Research, Politics, and Resource Management Decisions: A Case Study of River Research in Grand Canyon

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Abstract The literature on research utilization and policy making suggests that decision processes involve both rational, intellectual analysis and social or political interaction. Several writers suggest that this relationship also exists in the recreation and resource management fields, but few studies treat the issue explicitly. This paper presents a case study of river research in Grand Canyon National Park. It illustrates the role of research in the political decision process, develops generalizations from the case study, and ties them to the utilization and policy literature.

KEY WORDS: *policy, decision making, utilization, application, planning, politics.*

Research in recreation and resource management is seldom purely theoretical; there are opportunities for theoretical advances, but work in this area is usually applied, particularly in agency-sponsored work. Application means that results affect policy decisions rather than simply adding to the body of scientific knowledge, but there is great variation in the extent to which research results are "used." Some reports are shelved and never seen again, while others become an integral part of

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planning and management. How is research used in recreation and resource management, and what causes differences in utilization?

It is often assumed that policy decisions are made in a rational, linear way. Idealized conceptions of the decision process usually include identifying goals, developing alternatives, considering consequences, and making an optimal decision. But real-world decisions seldom fit such an orderly model. Decision makers are usually faced with unclear and changing objectives, and information for developing alternatives is limited by time, money, and the individual's cognitive ability (March and Simon 1958). As a result, decisions are most often "satisfactory" rather than "optimal."

Similarly, policy adjustments are incremental, meaning that changes are usually small relative to previous policies (Wildavsky 1964, and others). More generally, the "incrementalism" concept argues that decision makers consider a limited number of alternatives that differ only incrementally from each other and from the status quo (Braybrooke and Lindblom 1963). Large-scale changes are discounted as politically unrealistic, and long-term goals are usually too remote to have much impact. Only immediate consequences are assessed, and less tangible impacts are discounted. Braybrooke and Lindblom also suggest that goals are seldom considered apart from the means or resources available to reach them, so goals and means are probably developed simultaneously. Several theorists (e.g., Weiss 1977; Lindblom and Cohen 1979; Wildavsky 1979) differentiate rational analysis or intellectual cogitation from social or political interaction. Their conclusion is that effective problem solving necessarily recognizes and integrates both activities.

Where does research enter in? Information based on research is one of the rational or intellectual components of decision making, but results become part of a dynamic political process. Policy makers have ongoing relationships with information sources as diverse as administrators, politicians, journalists, interest groups, and social scientists, and the decision process is disorderly and iterative as well as intellectual and rational. Research is only one kind of input, and it may be used by policy makers for a variety of purposes besides rational analysis. These include delaying action, avoiding responsibility, discrediting an opponent or policy, or gaining recognition for success or support for future programs (see Weiss 1977 for a discussion of these issues).

The factors affecting research utilization can be divided into two

general categories. The first concerns "scientific" characteristics of the research itself, including methodological quality, relevance and timeliness of information, and strength of findings (Cox 1977; Rossi and Wright 1977; Hawkins et al. 1978). Scientists tend to focus on factors in this category, particularly methodological problems such as defining research issues, designing the study, and reporting results in terms that make sense to clients.

High quality is clearly necessary if research is to stand up in the public arena, but it does not insure that results will actually be used in decision making. Even good research is sometimes ignored, and the possible reasons for this fall into a second category of "political" factors affecting utilization. The word *politics* often has negative connotations, particularly among scientists, but in an ideal sense politics can be defined as getting things done where people are involved, which means dealing with personalities, values, budgets, bureaucracies, regulations, laws, and conflicts between interest groups. Research application necessarily involves these factors.

Weiss and Bacavalas (1980) suggest that decision makers assess research on both scientific and political merit. A "truth test" judges the work in terms of its relevance, quality, and conformity with the individual's own knowledge of the situation, while a "utility test" determines the work's relationship to existing policy and its implications for a course of action.

Several writers suggest that research and politics interact in the recreation and resource management fields as they do in other areas (see, for example, Beckman 1964; Bolan 1969; Mak et al. 1977; Kilgore 1978). However, few studies treat the issue explicitly. The remainder of this paper focuses on the Colorado River in Grand Canyon. The next section presents a case study that illustrates the role of research in the political decision-making process. The concluding section develops generalizations from the case study and ties them to the literature discussed in the introduction.

Grand Canyon

The Colorado River in Grand Canyon offers unique opportunities for white-water and backcountry experiences. Problems of crowding and conflict were identified in the late 1960s and early 1970s, and plans to

resolve them have now progressed through the Environmental Impact Statement (EIS) process to an approved River Management Plan. The latter document outlines a comprehensive management strategy based on research results, management expertise, public involvement, and political compromise. The following discussion draws heavily from a more thorough historical review by Shelby and Nielsen (1976b); that report provides extensive documentation not duplicated here.

Problems and Controversy

River runners and managers alike were alarmed by rapid increases in river use in Grand Canyon National Park (from 547 people in 1965 to 16,428 in 1972). The 1971 Draft Master Plan for the park indicated a concern for river management issues and suggested that river trips should provide a "wilderness experience." The River Use Plan issued in 1972 was an attempt to address the problem of uncontrolled use, and there were two major issues addressed in the plan that became the foci of controversy. The first concerned use levels. Commercial outfitters had been allotted 105,000 user days for 1972, but had used only 89,000; they would be held to the lower level for the next few seasons. In addition, however, the Use Plan called for a further reduction to 55,000 user days by the 1977 season.

The second major issue involved the use of motorized rafts. The plan acknowledged that the issue was somewhat subjective, but indicated that the goal was to provide opportunities for an intimate man–nature relationship where the river was run "on its own terms." The plan went on to compare trip prices, indicate that many river passengers were unaware of alternative types of trips (later surveys supported this), and imply that the Park Service had a responsibility to see that the visitors' experience was "the best that can be provided." The conclusion was that motor use on river trips should be phased out.

The plan was a laudable attempt to establish management goals, but it went too far with too little information. Controversy raged over the use level and phase-out issues during the next year and a half. Managers at Grand Canyon felt pressure from within the Department of the Interior to reduce use and limit motors, but the information about the effects of policy alternatives was severely limited. The basis for the decisions was

thus unclear, and they appeared final, even though the Use Plan indicated the need for a "coordinated research program" integrating the "political, biological, sociological, and management sectors."

In March of 1973, with the River Use Plan only three months old, the Department of the Interior defended the plan by stating that "The decision which has been made regarding limitations on public use and motors on the Colorado River . . . was not made hastily and without taking into account all relevant factors." Regarding use levels, the document indicated that further information was needed and several years would be required to collect it. The reduction of use announced in the Use Plan was thus put on a conditional basis pending the outcome of research and other information gathering.

In regard to the motor–oar issue, however, the Interior document restated the position presented in the River Use Plan: "Basically motors are antithetical to the quality of a wilderness experience that is, and should be, obtainable in the Grand Canyon." It went on to evaluate the advantages of each kind of trip. The lack of air, water, and noise pollution were seen as advantages of oar trips, although "the environmental or sociological impact of such pollution" was not yet known. However, pollution was not the only issue. The Canyon was described as a "refuge from the pressure of modern life," a unique place in which one could "escape civilization." Oar travel was in keeping with the nature of the river-canyon "sanctuary" and the "unique character of the river-running adventure."

The arguments that had been made in favor of motors fell into two categories—safety and convenience. Proponents of motor travel said that the greater size and power of their craft made for less danger in the rapids. Convenience arguments stated that motor travel was easier, faster, and cheaper. The Interior document summarily dismissed both contentions, but controversy over the motor–oar issue generally continued to form along these same lines. The point is that the agency was using two different sets of "ground rules"; the use level issue would not be decided until research results were available, but the motor–oar issue had already been decided even though all parties acknowledged the need for more information.

The reasons for this difference are not clear, but there are at least two possible explanations. The first is that the increase in use in the late

1960s and early 1970s was primarily due to an increase in motorized trips, and the Park Service had hoped that eliminating motors would solve the over-use problem. This seems unlikely because the two issues had already been distinguished and addressed separately. The more likely explanation is that the over-use problem was seen as amenable to other management strategies (such as redistribution of launches), while motors were an "all-or-nothing" issue. Recall that the Interior document argued that "motors are antithetical to . . . wilderness," a contention supported by the wilderness act, more general wilderness philosophy, and Park Service tradition. It appears that motors were simply unacceptable to the interest groups, Interior officials, and Park Service personnel who supported the wilderness goal for river trips, and "rational" input from research was less important than these institutional, group, and personal norms.

There was one final but important point. Users and outfitters reacted favorably to other regulations, such as those affecting trip departures and camp practices. No one seemed to contest the need to regulate or the agency's legitimacy to do so; only the content of particular regulations was in question.

The river outfitters organized and filed a court suit protesting the motor phase-out, which they lost. They then increased their efforts at political and public pressure. The response of Park Service personnnel was marked by hasty, inconsistent decision making. An October 31, 1973, news release from regional director Howard Chapman altered the motor phase-out, saying it had "been deferred pending further study." Here it appeared clear that research would be conducted to investigate both the motor–oar and use-level issues, and that the results would be used in decisions. However, a December 10 letter to Senator Goldwater from acting Secretary of the Interior Whitaker indicated that studies would "in no way alter" the goal of wilderness classification for the river. This was supported by an April 2, 1974, letter from NPS Director Walker to Senator Steiger, which stated that "the motors decision has already been made."

The outfitters continued to apply political pressure, maintaining their position that studies should form the basis for the motor–oar decision. This finally had an effect, and on June 3 Director Walker reversed his earlier position. He stated in a letter to Senator Jackson that studies would "provide a base" for river management decisions and that

"existing river uses would . . . not be changed" until study was completed.

Studies were done in the next three years. The sociological research (one of 29 studies in the research program) centered on the carrying capacity and motor–oar issues. It is interesting to note that, while the research was being designed and initiated, allocation of permits between private and commercial users had not yet become an issue because allotments allowed the 1972 level of use to continue. However, allocation began to appear inequitable as applications for private permits exceeded the number available by a greater and greater margin. In the progress report for the first year pilot study, it was pointed out that the growing private–commercial controversy had not been mentioned or funded in the originial contract, and the study would not sample private trips or look at this issue. When outspoken private users learned of this and expressed their displeasure to the Park Service, the agency decided to provide additional funds to address the problem. Allocation had now become an issue, and pressure from an interest group prompted research.

The sociological study report (Shelby and Nielsen 1976a, b, c) was submitted in June of 1976, and reports on the 28 other studies were received about the same time. These included an economic analysis of outfitting businesses; a campsite inventory; a study of trails; ecological/biological studies of streamside flora and fauna, human waste disposal, fish, and water quality; and studies of hydrology and erosion. The Park Service put together a synopsis summarizing the findings and began integrating results into a management plan.

A year and a half later, at the end of 1977, the Park Service issued a Draft River Management Plan (USDI 1977a) and a Draft Environmental Statement (USDI 1977b). These documents included proposals for establishing a carrying capacity and limiting motor use that were finalized in a Final Environmental Statement (USDI 1979a) and Final River Management Plan (USDI 1979b). The following information is drawn from all four documents.

What Was Decided?

The management plan first established the "product" that was to be provided. "The goals for management of the Colorado River in Grand

Canyon will be to perpetuate the wilderness river-running experience and to attempt to mitigate the influences of man's manipulation of the river'' (USDI 1977a:12). The wilderness experience goal was supported by earlier documents, including the 1971 Draft and 1975 Final Master Plans for the park, input from public meetings, two surveys of river users, and the judgment of managers. The solidity of this goal was extremely important throughout the discussion and controversy that surrounded the development of the management plan. Managers referred to it continually, explaining how proposed policies fit with the management goal. If someone questioned a policy, they had to either show why it didn't serve the goal or else question the goal itself.

Use Levels and Carrying Capacity. The management plan considered three different types of carrying capacities. Ecological studies showed that current use was causing changes, but these were more a function of use patterns and activities then they were of overall use levels. One party using inappropriate camping techniques (e.g., for waste disposal) had a greater effect than many parties using lower impact methods. The solution was a set of prescriptions aimed more precisely at decreasing impact, including carry-out of human waste, eliminating wood-gathering for fires, and establishing an education program to inform users of appropriate use practices. In the biological area, then, research showed that an overall cutback in use was not necessary to achieve the desired ecological conditions.

One of the alternatives considered in the decision process was to ''increase visitor use level to the absolute physical capacity of the system.'' The campsite inventory study had developed a physical carrying capacity based on a computer simulation model. Using the one party per beach norm and assumptions about space needs for sleeping (a 4′ × 8′ flat area for each person), each site was evaluated in terms of the largest trip it could accommodate. ''Under a very tight scheduling system of launch days and times, campsite space assignment, structured river travel restriction, time and area limitations at attraction sites, and a standardized trip length of 12 days, this alternative could . . . [result in] . . . an 85% increase in total visitors and a 242% increase in total user days'' (USDI 1979a: VIII-4).

The greatest impact of this alternatiye would be social. By standardizing trips, it would ''significantly reduce options for trip variety and experiences.'' Strict scheduling would be required to reduce encounters

among groups, and even then they would exceed current levels. Regimentation would also occur in other aspects of the trip. In sum, "regimentation, scheduling, and lack of options would detract from the quality of the visitor's experience" (USDI 1979a: VIII-5). Research in this area showed that the canyon was physically capable of holding more people, but no one seemed particularly interested in the necessary trade-offs; this alternative did not fit with management objectives or public norms regarding the wilderness experience.

What about social capacity? The management plan described a wilderness experience in terms of close contact with the river-canyon environment without interference from other parties. Research had shown that use was concentrated in both space (popular attractions and camps) and time (heavy use days of the week and months of the year). The problem was to establish a number that would allow as many people as possible to use the resource without exceeding policy standards describing the desired experience.

The solution required distributing use more evenly, resulting in less use at peak times. Although this might have been accomplished by decreasing seasonal use levels, a more efficient approach (see Shelby and Nielsen 1976a) was to establish the daily launch limits that data showed would produce a contact level in line with most people's preferences (three or less encounters with other groups per day). It was then possible to lengthen the season so that this number of parties could leave on as many days as possible. Clear management objectives (reducing encounters) and research showing the connection of management parameters (use levels) to visitor experience parameters (encounters) made it possible to plan for a lower-contact experience with a substantial increase in overall use.

The plan also called for a six-month summer season and a lower-use winter season. Although the primary justification for the lower winter level was biological, it was also intended to "provide for a wilderness river trip where the likelihood of encountering other trips is remote" (USDI 1979a:I-8). Interactions between researchers and managers had helped both groups think more clearly about experiences, and the plan provided for two kinds of experiences with different encounter levels, a "first" in river management.

Motors and Oars. The "wilderness experience" goal was a major consideration in deciding the motor–oar issue. The plan defined the

experience in terms of opportunities for relaxed conversation, interpretation, off-river hiking, a close relationship with the natural environment, and meeting the river on its own terms. The problem was to determine which kind of trip best met these management objectives.

Research results from observation of 39 commercial trips showed a number of structural differences between the standard motor and oar options (Shelby and Nielsen 1976b; Shelby 1980). Motor trips had more people, fewer boats and boatmen, more people per boat, and more contact with other parties. They also spent less time in the canyon and made fewer and shorter side trips. But how did these differences affect passenger perceptions and experiences?

Experimental combination trips allowed passengers to travel one half of the canyon on an oar-powered raft and the other half on a motor rig. The self-selected sample of 56 people was demographically similar to the user population and, if anything, predisposed in favor of motor travel (see Shelby 1980 for further explanation). After experiencing both kinds of trips, however, an overwhelming majority (80 to 90 percent) preferred oar travel. Reasons given by passengers included the slower, more relaxed pace, the opportunity to experience natural sounds and water movement, and the smaller, more comfortable social groupings. People described motorized travel as speedy, hurried, rushed, noisy, loud, and crowded. By contrast, oar travel was described as leisurely, relaxing, peaceful, quiet, friendly, individualized, and intimate. The data, then, appeared compelling; motor trips did not fit with the definition of a wilderness experience.

The Management Plan called for a phase-out of motorized travel. The data described above suggested that the conversion to rowing trips would lead to smaller parties, smaller boats, fewer people per boat, a lower passenger–guide ratio, longer trips with more stops at attraction sites, and quieter travel. The fast, short trip would be eliminated. These differences would change the character of river trips to be "more consistent with a natural or wilderness experience," with greater opportunities for a close relationship with the environment, relaxed social interaction, and interpretation by guides (USDI 1979a:III–17–20). Data from the other studies in the Colorado River Research Program were used to show that the decision would have little impact on biological, economic, or safety factors and would reduce noise and water pollution.

The decision was fairly unique in river management. Biological and

economic factors had been considered but did not show major differences in the impacts of motor versus oar trips, so the choice had been made primarily on the basis of social aspects of the visitor experience. But most importantly the agency had, after considerable vacillation, specified management goals and made a commitment to a "public" decision process; data were then gathered that helped clarify goals and showed how different alternatives fit within them.

To summarize, the Park Service reacted to initial problems of crowding and conflict by deciding to reduce use and phase out motors. Those decisions would have been controversial anyway, but their apparent arbitrariness in the absence of supporting data left them open to question. Political pressure from a variety of sources caused the agency to back down until more complete information was available and data were collected and integrated into policy making. On the basis of more comprehensive research information, the use-level decision was reversed and use limits were raised. The decision to phase out motors remained the same, but it was based on more specific management goals and solid information about which alternative best accomplished those goals.

Research, Politics, and Decision Making

The introductory section of this paper discussed general conclusions from the literature on research utilization and decision making, and the next section described a case study illustrating many of those principles. This concluding section develops generalizations from the case study and ties them to the work discussed in the introduction.

(*1*) *Determining policy direction is an interactive process, so management goals should be stated as early as possible; information needs become more clear and goals can be more thoroughly developed as managers interact with researchers, interest groups, and others.* In Grand Canyon the "wilderness experience" goal was suggested somewhat tentatively in 1971 (perhaps as a political "trial balloon"). Succeeding documents restated and clarified the goal as public reaction and research results provided more information. By the time final documents were written, the goal was clearly defined and well established. General goals are needed at the outset to determine the relevant areas for research and give the public information about what managers are

thinking. But as data become available, there will be more information about possibilities and public sentiment. Grand Canyon data helped clarify objectives for carrying capacity (e.g., minimize encounters among groups) as well as for travel modes (e.g., maximize opportunities for relaxed conversation and interpretation). This illustrates the dynamic relationship between goals and policy formulation described by Braybrooke and Lindblom (1963).

Stating management goals will also help focus the interactive process. Critics can disagree with goals, giving managers a chance to reconsider or modify their position or perhaps better defend it. Critics may also find themselves agreeing with general goals, but disagreeing with the action chosen to reach them. This may encourage managers to think of more effective policies, or users may suggest alternatives of their own. Both these are more likely to create a situation where managers and users are working together to come up with the best solution; criticism is more likely to be constructive.

(2) *As a corollary to (1) above, dialogue between managers and researchers is an essential part of the interactive process.* Meetings with Park Service personnel and an annual Grand Canyon Research Symposium provided a number of opportunities for researchers to report preliminary findings. This encouraged them to organize their thoughts and allowed managers and others to see patterns emerge. All groups had numerous opportunities to identify unanticipated problems and take corrective action, and managers were able to learn about issues along with researchers. When final research reports were submitted there were more details, but no major surprises.

Researchers often assume that their input is solely "rational." This case and other work (e.g., Wildavsky 1979) suggest that research must be combined with political interaction in the decision process. Controversial policies probably require support from both areas. The early decisions to reduce use and eliminate motors in Grand Canyon are classic examples where managers went beyond their data and/or their political support and were forced to back down.

(3) *Agencies can establish the "ground rules" regarding the use of scientific data.* The Park Service did this unwittingly in the early stages at Grand Canyon by saying that carrying capacity decisions would take research results into account, while the decision to phase out motors would not. Outfitters opposing this first (1972) motor phase-out argued

that the same principle should apply to the motor–oar issue, and they pushed the Park Service into a more extensive research effort. The same thing happened later when allocation became an issue, and private users insisted that sociological research be extended to include private trips. Rational analysis in the form of research was thus established as a legitimate part of the decision process.

(4) *A good information base requires an investment of time and money.* The Colorado River Research Program for Grand Canyon took three years of intensive work on 29 different studies at a cost of about $750,000. Areas lacking the national prominence of a place like Grand Canyon cannot afford and may not need this kind of investment, but this often is used as an excuse for limited data, low quality information, and poorly founded decisions. Similarly, budget limitations create difficult situations for researchers, who must realistically assess how much can be done with the available resources. The result may be a scaled-down project with limited objectives, or no project at all if funds are inadequate. Researchers have an ethical obligation to avoid "token" projects that just satisfy legal or "public relations" requirements.

If policies are questioned, the investment in good information may save a great deal of time and money that would otherwise be spent defending and back-tracking. At this point methodological quality of the study and strength of the findings are crucial, as Kilgore (1978) suggests. Researchers have an obligation to stand behind their work and explain or defend it, in court if necessary. This will obviously be difficult if the work is poor or conclusions have overstated the results.

(5) *Research may serve purposes other than information-gathering,* as Weiss (1977) suggests. The research program in Grand Canyon "bought" three years of time to stabilize use under an interim management plan. This gave everyone a chance to define the issues and think about and experiment with solutions in a more relaxed atmosphere where new ideas were less threatening. The issues were complex and all parties had a chance to become "educated." It appears that these benefits were unanticipated, but policy makers aware of such possibilities may be able to capitalize on them.

(6) *Finally, social science data tend to represent the views of less vocal individuals or groups, and research results may be attacked by those who are more vocal.* Grand Canyon data from public meetings and user surveys showed that most people supported the "wilderness ex-

perience'' goal, but these findings were questioned by some outfitters whose views had previously carried greater weight. Similarly, outfitters running motorized trips were quick to contest results from the motor–oar experiment, which showed user preferences for oar travel. This is an example of a ''collective action'' problem; organized interests have powerful structural motivations to make their views known to policy makers, while more isolated individuals who make up the public at large are less likely to either speak up or speak forcefully. Publicly funded social science research is essentially a structural solution to make the quieter voices heard. Similarly, Friesema and Culhane (1976) show that public comments on U.S.F.S. Environmental Impact Statements act in a similar way; they better represent the views of non-business interests than do district rangers' routine contacts.

Epilogue

Just prior to this writing, a rider was attached to the National Park Service appropriations bill for fiscal year 1981. Introduced by a Utah senator at the suggestion of a small group of river outfitters who were apparently disgruntled about the motor phase-out, the rider prohibits the Park Service from spending any of its 1981 budget to implement the River Management Plan for Grand Canyon. This appears to override the planning and decision process that has been going on since 1974, which is based on a considerable amount of research, public involvement, political interaction, and compromise. However, political decision theory that sees a balance between rational analysis and planning on the one hand and political interaction and compromise on the other would suggest that this maneuver will not prevail in the long run. Time will tell.

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