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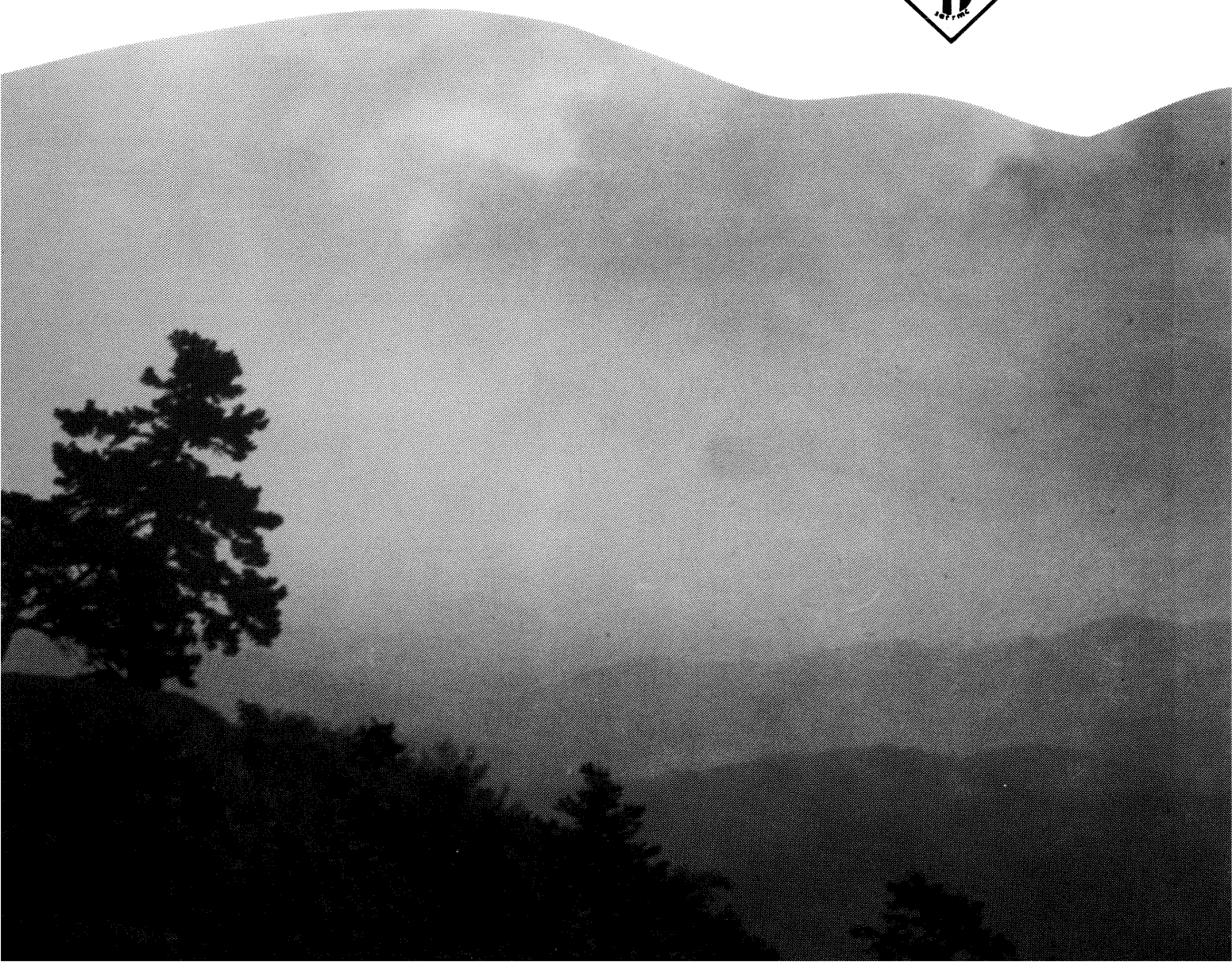

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FOREWORD

The 1991 Southeastern Recreation Research (SERR) Conference was held in Asheville, North Carolina on February 14-16, 1991. The conference was well attended by individuals from regional academic institutions and representatives from various recreation resource management agencies. The purpose of the conference was to:

1. Provide a forum to exchange information among researchers, managers and students about outdoor recreation research and/or management techniques in the Southeast.

2. Present recent recreation research techniques.

3. Discuss new directions and trends in recreation research management.

The theme of the conference was Tourism and Natural Resources. The conference began with a natural resource economics workshop chaired by Ms. Barbara McDonald and Ms. Sharon Randall and presented by Ken Cordell, Don English, Roger Clemmons of the Southeastern Forest Experiment Station. Included in the two days of events were workshops, an invited speakers session chaired by Chris Cornell and Howard Clonts, a contributed papers session chaired by Kathy Andereck and Steve Selin, and a concurrent poster session. Dan Williams, Joe Roggenbuck and Hugh Devine organized a faculty-student workshop, and Sharon Randall was responsible for entertainment. We would like to thank all session coordinators and the entire steering committee for organizing a fine conference program.

This proceedings contains papers from the contributed papers session mentioned above. The SERR steering committee decided that all presentations would be eligible for inclusion in the proceedings and would be subject to a rigorous peer review. All of the contributed papers were initially screened for inclusion in the program and then peer-reviewed post-conference by at least two reviewers whose identity was not revealed to the authors. Copies of the blind reviews were sent to the authors to aid them in making their revisions for final inclusion in these proceedings. No paper was rejected outright, but some papers were substantially rewritten prior to publication. This process has produced a proceedings with substantive scholarly content and the authors are to be commended for their dedication.

We would like to thank the Southern Appalachian Research/Resource Management Cooperative (SARRMC), the USDA Forest Service Southeastern Forest Experiment Station, the Southeast Council of State Outdoor Recreation Planners, and the University of South Alabama for their support for this thirteenth annual SERR Conference. Finally we would like to recognize the individuals listed below for their service as manuscript reviewers:

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Recreation and Tourism Monitoring Systems: Conceptual and Methodological Issues

Daniel J. Stynes[1]

Abstract. General guidelines for development of recreation and tourism monitoring systems are advanced. Monitoring programs should begin with clear purposes and intended users. Purposes provide guidance for selection and measurement of system characteristics to be monitored and criteria for evaluating a given monitoring program. Extensive research and analysis are required to support monitoring systems, particularly during the design stage. Monitoring programs should include systems for communicating with the intended clients and should be evaluated based upon the benefits to these clients. Improved recreation and tourism monitoring requires clearer purposes, a better balance between data gathering and data analysis, and much greater up-front investments in problem conceptualization and research.

Introduction

Over the past decade, many states have initiated statewide travel monitoring programs (e.g. Spotts and Holecek 1990). We also see increased monitoring of recreation use and environmental and social conditions within parks (Chilman and others 1990). While sometimes drawing loosely from systems theory, control theory, measurement theory, cybernetics, information systems and forecasting, the field of monitoring lacks general conceptual or theoretical foundations. Recreation and tourism monitoring has been particularly ad hoc with the distinctions between monitoring, measurement, evaluation, and forecasting not always clearly drawn.

In spite of frequent use of the word "monitoring" in recreation and tourism today, systematic monitoring programs are hard to find. Recreation and tourism organizations gather many kinds of data on a periodic basis in order to comply with various internal and external requirements. The most common monitoring efforts are for internal management accounting, e.g., systems for monitoring budgets, sales, personnel, and inventory. Although I won't directly address these kinds of monitoring systems here, they provide good models for application to other areas of monitoring, and give management personnel a general understanding of the potential costs and benefits of monitoring programs. These systems also represent an underutilized source of data for broader monitoring efforts.

Monitoring is increasingly advocated as a way to address broader management, planning and research problems within recreation and tourism. Many one time efforts, however, have been sold as monitoring studies and many decisions have been postponed or avoided by the phrase, "We are monitoring the problem". "Monitoring" has a ring of being on top of things, even when we are not. Formal monitoring programs offer great promise for management, planning and research. However, there also exist pitfalls and opportunity costs of making long range commitments of resources to data gathering programs, without a clear understanding of what needs to be monitored and why.

My purpose in this paper is to provide general guidance and direction for recreation and tourism monitoring programs, drawing from a review of monitoring concepts, theory, and programs from other fields and an assessment of current recreation and travel monitoring efforts. I will focus on general principles and foundations for monitoring programs rather than the nuts and bolts of particular systems.

Definition and Purposes of Monitoring

Monitoring is the systematic and periodic measurement of the state of a system. The basic elements of a monitoring program are therefore: (1) definition of the system to be monitored, (2) identification of the characteristics (states) of the system that are of interest, (3) the specification of procedures for measuring these characteristics, usually by means of systematic and consistent protocols, and (4) some indication of the time intervals at which measurements are to be made.

A simple example of a monitoring system is the household thermostat. The house is the system and the characteristic of interest is temperature. The

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measurement procedures involve a temperature sensitive device that can turn an electrical switch on or off. This monitoring is continuous and automated. The thermostat both monitors and controls temperature in the house by turning the furnace or air conditioner on or off when the temperature falls above or below some preset threshold.

Purposes

The thermostat example illustrates that information from a monitoring procedure is an input to some decision making process, in this case an automated one. While not part of the formal definition of monitoring, the decision process and purpose provide the rationale for monitoring and are therefore essential to the design of a monitoring system. The purpose of the household thermostat defines the appropriate system (the house), what characteristic of the system should be monitored (temperature), how it should be measured (in one or several locations), and how frequently. If the purpose is only to maintain household temperature within a given range, we have one system. If we add energy efficiency as a purpose or divide the house into subsystems (rooms), a different monitoring system may be called for. If we add an objective of economic efficiency we also need to know about the costs of a specific monitoring system relative to its benefits.

As we see, it is difficult to design or evaluate a monitoring system even for the simple problem addressed by the household thermostat without clear purposes. Also essential is some knowledge of the behavior of the system being monitored; in this case knowledge of air circulation patterns, heating system characteristics, and preferences and lifestyles of household members.

Different purposes of monitoring are suggested by words that often accompany the term. Thermostat type systems are often labeled "monitoring and control" systems. Other terms that often accompany "monitoring" and suggest its purpose are "forecasting", "evaluation", "research", and "inventory". Monitoring in tourism is frequently linked to forecasting of demand or to evaluation of marketing strategies and performance. In the forecasting context, monitoring is a means of tracking systems we are unable to forecast, or for identifying historical patterns and establishing a data base from which forecasts may be derived. When used with "evaluation" and "research", monitoring generally implies an on-going program, with periodic assessments or longitudinal investigations acknowledging change over time.

Inventory and monitoring

Within natural resources, the term "monitoring" frequently appears with the term "inventory", as part of inventory and monitoring programs. Here the inventory constitutes "baseline" measurements and monitoring implies these measurements will be repeated periodically to update the inventory. The term "inventory" seems to be the least helpful of the terms that accompany "monitoring". Unlike the other companion terms mentioned above, the word "inventory" provides little guidance about what characteristics should be monitored or by what criteria a monitoring program should be evaluated. "Inventory" suggests no clear purpose beyond the act of counting.

Further, an inventory usually implies a comprehensive count, which is impossible in all but the simplest of situations. Even if a complete baseline inventory is possible, the monitoring of all variables that are inventoried, is almost always neither desirable nor practical. Inventories generally do not reveal much about dynamics of systems or relationships among variables, essential ingredients in the design of efficient monitoring systems. Further, when monitoring is tied to inventory work, there is a tendency to first complete the inventory before addressing monitoring. Unfortunately, comprehensive resource inventories are often never completed and hence the monitoring part of such programs may never materialize. Even if it does, the inventory generally provides very limited information for the design of a monitoring system. It seems that inventories are more likely to lead monitoring astray than to provide useful guidance.

Monitoring is essentially an applied activity, which must therefore be guided by a clear understanding of the purposes that monitoring is to serve. Programs that monitor for the sake of monitoring or with some possible unanticipated or undesignated future use in mind are usually doomed to failure.

Elements of a Monitoring System

In the following sections four essential elements of a monitoring system are discussed. Monitoring systems should begin with a clear purpose, which guides the choice of characteristics to be monitored, how they will be measured, and how often. Periodic and systematic measurement is the core of a monitoring program. Completing the monitoring system requires procedures to analyze the data that are gathered and finally to communicate these data as information to the intended users. We discuss these four components in general terms, while also drawing observations for recreation and tourism monitoring systems.

Purposes, Users, and Uses

Monitoring

As monitoring is fundamentally an applied activity, a monitoring system should have well defined purposes, uses, and users. Ideally monitoring systems should be clearly linked to specific decisions. The purpose of monitoring, like forecasting, is to improve decisions (Martino 1972). This provides the criteria for evaluating a monitoring system. Do the benefits of a monitoring system (improved decisions) exceed the costs?

At least six potential uses of monitoring systems can be identified from the literature: (1) surveillance and detection, (2) regulation and control, (3) trend identification and forecasting, (4) resource allocation, (5) evaluation, and (6) scientific research. These purposes overlap considerably.

Surveillance and detection--Smoke alarms and a host of other security and warning systems are used to detect some condition or change in state. When the condition is detected, a signal is sent so that some action can be taken. Within recreation, the "limits to acceptable change" (LAC) approach (Stankey and others 1985) to recreation carrying capacity suggests a monitoring system of this sort. However, with the exception of standard security systems, formal monitoring programs whose purpose is primarily detection are not yet that prevalent in recreation and tourism. Such systems will likely increase as recreation and tourism managers identify conditions that are important to detect and research identifies efficient means of doing it. A recent proposal for monitoring sound levels in parks and wilderness areas is a good example (Dunholter and others 1989).

Regulation and control--Regulation and control is a quite general use of monitoring. As illustrated by the thermostat, control systems usually monitor one or more state variables and use this information to take appropriate actions to adjust or steer the system toward some desired state or perhaps to keep the system behavior within tolerable limits. Control systems may be fully automated, like the thermostat. More commonly, monitoring information is provided to a decision-maker, who decides what, if any, course of action may be required. For example, the Federal Reserve Board adjusts interest rates and the money supply based upon its evaluation of regularly reported economic indicators and other factors. Automated control systems require a clear understanding of the system's behavior, along with the ability to translate this knowledge into control procedures. Monitoring systems that are used for regulation or control must be designed to meet the specific needs of the decisionmaker or automated control procedure. In particular, monitoring information must be timely, taking into account lag times in processing the information and lead times to implement a control procedure.

Forecasting--One of the most common uses of monitoring in recreation and tourism is to identify trends in use and to forecast future demand and use. Monitoring has frequently been raised as a solution to problems encountered in forecasting recreation and travel demand (LaPage 1980). Historical trend data is usually found to be too inconsistent to identify clear trends that might be extended using time series methods and structural forecasting models based on cross sectional data are usually found to be just as inaccurate (Stynes and others 1980). More consistent monitoring of use can help in identifying trends, while also providing a consistent time series of observations from which improved forecasting models can be estimated. The monitoring of recreation use, sales, or visits likely accounts for the majority of existing monitoring within both recreation and tourism. Federal, state, local and private providers are increasingly establishing more consistent use measurement and

reporting procedures. Uses of this information to date have been more for financial accounting or justification of programs, although applications to trend identification, control, marketing, management, and other problems are growing.

Resource allocation--Monitoring can be used to allocate resources across spatial or organizational units. Resource allocation is a form of control that also typically involves some sort of evaluation. Individuals or units that perform well can be rewarded and resources can be reallocated to where they are most needed based on monitoring information.

Evaluation--In both the planning and program analysis literature, monitoring is frequently recommended in conjunction with evaluation. Monitoring can be used to evaluate the implementation of a program or its impacts over time. Rossi and Freeman (1982) recommend that program implementation monitoring should cover both program coverage (Does the program reach the intended targets?) and program service (Do the delivered services match what was intended?). In assessing impacts of a program, monitoring helps to establish baselines and to trace changes before, during, and after a program. Program objectives or standards provide guidance on what should be monitored. A model or theory of how a program is supposed to work is often helpful in designing a monitoring system for evaluation purposes. Meis (1990) discusses the role of monitoring in evaluating the performance of recreation resource management agencies.

Scientific research--Scientific research is an important and often demanding user of monitoring information. Recreation and tourism research has been criticized particularly for its lack of longitudinal studies and understanding of change (Stynes and Driver 1991). Monitoring can surely contribute to improving the state of affairs, but we must recognize that research has quite specific data needs, that must be clearly identified at the start.

Clients and Users

Hand-in-hand with identifying purposes of a monitoring program is the identification of clients or users of monitoring information. Potential users (clients) of recreation and tourism monitoring systems fall into four general categories : (1) consumers including the general public, (2) recreation and travel providers, (3) planning, coordinating and policy-making groups, and (4) researchers. Recreation monitoring systems have been directed principally at managers or have been part of research programs. State travel offices seem to be responsible for much of the recent interest in tourism monitoring, although broader research and marketing audiences are also involved.

In recreation and tourism, consumers and the general public are not often directly considered as clients for monitoring programs, although there are numerous instances where this is the case. Regular reporting of snow, traffic and weather conditions along with campsite availability and the like are monitoring programs aimed at consumers. Quality rating services that include regular inspections and updating are also monitoring systems. These are good examples of systems that are useful for both management and consumers. Tourism providers have tended to pay more attention to the consumer's information needs than recreation providers. Often annual reports of budgets, visitors served, economic impacts and the like are also aimed at various publics.

There is a tendency toward multi-purpose, multi-user monitoring systems within recreation and tourism. While such systems offer potential efficiencies, I think many of these systems are premature. Such systems must carefully consider the distinct needs of different users/uses in the design of the system if they are to serve any particularly well. Intended uses should be planned into a monitoring system from the start. In trying to serve a very general, undesignated audience many state travel monitors do not serve any particular users or uses very well. Most cannot be validly used for evaluation of travel promotion (although this is a frequent use) and are not sufficiently desegregated for resource allocation decisions. While undesignated but anticipated research uses of these data are often advanced in support of monitors, the data assembled in such programs often do not meet the specific needs of forecasting models or other scientific research.

Measurement

Measurement is the second key component of a monitoring system. One of the most important decisions in the design of a monitoring system is the selection of appropriate variables and measures of these variables. As there are an infinite number of variables that could be measured for almost any problem, some subset of the most relevant and useful variables must be chosen based on the intended application or purpose.

Within recreation and tourism there is not wide agreement on what variables should be monitored or how. This makes the design of monitoring systems difficult. Lacking agreement, there is a tendency to adopt any convenient variable or all available variables, particularly when the purpose and scope of a monitoring effort are not adequately defined. Efficient monitoring systems are based on a good understanding of the system being monitored. In many recreation and travel monitoring situations, we simply do not yet understand the system sufficiently to decide what to monitor or how. This argues for a strong up-front research component of recreation and travel monitoring efforts.

Indicators and Indices

One way of dealing with the "too many variables" problem is the development and use of indicators and indices. These attempt to summarize the states of complex systems via a few key variables or indexes . Indicator development has been a key part of many environmental (Inhaber 1976), social (Andrews and Withey 1976) and economic (Moore 1990) monitoring programs. Limited work on recreation or travel indicators has been carried out.

Indicators can be single variables that are especially revealing or sensitive, as for example the use of particular organisms or "indicator species" to signal the presence of contaminants in the environment (Worf 1980). Machlis and Wright (1984) propose the use of social indicators to monitor ecological changes. Indicators are selected based on their ability to accumulate, integrate, or magnify characteristics of interest. For recreation and tourism, individual parks, highway segments, or parking areas may be indicators of overall activity in an area. However, research is needed to identify and validate such claims.

When scientists cannot find naturally occurring indicators, they often develop their own. Environmental, social and economic indices are developed from many variables. Such indices attempt to reduce a large quantity of data to a simple form, while retaining the information essential to the proposed use of the index. Air and water quality indices, the Dow Jones Industrial average, and a host of quality of life measures are examples of indices that can be used to monitor the state of complex systems. As with monitoring more generally, Ott (1978) notes that indices must be developed with a clear purpose, and this purpose must be respected in applying the index.

The identification of indicators and indices needs to be a much stronger part of recreation and tourism monitoring programs. This is one of several areas where research to support the development of monitoring programs is needed.

Measurement Alternatives

In addition to identifying the variables of interest, monitoring requires a systematic means of measuring them. Any of the usual measurement methods may be used in a monitoring program, i.e. surveys, physical instruments, observation, and secondary sources. The choice of measurement technique rests upon the tradeoff between accuracy (reliability and validity) and costs. Such tradeoffs cannot be evaluated without a clear idea of who will make what decisions as a result of monitoring information. The repeated nature of monitoring also requires consistency in measurements over time, generally increasing costs. Careful evaluation of costs relative to benefits are even more important in monitoring, than for one time measurements. This again justifies more extensive up-front research to achieve efficiencies in a monitoring system. A good example of research to support the development of a recreation monitoring program is van Cleave and others (1990). In this study, instrumentation, measurement protocols and costs of alternative systems are all evaluated in the field to guide the design of a trail monitoring program.

Particular purposes of a monitoring program may impose additional requirements, for example, regarding the timeliness of information. Early warning systems are of little use if warnings are not issued in time for clients to take the appropriate action. In tourism, although marketing decisions often dictate the timing of monitoring information, few existing systems put information in the hands of marketing personnel in time to adjust the marketing mix before the end of the season.

As many recreation and tourism monitoring efforts to date have been of the "quick and dirty" variety, secondary data sources are frequently used, in spite of well known limitations of these data for measuring tourism activity (Tyrrell 1985). Monitoring systems that combine secondary and primary data are recommended. Secondary sources can provide regular measurements relatively inexpensively, with primary data gathered to fill gaps, adapt the data to a particular use, and correct for known problems. This leads to the third part of a monitoring system, analysis.

Analysis

The third and perhaps most neglected component in recreation and tourism monitoring systems is analysis. Recreation and tourism monitoring tends to have a poor balance between data gathering and compilation relative to data analysis. There are a host of both simple and more complex types of data analyses that should be considered within recreation and travel monitoring systems. Examples include the use of price indices, population change adjustments, Z-scores and other data transformations, seasonal adjustments, weighting data from non-representative samples, and adjusting for outliers, missing data and other problems. Such analyses are an important part of the subsurface necessary to support a sound monitoring program. These kinds of analysis are difficult to find in many recreation and travel monitors.

A number of more complex analyses are also dictated by some of the unique problems of tourism data, such as the contamination of most secondary indicators of tourism activity by local activity. A variety of secondary economic series (sales, sales tax and employment) are routinely advanced as tourism indicators. These are generally not adequately supported by studies to determine the validity of such series as measures of tourism. The percentage of these economic measures attributable to tourism is generally unknown and there is limited understanding of how this percentage may vary across particular sectors, time or space.

More complete analysis of data that are used in recreation and travel monitors is called for. More thorough and complex analyses can improve the quality and detail of the information provided, but it also tends to build in assumptions of the analyst. All but the simplest of monitoring systems involve a number of built-in and often hidden assumptions. For example, many travel monitors are sensitive to shifts in travel mode, length of stay, choice of accommodations, or spending patterns. If the volume of tourist activity is monitored by means of local sales taxes, lodging occupancy rates, nearby state park visits, or a local traffic counter, assumptions are being made about how these available indicators relate to tourist volume. If these structural assumptions are not periodically evaluated, the travel monitor can be both inaccurate and misleading. For example, an increase in the monitor's estimate of tourist volume could be due to changes in sales tax rate, prices, lodging's share of the market, change in lodging capacity, state park fees, weather, transportation mode, traffic patterns, or size of the resident population. Because of these problems, some tourism monitors (e.g. Spotts and Holecek 1990) have opted to provide much of the related data in relatively unprocessed form and let the user interpret and evaluate it.

Comprehensive monitoring systems are somewhat like icebergs, with most of the structure beneath the surface. It is the part that lies beneath the surface that keeps the iceberg and the monitor afloat and imparts stability. Recreation and travel indices lack the uniform system of accounts that support good economic indicators and help avoid problems of double counting and bias. We also lack a good understanding of the relationships among variables that is essential for proper sampling and weighting in index construction. Tourism indices often reflect a "kitchen sink" approach, with all available measures thrown together and reported individually or as a gross "average". Such indices depend excessively on the law of averages holding more strongly than the "one bad apple" principle.

In addition to more complete and appropriate analysis of the data presented in a monitoring system, a strong supporting research program is necessary to: (1) answer questions that arise in the design of the system, (2) test the reliability and validity of the system, (3) evaluate and refine the system over time, and (4) fully utilize the data that are gathered. Research is particularly crucial during the design stage, yet few recreation and tourism monitors are supported by much research. The less we know about a system, the more difficult and expensive it is to monitor its state.

Communication/Delivery

The final component of a monitoring program is a system for communicating the information to intended users. For the information provided by an indicator or monitoring system to be used and useful, it must be communicated to the intended clients in the right way at the right time. There are a host of important questions here, many requiring research and evaluation studies to decide on appropriate systems for communicating with the intended clients and delivering the intended product/service. The level of complexity, degree of detail, format, and media for conveying information must be tailored to the client or clients needs. The information needs of scientists are quite different from those of recreation and travel providers, which in turn are different from those of consumers. Even when there are common information needs, the form in which information is communicated to different audiences may be quite different.

A common problem in communicating monitoring information to decisionmakers is reaching a suitable compromise between simplification and oversimplification. This is particularly the case in developing indicators and indexes. Is it sufficient for the user to know that tourism is "up" or "down", however that may be interpreted, or should the monitor clarify what is happening with person trips, party trips, visitor days, spending, or room nights? Is tourism up relative to last month, this month last year, or on a seasonally adjusted basis? How much is it up? In relative or absolute terms? Where is it up? Does it matter if it is down in 3 of 7 regions, or within 5 of 11 market segments? How much of this detail does a given user need? How much must he or she understand to appropriately use the information? Is the information most clearly presented in a table, a graph, a pie chart, a 1-10 scale, as a percentage increase over the last period, or relative to some base year? Which base year? The communication element of monitoring has not received much attention in recreation and tourism.

Effective monitoring systems will include opportunities for system users to provide feedback about the monitoring system. For a monitoring system to survive it must provide useful information to the intended users on a continuing basis. This objective is easiest to evaluate when users are clearly identified. Given the dearth of regularly reported information on recreation and tourism, the users and uses of recreation and travel monitors often go far beyond the original intent. While this fact is often advanced as a benefit of such monitors, one needs to evaluate whether the planned and unplanned users are interpreting and applying the information correctly.

Recommendations and Conclusions

Monitoring offers great promise for recreation and tourism. Monitoring directs needed attention to systematic and consistent gathering of information over time. Such information is crucial to documenting trends, and provides a basis for understanding change. Ideally, monitoring should also direct attention to important measurement questions and help to link data gathering more directly to management and research questions. Understanding of the important questions (decisions) and what data are needed to answer (make) them is a prerequisite to useful monitoring. Premature institutionalization of monitoring systems that are not directed efficiently at the important questions could waste data gathering and research resources.

There are three ways that we can improve monitoring of recreation and tourism: (1) start with clearer purposes for monitoring, (2) learn from monitoring in other fields, and (3) pay close attention to special characteristics of recreation and tourism.

Many improvements in recreation and travel monitoring can come from simply clarifying the purposes of monitoring. Relative to tourism

monitoring, for example, Mal Bevins has made the distinction between a barometer and a thermometer. A barometer serves as an indicator of likely future conditions while a thermometer is a measure of current conditions. Many travel monitoring systems that only measure present or past levels of travel activity are called "travel barometers". True travel barometers would report indicators of future recreation and tourism activity, i.e. leading indicators. The problem here is a lack of clarity about the purposes of such systems. Are they to be used as measures of past levels of activity or as future indicators? If the latter, we should learn from the extensive work of economists in developing leading indicators (Moore 1990).

We can improve recreation and travel monitoring by applying what has been learned not only in economic monitoring, but also in social, physical, biological, and environmental monitoring. Some of our travel monitoring systems bear a surface resemblance to counterparts from economics and environmental quality, but often lack similar foundations. Key lessons from monitoring in other fields include being selective in what is monitored, using indicators and indices to simplify and focus monitoring efforts, and investing adequate resources up-front in research and development of monitoring systems.

While we can learn a great deal from monitoring in other fields, there are also a number of somewhat unique attributes of recreation and travel that need to be carefully considered in developing our own monitoring programs. Recreation and tourism are umbrella terms for a rather diverse array of activities, markets, and market segments. What we are monitoring must be carefully defined and operationalized. This requires some delimitation of what the terms "recreation" and "tourism" encompass. Monitoring systems will be more clearly defined if the words "recreation" and "tourism" are used as modifiers of nouns like activity, trips, supply, investment, spending, quality, and the like. Perdue and others (1990), for example, propose a system for monitoring travel expenditures.

Travel is an essential part of recreation and tourism, and introduces an important spatial component. Consideration must be given to monitoring of origin conditions versus destination conditions versus en route conditions. Most recreation and travel monitoring has focused on monitoring activity at travel destinations, along with selected en route indicators (mostly traffic counts). These measures reveal little about what is happening at the sources, where most travel promotion is directed. Improvements in monitoring of changing conditions at origins and en route need to be considered as part of more comprehensive monitoring systems.

It is increasingly important to capture dimensions of quality, not just quantity, in recreation and tourism monitoring programs. Both consumer and management decisions are increasingly concerned with quality. Monitoring of customer satisfaction is one "bottom-line" approach (Williamson and others 1990). Advances in the measurement of service quality should be considered in monitoring recreation and tourism quality (Mahoney and Warnell 1990).

Progress demands that monitoring programs involve more science and less politics, and devote as much attention to research and data analysis as to data gathering and compilation. In conclusion, I would advance six recommendations for improving recreation and travel monitoring:

1. Start with a clear purpose for monitoring and clearly defined users and uses of the information to be provided. Involve the intended users early in the process of developing a monitoring system or it is unlikely to meet their needs. Translate users and uses into concrete decisions that the information will be used to make.

2. Invest considerable resources up-front in monitoring system development. Allow for several years of research and development for comprehensive social, economic and environmental monitoring systems. These investments will pay off later in a better system and reduced costs. Development costs are one-time, while operational costs will continue for the life of the program.

3. Once a system is operational, time and effort that goes into substantive analysis, evaluation, and on-going research in support of a monitoring program should at least equal the time and effort devoted to routine data gathering and compilation.

4. Realistically evaluate the costs relative to the benefits of alternative monitoring systems. Beware of making unrealistic assumptions about possible future users and uses or the interests of these hypothetical users in supporting the costs of the program.

5. To survive, monitoring programs must be efficient and responsive to the needs of users or clients. Monitoring implies an open ended future commitment of resources by someone. It is best if this commitment is institutionalized, to include clear systems for communicating with intended users and feedback systems to ensure the system is meeting the intended purposes.

6. Finally, I recommend greater attention to more narrowly defined monitoring systems with specific purposes. There is a tendency in recreation and tourism to propose comprehensive, multi-user and multi-purpose systems without first tackling more modest goals. Systems for monitoring use of an individual park, tourist traffic in an area, recreation site quality, and the like should be worked out before moving toward more comprehensive systems.

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Economic Impacts of Recreation and Tourism: Segmentation as a Means of Reducing Variance in Visitor Spending Profiles at Corps of Engineers Lakes

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Abstract. The purpose of this study is to segment recreationists into groups which are homogeneous with respect to their spending patterns and trip characteristics. Data were derived from a larger study aimed at developing nationally representative expenditure profiles for recreation visitors to Corps of Engineers projects. Segmentation of these data reduces variance and helps identify distinctive final demand vectors for input output applications. A-priori and cluster analysis approaches for identifying segments are compared. The a-priori segmentation approach identified 12 segments and the cluster analysis approach identified 3 segments. The three nonresident clusters - labeled "day use", "overnight boating", and "overnight camping" - show lower mean squares within groups than the a-priori segments on almost all nonresident spending categories with an exception of boating expenses. For the Corps of Engineers, implications of these findings for the estimation of economic impacts are discussed.

Introduction

Economic impacts of outdoor recreation have continued to grow with increasing participation in outdoor recreation activities (Alward 1986). There are two types of such impacts. The primary economic impacts on a region's economy are from initial outdoor recreation users' expenditures. Secondary economic impacts on a region include changes in business output or sales, employment, net income, tax revenue, and government spending resulting from the primary spending. Through these two types of economic impacts, it is possible to estimate the contribution of outdoor recreation to a region (Propst and Gavrilis 1987; Mak 1989).

There are two challenges in estimating the economic impacts of recreation: 1) collecting reliable spending and visitation data, and 2) conducting appropriate analyses to provide valid impact estimates. An initial attempt to meet these challenges was the 1985 Public Area Recreation Visitor Survey (PARVS). The PARVS was a coordinated multi-regional data collection effort among federal and state agencies. A primary objective of the PARVS was to obtain nationwide information about the use of public recreation areas. Another important objective was to generate the spending data needed to estimate the economic impacts of visitors to public recreation areas (Alward and Lofting 1985; Propst 1988). Through revisions of the PARVS design, the Corps of Engineers Recreation Spending Study (CERSS) was developed. The primary purposes of the CERSS are 1) to estimate total resident and nonresident recreation expenditures associated with Corps of engineers projects, 2) to develop a representative set of spending profiles for visitor segments that are homogeneous with respect to spending patterns, and 3) to derive regional I/O models to estimate economic impacts (Propst and Stynes 1988).

Problems

There have been a substantial number of recreation spending studies, but most are not focused on applying economic impact analysis. They typically describe aggregate or total visitor spending rather than estimate employment and income effects (Henderson and Cooper 1983; Rose 1981; Jordan and Talhelm 1985; Stynes and Mahoney 1986).

Input-output (I/O) models are used to derive the regional economic impacts of recreation industries or activities. However, the credibility of these impacts has been questioned (Petersen 1990). Possible reasons for inaccurate estimates of impacts include a lack of: 1) detailed estimates of recreation use and 2) accurate estimates of user expenditures. These two variables are the basic components for deriving recreation expenditure profiles used in I/O analysis. For example, Micro-IMPLAN, an I/O analysis system in common usage, requires input in the form of "vectors of final demand". In the case of recreation, a final demand vector consists of spending means for various goods and services

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multiplied by the total visitation to a given resource (Twirl 1985):

Final Demand Vector
for Recreation = Total Visitation * Average Recreation Spending

Average recreation spending often displays high variance because: 1) recreation products and services are diverse and 2) spending for goods or services often includes many zeros and extremely large outlawries. Segmentation of recreationists is one way to reduce variance and to identify more realistic and distinctive spending profiles (Stynes and Chung 1986). This is because segmentation can produce groups which are homogeneous with respect to their spending patterns. Thus, final demand vectors can be derived for various segments and generalization across populations can then be made on the basis of a given mix of segments. To illustrate, local day users and nonresident overnight users on extended trips are two distinct segments that clearly have unique spending patterns and vary greatly in terms of total amounts spent. Combining these two segments merges significant reports of zero spending (day user) with a number of large outlawries (long trip overnight nonresidents), thereby increasing variation about the mean. Splitting the sample into two segments that are more homogeneous with respect to their spending patterns reduces the variance in each group.

It is assumed that economic impact results may be sensitive to the formulation of "final demand" specifications, which, in turn, will depend upon the segmentation of recreationists. Therefore, the research question is: How should recreationists be segmented so that the vectors of final demand can be produced with the least amount of variance? Since these vectors are key requirements of I/O software, such as Micro-IMPLAN, this question is central to assuring accurate economic impact estimates.

Study Objectives

The primary aim of this paper is to test methods for segmenting recreationists based on activities, origins, duration, spending, and other trip characteristics. In this way, the study seeks to provide a segmentation analysis method for I/O applications. This paper deals only with variable trip costs for nonresidents, not durable goods expenditures or expenses incurred by local residents.

Methods

During the summers of 1989 and 1990, visitors to 12 Corps lakes nationwide were sampled (Propst and others 1991). A two-step procedure involving both on-site interviews and mail back questionnaires was employed. Spending for durable goods (e.g., boats and recreation vehicles) and trip characteristics (e.g., length of stay) were measured in conjunction with the on-site interview. Spending for non-durable, trip related goods and services (e.g., food, gas, and lodging) was measured through a mail back questionnaire distributed to the on-site interview respondents at the completion of the interview.

Two segmentation approaches were used to define visitor segments: 1) an a-priori approach and 2) a statistical approach. The a-priori approach involved consultation with Corps staff and a review of literature, which identified 4 key variables needed to describe water-based recreation segments that are homogeneous with respect to their spending patterns. These 4 variables are: camping participation, boating participation, duration of stay, and visitor origin.

As a statistical approach, cluster analysis was used to form visitor segments based on one or more similar criteria, such as the respondents' spending patterns. The intent was to identify clusters that show high internal (within cluster) homogeneity and high external (between clusters) heterogeneity. Cluster analysis groups all possible pairs of individuals/objects based on their distance from each other in terms of various statistical properties. Methods commonly used for measuring distance for cluster analysis are: 1) Euclidean distance, 2) Squared Euclidean distance, 3) Manhattan or city-block distance, 4) Minkowski distance, and 5) Mahalanobis D^2 (Norusis 1986). Euclidian distance is the most common approach.

It is important to standardize criteria variables before running the cluster analysis because attempting to group variables that are scaled

differently or vary in units of measure will otherwise lead to confusing and misleading results. Grouping procedures used in the cluster analysis are identified as: single linkage (nearest neighbor), complete linkage (maximum distance or furthest neighbor), average linkage (average distance), Ward's distance (minimum variance), and the centroid method (distance between means) (Norusis 1986).

Although cluster analysis seeks to group relatively homogeneous sets of individuals/objects without requiring any prior classification of the sample, there are a number of theoretical concerns. First, cluster analysis is not supported by an extensive body of statistical reasoning or rationale. Second, different clustering methods may generate different solutions within a single data set. Third, it is often hard to interpret the result of cluster analysis (Aldenderfer and Blashfield 1989).

The present analysis utilized a Quick Cluster Procedure in SPSS PC+. This procedure can be used to cluster large number of cases efficiently without requiring substantial computer resources. The rationale is based on nearest centroid sorting (Anderberg 1973) where a case is assigned to the cluster for which the distance between the case and the center of the cluster (centroid) is smallest.

The cluster variables included: the 4 variables which were used in the a-priori segmentation approach, total average spending per party per trip, and average spending on each spending category per party per trip. In addition, raw spending variables and transformed spending variables were tested. Thus, the final cluster variables were nine spending categories which consisted of variable trip costs for: 1) lodging, 2) food and beverage, 3) auto and R.V, 4) boats, 5) fishing, 6) entertainment, 7) miscellaneous[2], 8) other[3], and 9) average nonresident trip spending within 30 miles of the study areas. Nonresident spending was selected because I/O analysis usually requires vectors of final demand which represent injections of new money into a study region. The mean squares within the 9 variables were compared using the two segmentation approaches described earlier. Since the raw data had many zeros in each spending category and some large outlawries, log transformations were performed. Everitt (1980) recommends a log transformation when the normality of variable is in question.

[2] Camera film, video type purchase and developing, souvenir and gift, footwear, and clothing.

[3] Haircut, perm, laundry and the like, physicians, dentists, hospitals, and other expenses not listed in the questionnaire.

Results

Over 3,100 on-site interviews and 2,100 mail back questionnaires were collected. The overall response rate across all 12 lakes was approximately 70 percent with several lakes generating response rates in excess of 80 percent (Table 1).

When parties who spent zero on their trips are included, average variable trip spending ranged from $105 per party/trip at Lake McNary (Washington/Oregon) to $498 per party/trip at Lake Cumberland (Kentucky) (Propst and others 1991).

The a priori segmentation approach using 4 different segment variables identified 12 segments. The four variables used to define visitor segments were measures of participation in camping and boating activities, duration of stay, and visitor origin. These variables were selected to describe water-based recreation segments thought to be homogeneous with respect to their spending patterns.

An average of 61 percent of all visitors to the 12 lakes in the sample were boaters. For individual lakes, the percentage of boaters ranged from 25 percent at Lake Mendocino to 91 percent at Lake Dworshak. Nearly half (47%) of all visitors were nonresidents. Lake Cumberland, located in a rural tourism region, had the highest proportion of nonresident visitors (78%). Priest Lake, located partially within the City of Nashville, received 13 percent nonresident visitation. The pattern of day vs. overnight visitors reflects the difference in visitor origins, with Lake Cumberland having the highest proportion of overnight users, and Lake Priest the lowest. Other lakes in the sample show similar patterns, with a high proportion of

nonresident visitors associated with a high proportion of overnight visitors, and vice versa.

All four variables were recoded to dichotomous values: "0" (no) or "1" (yes). For example, a "0" for camping participation identifies the party as non-campers, whereas a "1" identifies the party as having camped. Likewise, a visitor origin of "0" identifies a party whose permanent residence was more than 30 miles from the lake.

This a-priori segmentation approach using 4 different variables results in 16 different combinations from the following formula;

$$S = C + 2*D + 4*R + 8*B$$

where, S = given visitor segment
C = camper or not a camper
D = day user vs overnight visitor
R = Resident vs non-resident
B = boater or not a boater

The visitor segment variable (S) has a range from 0 to 15. Four of the sixteen segments are illogical, and have been excluded. These excluded segments are the combination of campers (1) and day users (0). Because a camper is supposed to be an overnight user, it is illogical if the case was coded "1" (yes) for camping and "0" (no) for overnight.

Spending estimates for aggregated categories of trip-related expenses are shown in Table 4. Thirty-six specific trip expenses were combined to produce these 10 larger categories. Table 4 also displays the expenditure means and standard errors for the 12 segments. For example, overnight nonresident boaters (O/NR/NC/B) spent an average of $182 per party per trip for lodging (n=253). Also, Table 4 shows the proportion of spending that occurred within the study area (within 30 miles of the project). To illustrate, 78 percent of overnight, nonresident boater spending occurred within 30 miles of study areas. In terms of variance, standard error of mean is expressed as a percentage. For example, the standard error is 8 percent of the mean for food and beverage (M=$140). Thus, with 95 percent confidence, the true mean of food and beverage ranges between MM*2*.08 to M+M*2*.08 per party per trip, which is $118 to $162.

Using Kruskal-Wallis one-way ANOVA, the 12 segments were tested for significant differences in terms of average spending within 30 miles of the study areas. There was a significant effect overall (p=0.0000). Furthermore, based on the Mann-Whitney test, 10 pairs of segments were not significant (p=0.21 to 0.84).

Cluster analysis identified 3 clusters which are distinct in terms of frequency of cases in each group and ability to assign a distinct label. Cluster group 1 shows relatively high lodging, food and beverage, auto/R.V., and Miscellaneous expenses. Cluster 1's expenditures on lodging and food and beverage were somewhat lower than cluster group 3 which is described as overnight boaters. Cluster group 3 indicates high expenditures on lodging, food and beverage, boating, and other expenses. Cluster group 2 had the lowest average spending pattern in every category except boat and fishing expenses. This cluster can be interpreted as a day user group including day use boaters, the largest number of parties in the sample.

As a comparison of the a-priori approach and the cluster analysis approach, Table 6 presents the mean squares of the log transformed spending category averages within groups. Mean squares are indicators degree of within group variance for the 6 nonresident segments identified by the a-priori approach and 3 segments developed by cluster analysis.

With the exception of boating expenses, the three clusters show lower mean square differences than the 6 segments on all spending categories.

Discussion

The high response rates associated with this study are gratifying given the relatively low response rates in other recreation spending studies employing mail back questionnaires. Furthermore, variances on spending means, typically high in most recreation spending studies, were reduced by the segmentation procedures.

The spending data were consistent with variations in regional characteristics. That is, visitors to Corps lakes in primarily urban areas displayed the lowest average trip spending, reflecting primarily day use

activities by local residents. On the other hand, visitors to more remote, rural lakes spent higher average amounts on a per trip basis, indicating more overnight trips of longer duration.

For input-output purposes, cluster analysis is superior to analysis of variance because the entire spending profile can be considered in detail rather than just the overall mean across all spending items. Compared to the a-priori approach, the cluster analysis approach results in fewer and more simplified segments: overnight campers, overnight boaters, and day users. Furthermore, the mean squares within the spending variables for the 3 clusters are generally less than those of the a-priori segmentation approach, indicating some slight improvement in homogeneity of spending. On the other hand, the a-priori approach can provide more specific final demand vectors for economic impact analysis than the cluster approach.

Conclusions

To produce vectors of final demand for I/O analysis, average spending is multiplied by total visitation to derive total spending. This means that visitation data must be provided for the same set of segments for which average spending was measured. For the Corps of Engineers, a redesign of the use estimation procedures may be necessary. Cluster analysis of over 1,000 cases for which trip spending was measured indicates 3 broad segments of visitors sharing similar spending patterns: 1) overnight boaters, 2) overnight campers, and 3) day users. Furthermore for I/O purpose, it is essential to distinguish between residents and nonresidents. Presently, visitation data for 2 segments are routinely collected by the Corps of Engineers: 1) day users and 2) campers. "Day use" visitation figures include overnight non-campers (i.e., those who stay in hotels, with friends and relatives, at second home or on a boat). Therefore, multiplying these routinely collected, Corps "day use" visitation figures by average day user spending per trip exaggerates real day use total spending. Expanding use estimation procedures to identify boaters, overnight non campers, and nonresidents will provide more accurate estimates of total economic impacts.

The results presented in this paper have strong implications for policy evaluation within the Corps of Engineers. The use of segmentation and the existence of a reliable data base will permit generalization to other lakes which were not surveyed but which possess characteristics similar to a class of lakes contained in the study. In addition, the Corps will be able to estimate the effects of proposed new recreation developments or management scenarios in terms of employment and household income. Thirdly, the Corps will be able to compare recreation impacts to equivalent impacts of other water uses, such as commercial navigation and hydroelectric power production.

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Tables

Table 1. Survey locations, dates and mailback questionnaire response rates: Corps of Engineers national visitor spending study, 1989-90

Project Name (State)	Survey Dates	Number Rec. areas Surveyed	Number Survey Locations[3]	Sample Size On-Site	Sample Size Mailback Frame[4] A	Sample Size Mailbacks Returned B	Mailback Response Rate (%) B/A*100
	1989						
J. Percy Priest (TN)	8/10-9/4	15	15	323	308	159	52
McNary/Ice Harbor (OR, WA)	8/3-8/20	12	15	194	194	88	45
Mendocino (CA)[1]	8/24-9/21	4	12	103	100	66	66
Oahe (ND and SD)	7/23-9/14	25	25	236	233	135	58
Raystown (PA)	7/25-10/1	13	13	416	415	279	67
Shelbyville (IL)	7/21-8/6; 9/7-9/14	13	13	266	260	165	63
1989 Total		82	93	1538	1510	892	59
	1990						
Cumberland (KY)	8/4-8/20; 9/18-9/22	17	22	250	250	194	78
Dworshak (ID)	8/4-9/3	7	7	190	190	168	89
Lanier (GA)	6/21-7/28; 8/31-9/16	35	42	289	285	201	71
Milford (KS)	6/22-7/30	12	22	329	326	268	82
Ouachita (AK)	8/3-8/26	17	17	221	219	175	80
Willamette (OR)[2]	6/26-7/29	111	16	368	364	292	80
1990 Total		99	126	1647	1634	1298	79
GRAND TOTAL		181	219	3185	3144	2190	70

[1] Relatively low number of interviews due to large portion of interview period in non-peak season and loss of approximately 40 interview forms in the mail.

[2] "Willamette" includes Fern Ridge, Cottage Grove, and Fall Creek Reservoirs. These reservoirs were grouped for subsequent analyses due to close proximity and similarities in size and visitor use patterns.

[3] A given recreation area that is relatively large and/or complex (e.g., a state park) was divided into several survey locations (e.g., campground boat launch area, beach). Thus, the number of locations where interviews occurred exceeds the number of recreation areas.

[4] These are the number of on-site parties interviewed who also agreed to return the mailback questionnaire.

Source: Propst and others (1991).

Table 2. Percentage of four key segmentation variables for Corps of Engineers National Visitor Spending Study, 1989-90

Lake	Boaters	Non-Boaters	Residents	Non-Residents	Day Users	All Overnight	Campers	Other Overnight	Sample Size
McNary	45	55	77	23	69	31	22	9	194
Mendocino	25	75	29	71	35	65	56	9	103
Oahe	62	38	45	55	44	56	30	26	236
Priest	28	72	87	13	80	20	11	9	323
Raystown	75	25	31	69	31	69	53	16	416
Shelbyville	52	48	59	41	58	42	22	20	266
Cumberland	77	23	22	78	15	85	39	46	250
Dworshak	91	9	27	73	32	68	64	4	190
Lanier	61	39	76	24	35	65	37	28	289
Milford	67	33	44	56	25	75	69	6	329
Ouachita	80	20	29	71	22	78	35	43	221
Willamette	59	41	82	18	77	23	22	1	368
1989 Average	52	48	55	45	53	47	32	15	1538
1990 Average	67	27	46	48	32	61	42	19	1647
12 Lake Avg.	61	39	53	47	45	55	38	17	3185

Source: Propst and others (1991).

The 12 remaining visitor segments are:

D/R/B: day user, resident who participated in boating
D/R/NB: day user, resident who did not participate in boating
D/NR/B: day user, nonresident who participated in boating
D/NR/NB: day user, nonresident who did not participate in boating
O/R/C/B: overnight user, resident who participated in both camping and boating
O/R/NC/B: overnight user, resident who participated in boating
O/R/C/NB: overnight user, resident who participated in camping
O/R/NC/NB: overnight user, resident who participated neither camping nor boating
O/NR/C/B: overnight user, nonresident who participated in both boating and camping
O/NR/NC/B: overnight user, nonresident who participated in boating
O/NR/C/NB: overnight user, nonresident who participated in camping
O/NR/NC/NB: overnight user, nonresident who participated in neither camping nor boating

Table 3 shows the distribution of these segments across the 12 lakes.

Table 3. Distribution of Visitor Segments across 12 Corps Lakes (Summers 1989-90 Expenditure Study): Mailback Surveys

Lake	McNary		Mendocino		Oahe		Priest		Raystown		Shelbyville		Cumberland		Dworshak		Lanier		Milford		Ouachita		Willamette		Total	
	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT
Day Users																										
D/R/B	27	31	2	3	18	13	52	33	47	17	52	32	12	6	25	15	35	17	30	11	14	8	128	44	442	20
D/R/NB	21	24	13	20	23	17	73	46	16	6	33	20	12	6	2	1	34	17	18	7	7	4	70	24	322	15
D/NR/B	5	6	0	0	5	4	1	1	17	6	3	2	3	2	23	14	5	2	8	3	11	6	18	6	99	5
D/NR/NB	1	1	9	14	7	5	1	1	10	4	10	6	1	1	2	1	1	0	3	1	3	2	15	5	63	3
Overnight Users (Residents)																										
O/R/C/B	4	5	0	0	3	2	5	3	12	4	4	2	8	4	20	12	28	14	38	14	15	9	16	6	153	7
O/R/NC/B	1	1	0	0	4	3	4	3	1	0	4	2	7	4	0	0	26	13	6	2	12	7	1	0	66	3
O/R/C/NB	15	17	0	0	3	2	3	2	10	4	8	5	3	2	1	1	26	13	22	8	3	2	21	7	115	5
0/R/NC/NB	0	0	0	0	1	1	2	1	2	1	2	1	2	1	0	0	3	1	0	0	0	0	0	0	12	1
Overnight Users (Nonresidents)																										
O/NR/C/B	1	1	15	23	24	18	0	0	108	39	10	6	41	21	78	47	5	2	95	36	35	20	12	4	424	19
O/NR/NC/B	3	3	3	5	36	27	1	1	29	10	15	9	76	39	4	2	20	10	11	4	53	31	2	1	253	12
O/NR/C/NB	8	9	20	30	9	7	9	6	22	8	11	7	21	11	10	6	12	6	36	14	13	8	7	2	178	8
O/NR/NC/NB	2	2	4	6	1	1	7	4	5	2	10	6	9	5	1	1	7	3	0	0	8	5	0	0	54	2
valid cases	88	100	66	100	134	100	158	100	279	100	162	100	195	100	166	100	202	100	267	100	174	100	290	100	2181	100
missing	0		0		1		1		0		3		0		0		0		0		0		0		5	
TOTAL	88		66		135		159		279		165		195		166		202		267		174		290		2186	

Notes:
D: Day users
O: Overnight users
R: Resident (permanent home located within 30 miles of project)
NR: Nonresident (permanent home located more than 30 miles from project)
C: Campers
NC: Overnight users who stay overnight in hotels/motels, with family/friends, or on a boat
B: Boaters (users who participate in boating activities on the project)
NB: Nonboaters (users who participate in recreation activities other than boating on the project)
Source: Propst and others (1991).

Table 4. Mean trip spending by 12 segments for all 12 lakes

Segment	D/R/B				D/R/NB				D/NR/B				
# of cases	442					322				99			
Spending category	Mean	% of Category	%of zero Spending	% in Region	%SE Mean	Mean	% of Category	%of zero Spending	% in Region	%SE Mean	Mean	% of Category	%of zero Spending	% in Region	%SE Mean
Lodging	0.00	0				0.00	0				0.00	0			
Food & Beverage	16.80	22	27.4	93	8	10.48	25	35	90	9	24.11	30	22	45	14
Auto & RV	12.98	17	19	92	11	7.07	17	31	86	19	25.78	32	14	24	24
Boat	24.96	33	17.2	95	12	7.57	18	91	100	46	22.98	29	20	40	20
Fish	1.41	2	76.5	99	12	1.03	2	84	92	22	2.09	3	72	68	32
Hunt	0.38	1	99.1	95	66	0.26	1	99	100	73	0.00	0	100		
Entertainment	2.27	3	95.5	89	40	2.73	6	94	77	33	1.13	1	96	72	51
Misc.	8.45	11	82.4	75	27	10.52	25	85	74	31	3.19	4	79	28	26
Other	7.81	10	95	97	45	2.60	6	95	97	53	0.34	0	98	56	71
Total	75.06	100	2.9	92	11	42.26	100	17	85	18	79.62	100	6	38	13

Segment	D/NR/NB					O/R/C/B					O/R/C/NB				
# of cases	63					153					115				
Spending category	Mean	% of Category	%of zero Spending	% in Region	%SE Mean	Mean	% of Category	%of zero Spending	% in Region	%SE Mean	Mean	% of Category	%of zero Spending	% in Region	%SE Mean
Lodging	0.00	0				21.97	12	33.3	99	11	19.37	12	37	84	16
Food & Beverage	26.11	40	13	69	18	72.61	39	12.4	88	8	58.47	35	20	74	11
Auto & RV	13.29	20	22	43	16	27.95	15	9.2	82	9	51.25	31	10	55	38
Boat	1.14	2	91	59	42	34.38	18	23.5	81	17	0.73	0	95	97	48
Fish	0.10	0	97	100	70	5.52	3	55.6	95	27	2.17	1	73	69	29
Hunt	0.00	0	100			0.00	0				0.00	0			
Entertainment	2.62	4	94	14	71	1.83	1	94.8	46	58	2.79	2	96	95	65
Misc.	19.90	31	78	26	50	15.01	8	62.1	94	28	10.22	6	62	89	27
Other	1.73	3	91	78	53	9.31	5	86.9	82	43	20.03	12	87	93	73
Total	64.89	100	6	49	17	188.58	100	0.7	87	9	165.03	100	2	73	24

Segment	O/NR/C/B					O/NR/C/NB				
# of cases	424					178				
Spending category	Mean	% of Category	%of zero Spending	% in Region	%SE Mean	Mean	% of Category	%of zero Spending	% in Region	%SE Mean
Lodging	39.15	13	25	89	9	53.62	16	22	41	24
Food & Beverage	95.65	32	10	61	5	100.06	30	12	50	10
Auto & RV	57.21	19	6	44	6	101.65	30	10	36	16
Boat	60.60	20	18	76	13	2.67	1	96	95	63
Fish	7.06	2	55	70	16	2.57	1	74	73	19
Hunt	0.00	0				0.00	0			
Entertainment	4.52	2	86	68	23	13.67	4	75	51	21
Misc.	26.50	9	49	54	17	39.02	12	51	30	29
Other	9.54	3	86	70	28	24.89	7	83	15	57
Total	300.23	100	0	64	6	338.14	100	2	40	17

Table 5. Final cluster centers for log transformed spending categories

Spending category	Final cluster centers 1	2	3
Number of cases	127	754	193
Lodging	3.79	1.66	4.59
Food & beverage	4.96	3.17	5.13
Auto & R.V.	4.58	2.87	4.23
Boating	1.28	1.90	4.10
Fishing	0.57	0.62	1.97
Entertainment	2.44	0.25	0.76
Misc.	4.00	0.81	2.74
Other	0.64	0.15	1.15
Total within 30 mi.	5.13	3.60	6.14

Note: This cluster analysis is based on the nonresident spending (N=1074).

Table 6. The comparison of mean of squares of two segmentation approaches

Spending category	6 segment Mean Square	3 segment Mean Square
Lodging	3.60	3.07
Food & beverage	2.23	1.83
Auto & R.V.	1.73	1.44
Boating	2.15	3.00
Fishing	1.43	1.28
Entertainment	1.74	1.34
Misc.	3.20	1.99
Other	1.35	1.21
Total within 30 m.	2.64	2.55
Average	2.23	1.97

Note: All spending categories are log transformed based on the nonresident spending (N=1074).

Predicting Zoo Visitor Satisfaction

Linda L. Caldwell, Kathleen L. Andereck, and Keith Debbage[1]

Abstract. The purpose of this research was to predict zoo visitor satisfaction based on education and recreation related variables. Six hundred and thirty (630) visitors provided responses at three time points regarding their zoo visit. Multiple linear regression was utilized to predict satisfaction from the following independent variables: recreational aspects of the visit; educational aspects of the visit; and level of optimal arousal, and crowding. Findings indicated that all three variables contributed to predicting satisfaction at two time points: immediately after visitation and one month post visitation. These three variables accounted for 27% of the variance in satisfaction immediately post visit and 38% of the variance one month post visit.

Introduction

Predicting satisfaction of outdoor recreationists has been a topic of interest to outdoor recreation managers for quite some time. A zoo is a special case of an outdoor recreation area. While a zoo has elements of the "classic" outdoor recreation experience, such as natural habitat and animal life, it is at the same time a contrived and "artificial" experience. A zoo experience also includes both outdoor and indoor environments, which additionally differentiates it from typical outdoor recreation areas.

Like some other outdoor resource agencies, such as the United States Forest Service, the zoo has multiple purposes. One of the primary functions of zoos is education. With regard to visitors, zoo managers typically do not see themselves as providing a recreational opportunity, but rather an educational one (Light 1989). Learning about specific animals, about wildlife in general, and developing an appreciation of endangered species are but 3 education related goals of zoos.

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Given the emphasis zoos place on education, as well as the unique outdoor recreation attributes of zoos, this study, conducted at the North Carolina Zoological Park (NCZP) in Asheboro, N.C., sought to explore recreational and educational variables that contributed to satisfaction with the zoo visit.

The study reported here was part of a larger research project designed to gain an understanding of visitors to the NCZP. The main objectives of this research project were to gather information on: (1) visitor travel patterns associated with their visit to the zoo; (2) visitor demographics; (3) money spent at the zoo; (3) visitor expectations about and motives for the visit; and (4) levels of satisfaction associated with the visit.

For the study of interest in this paper, the following research question guided the investigation: What variables contributed to visitors' levels of satisfaction with their visit to the NCZP? Specifically, the influence of weather, educational experience, recreational experience, level of optimal arousal, and perceptions of crowding on overall satisfaction with the visit were examined.

A final purpose of this investigation was to examine the stability of these relationships over time. Therefore, satisfaction with the zoo visit, and its relationship with the previously mentioned variables, was measured at two time points: directly after the visit and again approximately one month after the visit.

Methods

Study Area

The North Carolina Zoological Park is located near the geographic and demographic center of the state of North Carolina. Although the zoo is in a predominantly rural location, it is only 30 miles from an interstate (I-85) and two miles from a major US highway (220). It is also less than 70 miles from the three metropolitan statistical areas (MSAs) in North Carolina. The NCZP is the third most visited zoo in the southeastern region and it ranks fifth in the region in terms of its species collection. The zoo covers 1,448 acres making it one of the world's largest natural habitat zoological parks in physical size, and a major part of the

state's growing tourist industry. With the development of additional facilities, the NCZP is projected to attract approximately one million persons in 1994. Current statistics indicate that the NCZP serves over 600,000 visitors annually.

Procedures and Sample

To meet the objectives of the larger research project, a multi-part study was designed. Visitors selected for the study were asked to provide information at three different time points: (1) before entering the zoo; (2) after the visit was completed; and (3) one month after the visit. Three questionnaires were designed for each data collection point. These questionnaires were developed in conjunction with the Director of Marketing at the NCZP and were pre-tested. The two on-site questionnaires were 4 pages long, and the mail questionnaire was 8 pages long. While some similar questions were asked in each questionnaire, each questionnaire asked a number of different questions as well.

Data were collected from visitors to the zoo on 31 days from April 13, 1990 through August 7, 1990[2]. Dates for data collection were determined by reviewing 1987-89 mean zoo visitation figures from April through September for arrivals by weekday, weekend, and monthly totals. Based on these figures, and a need for proportionate representation by day of week and month, days were randomly selected to reflect the proportional distribution of visitors.

On the days of data collection, research assistants stationed themselves outside the entrance to the zoo, near the ticket booth. Assistants approached every nth visitor and asked for their cooperation in the study. Due to the nature of the study, large and/or organized groups were not selected for inclusion. Children under 16 were also excluded from the sampling frame.

If the visitor agreed to participate in the study, the research assistant asked the visitor a set of questions on the pre-visit instrument. The visitor then completed a set of self-administered questions. The "interview" technique was utilized to establish rapport with the visitor and therefore increase response rate in completion of the entire study. Also, as an incentive to participate in the study, a free zoo t-shirt was offered. After the zoo visit was finished, the respondent filled out a second, self-administered questionnaire. A third questionnaire was mailed to the visitor approximately four weeks after his or her visit to the zoo. Visitors who completed all three questionnaires were mailed their free zoo t-shirt upon receipt of the mail-back questionnaire.

Because data collection occurred at three time points, calculation of response rate cannot be reflected in a single number. Table 1 summarizes the response rates for Phase I and Phase II, and also for each data collection point within these phases.

Sample Description

Of the final sample of 630 individuals, 44.1% (349) were male and 55.9% (442) were female. The majority (89.7%) were white. Of the total pre-visit N (795), 601 visitors indicated they were on a day trip while 170 were on vacation. The average party size was 4.22 (std. dev. = 4.38). Thirty-nine (39) percent of the groups visiting the zoo were comprised of couples with children; 18.0% were couples without children, and 18.0% consisted of multi-generational families. Most of the respondents were 21 to 50 years of age (21-30 years old, 26.0%; 31-40 years old, 38.1%, 41-50 years old; 18.1%). The median income was between $40,001 and $50,000. The educational level of the respondents was fairly evenly distributed: 22.2% were high school graduates; 22.3% had some college; 22.3% graduated from a four year college; and, 17.2% held advanced graduate degrees.

[2] These dates represent when the actual intercept study was conducted. Mail back surveys were returned through October, 1990.

Measures

In order to examine the relationships of interest to this study, multi-dimensional scales were created. Respondents to the questionnaires completed a number of Likert-type items that lent themselves to scale construction. A process of a-priori theorizing, factor analysis, and reliability analysis (Cronbach's alpha) was utilized to develop the scales.

The scales from the mail-back questionnaire were essentially parallel to those from the post-visit questionnaire. These scales measured: overall satisfaction, educational experience at the zoo, recreational experience at the zoo, optimal arousal, and crowding. Tables 2 and 3 contain the specific items used in the scale construction, as well as their means, standard deviations, and internal consistency scores. The alpha reliability scores are, for the most part, within the acceptable range. It should be noted that coefficient alpha is sensitive to the number of items which comprise a scale (the easiest way to increase alpha is to increase the total number of items in a scale). Therefore, the lower alphas may be a product of this phenomenon, as well as error variance.

To further confirm viability of these satisfaction measures, confirmatory principle components analysis with orthogonal rotation was utilized. This procedure produced four factors for the immediate post-visit data, although there was some ambiguity between the educational factor and the recreational factor. These factors accounted for 71.3% of the variance. The factor analytic procedure on the mail-back data (one month later) produced clear cut factors; these factors accounted for 70.9% of the variance.

In order to gather additional insight into visitor satisfaction levels, motives for visiting the zoo were examined. Motivation was measured by two methods and at two time points (prior to the zoo visit and again in the mail back questionnaire). These two methods were: (1) through an open-ended question (measured at both time points) and (2) using a number of statements that visitors responded to using a 5 point scale where 1 = not an important reason to 5 = extremely important reason (measured prior to the visit). Seeing the zoo and the animals, being with friends and family, and having a recreational experience were the main reasons listed via the open-ended responses, although the rank order of reasons changed from pre-visit to the recollection period.

Factor analysis on the motivation variables produced 4 clear cut factors (which accounted for 61.8% of the variance) from the Likert-type statements measuring motivation. These factors were also a product of a priori theorizing and reliability analysis. The following factors were produced: recreation and novelty (mean = 3.98); education of others in party (mean = 4.01); education of self (mean = 3.38); and to photograph animals and plants (mean = 3.06).

Temperature, cloud cover, and precipitation were measured at three time points on the day of the visit. Temperature was operationalized as the average of three temperature readings for the day. Cloud coverage was measured by the percent of cloud coverage based on three data points. Precipitation was dummy coded, rain or no rain. These measures were included to examine objective elements that may have had impact on visitor satisfaction.

Results

To predict visitor satisfaction, satisfaction was regressed on education, recreation, optimal arousal, crowding, temperature, cloud coverage, and precipitation via stepwise multiple regression. To assess stability of these measures and relationships over time, this procedure was conducted for the post-visit data and the mail-back data.

Results of the multiple regression analysis are presented in Tables 4 and 5. As can be seen, at both time points recreation experience was the strongest predictor of satisfaction, with a feeling of optimal arousal as the second strongest predictor. Crowding is only a predictor of satisfaction one month after the visit. In both analyses, education is the final significant predictor. None of the weather related variables are predictors of satisfaction.

Discussion

It was interesting that none of the objective, weather related variables were predictors of

satisfaction. This is particularly interesting since the weather during the data collection time period was either extremely pleasant or extremely hot. Also, many respondents mentioned weather as a negative or positive influence in their write-in comments on the questionnaire. In a study on factors associated with vacation satisfaction, Lounsbury and Hoopes (1985) found a similar phenomenon: none of the objective variables they measured were associated with vacation satisfaction. Part of the inconsistency in results between visitor satisfaction and weather related variables may be due to the fact that, while everyone talks about the weather, there is nothing that anyone can do about it.

Relaxation and satisfaction with the leisurely aspects of the vacation, however, were predictors of overall vacation satisfaction. Given these two findings, tentative conclusions could be advanced that the experiential elements of a vacation or trip are most important to visitors. This tentative conclusion suggests follow-up analysis to determine if there are differences among those who are on a full scale vacation versus those who are on day trips.

Lounsbury and Hoopes suggested that prior needs or expectations be measured and compared to subsequent levels of satisfaction. Our preliminary analysis of visitor motivations prior to their visit suggest that both education and recreation variables were strong motivators for the zoo visit. While further analysis is needed to fully understand the relationship between visitor motivation and satisfaction, there is a suggestion that visitor motives were consistent with variables which explained their satisfaction. The low R-squares, however, suggests that there are other variables influencing satisfaction.

Among the variables under consideration in this study, the recreation experience clearly had the most influence on satisfaction with the trip, both immediately after the visit as well as upon reflection one month after the visit. While the educational element of the visit was important, the beta weights indicate that at both time periods one's assessment of the recreational nature of the trip contributed the most to satisfaction. A person's level of psychological arousal, a construct theoretically linked with recreation experience, was also a stronger predictor of satisfaction at both time points than was the educational aspect of the visit.

In a review of the literature related to the educational or learning benefits of leisure, Roggenbuck and others (1990) cited research by Falk, Balling and associates which indicated that when children visit outdoor settings such as museums and zoos, novelty is an important consideration in arousal and subsequently, in learning benefits. They suggested that at low levels of setting novelty (arousal), children become bored and learning does not take place as easily. Whether this phenomenon holds for adults is a topic for further investigation.

The relationship of education and learning as a motivator or as a benefit of leisure has not been a high-priority topic of investigation (Roggenbuck and others 1990). A review of the existing literature, however, led Roggenbuck and others (1990) to conclude that "learning is a high priority motivator for engaging in leisure activities, often following relaxation in importance" (pg. 120). This study would support that conclusion, and suggest that the relationship of arousal, educational experience, and leisure should be further investigated.

The findings from this study can be potentially helpful to zoo directors and/or public relations personnel in terms of marketing their product. As well, this information may be useful in terms of structuring the zoo experience. For example, zoos may provide areas and opportunities to maximize the recreational component of visitors' experiences (such as picnic areas, rest areas, etc.). Finally, since optimal arousal is a function of a balance between novelty and familiarity (on a simplistic level), zoos may also find that changing exhibits, vegetation, and other aspects of the visit may prove worthwhile.

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Tables

Table 1. Response rates for each data collection point, Phase I and Phase II

	Phase I	Phase II	Total
Initial Contacts (Refusals)	431 (43)	452 (45)	883 (88)
Pre-visit N	388	407	795
Post-visit N (% of pre-visits)	364 (93.8%)	376 (92.4%)	740 (93.1%)
Mail back N (% of post-visits)	323 (88.7%)	307 (81.6%)	630 (85.1%)
Total N of useable responses (% of initial contacts)	323 (74.9%)	307 (67.9%)	630 (71.4%)

Table 2. Attitudes About the Zoo Experience: Immediately Post Visit

Item	Mean	Std.dev.	Alpha
OVERALL SATISFACTION 1			
All my expectations were met today.			
I cannot imagine a better visit to this zoo than the one I had today.			
Scale statistics:	3.77	.767	.7449
EDUCATION 1			
People in my group learned about wildlife.			
The signs at the animal exhibits increased my knowledge of the animals.			
I felt my visit was educational.			
I felt my visit was worthwhile.			
Scale statistics:	4.15	.498	.7681
RECREATION 1			
I had fun.			
I was relaxed.			
Everyone in my group had a good time.			
Scale statistics:	4.28	.470	.7518
OPTIMAL AROUSAL 1			
I felt there were many things wrong today that put a damper on my visit.*			
I was often bored.*			
The visit dragged on and on.*			
Scale statistics:	3.77	.784	.7515
CROWDING			
The number of people here today did not affect my ability to view the animals.			
I felt the zoo was too crowded.*			
Scale statistics:	3.78	.870	.6865

Coded: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree.

*Recoded variables.

Table 3. Attitudes About the Zoo Visit: Upon Reflection One Month Post Visit

Item	Mean	Std.dev.	Alpha
OVERALL SATISFACTION 2			
I cannot imagine anything that would have made my visit better.			
I was completely happy with my visit.			
I got to see and do everything I wanted to do.			
Scale statistics:	3.51	.806	.7403
EDUCATION 2			
I learned about wildlife in general.			
I learned about specific animals.			
Scale statistics:	4.00	.529	.7612
RECREATION 2			
I had fun.			
Members of my group had a good time.			
Scale statistics:	4.50	.515	.7105
OPTIMAL AROUSAL 2			
I had trouble finding my way around the zoo.*			
My visit dragged on and on.*			
I felt my visit was too tiring.*			
I was often bored during my visit.*			
Scale statistics:	4.10	.626	.7384
CROWDING			
The number of other visitors did not affect my ability to view the animals.			
Scale statistics:	3.60	1.09	

Coded: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree.

*Recoded items.

Table 4. Results of stepwise regression analysis to predict visitor satisfaction: Post-visit

Variable	B	Beta	R^2 Change	Sig.
Recreation	.584	.345	.239	.0000
Optimal Arousal	.160	.152	.023	.0001
Education	.218	.142	.012	.0026

Adj. R^2=.271, N=740.

Table 5. Results of stepwise regression analysis to predict visitor satisfaction: One month post visit

Variable	B	Beta	R^2-Change	Sig.
Recreation	.455	.290	.229	.0000
Optimal Arousal	.292	.229	.072	.0000
Crowding	.158	.218	.052	.0000
Education	.289	.054	.032	.0000

Adj. R^2=.380, N=630.

The National Coastal Recreation Inventory Project (NCRIP): A Topology and Distribution of Commercial Outdoor Recreation Opportunity in the Southeastern States

Tom Burkiewicz[1]

Abstract. Commercial outdoor recreation suppliers for the nation's coastal areas were identified using secondary sources. The spatial distribution of these sites across the Southeast and in relation to the coastal nation as a whole are investigated. The number of suppliers per county is correlated with a variety of socio-economic and land use variables at the national, regional, and state of Florida levels.

Introduction

The long-term trend in many coastal areas toward diminishing recreation resources and access to tidal waters has been documented as early as the 1960s (ORRRC 1962). As a result the National Oceanic and Atmospheric Administration (NOAA) has been interested in the economic and environmental impacts of outdoor recreation and its surrounding environments. The importance of an accurate inventory of outdoor recreation opportunity for strategic planning and valuation of resources cannot be understated (President's Commission on Americans Outdoors 1987). In order to assess coastal recreation opportunity NOAA is compiling data on public and private outdoor recreation opportunities in the coastal zones. In 1988 NOAA completed its inventory of public (state, federal and local government owned and managed) outdoor recreation sites in 328 coastal counties. The National Coastal Recreation Inventory Project (NCRIP), a cooperative project of NOAA, USDA Forest Service, and the University of Georgia, is the equivalent inventory for privately owned outdoor recreation opportunity.

Recreation and tourism are major economic forces in the coastal zones. Outdoor recreation depends, to a large extent, on the character and quality of the natural environment. Preserving and protecting these environments while taking full advantage of them often brings divergent interests into conflict. By accurately assessing the value (both economic and non-economic) of outdoor recreation, planners, managers, and policy makers can make better informed decisions regarding the use of these sensitive areas. A major obstacle to making these assessments is that very little, historically, has been known about the actual supply of non-public outdoor recreation facilities, areas and services.

In all areas of the country, public agencies have provided and preserved a wide range of outdoor recreation opportunities. Public recreation is only a part of the total outdoor recreation picture, however, private commercial, industrial and non-profit organizations provide a large portion, if not a majority of certain kinds of outdoor recreation opportunities. Private individuals and corporations own large tracts of land in the east and south upon which both informal and controlled recreation use is traditional. The full extent of this kind of use is difficult to assess because of more diverse ownership patterns, difficulty in locating owners, and the expense of conducting in-depth surveys. New methods of identifying and accounting for private outdoor recreation supply must be developed before a full and accurate accounting of total recreation resources can be obtained. It is critically important now as the availability of private land for recreation is rapidly decreasing (Task Force on Outdoor Recreation 1988).

NCRIP used a wide range of commercial references, phone listings, and state government agencies to identify the commercial and non-profit suppliers of outdoor recreation adequately enough, but these sources were limited in their ability to show the depth of opportunity. For instance, NCRIP has determined the number of marinas but not the number of boat slips, and the number of campgrounds but not the number of campsites. This results in equal weighting for sites with potentially vast differences in total recreation opportunity. This is an important limitation but it does not prevent preliminary findings regarding distribution of suppliers in the coastal areas.

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Private Outdoor Recreation Supply: The Missing Link

Supply and demand relationships in outdoor recreation have long been under investigation. Research has been productive in formulating theories and developing trend analyses that have proven helpful to planners, managers, and policy makers. In the area of economic valuation of outdoor recreation, results have also been substantive, particularly in the area of public recreation supply (President's Commission 1987; NOAA 1988). But it is also necessary when assessing the value of outdoor recreation to differentiate between public and non-public facilities, areas and services. As a result, the total economic value of natural resource based recreation has probably been understated.

Public recreation exists, primarily, outside the market place, operating as a "public good". Private recreation competes with other interests and economic forces in the more traditional milieu of the market (Cordell and others 1989). The quest to preserve land by non-profit groups also takes place within this world of competing demands. These studies, while contributing to overall knowledge, do not tell us how large a role non-public outdoor recreation plays in the coastal community and what that role is.

After reaching the peak of growth in the mid 1970s, net leisure time has steadily decreased. Despite this decrease, growth in demand for outdoor recreation has remained relatively constant (President's Commission 1987). Current demand trends appear to match the population growth rate (Cordell and others 1989). These demand trends leave an unclear and incomplete picture of the present situation and the future of the coastal zone. It is clear that all areas will be affected in some way by recreation demand. Some theorize that the slower growth in participation is a result of an aging national population. There is evidence that those over 65 show a significant decrease in their participation in outdoor recreation activities (U.S. Department of the Interior 1986). If this is so, then those areas where people retire, like Florida, will have demands different from other regions of the country. How then do we account for the amount and variety of outdoor recreation opportunity in these coastal destinations?

It is possible that the presence of public outdoor recreation areas or natural resource set asides encourages population growth, and the growth of adjunctive non-public recreation services (McLaughlin 1990; Powers 1991). To an extent, most researchers believe that opportunity will create demand (Clauson and Knetsch 1966) and in the coastal areas the natural attributes alone may be enough to create a growth environment. Natural resource attributes may be the single most important element in outdoor recreation opportunity.

Work by Van Horne and others (U.S. Department of the Interior 1986) and Cordell and others (1989) indicates the recent trend that most people are recreating closer to home. City and county parks are the focus of most outdoor recreation activity. Travel to distant sites has decreased. If the strongest demand is for nearby resources, then the private recreation resource base should be concentrated near population centers.

The complex interactions between public and private recreation resources need to be examined more closely. Ultimately the NCRIP data base will be able to provide data for an in-depth comparison of public and private outdoor recreation supply in the coastal areas. The next step in understanding these relationships is to completely and accurately identify the private resource base, the goal of this inventory project.

Hypotheses

Outdoor recreation theory suggests that the presence of outdoor recreation opportunities depends on a population source (Cordell and others 1989). Therefore, a positive correlation between population and number of commercial outdoor recreation suppliers should exist at every level. Where the population is more elderly there should be a weaker, or possibly a negative relationship with number of commercial outdoor recreation suppliers (U.S. Department of Interior 1986; Cordell and others 1989; President's Commission 1986). Though these studies were not specific for type of outdoor recreation, logic suggests that there should be some variation in the type of outdoor recreation opportunities enjoyed by the elderly.

Cordell and others (1989) assert that outdoor recreation is more likely to occur close to a body of water as well. Counties with more water area, lakes, river miles, or shoreline should have more private outdoor recreation opportunities. A positive correlation for number of commercial outdoor recreation suppliers with water area and water related variables would then be expected.

For other demographic, economic and land use variables (Tables 2-4) there are few theoretical assumptions or previous studies to indicate possible relationships. The NCRIP data provides an exploratory look into the relative presence or absence of these variables compared with commercial outdoor recreation supply.

By identifying specific relationships between these variables and commercial outdoor recreation supply, policy makers, planners and managers can compare the attributes of their areas to achieve some level of predictability for the presence of the qualities necessary to support commercial outdoor recreation. Specific resource use values can be more effectively addressed particularly in regards to their context.

Methodology

A comprehensive discussion of the methods of data collection used by NCRIP is included in these proceedings (Schretter 1991). A comprehensive survey of national directories, Chambers of Commerce, professional and trade listings was made to identify commercial outdoor recreation sites and facilities. Once the data were collected they were summarized by county into facility type and ownership categories and entered into a data base, checked and verified by different sources, and duplications eliminated. For this investigation, only the distribution of commercially owned and operated facilities (such as marinas, campgrounds, charterboats, stables, golf courses, day camps, cruises) are included. The word supplier is used to refer to all facilities, services and sites because some facility types, i.e. charterboats do not include well defined land or water areas.

Data Analysis

Commercial outdoor recreation supply is presented in two ways. First, the spatial distribution of the aggregate number of sites is made based on the density of sites at the county level. Second, at the county level, the aggregate and individual site types are correlated with the socioeconomic variables using canonical correlation and individual regressions. Canonical correlation was selected due to the large number of variables and site types, and the clustering of the site types. A SAS program at the University of Georgia mainframe computer generated the canonical correlations.

Individual regressions were calculated to indicate the unweighted individual relationship between each variable and each of the five most numerous site types and the aggregate total of all commercial site types. Beta was used to indicate the direction of the correlation. Data were analyzed by aggregating counties at the national, regional, and state levels using dBase Stats from Ashton-Tate.

Analysis of data in the Southeast is significantly distorted by the presence of Florida in the data base. Twenty-six percent (4818 of 18,271 sites) of all coastal commercial outdoor recreation sites nationwide are in Florida. This represents over 63 percent of the 7,557 sites in the Southeast. This cannot be accounted for solely by the fact that the entire state of Florida is included in this inventory because most of these suppliers are located in the southern tip of Florida. Six counties of southern Florida represent over 2500 commercial outdoor recreation suppliers. For this reason Florida is considered separately from the other states (North Carolina through Texas).

Findings

Spatial Distribution

The distribution of commercial outdoor recreation suppliers in the southeast differs from the national distribution (Table 1). Outside of Florida there are fewer suppliers per county than within Florida. Across all regions, including the Southeast, a relative few counties with a heavy concentration of commercial outdoor recreation suppliers drive up the average. Differences within the region at the state level are obscured by Florida data.

Figure 1 illustrates the bi-modality of the distribution of commercial outdoor recreation suppliers by county in the southeast and Florida. Nearly one quarter (37 of 150) of the southeastern counties contain five or fewer suppliers, one sixth of the counties (25) contain over 100 sites. The number of suppliers per county ranges from zero to 458 in the southeast. Commercial outdoor recreation supply appears to be predominantly an all or nothing situation.

A look at the number of commercial outdoor recreation suppliers per county reveals some important aspects of commercial outdoor recreation supply. The counties with the greatest number of commercial outdoor recreation suppliers are located in or are adjacent to (1) counties with large populations, and/or (2) counties with specific outdoor recreation attractions in the form of a National Park or National Forest, or (3) an area with a tradition of outdoor recreation (Myrtle Beach), or (4) an area developed specifically for outdoor recreation (Hilton Head or Jekyll Island). Map 1 shows the aggregate (all types) number of commercial outdoor recreation suppliers per county in the Southeast.

In North Carolina the counties with the most commercial outdoor recreation suppliers (Carteret, 120 and Dare, 110) are adjacent to The Outer Banks National Seashore and contain a National Forest (Croatan). A lesser concentration of number of suppliers are within the counties adjacent to and including the largest population center in the North Carolina coastal zone, Wilmington (New Hanover, 70 and Brunswick, 66). In South Carolina this pattern holds as well for Myrtle Beach (Horry, 105), Hilton Head (Beaufort, 90), and Charleston (86).

Georgia presents an anomaly of sorts, in that Cumberland Island, a major outdoor recreation resource, is located in Camden County (10) which has few commercial outdoor recreation suppliers. The remoteness of Cumberland Island from hotels, major highways and other elements of developed infrastructure, and the primitive nature of its experience illustrates that a significant public natural area alone is not sufficient to encourage the presence of commercial outdoor recreation suppliers. The Savannah area (Chatham County, 49) contains the second highest total of suppliers in Georgia. Glynn County (69) contains the most and contains areas developed specifically for coastal outdoor recreation.

From Alabama along the Gulf coast to Texas the spatial distribution of commercial outdoor recreation suppliers shows the same trend. The most populous counties are the best supplied or are adjacent to well supplied counties. Houston (Harris County, TX), Greater New Orleans, and Mobile Bay, Alabama all represent centers of commercial outdoor recreation sites in the Gulf of Mexico.

The situation in Florida is unique, both in terms of representation and analysis. Because of proximity to the Atlantic and Gulf coasts, the entire state of Florida is considered for inclusion in this study. As previously stated, over 60 percent of the identified commercial outdoor recreation suppliers in the Southeastern coastal zone are located in Florida. More than 2500 commercial outdoor recreation suppliers are located in counties extending around the tip of Florida from Palm Beach to Tampa Bay. This area is truly coastal in its environment and contains more commercial outdoor recreation suppliers than any other distinct area in the coastal nation.

Along both coasts, South Florida has developed an effective tourism infrastructure in the form of hotels, highways, and significant public set asides for preservation and recreation (i.e. Everglades National Park). Other land uses exist along side outdoor recreation in these counties. Rapid population growth, agriculture, and related economic development have made Florida an object of intense interest because of the interaction of socioeconomic and natural forces in the coastal areas.

Commercial Outdoor Recreation Supply and Sociometric Variables

NCRIP data reveals both regional differences over all commercial outdoor recreation facility types, and differences in the distribution of specific site types among the regions. The depth of these differences can be further investigated by comparing the distribution of sites to land use, economic and demographic variables. These variables are listed along with correlations with the six most numerous

supplier types and total suppliers in Tables 2-4 for the nation, region and Florida.

Due to the fact that the data are county based, and that variables are divided into distinct types, the distribution of sites tends to cluster more than to spread into linear form. Canonical Correlation technique was selected to investigate which groups of variables have more powerful relationships with outdoor recreation suppliers. Individual regressions between total commercial outdoor recreation facilities by county and specific variables were computed to find the significant individual correlates.

Canonical Correlation

Initial canonical analysis included a large number of variables in each group. Due to programming limitations the national database was the only one used in our canonical correlation. The interpretation of these statistics is open to a large amount of ambiguity so is used here only to note the strength of the correlation between groups of variables. When the list of facility types and the per county total of commercial outdoor recreation sites were compared to the cluster of land use variables a correlation of .694 was obtained. The canonical correlation between sites and demographic variables was a much stronger .936. Only a few economic variables correlate with commercial outdoor recreation supply though the canonical correlation was quite high at .937.

From this analysis there appears to be a greater relationship between economic and population factors with the number of commercial outdoor recreation suppliers than for patterns of land use. It is also possible that significant regional, state, or county level relationships between the variables and commercial outdoor recreation suppliers are lost by aggregating the data into a national whole.

Regression Analysis

An in-depth look at individual regressions between socioeconomic variables and supply data reveals that regional differences are lost by aggregating at the national level. Strong relationships in one region may be off-set by weaker, non-existent, or relationships of opposite direction in other regions (Tables 2-4). In general the data for Florida shows the strongest correlations of number of suppliers with land use and socioeconomic variables. Other states were analyzed but the small number of counties in most of them prevented reliable statistical inference. Correlations across the rest of the Southeast were generally weaker than for the Florida data.

Land Use Variable Analysis

Nationally, and for the rest of the Southeast, correlations were generally weak between water-related variables and number of commercial outdoor recreation suppliers. The only water based variables available at time of analysis were total amount of water area and percent of wetland. Wetlands were not a consistent correlate of recreation supply in the Southeast or nationwide. Several counties in South Florida (Dade, Monroe, and Collier) have both high numbers of marinas and charterboats, and also include large areas of the Everglades (Table 4). This may in part be responsible for some of the correlation with wetlands. Monroe County contains the largest portion of the Everglades and the Florida Keys, where the majority of the outdoor recreation suppliers are actually located. Also in Florida, water area showed some correlation with water based facilities like marinas and charter boats, and some negative correlation with campgrounds.

The total amount of land area in each county did not appear to be correlated with the number of commercial outdoor recreation suppliers. At the national level total area had a moderate correlation for only one facility type, campgrounds ($r=.54$, Table 2). In Florida these relationships were somewhat stronger than for the coastal nation or for the rest of the Southeast. Percent of forest in the county was negatively correlated with several supplier types in Florida (Table 4). With the important role of forests in regards to outdoor recreation this finding warrants further study, particularly in light of recent trends of significant loss of forest acreage in Florida (Hubbard 1990). This trend was not evident in other areas of the southeast.

Economic Variable Analysis

Of the three economic variables available for this analysis only the percent of people below poverty level income consistently correlated (negatively) at the national, regional and Florida levels. As the tables indicate there seem to be fewer people living in poverty where commercial outdoor recreation suppliers are more numerous. In Florida there is statistical significance in the regression computed for all five major supplier types and the total of all supplier types with poverty level (Table 4).

Demographic Variable Analysis

Population is the most consistently and strongly correlated variable to number of commercial outdoor recreation suppliers. At the national level correlations were found for population with golf courses and the total of all facilities. Other demographic variables; percent elderly, percent white, total employed persons and those employed in service industries all showed a small but statistically significant level of correlation with population.

Nationwide, population density correlated less with number of suppliers than did total population. One possible explanation of this is that population density may encourage commercial outdoor recreation opportunity up to a certain level past which supply falls off dramatically. In counties that include large cities, specifically Boston, Philadelphia, and New York City, there is far less outdoor recreation opportunity than in the surrounding counties. New Orleans and Mobile Bay both show a tendency for this trend in the Southeast region. Another possibility is that large populations may exist in geographically large counties reducing population density but leaving enough land and water area available for the development of larger numbers of commercial outdoor recreation suppliers. Further study is indicated, particularly since total area did not correlate highly with number of suppliers.

Other demographic variables showed mixed relationships. The percent of elderly correlated positively with most facility types in the Florida data. If the elderly participate less in outdoor recreation, as predicted by recreation theory, then at best a weak relationship would be predicted in Florida because of its reputation as a retirement destination. Clearly there are other factors at work. Possibly, the influx of tourists are not adequately accounted for, or the kinds of outdoor recreation popular with the elderly are not included within the scope of this study. In the Southeast and at the national level there seemed to be little correlation of number of suppliers with the percent of elderly.

Race showed only a weak relationship with commercial outdoor recreation suppliers, as the percent of white people per county correlated only weakly at all levels. The correlations, while small, appeared in relation to some facility types in Florida indicating a weak trend for more commercial outdoor recreation suppliers when a larger percentage of the county population is white.

Conclusions

A significant finding of the NCRIP data is that the correlation of economic, land use, and demographic variables with commercial outdoor recreation suppliers was stronger in Florida than for the remainder of the coastal Southeast or the coastal nation as a whole. It is possible that these correlations were more powerful because outdoor recreation is a more significant part of the economics and lifestyle of the state. Because of the small number of coastal counties in some states, a state by state statistical comparison is difficult. Florida represents a testing ground for the interaction of outdoor recreation with other competing demands and environmental conditions because all of its 67 counties were included in the study area and because outdoor recreation plays a significant role in that state's economic and lifestyle patterns. Information gathered in Florida has implications for other coastal areas experiencing rapid growth and development. A unique opportunity exists to expand the knowledge base with further exploration into Florida's outdoor recreation base and its environment.

Both the spatial distribution and regression analysis of the number of commercial outdoor recreation suppliers indicate the importance of a nearby population center for the support of commercial opportunity. Access by adequate transportation and other infrastructure aspects may also be an important part of the commercial outdoor recreation supply equation. This study was unable to

investigate these dimensions. Regional, state, and county differences reflect a unique combination of the total forces influencing the number of commercial outdoor recreation suppliers at each level. Every community has its own natural resource capabilities, demographics, land use tradition and trends, and economic climate influencing outdoor recreation supply. Understanding and valuing the role of outdoor recreation will occur as each community looks into the full spectrum of influences on outdoor recreation and recognizes the importance of natural resource character and quality in their community.

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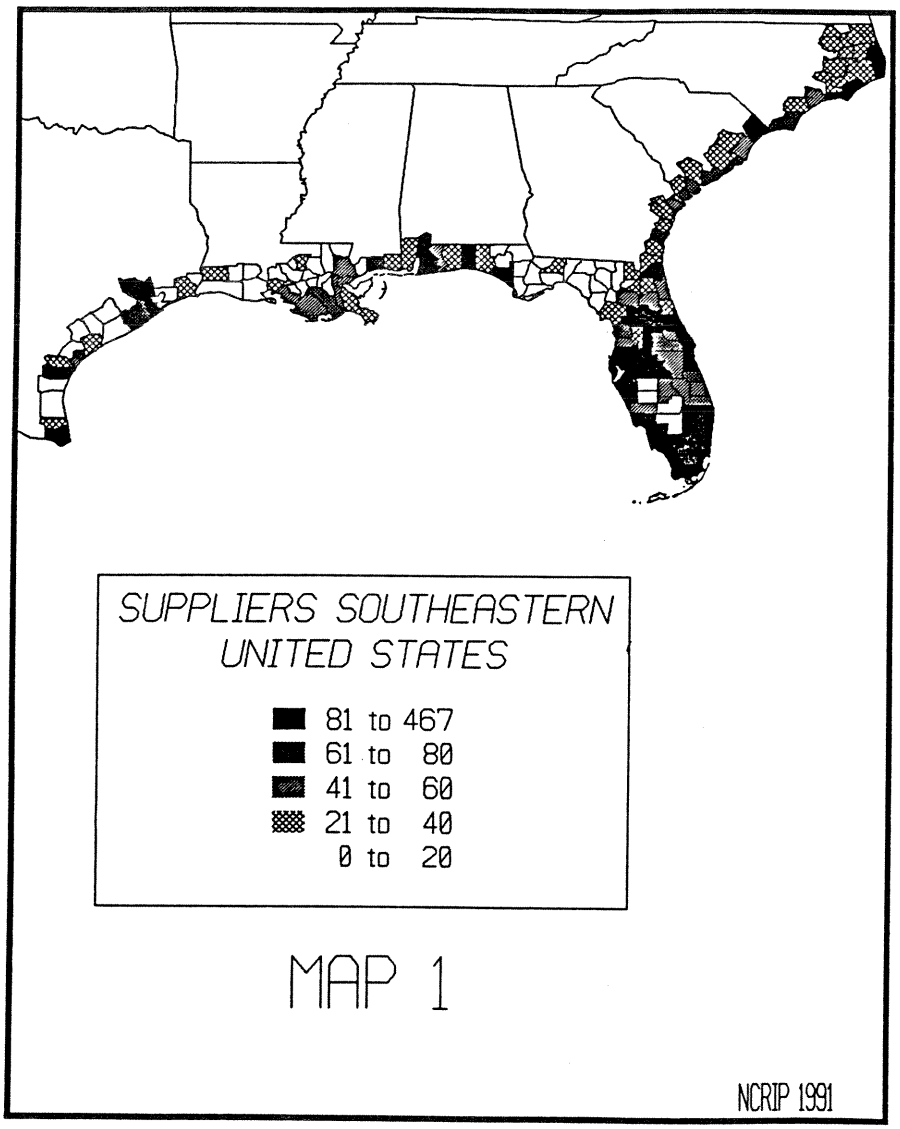

Figure 1. Illustrates the bi-modality of the distribution of commercial outdoor recreation suppliers by county in the southeast and Florida.

Tables

Table 1. Summary Statistics of Commercial Outdoor Recreation Suppliers in the Southeast and Nation

	Mean	Median	Counties with fewer than 6	Counties with more than 100
Nation N=328	55.7	30	59 (18%)	56 (17.0%)
Southeast N=83	33.0	15	29 (35%)	7 (8.5%)
Florida N=67	67.9	35	8 (12%)	17 (25.0%)

Source: NCRIP 1991.

Table 2. Regression Figures for Facility Type and Socioeconomic Variables National Coastal Counties, N=328

Variables	Marinas	Campgrounds	Golf Courses	Charter Boats	Stables	Total Facility
% Agricltr				-.17		-.13*
% Forest			-.16	-.17		-.14
% Urban		-.21			.15	
% Wetland				.23	-.20	
Land Area		.54	.33	.18	.21	.37
Water Area	.18	.22		.31		.22
Population	.28	.23	.58	.33	.42	.55
Density		.13*				
% Elderly	.32	.37	.37	.25	.21	.39
% White	.29	.32	.34	.25	.35	.39
Service Ind.	.19	.15	.48	.28	.33	.45
Employed	.21	.18	.52	.30	.37	.49
HH Income	.16	-.14*	.20		.40	.16
% Poverty	-.30		-.30	-.18	-.41	-.30
Unemploy	-.20		-.20		-.26	-.18

* $p<.05$, otherwise $p<.01$.
Source:NCRIP 1991.

Table 3. Regression Figures for Facility Type And Socioeconomic Variables Southeast Without Florida, N=83

Variables	Marinas	Campgrounds	Golf Courses	Charter Boats	Stables	Total Facility
% Agricltr						
% Forest						
% Urban	.37		.35		.44	.38
% Wetland				.28		
Land Area		.24*	.35		.37	.33
Water Area	.30			.44		.26*
Population	.36	.34	.73		.93	.60
Density	.29		.40		.52	.39
% Elderly	.27					.24*
% White	.33	.30	.23*	.26*	.31	.37
Service Empl	.38	.28*	.72		.92	.56
Employed	.33	.29	.72		.93	.57
HH Inc						
% Poverty	-.31		-.27			-.27
Unemploy	.23*					

* $p<.05$, otherwise $p<.01$.
Source: NCRIP 1991.

Table 4. Regression Figures for Facility Type And Socioeconomic Variables Florida, N=67

Variables	Marinas	Campgrounds	Golf Courses	Charter Boats	Stables	Total Facility
% Agricultr						
% Forest	-.47	-.53	-.50	-.31		-.52
% Urban	.47		.42		.40	.41
% Wetland	.57			.61		.56
Land Area	.38	.50	.50	.35	.48	.51
Water Area	.54	-.59	.35	.59	.31	.62
Population	.67		.67	.42	.78	.67
Density	.59		.50	.33	.50	.52
% Elderly	.40	.53	.46		.36	.45
% White	.38	.49	.39		.38	.45
Service Empl	.62		.63	.39	.73	.63
Employed	.63		.64	.40	.74	.63
HH Inc	.47		.51	.36	.51	.73
% Poverty	-.54	-.45	-.56	-.40	-.51	-.57
Unemploy	-.31					

Source: NCRIP 1991.

Directions in Modeling of Recreation and Tourism Behavior

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Abstract. Modeling of recreation and tourism behavior has been directed primarily by applied problems. This paper reviews the changing nature of the recreation management and policy agenda, noting the shift toward a stronger consumer orientation. In response to the changing applied questions, eight directions in the modeling of leisure behavior are discussed. More process-oriented models and efforts to integrate disciplinary perspectives are called for.

Introduction

The purpose of this paper is to review trends in behavioral modeling in recreation and tourism and to suggest future directions. Trends in recreation and tourism modeling are identified primarily as responses to changing management and policy questions. Recreation and tourism are very applied fields and both research and modeling in these fields, while often viewed as theoretical, are primarily directed by the applied questions. Research, including formal modeling, influences the management and policy agenda, but these feedback effects arise more from the role of models as guiding frameworks or paradigms than as tools for solving particular problems.

The paper focuses attention on the changing management and policy agenda, along with the implications of these changes for researchers in general, and modelers more specifically. Managers and researchers face increasingly complex problems, requiring systematic frameworks to help organize and structure efforts to find solutions. While models are more often seen as tools for simplifying problems, their value will increasingly be as tools for organizing complexity.

A Brief Historical Perspective

Much of the quantitative modeling in recreation during the 1960's and 70's was carried out in conjunction with national, state, and regional planning efforts (e.g. ORRRC 1962, Cicchetti 1973, Adams and others 1973). Most of these models were directed at estimating or forecasting recreational use. During the 1970's, the travel cost method attracted many economists to both methodological and applied problems in recreation (Fletcher and others 1990). Formal modeling in recreation became increasingly dominated by economic modeling approaches, with standard economic assumptions prominent in model specification decisions. These assumptions for example encouraged nonlinear specifications, and the inclusion of variables that would capture income and substitution effects. In response to policy questions, the purposes of these demand models shifted more toward valuation questions than strictly behavioral ones (Langer and Haught 1991).

Management and policy questions gradually shifted from the objective of meeting demand in the 1960's to valuation and carrying capacity problems during the 1970's. The approach to both valuation and carrying capacity was to simplify the problems via formal or informal models (some would argue oversimplify). Economists tackled the valuation question while other social scientists, principally sociologists and geographers, studied carrying capacity (Graefe and others 1984).

Valuation problems were addressed almost entirely within a modeling framework and almost exclusively by economists. Modeling played a more modest role in studying carrying capacity problems, in spite of several good modeling approaches to the problem. Among these are a number of models that are based in operations research techniques including several simulation models (e.g. Shechter and Lucas 1978, Stynes 1978). Unfortunately, modeling expertise came largely from outside the field and what impact modelers had in the carrying capacity area quickly dissipated as outside interest in recreation problems waned or shifted to valuation. This was unfortunate as the carrying capacity topic offered in many ways an ideal testing ground both for the application of models to complex management questions and for the integration of disciplinary perspectives on a problem.

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The Transition to the 1990's

The 1980's may be characterized as a transition period between what we experienced in the 1960-70's and what we might expect in the 1990's. To some extent the 1980's represented a retreat from the quantitative approaches of the late 1960's and early 70's. Social psychologists, who like sociologists do not have a strong modeling tradition, rose to clearly dominate recreation researchers both in numbers and in determining the recreation research agenda. A similar shift may be seen in tourism, with social-psychological orientations dominating earlier geographic and economic ones.

More importantly, during the 1980's, the perception of applied problems within recreation was dramatically reconfigured from a resource management focus to a focus on the consumer and his or her experience. This change in perspective has, of course, much earlier roots among researchers, but not until the 1980's did it begin to also influence management philosophy, and hence to begin to redirect applied research, and in turn modeling. By the 1980's, a consumer/ marketing orientation was already strong in tourism research. The convergence of tourism and recreation research during the 1980's therefore served to support and reinforce the growing consumer orientation within recreation.

This change in orientation presented new problems for managers, policymakers, researchers and modelers. Each of these groups have struggled throughout the 1980's to make the necessary adjustments. Changes in management and policy perspectives have wide ranging implications. It is important to recognize, however, that changes in modeling are primarily a response to the changing applied questions. Unlike other fields, modeling in recreation has rarely played a major role in guiding the research agenda itself.

Directions in Modeling of Leisure Behavior

Eight directions in modeling may be identified. All of these may be seen as responses by modelers to the applied questions being asked. Many of these changes in modeling are already well underway, while others are just beginning to surface.

1. A focus on individuals and individual differences--Greater attention to the needs and behavior of individuals has required more desegregate models that better capture behavioral processes at the level of individual decisionmakers. Such models are generally seen as providing richer explanations of behavior and shed light on differences in behavior at the individual or, more realistically, market segment level. Trip generation and trip distribution models developed in the late 1960's and throughout the 1970's (e.g. Ellis and van Doren 1966, Cesario 1973, Cicchetti 1973) largely described aggregate behavior or the behavior of an average consumer. During the 1980's, these models became increasingly irrelevant to many (although, not all) of the management and policy questions being asked. Throughout the 1980's we have seen a shift to desegregate versions of these models using discrete choice methods such as the multinominal logit model (Stynes and Peterson 1984). These models and related multi-attribute decompositional techniques (Louviere 1988) have been extended to a broader range of leisure choices, while also being used extensively to study consumer preferences for landscapes (Schroeder 1991) and recreation experiences more generally (Louviere and Timmermans 1990). The trend toward desegregate models in recreation follows similar shifts in geography, economics, marketing, and transportation during the 1970's.

2. Emphasis on quality as much as quantity--In response to consumer interest in quality and the specialization of both products and markets, managers are increasingly concerned with quality. Existing models have not adequately dealt with the quality dimensions of recreation and travel products and services. This is partly due to the limitations of the predominantly aggregate approaches to date. Desegregate models can better capture quality dimensions, particularly those that may vary across individuals or recreational subgroups. Incorporating quality in quantitative models will require better measures of recreation quality. While qualitative methods will be helpful in developing these measures, we need to dispel the mistaken notion that quantitative approaches cannot address quality by developing improved (quantitative) measures of quality and incorporating these measures in behavioral models. Modelers have typically defined quality as an attribute of a site or something inherent in the recreation experience. In some cases

it may be more productive to define quality as a judgement of a particular individual in a particular situation.

3. Need to better model/understand the consumption process--As management has turned more to managing use versus simply providing for it, there is a need for better information about the consumption process. An understanding of consumer behavior is needed to market recreation and tourism resources as well as to manage visitor experiences. Such knowledge is required whether management is aimed at increasing visitor enjoyment or at protecting natural resources. Our understanding and models of the recreation or travel experience must include the roles of management, the consumer, other users, and providers of supporting or ancillary services that are part of the recreation or travel package. Many problems require models that capture both on-site behavior as well as selected aspects of the four other stages of the recreation experience defined by Clawson and Knetsch (1966).

4. Treating recreation & travel as services rather than products--Models, like most research in recreation and tourism, have been largely adapted or borrowed from other fields. Models used in recreation and tourism are borrowed primarily from resource management fields, geography, economics, or marketing, all of which tend to carry a product orientation. An overreliance on these models has caused modelers to ignore or oversimplify many of the essential elements of recreation and tourism that derive from their service nature (Mahoney 1987). For example, recreation behavior models deal inadequately with the role of the consumer in producing experiences, often treat the supply of recreation as an inventory that can be stockpiled, and lean toward product rather than service attributes in defining the characteristics of recreation or travel. A service perspective on recreation demands different approaches not only for management, but also for modeling. A simple example is the use of queuing models rather than inventory control models.

5. Need for more dynamic models--An overreliance on cross-sectional surveys and lack of dynamic modeling skills leaves the field with little understanding of fundamental temporal processes. Managers and policymakers have inadequate tools to deal with the increasing variety and rate of change both within recreation organizations and outside. Shorter lead times and increasing response times demand either longer range projection/anticipation or quicker research turnaround. This suggests more attention by modelers to simulation, the identification of leading indicators, feedback processes and models of change. Wider use of systems approaches and simulation models will help direct greater attention to dynamics. Stynes and Driver (1991), for example, discuss the dynamic elements of recreation benefits via a systems model.

6. Capturing consumer information in models--Managers are increasingly looking at communication and information as management tools, be it in the guise of education, advertising, public information, persuasion, or value clarification (Stynes 1988). Increasing research attention has been directed to these areas during the 1980's, but information is seldom captured in any meaningful way in our models. Numerous conceptual and theoretical models provide useful foundations for capturing information effects in behavioral models, but these remain to be put into practice in models of recreation behavior. Ideas from marketing (Mitchell 1978), persuasion (Manfredo and Tierney 1991), communication networks (Stokowski 1990), and the economics of information (Hirschleifer and Riley 1979) all suggest ways to improve models of recreation behavior via more direct consideration of information variables. Most modeling of information as a determinant of recreation behavior to date has served primarily to illustrate that there are problems and biases from ignoring it (e.g. Stynes and Peterson 1990; Stynes and others 1985). As with quality, improved measures of information (Spotts and Stynes 1985) and appropriate ways of specifying information variables in models of recreation behavior are needed to complete the job.

7. Modeling structural characteristics in recreation and tourism markets--While much modeling in recreation and tourism has an economic or marketing orientation, there is limited research into the structure of recreation and tourism organizations or markets. The informational characteristics of recreation markets is one example that has recently surfaced in the contingent valuation literature (Mitchell and Carson 1989).

Models of recreation behavior almost always include many structural assumptions, that are all too often unspecified and untested. These assumptions are often critical to the applicability of the model to a particular problem.

A case in point is the debate over the appropriateness of consumer surplus as a measure of value (See for example, Chappelle 1990). This debate has generally centered around Hicksian compensated demand functions versus uncompensated Marshallian models. In the typical recreation application this turns out to be a trivial technical matter. In focusing on this and other theoretical issues, the debate has totally missed the point that markets for recreation are fundamentally different than those for timber and most other market goods. It is the structure of the market (and the purpose to which values are put) that determines which measures of value are appropriate. For recreation it turns out this measure usually is the consumer surplus. The structure of timber markets (sealed bids) implies surpluses for timber are zero, yet recent RPA documents (USDA Forest Service 1990) assign much higher surpluses to timber than recreation. The Forest Service also seeks market prices for recreation based on similar goods that are provided in totally different markets. The flaw here is in assuming that economic (exchange) value is somehow inherent in the good, rather than a result of the structure of the market in which it is exchanged and the context in which a give value is used. Our models study attributes of goods and services, often to the neglect of market structures and purposes.

There are many other structural characteristics that have largely been ignored in economic models, e.g. public-private mix, input-output structure of recreation businesses, firm size, agglomeration factors, and competition. Understanding of the structural characteristics of recreation markets is critical to much of the present recreation and travel policy agenda. The lack of study of structural characteristics within recreation and tourism is not limited to economics. In geographic models, failure to account for spatial structure has been acknowledged (Fotheringham 1981). In sociology, concerns over the appropriate social group and decisionmaking unit are also structural matters (Cheek and Burch 1976).

8. Importance of motivations--Recreation and tourism management and marketing is increasingly concerned with understanding consumer motivations (Schreyer 1986). The freedom inherent in leisure choices, along with the consumer's role in producing recreation experiences gives the consumer considerable latitude in using the recreation and travel resources provided by others to achieve a variety of personal goals. The consumer's perception of quality and overall satisfaction are therefore highly dependent on his or her motivations, which can vary widely over individuals and particular circumstances. While there is a considerable body of research on motivations, we have only begun to consider how motivations may be captured in behavioral models. To date, researchers have concentrated primarily on identifying and measuring motivations (Tinsley 1986). Motivations have occasionally been used to explain differences in perceptions or satisfaction, but have rarely been used directly to improve models of recreation or travel behavior. Here we again have a problem of motivational researchers and modelers operating in somewhat distinct realms.

Conclusions and Recommendations

The above list is both a list of shortcomings of current models of leisure behavior and an indication of where modeling needs to go in order to respond to the changing management and policy agenda. This creates two critical problems for modelers. First, the failure of traditional models to take most of these variables into account represents potential sources of error in model predictions of use, demand, value and recreation behavior, more generally. This is the lesser of the two problems. The more serious problem is that the traditional models become not just inaccurate, but in many respects irrelevant to the most pressing management and policy questions of the day. As an applied field, modeling, like research more generally, must adapt to the changing problems. While some of these problems may be addressed by fine tuning our current models, some questions demand quite new and different approaches.

Some efforts during the 1980's to bridge the gap are best seen as transition tools. Some of the most useful models during this period have been broad conceptual models and management frameworks

that have provided some organization and direction during a period of major change. For example, the recreation opportunity spectrum (ROS), research on recreation experience preferences (REP), and management frameworks based on limits to acceptable change (LAC) have played significant roles in re-orienting management philosophy and research toward a stronger consumer orientation. Efforts to integrate this work into more formal behavioral modeling will likely require extensive refinement and improvement of these concepts and tools, both to meet the requirements of formal models and to correct a number of shortcomings that modeling will tend to reveal.

Over the past ten years psychologists in particular, have made significant contributions to our understanding of leisure behavior, while economists and geographers have developed better appreciations of the shortcomings of their models. The 1990's should be a period of integrating disciplinary contributions to our understanding of leisure behavior. Our knowledge base has grown sufficiently to require greater use of models to help organize the complexities of leisure behavior.

Two complimentary modeling thrusts are recommended. On the one hand, efforts must proceed to address the eight items noted above. A variety of approaches designed to capture consumer information, motivations, quality, market structure, dynamics, and processes at the level of designated market segments are needed. Initially, these models will likely need to address these issues one or two at a time, seeking to simplify what are quite complex matters in the most appropriate ways. Most will start by simply adapting existing models until it is clear that quite different models are called for. An essential complement to these modeling efforts will be more comprehensive models that attempt to put all of this together, illustrating where each of the pieces may fit and helping to identify missing pieces. These kinds of conceptual models will prove as useful to managers as to researchers in organizing our approaches to increasingly complex problems.

Three final recommendations are directed at modelers in recreation and tourism. These involve somewhat broader concerns than the eight directions discussed above. First, we should seek more process-oriented models. Most existing models of recreation behavior do not come close to capturing basic behavioral processes. Our models are best described as statistical, correlational, or "black box" models. As long as they predict well, we use them. There are both practical and theoretical advantages to more process-oriented models. Models that capture basic processes are often simpler and more stable over time. They provide greater insights into behavior. In other sciences, modeling has played a much stronger role in directing inquiry into fundamental laws and processes. Indeed, the term "model" is often synonymous with "theory" in these fields. Few models of recreation behavior constitute very rich theories.

Secondly, models and modeling should adopt more integrative approaches. Recreation and tourism research tends to be compartmentalized into narrow disciplinary perspectives on problems. Existing models of recreation behavior reflect this compartmentalization. Virtually all formal models of recreation and tourism behavior originate from a handful of disciplines with strong modeling traditions, primarily economics, geography, and transportation. Formal models are seldom used in sociological or psychological investigations of leisure. The result is a considerable gulf between what research has found out about leisure and what subset of this knowledge has been translated into models of leisure behavior. We increasingly find that the missing pieces of our models are social and psychological. By employing a common mathematical language and providing organizational structures, models are one of our best vehicles for integrating different disciplinary perspectives. We need more sociologists and psychologists with modeling orientations.

The carrying capacity topic illustrates the potential. Here we have a complex set of problems, both management and scientific ones, that require comprehensive solutions. Most of the major recreation research themes and management concerns arise in the carrying capacity context. Each of the eight directions/shortcomings of models of leisure behavior surface here. Characteristically, the geographic, economic, and some of the environmental aspects of carrying capacity have been modeled, but solutions to the problem rest heavily on perceptions, motivations, and management objectives. The social and psychological elements of the problem have not

been modeled. If we wish to demonstrate/test the ability of modeling approaches to help clarify and solve management problems, while also contributing to directing, organizing, and integrating research, the carrying capacity topic would be a good place to start. Unfortunately, just when it seems most of the key pieces are available, managers and researchers have turned to a new set of problems.

This leads to the final recommendation. As an applied field, it is encouraging to see modeling of leisure behavior directed at applied problems. However, models and modeling approaches are far more useful as vehicles for directing and organizing research than for solving applied problems. Recreation and tourism researchers have seldom used models for other than fairly narrow applied purposes. Such limited use of modeling is largely due to a limited understanding of modeling within recreation and tourism. Most of the best models of leisure behavior have been developed outside the field and there are few researchers within the field with strong modeling skills. Quantitative training of leisure researchers is skewed heavily toward statistics. This gives leisure scientists some knowledge of estimation techniques, but few skills in the broader art and science of model specification and application. The range of functional forms and mathematical structures that leisure scientists are exposed to is limited largely to linear models and the normal distribution. While modelers from outside the field can help in building models to solve particular applied problems, the use of models as paradigms for a leisure science must come from within. This use of models will require substantive changes in the training of leisure scientists.

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Rail-Trails in South Carolina: Inventory and Prospect

Robert L. Janiskee and James F. Schmid, Jr.[1]

Abstract. Rail-trail development in South Carolina has been hindered by a lack of research identifying railbed abandonment patterns and investigating associated rail-trail conversion projects. This study addressed that problem by examining Nielson's abandoned railbed inventories, the South Carolina Rail Plans, other government documents, and responses to a rail-trail questionnaire sent by state recreation planners to more than 500 municipalities. By 1989, more than 1,300 miles of railroad right-of-way had been abandoned in South Carolina, but only 18 miles had been converted to rail-trails open for public use. Creating a better rail-trail system in South Carolina will require increased public awareness, greater local initiative, a statewide comprehensive trail plan, trails legislation, proactive railbanking, the combining of rail-trail and utility corridor functions, and a greater commitment of state government resources.

Key Words: rail-trails, hiking trails

Introduction

In its heyday during the 1920s, America's railroad network included more than 260,000 miles of right-of-way. During the years since, however, trucking competition and other factors have led to the abandonment of more than 120,000 miles of track. Attrition continues at a rapid rate--currently more than 3,000 miles per year--and by 2000 there may be only 100,000 road miles left.

The huge supply of abandoned railroad right-of-way in America is of considerable interest to recreation planners and managers. Although most railbed taken out of service is eventually obliterated or badly fragmented, a great deal is suitable for recreational development. Abandoned railroad rights-of-way are about 100 feet wide, occupy roughly ten acres to the mile, and offer gentle grades, scenic attractions, convenient locations, linkage functions, and other features that make them nearly ideal as trails for the enjoyment of bicyclists, pleasure walkers, hikers, joggers, bird-watchers, cross-country skiers, and horseback riders (RTC 1989). These same characteristics make them highly appealing as greenways, linear parks, and wildlife corridors (Grove 1990, Little 1990). This paper focuses on the trail development option, which is commonly termed rail-trail conversion.

Rail-trail conversion is an idea whose time has come. The initial rail-trail projects developed in the 1960s were welcomed as a worthwhile innovation, but they were too few and scattered to serve as much more than a harbinger of things to come. In the 1970s, however, mounting demand for public recreation facilities and greenway corridors provided a strong impetus to rail-trail development. As the 1980s drew to a close the nation's network of rail-trails stood at more than 3,000 miles of trails in 34 states, at least 250 additional projects were in the planning or construction stages, and 30 million Americans were using rail-trails each year (Mills 1990). Strong leadership and technical assistance was also being provided by the Rails-to-Trails Conservancy (RTC), a 62,000-member non-profit organization of rail-trail developers and advocates that publishes a newsletter, manuals, and guidebooks.

Although the RTC and other rail-trail advocates have projected continued healthy growth in rail-trail development, it is likely that growth will be very intermittent in many locales and completely stifled in some. Rail-trail conversion is subject to a variety of constraints (RTC 1988). The railway abandonment process is complicated, and opportunities for local input may be very limited. In most places, residents remain ill-informed about the advantages of rail-trail projects and community leaders lack strong incentives to consider rail-trail options before they are foreclosed or preempted. Numerous troubles arise from the fact that nearly all railbeds cross or impinge on private land, highways, utility corridors, and easements. Adjacent property owners often lay claim to derelict railbeds, and many local residents oppose trail projects for fear they will bring littering, trespassing, vandalism, and other problems into their neighborhoods. Money difficulties are a perennial problem, since it can be fairly costly to acquire, build, and maintain rail-trails (RTC 1988). All things considered, it is no wonder that only 240

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abandoned railbeds had been converted to rail-trails by 1990.

The geographic distribution of rail-trails is very uneven. The main concentrations are in the Northeast and Midwest (especially Wisconsin), where projects of this type were being developed as early as 1964. An interesting question is why rail-trail projects have been comparatively scarce in the South, even though the region has a large stock of abandoned railbed. Rail-trails have been constructed in a variety of southern locales, and more are in the works. Nevertheless, the South has lagged well behind other regions of the country, and Florida is the only state in the entire region with an active rails-to-trails program. In view of these facts, studies investigating rail-trail development in the southern states could prove very helpful.

South Carolina is one southern state whose rail-trail system has never been studied systematically. This paper reports the salient results of a study designed to inventory South Carolina's abandoned railbeds, catalog existing or planned rail-trails, identify potential rail trail conversions, and suggest means by which the state's rail-trail system could be expanded and improved (Schmid 1989).

Methods

There is no single, comprehensive source of information about the amount and location of South Carolina's abandoned railroad rights-of-way. It was therefore necessary to glean relevant data from Nielsen's (1971, 1986) abandoned railbed inventories, the South Carolina Rail Plans (SCPSC 1980, 1984), and various publications of the U.S. Department of Transportation (1977a, 1977b), the Bureau of Outdoor Recreation (Lennon 1972), and the Interstate Commerce Commission (1989).

Identifying South Carolina's existing, planned, and potential rail-trails also entailed using a variety of information sources. A key source of relevant data was a simple (two question) rail-trail survey form sent by South Carolina's Department of Parks, Recreation, and Tourism to more than 500 municipalities in 1989 (Schmid 1989). Recipients were asked if they knew of any existing trails located on abandoned railroad beds, and to provide details as appropriate. They were also asked to provide information about any abandoned railroad corridors that could be converted into trails. There were 106 responses, with 4 mentioning existing trails and 29 offering information about potential rail-trails.

De Hart's (1984) book on South Carolina hiking trails provided useful information about some trails and trail segments. Supplementary information was obtained from many sources, including private foundation reports, Land and Water Conservation Fund project reports, the U.S. Forest Service, the National Park Service, the Nature Conservancy, the National Railway Historical Society, and various state agencies such as the Land Resources Commission, the State Forestry Commission, and the Heritage Trust. Each agency or organization associated with existing or planned rail-trails was sent a National Rails-to-Trails Inventory Survey. This is the same instrument used by the Rails-to-Trails Conservancy to judge whether particular rail-trails should be included in the RTC's annual guide.

Results

Abandoned Rights-of-Way

South Carolina's railway system peaked at 3,784 miles in the 1920s. Between 1923 and 1970, nearly one-fifth (721 miles) of this right-of-way was abandoned (Figure 1). An additional 262 miles were abandoned in the 1970s, and 347 more in the 1980s. By 1989 abandonments totalled 1,330 miles--more than one-third of peak length--and abandoned railbed could be found in 36 of the state's 46 counties. Much of this abandoned railbed lies in and near urban areas, where additional trails, greenways, and wildlife corridors are most needed. Accessibility is usually good because most railbeds parallel highways.

Officially Designated Rail-Trails

Despite the large supply of abandoned railbeds, only five officially designated rail-trails, totalling just 18 miles, were open for public use in South Carolina by 1989 (Figure 2). These projects are not only in widely scattered parts of the state, but also reflect different managerial opportunities, concepts, and methods.

The Cathedral Aisle Trail--South Carolina's oldest rail-trail is in the heart of Aiken. Dubbed the Cathedral Aisle Trail, it is a three-mile long rail-trail developed as part of a 25-mile network of trails that crisscrosses the 1,200 acre Hitchcock Woods Preserve. The trail came into existence in 1939 when a portion of the long-abandoned (since 1852) Charleston-to-Hamburg line--once famed as the longest railroad line in the world, and the first in America to carry passengers--was converted to recreational use. The trail traverses a parcel of land that was once part of millionaire Thomas Hitchcock's private hunting preserve, and then became a nature preserve managed by the Hitchcock Foundation. The Hitchcock Woods trail system is maintained with volunteer help and contributions, and is available for public use at no charge.

The Swamp Fox Trail--In the 250,000-acre Francis Marion National Forest north of Charleston, the Forest Service owns and maintains the 21-mile Swamp Fox Trail. This trail has three segments, totalling about six miles, that occupy grades of a 300-mile logging railroad system built in the late 1800s and abandoned in the 1920s. The elevated tramways, boardwalks, and bridges of the Swamp Fox Trail have kept hikers high and dry in the swampy terrain since the trail was opened to the public in 1970. Although located close to Charleston, the trail is estimated to get only 1,000 visitor days of use each year--apparently because it is not well publicized and can be unpleasant to use in the hot, muggy summer. Hurricane Hugo destroyed 70 percent or more of the forest's mature trees in September 1989, and the trail accordingly offers good vantage points from which to view the results of the nation's single most damaging storm (Janiskee 1990).

The Blue Ridge Railroad Historical Trail--One of the most historically interesting and scenic trails in the southeastern U.S. is the Blue Ridge Railroad Historical Trail, which is located in Oconee County near Walhalla. The trail has a five-mile segment beginning at Stumphouse Mountain Tunnel Park and extending along an easement leased to the Pendleton District Historical and Recreational Commission. The converted railbed was once part of the Blue Ridge Railroad project, an ill-fated attempt in the 1850s to penetrate the Appalachians and gain access to Knoxville and the rich Interior region beyond. Bankruptcy and the Civil War aborted the enterprise, leaving a 1,617-foot unfinished tunnel and miles of unused railbeds. In 1974 Seneca's Boy Scout Troop 219 began converting the old railbed into a hiking trail. The job was completed in 1976 as a Bicentennial project, and the trail is now listed on the National Register of Historic Railroad Trails. The Stumphouse Mountain Tunnel Park attracts thousands of visitors each year, many of whom use the associated rail-trail and primitive campground. The Boy Scouts still maintain the trail as a civic undertaking, and about 300 hike the trail each year to earn a medal or patch.

The West Ashley Bikeway--The West Ashley Bikeway is an expensive ($140,000) two-mile rail-trail constructed in 1983 by Charleston's Department of Parks with the help of Land and Water Conservation Fund monies. The project provided a major facelift for an abandoned, trash-strewn railbed obtained via a 20-year lease (at $1 per year) from the SC Department of Highways and Public Transportation, which had acquired the right-of-way for an expressway that was never built. Although meant to be only the first phase of an ambitious bikeways system for the city that was conceived in the 1970s, it has remained the only closed-to-motor-traffic bikeway in the city. It performs important services as a linear park and greenway for walking and jogging, but it sees little use as a bikeway because it is sandwiched between two busy roads and there are no connecting bikepaths.

Big Trestle Park--In the late 1970s, the Seaboard Coast Line Railroad abandoned its Charleston-to-Savannah line and donated the half-mile Broad River Trestle and 1.5 miles of contiguous right-of-way to Jasper County. By 1984 the County had converted the trestle into a fishing pier with the right-of-way as an access route. Dubbed Big Trestle Park, this undertaking is one of the region's most unusual rail-trail projects. Unfortunately, it is also among the least successful. The trestle has been destroyed by several fires (apparently the work of arsonists), and with the trestle gone only a few locals still come to this site to fish and crab. The County still grades the old railbed twice a year and picks up litter, but the future of the trail is uncertain. The South Carolina Department of Parks, Recreation, and Tourism (1990) did not

include Big Trestle Park in its new rail-trails brochure.

Rail-Trails Under Development

Four additional rail-trails were under development in South Carolina as of 1989, although one project has since been canceled. In 1988 North Augusta used municipal funds and a state recreation grant to buy a 5-mile segment of abandoned right-of-way from the Norfolk Southern Railroad for $100,000. The corridor was needed for the city's water, sewer, and other utility lines, but the railbed will also be used as a rail-trail called the Greeneway. Named in honor of North Augusta mayor Thomas Greene, the Greeneway will run beside the city's biggest park (Riverview Park) and within easy walking distance of most of the city's residents. It is slated for opening by 1992.

In 1981, Charleston's Public Works Commission paid the Seaboard Coast Line Railroad $1.75 million for 10 miles of abandoned right-of-way stretching from Folly Road (SC 171) to Main Road on Johns Island. Although primarily acquired for sewer lines, this land will also serve as a greenway buffer and rail-trail known as the West Ashley Greenway. In 1989 the Charleston Parks department budgeted $50,000 to start trail development.

Marion is another place where a local rail-trail is in the making. In 1986 Marion County purchased the Marion-to-Mullins segment of the abandoned Mullins-to-Pee Dee railroad line. The portion that was within the city limits of Marion was deeded to the city, and by 1987 the city had converted this segment into an attractive greenway in the heart of the community. Marion officials have since acquired two more miles of the line for a fitness trail, and are collaborating with the County in the hope that the rail-trail can be extended eight miles to the banks of the Pee Dee River.

The city of Cayce, located just across the Congaree River from Columbia, recently canceled plans for a park that would have incorporated a 1.25 mile railbed abandoned in 1975 after being used to haul clay for brick kilns. The city had planned to run a sewer line the length of the right-of-way, and also build picnic shelters, parking facilities, and a rail-trail called the Guignard Trail. Revised plans call for a road instead of a rail-trail.

Potential Rail-Trails

Many of South Carolina's abandoned railbeds may be suitable for rail-trail conversion. At least four segments, totalling more than 60 miles, are already being considered for rail-trail projects in the McCormick, Barnwell, York, and Cheraw communities. These communities have been working on the proposals for up to four years, and in all but one case (a segment running between McCormick and Calhoun Falls) acquisition of the abandoned right-of-way is the major remaining obstacle.

Discussion

Given the well documented need for additional trails, greenways, and wildlife corridors, the nine rail-trails already opened or under development in South Carolina are not enough. The state is blessed with numerous opportunities for rail-trail conversion projects, however, and the foundation has been laid for what could become a rail-trail network serving every region of the state and many of its cities. Creating a network of this scope and worth will require increased public awareness of rail-trail values and opportunities, greater initiative on the part of local recreation agencies, more comprehensive planning, new legislation, and a stronger commitment of state government resources to technical and financial assistance for rail-trail development.

The rail-trails under development in North Augusta and Charleston illustrate a relatively new and promising approach to rail-trail conversion in South Carolina. Both of these projects employ abandoned railroad right-of-way that was acquired by municipal government primarily for utility corridor use, especially for water and sewer lines. It appears that piggybacking rail-trail developments on utility corridor projects is an appealing concept because parks and recreation departments gain trails without purchasing land, while public works departments avoid landscaping and maintenance costs. Detailed case studies of this symbiotic relationship should be high on the rail-trails research agenda.

It remains to be seen whether this or any other managerial strategy will significantly quicken the pace of growth in South Carolina's rail-trail system. Most newly abandoned railroad rights-of-way in the state are not even being considered for trail use, and there is still no "railbanking" or other formal procedure for ensuring that this will be done. In 1990 at least five rail-trail proposals were making little or no headway because right-of-way could not be acquired and local support was inadequate. Unfortunately, if abandoned railbeds are not promptly converted to rail-trails, the opportunity is often severely impaired or lost. Thus, if rail-trails are to be developed at a rapid pace in South Carolina, some corrective actions must be taken in the near future.

Experience has shown that responsibility for the planning, acquisition, development, and maintenance of rail-trails rests primarily with local recreation providers. To improve these efforts there should be more and better communication of ideas and sharing of experiences. The leadership in this area demonstrated by the Rails-to-Trails Conservancy and its affiliates is exemplary, but state government also needs to play a very active role. At present, state information services and technical assistance related to rail-trails are very limited.

South Carolina's government can give rail-trail development in the state a tremendous boost by emulating other states with successful rail-trail programs. A logical place to begin is with a statewide comprehensive trail plan, a project that is long overdue. Since rail-trail proposals tend to be blocked at the acquisition stage, improved acquisition strategies, tactics, and funding mechanisms are also urgently needed. Many obstacles could be removed through Trails Act legislation providing for right of first refusal to the state on abandoned railbeds, power of eminent domain, owner exemptions from liability when land is used for recreational purposes, conservation easements, and other means to preserve abandoned rights-of-way and develop them for recreational use. Much can be done to promote the "railbanking" process that yields voluntary agreements between railroads and trail managing agencies to dedicate unused rail corridors to interim trail use. The state must also improve its technical assistance and strive to provide more funding for rail-trail projects.

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Figures

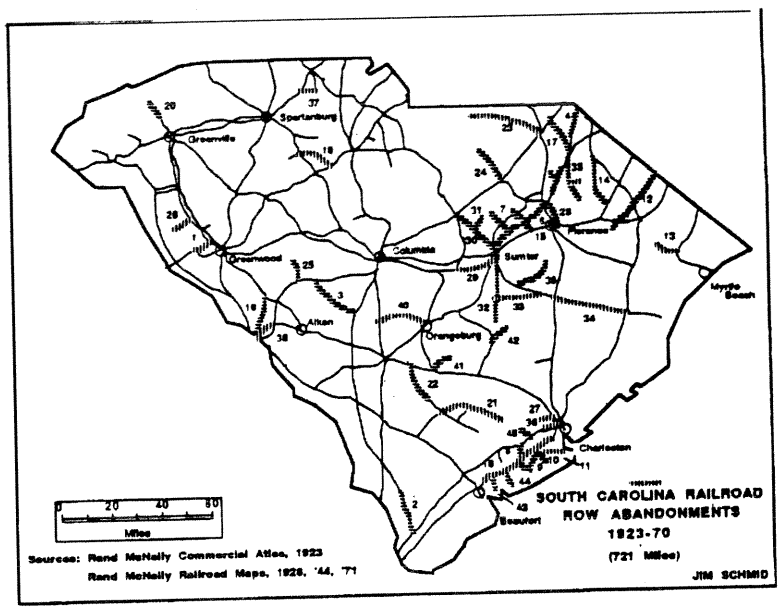

Figure 1. Railroad right-of-way abandoned in South Carolina, 1923-1970. The state's rail system peaked at 3,784 miles in the 1920s, but nearly one-fifth (721 miles) had been abandoned by 1970.

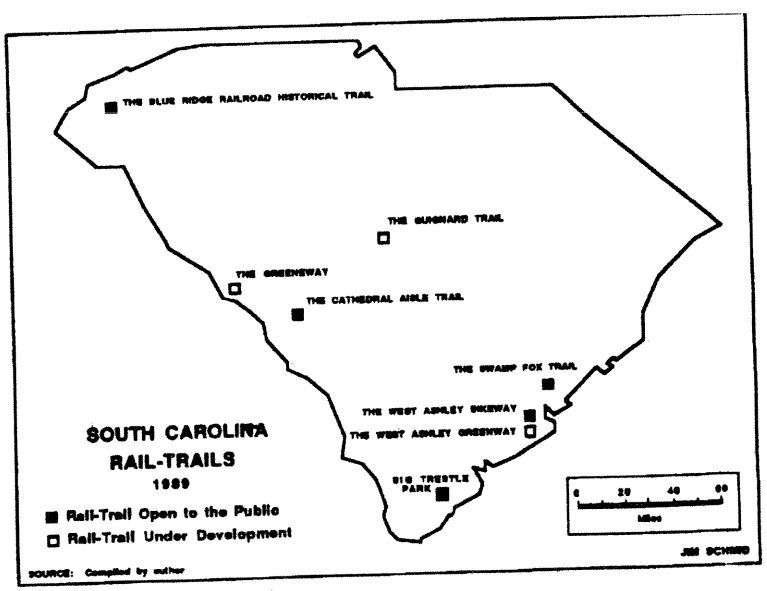

Figure 2. Rail-trails opened or under construction in South Carolina, 1989. Track abandonments in the state totaled 1,330 miles by 1989, but only five officially designated rail-trails were available for public use, and just four more were under construction. The Guignard Trail project was subsequently abandoned. Not show on the map is a rail-trail project under construction in the city of Marion in the late 1980s.

Monitoring and Evaluation of an Off-Road Vehicle Riding Area in Kentucky

Kenneth Chilman, James Vogel, and Jerry Conley[1]

Abstract. There is considerable current interest in developing recreation monitoring systems for wildland areas. Recreation monitoring includes physical-biological measurements of site impacts and social measurements of visitor numbers and perceptions. Design of monitoring systems involves representative samples of several variables on large and diverse land areas at relatively low cost. This paper discusses (1) how a monitoring system has evolved since 1973 for an off-road vehicle (ORV) riding area, (2) results of monitoring measurements, and (3) evaluations of the measurements. Monitoring systems are seen here as a drastic change in thinking about recreation management, as part of structured management information systems for decision-making.

Introduction

Monitoring and evaluation are being increasingly called for as necessary components of recreation area management systems (Stankey and others 1983; Manning 1986; Lucas 1990). Recreation monitoring needs to include both physical-biological measurements of site impacts and social measurements of visitor numbers and perceptions of conditions. Research on site impact measurements has been done for some time, but considerably less research has been done on social monitoring of numbers and types of visitors causing the impacts (Hammitt and Cole 1987). Recently, research has been underway to develop integrated systems of monitoring measurements for large land areas (Chilman and others 1990).

The research reported here represents the first remeasurement of a system of recreation monitoring measurements. Then the evaluation of the remeasurement results is discussed. Evaluation concepts in the recreation research literature, which focus on using management objectives and standards, were not applicable in this study (Manning 1986, Hammitt and Cole 1987). New approaches to evaluation of monitoring data were explored.

What happens to area conditions when a large wildland area is opened to ORV riding? How can the conditions be measured? How are the results of these measurements evaluated for management purposes? This study reports (1) how a recreation monitoring system has evolved since 1973 for an off-road vehicle (ORV) riding area, (2) results of the 1989-90 monitoring remeasurements, and (3) development of structured approaches to assist evaluation of the monitoring data.

How the Monitoring System Evolved

How did it happen that a system of integrated monitoring measurements, both physical-biological and social, developed for the study area? Monitoring began with measurement of ORV site impacts, counts and interviews of ORV riders were added, then remeasurement as an integrated system took place in 1984 and in 1989-90.

Turkey Bay ORV Area

The study area is a 2500-acre designated ORV riding area near Turkey Bay within Land Between the Lakes (LBL), a Tennessee Valley Authority (TVA) administered area in western Kentucky and Tennessee. The area is ninety percent forested, and is characterized by shallow clay soils with a limestone chert base. The ORV trails area contains over ninety-two miles of ORV trails and old logging roads. It offers a variety of riding experiences ranging from flat open meadows to steep hill climbs.

Turkey Bay was established as an ORV area in 1972. Beginning in the late 1960's, a problem was recognized with uncontrolled use of trailbikes throughout the 170,000-acre Land Between the Lakes. By the time President Nixon issued Executive Order 11644 in February, 1972 requiring federal agencies to develop policies and procedures to control the use of off-road vehicles on public lands, LBL was working on preliminary plans for Turkey Bay as a solution to the problem. Several

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years of discussions has produced a consensus that LBL should attempt to provide riding opportunities rather than exclude all off-road riding from LBL. This would be consistent with LBL's role as a demonstration area and would avoid the high costs of prohibiting off-road riding.

An agreement was also reached to provide one designated area open to off-road vehicles rather than providing a designated trail system. The open area management idea was identified as the logical choice for LBL for several reasons. In contrast to designated ORV trails, the open area concept assures less conflicts between riders and those pursuing non-motorized forms of recreation, it allows for a high degree of rider freedom, and it limits enforcement to a relatively short boundary rather than the length of a system of trails. It also focuses attention on a specific area for monitoring of environmental impacts (as required by Executive Order 11644).

The Turkey Bay area was given final approval for designation based on the following criteria: a central location close to main entrances to LBL and to the administration complex to allow easy access for riders and area managers, one main entrance to the designated area to facilitate management control, recognizable and definable natural features to serve as boundaries enclosing an area of the desired size and shape, a diverse topography and vegetative cover to interest riders, soil with high resistance to erosion to minimize adverse effects of ORV's, and existing use of the area for off-road riding indicating a preference for the area by local riders.

Development of Turkey Bay ORV Area, completed prior to its official opening on July 1, 1972, included establishment and marking of boundaries, minor grading and graveling of the entrance road and staging areas, bush hogging and mowing of a camping area and the installation of some basic structures such as loading ramps, an entrance sign, a bulletin board, trash cans and chemical toilets. No trail construction was done (some old roads and trails existed from prior land uses). The second year of operation some improvement and expansion of the camping area was done with installation of picnic tables and fire rings. Total cost of development was approximately $30,000.

In the years since the initial development of the area very little beyond normal maintenance has been necessary. Grading and installation of water bars on old logging roads that were eroding rapidly was done on a few occasions. Additional signs including speed limit signs on the entrance road, a rules and regulations sign, and a sign warning of rough terrain and stating "ride at your own risk" have been installed. Arrangements were made for patrol by LBL safety officers. Normal forestry and wildlife activities have continued and hunters are not excluded from hunting in the ORV area.

At the time of Turkey Bay's establishment, the major type of off-road use was trailbike riding. Four-wheel drive trucks and Jeeps were only a minor proportion of use at that time but increased greatly in the late 1970's. A proportionate increase in deeply rutted trails and hill climbs was noted and was a main focus of the monitoring in 1984. Three-wheel, and then four-wheel all-terrain vehicles (ATV) arrived in the late 1970's and mid 1980's, respectively, and have become the dominant ORV vehicle type at Turkey Bay.

Monitoring Research

The Turkey Bay ORV area was the first public land area officially designated for ORV riding in the United States. Because ORV riding was a controversial use of public land, a monitoring program was made a condition of the designation.

The monitoring at Turkey Bay is characterized by methods that allow the gathering of critical data with minimal costs and manpower. The initial monitoring plan drafted in the fall of 1972, and implemented in the summer of 1973, concentrated on the mapping and measuring of use areas, primarily old logging roads and trails (all in 1972). Trail length and width were measured and each trail was rated according to use level -- light, medium, or heavy. In addition, twenty 25-foot trail sections were marked for erosion measurements. The width of bare soil was measured every five feet and trail depth was measured at three points along the trail section by placing and eight-foot pole across the trail and measuring from the bottom of the pole to the bottom of the deepest rut. Tree and shrub mortality were determined by counting all dead stems, half inch or larger, to a distance of 15 feet

from the trail center. This procedure was duplicated in control plots of the same 25 x 30 foot size, parallel to the trail sections. Comparison of mortality from the trail and control sections indicated mortality due to off-road vehicles. Photos were taken of trail sections to provide a visual record of changes.

Several methods were used in an attempt to measure impacts on wildlife, including deer track counts, turkey counts and brood surveys, and casual field surveys for sighting and signs of birds and mammals. In addition to the trail sections and wildlife surveys, 16 photo-points were established at areas thought to be most vulnerable to off-road riding, such as stream banks and steep hills. The monitoring plan was designed to be carried out over a period of five years with mapping and measurement of total area impacted and survey of established trail sections done every two years (1973, 1975, 1977) and wildlife surveys done every year.

Equally vital to management decisions is information concerning the use and users of the area. The desires and opinions of the riders as well as who the riders were, where they came from, and when and how much they would use the area were not known. In 1973, studies were conducted to construct a profile of the off-road cyclist at LBL (Chilman and Kupcikevicius 1973). The methods used were brief on-site interviews conducted at staging areas followed by more detailed questionnaires mailed to each person interviewed. Another year-long study, employing brief on-site interviews, was completed in 1976 (Chilman and Mize 1976). This study was done to determine the number of visitors who entered Turkey Bay ORV area as well as the number who were off-road riders, the amount of time they rode while in the area, and the frequency of accidents. The survey information was coordinated with data from an automatic traffic counter on the entrance road maintained year-round by the LBL staff.

The intended five-year life of the initial monitoring plan expired in 1977. Though some new monitoring options were investigated by LBL staff in 1981 and 1982, no monitoring remeasurements were done until 1984 (Ladley 1985). At that time a summer-long monitoring effort combined impact measurements, counts, and user surveys. The trail study sections were not resurveyed; rather, the impact measurements focused on remapping and measurement of the impacted area with more specific, written measurement and erosion assessment procedures. Counts and interviews were repeated in a manner similar to those used previously.

The most recent monitoring, begun in the winter of 1989 and continued through fall 1990, encompassed repeating the user surveys, counts, and impact measurements, with some modifications of the methods used in 1984. Wildlife studies designed to compare the populations of several key species on the ORV area and another area within LBL with similar environmental characteristics were scheduled to begin in 1991. Hunting harvest data was used in the past as an available gauge of game populations within the ORV area and will continue to be used in future monitoring. Several eagles continue to occupy habitat in the Turkey Bay area and periodic census counts appear to indicate that their numbers are increasing.

Results of the Monitoring Measurements

The monitoring results discussed in this section reveal the changes occurring to the physical and social environment at Turkey Bay. However, changes have occurred in the management environment as well. The rules and regulations have remained short and simple but have been expanded. To the initial rules requiring spark arresters, operation of ORV's within the posted boundary, and prohibiting night riding, there have been added requirements that all riders wear safety helmets, a 15 mph speed limit to be enforced on the entrance road, and prohibition of the use of alcohol while operating an ORV. The designated boundary of the ORV area has been expanded slightly in several places to take in places where riders had a strong desire to ride including a hill climb, a dry creek bed, and two open fields. The total area increased from 2,350 to 2,500 acres.

There are presently several special events held annually at Turkey Bay ORV Area at the request of local ORV dealers and rider organizations. These events are permitted with the intention of fostering cooperation between ORV dealers, riders, and LBL

management, and include manufacturer-sponsored "fun days."

Impacted Area Measurements

The most dramatic aspect of the monitoring results has been the relatively low amount of impacted area. The rate of increase in impacted area has generally been slow but constant (Figure 1). The number of miles of trail increased rapidly in the first years of operation as new trails were added to the existing network of old logging roads, then slowed somewhat after 1975. By 1977, after five years of operation, the miles of trail had almost doubled and the area impacted had more than tripled. These changes might be alarming if not put in the context of the total number of acres within the ORV area: in 1977 only 2.1 percent of the total area was being directly impacted by ORV's.

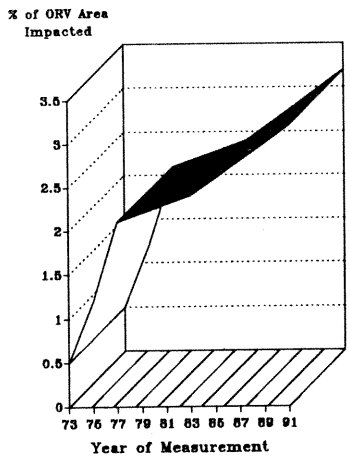

Figure 1. Percent of Total Area Impacted at Turkey Bay ORV Area.

The interim between measurements lengthened after 1977 to 7 years. In those years between 1977 and 1984, the rate of increase of impacts slowed considerably. The miles of trail only increased at a rate of about 2.5 miles per year. The rate increase for impacted area slowed also as the acres of ground impacted increased 22 percent (about 1.5 acres per year). The portion of the area impacted increased to 2.5 percent in 1984 and to 3.5 percent in 1990 (Table 1).

The first expansion of the trail system occurred on the south side of the ORV area nearest to the entrance road and staging areas. Two ridge and ravine areas in particular became the focus of riding activities. In ensuing years a network of trails reaching all portions of the ORV area developed with the highest concentrations remaining on the south half of the area. By 1984 the network of trails had reached 59 miles in length but a few blocks 50 to 100 acres in size remained without trails. Today, the largest such sections remaining are about 50 acres and the more typical unbroken block is about 20 acres.

In 1984, Ladley indicated there were 12 major hill climb areas (Ladley 1985). Today, there are about two dozen of these but most of the newer ones are small, lightly used and not severely eroded. The oldest of these, close to the entrance road and with 18+ years of use, are very severely eroded. Ruts are up to 6 feet deep (primarily from four-wheel drive vehicle use in the 1970's), but they have generally been stabilized at that stage as the deepest ruts reached a solid chert layer and receive little or no use due to their nearly impassable state.

Soil, Vegetation and Wildlife

The major method used to gauge the effect of ORV riding on soils and vegetation, the trail study sections measurement, was discontinued after the 1977 monitoring. Those measurements did indicate, as might be expected, serious erosion on steep sections of trail, especially at hill climbs, and on old logging roads where four-wheel drive vehicles operated. Displacement of soil and rock was observed but it was not being transported beyond the base of the slopes. When the underlying pavement of chert was reached, erosion effectively stopped. Trails on the relatively flat ridge tops and valley bottoms showed little erosion. This pattern of erosion remains today -- more severe erosion occurs where the trail grade is steep and relatively little occurs (perhaps about what would be expected with a well-used hiking trail) on the level sections. Soil Conservation Service personnel who had an opportunity to view the trails at Turkey Bay, including the oldest and most severely eroded hill

climbs, felt the level of erosion was not a cause for concern and noted little transfer of soil to the stream beds or to Kentucky Lake.

As for impact on vegetation, plants not growing directly in the trail where they would be driven on show little or no damage. Though some trees growing alongside the trail suffer exposure of and damage to roots, only a very few trees, with nearly complete root destruction, have been killed. The area trees, having established themselves in the dry, rocky soil of Turkey Bay, appear to be quite hardy. The control plots showed no difference in mortality between shrubs and seedlings alongside the trail and those in the control plots. Aside from the vegetation killed directly on the trail, ORV's appear to have little direct impact on the forest vegetation at Turkey Bay.

With 96.5 percent of the ORV area receiving no direct wheel-to-ground impact, it is reasonable to suspect that most wildlife species have not been disturbed. Field surveys conducted as part of the original monitoring plan showed that a variety of wildlife continued to inhabit the area. Sixty-four species of birds and several species of mammals were sighted or identified through sign. There has been an increase of turkey and winter bald eagle sightings. The deer harvest data has shown that the number of deer killed in the Turkey Bay area compares favorably with the number killed in similar areas throughout LBL. Deer are also among the species of wildlife most frequently sighted by riders.

Visitor Use

Accurate estimates of visitor numbers at Turkey Bay have not always been available. The surveys administered in 1975-76 estimated about 16,000 annual visits. Ladley's month of visitor counts and checkpoint interviews during July and August, 1984, put the number of visitors for that period at 3,057. Visitor counts are lacking between 1984 and 1990, but traffic counter monitoring and observation during summer 1990 indicate the number of visitors for July and August is very close to the number seen in 1984. The total number of visitors for 1990 is about 30,000. Visits appear to peak in the spring and fall seasons.

While numbers of users appear stable, other user statistics are not. The ratio of ORV to non-ORV visitors has increased and the types of ORV's used has gone through several phases. For example, during 1990, 64 percent of the visitors were ORV users while the figure was 43 percent in 1976. Similarly, the four-wheel ATV was just appearing in 1984 but today is the most frequently used ORV while three-wheel ATV use is declining (Table 2).

A new addition to the 1990 on-site interviews is a question that asks the respondents to rate their overall satisfaction with Turkey Bay ORV area on a scale from one to ten. A one would indicate "not at all satisfied" while ten would indicate "very satisfied." Results put the average response above nine. ORV riders indicate they are pleased to have a place to ride as other opportunities disappear. There are very few comparable opportunities to ride in the region and none offer the combined variety of terrain, freedom to ride, and free admission available at Turkey Bay.

There have not been any serious visitor related problems at Turkey Bay. Previous monitoring did note occasional rule violations, litter, and vandalism, but not at a level greater than expected or more than encountered at other LBL facilities. Three areas have been identified as needing steady attention and enforcement: boundary violations, riding without helmets, and speeding on the entrance road. The boundary marking had fallen into disrepair and some exterior trails had developed. A concerted effort was made during summer 1990 to close off all out-of-bounds trails and mark the boundary very clearly. The speed limit and helmet regulations require steady, consistent enforcement. LBL patrol officers have written citations for each of these offenses during this and previous years.

Evaluation of the Monitoring Data

Stankey and others (1983) indicated that "monitoring is a necessary but insufficient activity for performance assessment. An evaluative framework in which to interpret data must also be developed." They also stated that "Monitoring involves observation of phenomena and systematic collection of data for the purpose of evaluating attainment of area management objectives." But

what if no management plan objectives or standards exist? How then is evaluation to proceed? How is an "evaluative framework" to be developed?

A formal management plan was not developed for the Turkey Bay ORV Area in 1972 because little was known about ORV riding and its effects on wildlands. The Turkey Bay monitoring program was established to obtain information for management purposes. Now that monitoring data have been collected over a 17-year period, what kind of "evaluative framework" can be developed to guide management?

The framework developed operated at three levels. The first level was suggested by Stankey and others (1983): "evaluation -- the analysis and interpretation of the data, comparing actual effects with hypothesized or intended effects." Four "intended effects" were identified and their attainment in light of the monitoring data was considered. The second level consisted of the possible development of "evaluative standards" (Shelby and Heberlein 1986). And the third level went beyond basic objectives and standards to consider other aspects of the setting discussed by Wagar (1966) in his identification of recreation "quality" factors.

At the first level of evaluation, four "intended effects" of designating the ORV riding area could be identified from TVA records, publications, and discussions with managers. The four "intended effects" were (1) to contain ORV riding within one area of LBL, (2) to keep environmental impacts within acceptable limits, (3) to keep management costs low, and (4) to provide highly satisfactory visit experiences for LBL recreationists (Vogel and Chilman 1991). Containment of ORV riding within the 2500-acre Turkey Bay area has worked well. Although a few riders have strayed beyond the designated boundaries, no uncontrolled ORV riding in other parts of LBL has been reported in recent years. As for environmental impacts, the finding that only 3.5 percent of the total 2500 acres is being ridden on after 18 years of ORV riding would probably not have been predicted in 1972. Management costs estimated at approximately $6,000 per year are much lower than administration of ORV riding on designated trails. The high satisfaction ratings obtained during visitor interviews, along with indicators such as favorable comments received, attest to the achievement of providing satisfactory visit experiences. It appears that LBL has been successful in achieving the "intended effects" of the ORV riding area designation.

The second level of evaluation consisted of discussions about possible "evaluative standards." The establishment of standards are usually prompted by managers' perceived need to set limits on impacts that are approaching critical levels. The intensive measurement of physical effects of ORV riding at Turkey Bay did not indicate that impacts have reached critical levels. One result of zoning ORV riding into an area with few other uses is that other user groups do not complain about the presence of ORV users, or ORV trails or noise. This lack of complaints from LBL visitors has probably been a factor in LBL managers not perceiving a need to set limits. Past efforts to create water diversions on sloping trails have not been successful for various reasons, but further studies of effective water bar development are proposed. Standards for erosion control may be developed when more is learned about implementation. Observation and measurements of ORV riding patterns indicated that riding tends to be fairly evenly distributed throughout the area. For these reasons, there did not seem to be a strong need to establish standards for physical impacts or number of riders at this time.

The third level of evaluation involves the continuing search, beyond basic management objectives or standards, for ways to improve recreation quality. For this, we used four factors identified by Wagar (1966) as important for recreation quality: to provide a range of opportunities, to zone areas according to different conditions and uses, to develop management strategies specific to the zone conditions, and interpretation. Because quality means different things to different people, discussion of visitor interviews about their perceptions of conditions was included. The research team and LBL managers then discussed how these factors relate to the Turkey Bay situation. Under discussion was the range of ORV riding opportunities that ORV riders had identified in the region, the uniqueness of Turkey Bay in terms of size of area and freedom to ride anywhere within the designated area, the areas of Turkey Bay ORV area that had different conditions and the

implications for management. (Specifically, we identified two zones with different conditions from most of the area: the access corridor which is used by the 37.5% of visitors to the area that are non-ORV riders and the lakeshore area. Conditions within these two zones would be studied during future planning efforts.) Lastly, the management and research team discussed various visitors' perceptions of ways to improve the area, including provision of drinking water and better camping facilities.

Finally, the researchers and LBL managers discussed these three levels of evaluation in relation to the Quality Upgrading and Learning (QUAL) recreational carrying capacity planning process (Chilman and others 1990). This planning process would provide a structured approach for integrating the information collected and evaluated concerning area conditions into an area management plan when deemed necessary.

Discussion

The monitoring system reported here is a shift in thinking about recreation management. It may be at least as important to have a system of periodic measurements as it is to have a management plan for an area. Changes occur in many ways on large wildland areas, and it is necessary to quantify and discuss implications of the changes in conditions as they occur.

Hammitt and Cole (1987) stated that, "Reliable data are needed to manage recreation just as reliable inventory data are needed to manage other natural resources, such as timber. Unfortunately, they are seldom available. In recreation, management has too frequently had to rely on guesswork or the personal experience and intuition of managers. While a manager's professional opinion is important, it is no substitute for reliable and systematically collected inventory and monitoring data. This is particularly true when turnover in personnel is frequent, as in government agencies."

The recreation monitoring system reported in this study represents a change in thinking from primary dependence on "personal experience and intuition of managers" to a systematic, information-based foundation for management.

Other places where similar recreation monitoring systems are being implemented are: Ozark National Scenic Riverways, a 134-mile-long National Park Service area in Missouri, and, for backcountry management, an 1800-square-mile area of Grand Canyon National Park in Arizona. Problems of large size and diversity of wildland areas, and low budgets for management, are being overcome at these locations.

The concept of management information systems for recreation management means obtaining current information for resolving conflicts, making decisions about site development and management, and to help manager's respond to specific request for information from the public about specific locations. This information can also be useful in decisions involving multiple resources, where recreation is now at a disadvantage.

Problems remain to be addressed in further monitoring research. Monitoring means a continuing flow of information rather than "one-shot" studies. Methods are needed for processing this flow of data and making it readily available for management. Computer availability in field locations will help. Concepts from the area of management information systems (MIS) in business management will also be advantageous. Another problem currently being researched is ways field level managers can become involved in monitoring data collection and analysis. Can monitoring be incorporated in their already busy work schedules, and can field managers be trained to think of using data for answering management questions? Beyond training present managers, a basic change in thinking and training of future managers to design and utilize monitoring systems is needed.

These are exciting times in the area of recreation monitoring research. The design of monitoring and evaluation for large wildland areas is like working puzzles with many pieces. In this sense, it begins to parallel the actual complex work situations of many recreation managers. Manning (1986) has suggested that "The success of future research will be determined, to a large degree, by the extent to which researchers and managers understand each others' roles and processes." Perhaps monitoring research can help us toward achieving this understanding.

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Table 1. Comparison of Results of Impact Studies 1973-1990*

Study Year	Miles	Acreage	Total ORV Area Acreage	Percent of ORV Area Receiving Impact
1973	21.1	14.6	2,350	0.6%
1975	36.0	28.1	2,350	1.2%
1977	41.4	48.2	2,350	2.1%
1984	59.0	58.6	2,350	2.5%
1990	91.9	87.9	2,500	3.5%

*This table does not include entrance road, camping or staging areas.

Table 2. ORV Types Used at Turkey Bay ORV Area, 1973-1990

ORV Type	1973	1976	1984*	1990
Trailbike	95%	79%	36%	27%
Three-wheel ATV	--	--	41%	17%
Four-wheel ATV	--	--	**	49%
Four-wheel Drive, others	5%	21%	9%	7%

* In 1984, another category, Three-wheel ATVs and Trailbikes comprised 14% of total.
**Four-wheel ATVs were included in the "other" category in 1984.

Marketing Outdoor Recreation and Tourism in Georgia: The Development of a Statewide Directory

J. Mark Morgan[1]

Abstract. The President's Commission on Americans Outdoors (PCAO) makes numerous recommendations concerning the present and future status of outdoor recreation in America. Some of these initiatives address the need to improve information dispersal systems, specifically as it relates to developing comprehensive data bases which integrate public and private recreational opportunities. Acting upon this recommendation, the Department of Recreation and Leisure Services at Georgia Southern University published the Georgia Outdoor Directory: An Information Guide To Recreational Opportunities. This paper provides an in-depth discussion of the needs, methods, results, and implications of this process.

Introduction

Lack of information about outdoor recreational opportunities acts as a major barrier to activity participation. Conversely, information presented to recreationists in a timely and organized fashion helps to promote satisfying leisure experiences. Until recently, there was no comprehensive source of information that fully addressed the range of Georgia's outdoor opportunities (including both the public and private sector).

The Georgia Outdoor Directory was designed to accomplish three primary objectives: (1) to inform the public on the availability of outdoor recreational services (e.g., instructional classes, guided trips & equipment rentals) and the sponsorship of outdoor recreational places (e.g., federal, state & private); (2) to promote Georgia tourism (both as a tourist-destination and to encourage intrastate travel) and recreation-based economic development; and (3) to assist outdoor recreational businesses with a cost-free means of advertising.

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Need For The Project

The 1980's have been characterized by many experts as an era of "cutback management" in the Federal government, particularly with respect to social programs. Recreation is no exception to this trend. Considering these budget reductions, governmental agencies (which offer recreational services) have been forced to closely evaluate their role in the provision of such services. Some agencies have responded by curbing their involvement in recreation, whereas others have abolished these interests entirely. For example, in Spring, 1990, the Georgia Department of Natural Resources threatened to close two state parks & historic sites and restrict the services in seven others in response to a statewide budget crisis. These drastic measures were averted only through public outcry.

The private sector has been increasingly called upon to fill these recreational gaps. Government agencies often manage the resource (e.g., State and National Parks), but allow concessionaires and non-profit associations to control many of the service-related responsibilities. The Third Nationwide Outdoor Recreation Plan (NORP) successfully predicted privatization to be a major trend of the 1980's.

As a result of the transition from the public to private sector, recreationists are often left confused about the availability and sponsorship of recreational opportunities. Since decisions about participation are largely knowledge-dependent, it is imperative that potential users receive organized and up-to-date information. According to the PCAO, the fifth most commonly cited reason for participation in recreation was the availability of information. Moreover, 32% of the American public rated lack of information about recreational opportunities as a major deterrent to participation (NORP).

If we are truly at the "dawn" of the information age, it is not evident as far as outdoor recreation is concerned. There is far too little information sharing between the vast array of recreation providers. As a result, it is very difficult for potential users to contact providers for reservations or to obtain information on the availability of activities. Some directories are available, but typically they provide limited types of information.

For example, they either represent a particular agency (e.g., Department of Natural Resources) or simply promote regions of the state as tourist-destinations (e.g., Department of Industry, Trade & Tourism). Existing directories simply do not include comprehensive information on outdoor recreation, including both the public and private sectors.

According to the PCAO, better information systems are needed to benefit the public. Some of these recommendations include: (1) "a comprehensive information system integrating public and private recreational opportunities"; (2) the "creation of state recreation clearinghouses to provide the public with information on recreation opportunities"; and (3) "that states take the lead in developing recreation opportunity data bases." Until recently, no organization or agency had been willing to coordinate the effort. Therefore, the Department of Recreation & Leisure Services at Georgia Southern University responded to this challenge.

Methods

Since this project represents applied research, standardized methods were not considered to be appropriate. Instead, the methodology was tailored to meet a specific goal - to develop a directory of outdoor recreational services for the state of Georgia. The directory was completed by the following steps: (1) developing a list of keywords (recreational activities & services) to delineate the scope of the project; (2) checking each keyword against the collection of Georgia phone-fiche directories; (3) compiling an initial list of recreation providers based on the information collected; (4) telephoning each provider on the list to determine their address and exact affiliation with recreation; (5) sorting the resulting information according to the service provided (e.g., instruction, guided trips or equipment rentals); (6) sending a letter to each sponsor, thanking them for participating and verifying the information provided; and (7) contacting a print shop to photocopy and assemble the directory.

Results and Implications

In May, 1990 the first edition of the Georgia Outdoor Directory was produced. Aside from providing a needed service, the project's linkage with the $9.1 billion Georgia tourism industry furnished a strong economic justification for its support. Since 1980, Georgia has become an increasingly popular tourist destination, primarily because of "Georgia On My Mind", an aggressive advertising campaign launched by the Department of Industry, Trade & Tourism. As a result of this campaign and other factors, visitation at the state's welcome centers jumped from 10 million in 1984 to 15 million in 1987. Other examples include: increased attendance at Georgia's State Parks and Historic Sites, up to 14.9 million visitors in 1990; and continued interest in Georgia as a destination for sportsmen, approximately 66,000 non-residents visit the state annually to hunt and/or fish.

As visitation increases, so does direct recreational spending (e.g., fees, charges, licenses, etc.). For example, in 1990, Georgia State Parks & Historic Sites received over $11.5 million in facility generated income, representing 45.7% of their total operating budget. However, indirect spending (e.g., food & gas purchases, lodging, etc.) accounts for the significant "other" portion of tourism expenditures. In 1987, the Georgia Hospitality and Travel Association reported over $4.6 billion resulting from overnight accommodations alone. The net result of tourism dollars means "clean and new" money being pumped into the local economy.

It was anticipated that the directory would provide information to an increasing number of Georgia tourists, thereby indirectly serving to stimulate the statewide demand for outdoor recreation. The added visitation (and subsequent income) would be beneficial to the state at large, but especially important for outdoor-related enterprises in the private sector. One of the intended purposes of the directory was to assist outdoor-related businesses with their advertising efforts.

It can only be assumed that the directory has been successful in accomplishing its objectives. Since the directory was published, it has received widespread acclaim for its comprehensive and innovative approach to marketing Georgia's tourism

potential via outdoor recreation. Literally thousands of copies have been sold, the list of purchasers include: Georgia State Parks & Historic Sites, Georgia Department of Industry, Trade & Tourism, Chambers of Commerce, youth serving agencies, public libraries, and interested citizens.

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Marketing Tourism To The North Carolina Legislature

Nancy G. McGehee and Larry D. Gustke

Abstract. Given the growth possibilities of the North Carolina tourism industry, it is imperative that the industry enhance opportunities for cooperation between government, private, and non-profit agencies by designing and implementing an accurate, positive, and effective marketing plan. To develop a marketing plan, a survey of North Carolina legislators was designed and conducted in order to determine the current opinions, attitudes, and knowledge about the tourism industry. A conceptual model of how new ideas or innovations are adopted into a social system - The Diffusion of Innovations Theory - was also used to determine how to infuse the marketing plan into the legislature.

A population of 170 legislators were identified for the survey, and 78 (43.8%) responded. Results indicated that although legislators may not have a high awareness and specific knowledge about tourism, they do appreciate the value of the industry.

Opinion Leaders were identified so that they may be targeted in the marketing plan. The format for the plan was based on Lovelock and Weinberg's model. The primary components of the model included situational analysis (the survey), identification of problems and opportunities, establishment of marketing goals and strategies, an action plan, and a monitoring system to insure continued success.

The marketing plan includes several recommendations. A major goal in the plan was to increase availability of regular, up to date knowledge about tourism in North Carolina to legislators. The primary strategy for achieving this goal includes the active use of opinion leaders as "information disseminators". Educational efforts should focus on those identified as opinion leaders. Legislators look to and take the advice of those legislators they respect because of their time in office, education, and committee membership standing. The use of opinion leaders in this way is considered superior to the use of lobbyists or printed material, although it is a much more difficult channel to use.

Another goal of the marketing plan involved increasing the awareness of the economic advantages of the tourism industry in North Carolina to its citizens. If the general public is educated about the strengths of tourism in North Carolina, they will elect officials who also appreciate the industry. The strategy for reaching this goal includes a promotional campaign that focuses on 1) the diversity and impact of the industry, and 2) the important role that every citizen plays in making tourism a success in North Carolina.

A monitoring system is also recommended, in the form of both formal and informal surveys of the legislature. This serves as a self-check for the marketing plan to assure that it remains timely and achieves its goals.

Introduction

The tourism industry in North Carolina makes an important contribution to the state's economy. An estimated 6.2 billion dollars and 270,000 jobs are created by the industry, and travel expenditures have grown by 144% over the last decade (U.S. Travel Data Center, 1988). Recent reductions in state revenues resulting from a slowdown in the state's economy threatens legislative support for the industry and may result in a reduction in political and financial support for tourism. The industry has responded to this threat by recognizing the need to identify legislative perceptions of the industry, and to communicate and market the industry's value to the legislature and citizens of the state.

Given the growth possibilities of tourism, the industry must enhance opportunities for cooperation between government, private, and non-profit agencies by designing and implementing an accurate, positive, and effective marketing plan focusing on legislators. This plan should:

1) Identify the current image and knowledge of the industry held by legislators.

2) Propose methods or techniques for improving communication between public and private tourism entities and the North Carolina state legislature.

3) Focus on the education of legislators concerning the impact and value of the industry. Senators and representatives must be aware of how they can facilitate improvements in the attractiveness and economic impact of the tourism industry in North Carolina.

4) Develop marketing profiles of legislators, which identify opinion leaders who can facilitate innovation and adoption of a positive image of the tourism industry and what it can do for North Carolina.

The basis of effective marketing is understanding target markets. Crompton and Lamb (1986) define a target market as a relatively homogeneous group of people or organizations that have relatively similar service preferences with whom the agency seeks to develop a relationship. For the tourism

industry in North Carolina, an important target market is the state legislature. It provides legislative support and allocates $5.4 million in tax revenues for the promotion of North Carolina as a travel destination.

Recognizing the value and importance of legislative support, the Government Affairs Task Force (GATF) of the North Carolina Travel Council and the North Carolina Association of Convention and Visitor Bureaus engaged the Office of Parks and Tourism Research (OPTR) at North Carolina State University to conduct a survey of the State Legislature in June 1990. The study involved surveying both the Senate and the House of Representatives to identify legislative awareness and knowledge of the tourism industry.

The survey results are reported, and a marketing plan targeting the North Carolina Legislature is proposed based on Lovelock and Weinberg's format (1984). It is recommended that the marketing plan be executed using the diffusion of innovations theory. The diffusion of an innovation is "the process by which an innovation is communicated and adopted (or rejected)" (Lovelock and Weinberg, 1984). An innovation is any good, service, idea, or behavior pattern that is perceived as new by an individual. The tourism industry can apply the concept of diffusion of innovation when working to educate legislators through lobbying.

General Hypotheses

A vital part of the research process includes the generation of hypotheses - tentative guesses or conjectures about relationships (Wiersma 1986). Possible hypotheses for this thesis include: 1) Legislators have limited knowledge of the tourism industry and its economic value to the state, 2) A marketing plan can be designed to improve communication between the tourism industry and the North Carolina state legislature, and 3) diffusion of innovation theory can be applied to the identification of individuals (opinion leaders) who influence support for North Carolina Tourism.

Methods And Procedures

During the short legislative session in July of 1990 legislators were interviewed in order to achieve two primary objectives: 1) the identification of the awareness and knowledge of the legislators about the tourism industry, and 2) their opinions and perceptions of the industry. A total of 170 legislators were identified as potential respondents by acquiring a list from the Legislative Office Building in Raleigh, North Carolina. Seventy-eight Legislators answered the survey questions, resulting in a response rate of 45%. Although the response rate was low, it was representative of the legislature in the categories of age, length of time served in the legislature, education, and location.

The questionnaire consisted of thirty-one questions. Eleven of the questions were open-ended, while the remaining twenty were closed-ended. Seven of the questions were related to legislators' factual knowledge of tourism, and 23 of the questions focused on the opinions about the impact and value of the industry. The questionnaire was developed cooperatively by the Travel Council's Governmental Affairs Task Force (GATF) and the Office of Parks and Tourism Research (OPTR) at North Carolina State University.

Due to the shortness of the July session and the time required to conduct a telephone interview, legislators answered one half of the survey, and were then asked if they would prefer to be telephoned or have the rest of the survey mailed to them after the session had ended. Those not contacted during the short session were mailed a complete copy of the questionnaire and were requested to return it.

The responses to open-ended questions were content analyzed and trends were identified while the responses to the multiple choice questions were coded and frequency counts produced using PC SAS statistical software. From this information the strengths and weaknesses of the tourism industry as perceived by the legislature were determined.

The diffusion of innovations theory was also applied to identify legislative opinion leaders and to develop diffusion strategies. A comprehensive discussion of this application is continued in the chapter following the description of the legislative survey results.

Analysis And Results

Survey Results

A sound marketing plan must be based on a situational analysis of the environment that an organization confronts (Lovelock and Weinberg 1984). After collecting and synthesizing the data from the legislative survey, the results were divided into two primary categories: Legislative Knowledge and Legislative Opinions. The first deals with the legislator's knowledge of the basic statistics and impact of tourism. The second addresses the more opinion-oriented results. From this information, the tourism industry can identify problems and opportunities that will be important in the design of a successful marketing plan.

Legislative Knowledge About Tourism

The legislators were asked four questions related to knowledge of the economic impact of tourism in the state. The questions focused generally on the estimated value of tourism to the state's economy, its dollar value, the number of jobs generated through tourism, and wages associated with the tourism industry.

The first question about the economic value of the tourism industry was: How important is tourism to the economy of the state? A substantial 79.5% indicated that tourism was very important to the state's economy, while 17.9% responded that tourism was important to the economy of the state, and only 2.6% said that tourism was not very important to the economy.

Legislators also responded to this question: What would you estimate is the dollar value of tourism to the state's economy (Figure 1)? The results follow.

A significant 28.2% of the responding legislators stated that tourism was a 6 Billion dollar industry (the U.S. Travel Data Center estimates indicate 6.2 Billion dollars are generated by North Carolina Tourism). The second largest group of legislators (25.6%) reported that they were unsure of the value of the tourism industry. An additional 12.8% valued the industry at 1 Billion dollars, 5.1% at 100 million, 3.8% each at 12 and 18 Billion, and 1.3%

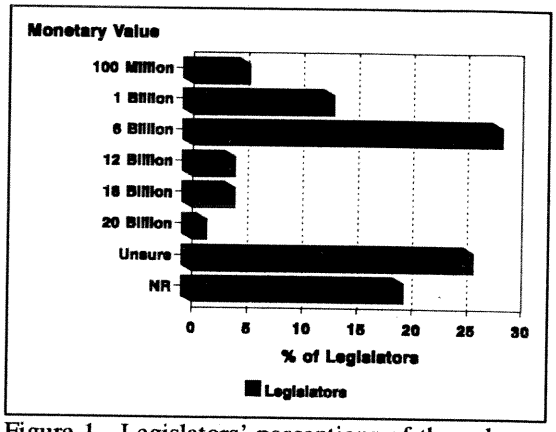

Figure 1. Legislators' perceptions of the value of tourism in North Carolina (N=78).

valued the industry at 20 Billion dollars. A substantial 19.2% did not respond to the question.

A common benchmark used to determine economic impact of an industry is the number of jobs the industry generates. Legislators were asked: What would you estimate are the number of jobs generated in North Carolina by tourism? One-fourth (26.9%) of the legislators indicated that tourism generated 200,000 jobs (Figure 2), while 17.9% stated that 250,000 jobs are attributed to tourism (current statistics indicate that the tourism industry provides between 200,000 and 250,000 jobs in North Carolina). The next largest groups (9% each) reported 50,000 and 150,000 jobs were tourism-oriented. An additional 7.7% identified the industry as responsible for 100,000 jobs, followed by 5.1% who indicated other estimates. Slightly less than one-quarter (24.4%) did not estimate the number of jobs generated by the tourism industry.

While considering the legislators' perceived quantity of jobs generated in the tourism industry, perceived quality is wise to look at as well. As job quality often relates to wages, legislators were asked: How would you describe the wages associated with the tourism industry? Almost one-half (44.9%) attributed average wages to the tourism industry, while 16.7% stated wages were above average. Over fifteen percent (15.4%) reported wages as low/below average and 1.3% indicated high wages. Over one-fifth (21.8%) did not respond.

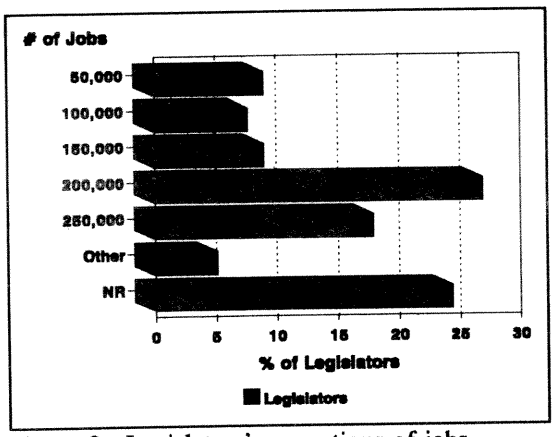

Figure 2. Legislators' perceptions of jobs generated by North Carolina tourism (N=78).

Legislative Opinions About Tourism

Determining the degree of past success in efforts to gain support from legislators is important when developing a legislative marketing plan. Feedback from the legislators about their perception of the success of these efforts was elicited by asking several questions.

A variety of employment opportunities in many diverse industries exist in North Carolina. The relative perceived importance of tourism as an industry which employs a large number of citizens was investigated by asking: Compared to other industries, how important is tourism as an employer in the state? Significant responses were recorded as both very important (48.7%) and important (43.6%) received a majority of the answers (Figure 3), followed by 6.4% of the legislators indicating that tourism was not very important. Slightly over one percent (1.3%) did not respond.

A positive image of an industry and its leaders often influences the support for and perception of the value and worth of that industry. The image that North Carolina legislators have of the tourism industry and its leaders was investigated by asking a series of questions. The first of these questions was: In terms of professional image, how would you rate the leaders of the North Carolina tourism industry as compared to the leaders of other industries? Over one-third of the legislators (37.2%) reported that tourism industry leaders had as strong a professional image as other industry leaders, while 28.2% of the legislators reported that

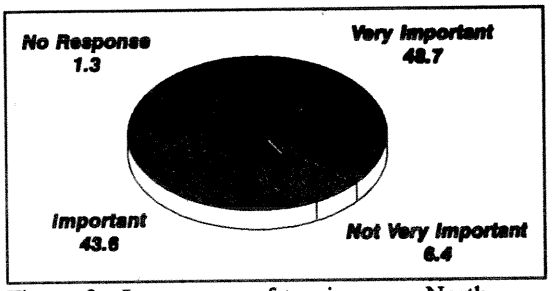

Figure 3. Importance of tourism as a North Carolina employer (0.0=Not important, N=78).

tourism leaders did not have as strong a professional image. Both a stronger professional image and a weaker professional image claimed 5.1% of the respondents, and 24.4% did not respond.

The image of an industry is often characterized in words or phrases by which the industry is described. To clarify their answers to questions about the image of the tourism industry, legislators were asked: What words or phrases would you use to describe the tourism industry? Over two-fifths (43.4%) of the responses were positive, using phrases such as: sleeping giant, active, very important, progressive, growing, and diverse. Negative descriptions came from 13.0% of the responding legislators, using phrases such as: disorganized, inadequate, not as polished, and ineffective. A significant 43.6% elected not to respond.

A more specific perception of the industry was elicited from the legislators by asking: Which of the following represent your perception of the industry? Those taking the survey were asked to check all that applied. One-half (50%) of those surveyed see the industry as growing. A need for better organization was cited by 23.1% of the legislators, 16.7% see the industry as coming of age, and 15.5% recognized weaknesses in professionalism of the industry . Only 9.0% of the legislators perceived the industry to be in transition, and 2.6% of the respondents suggested other descriptions. Nearly one-third (29.4%) declined to respond.

In an effort to isolate specific strengths and weaknesses which legislators associated with the industry, legislators were asked a series of questions. The strengths were identified in response

to the question: In your opinion, what are the strengths of the North Carolina tourism industry? The major strength was identified as the natural beauty of the state. Other responses included revenue for the state, strong infrastructure at the local level, variety, promotional campaigns, and the people in the industry.

The perceived weaknesses of the industry were discovered with this question; What are the weaknesses of the North Carolina tourism industry? Those most often identified were industry promotion, ineffective lobbying, and fragmented organization.

In an effort to gain insight into how to strengthen the tourism industry from the legislature's standpoint, those surveyed were asked: What should the industry do to improve or strengthen itself? The three primary responses included:

1. Organize the industry, developing leadership.
2. Actively promote the industry.
3. Educate your constituents and your legislators.

Despite current changes and fluctuations in the economy, demographic experts (U.S. Travel Data Center, 1989-90) continue to predict growth in service industries, especially in travel and tourism. An understanding of legislative perceptions of the tourism industries' revenue-generating economic opportunities will help the industry to better understand the role it is expected to play in the development of the state in the future. To discover these perceptions, legislators were asked to respond to the following question: By the year 2000, what industries do you think will be the top FIVE revenue generators for the state? While many different industries were indicated, the legislators responded that tourism would be the number one revenue generator for North Carolina by the year 2000, followed by manufacturing, agriculture, the textile industry, and forest resources (the lumber and furniture industries).

To investigate further the opinions of legislators on the subject of the economic importance of tourism as it relates to other industries in the state, this question was asked of the legislators: Trend experts suggest that tourism will be the number one industry in North Carolina by the year 2000. Do you agree with this statement, and what does this statement mean to you? Over one-half (52.6%) of the legislators agreed with the statement, while 25.6% did not know (were unsure of the statement), and 14.1% disagreed with the statement. No response was elicited from 7.7% of the legislators who returned a survey.

The three most common responses to the second half of the question were:

1. Tourism is important and should not be neglected (16.9%).
2. The tourism industry is good for the economy and is growing (16.8%).
3. I disagree; Other industries will be just as important (6.5%)

The tourism industry has tried to elicit and encourage legislative support. Attempts have enjoyed varying degrees of success. Feedback from the legislators about their perception of the success of these efforts was elicited by asking: What is your opinion of the success of the efforts of the tourism industry to encourage legislative support for the tourism industry? One-half (50%) of the legislators reported that the tourism industry had been successful in encouraging support (Figure 4). In contrast, 28.2% indicate that the industry was not very successful, while 10.3% perceive the tourism industry as very successful in its efforts. Finally, 7.7% reported that the industry was not successful, and a mere 3.8% did not respond.

Relative awareness of the impact, value, and contributions of the tourism industry in North Carolina is influenced by the availability of information generated about the industry. To determine the obtainability of that generated information, legislators were asked: Within the last year, how often have you heard or seen reports about North Carolina tourism? Over one-third (35.9%) of the legislators answered that they had often heard or seen reports about North Carolina tourism. An additional 24.4% responded that they had seldom heard or seen reports, while 20.5% said they regularly heard or had seen such reports. The remaining 19.2% did not respond.

In order to gain additional knowledge about legislative awareness of the value of the tourism

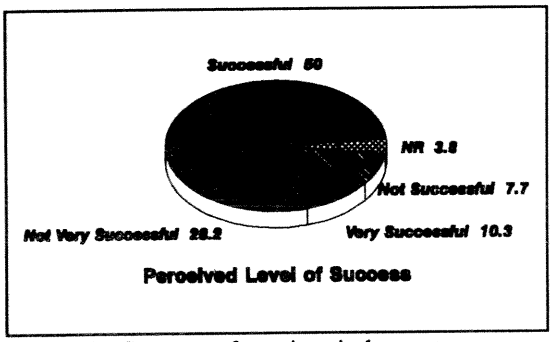

Figure 4. Success of tourism industry to encourage legislative support (N=78).

industry in North Carolina, legislators were asked: How does North Carolina rank nationally in the economic impact of tourism? Slightly more than one-fifth (21.8%) indicated that North Carolina ranked among the top ten states, while 15.4% placed the state among the top 15. Over one-tenth (12.8%) reported that they did not know/were not sure of the state's ranking, 10.3% responded that the state ranked among the top 25, 9.0% placed North Carolina among the top 20, and 6.4% ranked the state among the top 5. A significant 24.4% declined to respond.

Financial assistance is one form of legislative support which the tourism industry sees as valuable. To identify the degree of legislative commitment to the industry, several questions were asked. The first was designed to determine how legislators feel about the $5.4 Million currently allocated to the state's Division of Travel and Tourism for tourism promotion. Over one-half (53.9%) of the responding legislators stated that more dollars should be committed to promotion followed by 21.8% who indicated they were unsure about the amount of funding which should be committed. One-fifth (20.5%) determined the current level of funding to be adequate, a mere 2.6% felt fewer dollars should be committed to promotion, and only 1.3% did not respond. It should be noted that among those who indicated a need for more commitment, many felt that current budgetary constraints made it difficult to consider that increase at this time.

In order to understand the competitive environment in which the tourism industry operates, an awareness of current commitments of resources for promotion by surrounding states is helpful. To determine the legislators' perception of the importance of being a strong competitor in the southeastern United States, they were asked: For each of the following states, should North Carolina be more aggressive, equally aggressive, or less aggressive in promoting tourism (Table 1)? The majority of the respondents indicated that North Carolina should be more aggressive than all surrounding states (percentage by state); South Carolina (55.1%), Tennessee (50.0%), Virginia (50.0%), Florida (34.6%), and Georgia (46.2%). The next group of respondents favored equal promotional aggressiveness with: Virginia (35.9%), Tennessee (32.1%), Georgia (32.0%), Florida (30.8%), and South Carolina (29.5%). Those who advocated less promotional aggressiveness according to each state were: Florida (24.4%), Georgia (9.0%), Tennessee (6.4%), south Carolina (5.1%), and Virginia (3.8%).

Developing and implementing a more aggressive and competitive promotion program requires legislative support, smarter marketing decisions, and additional funds for promotion committed by both the state and the industry. In an effort to identify funding sources which would make such a promotion program a reality, the legislators were asked to select from a list of possible funding sources those they would recommend to increase financial support for tourism promotion. The question: Which of the following self-sustaining funding sources would you recommend the industry consider to increase financial support? The respondents could indicate more than one source, so the percentages will add up to more than 100%.

A statewide occupancy tax was favored by most (38.4%), while a statewide entertainment tax followed with 23.0%. Only 7.7% of the legislators recommended a meals tax, and 6.4% listed other possible sources. A substantial 39.7% did not indicate a preference or propose a source of funding.

A more aggressive promotion program will also require substantial legislative support. Generating that support requires an understanding of the perception of the activities and efforts which are appropriate and necessary to elicit such support. To provide some direction which will insure the success of future efforts at encouraging legislative support, legislators were asked to provide advice to

the tourism industry as to what it SHOULD and SHOULD NOT do to increase legislative support. Although their were a great variety of answers, the primary ones follow:

The legislators recommended that the industry SHOULD:

1. Lobby effectively, using facts and figures (52.7%).
2. Promote the tourism industry (10.4%).
3. Educate constituencies about the industry (9.1%).

Legislators recommended that the industry SHOULD NOT:

1. Lobby using threatening tactics (23.1%).
2. Do nothing (7.8%).
3. Overwhelm or over-inform legislators immediately preceding a legislative session (5.2%).

Even if we assume an active industry and a responsive legislature, there may still be obstacles which might block support for the tourism industry. These possible hindrances were identified by asking the legislators to list what obstacles might block legislative support for the tourism industry. A significant number of legislators (56.6%) identified a lack of revenue and the possibility of recession as the primary obstacle. A variety of other responses were made, including a lack of legislative knowledge through lobbying (7.8%), and poor tourism industry organization (7.8%).

Legislative support for any organization is influenced by several factors. One of those factors may be the degree of involvement an industry exhibits toward issues which effect not only the industry but the entire state as well. To identify what the legislator's see as the role of the tourism industry in supporting issues or programs which directly and indirectly impact the industry and the state, legislators were asked: Should the tourism industry be more, the same, or less active in supporting each of the following issues - environmental quality, economic development, transportation, education, health care, public safety, and cultural resources? The vast majority of legislators recommended that the tourism industry increase or at least maintain its current level of support for these issues. Only one respondent indicated that less involvement was necessary. Table 2 provides a breakdown of results.

Effective legislators are most familiar with two sub-populations: Their constituencies and their fellow legislators. To determine the perceived importance of tourism to these groups, legislators were asked two questions. The first one follows: In general, how important do you think tourism is to your constituents? A substantial 43.6% indicated that tourism is important to their constituents, while 29.5% said it was very important. An additional 21.7% reported that the tourism industry was not very important to their constituents. Only 2.6% responded that it was not important, while the same amount declined to respond.

To determine the legislators' perceptions of their colleagues recognition of the value of tourism, they were asked: In your opinion, how important is tourism to other legislators? Over one-half (57.7%) of those surveyed indicated that tourism was important to other legislators. In contrast,(24.4%) said that their colleagues did not think tourism was very important. Slightly more than 15 percent (15.4%) reported that tourism was very important among legislators, while 1.3% said that it was not important. The same amount (1.3%) did not respond.

An indication of the relative importance of tourism to legislators should be reflected in the sponsorship of legislation or the initiation of a program. To better identify the working relationship between industry and legislators, the legislators were asked two questions: First; During the last year, have any of your constituents requested that you support tourism legislation or programs? Second; During your term of office, have you sponsored a bill, voted for a bill, or supported programs which have helped the tourism industry to develop? In response to the first question, over one-half (56.4%) of the responding legislators indicated that they had been approached by one or more constituents to support a tourism-related program , 37.2% had not, and 5.1% did not remember. Only 1.3% did not respond. The predominant support requested was one the issue of an occupancy tax. Other issues cited included: funds for highways, local host and travel centers, meals tax, state park improvements,

aquariums, the zoo, and local Chamber of Commerce funds.

In response to the second question, 84.6% of the legislators reported that they had sponsored a bill, voted for a bill, or sponsored a program as requested by their constituents. One-tenth (10.2%) of those surveyed did not remember if they had sponsored legislation or a program, while only 2.6% responded that they had not sponsored a bill or program. Non-respondents made up only 2.6% of those surveyed. Again, the primary issue supported was an occupancy tax, followed by state funding for promotion and numerous local issues. Other issues cited were historic preservation, the zoo, highway bills, and state park improvements.

Since no single industry or profession exists in a vacuum, it is important to realize that many groups are competing for the legislative dollar. It is also important to determine the perceived importance of the tourism industry as a priority by the legislature. The following question was posed to the legislators: Many issues were faced by the legislature during the past short session and will be faced during the next session. Would you rate the support for tourism as : A high priority issue, a low priority issue, or an issue having little or no priority? Of those surveyed, 38.5% indicated that tourism was a low priority issue. In contrast, 32.1% reported tourism as a high priority issue. Only 7.7% responded that tourism was an issue having little or no priority, and 21.8% did not respond.

When interacting with the legislature, the tourism industry must look at the issue of establishing a political action committee, or PAC. When legislators were asked about this concept, they responded with the following: A significant 88.0% declined to respond; Those who did respond were almost evenly split. A mere 6.7% indicated that a PAC would increase awareness about the tourism industry and improve its lobbying ability, and 5.3% maintained that a PAC was not practical or ethical for the tourism industry.

Application of The Diffusion of Innovations Theory

The diffusion of innovations theory provides a model of how a particular idea or innovation is accepted or rejected into a social system. Different types of people adopt or reject new ideas at different rates of speed and often look to certain respected members of their social system as opinion leaders. Objective three of this study recommends the identification of opinion leaders in the legislature in order to facilitate an increase in support of the tourism industry. The diffusion of innovations theory can be applied in order to determine opinion leaders. Relative time or experience as a legislator, education, and participation on relevant committees are all important factors in the identification of opinion leaders. If, in fact, opinion leaders can be identified, use of these sub-populations would be superior to lobbyists or printed material, but a much more difficult channel to use.

Time--By combining the results of the survey with background information provided by the Principle Clerk's Office of both the House of Representatives and the Senate, a frequency distribution was plotted of the number of terms of office for each responding legislator, with one term equalling two years (North Carolina Center of Public Policy Research 1989). It was determined that the mean number of terms for those sampled is 5.46, the median is 3, with a mode of 1. Those who have served more than 6 terms are above the mean, so they can be identified as possible opinion leaders. These legislators have a heightened awareness and knowledge of the hidden agendas and informal leadership that exist in their social system.

Education--Level of education was determined through the legislators who responded to the survey. Since level of education is considered ordinal and not part of a true interval scale, only the sample median and the mode could be determined. In this case, the mode is more important as an indicator that 32.3% of the legislator's surveyed have a post graduate education - a master's degree, law school, dental school, divinity school, or pharmacy school. Opinion leaders generally have a better education than the average member of their social system, therefore an opinion leader in the legislature will likely possess a postgraduate education. These survey results indicate that an opinion leader can be identified as having at least a post graduate education.

Committees--In order for an opinion leader to be an effective liaison for the tourism industries' change

agent, he/she must be a member of key committees that affect legislative action relevant to the industry. Membership on at least three of the following committees is necessary. For the House of Representatives: 1) the Basic Resources Committee, important sub-committees being Wildlife, Natural and Scenic Areas, Marine Fisheries, and Cultural Resources and Parks, 2) Commerce, an important sub-committee being Tourism, 3) Infrastructure, with the sub-committee of Railways, Airports, and Waterways, and Highways. Other important committees include 4) Agriculture, Forestry and Horticulture, 5) Appropriations, and 6) Local Government. Important Senate committees include: 1) Appropriations, 2) Environment and Natural Resources, 3) Local Government and Regional Affairs, 4) Transportation 5) Ways and Means, 6) Appropriations on Natural and Economic Resources, and 7) Marine Resources and Wildlife.

Using these primary categorizations of legislators, opinion leaders can be identified, which reinforces Hypothesis 1: If the diffusion of innovations theory is applied, specific categories of adopters can be isolated, so that opinion leaders can be determined. The typical opinion leader will have served six terms of office, have a postgraduate education, and will be involved in at least three important committees.

Through analysis of the survey results and application of the diffusion of innovations theory, a marketing plan was designed for the legislature. Situational Analysis, Identification of Problems and Opportunities, and Marketing Goals were established on the basis of the survey results. Opinion leaders were identified through application of the diffusion of innovations theory. Both the survey results and the application of the diffusion of innovations theory form the foundation for the Marketing Plan, an executive summary of which is described in the next chapter.

Conclusions/Recommendations

Executive Summary

Objectives:

1) Identify the current image and knowledge of the industry held by legislators.

2) Propose methods or techniques for improving communication between public and private tourism entities and the North Carolina state legislature.

3) Focus on the education of legislators about the impact and value of the industry. Senators and representatives must be aware of how they can facilitate improvements in attractiveness and economic impact of the tourism industry in North Carolina.

4) Develop marketing profiles of legislators, which identify opinion leaders who can facilitate innovation and adoption of a positive image of the tourism industry and what it can do for North Carolina.

Goals:

1) To increase state supported funding of tourism by 25%.

2) Increase availability of regular, up-to-date knowledge about tourism in North Carolina to legislators.

3) Improve the professional image of the tourism industry.

4) Increase awareness of the advantages of the tourism industry in North Carolina to its citizens.

Major Strategies:

1) Establish and cultivate target sub-populations known as opinion leaders among members of the legislature using diffusion of innovation theory. Criterion used for determining opinion leadership includes relative time or experience in a position, education, and status in committees relevant to the tourism industry.

2) Produce a fact sheet that will regularly and accurately portray a informative picture of the tourism industry to be distributed to legislators on a year-round basis.

3) Create an "Industry Declaration" that will establish a centralized, united front for tourism. Include basic industry objectives and industry-wide stances on current issues. This will be revised yearly.

4) Take a simple, educational approach to statewide promotion of tourism to constituents.

5) Plan to re-survey legislators yearly for the next 5 years to determine effectiveness of the Marketing Plan, and re-evaluate choices of opinion leaders.

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Tables

Table 1. Level of promotional aggressiveness for North Carolina compared to other southeastern states (N=78)

	Promotion Aggressiveness			
State	More	Equally	Less	NR
Florida	34.6	30.8	24.4	10.2
Georgia	46.2	32.0	9.0	12.8
South Carolina	55.1	29.5	5.1	10.3
Tennessee	50.0	32.1	6.4	11.5
Virginia	50.0	35.9	3.8	10.3

Table 2. Legislators' recommendations about tourism industry involvement in other issues (N=78)

	Level of Involvement			
Issues	More	Equally	Less	NR
Environmental Quality	53.8	17.9	1.3	26.9
Economic Development	65.4	9.0	1.3	24.3
Transportation	52.6	20.5	1.3	25.6
Education	48.7	24.4	1.3	25.6
Health Care	34.6	38.5	1.3	25.6
Public Safety	38.5	34.6	1.3	25.6
Cultural Resources	48.7	23.1	1.3	26.9

Considerations in Using Qualitative Approaches in Studying Leisure, Recreation, Tourism, and Natural Resources

Karla A. Henderson[1]

Abstract. The purpose of this paper is to provide a framework for using qualitative approaches in studying questions surrounding recreation, leisure, tourism, and natural resources. The qualitative approach to research includes interpretive procedures that inductively describe, translate, and focus on the meaning rather than the frequency of occurring phenomena in the social world. The thesis of the paper is that researchers should have enough information to make choices about what research paradigms and methods may be used and should understand the strengths and weaknesses of using a qualitative approach to address particular research or evaluation questions as they pertain to areas of recreation, leisure, tourism, and natural resources research. Qualitative methods may be more appropriate than quantitative methods for some research questions but may not be practical in other situations.

Introduction

The qualitative approach to research includes interpretive procedures that inductively describe, translate, and focus on the meaning rather than the frequency of occurring phenomena in the social world (Van Maanen 1988). The qualitative approach generally uses the natural environment, focuses on determining the meaning attached to phenomena, acknowledges the researcher as the instrument in interaction with the phenomena being studied, and uses words as the primary symbols for generating grounded theory specific to the context in which the research occurs. It is often contrasted to the quantitative approach which focuses on deductive, statistical techniques for generating and analyzing data. These two ways of designing, discovering, and interpreting data, however, are not necessarily opposites. Both approaches can be useful in research and evaluation studies that address recreation, leisure, tourism, and natural resources questions.

The purpose of this paper is to provide a framework for using qualitative approaches in studying research questions. A general understanding of quantitative methods precludes an understanding of qualitative methods. No one method can fully explain reality. The thesis of the paper is that researchers should have enough information to make choices about what research paradigms and methods may be used and should understand the strengths and weaknesses of using a qualitative approach to address particular research or evaluation questions. Qualitative methods are more appropriate than quantitative methods for some research questions but may not be practical in other situations.

Background

The qualitative approach is not clearly understood by many people. k is often easier to describe than to define what is meant by the qualitative approach. The distinction is not as easy as saying that qualitative researchers use words while quantitative researchers use numbers, although in an oversimplified way, this distinction is true. The world view or paradigm that is held (commonly referred to as either positivism or interpretive social science), the general approach to research design that is chosen (qualitative verses quantitative), and the specific methods applied (i.e., participant observation, in depth interviewing) are often used to describe the ways that qualitative studies are conducted (Henderson 1990). These labels and descriptions, however, can create confusion. Total agreement does not exist among researchers concerning what the qualitative approach is. Further, qualitative data discovery and interpretation, as well as the development of grounded theory, are often considered mystical processes to those accustomed to statistical analysis. A researcher cannot appreciate the value of the qualitative approach without understanding the philosophical assumptions that are made surrounding the methodology. Philosophical discussions about which paradigm is better than the other are not productive, but researchers do need a broad philosophical base in

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order to enhance our understanding of these methods of research as they can be applied to tourism and natural resources.

The researcher contemplating using the qualitative approach should be flexible. For example, quantitative designs have typically had protocols associated with them. In the qualitative approach, systematic inquiry is still the framework used to identify patterns of phenomena; however, the process of using qualitative methods and techniques is generally not as linear as in applying the quantitative approach. In qualitative methods there is a nauseously interdependency between the nature of the social world and the specific methods used to study that social world (Douglas 1976). A strict adherence to any method or technique (i.e., surveys) may become a confinement to what can be learned through the qualitative approach to research (Wax 1971). Further, the problems that are addressed in the study of recreation, tourism, and leisure are boundless; therefore, we cannot deal with them only in a bounded rationality. If research problems surrounding tourism and natural resources are simplified too much, it is impossible to address them adequately.

A further concern about the research that has been conducted in our field relates to the gap between the researcher and the practitioner. While some of the research addressing leisure studies has only theoretical value, there is a need to continually consider how research can contribute to practice. Qualitative research, for example, may offer research done within a context directly applicable to the practice and provision of tourism. It also has the advantage that it may be presented in a way that the reader (e.g. a manager of a resorts does not need to know sophisticated statistical procedures in order to evaluate the validity of the results.

Thus, an emerging paradigm that focuses on interpretive views and the qualitative approach may be a useful means for addressing some of the applied and basic questions left unanswered by past tourism and leisure research. The enormous complexities of leisure can no longer be simplified in positivistic and quantitative terms (Gunter 1987). While statistics are helpful, they do not provide explanations. A diversity of researchers pursuing a multitude of topics within a variety of methodologies is needed. Researchers now have alternatives and expanding choices available for the study of tourism and natural resources.

Onto logical and Epistemological Aspects of the Qualitative Approach

A paradigm is a world view. It describes ontology or the nature of the social world. A paradigm is a fundamental model or theme which organizes one's view of something. It is broader than a set of rules for research. Thus, a paradigm provides the rationale for choosing a research approach. Two dominant world views or paradigms that have provided a basis for a philosophy of social and leisure science are positivism and interpretive social science. It may be useful to think of positivism as seeking facts or causes of social phenomena with the contention that truth can be obtained objectively and that truth is singular and external to the individual. Positivists believe that scientists can attain objective knowledge in the study of social and natural worlds, that natural and social sciences share a basic methodology, and the natural and social worlds are mechanistic (Filstead 1974). The interpretive paradigm allows researchers to look at themselves and how their ideas reflect the social reality of the world (Schwartz and Jacobs 1979). The interpretive paradigm allows researchers to view human behavior as a product of how people define their world and to see reality from others' eyes. The assumptions of the interpretive paradigm are that meanings are what are important, social behavior can best be understood in its natural environment, reality is the meaning attributed to experience, and social reality is not the same for all people (Bullock 1983).

"Approach" is used to describe how research is conducted. Approaches are used to describe epistemology. Epistemology is the science of knowing. It encompasses how we identify problems, seek answers, and hold beliefs about how one gets information. One's approach encompasses the assumptions, interests, and purposes which shape the methods chosen. The two approaches for research described are qualitative and quantitative. Quantitative emerges from the positivist world view and involves the testing of theory, the use of controlled data collection, and an analysis using statistics. Methods used in the qualitative approach generally have as a commonality the separation

from theoretical and methodological positivism that has dominated the mainstream of American social science during the 20th century (Lidz and Lidz 1988). The qualitative approach expropriates an emerging research design, uses the natural environment, focuses on determining the meaning attached to phenomena, acknowledges the researcher as the instrument in interaction with the phenomena being studied, and uses words as the primary symbols for generating grounded theory specific to the context in which the research occurs. As a means for illustrating contrast, Table 1 provides a summary of the typical relationships between the pure qualitative and the pure quantitative approach.

Methodology is the science of finding out (Babbie 1986). Methods are used to denote specific procedures. For example, field research is a method that includes systematically gathering data in a natural setting on specific aspects of social life by establishing an ongoing relationship with those studied (Manning 1987). In depth interviewing and field research are the most common methods used in qualitative approaches to research. Techniques involve the specific tasks undertaken to discover and interpret data within a given method. Methods and specific techniques emerge from the approach selected. Methods choices available to the researcher can be easily placed on a continuum. For example, observation and interviewing are methods. Either one cannot be considered strictly categorized as a qualitative or a quantitative method. Observation can range from interpretive field research (qualitative) to sophisticated numeric checklists (quantitative) and interviewing can range from structured close-ended telephone interviews with a random sample (quantitative) to an open-ended life history account using a theoretical sampling procedure (qualitative). Therefore, in describing methods one must examine the assumptions about the paradigm and the approach in order to know whether a particular method embodies a qualitative or a quantitative approach. Harper (1981) has cautioned researchers that it is sometimes easier to fit reality to our method than to fit method to the reality. Therefore, the nature of the problem rather than one's predisposition should dictate the methods chosen (Howe and Keller 1988).

Theory refers to an explanation of "what is. " A theoretical framework is a way of looking at the world and the assumptions made about it. Glaser and Strauss (1967) indicated that there are two extremes of theory which in general, but not always, describe the difference between the positivist and interpretive paradigms. The former is deductive theory, theory that is tested/confirmed, or theory that is formal and is referred to as *a priori*. The second type of theory is grounded theory or inductive theory which is developed relative to a substantive area (contextual within the place or activity) or relating to formal theory after data are discovered (conceptual ties to an area of inquiry). In grounded theory, the creation of a theory is based on observation rather than on deduction. In the interpretive paradigm the focus is on grounded theory, theory that emerges from the specific data being examined. Researchers using the qualitative approach generally develop grounded theory but may use a number of theoretical or conceptual frameworks as a basis for the research or as a way of interpreting the outcomes of research. Fielding and Fielding (1986) suggested that data are really only "rich" when they are grounded in a refined theoretical perspective.

Considerations About Approaches In Planning A Research Project

The design of a research project differs depending upon the qualitative and quantitative approach chosen. The quantitative approach relies on determining procedures ahead of time and generally following specific protocols with a stable treatment of the data. The qualitative approach, such as in using field studies (e.g., participant observation), allows for the questions to emerge as the researcher begins and may result in the variable treatment of the data. In the qualitative approach, data discovery and data analysis are ongoing processes throughout the research design. The depth and mutual dependence of qualitative data are acknowledged within a context of meaning that emerges as the data are discovered and interpreted. The qualitative approach also relies on a dynamic interchange between theory/concepts and data throughout the research.

The outcomes of the research will also differ between the two approaches. In the quantitative approach, the focus is on answering specific research questions or testing hypotheses and confirming theory. In qualitative approaches the focus is on explaining, developing patterns, and developing grounded theta by using depth of analysis and detail. Qualitative approaches use descriptions to explicate experiences. As Guba and Lincoln stated, "They (qualitative researchers) empathize, describe, judge, compare, portray, evoke images, and create for the reader or listener, the sense of having been there" (1981: 149). These tasks are often referred to as "thick" description. Generally the result of the qualitative approach is discovery, but these methods may sometimes result in theory confirmation. In general, researchers using the qualitative approach analyze data beyond mere description and focus on explanations within a particular context.

In making research choices concerning questions surrounding tourism and natural resources, one must decide if the interpretive view with its focus on the emergent/contextual approach is better for a particular situation or for her/himself than the predetermined/mechanistic aspects of positivist research (Ellis and Williams 1987). Further, one may look at the limitations of each approach such as whether valid Measurement instruments exist and whether one has enough time to complete a project. Related to these aspects are the major dimensions of subject/object relationships including the observer's interaction, the subjects' awareness of the research, and the situation (Gabby and Lincoln 1981). Does one want to be a participant or an observer, is the research to be overt or covert, is the situation to be natural or contrived? On a practical basis, one might want to consider how much time, money and other resources such as mechanical devices and computers are available. Table 2 provides a checklist for considering some of the major questions that one may ask in addressing the use of qualitative and quantitative approaches in research on tourism and natural resources.

The perceived inferiority and lack of understanding about doing interpretive research and using the qualitative approach needs to be addressed. A researcher may be able to justify the use of the qualitative approach by using previous knowledge and by referring to some of the literature available about tourism and leisure research (cf., Chenery and Russell 1987; Ellis and Williams 1987, Henderson 1990, 1991; Howe 1985). One may, however, have to address feelings of marginality in choosing to conduct qualitative studies (Shaffir and others 1980). The qualitative approach is sometimes scorned by positivists who do not understand the interpretive possibilities of science. While the public may better understand the results of qualitative reports, many believe that statistics are the "end all and be all of research. " Further, participants (respondents) may feel that the research being done may also have some marginality. The use of qualitative methods, while becoming more common in recreation, parks, and leisure research, is still far from predominant. Conducting research can be both an exciting and a frustrating experience; the researcher choosing to use a qualitative approach will want to know as much as s/he possibly can about the approach and will benefit from finding others who are supportive of the interpretive process.

The researcher should also be aware that ambiguity is the nature of qualitative methods. The researcher using the qualitative approach focuses on "letting the data speak" and utilizes a flexible design. The research questions are the product and not necessarily the antecedent of data collection (Bullock 1983). The design is purposely kept loose. On the other hand, the emergent qualities of the research are rigorous in that one must have a research plan that is definitive but that can be changed as the data emerge. Ambiguity in interpretive research is evident in that while one wants to remain open and flexible, it is also important to have a design or plan for how one remains open and flexible. In other words, the qualitative approach relies on detailed descriptive and contextual information and the researcher must have a plan for guiding the work and a plan for being flexible.

Some qualitative studies will use tight, prestructured plans and others will be loose and highly emergent ones. Most research using the qualitative approach lies between these two extremes. For novice researchers, it may be well to develop a fairly structured initial design to serve as a road map. The researcher, however, must continually remind her/himself of the inductivity of the research being conducted. Miles and Huberman (1984)

recommended that when the researcher is interested in a better understood phenomena within a familiar culture or subculture, a tighter design may be necessary. For example, if a researcher chooses to examine the leisure experience for a particular group of individuals such as single male elderly travelers, it may be necessary to establish a specific plan in order to get access to the sample. The researcher also may have less flexibility in how data are collected than with another group. In conducting the research, however, the researcher must remain as flexible as possible to let the best plan for the research emerge.

Summary

Many additional reflections are necessary in planning a research study using a qualitative approach, however the considerations presented here provide a basis for making decisions about methods choices in tourism and natural resources research. One overall assumption of the qualitative approach is that direct experiences are the way that we come to know truth (Douglas 1976). Interacting with human beings is not necessarily predictable. While researchers have a growing body of information about qualitative methods of research, qualitative designs often do not follow set protocols. Since qualitative studies are generally conducted in the natural environment (and not in laboratories) and since researchers are generally addressing human behavior, the researcher really never knows what data are going to emerge.

Qualitative approaches are not appropriate to use in all situations and are not necessarily the "approach of choice" for some researchers. If a researcher does not like uncertainty, intrigue, being around humans (who are highly complex and usually not very predictable), then s/he will probably not be very secure in using the qualitative approach for research on tourism and natural resources. If the researcher is not comfortable with the methods used in qualitative studies, then s/he should probably not be doing them. One's personal discomfort should not preclude having an appreciation of the approach. Researchers using qualitative methods need to employ the techniques of adventurers, detectives, and investigative journalists (Kirk and Miller 1986). Some researchers are born with these inclinations for doing qualitative research and simply need to refine them within the qualitative approach; others have to learn and develop these interactive research skills, or at the very least, learn to appreciate how they might be applied to research studies.

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Table 1. Typical Differences between Qualitative and Quantitative Approaches (adapted from Guba and Lincoln 1981)

Category	Qualitative	Quantitative
Design	Emerging	Predetermined
Data Discovery	Ongoing	One-shot
Nature of Data	Mutually dependent	Independent
Relationship to Theory	Dynamic, Discovered	Predetermined, Confirmed
Symbols Used	Words	Numbers
Data Collection Instrument	Researcher	Physical (i. e., Paper and Pencil)
Data Summary	Explanations	Statistics
Setting	Real Life or Natural	Laboratory or Controlled
Outcomes	Perspectives	Prediction
Interaction with People	Much	Limited
Values	Context dependent	Context free

Table 2. Checklist for Considering Qualitative or Quantitative Approaches (adapted from Patton 1980: 88-89).

Is the researcher interested in individualized outcomes related to tourism and natural resources?
Is the researcher interested in examining the process of research and the context in which it occurs?
Is detailed in depth information needed in order to understand aspects of tourism and natural resources?
Is the focus on quality and the meaning of the tourism experiences being studied?
Does the researcher desire to get close to the data providers (tourists) and immersed in their experiences?
Do no measuring devices exist that will provide reliable and valid data for the topic being studied?
Is the research question likely to change depending upon how the data emerge?
Is it possible that the answer to the research question may yield unexpected results?
Does it make more sense to use grounded theory than existing a priori theory in studying tourism and natural resources?
Does the researcher wish to get personally involved in the research?
Does the researcher have a philosophical and methodological bias toward the interpretive paradigm and qualitative methods?

If the answer is YES to any of these questions, the researcher ought to at least consider the qualitative approach as a possible way to approach the research question being addressed.

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