Problems and Practices
in Backcountry Recreation Management:
A Survey of National Park Service Managers

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Introduction

The Organic Act of 1916 (16 *United States Code* 1) directs the National Park Service (NPS) to "promote and regulate use of the Federal areas known as National Parks. . ." and to "conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Park managers struggling to execute this mandate encounter situations on a daily basis that require balancing visitor use with its attendant resource impacts. For most parks, visitor use is concentrated in front-country park development zones, where facilities, site-hardening techniques, and visitor management programs are used to minimize environmental impacts. Because development zones are managed for intensive use, manipulating natural resources is permitted to support visitor activities. In contrast, backcountry or natural zones are managed to protect, restore, and perpetuate the natural resources and processes in as natural a condition as possible. In these natural zones, managers are to provide opportunities for visitors to benefit from and enjoy natural environments that are evolving through natural processes and that are minimally influenced by human action (U.S. Department of the Interior, National Park Service 1991).

NPS Management Policies (U.S. Department of the Interior, National Park Service 1988*a*) specifically directs managers to balance the adverse effects of visitor use on park resources with the quality of visitor experiences:

Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreation experiences. The National Park Service will identify limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur (Chapter 8:3).

Examples of physical and biological impacts from visitors include trampling and loss of vegetative cover, damaging trees at campsites, compacting and eroding organic litter and soil, introducing exotic vegetation, harassing or displacing wildlife, and polluting water resources (Cole 1987, Hammitt and Cole 1987, Kuss et al. 1990). Examples of impacts to the quality of the visitor experience include visitor crowding, conflicts between incompatible visitor activities, reduction in visitor learning, and spatial,

temporal, or total visitor displacement (Manning 1986, Roggenbuck and Lucas 1987, Stankey 1973, Shelby and Heberlein 1986).

Park managers have responded to these problems with a variety of visitor and resource management strategies and actions. These management approaches may be classified, for example, on the basis of their objective or strategic purpose (Manning 1979). Four basic management strategies of this type that apply to backcountry recreation problems are (1) the number of recreation areas or facilities may be increased to accommodate additional demand, (2) the demand for recreation may be limited through restrictions on recreation use, (3) the character of recreation use may be modified to reduce its adverse impact, and (4) the resource base may be modified to enhance its durability. Even within each of these basic strategies, a number of sub-strategies exist.

A second approach for classifying back-country recreation management practices focuses on tactics. Management tactics are specific actions or tools that managers use to accomplish a management strategy (Cole et al. 1987). Restrictions on length of stay, differential fees, and use permits are examples of tactics designed to accomplish the strategy of limiting recreation use.

Tactics are often classified according to the directness with which they act on visitor behavior (Peterson and Lime 1979, Lime 1977, 1979). Direct management practices act directly on visitor behavior. Indirect management practices attempt to influence the decision factors that lead to visitor behavior. For example, a direct management approach aimed at reducing campfires in a backcountry area would be to establish and enforce a regulation that bars campfires. An indirect approach would be to initiate an educational program that informs visitors of the undesirable ecological and aesthetic impacts of campfires and that encourages the use of portable stoves.

The diversity of backcountry recreation management problems and potential management approaches results in considerable complexity for backcountry managers. Managers often lack adequate information on the nature, severity, and causes of back-country problems and on successful management approaches to reduce such problems. Moreover, little or no formal effort or program exists that is designed to foster communication among backcountry managers. Consequently, information about backcountry management problems and alternative solutions is not effectively gathered, analyzed, and shared. This lack of information sharing results in considerable inefficiency.

Three studies have attempted to address, to some degree, the types of problems previously described. In each of these cases, researchers have surveyed resource managers. The first study (Godin and Leonard 1979) surveyed a small sample of managers of designated wilderness on Forest Service lands. No National Park Service units were included in this initial study. A second study (Bury and Fish 1980, Fish and Bury 1981) also focused on managers of designated wilderness, but some National Park Service and Fish and Wildlife Service units, along with Forest Service areas, were included. A principal focus of this study was on the interagency differences in wilderness management. The National Park Service was found to be considerably more regulatory in its approach to backcountry recreation management compared to the Forest Service, which used more indirect and educational approaches. Washburne and Cole (1983) conducted the most recent and sophisticated study to date, although the researchers also focused on designated and potential wilderness areas. This study documented a diversity of management problems and approaches, but also suggested that many problems are shared across areas and that managers can benefit from knowledge about these shared problems and their potential solutions.

Study Objectives and Products

The overall goal of this study is to describe the nature and diversity of visitor-related backcountry management problems and practices in NPS areas. The specific objectives of this study include the following:

1. Describe perceptions of NPS managers on the types and severity of backcountry recreation management problems.

2. Describe the diversity of actions that managers have adopted to solve these problems.

3. Describe perceptions of managers on the success of implemented actions.

4. Describe the knowledge and application of carrying capacity models that managers use and know.

5. Describe the type and extent of monitoring efforts that park managers use to assess recreation-caused impacts on park resources and visitor experiences.

6. Facilitate communication of effective management practices by compiling pertinent survey findings into dBASE databases, allowing managers to identify parks that apply alternative backcountry management practices.

The primary product of this study is this research report, which provides a current and comprehensive assessment of NPS backcountry recreation management problems and practices. The nature and perceived severity of visitor-related impacts on natural and cultural resources and on visitor experiences are described. Specific management actions and monitoring programs that are designed to address the problems are also documented.

A second product of this research is dBASE III Plus databases containing information that characterize each park unit and the specific actions that have been implemented to address backcountry recreation management problems. These databases, sent to each park that was surveyed, fulfill the sixth study objective. Directions in a Read.me file allow users to identify and list parks comparable to their own that use specific backcountry recreation management actions. Contacts and phone numbers for all parks are included to facilitate further communication regarding implementation methods, administrative costs, supporting actions, effectiveness, and other factors that could not be characterized by this study.

Study Methods

This study was conducted through a mail-back questionnaire sent to 106 NPS units that have substantial backcountry resources and overnight visitation. Our intent was to include primarily those parks that are actively involved in backcountry and wilderness recreation management. Two sources of information were used for selecting the parks that were included in the survey. A preliminary list of parks that listed backcountry campsites and camping was developed from listings in an NPS publication titled, *The National Parks: Camping Guide 1988-89* (U.S. Department of the Interior, National Park Service 1988*b*). Additional parks were added to this list based on backcountry overnight visitation data for the years 1986-90 (U.S. Department of the Interior, National Park Service 1990). Finally, managers from 5 parks excluded their parks from the survey due to their lack of perceived backcountry according to our working definitions:

Backcountry, as used by the NPS, refers generically to "primitive, undeveloped portions of parks" (*NPS Management Policies*, U.S. Department of the Interior, National Park Service 1988*a*). While backcountry areas are most often zoned as natural zones, they may occur in any land

classification zone, except the developed zone. Developments within backcountry areas are generally limited to trails, unpaved roads, and administrative facilities associated with dispersed recreation use. For the purposes of this study, backcountry was defined as those areas managed primarily for natural conditions and processes that are generally not accessible to visitors with standard passenger vehicles. Also included were sections of rivers, lakes, or ocean that parks manage as backcountry.

Surveys were sent to park superintendents in September 1991, with a request that they be directed to park staff responsible for back-country recreation management. The need for input from resource management staff was also noted. Compliance with our request was high. One follow-up letter and several phone calls led to the return of 93 completed surveys for a 92% response rate. Appendix A contains a listing of the parks included in this study. Seven of the eight parks that did not respond were among the lowest in back-country visitation.

The questionnaire (Appendix B) was composed of six sections:

1. Introduction and Description of Backcountry Areas and Use. Described the purpose of the study and solicited background information to characterize each park's resources and visitor use.

2. Backcountry Recreation Management Problems. Identified the type, perceived severity, and causes of backcountry recreation management problems.

3. Backcountry Recreation Management Actions. Identified specific actions implemented to address backcountry recreation management problems.

4. Effectiveness of Backcountry Recreation Management Actions. Identified the perceived effectiveness of selected management actions.

5. Recreation Carrying Capacity. Assessed the application of alternative carrying capacity models.

6. Resource and Visitor Monitoring Systems. Assessed the application of monitoring efforts that address visitor impacts on park resources and visitor experiences.

Questionnaire data were coded, inputed to dBASE III Plus databases, and transferred to SPSS-PC+ for statistical analysis.

The information in this report reflects the judgments and beliefs of NPS staff with backcountry recreation management respon-sibilities. Readers are cautioned that their responses may or may not be an accurate reflection of the actual extent of a problem or effectiveness of an implemented action. Few parks likely have sufficient data from research and monitoring programs to objec-tively evaluate or resolve many of the back-country recreation management problems identified in this survey. Indeed, these concerns highlight a critical deficiency in existing backcountry recreation management: the need for better data upon which to base management decision making.

Description of Backcountry Areas and Uses

This section characterizes each park's backcountry resources and visitor use. This information is included in the dBASE databases and may be used to identify or stratify parks by resource- and use-related factors.

Size of Backcountry Areas

The size of reported backcountry areas varied considerably, from just over 600 acres to 12 million acres (Table 1). The Alaska backcountry areas averaged more than 5.5 million acres, causing the mean of all back-country areas in the study to exceed 1 million acres. However, in the National Capital Region, the North Atlantic Region, the Midwest Region, the Southeast Region, and the Mid-Atlantic Region, backcountry areas averaged less than 100,000 acres. The median size of all NPS backcountry areas was 70,000 acres. Compared to wilderness areas managed by the Forest Service, Fish and Wildlife Service, and Bureau of Land Management, NPS backcountry areas are relatively large.

Table 1. Distribution of parks with backcountry areas of various sizes.

Acres In Backcountry	Number	Percent
5,000 or less	3	4
5,001 - 50,000	25	30
50,001 - 100,000	18	22
100,001 - 250,000	9	11
250,001 - 500,000	4	5
500,001 - 1,000,000	8	10
Over 1,000,000	15	18
Mean = 1,033,894 acres, Median = 70,000 acres		

Miles of Trails in the Backcountry

NPS backcountry areas have a mean of 125 miles of official trails and 59 miles of unofficial trails (Table 2). These means reflect substantial trail systems in a few areas; for example, nine parks had over 500 miles of official backcountry trails. The typical area (as reflected in median values) has 59 miles of official trails and 5 miles of unofficial trails. Fifteen of the backcountry areas in our survey had no officially recognized backcountry trails.

Table 2. Miles of official and unofficial back-country trails.

Miles	Official Trails	Unofficial Trails
	Number of Parks	
0	15	17
1 - 25	22	23
26 - 50	13	5
51 - 100	16	3
101 - 250	10	3
251 - 500	3	1
Over 500	9	2

Official Trails: Mean = 125, Median = 35
Unofficial Trails: Mean = 59, Median = 5

The Western Region park managers report-ed the greatest number of official trail miles per park at 228, followed by the Pacific Northwest and the Mid-Atlantic regions at 185 miles each. The mean for the Alaska backcountry areas was only 7 miles of official trail. The Western Region and the Mid-Atlantic Region reported the most unofficial trail miles per park at 257 and 200 miles, respectively. The mean for unofficial trails in other regions never exceeded 36 miles per backcountry area.

Shelters and Campsites in the Backcountry

About 70% of all NPS backcountry areas have no shelters, but two areas have more than 50 and another two have between 21 and 50 (Table 3). The Alaska Region, with a mean number of 26 shelters per backcountry area, far exceeds other regions. However, the National Capital Region had the highest density of shelters, with 0.20 per 1,000 acres, followed by the North Atlantic Region with 0.14 per 1,000 acres.

The mean number of campsites per back-country area varied significantly, from lows of 5 in the National Capital Region, 11 in the Alaska Region, and 14 in the Southeast Region to highs of 751 per area in the Western Region, 369 in the Mid-Atlantic Region, and 330 in the Pacific Northwest Region. Campsite densities, on a per-1,000-acre basis, were also quite variable.

Table 3. Number of shelters and campsites in the backcountry.

Number of Shelters	Parks	
	Number	Percent
0	57	70
1 - 5	12	15
6 - 10	5	6
11 - 20	3	4
21 - 50	2	2
More than 50	2	2
Mean = 7, Median = 0		

Number of Campsites	Parks	
	Number	Percent
0	30	34
1 - 10	14	16
11 - 25	11	13
26 - 50	6	6
51 - 100	12	14
101 - 1,000	11	1˙
Over 1,000	5	5
Mean = 226, Median = 10		

Regions with the lowest campsite densities were the Southeast Region (0.29), National Capital Region (0.33), and Southwest Region (0.35). Regions with the highest campsite densities were the Midwest Region (3.05), Mid-Atlantic Region (2.42), and Pacific Northwest Region (1.71).

Length of Stay in the Backcountry

Although backcountry recreation seemingly implies longer lengths of stay, the majority of all NPS visitors are day users (Table 4). Day use is more common than overnight use in 70% of backcountry areas and accounts for about two-thirds of all use. These figures suggest that NPS backcountry users are even more likely to be day users than are Forest Service wilderness users, where estimates of about 50% day use are common (Roggenbuck and Lucas 1987). Estimates of day use exceeded 90% in the National Capital Region and the North Atlantic Region; such use exceeded 80% in the Rocky Mountain Region and the Mid-Atlantic Region. Even in Alaska, the mean day use estimated by NPS personnel was 25% per park. This high percentage of estimated day use, if accurate, represents an important finding and suggests that a greater emphasis should be placed on the needs and impacts of this user group. A first step in responding to this user group might be to obtain and report actual measures of day use of the backcountry in the NPS statistical reporting system.

Table 4. Percent of day users, length of stay, and percent of backcountry visitors accompanied by commercial outfitters or guides.

Percent of Day Users Among Backcountry Visitors	Parks	
	Number	Percent
0	0	0
1 - 10	14	16
11 - 25	8	9
26 - 50	4	5
51 - 75	23	26
76 - 90	13	15
91 - 100	25	29
Mean = 64, Median = 70		

Length of stay in the backcountry for those staying overnight is short, with mean and median number of nights of stay at two. Fully one-fourth of all backcountry areas reported a mean length of stay of one night. Only the Alaska Region, with a mean stay of five nights for its overnight visitors had a regional mean length of stay in excess of the three nights reported by the Midwest and Southeast regions. Most people visit NPS backcountry areas on their own. However, for four areas, more than 50% of all visitors were estimated to be accompanied by a guide (Table 4).

Table 4. Cont.

Number of Nights Stay for Overnight Visitors	Parks	
	Number	Percent
1	23	26
2	42	48
3	12	14
4	4	5
5	1	1
6-10	5	5
More than 10	1	1
Mean = 9, Median = 1		

Percent of Visitors Accompanied by Commercial Outfitters	Parks	
	Number	Percent
0	27	32
1-10	41	48
11-25	13	9
26-50	5	6
51-75	2	2
76-90	2	2
91-100	0	0
Mean = 2, Median = 2		

Recreation Activities of Backcountry Visitors

As would be expected, most NPS back-country managers reported backpacking and hiking to be the most common recreation activity in their area. The next most frequently cited recreation activities were boating, followed by fishing, off-road vehicle use, and hunting. Horse and packstock use was surprisingly light; only three areas reported horse use as high as 26-50% of all use. Other noteworthy findings were the two areas that reported that aircraft users comprised 76-100% of all their use, the one area where rock climbers made up 51-75% of the use, and the high amounts of hunting in three areas (Table 5).

Experience Level of Backcountry Visitors

Managers of only 21% of the areas characterized their visitors as predominantly novices (Table 6). This portrayal challenges a common assumption that NPS users are relatively inexperienced. Six park managers (7% of the total) reported that the majority of their visitors were highly experienced. Some differences existed in the backcountry experience levels. Users of the Alaska Region were most experienced; Mid-Atlantic, Western, and National Capital Region visitors were seen as most likely to be novices.

Geographical or Resource Features that Attract Backcountry Visitors

Managers perceived that mountains and outstanding geological features were the most common backcountry resource features that attract visitors to the area (Table 7). The next most common attractions were rivers or streams, followed by seashores and coastal areas and lakes or reservoirs. In the next most popular tier of attractions were deserts and archeological or historical features. While wildlife and fish were seldom the most attractive backcountry features, they were most frequently mentioned as the second most important draw of the backcountry.

Existence of Management Plans

The two most common documents that provide direction to backcountry management are the general management plan and the resource management plan (Table 8). More than 70% of all areas had these two planning documents guiding their management. Another 19% said the park was in the process of preparing a resource management plan. Only about 30% of the parks responding to the survey had an approved backcountry management plan, and only an additional 12% were in preparation.

Table 5. Breakdown of percentage of backcountry use by various activity groups by parks.

Activity Group	Percentage of All Use Made up by Various Activity Groups Per Park							
	0 - 25		26 - 50		51 - 75		76 - 100	
	N	%	N	%	N	%	N	%
Backpackers/hikers	31	33	8	9	13	14	41	44
Boaters	67	72	12	13	4	4	10	11
Horseback/packstock users	90	97	3	3	0	0	0	0
Hunters	85	91	5	5	2	2	1	1
Fishermen	78	84	7	8	5	5	3	3
Off-road vehicle users	88	95	2	2	0	0	3	3
Others: Snowmobilers	2		0		0		0	
Cross-country skiers	7		1		0		0	
Rock climbers	7		1		1		0	
Mountain bikers	4		0		0		0	
Cavers	2		0		0		0	
Mountaineers	3		1		0		0	
Aircraft users	1		0		0		2	
Divers	1		1		0		0	

Table 6. Breakdown of experience level of backcountry visitors by park.

Level of Experience	Parks	
	Number	Percent
A majority are beginners/novices	19	21
A majority have intermediate levels of experience	27	30
A majority are highly experienced	6	7
A wide and relatively equal range of experienced levels are represented	39	43

Table 7. Parks' breakdown of geographical or resource features that draw backcountry recreationists.

Feature	Most Attractive Feature		Second Most Attractive Feature	
	Number	Percent	Number	Percent
Mountains	19	21	12	13
Lakes/reservoirs	8	9	6	7
Rivers/streams	11	12	13	14
Seashore/coastal	11	12	5	5
Swamp or other shallow water environments	2	2	0	0
Outstanding geological features	20	22	7	8
Grasslands	0	0	2	2
Deserts	5	6	5	5
Vegetation	3	3	5	5
Wildlife	3	3	20	22
Fish	3	3	15	16
Archeological/historical features	5	6	2	2
Other: Sand dunes	1	1		

Table 8. Breakdown of parks that have various kinds of management plans which provide direction for backcountry recreation management.

Type of Plan	Parks with Plan		Parks with Plan In Progress	
	Number	Percent	Number	Percent
General management plan	69	74	5	5
Resource management plan	66	71	18	19
Backcountry management plan	27	29	11	12
Wilderness management plan	17	18	8	9
Land protection plan	30	32	1	1
Other: River management plan	5	5	0	0
Cave management plan	1	1	0	0
Trail management plan	3	3	1	1
Statement for management	3	3	2	2
Climbing management plan	1	1	0	0

About 18% of the areas had a wilderness management plan, although this percentage made up 17 of the 29 areas (59%) that had designated wilderness. Another 8 areas had wilderness plans in progress. Five areas had a river plan that provided management direction to the backcountry.

Backcountry Recreation Management Problems

This section identifies the type and perceived severity of backcountry recreation management problems in parks. Forty-five specific management problems, organized into eight topical categories, were included in the questionnaire. Managers had the option of listing additional problems. Managers were asked to rate the perceived severity of each of these problems using a problem severity scale based on the geographical extent of problems in their backcountry. For presentation purposes, data for the two highest categories, "a problem in many areas" and "a problem in most areas" were combined. In addition, questions rating the extent to which various recreation activities contribute to general types of problems and the sources of information about problems were also included.

Perceived Severity of Backcountry Impacts

Campsite Impacts

Table 9 describes the extent to which various campsite impacts were perceived as problems. The most significant type of campsite impact, in terms of spatial distribution, was soil exposure and erosion, which managers for 36% of the parks reported as a problem in many or most areas of the parks. The next most commonly cited problem was herbaceous vegetation loss and compositional change.

Table 9. Parks' evaluations of extent of campsite impacts in the backcountry.

Type of Impact	Parks Indicating Impact is a Problem in Many or Most Areas	
	Number	Percent
Herbaceous vegetation loss/compositional change	27	30
Tree and shrub damage/loss	18	20
Soil exposure/erosion	32	36
Excessive site size	16	18
Multiple fire sites	21	23
Exotic vegetation introduction	14	15
User-constructed facilities/developments	7	8
Campsite proliferation	13	14

Trail Impacts

Most park managers reported that trail impacts are more widespread than campsite impacts (Table 10), perhaps reflecting the high percentage of day users who spend considerably more time on trails than campsites. Almost 50% of all park managers reported that soil erosion on trails was a problem in many or most areas of the backcountry. Trail widening was cited by 31% of the park managers, and 29% rated the formation of braided or multiple trails and the creation of undesired trails as serious problems.

Table 10. Parks' evaluation of extent of trail impacts in the backcountry.

Type of Impact	Parks Indicating Impact is a Problem in Many or Most Areas	
	Number	Percent
Soil erosion	37	44
Trail widening	26	31
Braided or multiple treads	24	29
Creation of undesired trails	24	29
Excessive trail muddiness	21	25
Other: Trail impacts from bicycles	1	1

Road Impacts (Four-Wheel-Drive)

About 30% of the study's backcountry managers did not respond to questions about four-wheel-drive road impacts, presumably because their parks had no such use. However, among those park managers that did respond, between 14% and 20% said that four-wheel-drive use was causing problems of soil erosion, road widening, and the creation of undesired roads in many or most places in the backcountry (Table 11).

Table 11. Parks' evaluation of extent of four-wheel-drive road impacts in the backcountry.

Type of Impact	Parks Indicating Impact Is a Problem in Many or Most Areas	
	Number	Percent
Soil erosion	10	14
Road widening	9	14
Braided or multiple track roads	7	11
Creation of undesired roads	13	20

Water Impacts

The survey asked backcountry managers to indicate the extent to which biological and chemical contamination and sedimentation pollution were visitor-caused problems in the backcountry. The most common water problem was biological contamination (e.g., *Giardia*, fecal-matter); 24% of all respondents reported this as a problem in many or most areas of the backcountry (Table 12).

Table 12. Parks' evaluation of extent of water impacts in the backcountry.

Type of Impact	Parks Indicating Impact Is a Problem in Many or Most Areas	
	Number	Percent
Biological contamination (e.g., *Giardia*, fecal-matter)	22	24
Chemical contamination (e.g., soaps, gasoline, or oil)	8	9
Sedimentation pollution (e.g., soil erosion)	11	13

The next most common problems were sedimentation or water turbidity due to recreation use, and eight park respondents said chemical contamination from such substances as soap and gasoline or oil was a problem in many or most areas. Although water impacts are less common than some other problems, the significance of these impacts is substantial, given the importance of pure water to natural ecosystems and recreationists.

Wildlife Impacts

The impact of recreationists on wildlife is not considered to be pervasive in NPS backcountry areas. Table 13 indicates that for the most common impact, attraction to and feeding of wildlife, only 14% of the park managers rated this as a problem in many or most areas. Another 11% of the park respondents reported that wildlife harassment or disturbance was common. Wildlife impacts are apparently highly localized. For example, 74% of the park managers reported wildlife harassment or disturbance in a few areas, and 58% and 43% reported wildlife displacement from important habitats and wildlife feeding and attraction, respectively, in a few areas.

Litter and Fecal-matter Problems

As is often found to be the case, littering is perceived to be a problem common to many NPS backcountry areas (Table 14). About 37% of all park respondents reported littering as a problem in many or most areas of the backcountry. Adequate disposal of human waste is also a problem. Approximately 25% rated this problem as common in many areas of their backcountry. Another 43% rated the problem as serious in a few areas. Horse use is minimal in the backcountry of national park areas (e.g., only three park respondents said as much as 26-50% of their use was by horse and packstock users), but 12% reported horse manure as a problem in many areas of the backcountry.

Table 13. Parks' evaluation of extent of wildlife impacts in the backcountry.

Type of Impact Resulting from Intentional or Unintentional Visitor Actions	Parks Indicating Impact Is a Problem in Many or Most Areas	
	Number	Percent
Wildlife harassment or disturbance	10	11
Wildlife displacement from important habitats	4	4
Wildlife attraction and feeding	13	14
Threatened/endangered species disturbance	5	6
Other: Hunting	1	1

Table 14. Parks' evaluation of extent of litter and fecal-matter problems in the backcountry.

Type of Impact	Parks Indicating Impact Is a Problem In Many or Most Areas	
	Number	Percent
Litter	34	37
Human fecal-matter	23	25
Horse manure	11	12
Other: Trash in firerings	1	1

Visitor Crowding and Conflicts

Three kinds of social carrying capacity problems were addressed in the study: (1) too many encounters with other visitors, (2) conflicts between user groups, and (3) inconsiderate behavior. About 27% of the park respondents reported that too many encounters with other visitors were a problem at many or most popular features of the backcountry (Table 15). Another 32% rated too many encounters as a problem at a few sites. Next most common were problems of too many contacts at many or most campsites and of contacts with large groups.

The most commonly perceived intergroup conflict was the hiker-horse user conflict; managers of eight parks said this was a problem in many or most parts of their backcountry. Other conflicts were mentioned less often. Four park managers each identified two different sets of conflicts: (1) between motorboaters and canoeists or kayakers and (2) between fishermen and nonfishermen; three park managers reported conflicts between divers and water-skiers, between aircraft and backcountry users, and between hikers and mountain bikers.

By far the most frequently cited inconsiderate behavior was pets running loose. Out of all the park respondents, 26% reported this as a concern in many or most areas. Another 44% reported the problem in a few areas of the backcountry. Use and abuse of alcohol and theft and vandalism at the parking area or in the backcountry were rated the next most common problems. About 10% of all park managers rated these problems as common in many places; another 54% reported that these problems existed in a few areas.

Illegal Collecting

The number of managers indicating that illegal collecting was a problem in many or most of the backcountry areas was relatively small (Table 16). This result is to be expected since the problem behavior carries legal sanctions and fines that either limits theft or limits managers' knowledge of its occurrence. However, because any theft represents the loss of park resources, some of which are nonrenewable, even low levels of theft are unacceptable to park managers. In this light, 16 park respondents reported theft of archeological artifacts in many or most places of the backcountry, and 50 park respondents reported this problem in a few areas as a significant concern for management. Another 7% of the areas reported illegal collecting of plants, animals, and rocks or minerals in many or most places in the backcountry. Among these resources, the theft of plants and rocks or minerals from a few places in the backcountry was cited as most common.

Table 15. Parks' evaluation of extent of visitor crowding and conflicts in the backcountry.

Type of Impact or Conflict	Parks Indicating Impact/Conflict Is a Problem in Many or Most Areas	
	Number	Percent
Too many encounters with other visitors: At campsites	16	18
At popular features	24	27
While hiking on trails	9	10
While traveling in boats	8	10
People traveling or camping in large groups	15	17
Conflicts between: Horses and hikers	8	9
Large groups and small groups	1	1
Divers and water-skiers	3	3
Speedboaters and sailboaters	2	2
Motorboaters and canoeists and kayakers	4	4
Fishermen and nonfishermen	4	4
Aircraft and backcountry users	3	3
Hikers and mountain bikers	3	3
Inconsiderate behavior problems: Excessive noise	6	7
Use or abuse of alcohol	11	12
Use or abuse of drugs	4	4
Nudity	2	2
Pets running loose	24	26
Theft (at parking area or in backcountry)	9	10
Vandalism (at parking area or in backcountry)	9	10

Table 16. Parks' evaluation of extent of illegal collecting by recreationists in the backcountry.

Type of Object Collected	Parks Indicating Impact Is a Problem in Many or Most Areas	
	Number	Percent
Plants	6	7
Animals	6	7
Fossils	5	6
Archeological artifacts	16	17
Rocks or minerals	6	7
Other: Taking fish over limit	1	1
Seashell collecting	1	1

Perceived Causes of Backcountry Impacts

A variety of recreation activities occur in the backcountry of national park areas, and these activities vary in their environmental and social impacts. We asked backcountry managers to indicate the extent to which day use, overnight use, horses, off-road vehicles/all-terrain vehicles (ORVs/ATVs), mountain bikes, motorboating, nonmotorboating, snowmobiling, and snowskiing contributed to a variety of physical, biological, and social impacts. Table 17 provides a summary of the relationship between recreation uses and perceived impacts. Significant findings are discussed for each type of impact.

Table. 17. Parks' ratings of extent to which various recreation activities are a moderate or major cause of backcountry recreation management problems.

Backcountry Problems	DU		OU		HU		OA		MTB		MB		NMB		SM		SS	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Campsite impacts	8	10	60	68	15	22	3	5	1	2	12	19	8	13	0	0	0	0
Trail impacts	39	47	28	34	30	43	8	14	6	10	1	2	2	3	0	0	0	0
Road impacts	21	35	9	16	3	6	22	37	2	4	0	0	1	2	0	0	0	0
Water impacts	19	24	25	32	15	24	4	6	1	2	17	26	9	15	0	0	3	5
Wildlife impacts	34	42	33	39	4	6	42	13	8	4	20	30	8	13	7	13	2	3
Litter	44	53	41	49	11	14	7	12	1	2	23	30	ΐ	14	0	0	1	2
Human and horse fecal-matter	22	28	32	39	28	38	2	0	1	2	12	49	ΐ	15	0	0	ΐ	7
Visitor encounters	39	49	24	30	14	14	7	14	6	10	15	28	ΐ	14	0	0	1	2
Visitor conflicts .	28	39	20	25	14	21	9	15	8	15	18	21	8	6	7	13	8	2
Inconsiderate visitor behavior	33	50	26	32	11	17	13	21	8	13	17	26	5	8	3	5	0	0
Illegal collecting	39	45	21	26	5	8	5	8	1	2	11	17	3	5	0	0	0	0

[1]Recreation Activity Codes:

DU - Day Use
OU - Overnight Use
HU - Horse Use

OA - ORV and ATV
MTB - Mountain Bike
MB - Motorboating

NMB - Nonmotorboating
SM - Snowmobiling
SS - Snowskiing

Campsite Impacts

As might be expected, overnight use by recreationists was the most commonly cited cause of impacts to campsites. Almost 70% identified such use as a moderate or major cause of campsite impact. The second most common problem source was horses; 22% of all respondents cited horses as a cause of campsite impacts. Somewhat surprisingly, motorboaters were almost as frequently (19%) recognized as contributing to campsite degradation. Most of these backcountry areas were reservoirs or rivers where motorboats provide access to the interior of parks.

Trail Impacts

Three kinds of recreation were dominant as causal agents for trail impacts: day use, horses, and overnight use. The percentages of park managers citing these three uses as moderate or major causes were 47%, 43%, and 34%, respectively. Once again, the managerial importance of day users in the backcountry is emphasized. Also, while only three backcountry areas have more than 25% of their use made up by horses, 43% of the park respondents see horses as a moderate or major problem for trail maintenance.

Road Impacts

The number of backcountry managers that reported various recreation activities as important causes of road impacts was relatively low, in part because most backcountry areas have no four-wheel-drive roads. Nevertheless, 37% of all respondents reported that ORVs/ATVs were moderate or major causes of road impacts; 35% reported day users to be causing problems at this level of severity. Only 16% of the responding managers noted important road impact problems from overnight users. Like hikers, most ORV/ATV enthusiasts are day users.

Water Impacts

Backcountry managers most frequently cited overnight use as a moderate or major cause of water impacts. Nearly one-third cited the overnight users. Motorboaters, horse users, and day users were each cited by about one-fourth of the respondents as important contributors to water impacts.

Wildlife Impacts

Day users, followed by overnight recreationists, were listed as moderate or major causes of wildlife impacts by about 40% of the park managers. While backcountry areas with motorboating and ORV/ATV use numbered far fewer, the impact of these activities on wildlife was relatively frequent. About 30% and 20% of the parks, respectively, cited these activities as important causes of wildlife impact.

Litter

Many backcountry managers reported that a variety of recreationists caused moderate or serious problems of littering. For example, about one-half cited day users and overnight users. Again, as was the case for wildlife impacts, some recreationists, such as motorboaters, horse users, and ORV/ATV users, were perceived to cause more litter problems than their numbers would suggest.

Human and Horse Fecal-matter

As would be expected, backcountry areas with high horse use or high overnight or day use had problems with horse manure and human fecal-matter. But again, some activities caused impacts beyond their number. For example, 36% of all reporting areas said horses were causing moderate or major problems of horse manure, even though few parks have even moderate amounts of horse use compared to other uses. Managing human waste from boaters in the backcountry is a problem in almost 20% of all areas.

Visitor Crowding and Conflicts

Too many encounters with other people in the backcountry is a relatively common problem, and day users are most often cited as the cause. About 50% identified these short-stay visitors as moderate or major contributors of crowding. Next most frequently mentioned problem sources, at 30%, were overnight hikers, followed by motorboaters and horse users. Again, the managers appear to consider that motorboaters and horse users cause crowding impacts beyond what their numbers would indicate.

Day users are also most often seen as causing visitor conflicts, apparently as the result of their large numbers. Many backcountry managers also cited motorboaters, overnight hikers, and horse users as moderate or major sources of conflict. Finally, mountain bikers were identified by about 15% of the parks reporting visitor conflicts.

Reports of inconsiderate behavior reflected responses regarding causes of crowding and conflict. Day users were most frequently mentioned (50% of all users), followed by overnight users and motorboaters. Again, ORV/ATV users, horse or packstock enthusiasts, and mountain bikers were mentioned as important sources of inconsiderate behavior more frequently than their representation among backcountry visitors would suggest.

Illegal Collecting

About 45% of the park managers in the survey reported that day users were a moderate or major cause of illegal collecting in their parks. This percentage far exceeds the level of problems from any other group. The next most frequently mentioned problem causes were overnight users and motorboaters.

Summary of Recreation Activity Causes of Backcountry Impacts

For almost all impacts, day users were the most frequently cited source of problems. Exceptions were overnight users for campsite impacts, water impacts, and problems of adequate human waste disposal. Motorboaters and horse users were often seen as causing impacts disproportionately above their numbers. Horse problems were most severe for trail, horse manure, water impacts, and visitor conflicts. Motorboater problems included litter, water impacts, visitor crowding, conflicts, and inconsiderate behavior. ORV/ATV impacts were not numerous, but some problems of road impacts and inconsiderate behavior were mentioned. Mountain bike problems and nonmotorboat problems were infrequently mentioned, and few listed snowmobile and snowskiing impacts. When these activities were cited, mountain bikers and snowmobilers were seen as causes of visitor conflicts and wildlife impacts. Nonmotorboaters were sometimes mentioned as causes of water, wildlife, and litter impacts, and adequate human waste disposal was sometimes a problem for both nonmotorboaters and snow-skiers.

Sources of Information and Action About Problems

We asked backcountry managers to identify the sources of information about problems in their roadless areas and the stimulus to take some action to address the problems. Far and away the most common source of information and the most frequent stimulus to action was the park staff (Table 18). About 90% of the park managers reported their own staff were the most or second most important source for both issues. A distant second source, with about 49% of the parks providing such high rankings, was resource inventory and monitoring efforts. The next most frequently cited source was unsolicited visitor comments and complaints.

About 47% of the respondents indicated that visitors were their first or second most important source of information about backcountry problems, and 34% reported the same about visitor comments prodding them to take action. Formal visitor surveys were almost never a source of information. Only one park mentioned such research as the most or second most source of information about a management problem, and no park said such studies were a driving force toward action.

Table 18. Parks' ranking of first or second most frequent source of information about backcountry recreation management problems and first or second most frequent stimulus to action to address identified problems.

Source	Parks That Identified Source		Parks that Identified Stimulus to Action	
	Number	Percent	Number	Percent
Concessioner operators	9	10	9	10
Park cooperating associations	3	3	4	4
Public interest organizations (e.g. NPCA, Sierra Club)	3	3	7	8
Park staff	86	92	84	90
Resource inventory and monitoring efforts	46	49	46	49
Unsolicited visitor comments and complaints	44	47	32	34
Visitor surveys	1	1	0	0
Other: Interagency cooperative efforts	1	1	2	2
Commercial or special uses	1	1	0	0

Backcountry Recreation Management Actions

This section identifies specific management actions that park managers have implemented to address backcountry recreation management problems. A list of over 100 actions, organized into 10 topical categories, was provided in the questionnaire. Managers had the option of listing additional actions. Respondents were asked to review the list and check all actions currently in effect for all or some portion of their park's backcountry.

Several terms were defined to differentiate between indirect management approaches and more direct regulatory approaches. The terms "encourage" and "discourage" were used to refer to indirect management approaches, primarily informational (communication through visitor contact and printed information), but also included resource manipulation and some light-handed regulatory actions. The terms "require" and "prohibit" were used to refer solely to more direct visitor regulations.

Limit and Regulate Visitor Use

Resource managers who face unacceptable environmental or social impacts in the backcountry might take a variety of actions to limit and regulate recreation use. These actions might range from direct controls on visitor behavior, such as a site closure, to more indirect interventions like education, which is designed to more subtly affect what visitors do. We asked managers to indicate whether they have taken any of 18 different actions to limit or regulate visitor use (Table 19).

Only five of the actions have been taken by more than 50% of the parks. The most common, at 68% implementation, was to require backcountry overnight visitors to obtain permits, followed by a requirement to limit group size. The next two most frequently adopted interventions were more light-handed: discouraging the use of environmentally sensitive areas and informing visitors of the park's concerns about impacts in high-attraction areas. The final management action that a majority of the parks adopted was to limit the length of stay in the backcountry.

The next tier of frequently implemented interventions was a combination of direct and indirect management actions. About 46% of the respondents had closed certain environmentally sensitive areas in the backcountry to all use and had encouraged groups to limit their size. Forty percent

Table 19. Actions taken by parks to limit the amount of backcountry visitor use.

Action	Parks Taking the Action	
	Number	Percent
Actively encourage the use of areas outside the park	23	25
Require backcountry overnight visitors to obtain permits	63	68
Require backcountry day use visitors to obtain permits	7	8
Encourage groups to limit their size	43	46
Require groups to limit their size	58	62
Require trip length-of-stay limits	47	51
Require certain skills or equipment for certain uses	20	22
Close roads to make backcountry access more difficult	29	31
Reduce road maintenance to make backcountry access more difficult	11	12
Close trails to make backcountry access more difficult	12	13
Reduce trail maintenance to make backcountry access more difficult	17	18
Discourage use of environmentally sensitive areas	50	54
Close environmentally sensitive areas to all use	43	46
Discourage use of "attraction" areas	8	9
Add or improve facilities (e.g., campsites, trails, bridges) in alternative areas	28	30
Eliminate facilities in high-use attraction areas	11	12
Inform visitors about park's concerns with visitor use impacts in attraction areas	50	54
Inform visitors about impacted conditions they may encounter in attraction areas	37	40
Other: Relocate/remove mooring buoys	1	1
Provide more permits for lightly used portions of the park	1	1
Inform visitors about impacts to wildlife	2	2

informed visitors about impacted conditions they may encounter at attraction areas. Surprisingly, even though day users are typically the most numerous type of visitor and have the highest perceived impacts on most backcountry resources, only 8% of the parks in the survey required them to obtain permits.

Administer Backcountry Use Permit Systems

Of the backcountry areas in the survey, 63 had a permit system in place. Of these areas, 35, or 56%, used the permit system to restrict visitor numbers (Table 20). Park managers issued the permits in a variety of fashions, but the most common was on a first-come, first-served basis only; 54% of all parks with backcountry permit systems issued the permits in this way. The second most frequently used system was a combination of first-come, first-served and reservations. Reservations were seldom used as the sole source of permits, and a lottery was never used by itself. By far the most common way for visitors to obtain the permits was in person; 68% of all backcountry areas used only this system. A distant second, at 18%, was making permits available in person, by mail, and by telephone.

Backcountry managers had a host of ways to restrict or ration permits. The most common way (27% of all parks with permits) was to ration permits by campsite availability; another 23% of the areas used a combination of limits for the entire backcountry and by availability of campsites (Table 20).

About two-thirds of all backcountry areas with permits reported that they were required only for certain activities. The most common activity by far was overnight backpacking, followed by caving and river use as a distant second and third, respectively. Finally, only two park managers charged a fee for issuing a backcountry permit (Table 20).

Table 20. Results of how backcountry use permit systems are administered.

Permit Administration	Parks Taking the Action	
	Number	Percent
Permits are issued by: Reservation only	5	8
First-come, first-served only	33	54
Reservation and first-come, first-served	20	33
A fee is charged to obtain a permit:	3	5
Cost of the permit: Range = $5.00 to $30.00, Mean = $17.50	2	3
Permits are used to restrict/ration visitor numbers	35	56
Permits are restricted/rationed: For the entire backcountry only	2	5
By access point only	1	2
By travel or management zones only	2	5
By campsite availability only	12	27
For selected problem areas only	3	7
For the entire backcountry and by access point	2	5
For the entire backcountry and by campsite availability	10	23
By access point and by campsite availability	2	5
By travel or management zones and by campsite availability	3	7
By travel or management zones and for selected problem areas	1	2
For the entire backcountry, by access point, and by campsite availability	1	2
For the entire backcountry, by travel or management zones, and by campsite availability	1	2

Table 20. Cont.

Permit Administration	Parks Taking the Action	
	Number	Percent
By access point, by travel or management zones, and by campsite	3	7
For the entire backcountry, by access point, by travel or management zones, and by campsite availability	1	2
Permits are required only for certain recreation activities:	41	66
Overnight backpacking	31	63
River use	4	8
Caving	5	10
Diving	3	6
Horse use	2	4
Hang gliding	2	4
Hunting	2	4
Permits are obtained: In person	42	68
In person and by mail	7	11
In person and by telephone	2	3
In person, by mail, and by telephone	11	18

Educate Visitors About Minimum-Impact Practices

More than three-fourths of all parks in our survey reported that they had a minimum-impact educational program. The most common type of education was for park rangers to convey low-impact messages to visitors during backcountry contacts (Table 21). Almost 90% of all backcountry areas with educational programs used this approach. Low-impact literature available on request, at visitor centers and ranger stations, and on bulletin boards at trailheads, was a strategy used by about two-thirds of all areas. About one-half of the park managers said they provided low-impact literature to most or all of their visitors. Finally, about 40% provided low-impact programs to local schools and outdoor educational programs and clubs on request. Few areas had videos or slide programs on low-impact behavior available for the public.

Enforce Backcountry Regulations

The most common managerial response to violations of backcountry regulations related to recreation use was a verbal warning; 63% of all respondents checked this response. About 30% of all park respondents, however, indicated that they issued violation notices with fines (Table 22).

Table 21. Actions taken by parks to educate visitors about minimum-impact backcountry use practices.

Action	Parks Taking the Action	
	Number	Percent
Park has a minimum-impact educational program	72	77
Low-impact literature is available on request	46	64
Low-impact literature is displayed at visitor centers and ranger stations	45	63
Low-impact literature is displayed on bulletin boards at backcountry access points	48	67
Low-impact literature is provided or shown to most or all backcountry visitors	37	51
Park rangers are instructed to convey low-impact messages during backcountry visitor contacts	64	89
Low-impact videos or slide programs are routinely shown at visitor centers	9	13
Low-impact videos or slide programs are shown to backcountry visitors on request	9	13
Low-impact literature, videos, or slide programs are sent on request to local schools and outdoor educational programs/clubs	14	19
Low-impact literature, videos, or slide programs are routinely sent to local schools and outdoor educational programs/clubs	4	6
Low-impact programs are presented by park staff on request to local schools and outdoor educational programs/clubs	29	40

Table 22. Actions most commonly taken by parks to enforce backcountry regulations.

Action	Parks Taking the Action	
	Number	Percent
Visitor contact	46	49
Verbal warnings	59	63
Written warnings, no fine	18	19
Violation notices, with fines	28	30

Reduce Campsite Impacts

The most common managerial response to campsite impacts is to establish campsite length-of-stay limits; almost two-thirds of all areas have such a limit (Table 23). However, the maximum length of stay is usually long (e.g., mean = nine nights; median = seven nights). Given that only 1-2% of all visitors are estimated to stay this long during back-country visits, these length-of-stay limits likely have little effect. The next most frequently used approaches are educational or site-management options. For example, from 40% to 50% of all park respondents perform general campsite maintenance, teach minimum-impact camping practices, and concentrate or channel use to durable sites. Often, firepits are located on sites that managers want visitors to use. More than one-third of the backcountry areas have closed and rehabilitated problem campsites.

Many backcountry areas prohibit certain behaviors in an effort to reduce impacts at campsites. For example, 83% of all survey participants said they prohibited visitors from cutting standing deadwood. About one-half has forbidden ground fires parkwide or in certain park areas and camping within certain distances of water or roads and facilities (Table 24). The median distance restriction for camping away from water was 100 feet; for roads and facilities it was 1,320 feet. About one-third of the parks disperse camping through regulations against camping in certain designated geographical areas of

Table 23. Actions taken by parks to reduce campsite impacts.

Action	Parks Taking the Action	
	Number	Percent
Establish campsite length-of-stay limits Maximum length: Range = 1 - 30, Mean = 9, Median = 7	58	64
Relocate campsites from fragile to durable soils or vegetation types	32	34
Locate campsites and facilities on durable sites	37	40
Concentrate or channel use on sites through firepit and facility location	40	43
Perform general campsite maintenance	46	49
Close or rehabilitate impacted campsites	34	37
Close or rehabilitate undesired campsites	34	37
Seed or transplant vegetation on campsites	25	27
Plant trees or shrubs on campsites	18	19
Provide shelters for visitor overnight use	9	10
Provide tent platforms	12	13
Provide firegrates (any type)	28	30
Provide tables	19	20
Teach minimum-impact camping techniques	42	45
Other: Disperse camping	4	4
Provide hitching rails	4	4
Designate cooking areas	4	4

the backcountry and camping near trails. The median required setback from trails for parks that had such regulations was for 300 feet. Managers were asked about camping prohibitions at sites that currently have no, light, or heavy impact. Few parks had regulations specific to existing impact conditions, but most parks that did have regulations prohibited camping in areas with no evidence of previous use.

Finally, we asked backcountry managers if they encouraged or required certain actions to reduce campsite impacts (Table 25). The most common requirement was for the use of backpacking stoves. About 37% of all parks had a mandatory use policy for such stoves; another 45% encouraged their use. About 30% of all backcountry areas required camping at designated campsites in certain parts of the backcountry; another 25% had regulations to use only designated campsites on a backcountrywide basis.

About 25% of the park managers restricted camping to certain geographical areas of the backcountry. Finally, 28% of all park respondents reported that they encouraged camping in impact-resistant ecosystems or vegetation types.

Table 24. Actions discouraged or prohibited by parks to reduce campsite impacts.

Action	Discouraged		Prohibited	
	Number	Percent	Number	Percent
Camping overnight	1	1	4	4
Camping in areas with no evidence of use	25	27	17	18
Camping on lightly impacted sites	11	12	4	4
Camping on heavily impacted sites	17	18	9	10
Camping within a certain distance (feet) or sight of roads or facilities (Distance: N = 37, Range = 50 - 5,280, Median = 1,320, Mean = 2,459)	6	6	43	46
Camping within a certain distance (feet) or sight of trails (Distance: N = 27, Range = 50 - 2640, Median = 300, Mean = 1,010)	11	12	28	30
Camping within a certain distance (feet) or sight of other campsites (Distance: N = 20, Range = 10 - 5,280, Median = 200, Mean = 1,199)	18	19	17	18
Camping within a certain distance of water (Distance: N = 38, Range = 5 - 2,640, Median = 100, Mean = 270)	4	4	41	44
Camping within a certain distance or sight of popular features (Distance: N = 6, Range = 200 - 1,320, Median = 200, Mean = 760)	10	11	14	15
Camping within certain designated geographical areas	6	6	33	35
Camping in fragile ecosystems or vegetation types	26	28	24	26
Starting ground fires, parkwide	11	12	40	43
Starting ground fires, in certain park areas	9	10	44	47
Cutting standing deadwood	7	8	77	83
Using axes or saws	14	15	17	18
Other: Camping on restored areas	1	1	1	1
Camping on archeological sites	1	1	2	2
Camping on sand dunes			1	1
Camping within 50 yards of a cave			1	1

Table 25. Actions encouraged or required by parks to reduce campsite impacts.

Action	Encouraged		Required	
	Number	Percent	Number	Percent
Camping on sites with no evidence of use	12	13	0	0
Camping on lightly impacted sites	7	8	0	0
Camping on moderately impacted sites	9	10	2	2
Camping on heavily impacted sites	9	10	4	4
Camping on designated campsites parkwide	16	17	23	25
Camping on designated campsites in certain areas	11	12	29	31
Camping within a certain distance (feet) of trails (Distance: N = 9, Range = 100 - 2,640, Median = 200, Mean = 1,240)	5	5	9	10
Camping within designated geographical areas	11	12	23	25
Camping in impact-resistant ecosystems/vegetation types	26	28	8	9
Using backpacking stoves	42	45	34	37
Other: Using hitch rails for horses	1	1	1	1
Disposing of wastewater away from water sources	1	1	0	0
Camping near trees where food can be hung	1	1	0	0

Reduce Visitor Crowding and Conflicts

While most backcountry managers did not perceive crowding or visitor conflicts as serious problems, many were concerned about too many encounters with other visitors at popular features and with pets running loose. Education was the most common managerial response to conflict and crowding problems (Table 27). For example, more than one-half of all backcountry areas informed visitors about crowded conditions they might encounter in certain areas. Almost one-half warned the public about conflicting uses they might encounter, encouraged quiet behavior and activities, and promoted the use of less popular access points and backcountry areas. About one-fourth of all backcountry areas encouraged off-season use, and designated trails for different types of recreation use.

Reduce Trail Impacts

Trail impacts were among the most widespread backcountry management problems, and we asked backcountry managers to indicate the extent to which they had adopted various strategies to reduce these impacts (Table 26). Maintenance, regulation, and trail closure were all used to combat trail problems. For example, just over one-half of all backcountry areas performed regular trail maintenance. Almost one-half of all parks discouraged off-trail travel or the use of unofficial trails, closed or rehabilitated impacted trails, or relocated trails to avoid fragile soils, vegetation types, or steep slopes. Thirty-four percent taught minimum-impact hiking techniques to reduce trail impacts.

Table 26. Actions taken by parks to reduce trail impacts.

Action	Parks Taking the Action	
	Number	Percent
Discourage off-trail travel	44	47
Encourage off-trail travel	10	11
Teach minimum-impact hiking techniques	32	34
Discourage use of unofficial trails	42	45
Discourage trail use during seasons when soils are saturated	19	20
Relocate trails from fragile to durable soils or vegetation types	38	41
Relocate trails to avoid steep grades	40	43
Perform regular general trail maintenance	48	52
Delineate trail edges to keep visitors on a defined tread	23	25
Close or rehabilitate impacted trails	27	29
Close or rehabilitate undesired trails	41	44
Install trail bog bridges or corduroy	28	30
Seed or transplant vegetation on trails	15	16
Apply trail soil cement	1	1
Gravel trails	13	14
Other: Install hardening/boardwalks over sensitive areas	2	2

Table 27. Actions taken by parks to reduce visitor crowding and conflicts.

Action	Parks Taking the Action	
	Number	Percent
Encourage visitors to use natural-colored equipment and clothing	17	18
Designate trails for different types of visitor use	25	27
Segregate different types of visitor use by geographical area	11	12
Stagger start times for river trips	5	5
Encourage weekday use	13	14
Discourage weekend use	4	4
Encourage off-season use	27	29
Discourage use during peak seasons	11	12
Encourage use of less popular access points and backcountry areas	35	38
Encourage quiet behavior and activities	42	45
Inform visitors about crowded conditions they may encounter in certain areas	52	56
Inform visitors about conflicting uses they may encounter in certain areas	37	40
Other: Encourage outfitters and large groups to use lesser used areas	2	2

Reduce Horse Impacts

Backcountry managers have taken a variety of actions in their efforts to reduce impacts from horses (Table 28), but only three have been adopted by more than 30% of all areas. Of the 60 areas that were open to horses, 55, or 92%, prohibit horses within certain areas or on certain trails in the backcountry. About 40% (63% of areas with stock) require that horse feed be carried into the backcountry and forbid horses from traveling off-trail. One-half of the areas open to horses limits the number of horses per group. Permissible horse group sizes ranged from 5 to 50, with a mean size of 12 and median of 10.

Reduce Litter

Almost 40% of the park respondents reported that litter was a problem in many or most backcountry areas. The most widely adopted program of all management intervention for all impacts was the "pack-it-in, pack-it-out" policy. More than 90% of all park managers had implemented this program. Managers of about three-fourths of all areas said that park staff removed litter in an effort to combat the problem. Four areas prohibited bottles, cans, or both in the backcountry (Table 29).

Table 28. Actions taken by parks to reduce horse impacts.

Action	Discouraged		Prohibited	
	Number	Percent	Number	Percent
Horse use is _____ (discouraged/prohibited) within certain areas or on certain trails	10	11	55	59
Horse use is _____ throughout the backcountry	7	8	8	9
Horse use is _____ within camp areas	11	12	22	24
Horse use is _____ during certain seasons	12	13	14	15
Horse use is _____ in certain ecosystems/ vegetation types	7	8	10	11
Horse use is _____ from off-trail travel	9	10	36	39

Action	Parks Taking the Action	
	Number	Percent
Restrict horse users to designated stock campsites	22	24
Require stockhorse users to obtain permits to graze horses	2	2
Permit grazing only in designated areas	7	8
Require stockhorse feed to be carried into backcountry	38	41
Encourage low-impact stock-restraint techniques	18	19
Require low-impact stock-restraint techniques	11	12
Limit horse numbers (Maximum number: N = 29, Range = 0 - 50, Median = 10, Mean = 12)	30	32
Other: Restrict stockhorse use to corridor trails	1	1

Table 29. Actions taken by parks to reduce littering.

Action	Parks Taking the Action	
	Number	Percent
Emphasize "pack-it-in, pack-it-out" policy	85	91
Prohibit cans, bottles, or both	4	4
Provide free litter bags	22	24
Remove visitor trash	70	75
Other: Remove debris from boaters from shore-lines	5	5

Table 30. Actions taken by parks to reduce wildlife impacts.

Action	Parks Taking the Action	
	Number	Percent
Prohibit all use in areas critical to wildlife	10	11
Prohibit use during periods critical to wildlife	36	39
Discourage camping in areas critical to wildlife	15	16
Prohibit camping in areas critical to wildlife	36	39
Locate campsites and trails away from areas critical to wildlife	25	27
Instruct visitors to view wildlife from a distance	49	53
Instruct visitors not to feed wildlife	69	74
Require campers to hang food out of reach of animals	23	25
Provide devices for hanging/securing food at campsites	18	19
Instruct campers on camping practices that will not attract animals	46	49
Discourage pets	17	18
Require pets to be leashed	35	38
Prohibit pets	57	61
Other: Properly dispose of food or fish wastes	1	1

Reduce Wildlife Impacts

A few backcountry area managers said that wildlife impacts from recreationists were problems in many or most of their areas, but most respondents said they had problems only in a few areas. We asked managers to indicate whether they had adopted 13 different interventions to reduce wildlife impacts, and 7 were used by more than 30% of the parks. The most common action, which 74% of the area managers adopted, was visitor instructions not to feed the wildlife. Next most frequent, at 61%, was prohibiting pets in the backcountry.

More than one-half instructed visitors to view wildlife from a distance. Finally, almost 40% of all areas prohibited use or camping in areas or at times critical to wildlife, or required that pets be on a leash (Table 30).

Reduce Problems with Human Fecal-matter

About one-fourth of all park managers reported adequate disposal of human fecal-matter as a problem in many or most areas of the backcountry. Another 43% indicated it was a problem in a few areas. Two-thirds of all park managers instructed their back-country visitors to bury their fecal-matter (Table 31). Another 45% of the areas provided toilets at some or all of their back-country campsites. Thirteen (13) park respondents direct their visitors, typically boaters, to carry out their body wastes.

Reduce Water Contamination

About the same number of backcountry managers reported water contamination problems as those who cited problems of human wastes. The managers have adopted a variety of actions to reduce water pollution. The most common strategy (at 57% adoption rate) was to instruct visitors to defecate away from all water sources. About 40% located toilets away from water sources, prohibited camping within a certain distance of streams or lakes, or prohibited bathing or washing dishes or clothes in lakes or streams (Table 32).

Table 31. Actions taken by parks to reduce problems with human fecal-matter.

Action	Parks Taking the Action	
	Number	Percent
Discourage camping in areas where waste disposal is a problem	6	6
Prohibit camping in areas where waste disposal is a problem	5	5
Permit camping only in areas where toilets are provided	11	12
Provide toilets at some or all campsites	42	45
Instruct visitors to bury human wastes	61	66
Instruct visitors to carry out human wastes	13	14
Other: Encourage visitors to use outhouses	1	1
Encourage visitors to carry out toilet paper	4	4
Encourage visitors to deposit wastes below tideline	1	1
Encourage visitors to burn toilet paper in winter	1	1

Table 32. Actions taken by parks to reduce water contamination.

Action	Parks Taking the Action	
	Number	Percent
Discourage camping within a certain distance of streams or lakes	17	18
Prohibit camping within a certain distance of streams or lakes	39	42
Discourage bathing or washing dishes/clothes in lakes and streams	13	14
Prohibit bathing or washing dishes/clothes in lakes and streams	36	39
Locate toilets away from all water sources	42	45
Instruct visitors to defecate away from all water sources	53	57
Other: Prohibit disposal of fish remains in water	1	1

Effectiveness of Backcountry Recreation Management Actions

The fourth section of the survey examined the perceived effectiveness of specific actions that have been implemented to address backcountry recreation management problems. Managers were asked to select two problems which they perceived the park had successfully addressed through implemented actions and two problems unresolved in spite of implemented actions. For each selected problem, managers were asked to provide a brief description of the action, list and rate the perceived effectiveness of implemented management actions, and comment on why each action was effective or ineffective and on additional factors that helped or hindered in resolving the problem. A scale ranging from "Not Effective = 1" to "Highly Effective = 4" was provided to standardize ratings.

The survey asked managers to select problems from the general impact categories highlighted in the Backcountry Recreation Management Problems section. Responses are summarized only for impact categories selected by more than five parks.

Campsite Impacts

Backcountry managers highlighted a number of actions implemented to address campsites impacts, ranging from highly effective to somewhat effective (Table 33). The most prevalent action adopted by nine parks was a requirement for visitors to camp only in designated sites. This form of visitor concentration was rated as highly effective by eight parks, compared to dispersed camping, which one park selected and rated as moderately effective. Other actions rated as highly effective included prohibiting fires, providing facilities to concentrate site use, restoring sites, limiting group sizes, and requiring campsite reservations. Some moderately effective actions included prohibiting fires, restricting camping near water sources, relocating sites away from attraction areas, and enforcing camping regulations. Four parks listed promoting low-impact camping through educational materials and programs; three rated this action as only somewhat effective. Managers attributed the low effectiveness of this action to the difficulty in reaching all campers; a permit system is likely to be necessary for this approach to be effective.

Trail Impacts

Most of the highly effective trail-impact management actions involved some form of trail work rather than visitor management (Table 34). These actions included trail maintenance and rehabilitation (four parks), boardwalk installation (two parks), delineation of trail treads (two parks), and braided trail revegetation (one park). Monitoring trail impacts, developing a trail plan and formal trail system, and establishing use quotas were also rated as highly effective. Some moderately effective actions included temporarily closing and relocating badly eroded trails, designating trails for different uses, and promoting dispersed hiking. Backcountry managers rated as somewhat effective actions such as blocking or signing informal trails and educational efforts to promote low-impact trail use.

Impacts to Wildlife

Nearly one-half of the actions listed by park managers that addressed impacts to wildlife were related to conflicts between visitors and bears. Actions rated as highly effective in reducing human-bear interactions included temporarily closing sensitive areas, regulating food storage and facilities, and disseminating educational materials (Table 35).

Table 33. Perceived effectiveness of management actions implemented to address campsite impacts.

Management Action	Effectiveness Scale Rating[1]	Park[2]	Comments
Restore campsites and disturbed areas closed to use	4	OLYM	Park seeds and cuttings propagated in greenhouse
Require camping on unvegetated surfaces	4	GUIS	
Require designated site camping	4	DEWA	
	4	OLYM	
	4	BIBE	
	4	GUMO	
	4	CUIS	Coupled with group size limits
	4	VOYA	Impact-resistant areas selected
	4	SLBE	Impact-resistant areas selected
	4	PRWI	Sites not visible from each other and trail
	3	GLAC	Site expansion still a problem
Prohibit overnight horse use	4	BAND	
Require overnight camping permit	4	OLYM	Permits communication of regulations and information
Prohibit campfires above 7,000 feet	4	GRTE	Some illegal fires still found
Install primitive pit toilets	4	DEWA	
Administer a campsite reservation system	4	CANY	Some sites have use limits
Require a group size limit of four	4	PRWI	
Enforce designated camping policy	4	DEWA	
Prohibit ground fires	4	BAND	
	3	CUIS	
Concentrate use on sites through facility development	4	VOYA	
Delineate campsite boundaries with logs	4	OLYM	Restricts site expansion
Anchor firegrates to concentrate use	4	DEWA	Monitoring shows a marked reduction in site size
Restrict camping activities to within 20 feet of site markers	3	PRWI	
Restrict camping near water resources	3	BAND	
Require dispersed camping	3	SHEN	Significant increase in number of sites
Relocate sites away from attraction areas	3	PRWI	Some camping still occurs at old attraction area sites
Enforce camping regulations	3	CATO	
Ban open fires	3	PRWI	Some illegal fires still found
Promote low-impact camping through educational materials	3	PRWI	Information widely distributed
	2	BUFF	Only on bulletin boards
	2	KEFJ	Difficult to reach all campers
	2	CATO	
Administer a permit system	3	BLCA	
	2	CANA	Low compliance due to water-based access
Patrol backcountry	2	BUFF	Patrols are too infrequent

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective; [2]See Appendix A for park codes

Table 34. Perceived effectiveness of management actions implemented to address trail impacts.

Management Action	Effectiveness Scale Rating[1]	Park[2]	Comments
Revegetate braided trails	4	OLYM	
Monitor trail impacts	4	GRCA	Used to establish priorities
	4	KEFJ	
Maintain and rehabilitate trails	4	GRCA	Trail rerouting, tread work, delineation, and revegetation
	4	OLYM	Tread work, drainage, and rock-retaining walls
	4	KEFJ	Use SCA and other trail crews
	4	PRWI	Volunteers used
	2	ARCH	Volunteers used
Install boardwalks and bridging in sensitive areas	4	DEWA	Expensive to construct and maintain
	4	GRPO	To prevent trail widening around muddy areas
Establish a formal trails system	4	DEWA	Identifies trails to be developed and maintained
Establish use quotas in popular areas	4	DENA	To redistribute use
Develop a trail management plan	4	KEFJ	To establish objectives, standards, and funding needs
Delineate and confine trail treads	4	PRWI	To keep hikers on the trail
	4	OLYM	
	2	CATO	
Conduct trail inventory and maintenance needs assessment	4	DEWA	To document and summarize trail maintenance needs
Block access to or sign informal trails	4	CARE	To prevent use
	3	PRWI	
	2	APIS	Insufficient amount of brush
	2	APIS	
	2	CATO	Pile brush between switchbacks
Temporarily close badly eroded trails	3	KEFJ	While awaiting rerouting work
Relocate trail segments in sensitive areas	3	PRWI	
Promote dispersed hiking	3	DENA	To prevent trail proliferation
Established a trails committee	3	DEWA	Directed development of a trail plan
Designate trails for different types of use	3	PRWI	To constrain high-impact uses to resistant trails and separate conflicting uses
Delineate formal trails with posts	3	JOTR	To identify formal trails
Established trail standards	2	DENA	To identify acceptable levels of trail impacts
Block vehicular access to backcountry roads and trails	2	DEWA	Ineffective in some areas
Promote low-impact trail use through educational materials	2	JOTR	
	1	CATO	

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective;
[2]See Appendix A for park codes

Table 35. Perceived effectiveness of management actions implemented to address wildlife impacts.

Management Action	Effectiveness Scale Rating[1]	Park[2]	Comments
Temporarily close sensitive areas	4	FOJE	To protect rare, threatened, and endangered species
	4	YELL	To address conflicts with bears
	4	CANA	To protect nesting sea turtles
	4	DENA	To protect critical habitats
	4	GLBA	To address conflicts with bears
	3	GUIS	To protect rare, threatened, and endangered species
	2	VOYA	
Require use of bear-proof food containers	4	GLBA	
Require visitors to hang food and provide them with information on clean camping practices	4	SHEN	
Provide facilities for hanging food and designated areas for cooking	4	GLAC	
Require that pets be kept on leash	4	BLCA	
Require that pets not be permitted in wilderness	4	BLCA	
Lessen wildlife impacts by distributing educational materials	4	WHIS	To address conflicts with bears
	4	GLAC	To address conflicts with bears
	4	GLBA	To address conflicts with bears
	3	DENA	
	3	GAAR	To address conflicts with bears
Hold workshop for commercial use licensees	4	KEFJ	Share management concerns, convey recommended practices
Develop a bear management plan	4	DENA	
	3	GAAR	
Administer a wildlife monitoring program	4	KEFJ	Can evaluate visitor impacts
Provide personal contacts with park rangers	3	KEFJ	
Park staff use bear-resistant food canisters	3	GAAR	To set an example for visitors
Install food lockers and hanging racks	3	BICA	To address conflicts with bears
Designate sites to avoid wildlife impacts	3	VOYA	
Promote a photographers' code of ethics	2	DENA	
Provide bear-proof food storage drums in problems areas	2	GAAR	Drums were effective but are an eyesore; temporary solution
Enforce regulations through patrols	2	GLAC	Insufficient number of patrols
	1	DENA	Backcountry too big to patrol

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective;
[2]See Appendix A for park codes

In contrast to other management problems, educational efforts for addressing wildlife impacts were rated as either highly or moderately effective (five parks). The potential for personal harm may result in a greater receptivity on the part of visitors than for other issues, where education is perceived by managers to be less effective. Highly effective actions for addressing other wildlife impacts (exclusive of bears) included temporarily closing sensitive areas, prohibiting pets, requiring pets to be leashed, and conducting workshops for commercial use licensees. Wildlife impact reduction actions that were rated as somewhat or not effective included enforcing regulations (too few staff) and promoting a photographers' code of ethics.

Water Contamination from Human Fecal-matter

The most common and effective action implemented to reduce water contamination from human fecal-matter was installing primitive toilets on designated sites or in high-use areas (Table 36). Parks rated this action as moderately to highly effective but noted some reservations, including concerns regarding the appropriateness of toilets in the backcountry and their high maintenance expense. An effective action for parks with water-based recreation is providing portable toilets, which are carried on boats. Marinas

Table 36. Perceived effectiveness of management actions implemented to address water contamination from human waste.

Management Action	Effectiveness Scale Rating[1]	Park[2]	Comments
Install primitive toilets	4	YELL	Only on high-use campsites
	4	GRCA	Only in certain zones
	4	ISRO	On all designated sites
	4	NOCA	Composting type
	3	CODA	Only in high-use areas
	3	VOYA	Vault-type toilets installed at all designated sites
Require river boaters to carry out wastes	4	GRCA	Boaters use portable toilets
Prohibit camping near roads	4	GUIS	Eliminated auto-campers
Require pretrip orientation and inspection	4	GRCA	For river boaters
Install floating restrooms on lake	3	CODA	Only in high-use areas
Require concession rental houseboats to have 100% containment of waste water	3	CODA	
Encourage portable toilet use for all boats	3	CODA	
Marinas on lake required to provide free pump-out service for all boats	3	CODA	
Monitor sanitation near campsites	3	GRCA	Identifies extent of problem
Promote proper waste disposal practices through educational materials	3	GRCA	
Require designated site camping	2	VOYA	Toilets provided at sites
Install fly-out pot toilet at a high elevation high-use site	2	GRTE	Expensive to service

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective
[2]See Appendix A for park codes

at Coulee Dam National Recreation Area are required to provide free pump-out service for both rental and private boats. Educational messages are common in most park brochures, but only one park rated this action as moderately effective.

Visitor Crowding and Conflicts

The management of visitor crowding and conflicts was identified as an unresolved problem by 82% of the respondents selecting this issue. The lack of success in addressing this management problem was reflected by the generally low effectiveness ratings provided for a diverse array of management actions, none of which were identified by more than one park (Table 37). The only actions rated as highly effective, visitor-use quotas and backcountry access controlled through a visitor transportation system, are highly regulatory. Actions rated as moderately effective included requiring dispersed and designated camping, disseminating educational information, and restricting canoe rentals and motorboat speeds. The parks listed eight additional actions as somewhat effective.

Table 37. Perceived effectiveness of management actions implemented to address visitor crowding and conflicts.

Management Actions	Effectiveness Scale Rating[1]	Park[2]	Comments
Permit backcountry access only through a visitor transportation system	4	DENA	Disperses departure times
Administer a visitor-use quota system	4	DENA	
Require dispersed camping	3	SHEN	Promotes solitude by dispersing visitors
Require designated site camping	3	VOYA	Separates campers and different user groups
Promote low social impacts through distribution of educational information	3	DENA	
Restrict the number of canoe rentals and areas where they can be used	3	BUFF	Effective because 80% of canoes are rented
Impose seasonal motorboat speed limits	3	DEWA	Difficult to enforce
Inform sea kayakers of areas with light motorboat use	3	KEFJ	Many groups not contacted
Request commercial helicopter operators to avoid overflights of popular trails	3	KEFJ	No jurisdiction of air space
Restrict horse use to designated trails	2	GLAC	Increases intensity of problems on selected trails
Promote shoulder- and off-season use and behavior that lessens conflicts	2	ISRO	Conflicts continue during peak season
Do not establish or maintain formal trails	2	DENA	Informal trails develop
Inform hikers of heavy horse use trails	2	GLAC	Same destinations sought
Increase maintenance on horse trails	2	GLAC	Reduces trail degradation as a source of conflict
Operate a visitor social experience monitoring program	2	GRCA	Obtaining cooperation of outfitters has been difficult
Encourage outfitters to consider crowding when scheduling trip launch dates	2	GRCA	Obtaining cooperation of outfitters has been difficult
Zone river segments for different use levels	2	BUFF	No monitoring to assess compliance

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective
[2]See Appendix A for park codes

Illegal Collecting

Another problem that parks commonly cited as unresolved in spite of implemented management actions was controlling illegal collecting. Effectiveness ratings were inconsistent for several actions that backcountry managers implemented (Table 38). For example, one park rated posting educational signs on cultural sites in popular areas as highly effective and two parks rated this action as somewhat effective. Comments suggested that signing sites draws more attention to cultural sites, and at least one park leaves unmarked those cultural sites that are not directly threatened. Parks also reported mixed success for closing sensitive cultural sites; insufficient staffing for patrols make closure difficult to enforce. Parks rated educational approaches as moderately to somewhat effective, with comments indicating that such efforts rarely reach the true culprits. One manager noted that no program or action was likely to effectively address the theft of small pot shards, which most backcountry visitors view as inconsequential. Parks viewed enforcement actions to be effective when theft cases were well publicized, but such publicity tended to be local. Enforcement was less effective for national and international visitors.

Table 38. Perceived effectiveness of management actions implemented to address illegal collecting.

Management Action	Effectiveness Scale Rating[1]	Park[2]	Comments
Close sensitive cultural sites to use	4	JOTR	
	2	BAND	No camping near sites
	3	AMIS	Posted "No Camping" signs
Require designated site camping	4	KLGO	Avoids archeological sites
Post some cultural sites with educational signs	4	JOTR	
	2	DEVA	
	2	CURE	Can draw attention to sites
Promote ethical behavior through education	3	PRWI	May not reach real culprits
	3	NAVA	
	2	JOTR	
	2	BAND	
Leave unused cultural sites unmarked and unpublicized	3	AMIS	Nothing to draw attention to sites
Require backcountry use permit	3	NAVA	Identifies vehicles of legitimate visitors
Establish a law enforcement database	3	BADL	
Restrict visitor access to ruins	3	NAVA	Visitor may enter ruins only with a ranger
Enforce park regulations	3	NAVA	Theft cases are publicized
	2	DEVA	Insufficient staffing
	1	BADL	Insufficient staffing
Conduct inventory of cultural resources	2	PRWI	Identifies site locations
	2	JOTR	
	2	CURE	
Require park approval of nature study programs	2	PRWI	Collecting permits required
Explain park policies	2	NAVA	Identifies rationale for park rules

[1]Effectiveness Scale: 1 - Not Effective, 2 - Somewhat Effective, 3 - Moderately Effective, 4 - Highly Effective
[2]See Appendix A for park codes

Recreation Carrying Capacity

The fifth section of the survey addressed the issue of recreation carrying capacity of back-country areas. Recreation carrying capacity is generally defined as the amount and type of recreation use a backcountry can accommodate while meeting NPS management objectives relating to both protecting the resource and maintaining the quality of the visitor experience.

The first question dealt with the current status of carrying capacity determination. Findings are shown in Table 39. Clearly, the concept of carrying capacity has not been well applied in NPS backcountry areas. Carrying capacity of backcountry areas has not been estimated at over 57% of the parks. Moreover, most of the park managers that have estimated a backcountry carrying capacity have done so without the aid of scientific research. This lack of analysis calls into question the validity of such carrying capacity estimates. Only 14 park respondents (or 15%) have estimated backcountry carrying capacity with the aid of scientific research studies.

The second question dealt with how back-country visitation relates to carrying capacity. If carrying capacity had not been formally determined or estimated, respondents were asked to estimate the recreation carrying

capacity of the backcountry. The question had two parts. The first part focused on current backcountry use. Findings are shown in Table 40. Some park managers (22%) concluded that their backcountry areas have not reached carrying capacity thresholds at any times or locations. However, the vast majority of respondents concluded that carrying capacity is being exceeded at least at some times or locations. These findings underscore the importance of determining and managing carrying capacity in NPS back-country areas. In the judgment of back-country managers, carrying capacities are now being exceeded at many times or

locations. However, managing this situation is difficult when carrying capacities have not been formally established. As shown in Table 39, only a minority of parks have established or even estimated carrying capacity for their backcountry areas.

The second part of this question asked about the probable relationship of backcountry visitation to carrying capacity if existing use limitations were not present. This part of the question addressed only parks that ration or limit backcountry visitor use. Findings are shown in Table 41. Clearly, without existing use limits, backcountry use would exceed carrying capacity often, or at least occasionally, in nearly all parks. Again, these findings emphasize the potential importance of

Table 39. Current status of carrying capacity determination.

Status	Number	Percent
Carrying capacity has been determined with the aid of scientific research studies	14	15
For entire backcountry For portions or zones of backcountry	4 14	
Carrying capacity has been estimated without the aid of scientific research studies	25	28
For entire backcountry For portions or zones of backcountry	12 25	
Carrying capacity has not been estimated	51	57
For entire backcountry For portions or zones of backcountry	49 17	

Table 40. Backcountry visitation relative to carrying capacity.

Relationship	Number	Percent
Visitor use never exceeds carrying capacity at any time or location	20	22
Visitor use occasionally exceeds carrying capacity at some times or locations	53	59
Visitor use often exceeds carrying capacity at some times or locations	17	19
Visitor use often exceeds carrying capacity throughout the backcountry	0	0

Table 41. Potential backcountry visitation related to perceived carrying capacity.

Relationship	Number	Percent
Visitor use would never exceed carrying capacity at any time or location	2	4
Visitor use would occasionally exceed carrying capacity at some times or locations	20	42
Visitor use would often exceed carrying capacity at some times or locations	19	40
Visitor use would often exceed carrying capacity throughout the backcountry	6	13

Table 42. Resource and social components of carrying capacity.

Relationship	Number	Percent
The resource component is the primary limiting factor in the recreation carrying capacity of this backcountry	25	28
The social component is the primary limiting factor in the recreation carrying capacity of this backcountry	12	13
The resource and social components contribute about equally to the recreation carrying capacity of this backcountry	27	30
The relative importance of the resource and social components of recreation carrying capacity are unknown for this backcountry	26	29

formally establishing carrying capacity. Without carrying capacity determinations, visitor-use limitations are difficult to justify and manage.

The third question focused on the relative importance of the resource and the social components of recreation carrying capacity. Recreation carrying capacity is often discussed and analyzed in terms of two basic components. One is resource capability and refers to the ability of natural or cultural resources to withstand visitor use. The other is social and refers to maintaining the quality of the visitor experience in light of crowding, conflicting uses, and related issues. The question asked respondents to judge the extent to which each of these components contributes to determining the carrying capacity of their backcountry areas. Findings are shown in Table 42.

Clearly, both components of carrying capacity are judged to be potentially important. While 29% of the respondents perceived that the resource component was the primary limiting factor in determining carrying capacity (compared to 13% for the social component), 30% of the respondents concluded that both components contributed about equally to the recreation carrying capacity of their backcountry areas. However, a substantial percentage of respondents (29%) were uncertain about the relative importance of the two components, underscoring the general uncertainty and lack of knowledge about carrying capacity.

The fourth question focused on current knowledge and use of specific carrying capacity models or processes. Over the past several years, three carrying capacity models or processes have been developed in the scientific literature on park and recreation management: Limits of Acceptable Change, Visitor Impact Management, and Carrying Capacity Assessment Process. (Primary citations for these models or processes are Limits of Acceptable Change (Stankey et al. 1985), Visitor Impact Management (Graefe et al. 1990), and Carrying Capacity Assessment Process (Shelby and Heberlein 1986).) NPS planners are currently developing a related carrying capacity model or process tentatively titled the Visitor Experience and Resource Protection Program. However, this model or process was not fully enough developed to include in this study. The survey asked respondents the extent to which they knew of, were familiar with, or had used each of these models or processes, or all of these. Findings are shown in Table 43.

Clearly, these models or processes are not well known or used. Limits of Acceptable Change is the most familiar carrying capacity model to NPS backcountry managers: 14% had used this model and an additional 29% were very familiar with it. However, over one-half of the respondents did not know much about this model or had not heard of it. Virtually no backcountry managers had used Visitor Impact Management or

Table 43. Knowledge and use of carrying capacity models or processes.

Item	Park's Knowledge or Use of Carrying Capacity Models					
	Limits of Acceptable Change		Visitor Impact Management		Carrying Capacity Assessment Process	
	Number	Percent	Number	Percent	Number	Percent
I have not heard of this	17	19	28	32	49	56
I have heard of this, but do not know very much about it	28	32	47	53	32	42
I am very familiar with this	29	33	11	13	1	1
I have used this in making recreation carrying capacity determinations	14	16	2	2	1	1

Carrying Capacity Assessment Process. Moreover, few respondents knew much about these two models or had heard of them.

The final question dealt with three of the most important elements of carrying capacity determination. Contemporary treatments of recreation carrying capacity emphasize developing management objectives, indicators, and standards. These elements are common to all three of the carrying capacity models or processes described earlier. *Management objectives* are broad statements describing the resource conditions and types of visitor opportunities that should be provided in a backcountry. *Indicators* are specific measurable variables that identify the primary resource and visitor experience attributes described by management objectives.

Standards define the quantitative, measurable condition of each indicator. Two examples may help clarify these terms and their use. Within the resource component of recreation carrying capacity, a management objective might be to "maintain natural conditions." A related indicator might be the amount of ground cover vegetation loss at backcountry campsites. A standard for this indicator might be that the area of bare ground at backcountry campsites should not exceed 50 square feet. Within the social component of recreation carrying capacity, a management objective might be to "provide opportunities for solitude." A related indicator might be the number of encounters that occur between hiking parties along trails. A standard for this indicator might be that the mean number of trail encounters per day should not exceed three.

The survey asked respondents the extent to which each of these elements had been developed for their backcountry area. Findings are shown in Table 44. All three of these elements clearly need more attention if carrying capacity determinations are to be conducted and backcountry areas are to be managed within their carrying capacities. Only a minority (44%) of backcountry areas had developed management objectives; the majority of the areas have not yet reached this basic level of analysis.

Table 44. Current status of backcountry management objectives, indicators, and standards.

Item	Number	Percent
Management objectives:		
Developed	40	44
Not developed	50	56
Indicators:		
Developed	17	19
Not developed	72	81
Standards:		
Developed	20	23
Not developed	69	78

Management objectives are vital in the early stages of carrying capacity analysis. Still more work is needed in developing indicators and standards; the vast majority of backcountry areas have not developed these elements of carrying capacity. Indicators and standards are vital in quantifying and managing recreation carrying capacity.

Resource and Visitor Experience Monitoring Programs

The survey asked managers to list and describe monitoring efforts that are used to assess the effects of visitor use on the condition of park resources and the quality of visitor experiences. Responses are summarized in Table 45 for five monitoring categories: campsites, trails, wildlife, water quality, and visitor experience.

Nearly 40% of the park managers reported using campsite monitoring to evaluate visitor impacts (Table 45). This action was the most prevalent form of recreation impact monitoring. Fewer than 10% of the park respondents conducted monitoring programs for any of the other resource or visitor experience attributes. Information on program history revealed that few parks have replicated campsite monitoring measurements or sustained these programs over long periods of time.

Table 45. Resource monitoring programs.

Type of Monitoring	Parks with Monitoring Programs					
	Monitoring: Recreation Impacts		Research and Monitoring: General		Informal Evaluations	
	Number	Percent	Number	Percent	Number	Percent
Campsite	34	39	0	0	19	22
Trail	8	9	12[1]	14	18	18
Wildlife	6	7	34	39	2	2
Water quality	8	9	46	52	0	0
Visitor experience	6	7	13	15	8	9

[1]Interpreted as general trail inventories and maintenance needs assessments.

Respondents described four general types of campsite monitoring:

1. photographic systems--photographs taken from permanent photopoints document change

2. condition class systems--conditions are matched to previously defined impact classes using visual criteria that describe overall site conditions

3. multiparameter rating systems--estimates or measurements are used to assign impact ratings for a number of different resource impacts

4. multiparameter measurement systems-- measurements are recorded for a number of different resource impacts

The survey did not provide sufficient information to permit a summary of the number of parks where these different approaches were used, and some parks combined two or more approaches. In general, the photographic and multiparameter rating systems were the most prevalent. An additional 19 parks used informal evaluations of campsite impacts. Typically, field rangers subjectively assess campsite conditions during routine patrols. Such evaluations are generally not standard, although some park staff use case incident reports or patrol logs for documentation purposes.

Only eight parks reported using trail-impact monitoring programs. Monitoring approaches included rapid assessment ratings, measurements for documenting trail width and incision, and research measuring vegetation and soil loss. Twelve parks use inventory approaches designed primarily

for assessing trail maintenance needs. These are typically conducted by maintenance division staff for setting priorities and directing trail maintenance work. Eighteen parks informally evaluate trail impacts and trail maintenance needs, which field rangers typically conduct during routine patrols.

Many parks misinterpreted our request and provided information on all wildlife monitoring programs. Most of the programs that were described were general research and monitoring efforts that did not appear to explicitly assess visitor impacts. From the information supplied, only six of the wildlife monitoring programs appeared to include components for assessing visitor impacts. An additional 34 parks reported research or monitoring efforts that were more general in nature.

Responses for water quality monitoring were similar to wildlife. Six monitoring efforts appeared to be at least partially directed to visitor impacts, while 46 parks described general water quality monitoring programs.

Only six (7%) of the parks conduct monitoring to assess social setting conditions (number of visitor encounters, perceptions of crowding, or conflicts) or visitor satisfaction. Parks conducting monitoring used either short visitor questionnaires or rangers who recorded visitor encounters during backcountry patrols. Thirteen parks cited research studies that surveyed backcountry visitors about their experiences. Finally, eight parks noted a variety of informal evaluation methods, which included visitor contacts with park staff, visitor input through suggestion boxes at park facilities, and visitor letters.

Summary, Conclusions, and Recommendations

In pursuing their dual mission of providing for public use and protecting park resources, national park managers encounter a large variety of management problems in backcountry areas. An equally diverse array of management actions can be applied to deal with these problems. This report explores these management problems and actions in an attempt to simplify this mission. A standard questionnaire categorized and listed backcountry recreation problems and management actions. We administered this questionnaire by mail to 106 national park system units with backcountry areas. We asked respondents to describe their backcountry conditions, rate the perceived severity of backcountry recreation management problems, and list any management actions and rate their perceived effectiveness. The survey attained a 92% response rate, yielding 93 completed questionnaires.

Backcountry recreation conditions vary widely across the national park system. For example, the size of backcountry areas ranged from just over 600 acres to 12 million.

The extent of trail and other facility development also varies widely as does the amount of visitor use accommodated. Finally, the visitors themselves are diverse, engaging in a variety of recreation activities-- day hiking, backpacking, horseback riding, boating, using off-road vehicles--and representing all experience levels.

Despite this diversity and complexity, this study found considerable unity and commonality among park responses. For example, the survey found that day users were the most common type of visitor--far and away--across all national park backcountry areas. Moreover, managers considered day users to be an important cause of several backcountry recreation problems, including trail impacts and crowding. Little attention is given to measuring and reporting day use in backcountry areas, and only 8% of all parks require day users to obtain backcountry permits. More research and management attention is needed for this type of backcountry visitor.

Backcountry managers reported some degree of consensus about the perceived severity of several types of backcountry impacts. Managers clearly regarded trail impacts to be the most severely pervasive problem, with nearly 50% of all parks reporting such impacts occurring in most or many areas within the backcountry. A second tier of impacts included campsite impacts, litter, crowding and related social problems,

disposal of human fecal-matter, and water pollution. Wildlife impacts, illegal collecting, and road impacts were rated as lower in severity.

Managers also reported the types of backcountry use that they considered to be the most responsible for backcountry impacts and problems. Day users were often cited as a prominent cause of such impacts. However, this situation is probably due to their large numbers, as noted earlier. Parks cited several types of users considerably more often than their numbers represented. These recreationists included horse and packstock users, motorboaters, ORV/ATV users, and mountain bikers. Since these types of uses appear to be causing impacts and problems out of proportion to their numbers, they should be subject to special management attention.

These judgments about the severity of backcountry impacts and their probable causes are based primarily on the perceptions of backcountry managers. Nearly all respondents reported that park staff observations were a primary source of information about backcountry conditions. More formal backcountry monitoring and research programs would be useful in validating these observational data.

Backcountry managers reported using a considerable variety of management actions. Each of the following actions are currently in effect at over one-half of all NPS backcountry areas:

1. employ a user permit system
2. limit group size
3. provide a minimum-impact educational program
4. limit lengths of stay
5. give verbal warnings for rules violations
6. maintain campsites and trails maintenance program
7. restrict campfires and firewood cutting
8. require camping setbacks
9. concentrate use on designated trails and campsites
10. provide user information on crowding and conflicting uses
11. restrict horse use
12. use the "pack-it-in, pack-it-out" regulation
13. prohibit wildlife feeding
14. restrict pets
15. provide user information on disposal of human fecal-matter
16. provide primitive toilets

In addition to asking managers about the actions they use, the survey also asked respondents to rate the perceived effectiveness of these actions. We organized responses according to several basic

categories of backcountry impacts or problems. The most effective actions reported across all NPS backcountry areas follow:

1. Campsite impacts
   - designate campsites
   - prohibit campfires
   - provide campsite facilities
   - restore sites
   - limit group sizes
   - implement campsite reservation system
2. Trail impacts
   - maintain and rehabilitate trails
   - use impact monitoring system
   - use formal trail system and plan
   - use quotas
3. Wildlife impacts
   - temporarily close sensitive areas
   - regulate food storage and facilities
   - provide user educational program
   - restrict pets
   - provide information workshops for commercial use licensees
4. Water impacts
   - provide primitive toilets at high-use sites
5. Crowding and conflicting uses
   - implement visitor use quotas
   - control backcountry access with a visitor transportation system

Managers generally perceived that two categories of problems were unresolved, even though they had used a variety of management actions. Although managers speculated that two actions (as noted

previously) were generally effective, 82% of the sample reported crowding and conflicting uses to be unresolved. Moreover, no management actions were regarded to be generally effective in dealing with illegal collecting.

Study findings demonstrate that backcountry managers continue to struggle with the issue of carrying capacity. Carrying capacity is a framework through which judgments can be made about the appropriate degree of resource protection and the type and level of visitor use that can be accommodated. Carrying capacity judgments can guide management actions. Currently, most NPS backcountry areas have not applied the concept of carrying capacity. Most areas that have applied the concept lack any kind of scientific base. The severity of this problem is reflected in the fact that the vast majority of managers suggest that carrying capacity is currently being exceeded in their backcountry areas in some locations or at some times. Moreover, without applying carrying capacity frameworks, visitor-use limits and other management actions are more difficult to justify and implement. Although several carrying capacity frameworks have been developed, NPS application and knowledge of these frameworks are limited.

Finally, monitoring programs that are focused on backcountry impacts and problems are also limited. Less than 40% of parks with backcountry areas monitor campsite impacts, while less than 10% of these areas monitor any other impact or problem.

This lack of monitoring suggests that objective information about such impacts and problems is limited and that backcountry resource and social conditions may be changing in unknown and possibly undesirable ways.

Based on these study findings, we offer several recommendations for improving backcountry recreation management.

1. Managers can and should use these study findings as a general guide for improving backcountry recreation management. Backcountry impacts and problems that are common across all NPS backcountry areas should be the focus of additional research and management attention.

2. Day use is a high-priority issue in backcountry management. Although backcountry seemingly implies longer lengths of stay, the majority of all visitors are day users. More research and management attention should be directed at day users.

3. Some backcountry users are believed to create more impacts and problems than their numbers represent. These users include horse and packstock users, motorboaters, ORV/ATV users, and mountain bikers. More intensive and restrictive management may need to be directed at these users.

4. More attention needs to be devoted to applying carrying capacity to backcountry areas. Several carrying capacity frameworks are now available. More importantly, the National Park Service is currently developing its own carrying capacity framework, called the Visitor Experience and Resource Protection Program. These frameworks should be applied to all backcountry areas.

5. Backcountry recreation monitoring programs should be substantially enhanced throughout the National Park Service. Monitoring is an inherent and necessary part of carrying capacity frameworks as described earlier. Applying carrying capacity frameworks can identify which backcountry impacts and problems are most important to monitor. Monitoring will also help validate management judgments.

6. Backcountry managers should communicate more effectively about shared problems and management actions. The results of this study should be used to further that communication program. Survey data have been compiled into dBASE III Plus files and sent to each park. Using this software, backcountry managers can find other national park system units that share characteristics or management problems or have used selected management actions. Personal contacts and telephone numbers are included to assist communication.

7. This study should be replicated periodically--perhaps every 5 to 10 years--to track trends in backcountry recreation management. Trends are needed to guide backcountry research and management programs. Moreover, periodical updates are needed to encourage communication among backcountry managers, as described earlier.

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Appendix A: National Park Service Units included in the Survey

National Park Service Unit	State	Park Code	Region Code
Acadia National Park	ME	ACAD	NAR
Amistad National Recreation Area	TX	AMIS	SWR
Aniakchak National Monument and Preserve	AK	ANIA	AR
Apostle Islands National Lake	WI	APIS	MWR
Arches National Park	UT	ARCH	RMR
Assateague Island National Seashore	MD	ASIS	MAR
Badlands National Park	SD	BADL	RMR
Bandelier National Monument	NM	BAND	SWR
Big Bend National Park	TX	BIBE	SWR
Big Thicket National Park	TX	BITH	SWR
Bighorn Canyon National Recreation Area	MT	BICA	RMR
Biscayne National Park	FL	BISC	SER
Black Canyon of the Gunnison National Monument	CO	BLCA	RMR
Blue Ridge Parkway	NC	BLRI	SWR
Bryce Canyon National Park	UT	BRCA	RMR
Buffalo National River	AR	BUFF	SWR
Canaveral National Seashore	FL	CANA	SER
Canyonlands National Park	UT	CANY	RMR
Cape Krusenstern National Monument	AK	CAKR	AR
Cape Lookout National Seashore	NC	CALO	SER
Capitol Reef National Park	UT	CARE	RMR
Catoctin Mountain Park	MD	CATO	NCR
Carlsbad Caverns National Park	NM	CACA	SWR
Channel Islands National Park	CA	CHIS	WR
Colorado National Monument	CO	COLM	RMR
Congaree Swamp National Monument	SC	COSW	SWR

National Park Service Unit	State	Park Code	Region Code
Coulee Dam National Recreation Area	WA	CODA	PNR
Crater Lake National Park	OR	CRLA	PNR
Craters of the Moon National Monument	ID	CRMO	PNR
Cumberland Gap National Historical Park	KY	CUGA	SER
Cumberland Island National Seashore	CA	CUIS	SER
Curecanti National Recreation Area	CO	CURE	RMR
Death Valley National Monument	CA	DEVA	WR
Delaware Water Gap National Recreation Area	PA	DEWA	MAR
Denali National Park and Preserve	AK	DENA	AR
Dinosaur National Monument	CO	DINO	RMR
Fort Jefferson National Monument	FL	FOJE	SER
Gates of the Arctic National Park and Preserve	AK	GAAR	AR
Glacier Bay National Park and Preserve	AK	GLBA	AR
Glacier National Park	MT	GLAC	RMR
Glen Canyon National Recreation Area	AK	GLCA	RMR
Golden Gate National Recreation Area	CA	GOGA	WR
Grand Canyon National Park	AZ	GRGA	WR
Grand Portage National Monument	MN	GRPO	MWR
Grand Teton National Park	WY	GRTE	RMR
Great Basin National Park	NV	GRBA	WR
Great Sand Dunes National Monument	CO	GRSA	RMR
Great Smoky Mountains National Park	TN	GRSM	SER
Guadalupe Mountains National Park	TX	GUMO	SWR
Gulf Islands National Seashore	MS	GUIS	SER
Isle Royale National Park	MI	ISRO	MWR
Joshua Tree National Monument	CA	JOTR	WR
Katmai National Park and Preserve	AK	KATM	AR
Kenai Fjords National Park	AK	KEFJ	AR

National Park Service Unit	State	Park Code	Region Code
Kings Canyon National Park	CA	KICA	WR
Kings Mountain National Military Park	NC	KIMO	SER
Klondike Gold Rush National Historical Park	AK	KLGO	AR
Kobuk Valley National Park	AK	KOVA	AR
Lake Chelan National Recreation Area	WA	LACH	PNR
Lake Clark National Park and Preserve	AK	LACL	AR
Lake Mead National Recreation Area	NV	LAME	WR
Lava Beds National Monument	CA	LABE	WR
Mammoth Cave National Park	KY	MACA	SER
Mount Rainier National Park	WA	MORA	PNR
Navajo National Monument	AZ	NAVA	SWR
Noatak National Preserve	AK	NOAT	AR
North Cascades National Park	WA	NOCA	PNR
Olympic National Park	WA	OLYM	PNR
Organ Pipe Cactus National Monument	AZ	ORPI	WR
Ozark National Scenic Riverways	MO	OZAR	MWR
Padre Island National Seashore	TX	PAIS	SWR
Petrified Forest National Park	AZ	PEFO	WR
Pictured Rocks National Lakeshore	MI	PIRO	MWR
Point Reyes National Seashore	CA	PORE	WR
Prince William Forest Park	VA	PRWI	NCR
Redwood National Park	CA	REDW	WR
Rocky Mountain National Park	CO	ROMO	RMR
Ross Lake National Recreation Area	WA	ROLA	PNR
Saguaro National Monument	AZ	SAGU	WR
Saint Croix National Scenic Riverway	WI	SACN	MWR
Sequoia National Park	CA	SEQU	WR
Shenandoah National Park	VA	SHEN	MAR

National Park Service Unit	State	Park Code	Region Code
Sleeping Bear Dunes National Lakeshore	MI	SLBE	MWR
Theodore Roosevelt National Park	ND	THRO	RMR
Voyageurs National Park	MN	VOYA	MWR
Whiskeytown-Shasta-Trinity National Recreation Area	CA	WHIS	WR
White Sands National Monument	NM	WHSA	SWR
Wind Cave National Park	SD	WICA	RMR
Wrangell-St. Elias National Park and Preserve	AR	WRST	AR
Yellowstone National Park	WY, MT, ID	YELL	RMR
Yosemite National Park	CA	YOSE	WR
Yukon-Charley Rivers National Preserve	AK	YUCH	AR
Zion National Park	UT	ZION	RMR

AR   Alaska Region
MAR   Mid-Atlantic Region
MWR   Midwest Region
NAR   North Atlantic Region
NCR   National Capital Region
PNR   Pacific Northwest Region
RMR   Rocky Mountain Region
SER   Southeast Region
SWR   Southwest Region
WR   Western Region

Appendix B: Backcountry Manager Questionnaire

Note: Alphanumeric codes in parentheses following questionnaire items refer to field names within five dBASE III Plus databases available for this report. Numbers typed in blanks for Sections III and V refer to the number of parks responding in the affirmative for those items.

NATIONAL PARK SERVICE
BACKCOUNTRY RECREATION MANAGEMENT SURVEY

I. INTRODUCTION

A. Purpose of Study

Park managers are often challenged to develop effective management actions to minimize resource impacts resulting from visitor use, and to protect the quality of visitors' experiences. As a result, a large number of recreation resource management techniques have been developed and applied by managers. The purpose of this study is to document and describe:

- The type and severity of problems related to recreation within NPS backcountry areas
- Management actions applied by managers to mitigate these problems
- The effectiveness of specific management actions in resolving these problems
- The type and extent of monitoring efforts applied by parks to address these problems

Study results will be distributed to all participating park units in both report and dBASE database formats to facilitate the communication of effective management actions and to provide park contacts for those seeking additional information. **Please complete and mail this survey and supporting materials to the address on the last page by November 8.**

B. Background Information

1. Park Unit Name: (NAME) _____   Park Code: (A1) _____

    Individual(s) who completed Survey: *Title*   Phone (PHONE)

    _____   _____   _____

    _____   _____   _____

    _____   _____   _____

<u>Working Definition of Backcountry</u> - As used by the NPS, this term refers generically to "primitive, undeveloped portions of parks" (*Management Policies*). While backcountry areas are most often zoned as natural zones, backcountry areas may occur in any land classification zone, except the developed zone. Developments within backcountry areas are generally limited to trails, unpaved roads, and administrative facilities associated with dispersed recreation use. For the purposes of this study, backcountry is defined as those areas managed primarily for natural conditions and processes that are generally not accessed by visitors with standard passenger vehicles. Include sections of rivers, lakes, or ocean which your park manages as backcountry.

If there are any clarifications or special circumstances pertaining to the application of our backcountry criteria, please note them below:

_____

_____

2. Using this definition, please estimate the number of acres in your park which qualify as backcountry: (A2) _____

3. Estimate the total mileage of:
    a. Officially recognized backcountry trails: (A3A) _____ miles
    b. Unofficial, backcountry trails (if known): (A3B) _____ miles

4. Number of backcountry facilities:
   a. Shelters (A4A) _____ (#)
   b. Campsites (estimate) (A4B) _____ (#)

5. Estimate the percentage of backcountry visitors that are:
   a. day users: (A5A) _____ %
   b. accompanied by commercial outfitters or guides: (A5B) _____ %

6. Estimate the average length of stay for **overnight** backcountry visitors? (A6) _____ nights

7. Estimate the percentage of backcountry visitors who are primarily:
   Backpackers/hikers: (A7A) _____ %
   Boaters: (A7B) _____ %
   Horseback/packstock users: (A7C) _____ %
   Hunters: (A7D) _____ %
   Fishermen: (A7E) _____ %
   Off-Road-Vehicle users: (A7F) _____ %
   Other major uses (please specify):
   _____ _____ %
   _____ _____ %

8. What is the best single description of the backcountry experience level of visitors to your backcountry:
   _____ A majority are beginners/novices (A8, coded as 1)
   _____ A majority have intermediate levels of experience (A8, coded as 2)
   _____ A majority are highly experienced (A8, coded as 3)
   _____ A wide and relatively equal range of experience levels are represented (A8, coded as 4)

9. Please numerically rank the top four geographic or resource features that draw backcountry recreationists
   to your park (use "1" as the highest rank): (A9A - highest, A9B, A9C, A9D - lowest)
   _____ Mountains (coded as 1)   _____ Vegetation (coded as 9)
   _____ Lakes/reservoirs (coded as 2)   _____ Wildlife (coded as 10)
   _____ Rivers/streams (coded as 3)   _____ Fish (coded as 11)
   _____ Seashore/coastal (coded as 4)   _____ Archaeological/historical features (coded as 12)
   _____ Swamp or other shallow water environments (coded as 5)
   _____ Outstanding geological features (coded as 6)
   _____ Grasslands (coded as 7)   _____ Other (please specify): _____
   _____ Deserts (coded as 8)   _____ Other (please specify): _____

10. Check any of the following park plans which address or provide any direction for backcountry recreation
    management (include expected completion dates for those in progress):
    _____ General Management Plan (A10A)   _____ Wilderness Management Plan (A10D)
    _____ Resource Management Plan (A10B)   _____ Land Protection Plan (A10E)
    _____ Backcountry Management Plan (A10C)
    _____ Other (please specify): _____

II. BACKCOUNTRY RECREATION MANAGEMENT PROBLEMS

This section identifies the type and perceived severity of backcountry recreation management problems in your park. Use the Problem Severity Scale provided to rate the following list of backcountry recreation management problems with respect to your park currently. Problems not listed can be added in the "Other" space provided. For each problem circle the most descriptive rating. Please review and discuss your ratings with other park staff, where appropriate.

Problem Severity Scale: 0 = Not a problem
1 = A problem in a few areas
2 = A problem in many areas
3 = A problem in most areas
(Scale values used as codes in variables below)

Backcountry Recreation Management Problems	Problem Severity Scale

1. CAMPSITE IMPACTS

a. Herbaceous vegetation loss/compositional change (B1A)	0 1 2 3
b. Tree and shrub damage/loss (B1B)	0 1 2 3
c. Soil exposure/erosion (B1C)	0 1 2 3
d. Excessive site size (B1D)	0 1 2 3
e. Multiple fire sites (B1E)	0 1 2 3
f. Exotic vegetation introduction (B1F)	0 1 2 3
g. User-constructed facilities/developments (B1G)	0 1 2 3
h. Campsite proliferation (B1H)	0 1 2 3
i. Other (please specify): _____	0 1 2 3

2. TRAIL IMPACTS

a. Soil erosion (B2A)	0 1 2 3
b. Trail widening (B2B)	0 1 2 3
c. Braided or multiple treads (B2C)	0 1 2 3
d. Creation of undesired trails (B2D)	0 1 2 3
e. Excessive trail muddiness (B2E)	0 1 2 3
f. Other (please specify): _____	0 1 2 3

3. ROAD IMPACTS (4-wheel drive)

a. Soil erosion (B3A)	0 1 2 3
b. Road widening (B3B)	0 1 2 3
c. Braided or multiple track roads (B3C)	0 1 2 3
d. Creation of undesired roads (B3D)	0 1 2 3
e. Other (please specify): _____	0 1 2 3

4. WATER IMPACTS

a. Biological contamination (e.g. giardia, fecal matter) (B4A)	0 1 2 3
b. Chemical contamination (e.g. soaps, gasoline/oil) (B4B)	0 1 2 3
c. Sedimentation pollution (e.g. soil erosion) (B4C)	0 1 2 3
d. Other (please specify): _____	0 1 2 3

Backcountry Recreation Management Problems	Problem Severity Scale

5. WILDLIFE IMPACTS
(Resulting from intentional or unintentional visitor actions)

a. Harassment/disturbance of wildlife (B5A)	0 1 2 3
b. Displacement of wildlife from important habitats (B5B)	0 1 2 3
c. Attraction/feeding of wildlife (B5C)	0 1 2 3
d. Disturbance of threatened/endangered species (B5D)	0 1 2 3
e. Other, (please specify): _____	0 1 2 3

6. LITTER / FECAL MATTER

a. Litter (B6A)	0 1 2 3
b. Human fecal matter (B6B)	0 1 2 3
c. Horse manure (B6C)	0 1 2 3
d. Other (please specify): _____	0 1 2 3

7. VISITOR CROWDING / CONFLICT
Too many encounters with other visitors:

a. at campsites (B7A)	0 1 2 3
b. at popular features (B7B)	0 1 2 3
c. while hiking on trails (B7C)	0 1 2 3
d. while travelling in boats (B7D)	0 1 2 3
e. who are travelling or camping in large groups (B7E)	0 1 2 3
f. Other, (please specify): _____	0 1 2 3

Incompatible uses - conflicts between different types of recreation use
(e.g. backpackers and horse users, canoeists and motorboaters)
Please list your primary incompatible user groups:

g. _____ and _____	0 1 2 3
h. _____ and _____	0 1 2 3
i. _____ and _____	0 1 2 3

Inconsiderate visitor behavior

j. Excessive noise (B7J)	0 1 2 3
k. Use/abuse of alcohol (B7K)	0 1 2 3
l. Use/abuse of drugs (B7L)	0 1 2 3
m. Nudity (B7M)	0 1 2 3
n. Pets running loose (B7N)	0 1 2 3
o. Theft (at parking area or in backcountry) (B7O)	0 1 2 3
p. Vandalism (at parking area or in backcountry) (B7P)	0 1 2 3
q. Other, (please specify): _____	0 1 2 3

8. ILLEGAL COLLECTING (By backcountry recreationists)

a. Plants (B8A)	0 1 2 3
b. Animals (B8B)	0 1 2 3
c. Fossils (B8C)	0 1 2 3
d. Archaeological artifacts (B8D)	0 1 2 3
e. Rocks/minerals	0 1 2 3
f. Other, (please specify): _____	0 1 2 3

9. Please rate the extent to which the following recreation activities are a contributing cause of the backcountry recreation management problems addressed in the previous section.

Use the following ratings:
0 = Not a cause
1 = Minor cause
2 = Moderate cause
3 = Major cause

BACKCOUNTRY PROBLEMS	RECREATION ACTIVITIES[1]									
	DU	OU	RS	OA	MB	BM	BN	SM	SS
Campsite Impacts									
Trail Impacts									
Road Impacts									
Water Impacts									
Wildlife Impacts									
Litter									
Human/Horse Fecal Matter									
Visitor Encounters									
Visitor Conflicts									
Inconsiderate Visitor Behavior									
Illegal Collecting									

1 - Recreation Activity Codes:
DU - Day Use
OU - Overnight Use
RS - Recreation Stock
OA - ORV & ATV
MB - Mountain Bike
BM - Boating, Motorized
BN - Boating, Non-Motorized
SM - Snowmobiling
SS - Snow Skiing

10. How does the park generally first recognize backcountry recreation management problems? Who provides the stimulus to actively address the problems identified? Please rank order (1 = most frequent source, 2 = second most frequent source, 3 = third most frequent source, etc.) each of the following "Problem Identification" and "Stimulus to Action" sources:

	Problem Identification	Stimulus to Action
a. Concessionaire operators		
b. Park cooperating associations		
c. Public interest organizations (e.g. NPCA, Sierra Club)		
d. Park staff		
e. Resource inventory and monitoring efforts		
f. Unsolicited visitor comments/complaints		
g. Visitor surveys		
h. Other (please specify): _____		

III. BACKCOUNTRY RECREATION MANAGEMENT ACTIONS

This section identifies management actions implemented by your park to address the backcountry recreation management problems evaluated in Section II.

Please review the following list of management actions and **check all actions that are currently in effect for all or some portion of the backcountry of your park.** Sections A and B contain more generic management actions that apply to a variety of management problems. All other actions are grouped by the problem that they are most typically adopted to address.

* Special Note: The terms "encourage" and "discourage" used below may refer to a variety of management approaches, primarily informational (communication through visitor contact and printed information), but also including resource manipulation and possibly regulatory actions. The terms "require" and "prohibit" refer solely to visitor regulations.

A. ACTIONS TO LIMIT AMOUNT OF VISITOR USE (number of parks employing action listed in blanks)

1. <u>23</u> Actively encourage the use of areas outside the park (C1)
2. <u>63</u> Backcountry overnight visitors are required to obtain permits (C2)
3. <u>7</u> Backcountry day use visitors are required to obtain permits (C3)

If your park does not have a permit system, proceed to number 10 below, otherwise:

4. <u>35</u> Permits are used to restrict/ration visitor numbers (C4)
5. Permits are issued by (check all that apply):
   <u>28</u> a. reservation (C5A)
   <u>56</u> b. first-come, first-served (C5B)
   <u>3</u> c. lottery (C5C)
6. <u>2</u> A fee is charged to obtain a permit (C6A) (specify: $ 17.50) (C6B)
7. Permits are restricted/rationed (check all that apply):
   <u>17</u> a. for the entire backcountry (C7A)
   <u>10</u> b. by access point (C7B)
   <u>11</u> c. by travel or management zones (C7C)
   <u>33</u> d. by campsite availability (C7D)
   <u>4</u> e. for selected problem areas (C7E)
   ___ f. other: ____
8. <u>41</u> Permits are required only for certain recreational activities (C8A)
   (specify activities: _____) (C8B)
9. Permits are obtained:
   <u>18</u> a. by mail (C9A)
   <u>13</u> b. by telephone (C9B)
   <u>62</u> c. in person (C9C)
10. <u>43</u> Encourage groups to limit their size (C10)
11. <u>58</u> Require groups to limit their size (C11A) (specify maximum group size: 13.6) (C11B)
12. <u>47</u> Require trip length of stay limits (C12A) (specify maximum length of stay: 11.3) (C12B)
13. <u>20</u> Require certain skills and/or equipment for certain uses (C13)
14. Backcountry access is made more difficult by:
    <u>29</u> a. closing roads (C14A)
    <u>11</u> b. reducing road maintenance (C14B)
    <u>12</u> c. closing trails (C14C)
    <u>17</u> d. reducing trail maintenance (C14D)

15. __50__ Discourage use of environmentally sensitive areas (C15)
16. __43__ Close environmentally sensitive areas to all use (C16)
17. __8__ Discourage use of "attraction" areas (C17)
18. __28__ Add or improve facilities (e.g. campsites, trails, bridges) in alternative areas (C18)
19. __11__ Eliminate facilities in high use attraction areas (C19)
20. __50__ Inform visitors about park's concerns with visitor use impacts in "attraction" areas (C20)
21. __37__ Inform visitors about impacted conditions they may encounter in "attraction" areas (C21)
22. __—__ Other, (please specify): _____

B. ACTIONS TO EDUCATE VISITORS AND ENFORCE REGULATIONS

23. Do you teach low or minimum impact backcountry use practices:
    __72__ Yes; If yes, describe your educational program (check all that apply): (C23)
    __46__ a. Low impact literature is available on request (C23A)
    __45__ b. Low impact literature is displayed at visitor centers and ranger stations (C23B)
    __48__ c. Low impact literature is displayed on bulletin boards at backcountry access points (C23C)
    __37__ d. Low impact literature is provided or shown to most or all backcountry visitors (C23D)
    __64__ e. Park rangers are instructed to convey low impact messages during backcountry visitor contacts (C23E)
    __9__ f. Low impact videos or slide programs are routinely shown at visitor centers (C23F)
    __9__ g. Low impact videos or slide programs are shown to backcountry visitors upon request (C23G)
    __14__ h. Low impact literature, videos, or slide programs are sent upon request to local schools and outdoor education programs/clubs (C23H)
    __4__ i. Low impact literature, videos, or slide programs are routinely sent to local schools and outdoor education programs/clubs (C23I)
    __29__ j. Low impact programs are presented by park staff upon request to local schools and outdoor education programs/clubs (C23J)

24. Violations of backcountry regulations related to recreation use (camping, fires, party size, etc.) are most typically addressed or enforced by (check the most commonly applied action):
    __46__ a. Visitor contact (C24A)
    __59__ b. Verbal warnings (C24B)
    __18__ c. Written warnings, no fine (C24C)
    __28__ d. Violation notices, w/fines (C24D)

C. ACTIONS TO REDUCE CAMPSITE IMPACTS

25. __58__ Campsite length of stay limits (C25A) (specify maximum length: __9.4__) (C25B)
26. __32__ Relocate campsites from fragile to more durable soils and/or vegetation types (C26)
27. __37__ Locate campsites/facilities on durable sites (C27)
28. __40__ Concentrate or channel use on sites through location of firepits or other facilities (C28)
29. __46__ General campsite maintenance (C29)
30. __34__ Close/rehabilitate impacted campsites (C30)
31. __34__ Close/rehabilitate undesired campsites (C31)
32. __25__ Seed/transplant vegetation on campsites (C32)
33. __18__ Plant trees/shrubs on campsites (C33)
34. __9__ Provide shelters for visitor overnight use (C34)
35. __12__ Provide tent platforms (C35)
36. __28__ Provide firegrates (any type) (C36)
37. __19__ Provide tables (C37)
38. __42__ Teach minimum impact camping techniques (C38)
39. __—__ Other, (please specify): _____

	Discouraged	Prohibited
40. Overnight use is (C40DA/PA)	a. 1	4
Camping in areas with no evidence of use is (C40DB/PB)	b. 25	17
Camping on lightly impacted sites is (C40DC/PC)	c. 11	4
Camping on heavily impacted sites is (C40DD/PD)	d. 17	9
Camping within a certain distance or sight of roads/facilities (C40DE/PE)	e. 6	43 (Distance: 2459')(C40E)
Camping within a certain distance or sight of trails (C40DF/PF)	f. 11	28 (Distance: 1010')(C40F)
Camping within a certain distance or sight of other campsites (C40DG/PG)	g. 18	17 (Distance: 1199')(C40G)
Camping within a certain distance of water (C40DH/PH)	h. 4	41 (Distance: 270')(C40H)
Camping within a certain distance or sight of popular features (C40DI/PI)	i. 10	14 (Distance: 760')(C40I)
Camping within certain designated geographic areas (C40DJ/PJ)	j. 6	33
Camping in fragile ecosystem/vegetation types (C40DK/PK)	k. 26	24
Ground fires, parkwide, are (C40DL/PL)	l. 9	40
Ground fires, in certain park areas, are (C40DM/PM)	m. 9	44
Cutting standing dead wood is (C40DN/PN)	n. 7	77
Axes/saws are (C40DO/PO)	o. 14	17
Other, (please specify):	p. —	—

	Encouraged	Required
41. Camping on sites with no evidence of use is (C41EA/RA)	a. 12	0
Camping on lightly impacted sites is (C41EB/RB)	b. 7	0
Camping on moderately impacted sites is (C41EC/RC)	c. 9	2
Camping on heavily impacted sites is (C41ED/RD)	d. 9	4
Camping on designated campsites parkwide (C41EE/RE)	e. 16	23
Camping on designated campsites in certain areas (C41EF/RF)	f. 11	29
Camping within a certain distance of trails (C41EG/RG)	g. 5	9 (Distance: 1240')(C41G)
Camping within certain designated geographic areas	h. 11	23
Camping in impact-resistant ecosystem/vegetation types (C41EH/RH)	i. 26	8
Use of backpacking stoves is (C41EJ/RJ)	j. 42	34
Other, (please specify):	k. —	—

D. ACTIONS TO REDUCE TRAIL IMPACTS

42. 44 Off-trail travel is discouraged (C42)
43. 10 Off-trail travel is encouraged (C43)
44. 32 Teach minimum impact hiking techniques (C44)
45. 42 Use of unofficial trails is discouraged (C45)
46. 19 Trail use during seasons when soils are saturated is discouraged (C46)
47. 38 Relocate trails from fragile to more durable soils and/or vegetation types (C47)
48. 40 Relocate trails to avoid steep grades (C48)
49. 48 Perform regular general trail maintenance (C49)
50. 23 Delineate trail edges to keep visitors on a defined tread (C50)
51. 27 Close/rehabilitate impacted trails (C51)
52. 41 Close/rehabilitate undesired trails (C52)
53. 28 Install trail bog bridges or corduroy (C53)
54. 15 Seed/transplant vegetation on trails (C54)
55. 1 Apply trail soil cement (C55)
56. 13 Gravel trails (C56)
57. — Other, (please specify): _____

E. ACTIONS TO REDUCE VISITOR CROWDING AND CONFLICT

58. __17__ Encourage visitors to use natural colored equipment/clothing (C58)
59. __25__ Designate trails for different types of visitor use (C59)
60. __11__ Segregate different types of visitor use by geographic area (C60)
61. __5__ Stagger start times for river trips (C61)
62. __13__ Encourage weekday use (C62)
63. __4__ Discourage weekend use (C63)
64. __27__ Encourage off-season use (C64)
65. __11__ Discourage use during peak seasons (C65)
66. __35__ Encourage use of less popular access points and backcountry areas (C66)
67. __42__ Encourage quiet behavior and activities (C67)
68. __52__ Inform visitors about crowded conditions they may encounter in certain areas (C68)
69. __37__ Inform visitors about conflicting uses they may encounter in certain areas (C69)
70. __—__ Other, (please specify): _____

F. ACTIONS TO REDUCE RECREATION STOCK IMPACTS

71. Recreation stock use is:

    Discouraged   Prohibited

    a. __10__   __55__ within certain areas/on certain trails (C71DA/PA)
    b. __7__   __8__ throughout the backcountry (C71DB/PB)
    c. __11__   __22__ within camp areas (C71DC/PC)
    d. __12__   __14__ during certain seasons (C71DD/PD)
    e. __7__   __10__ in certain ecosystem/vegetation types (C71DE/PE)
    f. __9__   __36__ from off-trail travel (C71DF/PF)

72. __22__ Stock users are restricted to designated stock campsites (C72)
73. __2__ Stock users must obtain permits to graze recreation stock (C73)
74. __7__ Grazing permitted only in designated areas (C74)
75. __38__ Stock feed must be carried (C75)
76. __18__ Low impact stock-restraint techniques are encouraged (C76)
77. __11__ Low impact stock-restraint techniques are required (C77)
78. __30__ Limits on stock numbers (Specify maximum number): (C78A) __11.7__) (C78B)
79. __—__ Other, (please specify): _____

G. ACTIONS TO REDUCE LITTER

80. __85__ Emphasize "pack-it-in, pack-it-out" policy (C80)
81. __4__ Prohibit cans and/or bottles (C81)
82. __22__ Provide free litter bags (C82)
83. __70__ Remove visitor trash (C83)
84. __—__ Other, (please specify): _____

H. ACTIONS TO REDUCE WILDLIFE IMPACTS

85. __10__ All use is prohibited in areas critical to wildlife (C85)
86. __36__ Use is prohibited during periods critical to wildlife (C86)
87. __15__ Camping is discouraged in areas critical to wildlife (C87)
88. __36__ Camping is prohibited in areas critical to wildlife (C88)
89. __25__ Campsites and trails are located away from areas critical to wildlife (C89)
90. __49__ Visitors are instructed to view wildlife from a distance (C90)
91. __69__ Visitors are instructed to not feed wildlife (C91)

92. 23 Campers are required to hang food out of reach of animals (C92)
93. 18 Devices for hanging/securing food are provided at campsites (C93)
94. 46 Campers are instructed on camping practices that will not attract animals (C94)
95. 17 Pets are discouraged (C95)
96. 35 Pets must be leashed (C96)
97. 57 Pets are prohibited (C97)
98. —   Other, (please specify): _____

I. ACTIONS TO REDUCE PROBLEMS WITH HUMAN FECAL MATTER

99.   6   Camping is discouraged in areas where waste disposal is a problem (C99)
100. 5   Camping is prohibited in areas where waste disposal is a problem (C100)
101. 11 Camping is permitted only in areas where toilets are provided (C101)
102. 42 Toilets are provided at some or all campsites (C102)
103. 61 Visitors are instructed to bury human wastes (C103)
104. 13 Visitors are instructed to carry out human wastes (C104)
105. —   Other, (please specify): _____

J. ACTIONS TO REDUCE CONTAMINATION OF WATER

106. 17 Camping is discouraged within a certain distance of streams or lakes (C106)
107. 39 Camping is prohibited within a certain distance of streams or lakes (C107)
108. 13 Bathing or washing dishes/clothes in lakes/streams is discouraged (C108)
109. 36 Bathing or washing dishes/clothes in lakes/streams is prohibited (C109)
110. 42 Toilets are located away from all water sources (C110)
111. 53 Visitors are instructed to defecate away from all water sources (C111)
112. —   Other, (please specify): _____

IV. THE EFFECTIVENESS OF BACKCOUNTRY RECREATION MANAGEMENT ACTIONS

The purpose of this section is to obtain more detailed information about the effectiveness of specific management actions implemented by parks to address backcountry management problems.

Please select two backcountry management problems which you feel the park has successfully addressed through implemented management actions/programs and two problems which are unresolved in spite of management actions you may have implemented. Try to select general categories of impacts such as those highlighted in Section II (e.g. campsite impacts, trail impacts, ... illegal collecting) rather than highly specific problems.

For each management problem selected:
  1) describe the nature of the problem as related to your park,
  2) list all management actions implemented by the park to address the problem (including more generic actions such as those in Section III A & B),
  3) rate (using the Scale below) and comment on the perceived effectiveness of each management action towards resolving the problem, and
  4) comment on factors other than management actions which have helped or hindered the resolution of the management problem.

Effectiveness Scale:
  1 = Not effective   **3 = Moderately effective**
  2 = Somewhat effective   **4 = Highly effective**

Space is provided below for you to complete this section but we encourage you to use a word processor, if possible.

A. Management Problems the Park Has Addressed Successfully

1. Management problem number 1:

2. For each management action implemented by the park to address this problem, describe the action, rate its effectiveness using the **Effectiveness Scale**, and comment on your rating (why was the action effective or ineffective):

3. Describe any additional factors helping or hindering the resolution of the management problem:

1. Management problem number 2:

2. For each management action implemented by the park to address this problem, describe the action, rate its effectiveness using the **Effectiveness Scale**, and comment on your rating (why was the action effective or ineffective):

3. Describe any additional factors helping or hindering the resolution of the management problem:

1. Management problem number 3:

2. For each management action implemented by the park to address this problem, describe the action, rate its effectiveness using the **Effectiveness Scale**, and comment on your rating (why was the action effective or ineffective):

3. Describe any additional factors helping or hindering the resolution of the management problem:

_____

1. Management problem number 4:

2. For each management action implemented by the park to address this problem, describe the action, rate its effectiveness using the **Effectiveness Scale**, and comment on your rating (why was the action effective or ineffective):

3. Describe any additional factors helping or hindering the resolution of the management problem:

V. RECREATION CARRYING CAPACITY

This section concerns the recreation carrying capacity of the backcountry of your park. Recreation carrying capacity is the amount and type of recreation use a backcountry can accommodate while meeting NPS management objectives relating to both protecting the resource and maintaining the quality of the visitor experience.

1. First, we would like to know to what extent recreation carrying capacity has been determined for the backcountry of your park. Please check the situation below which best describes your park. (Check <u>all</u> that apply.)

   Carrying capacity has been determined with the aid of scientific research studies (Check <u>one</u> of the following.) (E1A)
   - <u>9</u> Carrying capacity has been determined for the backcountry
     - <u>4</u> For the entire backcountry (E1B)
     - <u>14</u> For portions or zones of the backcountry (E1C)

   <u>23</u> Carrying capacity has been estimated without the aid of scientific research studies (Check <u>one</u> of the following.) (E1D)
   - <u>12</u> For the entire backcountry (E1E)
   - <u>25</u> For portions or zones of the backcountry (E1F)

   <u>51</u> Carrying capacity has not been estimated (Check <u>one</u> of the following.) (E1G)
   - <u>49</u> For the entire backcountry (E1H)
   - <u>17</u> For portions or zones of the backcountry (E1I)

2. A. You may have established a formal recreation carrying capacity, or have estimated one, or at least have some rough "feeling" for the recreation carrying capacity of the backcountry of your park. Regardless of the methods you have used to determine or think about carrying capacity, please estimate how current visitor use (during the main use season) relates to the recreation carrying capacity of the backcountry. (Check <u>one</u> of the following.)

   - <u>20</u> Visitor use never exceeds carrying capacity at any time or location. (E2A, coded as 1)
   - <u>53</u> Visitor use occasionally exceeds carrying capacity at some times and/or locations. (E2A, coded as 2)
   - <u>17</u> Visitor use often exceeds carrying capacity at some times and/or locations. (E2A, coded as 3)
   - <u>0</u> Visitor use often exceeds carrying capacity throughout the backcountry. (E2A, coded as 4)

   B. [This question is <u>only</u> for parks which <u>ration or limit visitor use</u> of the backcountry (through permits, trailhead quotas, etc.).] Using the same categories as above, please estimate what would probably happen if visitor use was not rationed or limited. (Check <u>one</u> of the following.)

   - <u>2</u> Visitor use would never exceed carrying capacity at any time or location. (E2B, coded as 1)
   - <u>20</u> Visitor use would occasionally exceed carrying cap. at some times and/or locations.(E2B, coded as 2)
   - <u>19</u> Visitor use would often exceed carrying capacity at some times and/or locations. (E2B, coded as 3)
   - <u>6</u> Visitor use would often exceed carrying capacity throughout the backcountry. (E2B, coded as 4)

3. Recreation carrying capacity is often analyzed in terms of two basic components. The first is resource capability and refers to ability of natural and/or cultural resources to withstand visitor use. The second is social and refers to maintaining the quality of the visitor experience in light of crowding, conflicting uses and related issues. Based on your studies and/or observations, which of the following statements best describes your backcountry situation. (Check <u>one</u> of the following.)

   - <u>25</u> The resource component is the primary limiting factor in the recreation carrying capacity of this back-country. (E3, coded as 1)
   - <u>12</u> The social component is the primary limiting factor in the recreation carrying capacity of this backcountry. (E3, coded as 2)
   - <u>27</u> The resource and social components contribute about equally to the recreation carrying capacity of this backcountry. (E3, coded as 3)
   - <u>26</u> The relative importance of the resource and social components of recreation carrying capacity are unknown for this backcountry. (E3, coded as 4)

4. Several models or processes for determining recreation carrying capacity have been developed in the past few years. Please indicate the extent to which you are familiar and/or have used each of the following models or processes.

A. Limits of Acceptable Change (LAC) (Check one of the following.)
    17 I have not heard of this. (E4A, coded as 1)
    28 I have heard of this, but don't know very much about it. (E4A, coded as 2)
    29 I am very familiar with this. (E4A, coded as 3)
    14 I have used this in making recreation carrying capacity determinations. (E4A, coded as 4)

B. Visitor Impact Management (VIM) (Check one of the following.)
    28 I have not heard of this. (E4B, coded as 1)
    47 I have heard of this, but don't know very much about it. (E4B, coded as 2)
    11 I am very familiar with this. (E4B, coded as 3)
    2   I have used this in making recreation carrying capacity determinations. (E4B, coded as 4)

C. Carrying Capacity Assessment Process (C-CAP) (Check one of the following.)
    49 I have not heard of this. (E4C, coded as 1)
    37 I have heard of this, but don't know very much about it. (E4C, coded as 2)
    1   I am very familiar with this. (E4C, coded as 3)
    1   I have used this in making recreation carrying capacity determinations. (E4C, coded as 4)

5. A common element among the above three models or processes of recreation carrying capacity is emphasis on development of management objectives, indicators, and standards. Management objectives are broad statements describing the types of visitor opportunities that should be provided in a backcountry. Indicators are specific measurable variables which help to operationalize management objectives. Standards define the quantitative, measurable condition of each indicator. Two examples may help clarify these terms and their use. Within the resource component of recreation carrying capacity, a management objective might be to "maintain natural conditions." A related indicator might be the condition of ground cover vegetation at backcountry campsites. A standard for this indicator might be that the area of bare ground at backcountry campsites should not exceed 50 square feet. Within the social component of recreation carrying capacity, a management objective might be to "provide opportunities for solitude." A related indicator might be the number of encounters that occur between hiking parties along trails. A standard for this indicator might be that the average number of trail encounters per day should not exceed three.

We are interested in the extent to which management objectives, indicators, and standards have been developed for the backcountry of your park. You do not have to have used these specific terms. The above paragraph should help you understand the basic concepts each of these terms represents.

A. To what extent have management objectives been developed for the backcountry? (Check one.)
    50 Management objectives have not been developed. (E5A, coded as 1)
    40 Management objectives have been developed. I am enclosing a copy of the management objectives for the backcountry of this park. (E5A, coded as 2)

B. To what extent have indicators been developed for the backcountry? (Check one.)
    72 Indicators have not been developed. (E5B, coded as 1)
    17 Indicators have been developed. I am enclosing a copy of the indicators for the backcountry of this park. (E5B, coded as 2)

C. To what extent have standards been developed for the backcountry? (Check one.)
    69 Standards have not been developed. (E5C, coded as 1)
    20 Standards have been developed. I am enclosing a copy of the standards for the backcountry of this park. (E5C, coded as 2)

VI. DESCRIBE RESOURCE AND VISITOR MONITORING SYSTEMS

The purpose of this section is to document the type and extent of monitoring efforts applied by parks to address the condition of park resources and visitor experiences.

A. Resource Monitoring Systems

1. Briefly describe any parkwide or district level monitoring systems used to assess impacts caused by visitor use to each of the following resource categories. **Please include copies of any descriptive information, forms, or reports which describe these systems and the history of their use at the park.**

A. Campsites
Describe system(s) and which division(s) are responsible:

Program History (date initiated and frequency of monitoring):

B. Trails
Describe system(s) and which division(s) are responsible:

Program History (date initiated and frequency of monitoring):

C. Wildlife
Describe system(s) and which division(s) are responsible:

Program History (date initiated and frequency of monitoring):

D. Water Quality
Describe system(s) and which division(s) are responsible:

Program History (date initiated and frequency of monitoring):

B. Visitor Experience Monitoring Systems

2. Briefly describe any parkwide or district level monitoring systems used to assess social setting conditions (number of visitor encounters, perceptions of crowding or conflicts) or visitor satisfaction; do not include systems which only estimate or count visitor numbers. **Please include copies of any descriptive information, forms, or reports which describe these systems and the history of their use at the park.**

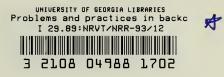Describe system(s) and which division(s) are responsible:

Program History (date initiated and frequency of monitoring):

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.