

A Successful Replication of the River Visitor Inventory and Monitoring Process for Capacity Management

Kenneth Chilman James Vogel Greg Brown John H. Burde¹

Introduction

This paper has 3 purposes: to discuss 1. case study research and its utility for recreation management decision-making, 2. the recreation visitor inventory and monitoring process developed from case study research, and 3. a successful replication of the process in a large-scale, multi-year application.

Although case study research is discussed in research textbooks as one of several ways of doing social research, it is rarely used in recreation research. Case studies are frequently used in business management and public administrative education to illustrate the complexities of management decision situations. They would appear to have similar advantages for teaching about the difficulties and strategies of large scale wildland management decisions.

Case studies are sometimes criticized as describing unique situations and being difficult to compare to other similar situations. This can be dealt with by identifying a class of similar situations and selecting multiple case examples from that class of decisions for study (Chilman 1972). Case research can be further structured by having a hypothesis to test in comparable cases.

In the situation discussed here, cases were selected within the category of recreational carrying capacity decision-making for large-scale wildland/water areas. These capacity decisions are initiated by increasing numbers of visitors, changes in types of visitors, proposals for development, or environmental concerns. A recreational visitor inventory process was applied with the hypothesis that differences would be found in conditions on various parts of the area and visitors attracted to those conditions. This is fundamentally the Recreation Opportunity Spectrum (ROS) concept of providing a range of opportunities and information about the various opportunities so that visitors can make informed choices to select their preferred quality opportunity.

This recreation visitor inventory process has been developed and tested on more than 30 land, river and lake management areas. It has been tested with various Federal land management agencies (U.S. Forest Service, National Park Service, Corps of Engineers, and others) in various places in the U.S. The inventory approach follows resource management procedures for trees or wildlife on large areas. Subunits with differing conditions are identified and inventory measurements (for recreation, systematic visitor counts and surveys) are done.

Of particular interest here is the development and application of this process on one large-scale river area – 134 miles of the Ozark National Scenic Riverways (ONSR) in southern Missouri and the replication of the process on 225 miles of the St. Croix National Scenic Riverway (SCR) along the Minnesota and Wisconsin boundary near Minneapolis.

Methods

Recreation management decision-making becomes more complex as more and different types of visitors arrive. More interest groups, such as various recreation user groups, commercial concessionaires, community groups, environmentalists and others, raise questions and often contest decisions. Ways to help managers better understand and defend their decision-making are needed.

Studies of decision-making have been done in business management and public administration for some time (Gore and Dyson 1964, Drucker 1973). Decision research has become a recognized field or research (Carroll and Johnson 1990). An early study examined the context and behavior of forest rangers (Kaufman 1960) but similar studies of recreation land management and decision-making are lacking. A doctoral dissertation by Chilman (1972) focused on ski area development decisions in California and began to examine other management decisions for wildland recreation.

Research questions included: What kinds of decisions do recreation managers make? What kinds of information might be useful for those decisions? How can such information be collected systematically and inexpensively? How can management personnel be trained to collect and communicate this information?

The research approach used for these studies has been participant observation, negative case analysis (Kidder 1981). In these cases, the researchers have been asked to participate by managers faced with difficult decisions. Together they examine the decision situation and devise information collection strategies that generally involve systematic visitor

¹ Southern Illinois University Carbondale; EDAW, Inc.; Univ. of South Australia; Southern Illinois Univ. Carbondale

inventories (counts and short one-page interviews) to examine types, densities, and perceptions of recreation visitors at various times and places on the management area. Then the Recreation Opportunity Spectrum (ROS) concept discussed by Manning (1985) is used to designate and maintain different densities and types of use on specific parts of the management area or on adjacent areas (Moore 2003). Information is provided to prospective visitors to help them choose recreation visit conditions closest to their desired opportunity.

Negative case analysis indicates whether use of the inventory and ROS analysis as a hypothesis works in a series of cases, or whether changes or adjustments are needed in the process.

The recreation visitor inventory process for large wildland areas has been described in Chilman (1983). Essentially, managers work with the researcher to identify parts of the management area where different use and environmental conditions exist, and where managers utilize differing management practices. When these management subunits are delineated, they are examined to identify travel pattern concentrations (TPC's) where use tends to concentrate. Travelways in and out of these TPC's are mapped and points on these travelways where visitors tend to pass by and stop briefly are located. These points are used as research stations to count numbers and types of visitors at specific times, and interviews are done to get visitors' perceptions of conditions.

A one-page survey is done; most visitors are willing to respond if they see it will not be lengthy. Questions are asked about their activities and time on this trip, and if they go to other areas for similar activities, why they picked this area today. If they have visited the area before, they are asked if they have noted changes in area conditions. Then they are asked their perception of use densities encountered, and if other users have been a problem. Finally, they are asked to rate their experience on this visit, and whether they have additional comments for the managers.

The questions about reasons for choice of the area and changes observed are of particular interest to the managers. The short survey also works well for repeating periodically for monitoring purposes.

Results

The first case describes Ozark National Scenic Riverways (ONSR) and the development and application of the river visitor inventory and monitoring process there since 1973 (Chilman et al 1996). ONSR consists of 134 miles of two exceptional free-flowing rivers: the Current and Jacks Fork rivers in southern Missouri. ONSR was established in 1964 as the first national scenic riverway in the U.S. The area is managed by the National Park Service (NPS).

Large increases in recreation use occurred when the area was publicized and canoe rental businesses were initiated. Concerns about resource damage, including water quality, and visitors' perceptions of crowding prompted the initiation of a 5-year research program in 1972 to establish recreational carrying capacities for the river. An experienced researcher, Dr. Leo Marnell who had worked at Yellowstone and Yosemite national parks, was brought in to organize the program.

One of Dr. Marnell's early observations was that concerns about "a lot" of canoeists did not specify what "a lot" meant. What were the numbers of canoeists (and boaters) at various times and places on the river? And additionally, did the canoeists perceive crowding as numbers increased? Research of this type for an entire large-scale area had not been done before, so new methods had to be developed. Marnell contacted researchers at the University of Missouri to help devise count and survey procedures.

Initially, time-lapse photography was employed at selected locations on the rivers to obtain canoe counts, but the cameras had to be placed at a distance from the river so they would not be stolen. Later this was changed to counts by observers stationed along the river to obtain data on numbers of canoes rented by individual concessionaires, with identifying decals on their canoes.

The 134 miles of riverways was divided into 10 zones, usually determined by major river access points for launching or takeouts of watercraft. Counts were done at the end of each zone to determine density of watercraft on each zone, and the counts were combined with surveys of river users exiting the rivers to determine their perceptions of conditions. At first, 3 or 4 page surveys were used until the most useful questions for management were determined and used in the one-page survey described above in Methods. Results of these and other studies were published in a 139 page report titled River Recreation Research at Ozark National Scenic Riverways 1970-1977 (Marnell et al 1978).

Before the 5-year research program could be completed, a series of court cases by canoe rental concessionaires protested any NPS effort to limit their businesses. These cases culminated in U.S. District Court in St. Louis in 1982. Following intensive probing by defense lawyers of the 1978 research report and data collection methods used in the report, the judge ruled that the NPS had conducted a thorough research program to support their decisions, and he ruled that the NPS had established evidence and the right to limit canoe use.

Accordingly, following legal appeals until 1984, the NPS established a planning team and developed a River Use Management Plan in 1985. Following the river use counts that found different levels of use on various river zones, the

Recreation Opportunity Spectrum concept was used: 3 levels of use (High – up to 70 canoes per mile per day; Medium – up to 30 canoes per mile per day; and Low – up to 10 canoes per mile per day) were identified on various zones to be maintained as choices for river users to best fit their preference for a river float experience. A brochure describing the various river zones was distributed to help visitors make informed choices.

Since 1985, a river use monitoring program has been operating. Essentially, one data collection person can collect river use monitoring data each summer using established procedures worked out during the earlier research. One-third of the Riverways (Upper Current, Jacks Fork, Lower Current) can be covered each year. Although changes in river use in the form of increased horseriding use along the Lower Jacks Fork and tubing use concentrations on the Lower Current have occurred, the basic River Use Management Plan conditions appear to be within Plan guidelines.

The river use monitoring program was discontinued after the 2002 season. A new NPS superintendent thought at that time that since there were no big problems with river use, he would discontinue the program until he evaluated ONSR park program needs.

The second case involved the replication of the river use inventory and monitoring process at another large scale national park area. St. Croix National Scenic Riverway (SCR) is a 252-mile national river area that includes 154 miles of the St. Croix River on the states' boundary between Minnesota and Wisconsin near Minneapolis and 98 miles of the intersecting Namekagon River in northwestern Wisconsin. Some 227 miles of the upper St. Croix River (above Stillwater, Minnesota) and the Namekagon River are managed by the NPS, the remaining 25 miles of SCR below Stillwater are managed jointly by the Wisconsin and Minnesota Departments of Natural Resources, the NPS, and Northern State Power Company.

In 1998, the NPS was faced with an upcoming requirement to place SCR canoe rental concessionaires under permit and anticipated controversy. NPS managers had heard of the earlier situation at ONSR and invited researchers from Southern Illinois University to replicate the recreation visitor inventory and monitoring process at SCR.

A 5-year research program was initiated. It was determined that with two research data collectors working during the summer, approximately one-third of the 227 miles could be sampled each year. Following 3 years to obtain baseline user count and survey data on the 227 miles, 2 years remained to do follow-up monitoring measurements on the Namekagon and on the St. Croix above Stillwater to Marshland. The monitoring follow-up was important because the first data collection season on the Namekagon had been especially rainy. The 2002 data, however, showed river use remeasurements remaining quite similar to the 1999 measurements.

Again, findings from the SCR research replication were consistent with the ONSR case. The inventory data collection procedures worked well at SCR. Different use density levels were found to exist on various sections, or zones, of SCR, lending themselves to the ROS Planning concept for capacity management. Of particular interest when this study was initiated, river use levels and perceptions of crowding were lower than expected, making the need to limit canoe concession rental levels below existing levels appear unnecessary at this time. The yearly use inventory reports were discussed and made available in meetings with concessionaire groups. The use data also helped managers make other decisions, such as the level of site development to add at Riverside Landing. Use data there was lower than expected so the amount of development planned was reduced.

Discussion

This paper had 3 purposes: to discuss 1. case study research and its utility for wildland recreation management decisions, 2. the recreation inventory and monitoring process developed from case study research, and 3. a successful replication of the inventory process in a large scale multi-year replication.

First, case studies are messy, time-consuming, and difficult to publish. Recreation research journals have become very quantitatively oriented and case studies are qualitative in nature. But case studies provide useful context to describe complex management areas and decision situations, context to illustrate where quantitative studies fit in the overall picture and how the data may be used.

Case study research may be structured by identifying a class of decisions and developing a research hypothesis and the inventory process means of testing the hypothesis in multiple cases.

The other part of the research design of participant observation, negative case analysis is participant observation. It may be more difficult to implement: to find decision situations to study and to be invited to participate by managers involved. We were initially invited to participate in the ONSR case by a researcher with experience in complex management situations. We participated in many discussions with this researcher and ONSR managers to define the research questions to be answered (Marnell et al 1978), and to develop methods to obtain the desired data. Several trips and considerable field time were necessary to understand the complexities of a 134-mile area and its users and management.

Other managers and researchers learned about the ONSR situation and how the research was working for the managers there, partly from word-of-mouth from managers to managers, and partly from presentations at research meetings and publications (Chilman et al 1977, Chilman et al 1981, and Chilman et al 1990). We were also doing similar recreation inventories at Lake Tahoe in California and Land Between the Lakes and several Corps of Engineers lakes, and discussing them at meetings.

Second, the recreation inventory process and procedures was an important outcome of the case research. Inventory of existing recreation conditions had been identified as an initial component of a recreation planning process (Manning 1985) but systematic recreation visitor inventory procedures for large scale management areas had not been developed and tested. Inventories have long been fundamental for management of trees or wildlife, but have not been a tradition in recreation management.

As well as developing systematic recreation visitor inventories for large and diverse management areas, managers told us that low-cost measurements were needed because of budget limitations, and that inventory data should be readily understandable and easy for managers to communicate in meetings with a wide variety of individuals and groups. Accordingly, we focused on high use seasons and four days per week (2 weekdays, 2 weekend days) as relatively small indicator samples. If special problems began to be identified at certain locations, sampling could be intensified there as funding was obtained.

Inventory data was presented as descriptive data, with relatively limited statistical analysis. Simply, the data were discussed as “these were the numbers of various types of visitors at these places and times” and “this is what they told us.” This appears to have an external validity in that visitors to those areas can verify that those seem to be numbers they observe and comments they hear. Managers have told us that having those data to discuss usually gives them increased credibility in discussions in meetings with individuals and groups, many of whom are able to spend more time in the areas than the increasingly desk-board managers.

Third, replication is an important hallmark of scientific research. As Sekaran (1984) states “To the extent that results are replicated or repeated, we will have confidence in our research being scientific.” Replication in case studies depends on identifying a class of similar situations and being able to replicate established processes to test hypotheses in cases from this class.

In the research reported here, cases were studied from large scale management areas facing recreational carrying capacity related decisions. Inventory data collection for these areas usually takes more than a year, so the opportunity here was to study results from two multi-year cases.

Findings in the cases were similar, with differences in conditions found to exist on various parts of the areas. These can form the basis for an area capacity plan using the Recreation Opportunity Spectrum, or identifying recreation opportunity choices to be provided and maintained for visitors. In addition, the data was useful for other management decisions, such as numbers of canoes to be permitted to concessionaires or site development levels at places along the rivers.

Finally, some observations on the concept of recreational carrying capacity. Carrying capacity is a concept borrowed from range and wildlife management (Dasmann 1964), and depends on population studies over time related to conditions on management areas. The focus in recreation management has been on limiting use, for example, the Limits of Acceptable Change capacity planning system (Stankey et al 1985).

It would appear from the studies reported above that a more positive focus would be on providing high quality recreation opportunities. This follows from Wagar (1964) that “Quality means different things to different people,” and the Recreation Opportunity Spectrum concept to identify and maintain a range of opportunity choices can be developed from systematic counts and interviews of recreation visitors using various parts of the management area. This information can be used for planning in discussion with individuals and groups and also to facilitate other types of management decisions. It can enhance the credibility of managers.

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