

Minor Violations, Major Damage: A Survey of Noncompliant Visitor Behavior and Managerial Practices

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A hiker, hot and thirsty, pauses to catch his breath and drink from his canteen. As he looks across the lush subalpine meadow bordering the trail, his eye catches the faint traces of a path cutting through the meadow to the next switchback. Throwing the canteen back in his pack, he starts out across the meadow. "After all," he muses, "I'm not leaving any tracks."

To the typical day hiker, the impact of a few minutes of off-trail hiking in a national park appears negligible, even in a highly sensitive area. Yet it is *minor* rule violations such as these which, according to a system-wide survey conducted by the University of Washington CPSU, cause over 80 million dollars of reparable damage to national park resources every year^{1,2}. Minor rule violations are also reported destroying nonreparable resources at about two-thirds of the reporting units, and annual clean-up costs are estimated to be approximately 18 million dollars. In all, *noncompliant visitor behavior* (see *Glossary of Terms*) emerges as a costly, system-wide problem which resource managers cannot afford to ignore.

The fact that the growth rate of national park use in the United States has exceeded the national population growth rate over the past two decades makes the magnitude of the problem even clearer. As host to 273 million recreational visitors in 1993, the National Park Service (NPS) encourages visitors to enjoy park resources. However, high visitation rates pose a challenge for resource managers, who must balance visitor enjoyment with the agency mandate of preserving park resources. In addition to documenting the magnitude and type of resource impacts due to noncompliance and specifying which of 20 explicitly defined types of noncompliant behavior are responsible for the damage, this survey also explored current managerial practices for preventing such damage in national parks, including managers' perceptions of the effectiveness and appropriateness of specific *noncompliance deterrence techniques* (see *Glossary of Terms*).

In describing damage to natural and cultural resources caused by noncompliant behavior, respondents answered in terms of 16 types of sites (10 frontcountry and 6 backcountry sites³) and gave both cost estimates for repairs and annual costs for recurring problems such as litter. Eighty-nine percent of the units reported reparable damage at frontcountry sites, with developed visitor sites most frequently reported as damaged, followed by frontcountry historic sites and picnic areas. Repair cost estimates concerning damage to historic sites totaled 32.3 million dollars; for all frontcountry sites reported, the repair cost estimate reached 66.3 million dollars. Of the units having backcountry, 87% reported reparable damage at some type of site, with damage to hiking and stock trails totaling about 4.6 million dollars and repairs for all backcountry sites reaching 13.7 million dollars for estimated repair costs and recurring annual costs of clean-up in frontcountry and backcountry sites). Overall, historical sites were most often reported as the most damaged type of site, followed by developed visitor sites⁴, archaeological/paleontological sites, accessible natural attractions, and campgrounds and picnic areas.

The high figures for repair and annual clean-up costs are sobering. However, due to the NPS mandate of resource preservation, the extent to which noncompliant visitor behavior impacts *nonreparable or nonrenewable resources* is an even more serious matter for park managers. Of all reporting units, 72% reported damage to nonreparable resources. Nonreparable damage was reported at frontcountry sites in 68% of reporting units and 71% of units with backcountry reported nonreparable damage in those areas. Archeological, paleontological, and historical sites are most often reported as having nonreparable damage. Managers' comments from the survey offer illustrative examples of the consequences of such damage:

If falcons do not successfully nest—this is irreparable for the year, and they may not return the following year—a potentially nonrenewable resource.

Totem poles are nonrenewable resources in the sense that they are cultural objects and are unique. While new or reproduction poles can be carved, these are not the same.

Cryptobiotic crust and plants are renewable, but so slow-growing that if destroyed or continually disturbed they may not return—or it may take decades.

Constant touching and rubbing of historic cannon wears away the carved/cast features, particularly when multiplied by 600,000 - 800,000 persons a year. Unlike, say, Civil War cannons, these 200+-year-old Spanish cannons are extremely rare.

Respondents were also asked to identify the noncompliant visitor behaviors they considered the most destructive at each type of site for which any degree of damage was reported. For all sites, littering is the highest-ranked damaging behavior, followed by damaging the built environment, damaging or defacing cultural or historical objects, collecting paleontological or cultural objects as souvenirs, and off-trail hiking. For backcountry sites, the highest-ranked damaging behavior is collecting paleontological or cultural objects, followed closely by littering and off-trail hiking.

Regarding visitor management strategies, the responding units reported the use of a variety of methods for controlling noncompliant behavior, ranging from brochures and informal personal contact to barriers and direct enforcement. However, although almost all units try to prevent noncompliance, managers estimated that these efforts deter only about 60% of such behavior in the frontcountry and 52% in the backcountry. Clearly, a substantial amount of damage caused by noncompliant visitor behavior—to both reparable and nonreparable resources—is undeterred by current control methods. If unchecked, this damage will reach crisis proportions in some units during the next century.

Compounding this problem is the apparent widespread disagreement among resource managers concerning philosophically acceptable and practically effective means of deterrence. Survey results showed a striking disparity among respondents when they were

¹ The survey employed an extensive questionnaire addressed to all NPS administrative units. The superintendent of each NPS field unit was contacted by phone and asked to recommend a staff person from the unit most qualified to complete the questionnaire. The questionnaire was sent directly to this person, except in cases where the superintendent asked to examine the questionnaire first, and then passed it on to the staff person. The questionnaires were mailed in March 1992 and garnered a response rate of 82%. The research was supported by the Office of the Associate Director of Natural Resource Management of the National Park Service with the Natural Resource Preservation Program (NRPP) Special Initiative funding.

² This survey has several limitations that should be kept in mind. Although we asked that the most knowledgeable person in the park complete the questionnaire, the extent to which respondents had accurate and complete knowledge of damage and the cost to repair or maintain resources is unknown. The costs reported here for repair and maintenance of NPS resources being damaged by noncompliance were estimated by assuming that the rates of damage in nonresponding units occur at the same level as in responding units. Finally, the attitudes of respondents toward the effectiveness and appropriateness of various deterrent strategies represent the population of people chosen by the unit's superintendent to complete the questionnaire. The extent to which these attitudes are congruent with other people in park management positions is unknown.

³ **Frontcountry:** Areas not designated backcountry and wilderness, and areas of backcountry and wilderness easily accessible to day-hikers.

Backcountry: Areas designated as backcountry or wilderness that are not easily accessible to day-hikers.

asked to consider the appropriateness and effectiveness of a variety of deterrence techniques in a hypothetical frontcountry subalpine setting, "Magnificent Meadows." (This hypothetical scenario was used to ensure that respondents answered questions concerning the use of deterrence techniques under identical conditions and assumptions.) When asked to rate informal personal contact in terms of *effectiveness* (see definition in **Glossary of Terms**) as a control strategy, for example, similar proportions of respondents rated this technique as 80% effective (highly effective) and 20% effective (minimally effective).

When respondents were asked to consider the *appropriateness* (see **Glossary of Terms**) of specific deterrence techniques, similar discrepancies surfaced. Given the context of NPS's explicit mandate of management for visitor enjoyment, 43% of responding managers believed that threats of citations or fines were inappropriate. Yet 17% of respondents chose threats of fines and citations as the best deterrence technique for use in Magnificent Meadows.

This lack of consensus concerning both effectiveness and appropriateness of visitor management strategies underscores the fact that little scientific knowledge is available to guide NPS resource managers in making decisions about deterring the noncompliance. Coupled with the magnitude of the problem, this fact indicates that the first step urgently needed for a coordinated approach to visitor control strategies is the establishment of an institutionally distributed database dealing directly with appropriate and effective means of deterring such behavior. Next, there must be an organizational agreement on acceptable means and strategies. This agreement will be reached only if accompanied by research in the national parks which examines the relationship between various deterrent approaches and the quality of visitor experiences. Finally, in order to make concrete recommendations for holistic visitor management strategies throughout the national park system, in-house research and a technology transfer program would be essential.

Although it would be unrealistic to hope that all damage-producing noncompliance could be prevented, related research at Mount Rainier National Park⁵ and the accompanying literature review suggest that a well-coordinated program of research and information dissemination to park staff dealing with noncompliant behavior, coupled with

the willingness of managers to act, would significantly reduce the incidence of resource damage. In fact, this problem represents an excellent opportunity for leadership on the part of both the NPS and the National Biological Survey (NBS). Specifically, appropriate divisions of these agencies could plan and fund a coordinated research program designed to provide system-wide guidelines for the deterrence of damaging noncompliant visitor behavior and, in turn, establish an information dissemination program to pro-

GLOSSARY OF TERMS:

Noncompliance [Noncompliant Visitor Behavior]—Minor rule-breaking behavior or failures to comply with minimum impact regulations (e.g., off-trail hiking, souvenir collecting, feeding wild animals, littering). This definition excludes major acts of vandalism and acts motivated by obvious criminal intent.

Deterrence: The act of preventing noncompliance. Managers who seek to deter noncompliance are trying to get visitors to follow the rules (and refrain from breaking the rules).

Deterrence technique: A method of deterring noncompliance (e.g., educational programs, regulatory signs, threats of fines).

Effectiveness: Defined here as the percentage of noncompliant behavior that would be deterred if the indicated means of control were adopted.

Appropriateness: Defined here as the extent to which a means of control is acceptable, given the broad philosophical principles concerning park management and the specific NPS mandate of management for visitor enjoyment.

note the use of this information. Considering the magnitude of repair and clean-up costs necessitated by ongoing noncompliance, such a research program would offer a highly favorable cost-benefit return. And visitors to the national parks would be spared the unfortunate irony of destroying the resources they hope to enjoy.

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⁴ Developed visitor sites are areas characterized by a concentration of visitor services such as restaurants, visitor centers, lodging facilities, etc.

⁵ See list of publications at the end of this article.