

VISITOR PERCEPTIONS OF LIVESTOCK GRAZING IN FIVE U.S. WILDERNESS AREAS

A Preliminary Assessment

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Abstract: More than 1,000 visitors to five U.S. Forest Service wilderness areas in the intermountain west were surveyed using on-site interviews and a mail-back questionnaire to determine both site-specific and general perceptions about livestock grazing in designated wilderness and on public lands in general. The proportion of visitors who accepted livestock grazing in wilderness (43%) was similar to the proportion who considered grazing to be unacceptable (40%). Three-quarters of those who accepted grazing, however, predicated their approval on proper management to protect rangeland ecosystems. A majority of the wilderness visitors surveyed reported that direct encounters and livestock impacts detract from a wilderness experience. Results describe the types of impacts that were perceived and the relative acceptability of different types of encounters. Wilderness visitors were more tolerant of grazing on nonwilderness public lands if properly managed to protect ecosystems.

THE WILDERNESS ACT OF 1964 ALLOWS LIVESTOCK GRAZING TO CONTINUE where it existed prior to the designation of an area as wilderness. Congress further clarified its position through the grazing guidelines of the Colorado Wilderness Act of 1980, which stated that livestock grazing could not be curtailed because of wilderness designation. Thus, barring a change in law and congressional policy, grazing will continue to be allowed in many existing and newly designated wilderness areas (McLaran 1990). Grazing now occurs in more than 35% of U.S. wilderness areas (Reed, et al. 1988) and this is likely to increase as the mid- and lower elevation Bureau of Land Management wilderness roadless areas are added to the wilderness system. So, managers in the United States, and perhaps even more frequently in other countries (MacKinnon, et al. 1986), must accommodate livestock graz-

ing while simultaneously protecting wilderness values. An understanding of the perceptions and beliefs of wilderness visitors about livestock grazing can help managers, grazing permittees, and all users cooperate to improve both grazing management and communication toward those goals.

Existing Social Science Research

Increasing public awareness of environmental problems has resulted in growing support for environmental protection and a shift toward ecosystem management on public lands (Dunlap 1991; Brown and Harris 1992). All resource managers must now be increasingly sensitive to broader viewpoints, the social values held by various publics, and their perceptions about particular management actions (Brunson 1992).

Research on perceptions of grazing in wilderness is limited, but began in 1949 when the Legislative Reference Service surveyed land management and conservation organizations to measure support for federal wilderness preservation and public sentiment on wilderness uses including grazing. They found qualified acceptance for grazing as a nonconforming use "only by sufferance and with a view to its eventual elimination" (Keyser 1949). In a study of visitor perceptions of wilderness recreational carrying capacity, Stankey (1973) found definitions of crowding that included references to environmental factors, such as littering, excessive use levels, and damage associated from grazing, noting that a majority of visitors were opposed to corrals for pack stock in wilderness. Wells (1995) reviewed articles in popular media on public lands grazing and found that critics and proponents alike typically present positions that are highly polarized.

Brunson and Steel (1994) conducted a national survey to identify public attitudes about federal rangeland management.



Cattle were most frequently seen on trails, in meadows and near lakes and streams.

They found that the public believed overgrazing and poor water quality due to livestock impacts continued to be problems on rangelands. Further, a majority of the respondents supported the establishment of more rangeland wilderness areas but did not support livestock grazing in wilderness.

An on-site study conducted in Oregon examined the effect of grazing intensity on scenic quality (Sanderson, et al. 1986). National forest visitors evaluated photographs of three types of landscapes (mountain grasslands, meadows, and forests) under three types of grazing management. While visitors gave high preference ratings to landscapes under all three types of grazing management, preference ratings decreased as grazing intensity increased.

Wallace, et. al (1996) surveyed national forest visitors about their perceptions of livestock grazing on public lands and described specific types of livestock encounters or evidence that detracted from visitor experiences (e.g., cows near camp, manure on the trail, cows or impacts near streams, etc.) Other types of livestock encounters added to the recreational experiences of many visitors (calves with mothers, cattle in the distance, cowboys moving cattle, etc.). Visitors in dispersed campsites were more critical of livestock grazing than were visitors in developed campgrounds (Mitchell, et al. 1996). The study also examined 10 associated issues that the literature associates with livestock grazing, such as range condition, conflicts with wildlife, and conflicts with recreation, and found that the biophysical impacts of grazing were more objectionable than were the social impacts. The majority of visitors approved of grazing on public lands but also predicated their support for grazing on improving range conditions and riparian areas and reducing conflicts with other users.

The present study extends this line of research by examining wilderness visitor perceptions and beliefs about livestock grazing in designated wilderness to (1) describe the effects of various aspects of livestock grazing on wilderness visitor experiences; (2) describe the overall position held by wilderness visitors regarding livestock grazing in wilderness and

on public lands; and (3) evaluate the importance of various subissues related to livestock grazing for wilderness visitors.

Methodology

Five USDA Forest Service wilderness areas with ongoing interaction between livestock and visitors were selected for study, the first four in Colorado and the last one in Utah: Weminuche (San Juan National Forest [NF]), West Elk (Gunnison NF), Uncompahgre (Uncompahgre NF), Flat Tops (White River NF), and High Uintas (Wasatch-Cache and Ashley NFs). While they are not intended to be representative of the entire National Wilderness Preservation System (NWPS) they are typical of the more than seventy upper-elevation wilderness areas found in the intermountain west.

Estimated visitor use ranges from 70,000 visitor days per year in the West Elk Wilderness to 233,000 in the Weminuche Wilderness. The livestock grazing allotments in these wilderness areas were designated for either cattle and horses, or sheep and goats. They were judged by area range conservationists as having satisfactory health or at least

“good” overall range condition—even though some localized impacts were evident. Livestock were typically brought to the allotments during late June to mid-July and were taken off in September or October. The period of highest recreation visitor use in the study areas also corresponded with the presence of livestock.

The sampling frame comprised national forest wilderness visitors present in any of the five study sites during July, August, and early September 1994, stratified by weekend/weekday and by early, middle, and late summer. Trailheads with moderate- to high-use levels, registration boxes, and a likelihood that visitors would encounter livestock during their



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Table 1: Wilderness visitor agreement with position statements regarding livestock grazing in wilderness.

Position statement	Wilderness visitors, <i>n</i> = 586	Percent (%) Agree
Grazing in this wilderness, as it is now managed, is acceptable.		
Numbers of livestock and grazing fees should be kept at current levels.		11
Grazing in this wilderness is acceptable as long as management continues to improve the range condition; protection of streams, lakes, and native flora and fauna, and reduces conflicts with other users.		
Adjustments in livestock numbers and management may be necessary.		32
Grazing is not an acceptable use of this wilderness. It degrades the land, favors livestock over wildlife, is not cost-effective, and conflicts with other uses.		40
I do not know enough about grazing in this wilderness and therefore cannot make a fair judgment about any of the positions stated above.		17

Table 2: Wilderness visitor evaluations of encounters that affect the visitor experience.

Wilderness visitors, n = 577			
	Detracts Percent (%)	Neutral Percent (%)	Adds Percent (%)
Other visitors	54	32	14
Rangers	7	42	51
Cowboys with cattle	63	24	13
Anglers/hunters	37	47	16
Backpackers	13	55	32
Outfitters	65	28	7
Wildlife	<1	<1	99
Cattle	68	22	10
Sheep	66	23	11
Dogs	48	40	12
Horses/mules	51	34	15
Other packstock	45	44	11

visit were selected for sampling. A combination of mail-back surveys and interviews were used to gather information. (Readers interested in sampling details and data analysis procedures should contact the authors).

Results

All visitors who were approached agreed either to complete an interview or to take a mail-back survey form. A total of 1,035 full-length mail-back surveys were

distributed and 487 returned for a response rate of 47%. Of the 121 interviewed, 50 returned the mail-back portion (containing only sociodemographic items and nonsite specific questions about grazing), resulting in a response rate of 41% for the shortened mail-back survey. When the 121 interviewees were combined with the 487 mail-back-only respondents (all those survey items that tested site-specific perceptions were found on both the interview and mail-back-only surveys), there

Table 3: Wilderness visitor evaluations of types of livestock encounters that affect the visitor experience.

Wilderness visitors, n = 580			
Type of livestock encounter	Detracts Percent (%)	Neutral Percent (%)	Adds Percent (%)
In the distance	54	31	15
In or near camp	87	9	4
In riparian areas	82	12	6
On or near trails	78	16	6
In meadows	63	25	12
Cowboys	47	37	16
Sheep herders	51	36	13
Manure in camp	88	12	<1
Tracks in riparian areas	69	25	6
Trampled areas	76	21	3
Tracks on trails	62	34	4
Young livestock with mothers	52	30	18
Odors	75	23	2
Livestock sounds	63	29	8
Fences	74	24	2
Salt	58	39	3
Tanks	66	30	4
Corrals	69	27	4
Evidence of predator control	68	28	4

were 608 respondents for a response rate of 53%. Site-specific items comprised the major portion of the survey.

Site-Specific Perceptions

Wilderness visitors answered three open-ended questions before learning that the study focused on livestock grazing. When asked to identify anything that interfered with their wilderness visit, 38% said "nothing interfered" while 62% perceived some type of interference with their visit. The most frequently cited interference was from other visitors (18%), including crowding (11%), litter (3%), and inappropriate behavior (4%). Others who felt that something interfered with their visit attributed the problem to livestock (15%), citing direct encounters (12%) and related impacts such as manure (3%) or horses (5%).

A second open-ended question asked respondents to describe any negative impacts to the environment that they had observed, and their causes. Fifty percent of the respondents failed to mention noticing any negative impacts to the environment, but of those visitors who did notice impacts, 19% (of all visitors) attributed them to human activities, citing litter (11%), fire rings (3%), inappropriate behavior (3%), and crowding (2%) as impacts. Seventeen percent of all respondents attributed negative impacts to livestock, mentioning overgrazing (6%), manure (4%), trail erosion (4%), and poor water quality (2%), among others.

The third open-ended question asked what changes in management, if any, visitors thought should occur. Many respondents did not specify any preferred changes for the wilderness area that they visited (48%). Notable, however were the (16%) who recommended changes in livestock management, including eliminating livestock (12%), and some suggested reducing livestock numbers and concentrations (4%). Other visitors (15%) suggested changes in visitor management including trail improvements (9%), limiting visitor numbers in wilderness (8%), changing behavior of visitors through education or enforcement (5%), or zoning areas or trails for different uses (2%).

These open-ended questions were followed by items specifically related to livestock grazing. Most visitors (53%) had

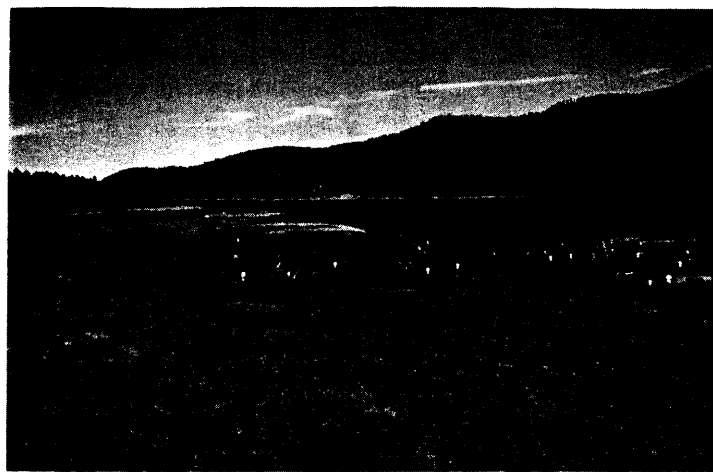
no expectations regarding the number of livestock encounters they would experience, about a fourth did not expect to encounter livestock, and the rest expected to have between one and five encounters with livestock. These expectations did not vary according to the number of days visitors had spent in wilderness during their trip. People expecting to see livestock were less likely to report that livestock-related impacts interfered with their enjoyment than were those not expecting to see livestock ($p < .05$). Forty-one percent of the respondents saw livestock and most of those had between one and five encounters (36%). Livestock were seen most frequently in meadows (32%), near lakes and streams (26%), and on trails (26%). Fewer respondents reported seeing livestock in campsites (12%).

Respondents were asked to choose from among three position statements about livestock grazing in the area that they visited (see Table 1). Only 11% of the respondents accepted grazing in wilderness as it is currently managed. Thirty-two percent of those surveyed accepted grazing in wilderness contingent on the proper management of rangeland ecosystems, but 40% felt that livestock grazing in wilderness was unacceptable because of environmental impacts and conflicts with other uses. Approximately 17% of those surveyed felt that they did not know enough about grazing in wilderness to choose a position on the issue. Notably, visitors expecting to see livestock were much more likely to accept grazing in wilderness as practiced or contingent on the improvement of management practices than were those not expecting to see livestock ($p < .01$).

General Perceptions and Effects on the Visitor Experience

Visitors then evaluated the degree to which 12 types of encounters affect a wilderness experience (see Table 2). Approximately two-thirds reported that direct encounters with livestock detract from a wilderness experience. Many also cited encounters with outfitters (65%), cowboys (63%), other visitors (54%), horses (51%), and dogs (48%) as detracting from a wilderness experience.

Respondents also rated the effect of various types of livestock encounters, impacts, and structures on the wilderness experience (see Table 3). For many visitors, all livestock encounters and related impacts and structures listed detracted from the wilderness experience but some clearly more often than others. Noticeable detractors were manure in campsites (88%), livestock encounters in camp (87%), livestock near streams and lakes (82%), and on or near trails (78%). Seeing areas where livestock congregate (76%) and manure on trails (78%) also detract from a wilderness experience for most visitors. Seeing young livestock with mothers (52%), and seeing sheep herders (51%), and cowboys (47%) detract from a wilderness experience for about half of the respondents. Respondents who did not rate livestock encounters and related structures as detracting from a wilderness experience



Encounters with livestock near riparian areas detracted highly (from visitor enjoyment).

Perceptions about Livestock Grazing

In general, wilderness visitors were more tolerant of livestock grazing on public lands than they were about grazing in designated wilderness (see Table 4). Only 12% agreed that grazing on public lands under current policy is acceptable but most (57%) felt that grazing on public lands is acceptable if properly managed to protect rangeland ecosystems. Twenty

Many respondents indicated that livestock grazing is completely unacceptable in wilderness.

tended to rate them as neutral rather than as enhancing an experience.

When asked in an open-ended question what they perceived were indicators of proper management, the most frequent responses were healthy-looking and tall vegetation (18%), an area that does not appear overgrazed (9%), healthy riparian areas (4%), appropriate stocking rates (5%), a natural balance in the ecosystem (5%), and a rotational grazing system (3%). The most frequently cited indicators of improper allotment management were overgrazing (25%), impacted or short vegetation (14%), erosion (14%), too much manure (9%), bare soil (7%), trampling (5%), and overstocking (4%).

percent chose the position that grazing on public lands is unacceptable, while the remainder (12%) did not know enough about the issue to choose a position.

Ten subissues related to grazing on public lands were all assigned some degree of importance by wilderness visitors (see Table 5). The ranking of these subissues according to the mean importance scores shows that three of the four most important issues relate to biophysical effects (e.g., impacts on fragile lands, range condition, impacts on wildlife). Wilderness visitors also considered compatibility between livestock grazing and recreation to be one of the most important subissues. Issues such as protecting

Table 4: Wilderness visitor agreement with position statements regarding livestock grazing on public lands.

Wilderness visitors *n* = 572

Position statement	Percent (%)
Grazing on public lands under current policy is acceptable. Numbers of livestock and fees should be kept at current levels to allow ranchers to make a living.	12
Grazing is acceptable if management is improved to ensure good range condition, to protect riparian areas, and reduce conflicts with others. Adjustments in livestock management may be necessary.	56
Grazing is not an acceptable use of most public land. It degrades the land, favors livestock over wildlife, is not cost-effective, and conflicts with other uses.	20
I do not know enough about grazing fees or stocking rates to make a fair judgment about any of the position statements.	12

the ranching way of life, the importance of public versus private lands for livestock production, and the economic benefits of livestock production were rated lower in importance, though they still held some importance in forming the respondents' overall attitude or position on public lands grazing.

Discussion: Implications for Wilderness Managers

This study reveals that many wilderness visitors currently find grazing unacceptable

in wilderness or acceptable only with improved management. Our findings also suggest that certain actions by managers and livestock permittees might lessen the unacceptability of livestock grazing to wilderness visitors and, in some cases, increase the protection of wilderness resources. For example, social indicators and visitor standards for wilderness conditions might be incorporated into grazing management plans, along with biophysical indicators of range conditions, with the goal of making livestock

grazing more acceptable to wilderness visitors. Ivy, Stewart, and Lue (1992) and Wells (1995) have discussed the importance of addressing both situational (on-site variables) and dispositional (preconceived beliefs and expectations) factors in order to reduce conflict and increase tolerance among wilderness users, managers, and livestock producers.

Situational Factors

Situational factors include those on-site aspects of livestock grazing and management that affect the wilderness visitor experience, some of which can be managed. Encountering livestock or livestock-related impacts on trails, at campsites, or in riparian areas detracts from a wilderness experience for a large proportion of visitors. Over three-quarters of those interviewed indicated that livestock encounters near lakes and streams detract from a wilderness experience, yet they frequently did encounter livestock in riparian areas. Management practices that minimize the amount of time livestock spend near riparian areas would address these concerns.

Results show that livestock seen in the distance impact visitors considerably less than livestock encounters close to visitor use areas. Findings also indicate that the presence of cowboys or sheep herders detracts far less than encountering livestock in high-use or riparian areas. This suggests that grazing will be more acceptable to wilderness visitors if riders are used often enough to prevent cattle from congregating and to keep them away from visitor-use areas. While sheep are not dispersed in the same way as cattle, herders do have control over band location and could make a concerted effort to avoid popular visitor-use areas. Careful placement of salt, drift fences, and water improvements can complement efforts to disperse livestock away from visitor-use areas. Managing herd characteristics over time can change distribution, decrease the use of riparian areas, and otherwise make grazing more compatible with visitation (Howery, et al. 1995; Scott, et al. 1996; Roth, et al. 1983).

Livestock can be moved near trailheads and along trails on weekdays

Table 5: Wilderness visitor mean-importance rankings of livestock grazing subissues.

Issue	Wilderness Visitors
	Mean
1) Concern that sensitive rangelands should not be grazed.	4.47
2) Extent of overgrazing and ability to restore public lands to good condition.	4.37
3) Compatibility of livestock grazing and recreation.	4.23
4) Whether or not grazing conflicts with wildlife or reduces wildlife habitat.	4.19
5) The fairness of federal grazing fees and criteria used to judge fees.	4.11
6) Grazing in designated wilderness.	4.07
7) The relative importance of ranches as buffers for public lands management compared to other land uses.	3.96
8) Economic benefits provided to local communities by livestock operations vs. other types of development.	3.66
9) The relative importance of public vs. private lands for livestock production.	3.61
10) Protecting the western ranching tradition and way of life.	3.50

Visitors were asked to choose on a five point Likert scale from "strongly agree" to "strongly disagree" how important each of 20 subissue statements were in forming their overall attitude or position on public lands grazing. Two delph-tested statements from each of the above categories were included.

or during periods of low visitor use. The dispersal and handling of livestock around specific visitor-use areas should also be addressed in allotment management plans. In all cases, there should be a good deal more communication between wilderness managers and range conservationists.

Findings indicate that wilderness visitors are also concerned about the biophysical impacts that livestock grazing has on ecosystem health. Three of the four grazing subissues that were assigned the highest importance by wilderness visitors addressed biophysical impacts. One-third said they would accept grazing in wilderness if management continues to improve range condition and protect rangeland ecosystems. Range managers could protect natural conditions in wilderness by carefully managing riparian areas and fragile lands to reduce impacts. Grazing management in wilderness could also focus on achieving natural vegetative communities rather than vegetative communities with the highest possible forage value. Since it is not easy for most visitors to judge factors associated with range condition, such as percent utilization, natural erosion rates, species composition, and so forth, and since approval is linked to improvements in grazing management or range condition for many, such improvements should be interpreted for wilderness users. Wilderness users are often characterized by their high levels of education and a concern for the wilderness resource (Lucas 1990; Roggenbuck and Lucas, 1987), and are typically receptive to such information (Lucas, 1990 [2]). Although much of this type of education will be best conducted off-site, wilderness ranger contacts and trailhead bulletin boards can be utilized for this type of interpretation on-site.

Dispositional Factors

Improving on-site grazing management and interpretation alone may not change visitor perceptions and beliefs about grazing in wilderness. Dispositional factors, including visitor expectations about livestock encounters, knowledge about the origins of legal but nonconforming uses in wilderness, and the relationship between grazing allotments and the future

of nearby private ranch lands, should also be addressed carefully over time by managers. Many visitors either had no pretrip expectations about encountering livestock or had expected to see no livestock at all. Those who did expect to see livestock, however, perceived fewer impacts and were less likely to choose a position flatly opposing grazing in wilderness. Numerous studies link expectations to satisfaction (Manning 1986). Thus, managers should inform the public about grazing, thereby reducing the number of visitors with false expectations about the presence of livestock in wilderness areas with grazing allotments.

achieve the passage of The Wilderness Act and the formation of the NWPS. Off-site educational efforts might include displays, videos, and published materials that revisit the history of The 1964 Wilderness Act and The 1980 Colorado Wilderness Act.

Community-based conservation is an increasingly accepted strategy among international wildland managers and environmental nongovernmental organizations (NGOs) that work to win the support of local people living next to protected areas. When such support is achieved, they propose, it is local people and traditional land uses that becomes a

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If livestock are to be moved through visitor-use areas or along frequently used routes, visitor pretrip information becomes especially important. Wilderness users can be informed about which trails go through grazing allotments. Backcountry trail selector brochures describing trail attributes (i.e., use levels and scenery) have been successfully used in Yellowstone National Park to redistribute visitor use (Krumpe and Brown 1982). Wilderness trail selectors could be developed, which include information about livestock grazing and other nonconforming uses in trail or area attribute descriptions. This would also allow visitors who prefer to avoid livestock to choose areas and routes where they are less likely to encounter livestock or to visit portions of wilderness areas that do not have grazing allotments.

Many respondents indicated that livestock grazing is completely unacceptable in wilderness. Conflicts between these visitors and livestock might be lessened if visitors are exposed to information that explains the nonconforming use compromises that were necessary to

buffer against the encroachment of more intense and less desirable development (Elliot 1996; IUCN 1995; MacKinnon, et al., 1986). Knight, et al. (1995) point out the interdependence of ranch based properties and public land grazing allotments. In the United States we are just beginning to apply this concept and have been slow to see ranchers, Native Americans, and other nearby traditional rural residents as "local people" whose support we need to protect wilderness from the impacts associated with unprecedented subdivision and development in the rural intermountain west (Reibsame, et al. 1996).

Although biophysical conditions were important to wilderness visitors, many visitors judged appropriate range condition and allotment management largely by the appearance and length of vegetation on an allotment. These and other open-ended responses indicate that many users do not understand other ecologically based criteria utilized in the field of rangeland science. It would, therefore, be useful to incorporate explanations of range condition and rangeland management

techniques into off-site or near-site interpretive programs where they may be treated more adequately than at a trailhead or during a brief encounter. It may also be especially important to be honest about substandard range conditions where they occur and that are in the process of being improved.

Future Research

Future research should consider testing for changes in wilderness visitor perceptions of grazing after management actions have been taken to improve livestock-visitor interactions and/or range condition. Other studies might compare

perceptions about livestock grazing among visitors to wilderness and other nonwilderness area settings. Finally, both biophysical and social research are needed to support grazing management in achieving natural vegetative communities while minimizing visitor impacts in wilderness where grazing occurs. **IJW**

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