Very few interviewees maintained detailed records of how much they spent and where the expenditures were made. Most respondents made rough estimates, but the accuracy of these amounts is questionable.

Another cause of bias in the questionnaire, particularly with respect to the last section, was the fact that respondents were wary of denoting a high degree of willingness to pay for fear that it would result in a future increase in park fees. Several interviewees indicated that they interpreted the taking of the survey

itself as a precursor of fee increases, and, as a result, answered in such a manner as to discourage such policies.[1]

Costs of Provincial Parks

Just as there are benefits from recreational activity, so there exist the costs of supporting this activity. Aside from development costs, the costs of concern here were operation, maintenance, and repair costs borne by the Alberta Government for the parks and their facilities. These involve the costs of general administration, salaries, equipment, mobile outfits, electrical and plumbing supplies, maintenance of a warehouse and workshop, equipment repairs, and miscellaneous supplies, as well as those expenses that are specific to each park. In 1970, these total overhead costs amounted to $1,536,543.08 for all the parks in the province.

Some method was needed upon which to base the amount of this total figure to be borne by the parks within the study region, and further the amount to be borne by each park within the region. Ideally, the criterion would have been the relative capacities of the parks to accomodate recreationists, but few of the provincial parks were set up in such a manner that their capacities were known precisely.

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[1] Jeff Romm, The Value of Reservoir Recreation, p.46, found this to be the case as well.

In fact, in the study region, only two parks (Bow Valley and Cypress Hills) had numbered and separate units for camping. Therefore, no idea of the relative capacities and associated costs of the individual parks was known.

Consequently, the method of breakdown used concerned relative visitation to the parks. Of the 5,187,154 persons who visited parks in Alberta in 1970, 1,944,495 visited parks in the study region. Although there is some discrepancy concerning the degree of accuracy associated with these figures, they appear to show the relative distribution of the visitors within the South Saskatchewan River Basin and the rest of the province. Therefore, they were used as the basis upon which the costs were allocated.

Since 40.8 percent of all the park visitations in the province occurred in the study region, it was assumed that 40.8 percent of all the costs would presumably be borne by the parks within the Basin. This amounted to $626,909.58. Each park's share of this amount is shown in Table 5. Every park had, in addition, its own operation, maintenance, and repair costs. These figures are also shown in Table 5.

Willingness to Pay Data Results

Data which are important and basic to the analysis

TABLE 5

PRIMARY COST ALLOCATION TO PARKS, 1970

Park	Contribution to Overhead ($)	Operation, Maintenance, and Repair[a] ($)	Total ($)
Beauvais Lake	16,425.03	19,455.69	35,870.72
Big Hill Springs	18,869.98	7,583.34	26,453.32
Bow Valley	55,794.95	22,061.77	77,856.72
Bragg Creek	26,957.11	9,546.05	36,503.16
Chain Lakes	48,961.64	19,830.93[b]	68,792.57
Cypress Hills	231,517.71	98,266.27	329,783.98
Dinosaur	17,929.61	21,213.88	39,143.49
Kinbrook Island	38,680.32	21,684.52	60,364.84
Little Bow	23,446.42	27,980.75	51,427.17
Park Lake	96,042.55	21,470.91	117,513.46
Taber	24,762.93	12,500.48	37,263.41
Willow Creek	14,418.92	10,195.59	24,614.51
Woolford	5,015.28	7,979.27	12,994.55
Writing-on-Stone	8,087.13	9,405.81	17,492.94
Total	626,909.58	309,165.26	936,074.84

SOURCE: Department of Lands and Forests, Province of Alberta, Twenty-first Annual Report (Edmonton: Queen's Printer, 1970).

[a] A reduction factor was used to remove costs of development which were included in these figures. Fifteen percent was taken off all parks except Cypress Hills, where 30 percent was deducted. This was done at the suggestion of the Parks Planning Branch.

[b] Since Chain Lakes was still being developed, almost all of its costs were development costs. Consequently a reduction factor of 60 percent was suggested.

are contained in Table 6. The proportion of recreationists willing to pay more than their current trip expenditures for the recreation experience varied both within and between parks. One hundred percent of the sample at Woolford indicated willingness to pay more, whereas fewer than 30 percent of those interviewed at Little Bow were willing to do so. At all parks overall satisfaction was rated average or above average, and in only six parks was there a proportion who felt that the experience was below average. At Cypress Hills, 92.2 percent of the interviewees felt that their experience was above average, while only 20 percent of those interviewed at Big Hill Springs judged their experience in a similar manner. The greatest degree of dissatisfaction was held at Beauvais Lake where 12.5 percent felt the experience to be below average. Those parks located relatively close to major thoroughfares had recreationists who were travelling the greatest distances. The average number of miles travelled by those using Dinosaur Provincial Park was 2,390 miles, whereas the average number at Bragg Creek was only 146 miles.

In order to determine the net value of recreation as an economic activity for society and the South Saskatchewan River Basin, other specific information was required of participating recreationists. This information is presented as part of the analysis in the next chapter.

TABLE 6

MILES TRAVELLED, OVERALL PARK SATISFACTION AND WILLINGNESS TO PAY MORE, BY PARK, 1970

Park	Average Miles Travelled[a]		Overall Park Satisfaction			Willingness to Pay More	
	Trip	Basin	Above Average %	Average %	Below Average %	Yes %	No %
Beauvais Lake	358	308	50.0	37.5	12.5	62.5	37.5
Big Hill Springs	831	25	20.0	80.0	--	50.0	50.0
Bow Valley	1651	338	55.6	33.3	11.1	40.7	59.3
Bragg Creek	146	146	71.4	28.6	--	85.7	14.3
Chain Lakes	459	295	44.0	44.0	12.0	64.0	36.0
Cypress Hills	1385	407	92.2	7.0	0.8	73.0	27.0
Dinosaur	2390	575	88.9	--	11.1	70.0	30.0
Kinbrook Island	2161	403	41.1	58.8	--	60.0	40.0
Little Bow	359	219	70.5	29.4	--	29.4	70.6
Park Lake	501	217	68.6	27.4	3.9	41.2	58.8
Taber	1755	327	72.7	27.3	--	72.7	27.3
Willow Creek	829	362	44.4	55.6	--	77.8	22.2
Woolford	2340	273	66.7	33.3	--	100.0	0.0
Writing-on-Stone	933	633	33.3	66.7	--	66.7	33.3

[a]Only the mileage within the basin was used to calculate travel costs for non-resident expenditure impact. Non-residents were assumed to have visited only that park within the study region, thus all region trip expenditures were assumed to be the result of that park visit. This assumption is not considered unrealistic since virtually all non-resident park visitors were visiting points outside the region and the impact of expenditures for these points did not enter calculation of secondary benefits and cost for the region.

CHAPTER IV

EVALUATION OF PROVINCIAL PARKS

The benefits and costs associated with the recreational resources of the South Saskatchewan River Basin differ between evaluations of these resources with respect to society in general and to the study region. Both evaluations of benefits and costs were made for each park and for all parks collectively. A summary of net benefits is shown at the conclusion of this chapter.

Value to Society in General

Only primary benefits enter calculations in the evaluation of the recreational resources from the view of society. Secondary benefits which arise from an increase in economic activity generated by non-residents were assumed to be transfers of benefits from one region to another. As a result, little or no net increase or decrease in benefits are derived from the economic activity generated in this region.[1] This assumption implies that social welfare remains unaffected by intraprovincial transfers, an assumption which may not be strictly valid.

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[1] It should be noted that there exists some question as to the empirical validity of this assertion. There is some doubt that the type of expenditure made by non-residents in another region would be the same as the expenditure made at home. The economic impact of the different expenditures would probably not be equal. It is beyond the scope of this study to determine if the benefits generated by the expenditures of non-residents should be treated strictly as transfers from one region to another.

The primary benefits are made up of two components: a market component comprised of the fees that were paid by the resource users, and an extra-market component comprised of additional benefits received by the recreationists. No attempt was made to measure the value of the resources to non-users. The study was a destination study in this regard -- only those who used the parks were included in the sample. Even though there is little doubt that an 'option demand'[1] exists for these resources, it was not measured. This demand is characterized by a willingness to pay for retaining the option to use an area or facility that would be difficult, if not impossible, to replace and for which there exists no close substitute. The gross primary benefits are shown in Table 7.

The gross benefits realized by society from the recreational resources of the South Saskatchewan River Basin area during this time period amounted to $413,779.72. The market component of this amount was $62,542.52, and the extra-market component was $351,237.20. Table 7 indicates the contribution that each park made to this total amount.

Those costs which enter calculations with evaluation from society's view are primary costs of operation, maintenance, and repair to the provincial park resources. No

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[1] J.G. Krutilla, "Conservation Reconsidered", p.780.

TABLE 7

GROSS PRIMARY BENEFITS OF RECREATIONAL RESOURCES OF THE PROVINCIAL PARKS TO SOCIETY, 1970

Park	Number of Recreationists	Average Daily Extra-Market Benefits (¢)	Total Extra-Market Benefits ($)	Fees ($)	Total Primary Benefits ($)
Beauvais Lake	73,528	62.86	46,219.70	1,848.33	48,068.03
Big Hill Springs	55,713	5.28	2,941.65	--	2,941.65
Bow Valley	69,530	32.36	22,687.64	6,332.08	29,009.72
Bragg Creek	73,704	52.42	38,635.64	--	38,635.65
Chain Lakes	131,789	28.96	38,166.09	--	38,166.09
Cypress Hills	744,998	17.60	131,119.65	41,274.89	172,394.54
Dinosaur	37,877	11.40	4,317.98	2,358.50	6,676.48
Kinbrook Island	125,782	5.51	6,930.59	3,992.15	10,922.74
Little Bow	96,420	18.01	17,365.24	3,930.30	21,295.54
Park Lake	362,907	1.16	4,209.72	2,415.20	6,624.92
Taber	58,550	10.43	6,106.77	--	6,106.77
Willow Creek	48,047	47.43	22,788.69	4.02	22,792.71
Woolford	36,123	25.71	9,287.22	48.55	9,335.77
Writing-on-Stone	29,527	1.56	460.62	348.50	809.12
Total	1,994.495		351,237.20	62,542.52	413,779.72

costs of development are included. Alberta taxpayers bear this cost through the Alberta Provincial Treasury, and in 1970, these expenses amounted to $936,074.84[1] for all the provincial parks in the South Saskatchewan River Basin(Table 5).

The net social benefits of the provincial park recreational resources are summarized in Table 8. Only two parks -- Beauvais Lake and Bragg Creek -- showed positive net benefits. The remaining twelve had negative net benefits or social net costs ranging from $1,821.80 at Willow Creek to $157,389.44 at Cypress Hills.

Thus, from the point of view of society, cumulative net social costs of $522,295.12 result from the continued supplying and use of these resources.

Value to the South Saskatchewan River Basin

Secondary benefits and costs enter calculations in the evaluation from the point of view of the South Saskatchewan River Basin. The secondary benefits to the Basin of non-resident expenditures are estimated through the use of input-output analysis. Using the most recent table (1962)[2], and making a number of assumptions, the

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[1] Supra, p. 51.

[2] R.W. Wright, "The Alberta Economy - An Input-Output Analysis," Department of Economics, University of Calgary, 1964. (Mimeographed).

TABLE 8

NET BENEFITS PER PARK IN THE SOUTH SASKATCHEWAN RIVER BASIN TO SOCIETY, 1970

Park	Total Primary Benefits ($)	Total Primary Costs ($)	Net Social Primary Benefits ($)
Beauvais Lake	48,068.03	35,870.72	13,197.31
Big Hill Springs	2,941.65	26,453.32	(23,511.67)[a]
Bow Valley	29,009.72	77,856.72	(48,847.00)
Bragg Creek	38,635.64	36,503.16	2,132.48
Chain Lakes	38,166.09	68,792.57	(30,626.48)
Cypress Hills	172,394.54	392,783.98	(157,389.44)
Dinosaur	6,676.48	39,143.49	(32,467.01)
Kinbrook Island	10,992.74	60,364.84	(49,442.10)
Little Bow	21,295.54	51,427.17	(30,131.63)
Park Lake	6,624.92	117,513.46	(110,888.54)
Taber	6,106.77	37,263.41	(31,156.64)
Willow Creek	22,792.71	24,614.51	(1,821.80)
Woolford	9,335.77	12,994.55	(3,658.78)
Writing-on-Stone	809.12	17,492.94	(16,683.82)
Total	413,779.72	936,074.84	(522,295.12)

[a] Bracketed figures indicate a social deficit.

approximate impact of this category of expenditures on the Basin's economy was derived.

Non-resident expenditures represent an increase in the final demand for the products of the Basin's business enterprises. In this particular instance, all of the firms which were affected by this increased demand were part of the service sector of the region's economy. As a consequence, only the impact of expenditures on the service sector needs to be calculated.

The column totals of the Inverse Leontief matrix indicate the total expansion in sales throughout the economy, resulting from a one dollar increase in final demand for the products of that industry. These column totals are therefore called 'impact multipliers'. The multiplier for the service industries for the Province of Alberta in 1962 was 1.173370.[1]

Currently available data do not allow vigorous establishment of the full impact of non-resident expenditures on the study region, since no input-output table existed for the Basin at the time of this study. As a result, the induced regional effects of first-round expenditures could not have been determined with any marked degree of accuracy. Moreover, it was beyond the scope of this study to construct an input-output multiplier for the Province as a whole with modifications. It was assumed that while inter-industry

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[1] Ibid.

transactions for this area are probably not significantly different from those of the Province as a whole, leakages due to imports may be larger in the study area than for the Province. For this reason, and also to underestimate rather than overestimate, the impact multiplier in this study was assumed to be 1.1300275.[1]

The total primary benefits of the recreational resources to the study area are comprised of a market value of $40,027.21 and an extra-market value of $281,490.02.

The total spending of non-resident recreationists in the South Saskatchewan River Basin in 1970 was $13,463,144.41 as shown in Table 9. The resultant impact on the Basin output was $15,213,353.18. This amount, then, is the value of gross secondary benefits to the Basin induced by the expenditures of non-resident recreationists. The gross benefits from this view were $15,494,843.20.

The proportion of the primary costs of operation, maintenance and repair borne by residents of the study region is approximately 40 percent of the total or $374,429.94 (Table 5), assuming that the tax burden is proportional to the population.

The secondary costs are those incurred by Basin

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[1] The multiplier for the Province is 1.173370. The multiplier for the Basin is (.173370 x 3/4 or 1.1300275. A recent input-output study (unpublished) of the basin done by R.B. Long, Department of Agricultural Economics and Rural Sociology, University of Alberta, produced an impact multiplier of approximately this same value (1.15).

TABLE 9

EXPENDITURES IN SOUTH SASKATCHEWAN RIVER BASIN IN ALBERTA OF NON-RESIDENT RECREATIONISTS, 1970

Expenditure Category	Spending Per Person ($)	Spending of All Persons ($)	Percentage of Total Expenditures
Gas and Oil	11.64	8,115,536.04	60.28
Groceries and Sundries	3.88	2,705,178.68	20.09
Restaurant Meals	1.97	1,373,505.67	10.20
Motel Accomodation	0.01	6,972.11	.05
Camping Fees	1.30	906,374.30	6.73
Other Recreation Fees	.12	83,665.32	.62
Equipment	--	--	--
Car Repairs	.32	223,107.52	1.66
Miscellaneous	.07	48,804.77	.36
Total Spending	19.31	13,463,144.41	99.99

retailers in selling the goods and services to non-residents. Once again, in order to determine these costs, input-output tables were used. The cost of inputs as a percentage of total production in Alberta industries can be determined from the matrix of transactions of the Alberta economy.[1] The inputs, for which extra expenditures were incurred due to sales to non-resident recreationists, were domestically produced inputs and imported inputs. Any increase in the sales of the service industry resulted in an ultimate increase in output of other industries (such as agriculture, forestry, mining, petroleum products, etcetera), the value of which is determined from the inverse matrix. Each of these industries must purchase inputs from other industries. This amount can be determined from the technological matrix. The ultimate increase in costs to all provincial industries resulting from an increase in sales in the service industry is calculated by the addition of results from the following equation:[2]

$$\frac{\text{inverse matrix value } (\$1 \text{ industry's output})}{\$1 \text{ sale in service industry}} \times \frac{\text{technological matrix value } \$}{\$1 \text{ of industry's output}} = \frac{\$1 \text{ cost}}{\$1 \text{ of sales to service industry}}$$

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[1] R.W. Wright, "The Alberta Economy - An Input-Output Analysis", p.37.

[2] See Appendix D for further explanation and an example of how secondary costs were determined.

This equation gives the effect of a one dollar increase in sales in the service industry on inter-industry costs.

The same process was followed in determining the effect of imported inputs on the increase in costs. In this case, however, the technological coefficients were determined from the transactions matrix by dividing the value of the imported input by the total production value. As a result, it was determined that every dollar increase in final demand for the products of the service industry resulted in a total direct and indirect increase of 18.1021 cents in the purchase of domestically produced inputs, and of 6.4505 cents in the case of imported inputs. The variable cost to the Alberta economy of supporting a dollar sale of goods and services to non-resident recreationists is, therefore, 24.5526 cents.[1]

It may reasonably be assumed that regional requirements for domestically produced inputs and imports (and therefore costs) will vary. The requirements for the Province as a whole were probably different from those of any particular region. Consequently, the requirements for the South Saskatchewan River Basin industries may differ from those of the whole Province. However, since there was no outstanding reason to presume any marked variation from the

[1]An alternate procedure for calculating secondary costs is to reduce the final demand by the amount of the gross expenditures and then determine the difference in costs between these two values. This procedure was not used in this study and consequently it is not known if a different value for costs would result.

provincial requirements for inputs, for the purposes of this study the total variable cost of selling goods and services to non-resident recreationists was assumed to be the same as that for the Province: that is, 24.5526 cents per dollar of sales. The total secondary costs, then, were $3,305,551.99.

The net benefits to the South Saskatchewan River Basin from the use of provincial park recreation resources was estimated for 1970 at $11,814,861.27. Table 10 delineates this value.

While the data did not permit estimation of benefits and costs for the parks to the province as a whole, it can be expected that net social benefits would be of a magnitude similar to those of the region. The reason being that the exclusion of the expenditures of northern Alberta residents to the secondary benefit component would be offset by the sum of the benefits gained from the added primary benefit of extra-market benefits of northern Alberta residents and the secondary benefits of the expenditures outside the study region but within the province of non-Albertan study region provincial park visitors.

Summary and Implications

The net social benefits resulting from the use of the provincial park recreational resources of the Basin have been estimated from two points of view: society in general

TABLE 10

SOCIAL BENEFITS AND COSTS TO SOUTH SASKATCHEWAN RIVER BASIN FROM PROVINCIAL PARK RECREATIONAL RESOURCE USERS, 1970

	($)
Fees Paid by Residents	40,027.21
Extra-Market Benefits of Residents	241,462.81
	281,490.02
Costs Borne by Taxpayers of Basin	374,429.94
Net Primary Benefits	(92,939.92)[a]
Impact of Non-Resident Expenditures	15,213,353.18
Costs of Supporting Sales to Non-Residents	3,305,551.99
Net Secondary Benefits	11,907,801.19
Total Net Social Benefits	11,814,861.27

[a] Bracketed figure indicates deficit.

TABLE 11

NET SOCIAL BENEFITS TO SOCIETY IN GENERAL AND TO SOUTH SASKATCHEWAN RIVER BASIN OF BASIN PROVINCIAL PARK RECREATIONAL RESOURCES, 1970

	Society in General ($)	South Saskatchewan River Basin ($)
Social Benefits		
Primary	413,779.72	281,490.02
Secondary	- -	15,213,353.18
TOTAL	413,779.72	15,494,843.20
Social Costs		
Primary	936,074.84	374,429.94
Secondary	- -	3,305,551.99
TOTAL	936,074.84	3,679,981.93
Social Net Benefits		
Primary	(522,295.12)[a]	(92,939.92)
Secondary	- -	11,907,801.19
TOTAL	(522,295.12)	11,814,861.27
Total per Recreationist	(0.28)	6.08

[a] Bracketed figures indicate deficit.

and the South Saskatchewan River Basin specifically (Table 11). The net social cost realized by the general society during 1970 (in 1970 constant dollars) was estimated at $522,295.12, or $.28 per resource user. These results show that, to the general society, the resources of the study area provincial parks are not valued highly, since substantial social costs result. On the other hand, the results show that the resources are regionally relatively valuable, since significant net social benefits are derived from their use.

A large difference existed between net benefits derived from the point of view of society (-$522,295.12) and from the point of view of the Basin ($11,814,861.27). In the evaluation of provincial park resources, it appeared that the business activity generated by the expenditures of non-residents and the benefits which were derived from this activity had a far greater impact on the value of the provincial park than any market or extra-market value. This distinction implied a number of things: 1. that the method of estimating extra-market benefits left much to be desired; 2. that not all extra-market benefits were being evaluated; 3. that fees were so high as to act as a deterrent; 4. that the economic impact multipliers used overestimated secondary benefits of economic activity and underestimated secondary costs of supplying that activity; and 5. that expenditures of non-resident recreationists were being

overestimated. The method of estimating extra-market benefits had many drawbacks. These were summarized in Chapter Two. Similarly, it has been pointed out that an option demand probably exists for the resources and that other components of extra-market benefits have not been included in the estimate used in this study. The fees at provincial parks did not act as a deterrent since this would have been inconsistent with other findings; that in all interviews throughout the survey, no negative values were obtained. It is conceivable that the impact multipliers and expenditure estimates were incorrect or inaccurate. However, it is beyond the scope of this study to evaluate the accuracy of these data. As a result, the value determined represented the closest estimates of benefits and costs from each point of evaluation.

Since no estimate of marginal social benefits or costs has been derived, no estimate of the net effect on the value of the resources from a change in the numbers of resource users could be determined. The use of the provincial park resources varies seasonally; that is, the proportion of users during the summer months is far greater than at any other time of the year. Consequently, comparatively few benefits are being derived from these resources in non-summer months. Recreation activity, as a result, could increase substantially in the provincial parks during

these non-summer months with no proportional increase in primary costs since the majority of these costs are fixed. Even secondary costs per recreationist would not increase if it is assumed that no expansion in facilities would be required. Assuming that gross benefits are proportional to numbers of recreationists, net social benefits could be expanded through increased recreational use of the provincial park resources especially during the off-season time of year.

This increased activity could be generated by increased numbers of resource users or by extending the use of the resources by the current recreationists. Since constraints are imposed upon the amount of leisure time available to most recreationists, most are unable to utilize the resources in such a way as to equalize their marginal utility with their marginal costs. The increased activity, therefore, will probably have to be generated by an increased number of recreationists.

Chapter Five assesses the practicability of increased resource use, as well as examining trends and problems associated with the study area recreational resources.

CHAPTER V

POTENTIALS AND POLICY IMPLICATIONS FOR PROVINCIAL PARKS

The results of the previous chapter show that the resources of the provincial parks in the study region were producing a stream of net social costs from the societal viewpoint of evaluation. This situation was even more apparent when only tangible dollar items (market values) were included in the evaluation. If the objective of the Provincial Government in providing these resources to the public is to maximize net social benefits, ignoring equity or distributional factors as suggested in Chapter One, then a number of actions should be taken in order to achieve greater benefits. Several means are possible in achieving this result.

Potentials

If the present trends in provincial park use continue with no change in administrative policy, the number of visitors to all of the parks in the study region will approximate that shown in Table 12. These figures were based on the annual visitation patterns for the period 1960 to 1970 inclusive. On the basis of these visitations and the present schedule of fees, the revenue (total annual fees) from all parks would increase to the amount shown in Table 12. Assuming that costs continue to rise at their

TABLE 12

PROJECTIONS OF VISITATION AND REVENUE FROM PROVINCIAL PARKS IN THE SSRB, 1975-1985

Year	Visitation[a]	Revenue[b] ($)
1970	1,994,495	62,542.52
1975	2,767,902	86,794.69
1976	2,932,692	91,962.10
1977	3,097,482	97,129.51
1978	3,262,271	102,296.90
1979	3,427,061	107,464.31
1980	3,591,851	112,631.73
1985	4,415,799	138,468.73

[a] Projections of visitation are based on the linear equation:

$$y = 131,266.9 + 164,798.7x, \text{ where } x = \text{year } (1960 = 1)$$

[b] Constant 1970 dollars

present rate, at no point will revenue exceed or even equal costs. As a consequence, no break-even point will ever be reached where no net loss is incurred from a societal view of evaluation. Only if costs increase at a decreasing rate will revenue tend towards and ultimately exceed costs.

If it is deemed desirable that total overall benefits are to be increased with no particular regard to the economic self-sufficiency of the parks, then it may not be important to increase actual dollar revenues (market benefits). This disregard may indeed be the case in reality since:

> "The main function of a park should be to provide a diversity of healthful enjoyment to meet the widely varied needs and desires of a family group who have come to the park [1] primarily to enjoy nature and the outdoors".

Maximum total overall benefits are achieved when both market and extra-market benefit components are at a maximum. If, however, a functional relationship between market and extra-market benefits exists, then a maximum of total benefits exists at the point where a marginal unit of market benefit equals a marginal unit of extra-market benefit -- assuming an inverse relationship between these two components. No attempt is made to determine the value of the marginal unit in either case, nor is it suggested

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[1] Alberta Department of Lands and Forests, "Provincial Parks Policy," March 1967, p.15. (Mimeographed).

that either of these units is indeed empirically measurable. Maximum net benefits occur at the point where a marginal unit of benefit just equals the additional unit of cost incurred. Such marginal costs can be calculated empirically. However, marginal units of benefits, as mentioned above, are difficult, if not impossible, to measure. It is therefore impossible to estimate the point of attaining maximum net benefits.

Alternatives

Four straightforward means by which market benefits in the form of revenues can be raised seem apparent. These are: 1. increasing numbers of actual resource users; 2. changing the schedule of fees for the use of the resources and the related services; 3. changing the temporal distribution of park resource users and by so doing, increase the numbers of recreationists; and 4. modifying the product-mix so that different units may be priced differently. Each of these methods will have definite implications for the future stream of benefits to be derived from the resources, and it is probable that no single method will produce an optimum outcome.

It becomes substantially more difficult, however, to gauge increases in extra-market benefits since these are primarily subjective in nature (depending upon the recreationist and his reactions to his surroundings). Each resource

user derives different benefits from the varied aspects of the park resources. However, a number of aspects can be regarded as definite advantages and disadvantages and, therefore, directly influence extra-market benefits. These positive and negative aspects have been gathered and are shown in Tables 13 and 14. The former indicates the most frequent specific responses to the general question of each park's disadvantages; the latter, the advantages. These responses were given by the individual recreationist with no prompting from the interviewer. Although it is not entirely correct to lump all the parks together since they are so different, these tables reflect components of the parks in which recreationists were staying that affect the extra-market benefits.

From Table 13 it can be seen that many of the negative aspects are related to the services associated with the park and not necessarily with the quality of type of resource itself. It would appear, then, that benefits could be increased primarily by a capital outlay for costs associated with more intensive service-oriented development, such as more facilities, better access, larger occupancy sites, etcetera.

Some of the positive aspects, as shown in Table 14, are in direct conflict with some of the negative ones. This situation arose for two reasons. The first is the problem of aggregation. These aspects deal with all

TABLE 13

MAJOR NEGATIVE RESPONSES BY PARK USERS
ON ASPECTS OF THE PROVINCIAL PARKS

Category	No. of Respondents
A. Facilities	
i) Too Few Facilities	71
ii) Poor Occupancy Sites	4
iii) No Lights in Outhouses	23
iv) No Store	32
v) Messy	3
	133
B. Irritants	
i) Noise	41
ii) Crowding	73
iii) Miscellaneous(defacing,curfew,dogs,etc.)	18
	132
C. Campsite	
i) Poor Access	17
ii) Poor Planning and Site	25
iii) Miscellaneous (openness,bugs,highways)	50
	92

TABLE 14

MAJOR POSITIVE RESPONSES BY PARK USERS
ON ASPECTS ON THE PROVINCIAL PARKS

Category	No. of Respondents
A. Park Administration	
i) Clean and Quiet	46
ii) Well Planned	24
iii) Well Supervised (a lot of people, inexpensive)	20
	90
B. Facilities	
i) Excellent Facilities (water, power, telephone, washrooms)	76
ii) Good Physical Facilities (boating, swimming, etc.)	64
	140
C. Park Site	
i) Close to Home	93
ii) Scenic	92
iii) Good Access	35
iv) Excellent Natural Surroundings (boating, fishing, swimming)	60
v) Generally Good Camping	37
	317

provincial parks in the study region grouped together. Second, within any park, an advantage to one recreationist may be considered a disadvantage to another.

Only two of the fourteen provincial parks in the Basin had separate and numbered occupancy sites. These were Bow Valley and Cypress Hills. The remaining twelve were either totally open or had only partial barriers separating sites. As a result, the capacity of the parks was not known. The extent to which the parks were utilized remains a matter of judgement. However, in the case of Bow Valley and Cypress Hills, where the campsites were numbered, it can safely be said that they were never overutilized (assuming that the number of prepared occupancy sites delineates optimum utilization) even when the parks were completely full. Since only estimates can be made concerning the other parks, this study would suggest that almost all parks were underutilized for the most part of the summer recreating season (Table 15). Only in a very rare instance would any recreationist be turned away from the camping facilities for lack of space. In fact, on several occasion during the weekday surveys, the interviewers found no one in the parks except the park employees. It can be concluded, therefore, that most of the provincial park resources are underutilized. Logically, then, greater benefits could be derived from these recreational resources.

TABLE 15

DAILY VISITATION PER PARK, AUGUST 9 - 17*, 1969

August:	9	10	11	12	13	14	15	16	17
Park	w/e	w/e	w/d	w/d	w/d	w/d	w/d	w/e	w/e
Beauvais Lake	148	388	148	172	236	204	224	244	388
Big Hill Springs	312	1,140	120	96	124	234	424	960	1,340
Bow Valley	1,196	1,344	732	528	296	1,256	1,012	944	980
Bragg Creek	1,456	2,444	272	280	214	232	420	620	2,004
Chain Lakes	1,716	1,648	540	584	728	548	776	1,132	1,124
Cypress Hills	6,196	7,264	4,608	4,628	4,372	4,100	6,308	5,260	6,460
Dinosaur	300	496	160	176	248	236	236	172	468
Kinbrook Island	1,488	3,420	1,112	780	868	944	592	1,212	1,880
Little Bow	496	1,916	84	222	184	244	260	400	1,360
Park Lake	3,232	7,872	3,844	1,248	2,460	2,377	2,189	2,276	6,884
Taber	692	1,380	592	328	512	384	380	468	1,112
Willow Creek	396	1,236	232	196	252	196	284	208	876
Woolford	64	276	92	96	60	76	120	372	96
Writing-on-Stone	84	640	120	108	116	88	104	224	256
All Parks	17,776	31,464	12,656	9,442	10,670	11,119	13,329	14,492	25,228

* This time period was chosen randomly from the visitation data available at the time of the study.

Market benefits increase in proportion to the increasing numbers of recreationists. These numbers are increasing rapidly (as mentioned earlier in Chapter One, Table One). In other words, market benefits have been increasing and it is questionable whether government policies could improve this situation further. Moreover, it must be remembered that, although an increase in the number of recreationists will bring about a rise in market benefits, it would also bring to bear more pressure on the resource itself. The decision, then, lies with the government. This may increase market revenue, but it would also probably lead to an increase in costs of operating, maintaining, and repairing the resources and the services in order to maintain the present quality.

The second suggested means of increasing revenues was to alter the method of revenue collection. A number of possibilities or combination of possibilities present themselves. First, distinction could be made within the park users, between provincial residents and non-provincial residents. The non-provincial residents could be charged in one of three different manners: 1. by the purchase of a Alberta Provincial Park Membership which would allow use of all park facilities at no charge; 2. by the purchase of a membership which would allow entrance to the park only, leaving the recreationist liable for a fee to cover over-

night accomodation; or 3. by simply charging these non-provincial recreationists more than the amount charged provincial residents for the use of the park resources. Second, provincial residents, on the other hand, could continue to be charged the same amount as at present, could be admitted at no charge, or could be charged more. The second suggestion of no charge might mean an increase in provincial taxes and there may be political constraints or concerns of equity brought to bear. Similarly, there may be like constraints and concerns associated with an increase in fees. Third, the fee structure itself may be changed so that the different services, such as electricity, water, and sewage disposal, cost more per day, or fees could be varied on a park basis. Moreover, substantial revenue could be gained by enforcing an entrance fee on anyone who enters a park (at present, only those who stay overnight are charged). In this situation, the overnight camper would be required to pay a camping fee over and above the entrance costs.

The third suggestion for increasing revenue was to affect the temporal distribution of the resource use. In other words, increase the weekday use of the parks in the summer, and augment early spring, late fall, and winter use of the parks. In this manner, a greater number of recreationist would use the resources, since a lesser percentage of annual capacity would be lost. A fee structure

could be formulated to take advantage of this distribution.

It was suggested that educational institutions could take advantage of the park resources to facilitate their outdoor education programs. Also, various outdoor organizations could hold meetings or field trips in the provincial parks. These uses could be brought about through negotiation with park officials. Such winter activities as skiing, snowshoeing, and snowmobiling could easily be facilitated in most parks and could contribute greatly to market revenue.

Constraints on Alternatives

To increase total benefits -- market and extra-market -- a number of distinct alternate policies appear as outlined above. Associated with each alternative, however, are a number of constraints or negative pressures which are brought to bear on that policy. The degree of success in the application of any alternative will be, to some extent, dependent upon the constraints imposed on it. It is important, therefore, to examine all constraints connected with each alternative.

Although numbers of recreationists are increasing rapidly, probably greater numbers could be attained through a market development scheme. However, before such a scheme could be undertaken, estimates of the carrying capacity of the resource must be determined in order that the renewability

of that resource is maintained. As noted earlier, the capacity of most parks is not known, and, as a consequence, the feasible number of increased recreationists is not known. The constraint, therefore, is the determination of the extent to which the number of recreationists can be increased consistent with a conservation policy. In addition, primary costs of operation, maintenance, and repair would also increase with the increasing number of resource users.

By changing the system of fees, a number of constraints become apparent, notably political and equity constraints. Justification for discriminating between provincial residents and non-provincial residents is based on the fact that non-provincial residents do not directly support the Alberta Provincial Parks through taxes, as do the provincial residents. In this way, Albertans are subsidizing the recreation of non-provincial residents. The extent to which reciprocal action might be taken by other provinces and states may have a bearing on the advisability of adopting this discriminating policy in Alberta. Political concerns and equity considerations have a marked bearing on the fee structure, over and above any provincial park membership. However, virtually no increase in primary costs to the provincial parks arises from this method of gaining greater revenue.

Any change in the fee structure to residents will

be full of similar concerns. Since many parks were developed due to a local demand for a recreation area, it would seem that any increase would have a negative effect politically and may adversely affect benefits. If no fee were charged to residents, a possibility exists that taxes might be raised. Tax changes are seldom undertaken without negative reaction and, consequently, a strong political constraint is connected with this method of revenue increase. Similarly, changes in the fee structure between and within parks will be constrained by political and equity considerations.

By affecting the temporal distribution of park users more recreationists could use the resources and facilities for a longer season. However, the potential for off-season use is quite low for several reasons. Winters in the South Saskatchewan River Basin are quite sever, and the desire to be out-of-doors is probably quite low. Social and traditional factors such as the school year will also have a bearing on the attendance figures. In addition, ecological or biological constraints on the resources may render their use inadvisable at such times of the year when damage could be done to the supporting environment. It is probable that costs of supporting this out-of-season activity would increase, although by how much is a matter of estimation.

The costs associated with the methods for increasing revenue outlined above are hypothesized as being relatively

marginal. The first method, which suggested an increased number of recreationists, will result in increased primary costs of operation, maintenance, and repair to the parks. However, no development costs would be augmented, since almost all parks are underutilized at present.

The second alternative -- changing the fee structure -- will result in no increase in costs to the provincial park operation. The only expense would arise from obtaining new receipts for non-provincial recreationists: hardly a significant amount.

The costs associated with changing the temporal distribution of park users are not known. It can be hypothesized, however, that costs will indeed rise. Different activities within the park would probably result in higher primary costs. Extending the usefulness of the parks to early spring and late fall and winter will undoubtedly result in higher costs since in addition to the resulting higher primary costs, park personnel would have to be on staff for a longer period of time.

Summary

At present the provincial parks provide substantial net social benefits to the South Saskatchewan River Basin through the transfer of benefits from other regions. The only appropriate policy regarding their use is that they

remain in use, as at present. This policy is in direct opposition to that dictated by the societal evaluation since net social costs result from park operation. If the societal net social costs were substantially greater than the net social benefits to the study region, a case could be made for the changing of the resource use to some other more beneficial use. However, since the study region net social benefits are more than twentyfold the societal net social costs, the provincial parks in the Basin should remain open, and indeed, an attempt should be made to increase the numbers of non-residents using the resources.

The recreational resources of the provincial parks in the Basin are currently being underutilized, as suggested in Table 15. Potential exists, therefore, for an increase in recreational activity in the Basin's parks. Since net social benefits are a function of the number of recreationists, increases in recreational activity will lead to increases in net social benefits. In other words, greater utilization of the resources will produce higher net social benefits.

Probably no single alternate policy proposal will bring about net benefits from the park resources consistent with an attempt to maximize net social benefits. Since none of the parks is being utilized at its full capacity, net social benefits can be increased through a higher rate of utilization in all regions of the Basin.

However, those parks which are relatively close to large urban concentrations (including the Trans-Canada Highway) are most highly utilized. To spatially redistribute the recreationists, it would appear that development of service-oriented resources would lead to greater utilization.

The question still remains as to how to change the temporal distribution of recreationists in the present context. It is suggested that only social change can bring this about. With the advent of the three- and four-day work week, this generally accepted social change may come about, thereby leading to a change in the temporal distribution of park use.

From the viewpoint of the South Saskatchewan River Basin itself, there would appear to be a large potential to realize increased benefits from the recreation activity of non-residents with little additional costs involved. Some of the extra-market benefits presently received by non-residents could be appropriated by the Province through a different fee structure. It would probably be difficult to draw a distinction between provincial and non-provincial residents in order to facilitate fee collection. The extent to which such benefits may be appropriated is impossible to calculate with the data from this study. However, increasing populations and increased mobility will necessarily lead to more non-provincial residents desiring the use of Alberta Provincial Park resources. It can be postulated

that willingness to pay for the use of these resources and the associated services will also increase.

With increased utilization of the parks in the study region, net social costs will probably decrease. Even if the parks do not become economically viable, their provision of healthful enjoyment, in keeping with the Provincial Parks policy, is sufficient justification for recreational usage of the resources.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Three primary objectives were identified in Chapter One of this study. One was to determine the extra-market benefits which accrue to the participating recreationists; the second was to determine the regional economic impact of the expenditures of recreationists; and the third was to estimate the direction of future resource utilization in order to maximize the present value of net social benefits. An estimate of extra-market benefits was determined through a questionnaire subject to the limitations and inadequacies outlined in Chapters Two and Three. These resources contribute other benefits which were not measured in the study but were recognized. Benefits that non-resource users gain from the knowledge that such resources exist are exemplary of these benefits not measured.

The following results were obtained: average daily extra-market benefits per recreationist amounted to $0.18 for all parks and ranged from $0.01 at Park Lake to $0.63 at Beauvais Lake. The second objective produced the following results: provincial park resources in the South Saskatchewan River Basin in Alberta, through the support of recreational activity, produced a net social

deficit of $522,295.12 to society in general and net social benefits of $11,814,861.27 to the South Saskatchewan River Basin. The third objective requires further data and analysis.

Physical capacities of the parks are not known. However, on the assumption that peak use of the parks represents relative capacities, the park resources are currently underutilized during weekdays and non-summer months.

The nature of benefits and costs suggests that net social benefits could be increased through expansion of recreational activity in the provincial parks. In other words, the direction of utilization is an expansionary one, while being consistent with a conservation policy. This expansion in activity is difficult to foresee due to social and traditional factors such as the school year, the five-day work week, and the custom of taking holidays in the summer. However, should this temporal redistribution occur, there is little likelihood that full utilization will be realized for a number of years. It must be realized that, as increased utilization takes place, the quality of the resource and consequently, that of the recreation experience may decline. Alternate public land uses of the resources may also prevent increasing net social benefits. Outlays of public funds may increase substantially if the

quality of the resource is to remain unchanged, or these outlays may increase so that net social benefits are not prevented from rising.

The benefits to be derived from an alternate use of the resources must be compared with those foregone by the exclusion of provincial park recreation activity. In addition, the benefits gained from quality improvements of the provincial park recreational resources must be compared with the benefits of using limited public funds in a different manner.

This study has attempted to provide the basis for a comparison of the recreational use of the resources of the provincial parks of the South Saskatchewan River Basin with other real or potential uses of the resources. This basis is not sufficient, primarily due to the limitations of quantification of extra-market values. All benefits and costs, even if quantification is not easy or indeed possible, should be considered in all public policy decisions involving provincial park resources. Further study into the identification and quantification of extra-market variables is a prerequisite to providing a full basis for comparison of resource uses.

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APPENDIX A

MISCELLANEOUS TABLES

TABLE 1

RECREATION TRENDS IN THE UNITED STATES

	Visits to National Parks (per 100 persons)	Weekly Hours of Leisure (per employed person)
1930	2.26	15.0
1935	3.19	17.1
1940	5.58	18.8
1945	3.42	17.8
1950	9.20	21.6
1955	11.46	22.3
1960	13.24	23.1
1976 (estimated)	20.98	26.6
2000 (estimated)	29.10	30.6

SOURCE: Outdoor Recreation Resources Review Commission, Prospective Demand for Outdoor Recreation, Report No. 26 (Washington, D.C.: U.S. Government Printing Office, 1964), p.6, Table 1.

TABLE 2

NUMBERS OF VISITORS TO NATIONAL PARKS IN ALBERTA, 1958-1968

Year	Banff		Jasper		Waterton Lakes	
	Number	% Change	Number	% Change	Number	% Change
1958	790,910		332,024		302,872	
1959	880,150	+11.2	332,251	+0.1	362,829	+19.8
1960	980,069	+11.4	324,857	-2.2	340,220	-6.2
1961	1,078,008	+10.0	356,538	+9.8	349,496	+2.7
1962	1,069,623	-0.8	346,493	-2.8	420,865	+20.4
1963	1,374,576	+28.5	392,987	+13.4	444,752	+5.7
1964	1,650,257	+20.1	468,579	+19.2	441,803	-0.7
1965	1,605,784	-2.7	480,102	+2.5	371,258	-16.2
1966	1,803,490	+12.3	522,658	+8.9	393,426	+6.0
1967	2,044,537	+13.4	595,164	+13.9	487,589	+23.9
1968	2.050.735	+0.3	652,186	+9.6	503,729	+3.3

SOURCE: Dominion Bureau of Statistics, Canada Yearbook (Ottawa: Queen's Printer, 1958-1968).

TABLE 3

EDUCATION LEVELS OF RESPONDENTS PER PARK

Park	Grade School (%)	Part High School (%)	High School Graduate (%)	Technical School (%)	Part University (%)	University Graduate (%)	Graduate School (%)
Beauvais Lake	12.5	25.0	62.5	-	-	-	-
Big Hill Springs	-	50.0	-	-	10.0	30.0	10.0
Bow Valley	14.8	22.2	22.2	3.7	18.5	14.8	3.7
Bragg Creek	14.3	42.9	7.1	21.4	7.1	7.1	-
Chain Lakes	20.0	24.0	40.0	4.0	-	12.0	-
Cypress Hills	16.0	28.0	27.2	7.2	8.0	12.0	1.6
Dinosaur	10.0	10.0	30.0	-	10.0	30.0	10.0
Kinbrook Island	19.0	14.3	28.6	-	14.3	23.8	-
Little Bow	6.7	26.7	46.7	13.3	-	6.7	-
Park Lake	15.7	33.3	23.5	5.9	5.9	13.7	2.0
Taber	41.7	8.3	16.7	8.3	16.7	-	-
Willow Creek	-	11.1	22.2	11.1	22.2	33.3	-
Woolford	-	33.3	66.7	-	-	-	-
Writing-on-Stone	-	33.3	-	-	-	66.7	

TABLE 4

AVERAGE AGE OF INTERVIEWEE AND SPOUSE, AVERAGE FAMILY SIZE AND AVERAGE FAMILY INCOME OF RESPONDENTS, PER PARK

Park	Interviewee Age	Spouse Age	Family Size	Family Income ($)
Beauvais Lake	40	42	2.9	6,300
Big Hill Springs	28	30	3.6	7,300
Bow Valley	36	35	4.2	7,700
Bragg Creek	35	34	3.4	7,500
Chain Lakes	36	34	3.6	6,900
Cypress Hills	36	36	3.5	7,300
Dinosaur	34	35	3.2	8,000
Kinbrook Island	38	40	3.9	7,200
Little Bow	33	34	3.9	7,500
Park Lake	31	37	3.5	5,800
Taber	36	37	3.9	6,600
Willow Creek	34	33	4.0	8,300
Woolford	43	43	5.3	6,700
Writing-on-Stone	33	40	2.7	5,300
Simple Mean	35.2	36.4	3.7	7,030

TABLE 5

DEGREE OF OVERALL SATISFACTION WITH THE PARKS

Park	High (%)	Moderately High (%)	Average (%)	Moderately Low (%)	Low (%)
Beauvais Lake	12.5	37.5	37.5	-	12.5
Big Hill Springs	20.0	-	80.0	-	-
Bow Valley	14.8	40.7	33.3	11.1	-
Bragg Creek	35.7	35.7	28.6	-	-
Chain Lakes	16.0	28.0	44.0	12.0	-
Cypress Hills	62.8	29.4	7.0	0.8	-
Dinosaur	22.2	66.6	-	11.1	-
Kinbrook Island	-	41.1	58.8	-	-
Little Bow	29.4	41.1	29.4	-	-
Park Lake	39.2	29.4	27.4	3.9	-
Taber	18.2	54.4	27.3	-	-
Willow Creek	11.1	33.3	55.6	-	-
Woolford	-	66.7	33.3	-	-
Writing-on-Stone	-	33.3	66.7	-	-

TABLE 6

PROPORTION OF OUT OF PROVINCE RESPONDENTS BY STATE OR PROVINCE

State or Province	Number of Respondents	Percent of Total Respondents
Saskatchewan	19	25.0
British Columbia	11	14.7
Ontario	10	13.4
California	6	7.9
Manitoba	5	6.7
Quebec	3	4.0
Washington	3	4.0
Minnesota	3	4.0
Montana	2	2.8
Oregon	2	2.8
New York	2	2.8
Northwest Territories	1	1.4
Other American States	8	10.5
Total	76	100.0

APPENDIX B

QUESTIONNAIRE

AGE AND INCOME CARDS

CONFIDENTIAL

Department of Agricultural Economics
and Rural Sociology
University of Alberta

Recreation Interview Sheet

Park _____ Date _____ Time _____ Interviewer ____

Weather _____

1. Residence

a) Where do you live? _____
Nearest town or city Province/State

b) What is the population of the centre in which you live?

	Current	Interviewee's Youth	Spouse's Youth
Rural District	_____	_____	_____
(village) under 500	_____	_____	_____
(town) 500 - 5,000	_____	_____	_____
(small city) 5,000 - 50,000	_____	_____	_____
(large city) over 50,000	_____	_____	_____

2. Personal Characteristics

a) Would you kindly relate the letter on this card which best describes your family income?

A___B___C___D___E___F___G___H___I___J___

b) What is your occupation? _____

What is your spouse's occupation? _____

c) Sex M___F___

d) Would you kindly indicate which letter best describes your age?

A___B___C___D___E___F___G___H___I___J___

e) Would you kindly indicate which letter best describes your spouse's age?

A___B___C___D___E___F___G___H___I___J___

f) What level of formal education have you and your spouse attained?

	Interviewee	Spouse		Interviewee	Spouse
grade school	__	__	university graduate	__	__
part high school	__	__	graduate school	__	__
high school graduate	__	__	technical or vocational	__	__
part undergraduate university or college	__	__			

g) Which of the following best describes the group forming this party?

one person alone	_____	one couple only	_____
one family with children	____	two/more couples	____
two families with children	_____	group of friends	____
organized group	_____	other	_____

h) How many are there in this group? _____

i) How many in your immediate family including self? _____

j) How many of your family on this trip? _____

k) Does this include your spouse? Yes___No___(may be obvious)

l) How much annual vacation allowance do you receive?

_____days/year_____

m) How much annual vacation does your spouse receive? (leave blank if housewife) _____days/year

n) Other details noted _____

_____

3. Visitation Information

a) What mode of transportation are you using on this trip?

Automobile__ Camper Truck__ Camper Van ___Motorcycle__

Other (specify) _____

b) What type of accomodation are you using on this trip?

Tent__ Camper Truck__ Camper Van__ Tent Trailer __

Lean-to__ House Trailer__ Motel__ Private home __

Cabins__ Other (specify) _____

c) Did you bring any of the following? Row boat ____

Power boat ____ Canoe _____

d) What kind of trip is this (overall trip)? Day ___

Weekend ___ Part of Vacation___ All of Vacation___

Combined business/pleasure ___ Visiting friends/

relatives ___ Other ___

e) Is this a paid vacation? Yes__ No__ Partially___

If this a paid vacation for your spouse? Yes__

No__ Partially___

f) Does your vacation come at the same time as that of

your spouse? Yes___ No___

g) On this trip how many days are you spending in the South

Saskatchewan River Basin? _____days

h) How long did you stay in this park on this trip?

_____hours (if not overnight)

_____ nights _____days

i) Were there or are there to be other areas visited on this trip? Yes___ No___ Undecided___

If Yes or Undecided: Where ____ How long ____ Activities ____

_____ _____ _____

_____ _____ _____

_____ _____ _____

What is your main destination? _____

j) During your park visit which of the following activities if your group engaged in and approximately how many hours per day for each?

Activity	Hours per Day: Interviewee	Spouse	others in group: male	female
	ages of other			
__Camping	na	na	na	na
__Picnicing				
__Fishing				
__Pleasure boating				
__Hiking or walking				
__Riding				
__Swimming				
__Water skiing				
__Sightseeing				
__Just being here	na	na	na	na
_____ (other)				

Details noted: _____

_____

k) Could you please give me an estimate of your family's trip expenditures for the following?

	Total Trip	South Sask. River Basin Area
Gas and Oil : miles travelled	_____	_____
mileage	_____	_____
expenditure	_____	_____
Groceries and Sundries (bought during trip only)	_____	_____
Restaurants	_____	_____
Motel Expenses	_____	_____
Camping Fees	_____	_____
Other Recreation Fees (e.g. fishing licences)	_____	_____
Equipment	_____	_____
Car Repairs	_____	_____
Other	_____	_____
TOTALS	_____	_____

l) Is this your first visit to this park? Yes___ No___

(if no) When did you first come? _____(year)

Average number of trips per year _____
or one trip every _____years

Average number of days per trip _____

How many of these trip were day trips _____

weekend trips_____ vacation_____

Do you expect to come 1) more often_____

2) less often _____

s) same _____

(if 1) or 2), Why? _____

_____

(if yes) Do you expect to come again? Yes____No_____

How many trips per year? _____

How many of these trips would be day trips _____

weekend trips _____vacation_____

Average number of days per trip _____

Why do you plan to come again? _____

_____

(If no) Why? _____

m) Is this your first visit to the South Saskatchwan River Basin Area? Yes_____No_____(may be obvious)

(If no) Because of residence in the area? Yes___No___

(If No) When did you first visit the South Saskatchewan River Basin Area? _____(year)

Average number of trips per year_____

How many of these trips were day trips_____

weekend trips_____vacation_____

Do you expect to come: 1)more often_____

2) less oftern_____

3) same _____

(If 1) or 2)) Why? _____

_____

(If Yes) Do you expect to come again? Yes___No___

(If Yes) How many times per year? _____

Of these how many would be day trips_____

weekend trips_____vacation_____

Average number of days per trip_____

(If No) Why? _____

n) How often in the past have you used the provincial parks in this basin? _____(times/year)

Average number of days per visit _____

Do you plan to use these parks

1) more often _____

2) less often _____

3) same _____

Names of other parks _____

_____

4. Motivation

a) How did you find out about this park? _____

_____

b) When did you first visit the South Saskatchewan River Basin for purposes of recreation? _____

c) How many years have you and your spouse engaged in (mention activities noted earlier)

Interviewee		Spouse	
Activity	No. of Years	Activity	No. of Years
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

d) For these activities as found in the park, how would you and your spouse rate your degree of satisfaction with the park?

1. Overall:

Interviewee: High__Moderately high__Average__Moderately Low__ Low__

Spouse: High__Moderately high__Average__Moderately Low__Low__

2. Facilities:

Interviewee: High__Moderately high__ Average__ Moderately low__ Low__

Spouse: High__Moderately high__Average__Moderately low__Low__

3. Natural Surroundings:

Interviewee: High__Moderately high__Average__Moderately low__ Low__

Spouse: High__Moderately high__Average__Moderately low__Low__

e) Could you suggest one or more reasons why you might prefer this park over other areas you may have visited?

_____

_____

f) What do you feel are some of the disadvantages of this park?

_____

_____

g) Before coming on this trip did you consider other parks or areas?

Yes_____No_____

(If Yes) What alternatives? Name Location

_____ _____

_____ _____

_____ _____

Other remarks: _____

_____

5. Willingness to Pay

For these final questions, suppose you were confronted with a situation where you might have to pay an additional sum so you and your family could visit this area. This is not to suggest you will ever be confronted with this kind of situation, but rather to give us some idea of the worth of this area to you and your family.

a) Do you consider this park to be worth more per trip than you and your family presently spend to come?

Yes_____No_____Undecided_____

(If yes or undecided) Approximately how much more than your current trip expenses would you be willing to pay per day_____per trip_____.

0___1/100__1/50__1/8__1/4__1/2__3/4__1__other_____

0___1%__2%__5%__ 10%__15%__30%__50%__75%__100%__other__

0___25¢__50¢__75¢__$1.__$1.25__$1.50__$1.75__$2.00__

$2.50__$5.__$10.__other___

b) Finally, how much more per trip would you be willing to pay for the following activities as found in this park for a trip such as your current one? (If inclusive, join by a line).

Camping _____

Picnicing _____

Boating _____

Water skiing _____

Swimming _____

Fishing _____

Other _____ _____

Remarks noted:_____

_____

CARD 1

Family Income : This should include wages and salaries, business profits, farm income, pensions, rents, and other income received by you and the members of your immediate family.

Yearly Income	Weekly Income
A. Under $3,000	A. Under $58
B. $3,000 - 3,999	B. $58 - 77
C. $4,000 - 4,999	C. $78 - 95
D. $5,000 - 5,999	D. $96 - 115
E. $6,000 - 6,999	E. $116 - 134
F. $7,000 - 7,999	F. $135 - 154
G. $8,000 - 8,999	G. $155 - 172
H. $9,000 - 9,999	H. $173 - 192
I. $10,000 - 14,999	I. $193 - 289
J. $15,000 and over	J. $290 and over

CARD II

Age : Numbers below expressed in years of age.

A.	Under 20
B.	20 - 24
C.	25 - 29
D.	30 - 34
E.	35 - 39
F.	40 - 44
G.	45 - 49
H.	50 - 54
I.	55 - 59
J.	60 and over

APPENDIX C

TRAVEL-COST METHOD OF BENEFIT ESTIMATION

The 'Travel-Cost' or 'Clawson-Hotelling'[1] method of benefit estimation is an indirect means of recreation site valuation. The approach produces a demand curve for the total recreation experience and a second one for the recreation opportunity per se. It uses recreationists' excursion costs as a proxy for the price of the experience and the per capita attendance at a particular recreation site from different population zones as an index of quantity of recreation consumed. Costs are calculated from distances travelled and expenditures made. Users are interviewed to determine the origin of their trip and the dollars they have spent. Total distances travelled by each party are multiplied by standard operating expenses per mile to obtain automobile expenditures. Population sizes of the different areas of origin are obtained and per capita attendance determined. This relationsip between per capita attendance and costs of attendance provides a demand

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[1] For a more detailed explanation the reader is referred to a letter from Harold Hotelling to the Director of the United States National Park Service (dated 1947) which is quoted in: Outdoor Recreation Resources Review Commission, Economic Studies of Outdoor Recreation, Study Report No. 24 (Washington, D.C.: U.S. Government Printing Office, 1062),p.56; and : Marion Clawson, Methods of Measuring the Demand for and Value of Outdoor Recreation, Reprint No. 10 (Washington,D.C.: Resources for the Future Inc., Feb. 1959).

schedule for the total recreation experience.

The demand for the recreation opportunity *per se* can be deduced by observing the influence of hypothetical additional costs on per capita attendance. These additional costs assume the role of possible admission charges to be levied at the entrance of the site. They indicate the changes in attendance that imposition of various entrance fees will cause. Park attendance from each area of origin at different fee levels is determined by multiplying the charged per capita attendance by the area's population size. Summation of all areas' attendance yields total expected park attendance at the various hypothetical fee levels. Graphing the relationships between hypothesized fees and expected attendance produces a demand curve for the recreation resource itself.

Several assumptions are implicit in this technique.

1. In calculating the cost per trip to and from the park it was assumed that the park is the major destination and primary purpose of the trip. For people on tours lasting several weeks, this assumption is unrealistic.

2. The approach implies the ability to define groups of recreationist with homogeneous preferences for money and for recreation.

3. Units of recreation are assumed to be of a homogeneous nature.

4. Users of the park view an increase in entrance fees rationally -- "that is, they would regard it as no more serious than any other equally large increase in total costs of visiting the park."[1]

5. The experience of users from one location zone provides a measure of what people in other location zones would do if costs in money and time were the same.[2]

There are many shortcomings of this method inherent in these assumption. The second and third assumptions are essential to the thesis that all recreationists within a specific group would be willing to pay an equal amount for a marginal unit of recreation. However, a recreation day is a variable package or good. The value received by one individual for a recreation day is dependent on many factors of which cost is but one. Weather, crowding, accessibility, and other factors must also be included in any individual evaluation.

Moreover, the recreationist who spends more than others may do so to consume a personally more valuable product. The value he places on the resource should be equated with the value that other recreationists, who are

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[1] Marion Clawson, Methods of Measuring the Demand for and Value of Outdoor Recreation, p.24

[2] Ibid.

spending less, place upon the resource. "Its value to people with differing preferences cannot be easily approximated by associated costs."[1]

This indirect method, instead of relying on individual reactions and actual evaluations, puts its strength behind the notion that individuals will react in the same way and that they will have similar evaluations. This notion is the most substantial weakness of this method.

As a comparison to those benefits determined by the direct method (Chapter IV), the Travel-Cost method of revenue estimation was applied to two provincial parks -- Chain Lakes and Park Lake.

The relationship between per capita attendance and average cost per trip was determined as the following on the basis of the survey questionnaire.

Chain Lakes

$$\text{Log } Y = 1.5873 - 0.3191 \text{ Log } X$$

Park Lake

$$\text{Log } Y = 2.2977 - 0.6242 \text{ Log } X$$

The demand for the recreation experience <u>per se</u> was derived from each of these two equations by determining the effect of different hypothetical fees on attendance.

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[1] W.S. Pattison, "Moose Hunting Activity in Northern Alberta : A Case Study in Wildlife Economics," p.26

Table 1 shows that revenue is maximized at Chain Lakes when the fee charged is $1.00, with 3,916 as the predicted attendance figure. Table 2 shows that a maximum revenue of $2,713.50 is attained at Park Lake when the fee is $6.75 and 402 persons visit the park.

TABLE 1

DERIVED DEMAND DATA FOR CHAIN LAKES PROVINCIAL PARK

Hypothetical Fee ($)	Predicted Visits	Total Revenue ($)
.25	8,920	2,230.00
.50	6.544	3,272.00
1.00	3,916	3,916.00
1.50	2,533	3,799.50
2.00	1,768	3,536.00
2.50	1,284	3,210.00

TABLE 2

DERIVED DEMAND DATA FOR PARK LAKE PROVINCIAL PARK

Hypothetical Fee ($)	Predicted Visits	Total Revenue ($)
1.00	1,543	1,543.00
2.00	1,085	2,170.00
3.00	821	2,463.00
4.00	652	2,608.00
5.00	536	2,680.00
6.00	450	2,700.00
6.75	402	2,713.50
7.00	386	2,702.00
8.00	333	2,664.00

In Chapter IV (Table 8)[1] primary benefits or market revenue from Chain Lakes and Park Lake are estimated at $38,166.09 and $6,624.92, respectively. These estimates are substantially larger than those made by the Travel-Cost method. One postulated reason for this discrepancy is that the greatest number of park users are local residents. As a result, the demand curve for the recreation experience *per se* is extremely elastic in the region of small hypothetical fees. Consequently, a small change in fee creates a large change in the number of local recreationists demanding the resource.

[1] *Supra*, p. 58

APPENDIX D

DETERMINATION OF SECONDARY COSTS

The methodology of determining secondary costs is shown using the example of the agriculture industry.

Assume a one dollar increase in sales of the service industries. This results in an ultimate increase in the gross output of the agricultural industry of $0.000351. This value is obtained from the inverse matrix. The agricultural industry must purchase inputs from all other industries amounting to $0.3872 for each dollar of increased output.

Consequently, the ultimate increase in costs to the agricultural industry resulting from the one dollar increase in sales in the service industry is as follows:

$$\frac{\$0.000351 \text{ agric. output}}{\$1 \text{ sales in service industry}} \times \frac{\$0.3872 \text{ cost}}{\$1 \text{ agric. output}} = \begin{matrix} .00013590 \\ \text{cost/\$1 sale} \\ \text{in service} \\ \text{industry} \end{matrix}$$

Similarly, other industries sustain increased production costs per one dollar of sales in the service industries. This is totalled over all industries in Table 1.

Since imports also enter the region, the same process must be undertaken to determine their value (Table 2).

The total effect of a one dollar increase in sales in the service industries:

	18.1021¢	increase in purchase of domestically produced inputs throughout the economy
	6.4505¢	increase in imported inputs
Total	24.5526¢	increase in costs to support sale of $1.00 of goods and services in services industry

TABLE 1

EFFECT ON INTERINDUSTRY COSTS

Industry	Tech. Coeff.[a] (Cost/$ Output)	Inverse Coeff.[a] (Output/$ Sales in S.I.)	Costs/$ Sales in S.I.
1	.3872	.000351	.00013590
2	.2881	.000041	.00001181
3	.2554	.011636	.00197183
4	.3370	.000741	.00024971
5	.8645	.000070	.00006051
6	.7942	.000011	.00000873
7	.8157	.000024	.00001957
8	.6412	.000058	.00003718
9	.2725	.000254	.00006921
10	.2043	.000114	.00002329
11	.5860	.000024	.00001406
12	.3644	.003144	.00114724
13	.4851	.000123	.00005966
14	.3690	.002373	.00087563
15	.2661	.004502	.00119798
16	.3139	.001618	.00050789
17	.3195	.001439	.00045976
18	.3177	.000012	.00000381
19	.4122	.000427	.00017600
20	.6179	.000064	.00003954
21	.6179	.000425	.00026260
22	.8069	.004969	.00400948
23	.4490	.001150	.00051635
24	.2734	.000190	.00005194
25	.3131	.000000	.00000000
26	.3323	.007113	.00236364
27	.3306	.022104	.00730758
28	.3897	.051927	.02023595
29	.2945	.006586	.00193957
30	.1241	.010393	.00128977
31	.1296	1.041479	.13497503
		Total	.18102122

[a] R.W. Wright, "The Alberta Economy - An Input-Output Analysis".

TABLE 2

EFFECT ON IMPORTS

Industry	Imported Input Coeff.[a]	Inverse Coeff.[a]	Imported Input Cost/$ Sales in Service Industry
1	.0464	.000351	.00001628
2	.0461	.000041	.00000189
3	.1066	.011636	.00124039
4	.0716	.000741	.00005305
5	.0287	.000070	.00000200
6	.0388	.000011	.00000042
7	.0800	.000024	.00000192
8	.0459	.000058	.00000266
9	.5126	.000254	.00013020
10	.2109	.000114	.00002404
11	.4815	.000024	.00001155
12	.1012	.003144	.00031817
13	.3130	.000123	.00003849
14	.1416	.002373	.00033501
15	.2319	.004502	.00104401
16	.4095	.001618	.00066257
17	.3607	.001439	.00051904
18	.3073	.000012	.00000368
19	.2166	.000427	.00009248
20	.3463	.000064	.00002216
21	.0531	.000425	.00002256
22	.0084	.004969	.00004173
23	.2754	.001150	.00031571
24	.1727	.000190	.00003281
25	.2635	.000000	.00000000
26	.2533	.007113	.00180172
27	.0769	.022104	.00169979
28.	.1596	.051927	.00828754
29	.0574	.006586	.00037803
30	.0216	.010393	.00022448
31	.0453	1.041474	.04717877
		Total	.06450515

[a] Ibid.