

CHAPTER VIII- TN 40: EVALUATION OF THE IMPACT OF THE CREATION OF A NEW NATIONAL PARK: A LONGITUDINAL STUDY

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ABSTRACT

The creation of a national park has long-term effects upon the physical and social environment in which it is located. Responsible expenditure of public moneys dictates that efforts be made to maximize beneficial outcomes and to avoid the adverse effects of park development. Officials responsible for the establishment of parks should rely upon whatever tools are available for predicting the consequences of decisions taken.

This paper examines the use of economic impact studies by the creators of National Parks in Canada. First, the role of economic impact analyses in the sequence of events that has recently been typical of the creation of new national parks in Canada is sketched. Next, references reflecting the state of the art are noted and two types of impact assessments are distinguished. A case study representative of the two types is presented, showing how and why the events that actually took place in developing a specific national park differed from what had been predicted.

The paper suggests how, in the light of Parks Canada's experience, economic impact studies can be refined and improved, and the role they should play in future park development.

INTRODUCTION

The creation of a national park has long-term and in many ways irreversible effects upon the physical and social environment in which it is located. Responsible expenditure of public moneys dictates that efforts be made to maximize beneficial outcomes and to avoid adverse effects of development of a park. Officials responsible for the establishment of parks should therefore rely upon whatever tools are available for predicting consequences of decisions taken.

Although proven techniques for assessing the impact of developing a major park cannot yet be claimed, progress is being made. Some aspects of this progress are clearly documented in this volume. This paper not only cites these developments but points up some interesting results of studying an area from before a national park was created (1964) until the park was in full operation (1973).

It is by detailed analysis of what happened with respect to one park in particular that this paper frankly examines the use of economic impact studies by the creators of national parks in Canada. The role of economic impact analyses in the sequence of events that has recently been typical of the creation of new national parks in Canada is first described for those not familiar with it. However, the main thrusts of this presentation are directed toward suggesting how, in the light of Parks Canada's experience, economic impact studies can be refined and improved. Possibly of even more importance are reflections on what role such studies should play in development of new parks from conception to implementation and operation.

THE ROLE OF ECONOMIC IMPACT STUDIES IN THE PROCESS OF CREATING A NATIONAL PARK

The creation of a national park in Canada involves bilateral negotiations between the Federal and Provincial levels of Government. The Federal Government desires to realize certain national objectives in developing a national park. Because the Federal Government ultimately requires title in fee simple to the land that will become a national park, and the land must be transferred to it by the province free of any encumbrance, a strong bargaining situation arises. Provincial Governments, in exchange for granting title and relinquishing the right to resources within the park, seek to ensure that proposed parks are compatible with and will enhance regional growth and development within the province, or help attain some other provincial objectives. It is within such a context of intergovernmental relations that economic studies of

proposed national parks are conducted.

The sequence of events related to creating a national park involves definable phases (see Figure 1) and normally extends over several years. The first step of relevance to this discussion consists of the preparation of a concept plan that outlines in general terms where the park will be located, something about its size, the features to be highlighted and the type of development to be undertaken. This plan may involve only one or several options for the development of a park. Although it is customarily the Federal Government which prepares the plan, the process of concept plan formulation is dynamic, characterized by discussions and "tailoring" of the plan in the interests of producing an end product that appears viable and mutually desirable.

It is only after the discussion of the concept plan has evolved to a certain stage that an economic impact assessment is normally commissioned to evaluate the viability of implementing the plan(s). At this stage an economic impact study is used to determine if or on what basis a park proposal should be moved beyond the concept plan stage. In such a study one evaluates what is only, in fact, an outline of what might be. Given that many details may be modified prior to final development of the park, it is necessary to deal with approximations. Because the analyst is charged with evaluating the impact of a development as outlined in the concept plan, the effects of deviations from that plan or the effects of exogenous influences not considered in the study are seldom pursued.

FIGURE 1: THE SEQUENCE OF EVENTS IN PARKS DEVELOPMENT

1. Proposal for a Park Considered Internally.
2. Bilateral Negotiations Begin.
3. Preparation of the Concept Plan for the Park.
4. Economic Impact Assessment of the Proposed Park.
5. Evaluation and Reaction to Economic Impact Study.
6. Agreement in Principle to Create the Park.
7. Preparation of Master Plan for Park Development.
8. Development of the Park.

If a proposal to develop a park is judged to be viable on the basis of the economic impact assessment, formal negotiations between the governments involved will proceed and possibly pursue new development alternatives before an agreement in principle is reached. During this process, it is likely that the decisions and compromises made will modify some aspects of the original concept plan. For example, if both parties do not concur about the viability of the proposed park, the negotiations could involve appropriate land transfers or other compensation to promote agreement.

After a formal agreement to create a park has been struck, detailed planning commences, carrying a high potential for further modification of the concept plan upon which the economic impact analysis of a park was based. In this regard it should be noted that there is no mechanism to ensure that the final design of a park adheres closely to the concept plan on the basis of which the park was judged to be viable. The consequences of changes may become evident only after the park is developed.

ECONOMIC IMPACT STUDIES

With respect to the work done for Parks Canada, two types of economic impact analyses can be distinguished. The type that has usually been employed in evaluating proposed national parks in Canada consists of a single predictive assessment of the outcome of developing a park (see TN 39 for one example). Among these a priori studies there can be wide variation in the

approach to evaluation. Some focus on secondary benefits only, others attempt to include an evaluation of the primary benefits to future park users. The accounts prepared (local, regional, provincial) and the degree of detail and comprehensiveness of these studies are variable. Details are not provided here because many of the studies prepared relate to park proposals still under consideration.

The state of the art of impact assessment to 1970 has been summarized for Parks Canada as part of an evaluation of the proposed Gros Morne National Park in Newfoundland. (Again see TN 39 and relevant introduction and review material for Chapter VIII.) In this report Hildebrandt-Young (1974) reviewed techniques used by others and available to those conducting economic impact analyses. Their bibliography includes more than 160 items which deal with public finance and economic problems of national park development. The Coomber and Biswas monograph "Evaluation of Environmental Intangibles: Review of Techniques" (1972) prepared for Environment Canada provides a complementary review which focuses almost exclusively on primary benefits.

In contrast to a priori studies are those which examine the consequence of creation of a park after it is in operation. These analyses measure what really happened as a result of developing a park and compare actual outcomes with what had been predicted. Apart from the timing, such studies are similar to predictive studies in terms of the variations possible in scope, details and comprehensiveness. However, findings from follow-up economic impact assessments can suggest how predictive models might be improved. The only follow-up study of the impact of creating a National Park in Canada to date is that of Kejimikujik National Park. This followup is reviewed in some detail here.

THE KEJIMKUJIK STUDIES

In 1962 an area approximately 150 square miles surrounding Kejimikujik Lake in southwestern Nova Scotia was proposed for development as a national park. As one stage in the creation of the park, an a priori study was commissioned to assess the economic impact of the park on the area judged to be within normal commuting distance to the park for reasons of employment. The objectives of the Economic Survey of the Kejimikujik Park Area were to (a) provide bench-mark data on the economic conditions of the area to enable comparison with future conditions resulting from a change in resource use, and (b) to determine the economic justification for a specified change in resource use (i.e. for the establishment of a national park) in terms of the total benefits to be derived relative to total costs (Institute of Public Affairs 1964; 1974).

The 1964 study did provide income, employment and property values as parameters of economic conditions, and a methodology for reassessment of these at a later date. However, without having attempted to measure the benefits of creating a park, but having suggested procedures that might be employed in doing so, the report concludes with a favourable "estimation" of the prospects for success of the park as an economic stimulant. In terms of how the authors of this paper suggest an evaluation should proceed, the study would be harshly critiqued. It should be borne in mind, though, that the study was carried out in 1964, and methods for impact analysis have improved since then.

Regardless of the shortcomings of formal study, the history of the development of Kejimikujik serves to point up how and why even a rigorous, expensive and thorough analysis might have failed to predict what has happened there. In this regard one should note that no control mechanisms existed to keep park development on the right "trajectory" to fulfill and realize the expectations for the park that had been expressed in the concept plan.

After agreement in principle had been reached, a Master Development Plan was formulated in 1965 to delineate facility location and development zones within the park. The

plan was based on an expected volume of visitor days and a number of rental accommodation units to be available outside the park boundaries by 1970. The volume-of--use estimate was based on use figures for the three existing national parks in the Maritime Provinces. It was assumed that the flow patterns of visitors to Kejimikujik would be similar to those of visitors to Cape Breton Highlands National Park which is in the opposite end of Nova Scotia to Kejimikujik (see Figure 2). Moreover, it was assumed that Nova Scotia residents would use the new park as much as New Brunswick residents used Fundy National Park. By considering these factors, a need for 1000 campsites within the park was foreseen. The need for much private sector accommodation outside the park was accepted. Unfortunately, details on the basis for estimating accommodation requirements are not known.

Kejimikujik National Park was officially opened in 1969, four years after the first master plan was prepared. Although the master plan was based on an estimate of 210,000 entrants by 1970, the actual use volume in 1971 was only about 150,00 visitors. The number of campsites that had been developed by 1971 was only 330, less than one third of what had been planned.

Because of a Parks Canada moratorium on campground development in the park, 330 sites was not to be exceeded in order to encourage campground development near the park by the private sector. However, even in 1973, the Park's 330 campsites seldom reached 75 percent occupancy on week days. Admittedly on weekends in July and August the park's campsites were usually filled to capacity. Turning away potential users was often a problem. Still, it is interesting to note here that although the Kejimikujik campgrounds are usually full by 9 p.m. Friday evenings, one private campground just outside the park has only "reasonable" occupancy on "some" weekends. Other major campgrounds in the area are used mainly on weekends, but these have their own resource base and cater to people who reserve sites on which to park trailers for the whole summer.

The characteristics of visitors to the Park are quite different from what had been expected. Nova Scotia residents constituted more than 69 percent of all park users in 1973, whereas it had been predicted that they would amount for approximately one third of the visitors to Kejimikujik. In contrast, residents from the other Canadian provinces accounted for only 11 percent of the users; much less than the 33 percent that had been expected. From the perspective of "user-days", Nova Scotian and other Canadians represented 67 and 13 percent respectively of the total for the Park, with the remainder being largely from the USA. Lastly, it should be noted that just less than one half of all visitors to Kejimikujik National Park in 1973 were day users.

Five years after the opening of the park, and while the events just described transpired, the Institute of Public Affairs (1974) conducted a second study to measure the actual socio-economic impact of the park on the local area. The study replicated in part the surveys carried out in 1964 (Institute of Public Affairs 1964). Comparisons were made of income and employment before and after creation of the park. However, an assessment of property values was not repeated in the follow-up study, although changes in property value have been recognized as important in determining the impact of such developments. The 1974 Kejimikujik National Park Socio-Economic Impact Study concluded that the park had not been a major generator of regional economic growth. It makes it very clear that the park did not have the developmental impact initially anticipated. The study reports that, as of 1973, the park provided direct and indirect employment for 113 people, (83 of whom were part-time workers) in the assessment, the loss of 33 part-time jobs at tourist facilities which were closed as a result of the park is recognized, but the 1974 review does not include estimation of foregone employment from the forest industry in computing, the net employment benefits, nor does it acknowledge the loss of use of the land for

hunting and trapping.

What is more, it is not emphasized in the follow-up assessment study that only 17 of the 30 full-time jobs and 22 of the 48 part-time positions which constitute the net employment effects were filled by local residents. The skilled workers used to administer the park and many of its programs were imported from outside the Region. Still, the report does conclude that the large number of part-time jobs at the park does not make for a stable economic climate, but no indication is given as to what increase or decrease in stability resulted from developing the park.

The net income impact of the park in 1973 was estimated as \$384,295, using the income multiplier of 1.108 derived in the 1974 follow-up study. But one should note that in calculating the impact and the multiplier, the wages paid to employees who were brought in from outside the area as park staff by Parks Canada are included. It might have been more appropriate to include only the local expenditures of these "imported" employees when computing the regional benefits of creating the park.

Inclusion of a consumer surplus value per visit by Nova Scotia residents in 1973 raises the amount of benefits to the province for that year by \$693,000 when conservative estimates of consumer surplus values are used (see TN 38 for Canadian consumer surplus values). The computations used to derive this primary benefit value are shown in Table 1.

TABLE 1: CALCULATION OF PRIMARY BENEFITS TO NOVA SCOTIA RESIDENTS USING KEJIMKUJIK NATIONAL PARK

Type of Use	Number of Users (persons)*	Consumer Surplus Value**	Primary Benefit Value(\$)
Day use	23949	5.00	119745
Overnight use	4839	9.00	43551
Camping Trip	15136	35.00	529760
			693056

* From Park Visitor Survey, 1973.

** Adapted from values in Table 1, TN 38.

Lest an unfavourable impression about the wisdom of creating Kejimkujik arises, some additional comments merit attention in passing. Although the economic assessment did not consider primary benefits, analysis of the characteristics of users of the park has shown that almost 70 percent of the visitors are residents of the province. Moreover, the development of Kejimkujik retains in the province the expenditures of those Nova Scotia residents who would otherwise travel out of the province to seek the type of experience that the park offers. Finally, neglecting to consider 1973 property values in the area with respect to real capital gain resulting from development of the park is only part of a failure to consider the gains derived from creating a park in 1964 that is sustaining employment in the local area and which now serves as an important element in developing the tourist potential of southern Nova Scotia.

SUGGESTION FOR IMPROVING ECONOMIC IMPACT ANALYSIS

It should be obvious that the studies of Kejimkujik were not reviewed as examples of research that should be used as models of how to analyze the impact of proposed parks. Also the other CORD Study impact analysis is not endorsed as a model to follow in doing other analyses (see TN 39). The case of Kejimkujik was presented because it is not typical of socio-economic impact studies of National Parks in Canada in one important respect - it involved a follow-up assessment of the impact of the creation of a major park. Having that salient feature, it serves as a springboard to a more general discussion of such studies and how these should be refined.

Two main thrusts are suggested as necessary in improving studies. One involves advancing the state of the analysis art and thus enhancing the quality of assessment studies. This is desirable in its own right, even if the function served by impact studies remains unchanged. The other thrust, which the authors believe the "Kejimikujik" and other studies show is necessary, entails promoting a closer and continuing interplay between the persons doing the impact analyses and the park planners and developers. The objective is to promote longitudinal assessments throughout the process of park creation and even until after the park has been developed. Naturally, efforts should be made to integrate the two types of improvements.

The sequence of steps shown in Figure 3 relate to the first of the two thrusts just cited - namely, ensuring high quality in economic impact studies. The first two steps involve clarifying and articulating the objectives of a park and thereby making more specific the development options to be considered. The statements in the figure suggest that it would be important early in a study to identify the expected relationships between park development and activities in the private sector. The third step consists of delineating what economic and social elements should be included in the socio-economic study accounts to measure the extent to which the objectives delineated in step 1 are attained. Although involving professional judgment, the prerogative of the client and the peculiarities of each situation will always be deciding factors regarding what is included, it is suggested that a general checklist of elements that should be considered in any socio-economic impact analysis would be helpful. Such a list would serve as a focus for discussion between the analyst technically responsible for an impact study and the "user client".

The remaining steps listed in Figure 3 relate directly to the accuracy of impact assessments. Their importance has become apparent from Parks Canada's experiences, some of which are cited in the next section, and from work done as part of the Canadian Outdoor Recreation Demand (CORD) Study.

FIGURE 2: RECOMMENDED STEPS IN PREPARATION OF AN ECONOMIC IMPACT ASSESSMENT

1. Identification of Objectives of Park Creation.
2. Specifications of Development Options of Concept Plan.
3. Delineation of Economic and Social Aspects to be Studied.
4. Selection of Base Data re: Use, Expenditures, Multipliers, etc.
5. Definition of Projection Procedures to be Used to Generate Data Required to Estimate Future Impact.
6. Preparation of the Accounts by which the Concept Plan or Development Option will be Evaluated.
7. Specification of the Likely Magnitude of Error or Expected Range of Variation of Various Impacts.
8. Preparation of a Longitudinal Evaluation Plan that Identifies Critical Indicators to Monitor, and their Predicted Values and Acceptable Range of Variations, for Ensuring that Economic Objectives of Developing the Park are Attained.

Probably the most important thing to note is that the final step suggested in Figure 3 involves creating a mechanism to promote continuing assessment of the impact of each modification to the concept plan during the possibly protracted process between first consideration of a park and its being in operation. The identification of critical indicators to be used in evaluating modifications could be the necessary tool to use in exerting the strong pressures needed to keep park development consistent with the objectives that were sought through its creation. In this regard one should note that many impact assessment studies have

been unfairly judged in retrospect because they were based on a concept plan which was extensively transformed after the studies were completed. Preparation of a longitudinal evaluation plan also leads to a redefinition of the role of impact assessment studies in the process of park creation, which is the second thrust to be considered in this presentation.

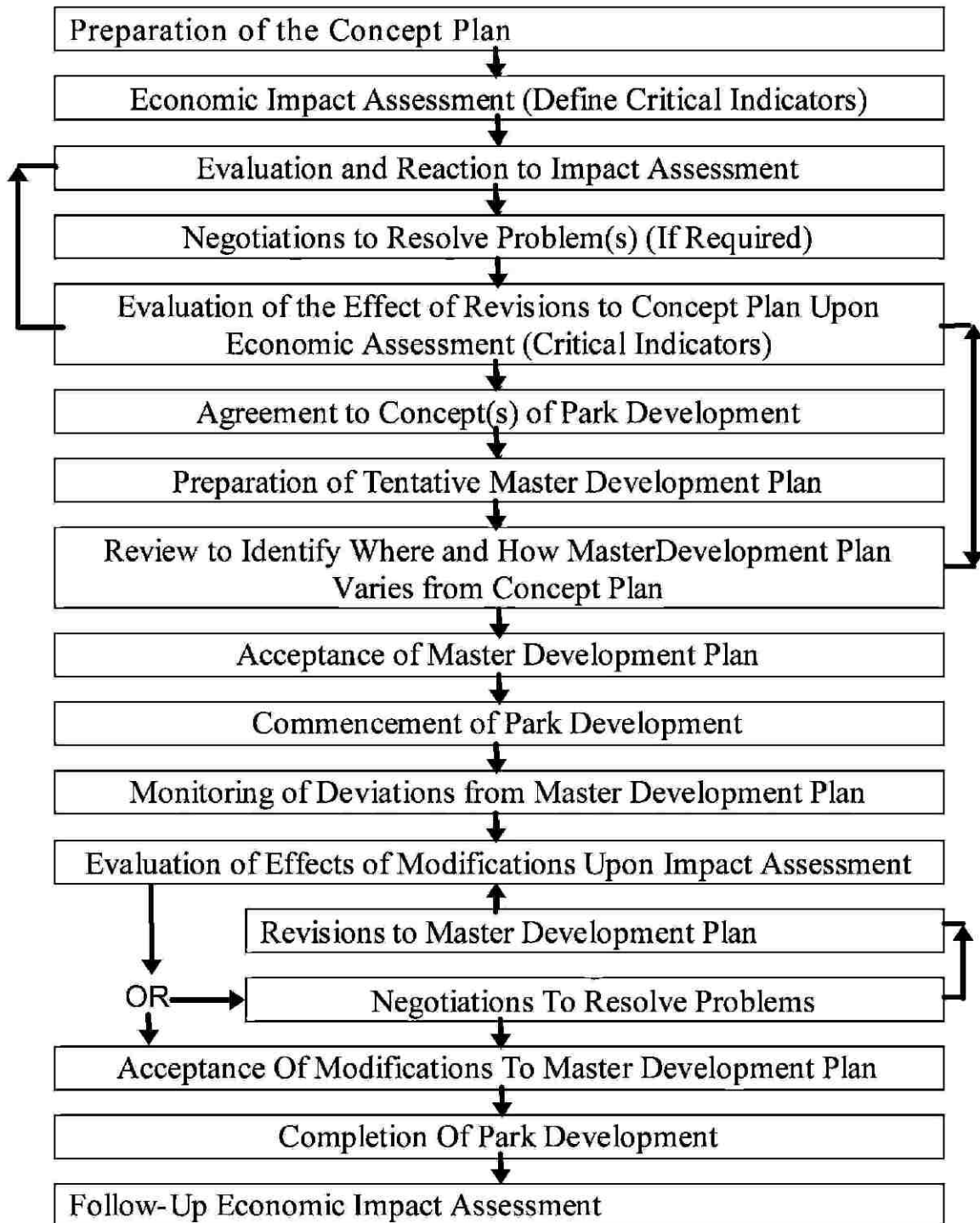
Figure 4 presents headings and a flow sequence which aid one in seeing how the process of creating a park might be elaborated to include a continuing relationship between impact forecasting and facility planning and development. It is characterized by feedback loops which suggest the necessary evaluation of the effects of implicit or explicit modifications to the concept plan of a park at various stages in the creation of a park. The first feedback loop relates to assessing the consequences of any major changes that result from the bilateral negotiations prior to signing a formal agreement, and identifying what effects these changes may have upon the accounts prepared in an original economic impact study. This reassessment would logically precede finalization of an agreement. The second feedback loop is included to focus on the need to ensure that the Master Development Plan is consistent with the objectives of creating the park. In practical terms it points up the need to form a linkage between the policy management functions of park acquisition and the planning functions within an organization. Finally, the figure implies that if a park is to attain objectives set for it during a negotiation process a monitoring, process must be introduced to ensure that the effects of modifications to the Master Development Plan are evaluated and that such changes are consistent with the desired results of creating the park.

In addition to building in an on-going evaluation process to detect potential unanticipated impacts, a follow-up economic impact assessment when development of the park has been completed is implied as desirable by the plan shown. This study would be valuable even though a longitudinal assessment procedure was introduced to document unanticipated effects and to point out what improvement in impact could be facilitated by future park development.

FIGURE 3: RECOMMENDED STEPS IN PREPARATION OF AN ECONOMIC IMPACT ASSESSMENT

1. Identification of Objectives of Parks Creation.
2. Specifications of Development Options of Concept Plan.
3. Delineation of Economic and Social Aspects to be Studied.
4. Selection of Base Data Re: Use, Expenditures, Multipliers, etc.
5. Definition of Projection Procedures to be used to Generate Data Required to Estimate Future Impact.
6. Preparation of the Accounts by which the Correct Plan or Development Option will be Evaluated.
7. Specification of the Likely Magnitude of Error or Expected Range of Variation of Various Impacts.
8. Preparation of a Longitudinal Evaluation Plan that Identifies Critical Indicators to Monitor, and their Predicted Values and Acceptable Range of Variations, for Ensuring that Economic Objectives of Developing the Park are Attained.

FIGURE 4: A PROPOSED ROLE FOR SOCIO-ECONOMIC IMPACT STUDIES LN THE PARK DEVELOPMENT PROCESS



DISCUSSION

Actually, the variables being considered and the kind of equation systems being developed to define use at a given point in time (base figures) and to make projections gives one an insight

into the problems involved in making reliable use estimates and realistic projections. Figure 5 lists some of the exogenous and endogenous variables that are relevant in predicting the dynamics of the development of Kejimikujik National Park. There was no attempt to be exhaustive in making the lists but rather a variety of variables were identified (see Appendix). In the Appendix, the variables listed in Figure 5 are discussed to provide an indication of why and how these variables are relevant to the Kejimikujik Park development.

Regardless of the complexity involved in stating a specific set of equations to model park use, by looking at Figure 6 one can get a fairly clear picture of the kinds of relations between variables which are seen to be of concern by Parks Canada. The flow chart in this figure shows the "directions of causality" implied by events that have been observed by Parks Canada.

In particular one may note that Figure 6 shows that a change in an exogenous variable from series 1 of Figure 5 results in a change in one or many of the classes of use of a park (series 3 of Figure 5). The structure of the figure then suggests that changes in use levels operate to influence the development of new facilities or the modifications of old facilities to meet use demands. As well, the structure of the flow chart implies that the modifications feed back to affect the amount of use of facilities just referred to (series 2 variables affecting series 3). Similarly, use causes the development of roads and thus development feeds back to cause use. The ultimate desirability of considering the lead-lag factors that affect reaching equilibrium is admitted but the problems involved are not pursued here.

A third series 2 variable (2.3 of Figure 5), which is somewhat different than the preceding two, is the class of crowding variables. Here the situation implied by the way Figure 6 is drawn is that increased use causes changes in crowding, but that as well, facility development changes crowding conditions. One could say that a 3-way feedback is implied that results in some kind of equilibrium between crowding, use and the development of facilities.

Figure 6, by its simplicity, suggests that modelling of park use is much simpler than it is in reality. Figure 7 is presented because by examining it one begins to see the fantastic complexity of interrelationships between variables that must be approximated if structurally adequate models of the dynamics of parks use are to be defined for use in economic and social impact studies.

The concern with adequate approximations has been introduced as an issue because, as one can guess by looking at Figure 7, it is simply not possible, with the amount of data that are available under normal budgetary and time constraints, to develop a set of 40 or more equations (unless Parks Canada over the long run develops a generalized modelling system easily applied to particular problems). Even when the equations indicated are adequately defined, there are problems in carrying out an estimation exercise to obtain the parameters for these equations (see TN 11 and comments on parameter estimation problems that are made there). Actual Parks Canada projects have invariably involved only a few equations and to this point in time have not involved estimation of parameters when capacity constraints are actually enforced on an equation system. There has been a need to be concerned with the Limited amount of data available, the quality of data (see e.g. TN 21), the proper form for individual equations (TN 35, TN 33, TN 30, TN 18, TN 1 and TN 3), the use of appropriate efficient estimation procedures for single equation models (TN 19) and other issues.

FIGURE 5: VARIABLES

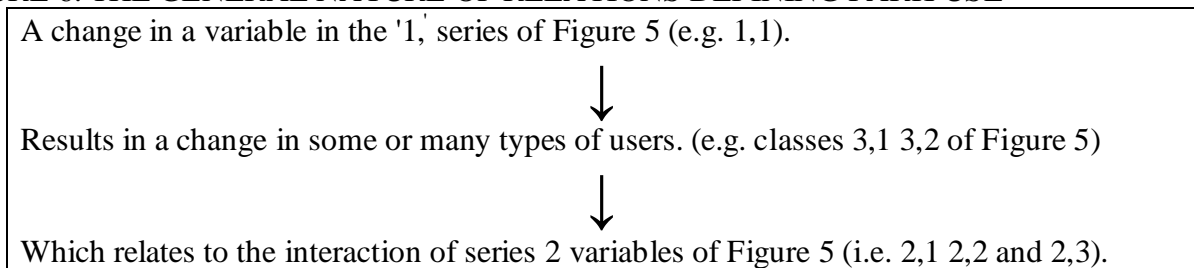
EXOGENOUS VARIABLES
<p>(1,1) The development of Nova Scotia Highways affecting the access to Kejimikujik National Park (independent of the use of Kejimikujik).</p> <p>(1,2) Level of development of facilities outside the park independent of the park (facilities not even necessarily in Nova Scotia).</p> <p>(1,3) Creation of a new National Provincial or Private Park independent of the pressures of Kejimikujik.</p> <p>(1,4) Policy decisions affecting the interest rate on funding of tourism development (e.g. creation of available low interest tourism development funds by the Government of Canada).</p> <p>(1,5) Weather: (a) series of bad seasons resulting in a change in the tendency to go to the park at all in future seasons (b) weather conditions influencing visiting on a given weekend or weekday.</p> <p>(1,6) Infestation of pests (causing an undesirable impression of the park which must be overcome in subsequent seasons).</p> <p>(1,7) National Parks policies such as the "Freeze" on campground development or administration policies affecting the amount and quality of beach and wilderness available or how these areas are used.</p> <p>(1,8) Population shifts independent of Park creation.</p> <p>(1,9) National or Regional economic change affecting the disposal income available for trips to parks.</p> <p>(1,10) Trends which involve drastic departure from past behaviour (e.g. are not explained by trends in past trends).</p>
ACTION ENDOGENOUS VARIABLES
<p>(2,1) Development of new facilities or modification of old facilities to meet user "demand".</p> <p>(2,2) Development of new roads or improvement of old roads to meet weekend or weekday park load.</p> <p>(2,3) Crowding or overuse of: a. activity areas; b. beaches; and c. campgrounds - because of weekdays and/or weekend use.</p>
USE CONSEQUENCE ENDOGENOUS VARIABLES
<p>(3,1) Local weekday use.</p> <p>(3,2) Local weekend camper use.</p> <p>(3,3) Other intra-provincial weekday use.</p> <p>(3,4) Other intra-provincial weekend camping use.</p> <p>(3,5) Other uses (e.g., beach use or interpretive facilities).</p>

Actually, a number of CORD studies implicitly point out the need for the kinds of use estimation equations referred to in Figure 7 (see TN 1, TN 4, TN 8, TN 18, TN 30 and TN 33). The basis on which the need for these equations is defined, is both by reference to the research of others and by the discussion of specific situations that illustrate why models of a certain type are appropriate to a given situation where it is possible to see that other models are not appropriate.

One should note that the commentary on Figures 5, 6, and 7 has not raised the issue of making projections. Obviously the exogenous variables (series 1 variables of Figure 5) were introduced because they should be part of the input to a set of "dynamic" demand equations. However progress towards developing projection equations has not been in the area of deriving

equations systems for individual sites. Effort has focused on estimating aggregate demand by people at various origins (see TN 6, TN 12, TN 13, TN 20 and TN 36).

FIGURE 6: THE GENERAL NATURE OF RELATIONS DEFINING PARK USE



Parks Canada work on projection of aggregate demand (origin modelling) cannot be described in detail here because there are too many notational complications, estimation problems requiring comment, etc. to allow a brief review to be meaningful. Still one may wish to note that CORD Study research has considered the type of demand models that Knetsch proposed for use (TN 34) and other similar models. The results of extensive research (starting with model formulation in TN 12) have been:

- (1) to develop formulas for predicting the accuracy of estimates if a model is structurally acceptable (TN 6)
- (2) to show structural problems with the models being considered and suggest solutions (TN 20)
- (3) to show the value of R^2 that is to be expected in the kind of modelling being done (TN 36)
- (4) to suggest a quantitative projection strategy and problems with this strategy (TN 13).

CONCLUSION

The title of this paper may have been misleading because the two economic studies associated with Kejimikujik National Park were used as a focus for a more general examination of impact assessments of major parks in Canada. The main concern has really been with deficiencies in impact studies and how these may be overcome.

Although numerous papers that offer improvements of models for use estimation were cited, it is not implied that the major methodological problem with economic impact studies of park development in Canada rests with the mathematical and economic models used. The importance of technical references is to communicate the current emphasis in use estimation of differentiating the various types of use that are made of an area depending on how it is developed, and to draw attention to assessment of the accuracy of estimates. Improvements in these technical areas have very practical and obvious applications.

In the view of the authors it is important to stress that the usefulness of economic impact assessments can be increased by redefining the role they play in a longitudinal process. So, in closing, the authors wish to reiterate their view that even if a very "sophisticated" study of Kejimikujik had been carried out in 1964, the results would have proven to be disappointing. Regardless of what methods might have been used to make estimates, there were at that time almost no suitable data available from which to generate use estimates for some base year, nor was there trend information on park use that could have been projected into the future. In addition, much of the methodology now available was developed only after that study. But most importantly the need to build longitudinal follow-up into the impact assessment of park development had not yet been recognized as critical.

FIGURE 7: DESCRIPTIVE SUMMARY OF EQUATIONS FOR PARK SUMMER SEASON USE OF KEJIMKUIK NATIONAL PARK

A. USE EQUATIONS¹

1. Day-use; immediate local area for weekdays.²
2. Day-use; immediate local area for weekend and long weekend.
3. Campground use; immediate local area for weekday (non-extended holiday weekday use).
4. Campground use; immediate local area for weekend days and long weekend.⁴
- 5.-8. Same equations for holiday use of the park (non-wilderness holiday use).
- 9.-10. Wilderness use equations; for weekend days (9) and holidays (10).³
- 11.-20. Similar equations for use of park by non-local people who are from rest of Nova Scotia.
- 21.-30. Equations to estimate use in the same categories by non-Nova-Scotian residents of Canada.
- 31.-40. Equations to estimate use in the same categories by U.S.A. residents.

B. CONSTRAINT EQUATIONS

41. Managed campground capacity constraint (campground use on a given day cannot exceed capacity).⁵
42. Administrative control of wilderness use.⁶
43. Facility and service capacity constraints (e.g. parking availability for day-use; picnic area capacity constraint⁷; capacity for guided hikes; interpretive films, tours, lectures, etc; and the like).

1. This figure does not explicitly introduce "en route", "main-destination" and other descriptions used in defining equations discussed or "estimated" in CORD Study research projects. One can consider that a full specification of all possible equations that should be considered would include, for example, en route and main-destination use equations for holiday use of Canadian National Parks by U.S. residents.
2. Independent variables should often include weekday loading and weekday turnover to reflect the space available for "new" weekend use, or these considerations must be built into the constraint equations.
3. The omission of weekday equations means that it is considered that "true" wilderness use of a National Park by a person cannot occur after work on a weekday.
4. As indicated in Figure 6, crowding is not viewed as a constraint. Rather, crowding variables are considered endogenous variables unless crowding control variables are introduced administratively as indicated in Equations 41 and 42.
5. See operations policy directive - on the use of overflow campgrounds.
6. Parks Canada does not presently exert specific controls on the number of users in wilderness areas such as the "controlled" maximum number on a trail that the U.S. Park Service uses at Yosemite National Park.
7. The work presented in TN 16 has been greatly extended by Ontario and includes definitions of capacities for a number of activities.

APPENDIX

The reader may find it interesting to note why some of the exogenous variables that have been listed (see Figure 5) have been indicated. In particular, he may be surprised to find out that all of these are exogenous variables that have influenced the development of Kejimikujik National Park. Specifically, the extension of a four-lane highway south from Halifax, which has been carried out independently of the development of Kejimikujik National Park, does have a tremendous impact on the accessibility of the park both for people who do not come from Nova Scotia and for Halifax residents who wish to go to the park.

Development of facilities outside the park independent of development in the park is a catch-all for impacts that could have, or did occur. Certainly one can refer to the development of the highway, cited as 1.1, as falling under 1.2 but a development which is much more in the spirit of what is referred to would have been the development of a new national park which at the time it was being considered was to be called Ship Harbour National Park. Negotiations on this park proceeded to the point of placing a land freeze on the land that was to be used for development of the park and it was only as a result of a great deal of public pressure that the Ship Harbour Park was not created. Had this park been created, the many users of Kejimikujik who come from Halifax would have had a place they could go which was much closer to Halifax and consequently, a drastic shift in the use of Kejimikujik National Park could have been expected.

Exogenous variables 1.5 and 1.6 refer to weather conditions and pest conditions that are well known to users of the Atlantic Region National Parks. Actually, one year in the Maritimes may be lovely then several years of bad weather can serve as a real discouragement to people who make their plans and go away for a holiday, only to end up having 2 weeks of rain. Similarly, the infestations of bag-worms in Kejimikujik National Park in 1973 and 1974 have left many people with an impression of the park that guarantees they will choose to go somewhere else where they will not continuously be wondering if one of these pests will fall from a tree onto them or into the food they are preparing.

Variable 1.7 points up the importance of policy decisions, such as a freeze on campground development in determining what use is made of a given national park. The preceding discussion has pointed out that original plans for Kejimikujik involved 1,000 campsites being built within the park. Obviously a policy decision that has held down the campsite development to 330 campsites has had an influence on the amount of use that has occurred at the park. However, in stating this, one must recognize that the decision to freeze campground development was not an endogenous decision based on lack of use; it was an exogenous decision based on considerations of the best ways to achieve regional development objectives.

Similarly, one can expect administrative policies affecting the amount and quality of beaches and wilderness to affect the use of National Parks. Here again, it is important to note that the decisions referred to are not decisions in response to present use, but management decisions based on considerations external to the particular park.

The variables listed as 1.8 through 1.10 are quite possibly the ones that would have been expected in a list of exogenous variables influencing park use. Though it is obvious that the population shifts, the national and regional economic changes and special transit activities do influence the use of parks, it should be pointed out that it is not obvious how to build these variables into a modelling framework. This is a problem that has received extensive treatment as part of the CORD Study and Technical Notes on this topic cited in the paper.