

The Influence of Wilderness Restoration Programs on Visitor Experience and Visitor Opinions of Managers

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Abstract—Wilderness campsites heavily damaged by recreational use pose a significant management challenge that threatens the integrity of the wilderness resource and the quality of the visitors' experience. This study, conducted in the Mission Mountains Wilderness of northwestern Montana, surveyed 293 visitors to determine what influence heavily damaged campsites and site restoration activities have on the quality of the visitors' experience, and to assess visitor opinions of the managers who implement or do not implement restoration. Visitors noticed campsite damage that reduced the quality of their experience as well as their opinions of managers. However, the quality of the visitors' experience and their opinions of managers improved significantly after they observed restoration activities.

The rationale for wilderness recreation management is to protect natural conditions and to provide opportunities for solitude or primitive and unconfined recreation experiences (Hendee and others 1990). When people visit a wilderness area today, they commonly see damage to campsites caused by recreation use and evidence of management actions to address these impacts. For example, when vegetation is severely trampled at a campsite and the soil begins to erode, it can influence the quality of the wilderness visitor's experience. A standard management action is to restore vegetation in heavily damaged campsites in wilderness. Recreational impacts at campsites in wilderness and how they influence the visitor experience is a concern to managers responsible for maintaining natural conditions.

Little is known however, about the perceptions of visitors regarding restoration, the appropriate levels of restoration or the role that managing agencies should play. The purpose of this study is to, (1) use visitor surveys to determine what influence site restoration programs have on the experience of wilderness users, and (2) to assess visitor opinions of the management agencies who implement site restoration.

Although many management actions are implemented to address social and ecological problems in wilderness,

management solutions to these problems and how they influence the quality of the visitors' experience have not been consistent or well documented. Reasons include the size of the wilderness preservation system and the fact that the federal agencies responsible for these areas often use different management approaches.

There are approximately one hundred and four million acres (42,105,263 hectares) of congressionally designated wilderness in the United States. The four federal agencies responsible for managing wilderness are the U.S.D.A. Forest Service, U.S.D.I. National Park Service, U.S.D.I. Bureau of Land Management and the U.S.D.I. U.S. Fish and Wildlife Service. The following excerpt from the 1964 Wilderness Act illustrates the challenges faced by the agency managers "these lands shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness."

When areas were first being designated as wilderness, managers believed that the best way to build a political constituency for wilderness was to increase the number of people who visited these areas. By the late 1960s, backpacking gained popularity, and many wilderness campsites were beginning to be severely damaged by an increasing number of visitors. At the same time, different types of wilderness visitors (horse users and hikers are one example) were beginning to experience conflicts. Managers began hearing more complaints from hikers about the damage to trails and campsites caused by horses, mules and other hikers. The federal agencies responsible for managing wilderness have typically reacted to these changes, such as damage to vegetation and crowding, rather than developing a proactive set of solutions that would prevent unacceptable levels of damage at campsites (Flood 1993).

Throughout the 1970s, managers struggled with the intent of the Wilderness Act and cautiously began to develop methods to better understand people's motives for entering wilderness. Because motives are often different for different visitors, managers began to realize they would have to implement measures to protect the resource from further impacts caused by the increasing numbers of people visiting wilderness. The need for comprehensive planning frameworks to improve wilderness management was apparent. During the early 1980s, the Limits of Acceptable Change (LAC) planning framework was developed to address changes in wilderness conditions and to better involve the public in the wilderness management planning process. The LAC process begins with the premise that change is inevitable, then moves on to determine how change will be inventoried, assessed and managed through indicators and standards (Stankey and others 1985; Stokes 1990).

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As a result of people recreating in wilderness over many years, resource impacts often exceed the standards set for a specific area. Examples include the number of campsites allowed in a lake basin, travel corridor or around a lake and, the degree of damage to a particular campsite. Generally, management plans provide a list of potential management actions to address exceeded standards. One option is to implement restoration. Because a wilderness manager's goal is to preserve natural conditions in wilderness according to the Wilderness Act and management plans, some managers have responded by implementing restoration programs.

What motivates visitors to spend time in wilderness and how they evaluate onsite conditions is a growing concern for managers and researchers (Aldo Leopold Wilderness Research Institute 1997). The use of theories to identify visitor intentions, how these intentions lead to benefits sought during the visit, and how onsite conditions influence the quality of the visitors' experience are not well understood. Over the past 20 years, wilderness research has used theories and models from the fields of psychology and sociology that measure human behavior and reshaped them to fit a wilderness paradigm. Previous studies (Cole 1996; Hall and Shelby 1993; Peterson 1974) have used the expectancy model to explore the role of expectations and actual perceived conditions in the satisfaction of wilderness experiences. The expectancy theory is used to signify how much visitor expectations influence the wilderness experience, especially with regard to visitors' perception of onsite conditions.

Being able to predict public visitor expectations of onsite conditions and their support for management practices could help resource managers develop successful strategies to maintain wilderness quality. Understanding the motivation and expectation of visitors is key to determining whether onsite conditions match desired outcomes. Results from recent studies indicate that wilderness user groups generally support management policies to regulate site improvements (Cole and others 1997; Shindler and Shelby 1993).

How visitors react to campsites affected by recreational use and how these campsites may influence their experience are not well understood. A need exists to identify and understand how onsite conditions in wilderness influence the visitors' experience and their opinions of managers. In three Western wilderness areas, Lucas (1987) found that visitors were more disturbed by environmental damage than by seeing other people. Research findings suggest that visitors who are sensitive to environmental damage either readjust their expectations to conform to the changing nature of the experience or are displaced to areas with fewer people and fewer damaged areas (Anderson 1980). Two types of visitors were identified: those who are displaced from an area and never return and those who return but use the resource differently. These individuals may go to other, less affected areas or make a readjustment of their expectations. They are motivated to reach their destination, even if their standards for impact and crowding are exceeded (Anderson and Brown 1984).

Previous experience in wilderness influences how people sort, evaluate and store information about a wilderness experience. In a study by Watson and Cronn (1994), the most experienced day-use visitors (those who first visited the area more than 10 years ago) reported significantly more resource impact problems than the less experienced groups.

This information suggests visitors can provide valuable information about wilderness conditions and visitor perceptions of management actions.

Although the primary goals of wilderness management are to maintain the free operation of natural processes and to preserve qualities such as wildness and solitude (Martin and others 1989), managers are also faced with the difficult task of administering areas "for the use and enjoyment of the American people." The difficulty lies in the fact that recreational use inevitably results in some changes to ecological and social conditions. Although the majority of wilderness areas are still relatively pristine, disturbances to campsites are highly concentrated at popular destinations and result in serious problems of visual impact. Thus, while some damaged campsites may not threaten the ecological integrity of an entire area, extensive soil erosion may produce serious localized resource damage and thus has the potential to influence the quality of visitors' experience (Cole 1993).

When restoration is the selected management action to restore damaged campsites, a series of trade-offs confront managers and wilderness visitors. While some campsites are closed for restoration, visitors may temporarily lose some freedom of choice, but the restored conditions may ultimately improve visitor experiences. The results from several studies suggest that visitors and managers evaluate bare ground, where vegetation has been destroyed, as the least acceptable impact at a wilderness campsite (Lucas 1980; Martin and others 1989; Shelby and Harris 1985). Managers and visitors are also more likely to identify campsite impacts as more severe and unacceptable the deeper they travel into the wilderness. However, more recent findings suggest that the number of campsites, rather than the amount of bare ground at campsites, should be considered when choosing indicators for evaluating campsite conditions (Cole 1993; Marion and others 1993).

An increasing number of studies are being conducted to better understand the attitudes of wilderness visitors toward wilderness management actions. In a study of six areas located in the Alpine Lakes, Mount Jefferson and Three Sisters Wilderness Areas in Washington and Oregon, researchers were surprised to find a high number of visitors who noticed campsite impacts that detracted from their experience. The research results also found a high level of support for current management actions and programs (Cole and others 1997). According to McCool and Lime (1988), "understanding visitor attitudes toward management actions and their benefits, consequences, costs, and values can help managers more effectively provide quality recreational experiences." Visitor attitudes are particularly important to managers where there is conflict among users or feelings of dissatisfaction about existing conditions (Lucas 1987).

Wilderness managers concerned about the steady deterioration of the wilderness resource often provide information and education about wilderness to current and future wilderness visitors. Wilderness education can be one method to influence visitor behavior. When people are provided information about "what" to expect prior to their visit, they are given an opportunity to make better decisions based on better information about biophysical and social conditions (Roggenbuck 1992; Schreyer and Roggenbuck 1978; Watson and Niccolucci 1992).

It would be helpful if managers knew how visitors might respond to different levels of damage at campsites, especially heavily damaged campsites, and how visitors might respond to restoration. It is also very important for managers to understand how different management actions can influence the quality of wilderness visitors' experience. Knowing this information will assist managers in providing quality recreation opportunities for wilderness visitors.

This study investigates how campsite restoration programs and heavily damaged campsites influence the quality of wilderness visitors' experience and their opinions of managers. The research questions are: 1) how do restoration activities and heavily damaged campsites influence the quality of the visitor experience; and 2) how do restoration activities, or lack of restoration activities to address damaged campsites, influence the visitors' opinions of managers?

Method

Description of Study Area

The study site for the research was located in northwestern Montana in the Mission Mountains Wilderness (MMW). The 73,877-acre (29,910 hectare) MMW is part of the National Wilderness Preservation System managed by the U.S. Forest Service. The MMW is located in Region One of the Flathead National Forest on the Swan Lake Ranger District.

Participants

Visitors to the Mission Mountains Wilderness (MMW) in northwestern Montana were recruited for participation in the study during the summer-use season of 1998. Visitors 18 years and older were asked to participate as they exited the wilderness. Visitors were both day-use and overnight visitors. Of those who participated in the study, 70 percent were day-use visitors, while approximately 30 percent were overnight visitors.

The majority (95%) of the visitors to the MMW came from nearby towns and cities (less than 100 miles). They primarily came from Missoula, Kalispell, Big Fork, Polson and other surrounding small towns and, 5% were out-of-state visitors. The average group size was 3 people per group. Many of the groups were family members or close relatives.

Materials

Data were collected using an exit survey developed from pre-existing visitor use surveys, conducted by the Forest Service in the Snow Lakes and Desolation Wilderness Areas. These surveys were used as models for the exit survey used in the Mission Mountains Wilderness. A pilot test of the instrument was conducted at the Glacier Lake trailhead (10 surveys were completed by wilderness visitors) to ensure reliability and validity.

Procedure

Visitors to the MMW were asked to fill out exit surveys during the 1998 summer-use period, from June 15 to September 15. The four sampling locations were areas where

active restoration was occurring. The selection of sampling locations for the four trailheads was based on overall use estimates compiled by the Forest Service for the past 10 years. The number of visitors who filled out exit surveys was proportional to the recorded use estimates. The initial targeted number of survey respondents was 300, which corresponds to approximately 10 percent of the estimated 3,000 visitors for the 1998 season. The number of sampling days assigned to each of the four trailhead contact points is proportional to the use estimates for the four trailheads. Both the data collection sites and days that the data were collected were randomly chosen. Visitors were contacted at the four trailheads on the sampling days and asked to complete the 10-minute exit survey onsite. Those who agreed to complete the survey were briefed about the purpose of the study. A total of 293 exit surveys were completed by MMW visitors. Six people contacted during the study period refused to fill out the survey.

Results

The results of the surveys indicated that a large percentage of visitors to the Mission Mountains Wilderness do notice heavily impacted campsites, which diminishes their experience. Conversely, visitors who observed restoration activities during their visit felt it had a positive effect on their experience and on their opinions of managers. Table 1 shows the number of visitor surveys completed at each trailhead location and the amount of time visitors spent in the wilderness during their visit.

Visitors in the study were asked to list the three most important reasons for taking this trip into the MMW. In the analysis, 87 related responses were grouped into four major reasons. The number one reason visitors listed for visiting the MMW was to engage in recreational activities. These activities included fishing, hiking, camping, using stock animals, rafting, huckleberry picking and swimming. The second was to experience solitude and spiritual renewal. These activities included freeing themselves from society and crowds, getting life into a better perspective, rest and relaxation, achieving a sense of solitude and renewing one's spiritual values. The third reason was nature appreciation. These activities included experiencing the natural scenic beauty, observing wildlife, better understanding the ecology, exploring, communing with nature and experiencing clean rivers, lakes and air. The fourth reason was to spend time with family and friends. These activities included being together with family and friends, introducing their children and grandchildren to wilderness, companionship and sharing Montana with friends and family.

The remaining survey questions asked visitors who observed restoration to rate how this may influence the quality of their future visits, whether it improved or detracted from their experience and how they felt the quality of their experience was influenced by observing heavily impacted sites versus restoration; they were also asked to rate their opinion of managers who implement restoration compared to managers who do little or nothing to address heavily impacted areas in wilderness.

The results in table 2 indicate that visitors felt restored campsites will increase the quality of their future visits. A total of 218 (72%) of the visitors indicated that the restored

Table 1—Visitor survey locations.

Trailhead location	Day-use visitors		Overnight visitors	
	n	hours/visit	n	days/visit
Glacier Lake	130	6	41	3
Cold Lake	47	7	16	3
Cedar & Piper Lakes	8	8	22	4
Crystal Lake	8	7	21	3
Total	193	-	100	-
Mean	-	7	-	3.25

Table 2—How will restored campsites influence the quality of your future visits?

Influence quality	n	M	SD	Median
	292	7	1.9	7

Ranked on a scale of 1 (greatly reduced), 5 (neutral), 9 (strongly increased).

campsites will increase or greatly increase the quality of their future visits.

The results in table 3 indicate that restoration did not detract from, but improved the quality of visitors' wilderness experience. Because we were interested in determining if restoration detracted from visitors' experience, a "neutral" or "had no effect" rating was not considered to detract from the experience. The results indicated that restoration activities had "not significantly detracted" from the quality of visitors' experience. One hundred and eighty-two visitors (63%) responded "strongly agree" or "agree" when asked if observing restoration improved the quality of their experience. Two hundred and sixty-five visitors (91%) responded strongly disagree, disagree or were neutral when asked if restoration detracted from the quality of their experience.

The results in table 4 indicate that visitors who intended to visit a natural setting and found damaged campsites felt this reduced or greatly reduced the quality of their experience. A majority of the visitors (71%) indicated that heavily impacted areas reduced or greatly reduced the quality of

Table 3—Influence of restoration on the quality of the visitor's experience.

Quality of visitor experience	n	M	SD	Median
Improved quality	291	3.8	0.98	4
Detracted quality	292	2.2	0.99	2

Ranked on a scale of 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree), 1 (strongly disagree).

Table 4—Influence of campsite conditions on the quality of visitor experience.

Campsite conditions	n	M	SD	Median
Heavily impacted sites	292	3.1	2.1	3
Presence of restoration	292	6.4	2.2	7

Ranked on a scale of 1 (greatly reduced), 5 (neutral), 9 (strongly increased).

their experience, whereas 67% of the visitors indicated that observing restoration increased or greatly increased the quality of their experience.

Visitor responses listed in table 5 indicate that visitor opinions of the managers were less positive after observing heavily impacted areas where little or no effort was made at restoring conditions. The results also indicate that the presence of restoration activities had a positive influence on visitors' opinions of managers. Two hundred and six visitors (71%) reported that their opinions of managers was negative or extremely negative when they observed impacted areas where little or nothing had been done to restore the impacts. This is compared with 226 visitors (74%) who reported that their opinion of managers who implemented restoration was positive to extremely positive. A total of 117 (40%) visitors rated their opinions of managers who implement restoration as extremely positive.

Further analysis compared short-time and long-time visitor responses to the same sets of questions. Responses from short-time visitors (0-5 years visiting the MMW) were compared with the responses of long-time visitors (20-plus years visiting the MMW). Table 6 shows the mean response scores for the groups. Notable differences were not apparent when comparing these two groups. Although both had a positive opinion of managers who implement restoration, they also indicated that their opinion of managers was reduced when little or no restoration effort was made to address impacts to vegetation and soil caused by recreational use.

In addition to the survey questions, respondents were asked to comment on the restoration program or the management of the MMW. Qualitative measures were used in

Table 5—Influence of restoration or "lack of restoration" on the visitor's opinions of managers.

Opinions of managers	n	M	SD	Median
Little or no restoration	288	3.3	1.8	3
Presence of restoration	292	7.2	2.4	8

Ranked on a scale of 1 (extremely negative), 5 (neutral), 9 (extremely positive), 0 (don't know).

Table 6—Comparing short-time and long-time visitor responses to restoration or impacted areas.

Comparing visitor responses	Short time	Long time
	n = 168	n = 52
Survey items	M	M
Influence on future visits	6.8 ^a	6.9 ^a
Influence of restoration on experience	6.2 ^a	6 ^a
Restoration detracts	2.1 ^b	2.2 ^b
Restoration improves	3.7 ^b	3 ^b
Opinion of managers yes restoration	7.1 ^c	7.2 ^c
Opinion of managers no restoration	3.2 ^c	3 ^c

^aResponses were ranked on a scales of 1 (greatly reduced), 5 (neutral), 9 (strongly increased).

^bRanked on a scale of 5 (strongly agree), 4 (agree), 3 (neutral), 2 (disagree), 1 (strongly disagree).

^cRanked on a scale of 1 (extremely negative), 5 (neutral), 9 (extremely positive), 0 (don't know).

the interpretation of the visitor comment section of the survey (Miles and Huberman 1994). Of the total 293 completed surveys, 108 respondents provided written comments. Of these, 58 were directed toward the restoration program. Among the 58 comments, 55 (95%) specifically supported the restoration efforts. The data analysis of these comments included a compilation of visitor comments, generating themes and categories of responses and summarizing them.

The visitor comments provided information about reactions to campsite impacts and restoration activities. Many of the comments highlighted the importance restoration plays in educating visitors about campsite impacts and the need to restore them. The most common phrase used by visitors to explain how they reacted to observing restoration was that they believed the area was "well cared for." Many respondents stated that their positive opinion of managers was the result of the managers' long-term commitment to restoration in the MMW. Many visitors indicated that when they visit other wilderness areas, they do not see impacted areas being restored or cared for at the level observed in the MMW.

Discussion

According to the Wilderness Act, one of the primary goals of wilderness management is to protect natural conditions. Historically, information and education have been two potential solutions to problems related to resource impacts in wilderness. These solutions are generally unobtrusive and hold long-term benefits for visitors and the wilderness resource. It seems that restoration, after information and education is another favored measure to achieve the desired resource conditions in wilderness, at least in the Mission Mountains Wilderness, while providing opportunities for quality visitor experiences.

Restoration is sometimes selected as a preferred management action to restore impacted areas back to their natural conditions. These research findings provide evidence that restoration can be an effective strategy to restore heavily damaged campsites. Although restoration is presumed to be the appropriate action to address damaged campsites, many managers are concerned that the long-term obtrusiveness of restoration activities may outweigh the benefits of restoring onsite conditions. The survey questions used in this study were designed to illuminate the influence restoration had on visitors' experience as well as their opinions of managers.

Because wilderness management is a newly evolving science, it is imperative that managers examine the influence of management actions on wilderness visitors' experience. Management decisions need to err on the side of wilderness and the experience of the wilderness visitor. If a manager's goal is to provide opportunities for quality wilderness experiences, restoration should play a more significant role as the number of visitors and impacts continue to grow. As positive as the results of this study are, replicated studies in other wilderness areas are needed. Additional information will assist wilderness managers who are weighing the potential costs and benefits of restoration.

Whereas many managers are faced with an increasing number of resource impacts, they are also challenged by reduced budgets. When managers face tough decisions, it can be difficult to determine the best use of available funds.

The results from this study inform wilderness managers about the benefits of selecting restoration as a preferred management action. Restoration has a high potential to restore damaged campsites. And, in the case of this study, it appears to improve the quality of visitors' experience, as well as their opinions of managers.

In the future, wilderness managers may select restoration more frequently as a potential solution to address impacts in wilderness. Even when visitors know a temporary loss of freedom will occur as a result of restoration activities, the potential for improved onsite conditions seems to be enough to convince them of the long-term benefits of restoration. Results from this study suggest that restrictions associated with restoration activities were perceived as short-term and less restrictive by visitors. Also, these visitors may be more likely to support restoration as a management approach than long-term restrictive measures, such as limits on types of use or overnight camping closures, to protect and restore resource conditions.

As we enter the next millennium, wilderness managers will continue to make tough management decisions. Many will be based on a "what you get for the dollars spent" philosophy. If the goal of research is to assess a situation and provide guidance in achieving new direction, concrete examples of how selected management actions can achieve the best benefits are needed. The results of this research indicate that restoration does influence visitors' experiences and opinions of managers in a positive way. Given these results, wilderness managers have evidence that supports restoration activities. There are strong similarities between the results from this study and previous studies by Cole and others (1997). Together, they support management decisions to address heavily damaged areas in wilderness.

For many visitors, wilderness is not just a nice place to visit. It is a place for significant contemplative experiences and has the power to enhance the quality of one's life. Restoring heavily damaged areas in wilderness does not have to be an anomaly, but an affirmation about what is right, and what good wilderness management should be.

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