PROTECTING RESOURCES
AND
VISITOR OPPORTUNITIES

**A decision process to help managers maintain
the quality of park resources and visitor experiences**

Conducted at Mesa Verde (shown here), Yellowstone, and Arches National Parks, the study helped park managers understand and apply a broadly applicable, yet focused, decision-making process that identifies and remedies unacceptable impacts to resource conditions and visitor experiences in parks. The field tests at these parks allowed researchers to understand the challenges managers face and the skills they employ during problem solving. PHOTOS BY JEFF SELLECK

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Introduction

The National Park Service has a mandate to protect natural and cultural resources while providing quality visitor experiences. This has never been an easy task, yet today the task is made more challenging because of increasing visitation, deferred maintenance, shrinking budgets, cumulative resource impacts, and expanded public participation. Managers frequently deal with such problems as trail deterioration, litter, wildlife displacement or habitat loss, unacceptable levels of crowding at attraction sites, and noncompliant visitor behavior. When managers face such visitor use problems, they are often uncertain about what decision-making process to use to address these impacts, or even what their problem-solving options are.

An important goal of technological innovation in the field of recreation resource management has been to help managers preserve the ecological and cultural integrity of recreation settings while providing the recreation opportunities that visitors desire. Important recreation resource management innovations developed thus far include:

- The Recreation Opportunity Spectrum Planning System (ROS) (Brown et al. 1978; Driver and Brown 1978; Clark and Stankey 1979)
- The Limits of Acceptable Change System for Wilderness Planning (LAC) (Stankey et al. 1985)
- Managing Wilderness Recreation Use: Common problems and potential solutions (A problem-solving handbook) (Cole et al. 1987)
- Visitor Impact Management Planning Framework (VIM) (Graefe et al. 1990)
- Benefits-based Management (BBM) (Driver 1994)
- Visitor Experience and Resource Protection Planning Process (VERP) (Hof et al. 1994)

For the most part, these innovations represent comprehensive planning and management frameworks. Taken together, they suggest a generalized planning process that includes articulating acceptable resource and experiential conditions, establishing management zones, selecting indicators and standards, monitoring resource and experiential conditions, identifying discrepancies between *actual* and *acceptable* conditions, and, finally, taking steps to bring actual conditions in line with what is acceptable. This "final" stage in the planning process is the one in which managers devise action plans to address specific impacts to resource conditions and visitor experiences. It is also the stage at which decision making often flounders. Thus, managers need a decision process that:

- Assists in specifying the scope, severity, and cause of the problem
- Facilitates the identification of a range of possible solutions
- Encourages an in-depth assessment of alternatives
- Strengthens the political credibility of the decision process
- Provides a resource for resolving conflicts between stakeholder groups
- Enables managers to fulfill the NPS mandate of use and preservation

The purpose of this study was to develop a decision process to address unacceptable impacts to resource conditions and visitor experiences in recreation areas.

Developing a decision process by managers for managers

The study incorporated a qualitative approach that engaged manager-participants in a series of hands-on, group decision-making sessions. The qualitative approach allowed participants to actively contribute to the development of the decision process and enabled researchers to deal with problem-solving obstacles as they emerged. Since there is no one "right" way to design a decision-making process, researchers attempted to identify and

implement those features that managers agreed upon with regard to process content and flow. A modified focus group or nominal group process and participant observation were employed as the principal data collection methods. Decision-making sessions were also tape-recorded.

Thirty-two people participated in the study. Participants were divided into three groups and group size ranged from 10–12 people. Field tests were conducted at Arches, Yellowstone, and Mesa Verde National Parks from January through April, 1997. Each field test lasted 2–3 days. Participants were drawn from Arches, Canyonlands, Grand Tetons, Mesa Verde, Theodore Roosevelt, and Yellowstone National Parks; the Bureau of Land Management's Moab District in Utah and Farmington District in New Mexico; and a local "Friends" group. Participants met together regularly to discuss and make park management decisions. Participants also worked in an area for which several unacceptable impacts to resources and visitor experiences had been identified. Further, participants were able to articulate acceptable conditions, or indicators and standards, for the unacceptable impacts they had identified.

During the field tests, managers engaged in a decision process with real-life implications and were encouraged to follow whatever decision-making steps and strategies made sense to them. Three decision-making worksheets and a decision-making handbook were available as problem-solving resources. However, managers were free to use the supporting materials at their own discretion. A half-hour *debriefing session* immediately followed each decision-making session. The debriefing session was necessary to elicit manager perceptions about the decision process. During the debriefing sessions, managers frequently identified the decision-making obstacles they had encountered and suggested how to restructure the decision process and supporting materials to eliminate these pitfalls.

Developing the decision process

The field tests allowed researchers to understand the challenges managers face and the skills they employ during problem solving. The field-testing process identified five steps that are essential to solving visitor use problems. This five-step process, together with a companion handbook and worksheets, comprises a decision process to maintain the quality of park resources and visitor experiences. The five decision-making steps are outlined in table 1. The steps include: problem awareness, problem specification, strategy and tactic selection, plan implementation, and monitoring. Although these steps were perceived to be critical to overall success, managers still struggled with the best way to accomplish each task. Of the five problem-solving steps, two steps received the most attention during the field tests: *problem specification* and *strategy and tac-*

tic selection. Many improvements were made to the decision process and supporting resources to guide managers through these two critical steps.

Problem specification

During problem specification, managers focused on an area for which they had identified one or more problems and specified acceptable resource and experiential conditions for that area. Then they determined whether there was a discrepancy between *existing* and *acceptable* conditions. Specifying acceptable conditions is equivalent to identifying the "line" that resource conditions and visitor experiences cannot cross. For example, managers may specify that during peak hours 80% of the visitors should encounter no more than 10 people (singly or in groups) on a specific quarter-mile stretch of trail. If more than 10 people are encountered more than 20% of the time along that stretch of trail during peak hours, then conditions are not within acceptable limits and managers must take action.

At Arches, managers had previously completed the VERP planning process (see *Park Science* 14(1):11–13 and 15(3):9,13). Therefore, during problem specification they referred to previously defined indicators and standards of acceptable conditions. For example, in attempting to address the problem of overcrowding at the Devil's Garden parking area, the following discussion ensued (Arches, researcher field notes, p. 4):

Participant E: [What is the] associated indicator and standard?

Participant D: 150 cars is the [estimated] acceptable limit…. The social standard is 20 persons at one time (PAOT) on a section of trail to Landscape Arch and 10 PAOT to Double "O" [Arch]. Beyond Double "O" it's 5 parties/hour.

Participant A: How many parking spaces [are presently available]?

Participant D: 35 marked spots.

Participant E: A parking lot with 150 slots is desirable.

Participant D: Currently on busy weekends we have 235–250 cars parked there. We want to be in standard 90% of the time, but [we are] only in standard 76% of the time.

Table 1.
Steps in the decision process to maintain the quality of park resources and visitor experiences

Step 1	*Problem Awareness*	Recognize that unacceptable impacts exist and must be addressed
Step 2	*Problem Specification*	Identify impact Describe acceptable impact levels Describe existing impact levels Determine if existing impact is unacceptable Identify root cause of impact
Step 3	*Strategy and Tactic Selection*	Select appropriate strategy Identify potential tactics Evaluate and select appropriate tactics
Step 4	*Plan Implementation*	Develop implementation plan for selected management tactics Identify specific management actions Identify person responsible for carrying out management actions Implement actions
Step 5	*Monitoring*	Monitor Effectiveness of actions If problem arises, return to problem specification stage

Managers at Arches had a good understanding of the conditions they were trying to achieve at various areas within the park. Their extensive use of VERP standards suggests that having gone through the VERP process helped them in identifying acceptable conditions and determining whether existing conditions were within acceptable limits.

At Yellowstone and Mesa Verde, managers determined acceptable conditions based primarily on manager perceptions. Although managers at Yellowstone had previously completed a VERP planning process to address winter use in the park, the problems they addressed during the field test fell outside the scope of earlier planning efforts. This approach lacked the rigor of specifying indicators and standards, but it drew upon considerable manager experience with an area over time. A lack of visitor and resource data hindered decision making, but the decision process helped to pinpoint the specific information managers needed. In fact, one manager at Yellowstone commented, "This process will trigger monitoring."

In general, managers felt that the problem specification portion of the process was helpful in their decision making. Although managers recognized the value of defining the problem, they tended to struggle with problem specification. In some cases managers glossed over this portion of the process in their haste to engage in brainstorming and tactic selection. At other times they defined the problem too broadly, failed to clearly specify the timing or location of the problem, or neglected to conduct an in-depth analysis of all the possible causes of the problem. One of the researchers analyzed *why* managers struggle with problem specification: "Once people start asking

'why,' the 'problem' begins to change. This is probably good, but maybe this 'backing up' ought to be recorded if for no other reason than to keep track of the path they followed to move from problem Z to problem A" (Mesa Verde, researcher field notes, p. 2).

Field test results suggest that problem specification is more complicated than it appears, and that what actually constitutes the "problem" may be a moving target—with definitions changing as the analysis proceeds. Based upon field test results, the decision process and supporting materials were modified to ensure that managers do not jump ahead to considering solutions before they have articulated the scope, severity, and cause of the specific problem they are addressing.

Strategy and Tactic Selection

The brainstorming portion of the process requires managers to identify strategies and tactics that are appropriate to the specific problem being addressed. Managers felt the decision process and supporting materials helped them to generate a range of possible solutions and think "outside of the box."

Field test results revealed a number of factors that either facilitate or inhibit brainstorming. Managers found brainstorming to be more effective when they jumped around, discussing tactics in a free-flowing manner. When managers considered tactics methodically, as if going through a lengthy checklist from top to bottom, the process felt overly tedious. During brainstorming, discussions frequently incorporated dialogue about specific management actions that could be developed for a tactic and the advantages and disadvantages of a potential tactic. One researcher felt such discussion "was generally good and may enhance products" in the next stage of the process. Facilitators play an important role during brainstorming by ensuring that some tactics are not discussed in too great of depth while other tactics are ignored.

Field test results also revealed an interesting brainstorming dilemma. To avoid getting bogged down, the process requires managers to focus on a *specific* problem at a *specific* location. However, this site-specific focus can inhibit brainstorming by limiting the consideration of tactics that would be most effective if conducted on a *park-wide* basis. Consider the following interaction between managers at Arches (Arches, researcher field notes, p. 10–11):

> The decision process … [was] modified to ensure that managers do not jump ahead to considering solutions before they have articulated the scope, severity, and cause of the specific problem….

Participant H: [I don't] see visitor education at Windows [as mandatory]. It must be park-wide but [I don't] know how it would be done with the hundreds of thousands of visitors.

Participant D: [We could] revisit queuing [and] reservations because indirectly [these approaches] would [address the problem] at Windows if we did [employ them] park-wide.

Participant C: Interesting comment. We should [record] that reservations, queuing, and visitor education are "maybe's;" they're "yes's" if done park-wide.

If managers had ruled out visitor education, queuing, and reservations as potential tactics simply because it seemed like too much work for a single location, and if managers failed to consider park-wide options, the potential effectiveness of these tactics at addressing site-specific problems might have gone unnoticed.

Tactic selection requires managers to assess the relative merits of various tactics. At Arches, one manager asked, "How do you answer the question 'Is this the best way to fix the problem?'" Managers used a wide variety of criteria to select tactics for implementation including park purpose, cost to visitors, manager expertise, legal compliance, off-site impacts, and economic feasibility, just to name a few. Although the decision process includes supporting materials to assist managers with tactic evaluation, improving this part of the decision process is an important direction for future research. Based on field test results, the decision process and supporting materials were modified to facilitate manager consideration of a variety of strategies and tactics. Modifications were also made to facilitate documenting the results of discussion and recording the reasons why specific tactics were selected. When managers consider a wide variety of options and document the reasons behind a chosen course of action, the political credibility of the decision process is strengthened.

Conclusion

This article outlines a decision process to maintain the quality of park resources and visitor experiences and highlights the contributions managers at Arches, Yellowstone, and Mesa Verde made to the development of the decision process. Technological innovation in the field of recreation resource management benefits from extensive manager involvement in the development process. By working closely with managers researchers were able to (1) better understand the process managers use to solve visitor use

problems and (2) develop a decision process and supporting materials that managers find useful and user-friendly.

To increase the quality of recreation resource management decision making, and to ensure that improvements in decision making can be replicated across the national park system, managers need decision-making frameworks, tools, and processes. This research project developed a decision process, handbook, and worksheets to help managers solve visitor use problems.

The decision process and handbook build upon previous research by Cole, Petersen, and Lucas (1987); Cole (1989); and Graefe, Kuss, and Vaske (1990). This effort's most important contribution, however, may be in developing a process in which managers use worksheets to specify their most critical problems and to iden-

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tify alternative management tactics to address these problems. The decision process can be used by managers who have implemented comprehensive planning frameworks, such as LAC, VIM, and VERP; however, it will also improve visitor use problem solving among managers who have not implemented these comprehensive planning processes.

The decision process to maintain the quality of park resources and visitor experiences, and the companion handbook and worksheets, are available from the University of Minnesota, Cooperative Park Studies Unit (1530 N. Cleveland Ave., St. Paul, MN 55108) and the Denver Service Center (c/o Marilyn Hof, National Park Service, 12795 W. Alameda Parkway, Lakewood, CO 80225-0287).

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