WILDERNESS VISITOR RESPONSE TO

RANGER EDUCATIONAL CONTACTS AT TRAILHEADS

by

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(ABSTRACT)

The use of wilderness rangers to educate visitors on
Without-A-Trace camping and wilderness ethics at trailheads
is a common management practice, but little is known about
how such contacts affect the visitors' wilderness
experiences. The purpose of this study was to determine
whether Shining Rock Wilderness visitors perceived trailhead
contacts as light-handed or heavy-handed and the factors
which caused them to perceive the contact the way they did.
It also determined whether or not the visitors felt that
site conditions in the wilderness were getting better or
worse.

On-site questionnaires were administered to visitors as they left the area. A majority felt the trailhead contact was a light-handed way to manage wilderness use. The visitors felt that the contact did not take away their freedom to choose how, when or where to recreate. The rangers were perceived as friendly, knowledgeable, and non-authoritarian. The condition of Shining Rock Wilderness was perceived to be relatively free of site impacts. There were no significant differences in the visitors' perceptions of the ranger or the contact due to the sex or experience of the ranger or the sex, age, or experience of the visitors. Implications for wilderness management and research are discussed.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

The Call for Wilderness Management

The National Wilderness Preservation System (NWPS) formally began with the passage of the Wilderness Act (PL 88-577) in 1964. The last two decades have seen significant progress in pursuing the goals set forth in the Wilderness Act, but two important problems remain: (1) the final selection and classification of lands which qualify for inclusion in the NWPS, and (2) wilderness management (Hendee et al. 1978). Hendee and his coauthors also state that, "The management challenge is increasingly important because of growing pressures of wilderness use and man's impact on all lands" (Hendee et al. 1978, pg. 1).

The management problem is complicated by the mandates of the Wilderness Act. The law states, "These (wilderness areas) 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".
Section 2(c) of the Act further defines this mandate by
stating that, "(wilderness) generally appears to have been
affected primarily by the forces of nature, with the imprint
of man's work substantially unnoticeable; (2) has
outstanding opportunities for solitude or a primitive and
unconfined type of recreation" (PL 88-577). Wilderness
managers must manage recreational use of wilderness so that
ecological impacts are minimized, but they must do it in a
way that leaves the visitors perceiving that they had an
unconfined recreation experience. But even light
recreational use of natural areas causes ecological impacts
(Cole 1983; Leonard et al. 1983). Therefore a manager must
manage to contain impacts within limits of acceptable
change, while still preserving the opportunity for a
primitive and unconfined recreation experience (Hendee et
al. 1978).

Types of Approaches to Wilderness Management

Managers have at their disposal a wide variety of
control measures to manage visitor use in a wilderness
setting (Gilbert et al. 1972) (Table 1). The visitor-use
management strategies are classified into two categories on

Table 1. Specific Methods for Managing Wilderness Visitors.

Type of Control	Method	Specific Control Policies
Regulatory	Increased policy enforcement	Impose fines Increase surveillance of BWCA
	Zoning regulations	Spatial zoning of uses Temporal zoning of uses Limit camping in some camp-sites to one night
	Restriction on use intensity	Open or close access points Require reservations Assign campsites and travel routes to each camper Limit usage via access points Limit size of parties Limit people per campsite Limit camping to campsites only Limit total BWCA population
Manipulative	Physical alterations	Open or close access roads Improve (or not) access roads Improve (or not) campsites Make portages more or less difficult Open or close portages
	Information dispersal	Advertise specific BWCA attributes to attract certain types of users Educate users regarding care of BWCA ecology Advertise underused areas of BWCA
	Eligibility requirements	Charge constant entrance fee Charge marginal cost fee Require demonstration of ecological knowledge

(Gilbert et al. 1972, pg. 137)

the basis of how they supposedly affect the visitors'
freedom of choice. "A regulatory control is one that
defines where, when, or how people may travel or camp"
(Gilbert et al. 1972, pg. 135). "Manipulative controls are
less obtrusive practices that control intensity of use
without directly interfering with the user's perceived
freedom of choice" (Gilbert et al. 1972, pg. 136). Other
authors classify the possible management actions in nearly
the same way. Hendee and his coauthors (1978) feel that
direct management emphasizes regulation of behavior, where
individual choice is restricted. Indirect management
emphasizes influencing or modifying behavior, and the
visitor retains the freedom to choose. They also feel that
it is helpful to think of a continuum of use-management
strategies which range from those that are subtle,
light-handed, and indirect to those that are direct and
authoritarian.

Hendee et al. (1978) and Lucas (1982) agree that
excessive regulations are counterproductive and that a
light-handed, indirect approach to manage wilderness is
preferable. Direct regulation is only justifiable if it is
the least management that is necessary: the minimum
regulation principle (Hendee et al. 1978). Management
actions should not physically or psychologically confine the

wilderness visitor for that would seem to contradict the
mandate for a primitive and unconfined type of recreation.
"The themes of freedom, spontaneity, and escape have emerged
as important components of the wilderness experience"
(Hendee et al. 1978, pg. 144). Some management strategies
(e.g. assigned travel routes and campsites) may reduce this
perceived freedom more than others (e.g. suggested travel
routes and campsites).

Lucas (1982) feels a systematic analysis should
precede adoption of recreation management actions,
particularly regulations. He describes a seven-step
systematic analysis to help managers avoid unnecessary and
inappropriate regulations and ensure that those adopted are
effective and justified. His first and second steps are to:
(1) identify the problem, and (2) identify the cause of the
problem.

One of the most widespread problems in wilderness is
site deterioration from human use. Over 80% of the managers
sampled in Godin and Leonard's (1979) survey of wilderness
managers mentioned this problem. Wilderness researchers and
managers feel that many site impacts are caused by the
visitor's ignorance of how to properly behave in a
wilderness. Hendee et al. (1978) feel that unskilled
actions are the most common cause of resource impact.

Bradley, a U.S. Forest Service wilderness management
officer, states, "Most impacts in wilderness areas are not
caused maliciously. Damage results from visitor's ignorance
of good land ethics or his insensitivity to the consequences
of his activities" (Bradley 1979, pg. 222). B. Smith, a
wilderness specialist for the U.S. Forest Service Pacific
Northwest Region, says times have changed in the
backcountry. Old time campers must learn new concepts (Hart
1980). Another U.S. Forest Service employee, T. Kolvalicky,
feels that there is a lack of a wilderness ethic among
wilderness users (Hart 1980). Several wilderness managers
agree that visitors lack the wilderness ethic (Godin and
Leonard 1979). Thus a lack of knowledge on how to properly
behave is apparently causing unnecessary site impacts in
wilderness.

Continuing with Lucas' scheme, the third step is to
identify and evaluate potential non-regulatory approaches
which may correct the cause of the problem. Not only should
a manager look at the feasibility of the possible management
actions, but he must consider their effectiveness. Lucas
(1982) feels that whether or not the control is effective is
the main question concerning indirect, light-handed
management.

Educating and providing information to visitors, a light-handed strategy, would seem a logical way to correct visitor's ignorance of how to behave in a wilderness. Site impacts should decrease if ignorance is the cause and education corrects the ignorance. But is this approach, as it has been implemented by wilderness rangers, perceived by the visitors as light-handed? And secondly, is education effective in reducing wilderness site impacts? The first question can be answered by an analysis of visitor preferences for a variety of management strategies. Such an analysis will show whether the most preferred strategies are also those considered to be light-handed by wilderness researchers. The second questions can be answered by an analysis of whether or not managers feel education and other light-handed strategies are effective. Research that has tested the effectiveness of education and information to reduce wilderness visitor site impacts also provides useful information.

Visitors' Preference for Wilderness Management

Several researchers have questioned visitors on what type of management they would prefer. Stankey (1973) surveyed visitors in four wilderness areas (Bob Marshall,

Bridger, High Uintas, and Boundary Waters Canoe Area
(BWCA)). He found that an indirect rationing technique,
sign and trail reduction, was better received than fees, (a
so called light-handed management strategy), direct
rationing techniques (lottery, mail reservation, and
first-come, first-served permit systems), and assigned
travel routes and campsites. The purists, those whose
values and desired wilderness outcomes were consistent with
wilderness as defined in the Wilderness Act, were most
supportive of the light-handed, indirect management
strategies. Manipulation of access to the wilderness
boundary, a light-handed management strategy, was rejected
by 60% of the BWCA users and about 40% of the users in the
other three areas. Zoning to reduce ecological impacts or
social conflicts received mixed results. In the BWCA, 60%
agreed with the concept of separating travel methods. In the
three western areas, only 25% agreed. Providing more
information was generally accepted by 60% of the visitors in
all four areas, and wilderness rangers received wide support
(58-66%). No respondents felt that the rangers were there to
check up on them.

In another study Stankey (1980) surveyed users in both
a heavily used and a lightly used wilderness in the West.
Users strongly supported use restrictions when use exceeds

capacity. Users were asked if they would favor or oppose a list of light-handed and heavy-handed use restriction strategies if controls were necessary. There were mixed results, especially between areas, on the acceptability of these techniques. In the lightly used Spanish Peaks Wilderness Area, light-handed management actions, such as reducing the number of trails and signs and closing access roads back from the wilderness boundary, were more favorably supported than such heavy-handed actions as permits and assigned campsites. However, the use of fees, a so-called light-handed strategy, was poorly supported. No management action in the Spanish Peaks received over 50% of the visitors' support.

In the heavily used Desolation Wilderness, such light-handed management strategies as a test of wilderness skill and knowledge and blocking the access roads back from the wilderness boundary were well supported (57% and 53% respectively), but so were two heavy-handed strategies (i.e. mail reservation permits (59%) and first-come, first-served permits (57%)). The support for permits was thought to be due in part to the fact that all of the wildernesses in the state (California) had a mandatory permit system (Stankey 1980). Reducing the number of trails and signs was somewhat supported by the visitors (43%), but they gave little

support (30% or less) to fees, assigned campsites and
permits issued by a lottery system.

Lucas (1980) looked at user attitudes and preferences
in nine western wilderness and roadless areas. Overall, use
permits with assigned travel routes were rejected, but
limiting party size to 12 or fewer was accepted. Closing
some areas to horses (zoning) was also accepted even in
horse areas. Patrolling by wilderness rangers was widely
accepted, but depending on the area, 4-15% of the users felt
rangers were undesirable. There were also mixed attitudes
concerning the appropriateness of certain "Without-A-Trace"
camping techniques. Prohibiting fires in areas where
firewood is scarce was a controversial issue, and 50-67% of
the users, depending on the area, felt that burying their
trash was desirable.

In the East, Hinton (1975) found that users of Shining
Rock Wilderness favored limiting party size and issuing a
limited number of permits, as long as they are given out on
a first-come first-served basis or by a mail reservation
system. The users also favored more informational pamphlets
and wilderness rangers who patrol and provide information.

Roggenbuck et al. (1982) surveyed users in three
southeastern wilderness areas. While there were differences
across study areas, controls to lower use or hold it at its

present level received wide support. Limits on group sizes and an advanced reservation system for a limited number of permits were quite favorably supported (64-85%), with moderate support (41-52%) for a first-come first-served permit distribution strategy. Fees and permits by a lottery system were rejected. About 80% of visitors supported providing more information to disperse use, but visitors rejected more regulatory controls (assigned travel routes and campsites).

The findings of these studies vary for a variety of reasons. The present management strategies, the amount of use, and the visitors' travel methods all seem to cause differences across and within study wildernesses. Visitors seem to support certain regulatory controls, especially where they are presently used, where overuse occurs, and where overuse may occur in the near future. They also strongly support many light-handed techniques including more information. Many of the results agree with what Hendee et al. (1978) and Gilbert et al. (1972) have written about heavy-handed and light-handed management. But the widespread support for patrolling wilderness rangers seems to contradict what they have stated. The wilderness rangers do perform surveillance in the backcountry and sometimes issue citations leading to fines. Gilbert et al. (1972) classify

such surveillance and fines as heavy-handed management. Perhaps the public doesn't view these rangers as performing this law enforcement role. Another contradiction may be the visitors' rejection of fees, a so-called light-handed strategy. It is not known whether this opposition stems from an economical or psychological (wilderness is free) basis.

Managers' Perceptions of Management Techniques

Research reports on managers' feelings about light-handed and heavy-handed management strategies and their effectiveness were also reviewed. Godin and Leonard (1979) surveyed managers of 63 of the then (January 1975) 125 designated wilderness areas. They found that most managers favor education over law enforcement. Many felt that some law enforcement was necessary, but by using education the need for law enforcement should be reduced over the next five years. They emphasized direct personal contact education for reducing user group conflicts. Many also felt that education of the users was the major means of minimizing site deterioration. Finally, in areas where problems started after the area was designated, managers felt that information and education were the most effective

strategies to solve the problems, especially in light of budget and manpower constraints.

Bury and Fish (1980) and Fish and Bury (1979) report a 1978 survey of all managers responsible for managing designated wilderness areas. They found that at least half of the managers in three federal agencies (United States Forest Service (USFS), National Park Service (NPS), and United States Fish and Wildlife Service (USFWS)) had implemented some type of control. Surveillance by wilderness rangers and education were two strategies used by all three agency managers. Overall, managers were more likely to implement light-handed strategies to prevent overuse and heavy-handed strategies to manage existing overuse. They also felt that heavy-handed strategies were more effective for managing overuse than light-handed strategies. However, judging the five most frequently used strategies, USFS managers emphasized light-handed management, while NPS and USFWS managers emphasized heavy-handed management. When evaluating specific strategies and their effectiveness, USFS managers believed surveillance by wilderness rangers was moderately effective, NPS managers felt it was highly effective, but USFWS managers rated it low to moderately effective. Education was judged moderate to low in effectiveness by the USFS and

NPS managers, but highly effective by USFWS managers.

Washburne and Cole (1983) surveyed managers of all officially designated wilderness areas and many areas that would probably soon be designated. They too found that many managers had implemented some type of control. However, most areas (80%) did not ration use and did not have plans to do so in the near future. Half of the areas used information/education to distribute use within an area, while only a few used site manipulation. Forty-eight percent of the areas had limits on party size, 54% had restrictions on camping, and over one-half used a no-trace camping education program. Advice on camping techniques was often given where there were no camping restrictions. The majority of managers felt that a personal contact with the visitor was the most effective technique to improve visitor camping practices and dispersal. Managers of heavily used areas commonly mentioned heavy-handed management strategies or physical alterations (a light-handed strategy) as being most effective in reducing impacts.

While the results of these studies vary, one could generalize and state that many managers use information/ education and other light-handed controls and feel they are effective, especially where overuse has not occurred. Heavy-handed controls are more often used where overuse has

occurred and are perceived to be more effective by many
managers using them. But there is considerable disagreement
among agencies and across managers within agencies on the
effectiveness of specific strategies, especially education
and surveillance.

Research On Effectiveness of Education and Information

Little empirical work was found confirming the notion
that education and information for wilderness visitors can
reduce site impacts in a wilderness area. However,
researchers have done considerable work, mostly outside
wilderness, using education and information to increase
visitor knowledge of rules and low impact behavior and to
reduce site impacts in developed areas.

Increasing Visitor Knowledge of Rules and Low Impact
Behavior

Several researchers have assessed the value of using
education/ information to increase visitors' knowledge of
park rules and low impact behaviors. They have assumed that
there is a positive correlation between visitors' knowledge
and their attitudes toward appropriate wilderness behaviors.

They believe that if managers help raise visitors' knowledge levels, these people will support management strategies and techniques that have been judged necessary. Fazio (1979a, 1979b) investigated these assumptions using several communication strategies. He dealt specifically with increasing visitor knowledge levels, which includes knowledge of "Without a Trace" camping. The most effective means he found was the use of wilderness rangers. Another effective technique was a slide-tape program. Fazio also investigated group and individual characteristics to see if any of them related to the effectiveness of the various treatments. Years of experience was the only factor which produced significant within-treatment-group variation.

Ross and Moeller (1974) distributed a recreation-area-rule brochure to increase campers' knowledge of rules in a developed campground. The brochure did increase knowledge, but this increase was affected by previous camping experiences in the area, age, camping style, and place of residence. Those visitors who scored best were older, local, experienced in the area, and camped in trailer campers or tent trailer campers. The authors called for contacts as visitors enter an area, and suggested the need for all members of the party to get the treatment - not just the leader.

Lukens and Taylor (1979) tested the effectiveness of posters displayed in equipment stores to teach visitors appropriate backcountry winter camping behavior. The information received on questionnaires and from observations of and discussions with visitors indicated that the posters were effective.

Feldman (1978) compared the effectiveness of a brochure and a tape-cassette in increasing visitors' knowledge and prompting the visitors to leave their cars and hike on suggested trails. The brochure was more effective in increasing visitor knowledge for first time visitors. Neither of the strategies was better than the other in inducing visitors to leave their cars, but the tape-cassette treatment was more effective than the control treatment. A difference was found, however, when treatment groups were broken into subgroups by group size. For the tape cassette treatment, smaller groups more readily left their cars to hike than did larger groups.

Robertson (1982) tried to determine the relation between visitor knowledge, attitudes, and selected characteristics and visitor behavior in wilderness. A four-part questionnaire was used to gather all of the visitor data. The results showed that five variables (visitor knowledge, visitor attitude, education, age, and

primitive camping experience) were significant in explaining 39% of the variance in the visitors' self-reported behavior. When the subjects were classified by knowledge, those who scored high on the knowledge scale tended to score high on the behavior scale. From this study the author concluded that the need for regulatory management would be lessened if the user's knowledge of appropriate behavior and skills were increased.

Reducing Rule Violations and Site Impacts

Empirical studies have been conducted using education/information to reduce developed campground impacts. Oliver et al. (1985) tested three communication channels and found that a brochure alone and the brochure plus personal contact were effective in reducing tree damage (nails, hatchet carving, etc.) and campsite litter. The brochure plus personal contact plus public involvement (report your lawbreaking neighbor), however, appeared no more effective than the non-public involvement treatments. None of the three treatments reduced litter in the fireplace, incidences of inappropriate noise, or lantern burns on trees. In addition, the evidence showed that type

of camping equipment, party type, and previous camping experience at the campground influenced the camper's responses to the messages. The authors also suggest that when using a personal contact approach, communicators should be personable, outgoing, dedicated, knowledgeable, and they should wear uniforms to increase their credibility.

Gallup (1981) tested a cartoon-illustrated interpretive brochure to determine if it increased campers' knowledge of the campground rules and reduced the rates of rule violation per campsite. The brochure not only listed the rules but discussed the underlying rationale behind the rules. It was handed out as the campers entered the campground. Gallup found that the brochure did not reduce the rate of rule violation, but did significantly increase campers' knowledge of the rules.

Iso-Ahola and Niblock (1981) studied whether campers who signed a petition stating that every effort should be made to keep state parks and recreation areas clean and free of litter actually littered less than those who didn't sign the petition. The results showed that campers who signed the petition reduced their littering by 52% but only in the cleaner campsites. The "cleanliness breeds cleanliness" idea was supported. Two reasons were proposed why the petition signing worked. One was that campers became aware

of the social norm against littering (Krauss et al. 1978).
The other reason was an attributional explanation. "The
visitors became aware not only of the social norm but more
importantly, a personal causation and responsibility for
littering" (Iso-Ahola 1980, pp. 285-286).

Christensen and Clark (1983) evaluated the
effectiveness of using bystander intervention procedures to
control and prevent littering in a campground. The
anti-littering message was distributed either by a ranger, a
volunteer, or a campground host. The message was delivered
either orally or as a printed cartoon. The subjects then
observed confederates litter, and the subjects' behavior (do
nothing, pick up the litter, intervene with the litterers,
report the litterers to a ranger) was recorded. Overall,
the appeals to help significantly increased the visitors'
helpful responses to littering. Picking up the litter was
the most common visitor reaction and intervening with the
litterer was second.

Other researchers have looked at impacts in general
recreational areas. Clark et al. (1972) examined the
effectiveness of traditional anti-litter measures (providing
trash bags, anti-litter appeals, providing extra trash
cans, etc.) and an incentive program for controlling litter
in a special interest hiking area, a dispersed car camping

area, a developed campground, and a theater. While the traditional methods appeared to be ineffective, the incentive program was quite successful. But the authors noted that in the dispersed car camping area, when trash bags were handed out without an incentive, the visitors seemed to at least carry out their own trash.

Lehart and Bailey (1975) examined five educational treatments (anti-litter statement, educational packet, a short lecture, clean- up instructions, and an incentive program) to see if they increased the amount of old litter school children picked up and reduced the amount of new litter thrown down on a nature trail. The anti-litter statement, educational packet and a short lecture reduced the amount of litter thrown down in a cleaned area, and the incentive program increased the amount of litter that children pick up over the whole area (cleaned and littered areas). The incentive program did not appear to work for reducing the amount of new litter thrown down in a clean area. A suspected reason was that the new litter was litter that had been planted, picked up, and then dropped on the way out. Several marked pieces of litter confirmed this possibility.

Marler (1971) measured the results of three different themes (reward-oriented theme, punishment-oriented theme,

and a factual theme) in informational packets on increasing knowledge, motivation, opinion, and behavior to reduce littering in picnic areas. The reward-oriented theme listed rewards such as not getting cut on broken glass or not getting a ticket. The punishment-oriented theme discussed how litter hurts and costs each visitor. The factual theme depended on the individual's ability to relate facts to his own behavior. The results were very mixed. Only the punishment-oriented theme resulted in less littering behavior than found in the control group, but participants in all themes had 100% agreement that litter and vandalism laws in national forests should be enforced and that litter is a national disgrace.

Muth and Clark (1978) attempted to determine the applicability of the incentive approach to controlling litter in roadless areas. They found that backcountry users responded favorably to simple verbal appeals for helping in area cleanups. Material incentives with the verbal appeals also worked, but many of the recreationists reacted negatively to the material incentives.

A final study that attempted to reduce impacts in outdoor recreational settings dealt with switchback shortcutting on trails. Mathery (1974) tried several techniques to reduce this problem. Revegetation efforts and

a wise use of educational signs reduced switchback shortcutting, but only if the visitors understood why they shouldn't shortcut switchbacks. A personal contact was the most effective technique, but the cost was prohibitive.

The review of this research indicates that many times education/information can increase visitor's knowledge and cause them to alter their behavior. A personal contact at the time of the information/education treatment seems to enhance the effectiveness of the treatment. Several authors believe that this management strategy does reduce wilderness recreational impacts. The results of the field experiments and various authors' personal experiences also suggest that such variables as age, knowledge, attitude, party size and type, experience variables, site cleanliness, and home residence do influence the effectiveness of the education/ information effort.

Dispersing Wilderness and Backcountry Use

The most extensive work done using education/ information in wilderness has been aimed at dispersing use away from heavily used sites. This literature is reviewed because of the wilderness setting in which it occurred and its attempts to modify visitor behavior. Roggenbuck and

Berrier (1981) compared two techniques to disperse campers from a heavily used meadow: (1) distributing a brochure describing alternative camping areas, and (2) distributing the brochure plus a personal appeal to disperse. An experimental design with observation of treatment effect revealed that both treatments were successful. Responses to the brochure were quite stable across various segments of the camping population, but the brochure plus personal contact showed more variability in its effectiveness. It worked best for novice campers and medium sized groups.

Lucas (1981) and Schomaker (1975) furnished brochures giving trail use information to wilderness hikers, but the study participants in both studies reported little change in their selection of travel routes. Lucas (1981) felt that his dispersal attempts had little success because the brochure had limited distribution, limited information, and there was a lack of visitor confidence in the brochure. Schomaker's (1975) study apparently had little success because by the time the visitors received the brochure (at the trailhead), it was too late to change plans. Schomaker also looked at visitor group variables to see if they affected whether or not trail routes were changed. The characteristics related to changing plans were place of residence, degree of commitment to planned route, and time

of week. Lime and Lucas (1977) used a brochure to help
canoeists in the Boundary Waters Canoe Area avoid crowded
areas and peak-use times. About one third of the visitors
said they used the information to help plan their trip, and
many felt it helped them avoid crowded conditions.

Visitor dispersal research has been conducted in
outdoor recreation areas besides wilderness areas. Canon et
al. (1979) provided a brochure which listed the "why" behind
the rules designed to disperse campers in a New England
backcountry area. Those who received the brochure camped
further from the trails, but contrary to the regulations,
they continued to use only previously used campsites. Krumpe
and Brown (1982) developed an information packet that
described the lightly used trails in Yellowstone National
Park as a decision network to aid overnight visitors.
Thirty-seven percent of the hikers who received the brochure
took a lightly used trail, whereas only 14% of the hikers
did in the control group.

Brown and Hunt (1969) used informational signs along
roads to distribute visitors more evenly over lightly used
roadside rest areas. This project too was quite successful.

The results of these studies indicate that
information/education often influence where wilderness
visitors travel or camp. Personal contacts enhanced the

effectiveness of this strategy for some user groups (e.g. novice campers). In addition, the more the visitors understood the reason behind wilderness rules, the more they seemed to comply and obey the rules. The information received from the educational contacts should also be perceived by the visitor as reliable information. Finally, information needs to be given to the visitor early enough so that it can be incorporated into their trip plans.

Summary Statements Concerning Education and Wilderness Rangers

Studies of visitor preferences and manager perceptions suggest that education and the use of wilderness rangers are accepted by most visitors. In some studies visitors requested these management strategies. Managers, however, show considerable variation in their perception of the effectiveness of these two management strategies. Research has shown that education and information can increase visitors' knowledge levels and their dispersion away from high use areas, but it hasn't always corrected their depreciative behaviors. Personal contacts (usually by rangers) have been shown to enhance the educational treatments' effectiveness.

Problem Statement and Objectives

There are a variety of strategies to manage visitor use in a wilderness area. They can be categorized as heavy-handed and light-handed. Managers use techniques from both categories depending on the type of problem to be corrected. Visitors prefer light-handed management strategies but accept heavy-handed management strategies when they feel they are needed.

Site deterioration from human use is a major problem in many wilderness areas (Godin and Leonard 1979). A possible reason for this is that visitors lack the knowledge or ethics to camp or travel without causing unnecessary environmental impacts (Bradley 1979; Hendee et al. 1978; Godin and Leonard 1979; Hart 1980). A trailhead contact between a ranger and the visitor may be a way to increase the visitors' knowledge and instill in them a wilderness ethic so that site impacts are minimized. An important remaining problem is a lack of information on whether visitors perceive a trailhead contact as light-handed or heavy-handed and what factors influence the perception of the contact as light-handed or heavy-handed. There has also been no empirical work to determine whether trailhead contacts are effective in reducing site impacts. Such

contacts might be ineffective because of the lateness of the
message transfer within the total recreation experience.
The specific objectives of this research are:

1. To determine whether a trailhead educational contact
    between a ranger and the visitor is perceived by the
    visitor as a light-handed or heavy-handed management
    strategy.

2. To determine the factors that cause the visitor to
    perceive the contact as light-handed or heavy-handed.

3. To determine whether wilderness visitors with trailhead
    contacts perceive the area as having reduced site
    impacts.

LITERATURE REVIEW

Theoretical Framework: Social Influence and Power

Many times when a wilderness ranger talks with a
visitor he is attempting to influence the visitor's attitude
or behavior so that it is consistent with the officially
accepted attitude or behavior. The kind of control the
visitor perceives the ranger used or could use may not only
determine whether the ranger is successful, but it may
determine how free and unconfined the visitor feels during
his wilderness experience. Thus, the kind of control a
ranger uses may determine the visitor's perception of
whether the management strategy of using wilderness rangers
as teachers is light-handed or heavy-handed. A social
psychological theory of social influence and power may help
explain the kinds of control a ranger is perceived as having
in informational contact situations at trailheads.

Social influence is defined as a change in one person's

behavior that is attributable to another person or group
(Raven and Rubin 1976). It is significant in developing
people's norms (Baron and Byrne 1984). Informational social
influence comes from our tendency to employ other persons as
a source of information (Baron and Byrne 1984). In a
situation when a wilderness ranger offers information to
alter a visitor's behavior, he is a potential social
influence. The effectiveness of such a contact may be
enhanced and better understood through awareness of the
social influence processes occurring at the setting. These
processes may also determine whether the visitor is
perceiving the educational contact as light-handed or
heavy-handed management.

The Bases of Social Power

The ranger's power, his ability to shape others'
behavior, may be defined as his potential (social) influence
(French and Raven 1959). The ranger's power may stem from
one or more of six separate bases of social power
(informational, expert, legitimate, referent, reward,
coercive) (Raven and Rubin 1976). Different bases of social
power work in different ways to influence the target's (the
visitor's) behavior or attitude. Some of the bases seem to

allow the target much more freedom in choosing his attitude and behavior after the influence attempt. Therefore, some bases may be interpreted as more light-handed power bases than others. By determining what power base the visitor perceives the ranger to use, one may be able to predict the relative freedom the visitor perceives he has in choosing his own attitudes and behaviors.

The six bases of social power can be categorized according to their social dependence and need for surveillance to bring about a positive or negative influence on a target's behavior or attitude. Social dependence and surveillance may also influence the target's perceived freedom when he behaves or expresses his attitude during or after the influence attempt.

Social dependence exists when the target must remember the source of the information in order to behave or express views congruent with those of the source. If a wilderness visitor changes his behavior only because he remembers the source (the ranger), and because of the source he trusts the information which causes his behavior change, the change is socially dependent. If, however, the visitor changes his behavior because he has internalized the information the ranger gave him, and does not need to recall that it was the ranger who gave him the information, the change is socially

independent. Thus, the bases of social power can be divided into two categories: socially dependent power bases and socially independent power bases. It is our assumption that a socially dependent power base would restrict the visitor's perceived freedom more than a socially independent power base. This is because the visitor is not making a behavioral or attitudinal change totally on his own, but is instead remembering the source (the ranger) and then incorporating the ranger's message into his thought process.

The power bases can also be categorized by the need for or lack of need for surveillance. When the target's (wilderness visitor's) private attitude is different than the officially accepted attitude or his tendency to behave is discrepant with the officially accepted way to behave, the source (ranger) may need to maintain surveillance to accomplish changing the target's (visitor's) behavior. Many studies have investigated the discrepancy between one's private beliefs and public actions (e.g. see Wicker 1969). This discrepancy happens many times when we do something for which we will be rewarded or to avoid punishment. We don't publicly behave in the way we privately feel we should. When a target feels this discrepancy, surveillance is of critical importance for an effective behavioral change. To a ranger this means that if he is asking the visitor to

change a camping behavior that the visitor privately feels
is acceptable, the ranger will need to check up on the
visitor to make sure he is complying. In power bases that
use surveillance, the visitor's freedom may be restricted
because he is being watched (or feels he is being watched),
and he may not be free to do what he privately feels is
appropriate.

Positive and negative influence relate to the target's
behavior after the influencing agent (IA) has attempted to
influence him. A positive influence occurs when the target
accepts the message and the power source and acts according
to the IA's wishes. A negative influence occurs when the
target does the opposite of what the IA wishes (Raven and
Rubin 1976).

The six bases of power may be placed into three
categories on their need for social dependence and
surveillance to bring about a behavior change in the target
(Table 2). Informational power is the only base in the
socially independent with surveillance unnecessary category.
With this power base, the content of the communication is
the critical factor. The content produces a cognitive
change in the target which can then guide his behavior
independently of the IA. One way information works is
pointing out inconsistencies in a target's attitudes or

Table 2. Categories of Social Power Bases.

Socially Independent Surveillance Unnecessary	Socially Dependent Surveillance Unnecessary	Socially Dependent Surveillance Necessary
Informational Power	Expert Power	Reward Power
	Referent Power	Coercive Power
	Legitimate Power	

behavior (Rokeach 1971). After becoming aware of his inconsistency, the target works to correct it, which involves changing his attitude or behavior so that they are consistent with each other. Because this power base is socially independent and does not require surveillance to bring about a change in the target (visitor), it seems to be the most light-handed power base a ranger could use.

Reward power and coercive power are in the category entitled socially dependent influences with surveillance important. The incentives (reward power) and punishments (coercive power) may be impersonal (money, prizes) or personal (liking, acceptance, love). Even though the promise of reward and threat of punishment are often thought of as almost synonymous with power and are highly effective techniques, they are both more fragile forms of influence than is informational power. For both of these powers, the target must remember what the IA wanted him to do and the IA must be aware of whether or not the target complied with his wishes. This emphasizes that reward and coercive power are socially dependent and based on surveillance. These power bases therefore seem to be the most heavy-handed ones a ranger could use.

Reward and coercive power are closely related bases of social power. Depending on your perspective, an ambiguous

statement like, "Getting a raise in your allowance depends on whether or not you do more chores" may be interpreted as either reward or punishment oriented. Four principles differentiate the two bases and separate some of the effects of each power base. When coercive power is used, the target tends to dislike the IA and tends to feel negative about the situation, as opposed to reward power where there is a greater probability that the IA will be liked (Reuben and Lewick 1973; Reuben et al. 1975; Horai et al. 1970). Second, the threat of punishment may compel the target to leave the situation entirely, whereas the promise of a reward may hold the target until the reward is received. Third, it appears that surveillance is easier to maintain when using reward power. The target finds it to his advantage to make the IA aware of his accomplishments, but will try to conceal his noncompliance in coercive situations (Thibaut and Kelly 1959). And fourth, surveillance, especially when needed in coercive situations, seems to make the IA somewhat suspicious of the target (Strickland 1958, Kruglanski 1970).

The three remaining sources of social power, legitimate, expert and referent power, all fall into the socially dependent with surveillance unimportant category. They might be considered more heavy-handed than

informational power but more light-handed than reward or
coercive power. In using expert power, the IA is perceived
or known to be extremely knowledgeable on some subject
(possibly a ranger's knowledge of wilderness camping
techniques), and the target accepts the information given to
him as factual. But to maintain the attitudinal or
behavioral change caused by this information, the target
must remember that it was an expert that gave it to him.
This differs from informational power where the target need
not remember the source because he has integrated the
information into his cognitive structure. For expert power,
the acceptance of the information is dependent on
remembering that the source was an expert. Negative expert
influence occurs when the target feels the IA is using his
knowledge to benefit himself, not the target. This may
cause the target to not do what is recommended.

Referent power is based upon the IA appearing to the
target as someone who has had the same experiences as he or
who is a member of his reference group. The IA is therefore
perceived as one who will likely look at things from the
same perspective. The term "referent" comes from studies on
reference groups (e.g. Merton and Rossi 1957) which show how
people refer to others in order to evaluate their own
opinions, beliefs, behaviors, and even emotions. It is the

target's identification with the IA, or his wish to be identified with the IA, that is critical to referent power. In this way, the target will do as the IA asks because he will evaluate his behavior in light of what the IA said, and he will strive for a positive evaluation. Negative referent power occurs when an individual deliberately disassociates himself from others, when he holds a different attitude or opinion just because someone he dislike holds that attitude.

Legitimate power stems from the internalized values in a subject which dictate that another person has a legitimate right to influence him and he has an obligation to accept this influence. Legitimate power may be seen in the roles different people play in society. During a fire emergency, people would most likely do what an authority figure (fireman) asks because he has the right to request actions and people are obligated to comply. Should, ought, oblige, and similar words denote a legitimate power situation. This type of power is quite evident in formal social organizations - e.g. military units, governments, industrial organizations - where each person has a role to fill and certain roles have power over other roles. Powerlessness can be a legitimate power, especially in societies that have social norms emphasizing the obligation of those with the required resources to help those without

(Berkowitz and Daniels 1963; Goransun and Berkowitz 1966).
A blind person may legitimately ask a sighted person for
help crossing a dangerous intersection and the sighted
person is obligated to comply. Experimenters, too, have been
shown to have a great deal of legitimate power over their
subjects (Milgram 1963, 1965).

Secondary Effects of Social Power

The previous discussion has covered only the primary
effects of social power - the immediate changes produced in
someone by an IA. Three secondary effects of social power
are discussed by Raven and Rubin (1976). Many times a
target will change his perceptions of some object, idea, or
activity after being made to interact with or think about
it. A target may find that he really likes, enjoys, or is
interested in an object. Then the target's further
interaction with the object will not need to be dependent on
the target's remembering the IA, but will be a socially
independent change because the target has privately accepted
that the object is good or the belief is right.

Another secondary effect concerns how the target feels
about the IA. As mentioned earlier, coercion may cause the
target to dislike the IA. The same is true of the

illegitimate use of power (e.g., power used to benefit the IA at the target's cost, or power not legitimately given to the I.A.). This may cause a negative change in the person's private attitude (Raven and Rubin 1976). A "negative halo" effect may also occur in these situations. The IA will seem less expert or less legitimate and therefore any information he presents will be less persuasive (Raven and Rubin 1976).

The third secondary change comes from Festinger's (1957) theory of cognitive dissonance. If the implications of one piece of knowledge are opposed to those of another, the two elements are dissonant. Festinger states that dissonance is uncomfortable and produces tension and that when we are aware of cognitive dissonance, we tend to make a cognitive or behavioral change in order to reduce the dissonance. Bem (1965) demonstrated this by seeing how people changed their self-attributions following a situation of forced compliance. In the event we can be substantially persuaded to do something that runs counter to our attitude, we will tend to restore cognitive consistency by changing our beliefs or attitude.

Perhaps by analyzing the ranger-visitor trailhead contact in terms of the social power framework, we can begin to understand the visitors' perception of the contact. Certain bases of social power seem to depend on greater

perceived control than others. By understanding the
visitors' perception of which social power base the ranger
exerts, we may be able to understand visitor perceptions of
light-handedness versus heavy-handedness of the contact.
This may tell us if the visitor actually perceives the
trailhead contact as light-handed and why it is or isn't
perceived that way.

LIMITATIONS

Before discussing the methods used in this research,
some of the limitations of this study will be discussed. The
study was originally designed to experimentally test the
effectiveness of trailhead educational contacts to reduce
campsite impacts. A quasi-experimental design was adopted
that would have permitted the researcher to monitor which
groups were contacted on treatment days (the trailhead .
education contact) and to monitor impacts in the treatment
groups' campsites before they arrived and after they left.
The design also called for control days (no trailhead
educational contact) so that campsite impacts of control
visitor groups could be recorded and compared to the impacts
of the treatment groups. Using this design a causal
relationship between the education contact and the amount
and kinds of campsite impacts could have been determined.

However, the researcher who was to measure the campsite
impacts had medical problems while conducting the pre-season

inventory during June of the research season. He was not able to return to work until August. It was apparent in early July that he would not be able to observe enough camping groups to make a statistical analysis of the results possible. Therefore the research was partially redesigned.

The research design became a survey of the weekend overnight wilderness visitors who were contacted at the wilderness trailhead by rangers. The data collection instrument used was the questionnaire made for the original study. It was designed to measure the socio- demographic variables that the literature showed may alter the effectiveness of the educational contact aimed at reducing campsite impacts (e.g. unwanted firerings, damaged trees and shrubs, etc.), the rapport established between the ranger and the visitor, and the visitors' perception of the condition of Shining Rock Wilderness. A second section of the questionnaire attempted to measure the kind of social power the ranger used, but this was only to be exploratory in nature. A third section measured the visitors' perception of the light-handedness or heavy-handedness of the trailhead contact. With the changes in the research design due to the researcher's medical problems, the theoretical context of social power became the primary foundation for the thesis. The direct measures of the

effectiveness of the contact in reducing campsite impacts were lost. No direct observations of each group's impacts were recorded and no control groups were used. Thus, no causal relationship could be tested.

STUDY HYPOTHESES AND RESEARCH QUESTIONS

Hypotheses One and Two

Education of users is a major goal for most land
managing agencies. Researchers feel that education is a
light-handed management strategy. It purportedly allows the
visitor the freedom to choose how, when, and where to
recreate and gives the manager a low degree of visitor
control (Gilbert et al. 1972; Hendee et al. 1978; Lucas
1982). Many times the education of wilderness visitors is
handled by wilderness rangers. While some of the rangers'
duties may be classified as heavy-handed (Gilbert et al.
1972), visitors apparently want wilderness rangers (Stankey
1973; Hinton 1975; Lucas 1980; and Roggenbuck et al. 1982).
Hypothesis one and two state: (1) A majority of the visitors
will judge a wilderness trailhead contact by a ranger to be
a light-handed management action; and (2) There will be a
positive correlation between a visitor's rating of

statements that suggest a trailhead contact permits the visitor the freedom to choose how, when and where to recreate and his feeling that the contact is light-handed; and a negative correlation between ratings of statements that suggest the contact takes away the visitor's freedom and his feeling that the contact is light-handed.

Hypothesis Three

When managers use light-handed management strategies, they should not be perceived as regulating or controlling visitor behavior (Gilbert et al. 1972; Hendee et al. 1978; and Lucas 1982). This implies that light-handed management does not depend upon surveillance to locate and correct rule breakers. Two of the bases of social power require surveillance to alter a target's (visitor's) behavior (Raven and Rubin 1976). Hypothesis three states: There will be a positive correlation between the visitor's perception of the ranger's use of informational, expert, legitimate, or referent power and the perceived light-handedness of the contact. In contrast, there will be a negative correlation between the visitor's perception of the ranger's use of coercive and reward power and the perceived light-handedness of the contact.

Hypothesis Four

Of the four power sources that don't require surveillance to be effective, only informational power is not socially dependent (Raven and Rubin 1976). Light-handed management stresses freedom from control. A socially dependent social power could potentially be interpreted as a power that lessens the visitor's psychological freedom. Hypothesis four states: There will be a stronger positive correlation between visitor's perception of the ranger's use of informational power and the perceived light-handedness of the contact than between the visitor's perception of the ranger's use of expert, legitimate, or referent power and the perceived light-handedness of the contact.

Research Questions One and Two

Researchers have long felt that education of users is an effective way to lessen recreational impacts in wilderness (Gilbert et al. 1972; Hendee et al. 1978; Lucas 1982). All agencies use education to some degree, yet there is no consensus among managers on its effectiveness (Godin

and Leonard 1978; Fish and Bury 1979; Bury and Fish 1980; Washburne and Cole 1983). Most managers agree that education does have beneficial effects, especially where overuse has not occurred. But in areas that have been heavily impacted, managers tend to feel that heavy-handed controls are more effective. The study wilderness area is heavily used and some areas are heavily impacted, but the manager there feels education is effective in reducing site impacts (Reid 1984).

The lack of consensus among managers and the lack of empirical research in wilderness does not permit the formulation of hypotheses regarding the effectiveness of education in reducing site impacts. Instead the following research questions were addressed by this research: (1) Do a majority of returning visitors perceive the wilderness as being less impacted now than it was on their earlier trips? and (2) Do a majority of visitors leaving the wilderness perceive it as containing few site impacts?

MATERIALS AND METHODS

Study Area

The study area for this research is Shining Rock
Wilderness. It is one of four areas in the eastern United
States designated as wilderness by the 1964 Wilderness Act.
It is located on the Pisgah National Forest in western North
Carolina. This 18,700-acre tract is preserved in its
natural state to provide a primitive, remote retreat from
civilization. Elevations vary in the wilderness from 3,400
feet near the Big East Fork trailhead to 6,030 feet on Cold
Mountain. Most of the topography is quite steep, except
along Shining Rock Ledge where it is rolling with gentle
slopes.

The area is unique in the East, for it contains a
complex mixture of rugged terrain and unusual vegetational
communities. It is one of the southernmost extensions of the
vegetative zone called the Canadian Zone. Spruce and fir

once dominated the upper elevations of this area. Many
parts of the upper elevations are now covered in thick
growths of mountain laurel, rhododendron, blueberries, and
blackberries. Other areas are large, open, grassy meadows.
As elevation decreases, the northern hardwood forest assumes
dominance. All these plant communities provide spectacular
floral blooms, and the grassy meadows offer unsurpassed
views of mountain panoramas.

More than thirty miles of trails are maintained in this
wilderness area. They allow the visitors access to almost
all of the area. The most heavily used entrances to Shining
Rock Wilderness are the parking lots near Mile Post 420 of
the Blue Ridge Parkway and at the point where the Big East
Fork of the Pigeon River crosses U.S. highway 276 (Figure
1). Three lightly used entrances also exist. One is near
the Sunburst Campground and the other two are at the Daniel
Boone Boy Scout Camp.

Overview of Research

A normal part of a wilderness ranger's work at Shining
Rock Wilderness is to contact visitors at a trailhead on
summer weekends. He or she teaches "Without-A-Trace" camping
techniques to the overnight users. The ranger also
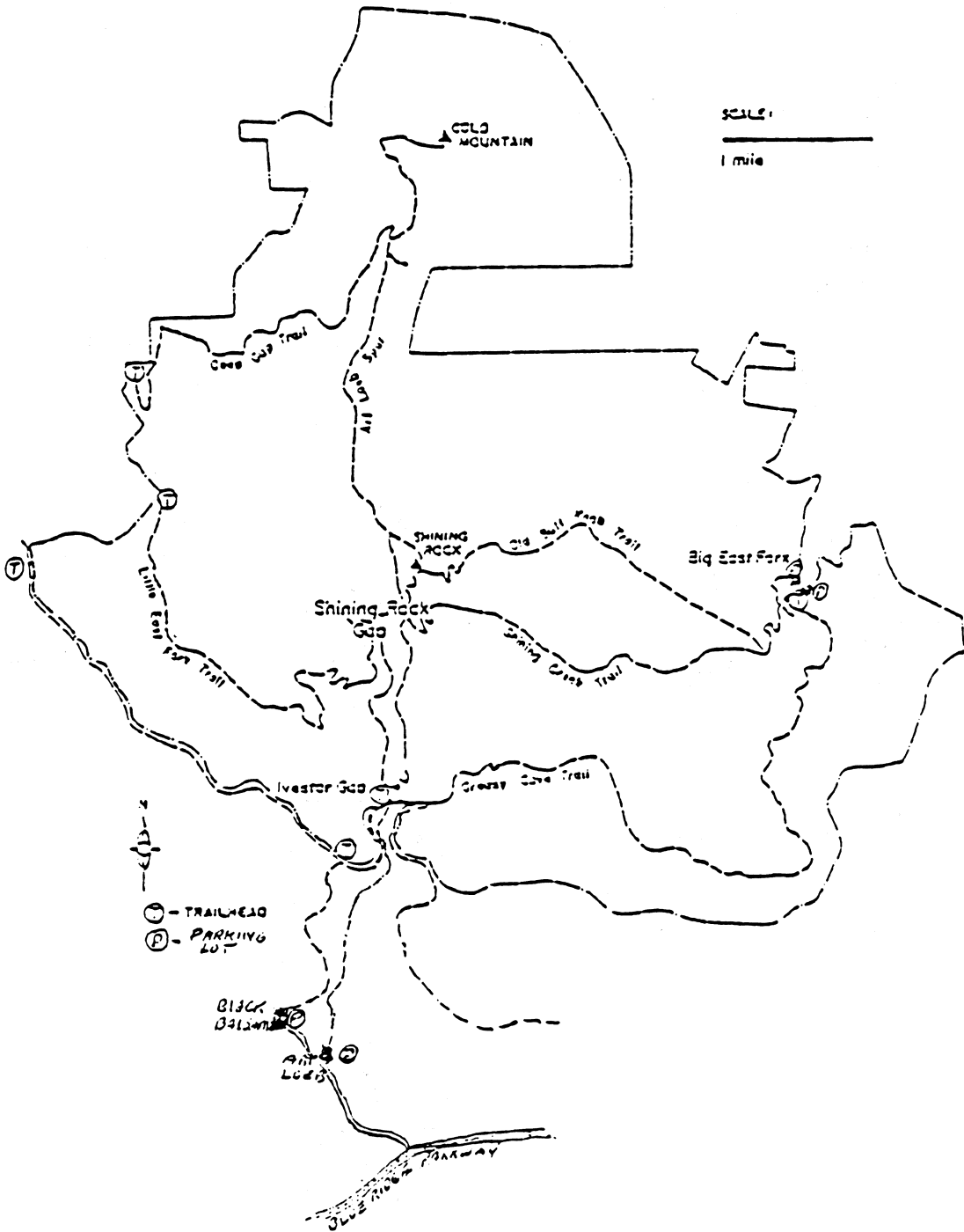
Figure 1. Trailheads at Shining Rock Wilderness.

encourages visitor dispersion, provides information on current events of interest, and answers any questions that visitors may have.

Weekends are times of heavy use of the wilderness, and most visitors enter through two of the area's trailheads (Big East Fork and Investor Gap) (Roggenbuck et al. 1979). As part of this study, visitors were contacted by rangers as they entered the wilderness area. They were also recontacted as they left and asked at that time to fill out a questionnaire. The questionnaire was used to measure the visitors' perceptions of the ranger, the trailhead contact, and the condition of the wilderness. The data collection procedures described next will address the following issues: (1) the study population and sampling procedures; (2) the trailheads sampled; (3) the messages that were given to the wilderness visitor at the initial contact and how they were given; (4) the final visitor contact; and (5) data collection instruments.

Study Population and Sampling Procedures

The study population was overnight backpackers over 16 years of age who use Shining Rock Wilderness on summer weekends. Because of financial and manpower constraints,

the sampling period was limited to the area's two high use
trailheads for the period from July 21 through Labor Day,
1984. During this period rangers contacted all members of an
overnight group when they arrived and gave questionnaires to
all members of exiting groups who had been contacted
earlier. Strictly speaking, this sample may not be
representative of Shining Rock Wilderness users. However,
for the purposes of this study, it will be assumed that it
is a representative sample.

Study Trailheads

The two trailheads that were used in this study were
the Big East Fork Trailhead and the Ivestor Gap Trailhead
(Figure 1). Rangers were not stationed at the Ivestor Gap
Trailhead but did work the parking lots of the two most
heavily used trails that lead to it (Black Balsam and Art
Loob parking lots). The Big East Fork Trailhead parking lot
is split into two lots by the Big East Fork of the Pigeon
River, but both were covered by one ranger.

Initial Wilderness Visitor Contact and Message

Wilderness rangers were stationed at the study trailheads from noon until an hour before sunset on Friday, from 11:00 a.m. until an hour before sunset on Saturday, and from 11:00 a.m. until 6:00 p.m. on Sunday. They greeted all visitors and gave those with backpacks educational messages.

The message was delivered in a verbal exchange between the ranger and the wilderness user. It generally contained information on how to reduce littering and vegetation damage and how to properly build a campfire so that one can remove its trace. Other Without-A-Trace camping techniques were mentioned when the ranger felt they were appropriate. Other parts of the message stressed camper dispersal in the wilderness, told visitors why dispersal is beneficial, informed visitors of other Without-A-Trace wilderness use techniques, and contained information on current events of interest (eagle management program, blueberries, etc.). Questions were also asked by the visitor, and the rangers did their best to answer them.

There was some variation in the message content. This was done in part to avoid burdening the visitor with irrelevant information. For example, those groups with

backpack stoves were not given the campfire building message
unless they asked for it. The author recognizes that this
uncontrolled variation in message content may explain
variation in visitor behaviors of interest.

How the message was presented followed the advice given
in the "Human Approach to Wilderness Management" (Bradley
1979). It calls for the visitor contacts to be warm,
friendly, and non- authoritarian. Rangers attempted to
establish a positive rapport with the visitor. To
accomplish all this required careful training (See Appendix
A). The rangers received training on being warm and
friendly but in a professional way. He or she then
determined the best way to effectively reach visitors when
they arrived.

Final Wilderness Visitor Contact

The final visitor contact occurred at the trailhead (or
parking lot) when the visitor exited the area. Upon
leaving, all previously contacted visitors aged 16 and
older were asked to fill out a short questionnaire, seal it
in an envelope, and return it to the ranger or a container
in the parking area. The rangers worked Saturdays and
Sundays to distribute questionnaires to overnight visitors

they had contacted earlier. An attempt was made to use a standardized speech (See Appendix B) to request the visitors' cooperation in filling out the questionnaire.

Data Collection Instruments

Two data collection instruments were used. The primary instrument was a short questionnaire (See Appendix C) completed by sample subjects at the trailheads as they left the wilderness. It measured the visitors' perception of the ranger, the contact, and the wilderness. It also recorded their experience level, sex, age, and the distance from the wilderness to their home.

Additional study data was recorded on the envelope in which the visitors put their completed post-trip questionnaires. Before distributing the envelopes, the ranger recorded the date, time, weather, location of the post-trip contact, and the ranger's initials who did the initial contact.

Acknowledgement of Limitations

The author recognizes that the study design and data collection instruments do not permit an exact measure of the

effect of trailhead contacts on site impact behavior in wilderness. This study only measured the visitors' perceptions of site impacts. Previous research (Knudson and Curry 1981; Lucas 1979) has shown that visitors often do not notice the site impacts that managers do. Second, site impacts in the wilderness may be changing - and perhaps lessening - but this change may be due to something other than trailhead contacts. Third, returning visitors may be perceiving a change when in fact there is no change. This could be due to memory recall problems; this would be especially likely if several years have passed since the last visit. Also, visitor norms about what wilderness behavior and site conditions are appropriate may be changing. If this is the case, then what was judged acceptable on previous visits may be judged more harshly on the sampled visit. These limitations suggest that visior opinions about site impacts can only be considered indicators of site condition.

Data Analysis

Both descriptive and probability statistics were used to describe study data. Frequency distributions were computed on the visitors' responses to the major dependent

and independent variables. These distributions help the reader better understand the data. They are also included to help area managers interpret study results.

Three statistical techniques were also used to analyze the data. Because of the nature of this data, they are all non-parametric. Tests of proportions (Clark and Schkade 1983) were used to see if a significant majority of the visitors answered positively or negatively to measures of freedom, social power, and light-handededness - heavy-handedness of the trailhead contact in Shining Rock Wilderness. A significant majority differs from a simple majority in that it has been statistically tested and found to come from a population whose proportion of agreement (or disagreement), with an issue is different than $P = 0.5$. For example, if 51 of sample visitors agreed and 49 disagreed, this is a simple majority, but not likely a significant majority. In a test of proportions (H : $P = 0.5$), the null hypothesis that the population's proportion for agreement is not different than $P = 0.5$ would not likely be rejected. Our next sample could easily be 49 in agreement and 51 in disagreement. If a sample shows a significant agreement (or disagreement), then there is a high level of confidence that the population has agreement (or disagreement).

Kendall's tau was used as a correlation technique to

assess the relationship between the visitor's rating of light-handedness versus heavy-handedness of the contact and the freedom measures and the social power measures. Correlations were used when testing the relationship between a visitor's age or experience and measures of the visitor's perception of the ranger, the discussion with the ranger, and the condition of Shining Rock Wilderness. Correlations were also used when testing the relationship between ranger-visitor rapport and the perceived light-handedness of the contact and visitor's attitudes on Without-A-Trace camping practices. Kendall's tau was chosen because its coefficients are somewhat more meaningful than Spearman's r when there are a large number of tied ranks in the data (Nie et al. 1975), as was the case with the study's data.

Chi-square tests of independence were used to study the relationship between the sex of the ranger, the experience of the ranger, and the sex of the visitor with the visitor's perception of the ranger, the discussion with the ranger, and the light-handedness of the contact.

RESULTS

Sample Size and Ranger Contacts

One hundred thirty-nine visitors filled out questionnaires. All were usable and no visitors refused to cooperate. It should be noted that most (81.4%) of the questionnaires were filled out during the last three weekends of the study (Table 3). Low wilderness visitation in July and early August was thought to be due to rainy weather. Manpower shortages occurred all summer and were the reason the Big East Fork trailhead was only manned by a ranger one weekend (Table 4). During the second weekend in August there was no research conducted because of a manpower shortage. Four different rangers were used in this study (3 males and 1 female). Table 5 shows the number of visitors contacted by each ranger who filled out a questionnaire.

Table 3.   Number of Questionnaires Administered Each Weekend.

Weekend	N	% of Total Response
July 21-22	12	8.7%
July 29	10	7.2%
August 4	4	2.9%
August 19	24	17.3%
August 25-26	29	20.9%
*September 2-3	60	43.2%
TOTAL	139	100%

*Labor Day Weekend

Table 4.   Number of Questionnaires Administered at Each Trailhead.

Trailhead	N	% of Total Response
Black Balsam Trailhead	113	81.3%
Art Loeb Trailhead	21	15.1%
Big East Fork Trailhead	5	3.6%
TOTAL	139	100%

Table 5. Number of Visitors Contacted by Each Ranger.

Ranger	N	% of Total Response
Ken	54	38.8%
Joan	47	33.8%
Scott	32	23.0%
Lawrence	6	4.3%
TOTAL	139	100%

Characteristics of Wilderness Users in the Study

The wilderness visitors' ages ranged from 16 to 64 with a median age of 30. Eighty-eight of the visitors were male and 48 were female (3 didn't report their gender). Just over 14% of the 139 visitors were on their first backpacking trip, and 53.4% had been backpacking for less than 7 years. Almost 60% of the respondents took fewer than five wilderness trips a year. Almost 19% took five or six trips a year, and about 21% backpacked more than six times a year. Fifty-nine percent (82) of the visitors had camped at Shining Rock Wilderness before this trip. Over half (51.2%) of these return visitors had been camping for less than five years. Most (80.8%) of the return visitors came to Shining Rock Wilderness only once or twice a year.

Visitors were given a list of Without-A-Trace camping practices and asked to mark the ones they knew before they arrived at Shining Rock Wilderness for this trip (Table 6). The table shows that most people said they knew of the camping practices. About 92 to 99% of the study participants knew the proper camping practices concerning litter, washing dishes, leftover food, care of living campsite trees and shrubs, and noise, but fewer (74.8 to 85.3%) knew the proper camping practices concerning

Table 6. Visitors' Knowledge of Proper Without-A-Trace Camping Techniques Prior to Arriving at Shining Rock Wilderness.

Without-A-Trace Techniques	N	% Responded Who Knew Techniques
Pack out all litter	137	99.3%
Remove all traces of your fire-ring	137	74.8%
Don't cut any standing dead trees or bushes	137	77.4%
Wash your dishes away from a stream, not in the stream	137	93.4%
Pack out your leftover food after you eat	137	94.2%
Don't cut any living trees or bushes	137	99.3%
Bury your human waste at least 6 inches below the soil surface	136	85.3%
Wash yourself away from a stream, not in the stream	137	84.7%
Don't make excessive noise	137	92.7%

fire-rings, care of dead campsite trees and shrubs, disposal
of human waste and wilderness bathing.

The visitors were then asked (after the educational
contact) if they agreed or disagreed with these camping
practices when they were in a wilderness (Table 7). Between
(90.3 and 100%) of the visitors agreed with all practices
except removing fire-rings and cutting dead trees or shrubs.
Only 76.8% agreed with removing fire-rings, and only 75.9%
felt that cutting dead trees and shrubs was inappropriate.

Finally, visitors were asked how many miles they had
driven from their home to get to Shining Rock Wilderness.
Distances ranged from 10 miles to over 999 miles. The mode
and median were 150 miles.

Light-handedness/Heavy-handedness Variables

To tap one of the major dependent variables in the
study (whether the trailhead contact was perceived as
light-handed or heavy-handed), the visitors were asked to
rate the statement, "Some people think that trailhead
contacts are a light-handed way to teach proper wilderness
use. Others feel it is heavy-handed". Table 8 shows the
responses to this question. (A 7-point likert scale ranging
from 1 - extremely light-handed to 7 - extremely

Table 7. Visitors' Agreement or Disagreement with Proper Without-A-Trace Camping Techniques.

Without-A-Trace Technique	Mean Response*	N	% Responding Agree or Strongly Agree
Pack out all litter	4.96	139	100%
Remove all traces of your firering	4.23	116	76.8%
Don't cut any standing dead trees or bushes	4.20	130	75.9%
Wash your dishes away from a stream, not in the stream	4.70	132	95.6%
Pack out your leftover food after you eat	4.64	131	91.3%
Don't cut any living trees or bushes	4.93	136	99.2%
Bury your human waste at least 6 inches below the soil surface	4.58	124	90.3%
Wash yourself away from a stream, not in the stream	4.61	126	92.7%
Don't make excessive noise	4.70	129	94.2%

*Based on 5-point Likert Scale (1-strongly disagree to 5-strongly agree).

Table 8. Visitors' Perception of the Light-handedness or Heavy-
          handedness of the Ranger Contact.

Category	Mean Response*	N	% Responding Extremely, Quite or Slightly Light-handed	% Responding Quite or Slightly Heavy-handed
Ranger Contact	2.76	132	59.8	3.3%

*Based on a 7-point Likert Scale (1-Extremely light-handed to
7-Extremely heavy-handed).

heavy-handed was used). Almost 60% of the visitors felt it was extremely, quite, or slightly light-handed, while only 3.8% felt it was quite or slightly heavy-handed. The rest were neutral.

Visitors were asked to give their feelings about the discussion they had with the wilderness ranger (Table 9). They recorded their agreement or disagreement with statements concerning the contact on a 5-point Likert scale. The majority of visitors agreed or strongly agreed with statements expressing like for the contact and disagreed or strongly disagreed with statements expressing dislike for the contact. Among the statements that expressed that the visitor liked the contact, the least agreement (70.6%) concerned the statement that the visitor could learn the proper way to use the wilderness, and the most agreement (87.0%) came on the statement that the visitor liked the contact because he now knows the Forest Service cares about wilderness the way he does. Among the statements suggesting that the visitor disliked the contact, the most disagreement (89.9%) with such statements was with the statement that the contact took away the visitor's freedom, and the least disagreement (78.5%) was with the statement that the visitor wanted to be left alone.

Table 9. Visitors' Feelings About Their Contact with a Wilderness Ranger.

	Mean Response[*]	N	% Responding Agree or Strongly Agree	% Responding Disagree or Strongly Disagree
I liked it because I could learn the proper way to use the wilderness.	3.97	129	70.6%	4.7%
I didn't like it because I wanted to be left alone.	1.82	136	4.8%	78.5%
I liked it because I now know the Forest Service cares about the wilderness the way I do.	4.37	131	87.0%	3.8%
I didn't like it because I felt it took away my freedom.	1.56	128	1.6%	89.9%
I didn't like it because I had to delay the start of my trip.	1.64	126	3.2%	86.5%
It made me feel anxious, like I would be watched my whole trip.	1.58	127	3.2%	89.0%
I liked it because my questions could be answered correctly.	4.06	128	78.1%	4.7%
I didn't like it because I felt I might be penalized if I didn't do what the ranger suggested.	1.75	127	5.5%	80.3%
I didn't like it because I felt I had to give up my favorite ways of camping.	1.59	127	4.0%	89.0%
I liked it because the Forest Service should be able to teach us how to use the wilderness.	4.32	130	86.1%	1.5%
I felt if I followed the ranger's suggestions, I could continue to freely use the wilderness.	4.26	131	83.9%	3.1%

[*]Based on a 5-point Likert Scale (1-strongly disagree to 5-strongly agree).

The visitors were also asked to describe the wilderness ranger that contacted them upon their arrival at Shining Rock Wilderness (Table 10). A semantic differential scale was used to obtain ratings on eight attributes of the ranger. Responses indicated that the rangers were generally extremely or quite well accepted. However, 21.0% of the visitors did judge the rangers to be slightly to extremely authoritarian. This may, however, be due to the visitors' misunderstanding of the word "authoritarian". They may have confused authoritarian with authoritative. Authoritative means having authority, being official, or being reliable because one is a recognized expert. Judging from the way the visitors answered the other seven attributes, the rangers should not have been perceived as authoritarian. The rangers were perceived as quite or extremely friendly and informed (99% and 93.7% agreement, respectively), but were rated lower in their warmth and expertness (82% and 85.1%, respectively).

Table 10. Visitors' Description of Wilderness Ranger.

Category	Ranger as Friendly/Unfriendly		Ranger as Like/Dislike	
	N	% of Total Response	N	% of Total Response
Extremely positive	72	53.0%	40	36.0%
Quite positive	58	43.0%	63	56.8%
Slightly positive	4	3.0%	6	5.4%
Neither	0	0.0%	1	0.9%
Slightly negative	1	0.7%	0	0.0%
Quite negative	0	0.0%	1	0.9%
Extremely negative	0	0.0%	0	0.0%
Total	135	100	111	100

Category	Ranger as Warm/Cold		Ranger as Pleasant/Unpleasant	
	N	% of Total Response	N	% of Total Response
Extremely positive	34	33.0%	64	56.1%
Quite positive	36	35.0%	40	35.1%
Slightly positive	12	11.7%	5	4.4%
Neither	14	13.6%	0	0.0%
Slightly negative	2	1.9%	0	0.0%
Quite negative	3	2.9%	4	3.5%
Extremely negative	2	1.9%	1	0.9%
Total	103	100	114	100

Table 10. Visitors' Description of Wilderness Ranger. (continued)

Ranger as Informed/Uninformed			Ranger as Expert/Inexpert		
Category	N	% of Total Response		N	% of Total Response
Extremely positive	49	38.3%		25	23.4%
Quite positive	67	52.3%		46	43.0%
Slightly positive	4	3.1%		20	18.7%
Neither	4	3.1%		13	12.1%
Slightly negative	3	2.3%		2	1.9%
Quite negative	0	0.0%		1	0.9%
Extremely negative	1	0.8%		0	0.0%
Total	128	100		107	100

Ranger as Non-authoritarian/Authoritarian			Ranger as Reliable/Unreliable		
Category	N	% of Total Response		N	% of Total Response
Extremely positive	13	12.4%		45	39.1%
Quite positive	12	11.4%		49	42.6%
Slightly positive	18	17.1%		11	9.6%
Neither	40	38.1%		8	7.0%
Slightly negative	6	5.7%		0	0.0%
Quite negative	7	6.7%		2	1.7%
Extremely negative	9	8.6%		0	0.0%
Total	105	100		115	100

Research Questions on Site Conditions

Research Question One

Do a majority of returning visitors perceive the wilderness as being less impacted now than it was on their earlier trips?

Visitors who had camped at Shining Rock Wilderness before this trip were asked how the condition of the wilderness on this trip compared to its condition on their previous trip(s). A list of impacts was given and visitors were asked if they perceived more of, less of, or about the same amount of a specific impact. They could also answer no opinion (Table 11). Visitors were also asked, on a 5 point Likert scale ranging from 1 - strongly agree to 5 - strongly disagree, whether they agreed or disagreed with statements concerning the condition of Shining Rock Wilderness during the trip they just completed (Table 11).

A majority responded that trail litter, campsite litter, damaged trees, and fire-rings had stayed the same. About 48% felt that the amount of noise other campers make had remained the same and about 40% felt the amount of human waste had remained unchanged. Thus, most visitors did not perceive a change. Of those visitors who did perceive a change, more reported litter (32.9% on campsite litter and

Table 11. Return Visitors' Perception of Problems at Shining Rock Wilderness.

Site Category Variable	Mean Response*	n	% Responding More Now	% Responding About the Same	% Responding Less Now
Trailside litter	1.73	82	9.8	56.1	31.7
Campsite litter	1.76	82	13.4	51.2	32.9
Damaged trees	1.95	82	22.0	54.9	19.5
Firerings	2.04	81	25.9	59.3	7.4
Skunks	0.75	81	0.0	27.2	21.0
Human waste	1.52	81	18.5	40.7	14.8
Noisy campers	1.75	82	18.1	48.2	24.1

*Based on a 4-point Likert Scale (1-Less now, 2-Some, 3-More now, 4-No opinion).

31.7% on trail litter) as having decreased rather than increased (13.4% on campsite litter and 9.8% on trail litter). But on the negative side, 25.9%, 22.0%, and 18.5%, respectively, reported that fire-rings, damaged trees, and human waste had increased instead of decreased (percentages that perceived decreases were 7.4%, 19.5%, and 14.8%, respectively). Finally, while no visitors felt skunk problems had increased, more visitors (27.2%) felt they had stayed the same rather than decreased (21.0%)[1] Most visitors (51.8%) had no opinion on problems concerning skunks.

Thus, to answer the first research question, a majority of the visitors saw no change in the condition of Shining Rock Wilderness. If those who did see a change can be taken to indicate a trend, litter and skunks may be decreasing but the number of fire-rings may be increasing. There was little difference in the percentages of visitors perceiving increases and decreases on damaged trees and human waste.

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[1]Shining Rock Wilderness managers have been concerned about the number of skunks in the area because they prowl in and around tents, annoy visitors, and may indicate unsanitary campsite conditions.

Research Question Two

Do a majority of visitors leaving the wilderness
perceive it as containing few site impacts?

Visitors were asked, on a 5-point Likert scale ranging
from 1 - strongly agree to 5 - strongly disagree, whether
they agreed or disagreed with statements concerning the
condition of Shining Rock Wilderness during the trip they
just completed (Table 12). A majority of the visitors
agreed or strongly agreed that there was little litter
(73.2% on trail litter and 80.4% on campsite litter) and
that skunks were not a problem (81.4%). More visitors
agreed (38.7%) than disagreed (34.1%) that there were too
many fire-rings, but more disagreed (51.4% and 47.4%
respectively) than agreed (30.2% and 30:4% respectively)
that unburied human waste and noisy campers were problems.

A test of proportions was run to see if a significant
majority of the visitors agreed or disagreed (neutral
responses were not counted) with statements concerning
specific impacts in Shining Rock Wilderness (Table 13). A
significant majority of these visitors' responses indicated
trail litter, campsite litter, skunks, unburied human waste,
and other noisy campers were not a problem on this trip.
More visitors agreed than disagreed that there were too many
fire-rings; however, this was not a significant majority.

Table 12. Problems Visitors Perceived During Their Wilderness Camping Trip.

Site Condition Variables	Mean Response*	N	% Responding Agree or Strongly Agree	% Responding Disagree or Strongly Disagree
Little trailside litter	3.75	138	73.2%	18.1%
Little campsite litter	3.94	138	80.4%	13.0%
Damaged trees	2.95	135	37.8%	43.7%
Too many fire-rings	3.15	132	38.7%	34.1%
Skunk problem	1.78	134	81.4%	8.9%
Unburied waste	2.77	133	30.2%	51.1%
Campers too noisy	3.84	135	30.4%	47.4$

*Based on a 5-point Likert Scale (1-Strongly disagree to 5-Strongly agree).

78

Table 13.   Test of Proportions* for Visitors' Ratings of Impacts Perceived on Their Just
Finished Trip.

Impact Statement	N	N of Visitors in Agreement or Disagreement**	Z-score	Alpha Level
There was very little litter along the trail.	126	A - 101	6.79	p=.000
There was very little litter at your campsite.	129	A - 111	8.19	p=.000
The trees and bushes at the campsite were damaged.	110	D - 59	0.07	p=.47
There were too many fire-rings in the wilderness.	96	A - 51	1.02	p=.15
Skunks were a concern at our campsite.	121	D - 109	13.72	p=.000
There was too much unburied human waste.	108	D - 68	2.54	p=.005
Other campers were too noisy.	105	D - 64	2.25	p=.012

*H_o: p=.5

**A=Agreement; D=Disagreement

Thus, to answer the second research question, impacts were not perceived to be important problems in Shining Rock Wilderness.

Hypotheses Tests[2]

Hypothesis One

A majority of the visitors will judge a wilderness trailhead contact by a ranger to be a light-handed management action.

A test of proportions was used to test this hypothesis. The number of visitors who rated the contact as extremely, quite, or slightly light-handed were combined and compared against the total number of visitors who rated the contact as neither light-handed nor heavy-handed or extremely, quite, or slightly heavy-handed. The test showed that a significant majority of the visitors (60%) judged the contact to be lighthanded (Table 14). This allows us to reject the null hypothesis that the population of wilderness users views trailhead contact as neither light-handed nor heavy-handed. The data collected suggests that the contact was perceived as light-handed.

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[2]The author realizes that from a theoretical standpoint, a statistical test can only be conducted on a null hypothesis. Hypotheses are stated here in directional form on the basis of past empirical and theoretical discussion in the literature. Statistical tests will, however, be performed on the hypotheses in their null form.

Table 14. Test of Proportions* of Light-handedness of the Contact.**

Light-handedness Measure	Total N	N who Rated Contact as Light-handed	Z-score	Alpha Level
light-handed-heavy-handed semantic differential	132	79	2.23	p=.0122

*H_o: p=.5

**Perceived light-handedness of the contact was measured by the statement: Some people think that trailhead contacts are a light-handed way to teach proper wilderness use. Others feel that it is heavy-handed. (Circle the number between the pair of words below (light-handed/heavy-handed) that best describes your feelings).

Hypothesis Two

There will be a significant positive correlation between a visitor's rating of statements that suggest a trailhead contact permits the visitor the freedom to choose how, when and where to recreate and his feeling that the contact is lighthanded, and a significant negative correlation between ratings of statements that suggest the contact takes away the visitor's freedom and his feeling the contact is lighthanded.

Kendall's Tau correlations were computed between each of seven statements and one semantic differential that were written to measure perceived freedom at the trailhead contact and a semantic differential that measured the degree of light-handedness or heavy-handedness of the contact (Table 15). The correlations ranged from -.11 to +.11, but none were significant at alpha = .05. Therefore, even though the correlation coefficients were in the hypothesized direction, there is not enough evidence to reject the null hypothesis. In this study, therefore, no relationship was found to exist between perceived freedom and the degree to which the contact was labelled light-handed versus heavy-handed.

Table 15. Correlation Between Eight Trailhead Freedom Measures and Perceived Light-handedness of the Contact.*

Freedom Measures	N	Kendall's Tau	Alpha Level
Non-Authoritarianism of Ranger	103	+.10	p=.10
I didn't like it because I wanted to be left alone.	123	-.09	p=.11
I didn't like it because I felt it took away my freedom.	125	-.05	p=.25
I didn't like it because I had to delay the start of my trip.	123	-.05	p=.27
It made me feel anxious, like I would be watched my whole trip.	124	-.11	p=.06
I didn't like it because I felt I might be penalized if I didn't do what the ranger suggested.	124	-.11	p=.08
I didn't like it because I felt I had to give up my favorite ways of camping.	124	-.03	p=.37
I felt if I followed the ranger's suggestions, I could continue to freely use the wilderness.	127	+.11	p=.08

*Perceived Light-handedness of the contact was measured by the statement: Some people think that trailhead contacts are a light-handed way to teach proper wilderness use. Others feel it is heavy-handed. (Circle the number between the pair of words below (light-handed/heavy-handed) that best describes your feelings).

A test of proportions was then conducted to see if a significant majority of visitors felt that the trailhead contact permitted freedom to make their own decisions when recreating. The same eight freedom measures used in testing Hypothesis Two were used. Table 16 contains the test of proportion results. They indicate a significant majority of the visitors agreed they retained the ability, as measured by each of the eight freedom measures, to choose how, when, and where to recreate.

Hypothesis Three

There will be a significant positive correlation between the visitor's perception of the ranger's use of informational, expert, legitimate, or referent power and the perceived light-handedness of the contact. In contrast, there will be a significant negative correlation between the visitor's perception of the ranger's use of coercive or reward power and the perceived light-handedness of the contact.

Kendall's Tau correlations were computed between ratings on each of the three semantic differential measures and four Likert statements that were thought to measure the ranger's use of informational, expert, legitimate, or referent power and the visitor's perception of the light-handedness of the contact (Table 17). In addition,

Table 16. Tests of Proportions* for Eight Trailhead Freedom Measures.

Freedom Measures	N	N of Visitors Who Agreed or Disagreed	N of Visitors In Agreement or Disagreement**	Z-score	Alpha Level
Non-Authoritarianism of Ranger	105	65	A - 43	2.6	p=.005
I didn't like it because I wanted to be left alone.	126	105	D - 99	9.1	p=.000
I didn't like it because I felt it took away my freedom.	128	117	D - 115	10.4	p=.000
I didn't like it because I had to delay the start of my trip.	126	113	D - 109	9.9	p=.000
It made me feel anxious, like I would be watched my whole trip.	127	117	D - 113	10.1	p=.000
I didn't like it because I felt I might be penalized if I didn't do what the ranger suggested.	127	109	D - 102	9.1	p=.000
I didn't like it because I felt I had to give up my favorite ways of camping.	127	118	D - 113	9.9	p=.000
I felt if I followed the ranger's suggestions, I could continue to freely use the wilderness.	131	114	A - 110	9.9	p=.000

*H_o: p=.5

**A-Agreement, D-Disagreement

Table 17. Correlations Between Perceived Light-handedness of the Contact* and Informational, Expert, Legitimate, and Referent Social Power Measures.

Social Power Items	Type of Social Power**	N	Kendall's Tau	Alpha Level
I liked it because I could learn the proper way to use the wilderness.	I	125	+.05	p=.24
I liked it because my questions could be answered correctly.	I	125	+.06	p=.24
Ranger perceived as informed	E	123	+.004	p=.48
Ranger perceived as an expert	E	104	+.03	p=.36
Ranger perceived as reliable	E	111	+.01	p=.45
I liked it because the Forest Service should be able to teach us how to use the wilderness.	L	126	+.13	p=.05
I liked it because I now know the Forest Service cares about the wilderness the way I do.	R	128	+.06	p=.22

*Some people think that trailhead contacts are a light-handed way to teach proper wilderness use. Others feel that it is heavy-handed. (Circle the number between the pair of words below (light-handed/heavy-handed) that best describes your feelings.

**I=informational; E=expert; L=legitimate; R=referent).

four Likert statements and one semantic differential measure
that were thought to measure the ranger's use of coercive or
reward power were also related to the visitor's perception
of the light-handedness of the contact. Only one of the
correlations was significant at alpha =.05. There was a
significant positive correlation between the perceived
light- handedness of the contact and the statement: "I liked
it (the contact) because the Forest Service should be able
to teach us how to use the wilderness." However, because of
the number of correlations that were run, one of the
correlations might be expected to be significant by chance
alone. Thus, there is not enough evidence to reject the
null hypothesis. The conclusion must be that there is
little relationship between power base used by the ranger
and perceived light-handedness of the contact.

A test of proportions was then run to see if a
significant majority of users had agreed that the rangers
used informational, expert, legitimate, or referent power,
but did not use coercive or reward power (Table 18). The
results show a significant majority of visitors indeed
agreed with those Likert and semantic differential
statements that measured the ranger's use of informational,
expert, legitimate, or referent power and disagreed with the
measures indicating the ranger used coercive power. But a

Table 18. Test of Proportions* for Social Power Measures.

Social Power Items	Type of Social Power**	N	N of visitors Who Agreed or Disagreed	N of visitors in Agreement or Disagreement	Z-scores	Alpha Level
Ranger perceived as informed	E	128	124	A - 120	10.4	p=.000
Ranger perceived as an expert	E	107	94	A - 91	9.1	p=.000
Ranger perceived as reliable	E	115	107	A - 105	10.0	p=.000
I liked it because my questions could be answered correctly.	I	128	106	A - 100	9.1	p=.000
I liked it because I could learn the proper way to use the wilderness.	I	129	97	A - 91	8.6	p=.000
I liked it because the Forest Service should be able to teach us how to use the wilderness.	L	130	114	A - 112	10.3	p=.000
I liked it because I now know the Forest Service cares about the wilderness the way I do.	R	131	119	A - 114	10.00	p=.000
I felt if I followed the ranger's suggestions, I could continue to freely use the wilderness.	Re	131	114	A - 110	9.9	p=.000

88

Table 18. Test of Proportions[*] for Social Power Measures. (continued)

Social Power Items	Type of Social Power[**]	N	N of visitors Who Agreed or Disagreed	N of visitors in Agreement or Disagreement	Z-scores	Alpha Level
It made me feel anxious, like I would be watched my whole trip.	C	127	117	D - 113	10.1	p=.000
I didn't like it because I wanted to be left alone.	C	126	105	D - 99	9.1	p=.000
I didn't like it because I felt I might be penalized if I didn't do what the ranger suggested.	C	127	109	D - 102	9.1	p=.000
Ranger perceived as authoritarian	C	105	65	D - 43	2.6	p=.005

[*]H_o: p=.5

[**]E=expert; I=informational; L=legitimate; R=referent; Re=reward; C=Coercive.

significant majority agreed with the measures indicating the ranger used reward power. These results indicate the visitors perceived the ranger used informational, expert, legitimate, referent, or reward power, but did not use coercive power.

Hypothesis Four

There will be a stronger positive correlation between a visitor's perception of the ranger's use of informational power and the perceived light-handedness of the contact than between the visitor's perception of the ranger's use of expert, legitimate, or referent power and the perceived light-handedness of the contact.

Table 17 shows the correlations between visitor's ratings of Likert and semantic differential statements that measure a ranger's use of informational, expert, legitimate, and referent power and the perceived light-handedness of the contact. Informational power did not correlate higher than the other powers. The highest correlation (.13) is on a measure of legitimate power. Therefore, there is no evidence to reject the null hypothesis that states that informational power is similar to expert, legitimate or referent power in its relationship with perceived light-handedness of the contact.

Visitor's Perceptions of Different Wilderness Rangers
and Their Trailhead Contacts

As indicated earlier, three different wilderness rangers made most of the study's trailhead contacts. Two were male (Scott and Ken) and one was female (Joan). Another difference among the three was Ken had worked previously in Shining Rock Wilderness as a wilderness ranger and had studied wilderness management in college. The other two had no wilderness ranger experience and no college classes dealing specifically with wilderness management. Earlier research on the use of information and communication to manage wilderness has suggested personalized contacts may vary in their effectiveness on the basis of the sex, personality, or the experience of the message's source (Roggenbuck and Berrier 1982). Given this, chi-square tests of independence were run to see if visitors differed in their perception of the ranger who contacted them, of the discussion they had with the ranger, or of the light-handedness of the contact because of the sex or experience of the ranger. Since there were very few scores on the negative end of the neutral position on these measures, many of the comparisons could not be run (13 of 20 for sex differences and 11 of 20 for experience

differences). Of those that were run, there were no significant differences (alpha =.05) in the visitor responses.

Differences By Socio-demographic
Characteristics of the Visitors

The visitors were categorized by several socio-demographic variables (age, sex, experience), and Chi-square tests of independence or Kendall's Tau correlations were run to see if different groups perceived the contact and ensuing discussion, the ranger, or the condition of the wilderness differently. It should be noted that differences by these variables were not hypothesized, and because 58 tests were run, one would expect about three (alpha =.05) to be significant by chance. The visitors were categorized by sex, but no significant difference was found in either their perception of the ranger or the light-handedness of the contact. The number of years a visitor has been backpacking produced only one significant relationship when correlated with 20 measures concerning the perception of the attributes of the ranger, the discussion with the ranger, or the light-handedness of the contact. The more experienced backpackers the visitors were, the more likely they were to

agree the contact was light-handed than were the less experienced visitors.

The years of experience of returning Shining Rock visitors (i.e. those who had been to Shining Rock before the trip of the study contact) was also correlated with the light-handedness of the contact, but no significant relationship appeared. This variable did show a significant relationship to perception of the condition of Shining Rock Wilderness over time. Among the visitors experienced at Shining Rock, those with less experience tended to believe there were fewer skunks.

Three statistically significant differences appeared when the age of the visitor was correlated with measures of feelings about the ranger and the discussion with the ranger. The older the visitor, the less authoritarian they perceived the ranger and the more they felt they could learn proper use of the wilderness and have their questions answered correctly. Thus only six significant relationships were found due to socio-demographic characteristics of the visitors, and three would be expected by chance alone. Because of this and the lack of variability in the scores, there appears to be little significance in these findings.

Effect of Rapport On Visitor Perceptions and Attitudes

Making a good first impression can help a ranger succeed in his educational contacts with visitors (Bradley 1979). The study attempted to measure established "first impressions" (rapport) through four semantic differential ratings (friendly-unfriendly, like-dislike, warm-cold, and pleasant-unpleasant) of the ranger. A rapport index was created by adding the semantic differentials together and then divided by four to get an average rating from each visitor. These average rapport ratings were then correlated with the light-handedness of the contact and the visitor's agreement with the appropriateness of using Without-A-Trace camping techniques in a wilderness. No significant relationship was found between the average rapport ratings and the light-handedness of the contact. One significant relationship did occur concerning visitor attitudes toward Without-A-Trace camping techniques. The stronger the rapport rating, the more the visitors agreed that living trees and shrubs should not be cut. Because 10 correlations were computed at alpha = .05, there is a strong possibility that one appeared significant by chance alone. Thus,

rapport did not appear to have a strong effect on feelings
about the trailhead contact or attitudes toward
Without-A-Trace camping techniques.

DISCUSSION

In interpretation of study results, the author acknowledges certain limitations in research findings. First, data collection was limited to weekends in late summer. Study participants may thus not represent all Shining Rock Wilderness users, and study findings may therefore have limited generalizability. Second, actual messages provided to wilderness visitors at trailheads varied somewhat across rangers and across time. Thus, variation in visitors' feelings about the contact and their response to it may be due to variations in the message. Finally, as has been previously stated, measures of effect of trailhead contact on wilderness site conditions were visitor perceptions of those conditions across time. Such visitor judgments may not reflect reality, because visitors may not be able to recognize impacts. Also, visitor perceptions of trends across time may be clouded by memory loss, differential amounts of time since previous visits to

the area, and changing norms on what is appropriate
wilderness use and site conditions. Within these
constraints, the interpretation of results falls into one of
five sections: perceived light-handedness of trailhead
contacts; social power and trailhead contacts; condition of
Shining Rock Wilderness; effects of visitor-ranger rapport;
and effects of individual ranger and visitor
characteristics.

Perceived Light-handedness of the Trailhead Contact

An educational trailhead contact between a ranger and a
visitor was perceived by a majority of the study visitors as
a lighthanded management strategy. This supports wilderness
researchers' (Gilbert et al. 1972; Hendee et al. 1978)
assertion that education is a lighthanded way to manage
wilderness visitors. In addition, although these authors
also list the use of surveillance and fines (possibly a
wilderness ranger's job) as heavy-handed management, the
visitors did not seem to evaluate rangers and trailhead
contacts on the basis of these potential duties. A majority
of visitors strongly disagreed with statements stating the
visitors would feel they would be observed or penalized for
wrongdoings because of the contact. Perhaps the visitors'

preference for wilderness rangers (Lucas 1980; Hinton 1975; and Stankey 1973) and their judging the use of rangers at trailheads to be lighthanded management imply that observing and punishing wrongdoers is appropriate and does not imply heavy-handed management. Permit requirements and many other types of management impact all visitors, whereas perhaps rangers only negatively influence the experience of wrongdoers. A wilderness user may not worry about a ranger penalizing wrongdoers if he did not perceive himself as a wrongdoer.

The visitors also support previous definitions of lighthanded management. A majority indicated they felt they had the freedom to choose who, when, and where to recreate. The visitors neither felt delayed nor that they had to give up their favorite ways of camping. This may carry negative implications for managers whose visitors have favorite ways of camping that cause impacts. But most wilderness visitors indicated they knew the proper Without-A-Trace camping techniques and agreed the techniques should be used in wilderness.

Study findings also indicate that trailhead contacts are congruent with the Wilderness Act. It calls for an unconfined type of recreation, and the visitors did not perceive themselves as confined during their wilderness

experience. Shining Rock Wilderness managers who use wilderness trailhead contacts are, according to this study's participants, apparently meeting the letter and spirit of the Wilderness Act, and are leaving visitors with the perception they are not being controlled by the managers.

Social Power and Trailhead Contacts

The basis of social power (French and Raven 1959, Raven and Rubin 1976) seemed like a practical theory to permit better understanding of the ranger-visitor contact and its relationship with perceived light-handedness and heavy-handedness of management. But study results did not support the social power hypotheses. There may be several reasons for this, but before discussing them, it should be noted that rangers were not perceived as sources of coercive power. Visitors apparently felt that rangers would not control their behavior by observing them and penalizing their wrongdoings.

As mentioned in the Limitations chapter, tests of social power hypothesis were not initially included as the primary focus of the study. Given this, operational measures of the various types of social power were not well pretested, and these measures may lack validity and/or

reliability. The measures could also have been better structured so that a more precise statistical analyses could have been performed.

The visitors may not have categorized the ranger's power the way Raven and Rubin (1976) categorized various bases of social power. They also may not have interpreted the study's measures of the social power bases as intended. Or, as previously mentioned, surveillance or a socially dependent influence may not be perceived by the wilderness visitor as limiting the freedom to choose how, when, or where to recreate. Some of these reasons may have prevented the hypothesized relationships between types of social power and perceived light-handedness.

Another possible reason that the results were not as hypothesized is because several power bases may be operating at the same time (Raven and Rubin 1976). If this happened, a very carefully planned questionnaire would be needed to separate and judge the amount of each power base the ranger was perceived to have used.

The most likely explanation for lack of the hypothesized relationships is that there was so little variation in the perception of the kind of power used, and so little variation in scores on the light-handedness versus heavy-handedness measure was found, that no significant

relationship was possible. There was little variation in either measure. Finally, study results may be accurate. There may be little relationship between freedom, as operationalized by social power, and perceived light-handedness versus heavy-handedness of a wilderness management strategy.

Condition of Shining Rock Wilderness

Visitors gave their perception of the impacts in the wilderness for their just completed trip. Returning visitors (visitors who camped at Shining Rock in previous years) also gave their perception of whether the condition of Shining Rock had improved since their earlier trips. As previously discussed in the Limitations Chapter, no causal inferences between the trailhead contact and any reduction in impacts can be made. One must also use caution in drawing conclusions from the visitor's rating of the condition of Shining Rock Wilderness, because Lucas (1979) and Knudson and Curry (1981) found that visitors do not perceive impacts the way a professionally trained manager or scientist perceives impacts. Visitors tend to overlook or underrate the amount of impacts.

Trail litter, campsite litter, noisy campers, unburied

human waste and skunks were not perceived as problems for the visitor's most recent trip. Damaged vegetation was perceived as somewhat of a problem. The presence of fire-rings was a problem for a substantial number of people during their most recently completed trip. Damaged vegetation, noisy campers, and unburied human waste have change little over time according to returning visitors. Litter and skunk impacts were perceived as decreasing over time, but fire-ring problems were judged to be increasing.

Litter may be down for several reasons. Rangers frequently patrol the area and clean it as they pass through. Concerned visitors also reported to the field researcher (both during the study season and during the previous year) that they carried out litter other visitors had left behind. It may also be that visitors litter less now than before because of persuasive attempts to reduce litter all over America (i.e. Keep America Beautiful Campaign). The ranger's educational contact may also be the reason litter is decreasing. And finally one cannot dismiss the possibility that the visitors may not have perceived litter and thereby rated the litter situation as better than it really is.

Skunks may be less of a problem because people may be leaving less food lying around their campsite. Either the rangers' educational contact or other persuasive influences (Forest Service brochures, etc.) may have improved the visitors' camping practices. Finally, the number of skunks and the amount of food left lying around a camp may not be positively correlated. Other factors may be responsible for the decrease in skunk problems.

Fire-rings are an impact of concern because a majority of returning visitors who noticed change perceived them as increasing. The presence and use of fire-rings have become a controversial issue (Hammitt 1981; Berger 1979). They do seem to violate the Wilderness Act's mandate for a wilderness substantially free of man's impacts. Yet research (Lucas 1980) shows many wilderness users feel fire-rings are acceptable. Visitors had the second lowest agreement with eliminating firerings of all the Without-A-Trace camping practices.

Effects of Rapport on Ranger-Visitor Trailhead Contacts

The rapport between the ranger and the visitor was positively rated by the visitor. There was no evidence that a difference in rapport caused different perceptions of the

light-handedness of the contact or, after the contact, of the appropriateness of nine Without- A-Trace camping practices. Keep in mind, though, that all rangers achieved a good rapport with the visitors. Perhaps more variation in rapport would produce different results.

Effects of Individual Ranger and Visitor Characteristics

The visitors all responded nearly identically and very positively to the ranger's contact. No differences were found to suggest that the sex or experience of the ranger had any effect on the visitors' responses. It must be emphasized though that this research is preliminary. Only three rangers (two males and one female) were included in the study, and they only ranged in experience from no experience to one previous year of experience. Also, other factors may cause changes in the visitors' perception of the contact (e.g. age, experience over long periods of time, dress, weather).

CONCLUSIONS

This study investigated the visitor's perception of
wilderness rangers, discussions with wilderness rangers at
trailheads, and of recreational impacts in Shining Rock
Wilderness. Because the study was conducted for just one
season, at one area, for a relatively short time period, and
had certain limitations, results must be viewed as
preliminary. Replication is needed before findings can be
considered definitive for Shining Rock Wilderness.
Acknowledging these constraints, the study found (1) a
trailhead contact was judged to be a lighthanded management
action by visitors who had received the trailhead
educational contact, (2) the rangers were perceived as using
informational, expert, referent, legitimate, and reward
power but not coercive power, (3) returning visitors who
perceived a change in Shining Rock's conditions judged
litter and skunk impacts to be decreasing and fire-ring
impacts to be increasing, (4) overnight visitors did not

perceive recreational impacts to be a problem on their most
recent trip, (5) the sex or experience of the ranger did not
influence how they were perceived by the visitor, (6) the
sex, age, or experience of the visitor did not influence
their perceptions, and (7) a good rapport was established
between the ranger and the visitor.

Implications for Wilderness Management

The findings of this study suggest visitors feel the
use of rangers at Shining Rock Wilderness trailheads is a
light-handed way to manage this wilderness. They do not
perceive a trailhead contact to impinge upon their freedom.
This indicates that rangers may work at wilderness
trailheads without causing them or the Forest Service to
appear authoritarian. In planning wilderness ranger-visitor
contacts, neither the sex or a previous season's experience
should necessarily be a factor in influencing a ranger's
perceived friendliness, warmth, or expertness. The rangers
were perceived as giving accurate information. This
suggests that trailhead personal contacts may be more
effective than brochure contacts, because Lucas (1980) has
suggested that brochures can be ineffective due to lack of
visitor confidence in their accuracy. Bradley (1978) feels

the better "first impression" a ranger can make on a
visitor, the better his chances of effectively accomplishing
his objectives. Possibly because of their motivation and
training, all the study rangers established a good rapport
with the visitors. Selecting motivated personnel and
properly training them to make a good first impression is
important.

The rangers were not perceived as coercive powers
(influencing agents who use surveillance and punishments to
change a target's behavior). Their appearance and their
discussions were apparently not coercive in nature. In
terms of dress, the study rangers wore no observable signs
of power other than a Forest Service Volunteer uniform. This
suggests that in Shining Rock Wilderness, a Forest Service
Volunteer uniform does not make the visitor feel threatened.
This is desirable where agencies or managers are trying to
take a "human" approach to managing people.

Some work may also need to be done to help rangers
reach visitors concerning proper fire-ring practices. Our
results indicate removing fire-rings is among the most
controversial Without-A-Trace camping practices. Perhaps if
all agencies managing wilderness could reach a consensus
about the appropriateness of fire-rings in a wilderness, the
visitor would be less confused. All agencies and rangers

could then give out the same advice, and they may then be perceived as more reliable.

Implications for Research

The most needed research is a measure of the effectiveness of ranger-visitor education contacts to reduce recreational site impacts in wilderness. Because this study included no control group and no experimental design, no definitive statements can be made about the effectiveness of trailhead contacts in reducing recreational site impacts. This study does indicate that wilderness visitors do know and agree with Without-A-Trace camping practices, and that Shining Rock generally is perceived as having few impacts. However, these improvements may not be due to trailhead contacts. Additional research might also examine whether patrolling wilderness rangers or trailhead brochures might accomplish the same beneficial results.

Further research is needed to determine the relationship, if any, between the type of social power used by a ranger, the visitors' perceived freedom, and the perceived light-handedness versus heavy-handedness of the contact. Perhaps a better designed and implemented study would be able to tell us more about the perceived power a

ranger holds. Further research could also determine whether threatening or punishing rule breakers if they do not correct their wrongdoings is perceived by the rule-abiding visitors as being lighthanded or heavy-handed. Other social psychological theories may be employed to better understand how or why a ranger-visitor contact does or doesn't work and how it relates to perceived freedom.

Complete information on the most desirable characteristics of a ranger (age, sex, experience, knowledge, etc.) are not yet known. A ranger who is in his 40's or 50's or who has several seasons' experience may be more effective than a ranger in his early 20's with little or no experience. The most effective training programs are also not known. Further research could examine these areas.

The questions of effectiveness of trailhead contacts could be answered through a well-funded and carefully designed field experiment which included several study areas, pretests and post-tests, a control group, and a variety of carefully varied treatments. Observations of behaviors or behavior traces appears the most appropriate measure of treatment effect. Finally, such a study would seem to benefit from the findings of this preliminary study.

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113

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APPENDIX A

Training Procedures for Trailhead Rangers

The rangers, Scott, Joan, Lawrence and Ken initially received training from the U.S. Forest Service. It included visitor information (types of users, experiences desired, etc.) and training on how to be friendly, professional, and helpful (How a ranger should act). It also included suggestions on how to open discussion on weather, camping equipment, cars, etc. to help establish a friendly rapport with the visitors.

The author provided an additional training session addressing the objectives of this study. It started with an overview of the study. Then the author explained to the rangers the following duties they were expected to perform: (1) to be at the trailhead or parking lot at the appointed times; (2) to contact all backpacking groups, (3) to provide and explain, if necessary, the standardized message contact (see Chapter 4: Initial Wilderness Visitor Contact and Message) to all backpacking groups, (4) to use their best judgment on how to effectively contact and influence each group, (5) to take note of which groups they had contacted (write notes, remember the visitor's car, etc.), (6) to

distribute the post-trip questionnaires and record
situational data (e.g. weather) on the questionnaire
envelope, and (7) to stress that the visitors read each
question carefully and respond to all questions.

Then the author went over the questionnaire and
explained the "why" behind each question. He then reviewed
his own experiences as a trailhead ranger (he worked in
Shining Rock Wilderness during the summer of 1983). Finally,
he explained his expectations for the summer's work and
answered all questions.

APPENDIX B

Posttrip Visitor Request to Complete Questionnaire

.

A graduate student from Virginia Tech in cooperation with the Forest Service is conducting his thesis research on several aspects of wilderness use and management. He is very much interested in your views and opinions. It would help him out very much if you would take ten or so minutes to fill out a short questionnaire. When you are through, please put them in this envelope, seal it, and drop it off in the deposit box or hand it back to me. Thank you.

APPENDIX C

Posttrip Questionnaire

YOUR OPINIONS ABOUT THE MANAGEMENT OF SHINING ROCK WILDERNESS

The Forest Service has implemented a program using volunteer wilderness rangers to improve the quality of Shining Rock Wilderness. The School of Forestry at Virginia Tech is assessing the effectiveness of this program and wants your opinions. We would appreciate it if you would take about 10 minutes to complete this survey.

1. About how many years have you been camping in backcountry or wilderness areas?
   _____years

2. About how many times a year do you go camping in backcountry or wilderness areas?
   _____times per year

3. Have you camped at Shining Rock Wilderness before this trip?
   Yes___ No___
   ↳ If yes - about how many years have you been camping here? ____years
              about how many times a year do you camp here? ____times a year

4. How would you describe the wilderness ranger that you met when you arrived here?
   (Circle the number between each pair of words that best describes your feelings.
   Your honest responses will help us improve the program.)

	Extremely	Quite	Slightly	Neither	Slightly	Quite	Extremely	
Friendly	1	2	3	4	5	6	7	Unfriendly
Like	1	2	3	4	5	6	7	Dislike
Cold	1	2	3	4	5	6	7	Warm
Pleasant	1	2	3	4	5	6	7	Unpleasant
Informed	1	2	3	4	5	6	7	Uninformed
Expert	1	2	3	4	5	6	7	Inexpert
Authoritarian	1	2	3	4	5	6	7	Non-authoritarian
Reliable	1	2	3	4	5	6	7	Unreliable

5. How do you feel about the underline discussion you had with the wilderness ranger?
   (Circle the number which best gives your feelings).

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I liked it because I could learn the proper way to use the wilderness.	5	4	3	2	1
I didn't like it because I wanted to be left alone.	5	4	3	2	1
I liked it because I now know the Forest Service cares about the wilderness the way I do.	5	4	3	2	1
I didn't like it because I felt it took away my freedom.	5	4	3	2	1
I didn't like it because I had to delay the start of my trip.	5	4	3	2	1
It made me feel anxious, like I would be watched my whole trip.	5	4	3	2	1
I liked it because my questions could be answered correctly.	5	4	3	2	1
I didn't like it because I felt I might be penalized if I didn't do what the ranger suggested.	5	4	3	2	1
I didn't like it because I felt I had to give up my favorite ways of camping.	5	4	3	2	1
I liked it because the Forest Service should be able to teach us how to use the wilderness.	5	4	3	2	1
I felt if I followed the ranger's suggestions, I could continue to freely use the wilderness.	5	4	3	2	1

6. Some people think that trailhead contacts are a lighthanded way to teach proper wilderness use. Others feel that it is heavyhanded. (Circle the number between the pair of words below that best describes your feelings).

	Extremely	Quite	Slightly	Neither	Slightly	Quite	Extremely	
Lighthanded	1	2	3	4	5	6	7	Heavyhanded

7. Which of the following Without a Trace camping practices did you know <u>before</u> this camping trip? (Check the ones you knew).

___Pack out all litter
___Remove all traces of your firering
___Don't cut any standing dead trees or bushes
___Wash your dishes away from a stream, not in the stream.
___Pack out your leftover food after you eat.

___Don't cut any living trees or bushes
___Bury your human waste at least 6 inches below the soil surface.
___Wash yourself away from a stream, not in the stream.
___Don't make excessive noise.

8. When you are in a designated Wildernsss, do you agree or disagree with the following camping practices. (Circle the number which best describes your feelings).

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Pack out all litter	5	4	3	2	1
Remove all traces of your firering	5	4	3	2	1
Don't cut any standing dead trees or bushes	5	4	3	2	1
Wash your dishes away from a stream, not in the stream	5	4	3	2	1
Pack out your leftover food after you eat	5	4	3	2	1
Don't cut any living trees or bushes	5	4	3	2	1
Bury your human waste at least 6 inches below the soil surface	5	4	3	2	1
Wash yourself away from a stream, not in the stream.	5	4	3	2	1
Don't make excessive noise	5	4	3	2	1

9. Please tell us if you agree or disagree with each of the following statements about potential problems in Shining Rock Wilderness <u>during this trip</u>.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
There was very little litter along the trail	5	4	3	2	1
There was very little litter at your campsite	5	4	3	2	1
The trees and bushes at the campsite were damaged	5	4	3	2	1
There were too many firerings in the wilderness	5	4	3	2	1
Skunks were a concern at our campsite	5	4	3	2	1
There was too much unburied human waste	5	4	3	2	1
Other campers were too noisy	5	4	3	2	1

10. If you have camped at Shining Rock Wilderness before, how does the condition of the wilderness compare with your previous trips? (Circle one answer for each item).

	More now	About the same	Less now	No opinion
Litter along the trails.	3	2	1	0
Litter at the campsites.	3	2	1	0
Damaged trees and bushes.	3	2	1	0
Firerings.	3	2	1	0
Skunks at the campsites.	3	2	1	0
Unburied human waste.	3	2	1	0
Noisy campers.	3	2	1	0

11. About how far did you travel from your home to get to Shining Rock Wilderness?
    _____ miles.

12. Additional Comments you would like to make: _____
    _____

13. Age_____   14. Sex: M_____   F_____

Thank you for your cooperation.