

United States
Department of
Agriculture

Forest Service

Intermountain
Forest and Range
Experiment Station

Research Paper
INT-277

June 1981

Redistributing Wilderness Use Through Information Supplied to Visitors

Robert C. Lucas



Aldo Leopold Wilderness Research Institute: Publication # 81

CITATION: Lucas, Robert C. 1981. Redistributing wilderness use through information supplied to visitors. Res. Pap. INT-277. Ogden, UT: USDA For. Serv., Intermountain Forest and Range Exper. Stn. 15 p.

THE AUTHOR

DR. ROBERT C. LUCAS is principal research social scientist and project leader of the Intermountain Station's Wilderness Management research work unit at the Forestry Sciences Laboratory at the University of Montana, Missoula. He has been with the Station since 1967. Dr. Lucas received his B.S., M.A., and Ph.D. from the University of Minnesota in 1957, 1959, and 1962. He also studied at the Free University of West Berlin, Germany, and at the University of Chicago. He has authored numerous publications dealing with wilderness management.

RESEARCH SUMMARY

The USDA Forest Service managers of a large part of the Selway-Bitterroot Wilderness in Montana sought to influence some visitors to shift from heavily used trailheads to more lightly used ones. To do this, they designed a brochure on relative use levels and on how to locate trailheads. They began distributing the brochure in 1974. An evaluation showed overall use patterns were not shifted toward the lightly used trailheads. A majority of visitors never saw the brochure. Only about one-fourth had it before they reached the trailhead, and about one-fourth of these said they used the brochure to choose a trailhead, usually a lightly used one. The number of visitors increased an average of 26 percent per year during the 2-year evaluation, apparently overwhelming the small redistributive effect of the brochure. Information on crowding was not one of the main factors cited by visitors as influencing trailhead choices, suggesting that the brochure's focus was too narrow. This study, and several other similar studies that are reviewed, suggest information programs—which are an attractive, nonauthoritarian, indirect technique—can redistribute use substantially if information about a variety of area conditions is presented to visitors early enough in the location choice process.

CONTENTS

	Page
INTRODUCTION	1
The Use Distribution Problem	1
Management to Redistribute Use	1
Information as a Use Redistribution Tool	2
THE STUDY AND RESEARCH METHODS	2
Study Area and Management Program	2
Evaluation	4
Use Patterns	4
Visitor Survey	4
Analysis and Underlying Theory	5
FINDINGS	6
Changes in Use Patterns	6
Visitor Response to the Brochure	7
REACHING VISITORS	7
INFLUENCING VISITORS	10
Visitor Opinion of the Brochure	11
Factors in Visitor Location Choices	12
DISCUSSION AND CONCLUSIONS	12
MANAGEMENT IMPLICATIONS	12
PUBLICATIONS CITED	13
APPENDIX	14
Excerpts from the "Routes to the Wilderness" Brochure	14-1

Redistributing Wilderness Use Through Information Supplied to Visitors

Robert C. Lucas

INTRODUCTION

Wilderness managers often want to redistribute some recreational use to achieve management objectives. Among ways managers can do this, one of the most attractive is to provide visitors with information to influence them to redistribute themselves. Little is known, however, about how to make information an effective management tool for redistributing visitor use.

The Use Distribution Problem

Wilderness recreational use is typically distributed unevenly. A few access points usually receive a majority of use, and a small proportion of the trail system commonly accounts for most visitor use (Hendee, Stankey, and Lucas 1978).

Concentrated recreational use can create adverse impacts on wilderness values. Growing use accentuates the problem. Resource impacts proliferate and affect too much land in key areas. The areas receiving highly concentrated use are often not the areas most capable of supporting it. Relatively fragile ecosystems may be heavily used while more durable places receive little or no use.

Crowding in popular areas also reduces opportunities for visitors to experience solitude. Visitors vary in the value they place on solitude (or low density use) and in their definitions of acceptable levels of contact with other wilderness visitors. But often, many visitors go to areas where concentrated use results in more contact with other parties than desired. At the same time, some visitors to lightly used portions of a wilderness may meet fewer people than they would like, or at least far fewer than they would accept. There is a mismatch, as there is between use and ecosystem durability.

Management to Redistribute Use

Wilderness managers may have any of at least three objectives for seeking to shift some use:

1. They may wish to reduce the extremity of the contrasts between lightly and heavily used areas. This would require shifting some use away from the heavily used areas to the less-used places. An even use distribution is not a logical goal for a wilderness because, as mentioned before, both the ecosystem's capability and visitors' desired levels of contact with others vary. However, managers and probably most other people familiar with use conditions in many wildernesses would agree that use is excessively concentrated.

2. Managers may want to increase or decrease use of specific locations within a wilderness to better match use to environmental capability. This would be particularly appropriate where information is available on the relative durability or fragility of different sections. It could also be related to visitor experiences, based on the availability of screened campsites, for example, or to provision of a range of likely encounter levels.

3. Managers may wish to redistribute different types of visitors so that those who prefer lower levels of encounters generally visit lightly used areas offering such opportunities, and those who prefer higher levels of contact go to areas where such experiences are commonly available.

Whatever the objectives, managers have a range of possible management actions for redistributing use. Management actions are of two main types, direct and indirect (Hendee, Stankey, and Lucas 1978). Direct regulation includes rationing use, either for an area as a whole, for each access point, or by campsites. These are powerful tools that could shift use patterns substantially. However, they also are heavy-handed, authori-

tarian measures, usually with high administrative costs. The impact of such bureaucratic control on a recreational experience, especially a wilderness experience, is likely to be substantial and negative. In some cases, conditions require this trade-off. But indirect management is generally worth trying first, before resorting to direct regulation.

Indirect management is usually not obvious to visitors. Visitor behavior can be modified by management actions such as changing access to make it easier or more difficult; for example, by changing the last part of an access road to a trail. Providing information to visitors to influence their choices of routes is another indirect visitor management technique.

Information as a Use Redistribution Tool

The use of information to redistribute use is a particularly appealing approach (Fazio 1979). It is non-authoritarian and permits the manager to be a helpful guide rather than someone who restricts and regulates. As a result, conflict and controversy can be avoided. Surveys show that wilderness visitors have high educational levels, indicating an ability to understand and use fairly complex information.

But how effective is information as a tool for use redistribution? This study seeks to help answer this question.

Information can be provided to visitors in many ways and in varying situations, and previous studies under different conditions have shown varying success in modifying use distribution. The evaluation of information as a management technique is strengthened by considering the combined results of several of those studies.

One study showed information can effectively redistribute use outside wilderness settings. Brown and Hunt (1969) experimented with roadside signs and substantially redirected use of highway rest and viewing areas.

An attempt to redistribute campers away from trails and previously used campsites in the Great Gulf Wilderness in New Hampshire relied more on rules (with some explanation) attached to permits, rather than on information about the areas. The attempt failed to achieve the desired behavior (Canon, Adler, and Leonard 1979).

In Colorado's Rawah Wilderness, Schomaker (1975) found that a map of "crowded areas" handed out at the trailhead had no appreciable effect on visitors' choices of travel routes.

In the Boundary Waters Canoe Area in Minnesota, people who had permits for the most heavily used entry points during the 1974 season were sent a packet of information in early spring 1975. The packet included information on use patterns, noting heavily used places and times. It provided information on fishing and wildlife observation opportunities in different areas, and named places where black bear depredations on camps were most common. Rules and regulations and no-motor zones also were presented. Three-fourths of the sampled respondents who visited the area in 1975 felt the information was useful, and about one-third were influenced in their choice of entry point, route, or time of subsequent visits (Lime and Lucas 1977). Visitors who

had less previous experience in the area were most often influenced.

An experiment in Yellowstone National Park also succeeded in redistributing a substantial amount of use (Krumpe 1979). A sample of persons applying for backcountry camping permits were given a "Trail Selector" that included a map and a brochure with descriptions of lightly used trails. The descriptions were arranged in a decision-tree form. Visitors were asked a series of questions about their preferences for backcountry experiences and guided to suggested routes, depending on their answers. They were asked about preferences for travel along streams, to mountain peaks, to lakes, or off-trail, cross-country travel. For each of these possibilities, several more questions dealing with length of trip, difficulty of the route, and more detailed aspects of the setting led to a suggestion. A sample of other applicants for permits was used as a comparison control group and did not get the "Trail Selector." Only 14 percent of the control group chose one of the routes in the "Trail Selector," compared to 37 percent of the experimental group who received it. Less-experienced visitors more often chose one of the suggested trails.

A study in the Shining Rock Wilderness in North Carolina tested an effort to modify campsite choices by means of a brochure describing 10 characteristics of each of five alternatives to a heavily used camping area (Roggenbuck and Berrier 1980). Both the brochure alone and in combination with a personal message were tested. The approaches did not differ significantly, and both resulted in a significant dispersal of campers to the alternative sites. Visitors with no previous experience in the area were more likely to disperse after receiving the information. Parties who received the personal contact and brochure treatment earlier in the day were more likely to disperse than those who were contacted later.

THE STUDY AND RESEARCH METHODS

Study Area and Management Program

The Stevensville Ranger District of the Bitterroot National Forest manages about 100,000 acres in the northeast corner of the over 1 million-acre Selway-Bitterroot Wilderness. The Wilderness is in both Idaho and Montana, but the Stevensville Ranger District portion is all in Montana, on the east slope of the Bitterroot Mountains (fig. 1).

Most trails in this area lead up narrow, steep canyons, all oriented east-west, to cirque lakes at their upper, western ends. Few connecting trails exist and loop trips are rare. The lakes vary in size and number, but most are about 10 to 12 miles by trail from the road ends.

The managers were concerned about highly concentrated use. Three of 12 trailheads received most of the use, and there were problems of badly impacted campsites. The other trailheads were considered attractive and capable of absorbing more use. Therefore, the managers decided to try to shift some use from the heavily used trails to similar but lightly used trails.

To accomplish this, the Ranger District staff designed a brochure (appendix 1) providing information on relative levels of use at each trailhead, expressed as a

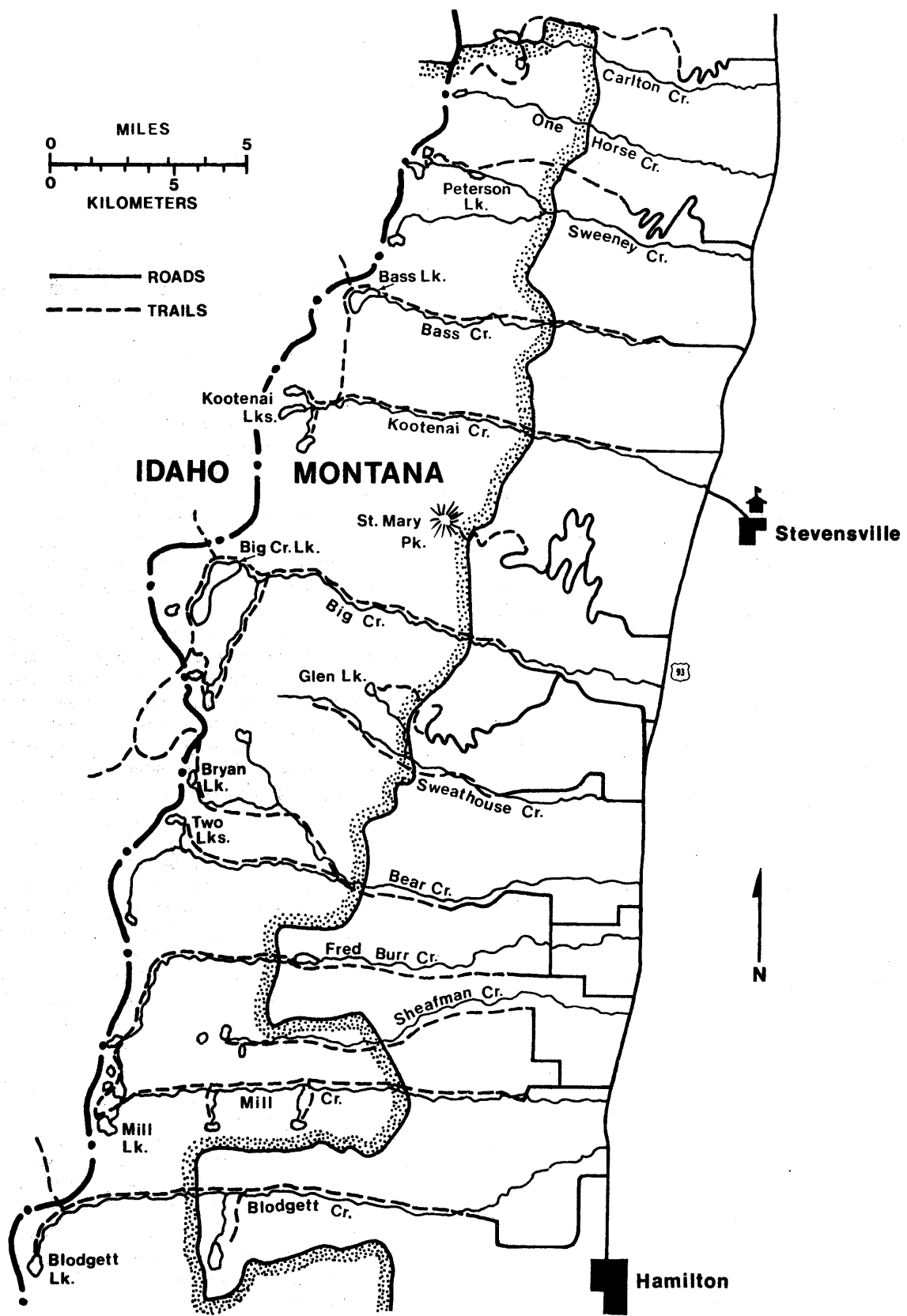


Figure 1.—The study area.

percent of the total. The brochure also explained how to find each trailhead, which is rendered somewhat difficult by an intricate network of roads through private ranch land in the Bitterroot Valley. These roads must be traveled to reach the trailheads at the base of the mountains. There also was some very limited information on a few heavily impacted campsites.

Distribution of the brochure began in 1974. It was available in boxes on registers at every trailhead (fig. 2) and at the Stevensville Ranger Station, the Forest Supervisor's Office in Hamilton, and the Forest Service Regional Office in Missoula. It also was mailed to people who wrote to these offices inquiring about visiting the Wilderness. The brochure, revised in 1977, is still in use. The current version provides less detail on use distribution, indicating only those four trails most heavily used and pointing out that they account for 70 percent of all use.

Evaluation

The Wilderness Management Research Work Unit evaluated this management effort at the District Ranger's request. The evaluation had four objectives:

1. To determine if use patterns shifted in the desired way, from heavily used to lightly used trails.
2. To determine to what extent visitors were exposed to the brochure; that is, what proportion obtained it, where, and at what stage in the trip planning process.
3. To determine how visitors reacted to the brochure; that is, whether it influenced choices of trails, if it was considered useful, and what changes were suggested.
4. To determine what factors influenced choices of trailheads and if those factors were unrelated to information in the brochure.

The field conditions were the same as they would have been without the study. The Ranger District planned and handled the brochure distribution in the normal way. Trail registers (used as an index of use at each trailhead) were maintained in the usual fashion. Use regulations were essentially unchanged throughout the 1973-75 period of the study.

Use Patterns

Use patterns, by trailheads, for 1974 and 1975 (the first years the brochure was distributed) were compared with 1973, a typical use season that served as the "before treatment" base. Trail register data were used as an index of relative use, expressed as a percentage of the total to make it independent of changes in total use from year to year. These data provided an incomplete measure because some visitors did not register. But the data were assumed to be comparable across the 3 years. We checked trail registration rates by direct, unobtrusive observation in the field at five trailheads in 1974.

Comparisons of relative use were made among individual trails, between all lightly used trails as one group and all heavily used trails as a second group, and among trails grouped into three categories—light, moderate, and heavy use.

Change from 1973 was classified as to whether or

not it was in the direction desired. This meant relative use was desired to decrease at heavily used trails and increase at lightly used trails. The moderately used trails did not have a clearly desired change and were not classified. We tested the hypothesis that change was in the desired direction.

Visitor Survey

To measure exposure of visitors to the brochure and people's reactions to it, we sent a mail questionnaire to a sample of people making visits to the study area in 1974 and 1975. The sample list was drawn from registered visitors, and all findings and conclusions apply only to visitors who registered. One person, the one whose name appeared on the permit, was sampled. This person is usually the party leader. For the group behavior we were concerned with, this is usually the key person.

This was a systematic sample with a random start. We sorted trail register cards for each trailhead into day use (in and out the same day) and campers (overnight stays). These were ordered by entry dates. After a random start, every third camper card and every sixth day user card were chosen for the sample. We sampled campers more heavily because we felt they were more critical: they penetrate the wilderness more deeply, stay longer, and have greater potential for causing impacts. Also, 1973



Figure 2.—Trail register and brochure dispenser box (to the right of the trail register) on the Big Creek trail

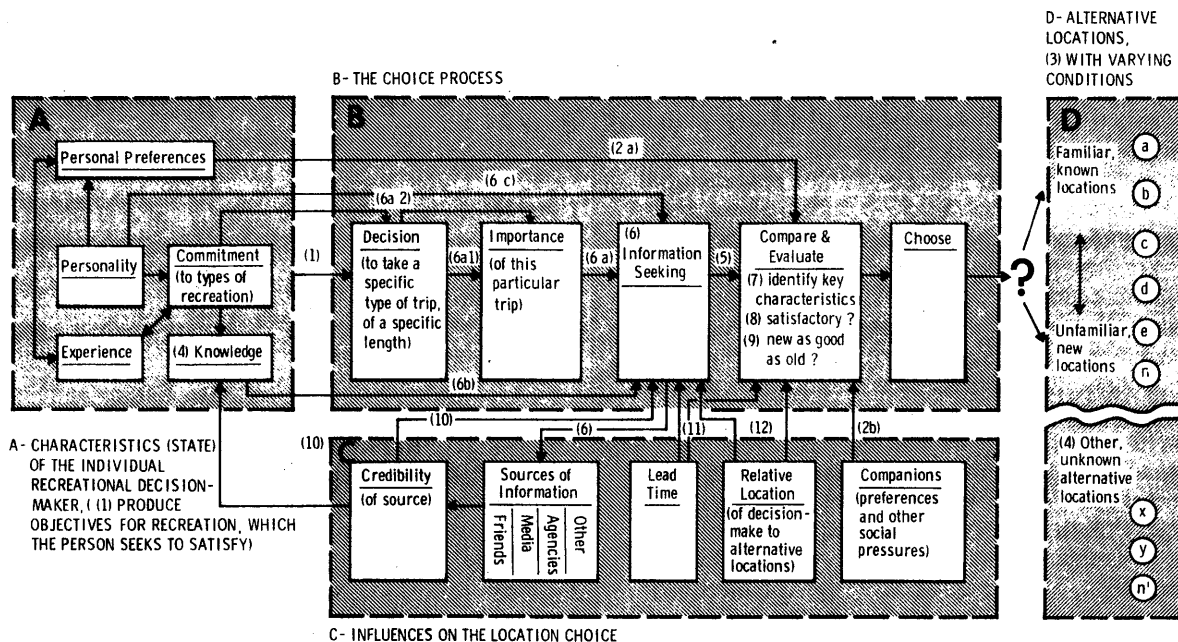


Figure 3.—The relationship among the components of recreational location choice behavior. (Numbered components and relationships correspond to description of the theory in the text.)

data indicated almost two-thirds of the visitors were day users; therefore, an unweighted sample would likely yield less detail about campers than seemed desirable. Data from day users were weighted (by 2) to counteract this overrepresentation of campers.

The resulting sample list was 611 names (271 in 1974 and 340 in 1975). Questionnaires were mailed to all 611, and 29 were returned by the Postal Service as undeliverable, leaving a sample list of 582 names and current addresses. Questionnaires were mailed throughout the summer and fall usually about a month after the visitor's trip. After 3 weeks, a second questionnaire was mailed to nonrespondents. Each year was treated as a separate sample.

Because the sampling frame was visits, it was possible for a person to be sampled more than once a year. An alphabetized mailing file made it possible to detect resampling of the same people. A special cover letter, used when a person was sampled a second time, explained that visits were sampled and that because each trip was different and attitudes can change, a second response was important. This occurred rarely, affecting less than 5 percent of the sample. Persons sampled three or more times, however, were excused after being contacted twice. This may have caused a small, probably insignificant bias, but consideration for visitors seemed to require this procedure.

The questionnaire requested information concerning a basic description of the trip, prior experience in the area, possession of the brochure, where and when it was obtained, factors influencing the choice of trailhead, the role of the brochure in influencing choice of trailhead, perceived usefulness of the brochure infor-

mation, and suggestions for its improvement.

Although none of the questions appeared personal or sensitive, respondents' anonymity and confidentiality were protected. Questionnaires were identified only with numbers, and, at the close of each season, all cards in the address files were destroyed.

Analysis and Underlying Theory

Analysis consisted of comparing tabulations, using chi-square or gamma to test differences and associations. I developed a general theoretical model of recreational location choice behavior to derive a series of hypotheses about the response of visitors to the brochure. Four major elements in the model are: (1) the characteristics of the person choosing the location; (2) the choice process; (3) influences on the choice; and (4) alternative potential locations with varying characteristics (fig. 3).

The proposed theory consists of the following basic assumptions and postulates about the relationships between components of these four elements.

Assumptions:

1. Visitors seek recreational experiences that satisfy their objectives.
2. The conditions contributing to a satisfactory experience vary among different visitors based (a) on personal preferences, and (b) usually also on preferences of companions, family, and other social pressures.
3. Locations vary in the combination of recreational characteristics they possess, and thus in their desirability for different visitors.
4. Visitors choose locations with incomplete know-

FINDINGS

ledge. They are not aware of all alternative locations nor of all the characteristics of each, and some of the information they possess is erroneous.

5. Visitors evaluate and compare locations based on their perceptions of the characteristics of known alternatives.

Postulates:

6. The effort visitors make to obtain information about alternative recreational locations:

a. Increases as the importance of the recreational experience increases (how much is at stake), which in part is a function of length of stay and of personal commitment to the type of recreational experience.

b. Decreases as the amount of information visitors perceive they already have increases, particularly personal familiarity from previous trips.

c. Increases as individual preference for novelty (or risk) increases in comparison to preference for familiarity (or security).

7. Visitor evaluations are based primarily on a few key characteristics that may vary among visitors.

8. The key characteristics are evaluated on a low-resolution scale, essentially as either "satisfactory" or "not satisfactory." The thresholds for "satisfactory" judgments vary among visitors. More detailed information helps people make these threshold decisions.

9. To choose a new alternative location, information must convince a person that it is highly probable a new place is at least as satisfactory (and possibly better) in terms of key characteristics as a familiar place (less so for high-novelty seekers or "explorers").

10. Visitors discount information about new alternatives based on their perception of the credibility of the sources and the information. Increased detail generally results in increased credibility. Information from an agency usually tends to be viewed as less credible than that from friends and acquaintances.

11. Information is most likely to influence decisions if it becomes available during the trip-planning phase, which is usually at home, but sometimes at a Ranger Station or other place. Information received later is less likely to influence decisions because:

a. Changing a decision requires more effort than making the original decision.

b. Additional information after a decision tends to be unwanted because it creates dissonance; most people would rather not *know* they may not have made the best possible choice.

12. Information is most likely to influence decisions if it is received at locations closer to home or farther from the alternative locations. This is because the closer persons are located to one alternative when new information is obtained, the less likely they are to consider other alternatives because the differences in relative travel costs become greater.

In other words, we view recreationists as having a general idea of what they are seeking, as using a crude benefit-cost analysis to determine how much effort they will put into gathering information to pick a location, as being only fairly good information processors with a streak of mental laziness, and as somewhat stubborn about changing their minds after they have chosen a place.

Changes in Use Patterns

Hypothesis: Lightly used trails will account for a larger proportion of total use, and heavily used trails a smaller proportion, after introduction of the brochure.

Trail register data were the only available index of shifts in use patterns, but these leave much to be desired and require caution in interpretation. Field checking in 1974 showed only 28 percent of the visitors to 5 trailheads registered (Lucas 1975). This was less than half the rate reported in other studies and was not expected. With such low registration rate, moderate fluctuations in registration rates among trailheads from year to year, which could easily occur, would substantially distort the pattern of relative use. Therefore, only large shifts should be viewed as meaningful. Although data on actual visitor behavior are ordinarily the most convincing evidence, in this case the trail register data, unfortunately, cannot be viewed as accurately reflecting real behavior. The data from sampled visitors concerning their response to the brochure may tell us more about its effectiveness.

With these cautions in mind, the trail register data show that in 1974 change was in the desired direction and consistent with the hypothesis, but only weakly so. Use of 6 of the 11 trails¹ shifted in the desired direction; 2 of 3 heavily used trails had less relative use, but only 4 of 8 lightly used trails had more (table 1).

If because of the low trail register compliance, only changes of over 20 percent from 1973 are considered, use of 4 trailheads apparently changed in the desired direction, 3 in the undesired direction, and 4 could be considered not changed significantly, again weakly consistent with the hypothesis.

In terms of use redistribution, 1975 appears to be a disaster. Only 3 of 11 trailheads changed in the desired direction, 1 heavily and 2 lightly used trailheads (table 1). Considering only changes of more than 20 percent, 2 were in the desired direction, 6 were not, and 3 were unchanged. Results are sharply inconsistent with the hypothesis.

Under the three-way classification of use levels, St. Mary's Peak, Bear Creek, Mill Creek, and Blodgett Creek are classified as moderately used, without a clearly desired direction of change. In this analysis, 4 of 7 trailheads changed in the desired direction in 1974, but only 2 of 7 in 1975—essentially the same situation described above.

If trailheads are grouped by level of use, and aggregate use compared, the conclusions are the same. In 1974, there was a small change in the desired direction (table 2). The magnitude of change (about 5 percent) is small, however. In 1975, the change is in the undesired direction and, at about 18 percent, is of greater magnitude.

¹The trailhead on Fred Burr Creek is blocked by private land; although it had a trail register, it had very little public use (9 parties in 3 years). Sheafman Creek also has no public access and was not mentioned in the brochure. In 3 years, 12 parties signed in at the trail register. Both of these trailheads were omitted from the analysis.

Table 1.—Change in relative use among trailheads, 1973-75

Trailhead	Use level ¹	Percentage of total groups for each year				
		1973	1974	Change ²	1975	Change ²
Carlton Creek	L	0.7	0.1	U* ³	0.3	U* ³
Sweeney Creek	L	6.8	5.6	U	5.0	U*
Bass Creek	H	16.7	21.5	U*	27.2	U*
Kootenai Creek	H	21.2	16.2	D*	23.9	U
St. Mary's Peak	L	10.2	12.0	D	4.5	U*
Big Creek	H	16.1	13.7	D	12.4	D*
Glen Lake	L	3.0	4.1	D*	3.5	D
Sweathouse Creek	L	1.4	2.7	D*	1.1	U*
Bear Creek	L	8.1	7.8	U	7.9	U
Mill Creek	L	7.8	5.1	U*	3.4	U*
Blodgett Creek	L	8.3	11.1	D*	10.7	D*

¹L = lightly used, H = heavily used.

²D = change in desired direction; U = change in undesired direction relative to 1973.

³* = change from 1973 exceeded 20 percent of 1973 value.

Table 2.—Change in relative aggregate use, for trailheads classified by level of use

Trailhead class	N	Percent of total groups for each year				
		1973	1974	Change	1975	Change ¹
Lightly used	8	46.1	48.5	D	36.5* ²	U
Heavily used	3	53.9	51.5	D	63.5	U
Lightly used	4	11.8	12.5	D	10.0	U
Moderately used	4	34.3	36.0	-	26.5*	-
Heavily used	3	53.9	51.5	D	63.5	U

¹D = change in desired direction; U = change in undesired direction.

²* = change from 1973 exceeded 20 percent of 1973 value.

If a three-way grouping is used, the conclusions remain unchanged (table 2). It is apparent that the 1975 change towards increased relative use of the heavily used trails came more at the expense of the 4 moderately used trails (with a 23 percent decline from 1973), rather than the lightly used trails.

Based solely on the use patterns as reflected by trail register data, the brochure was not effective. The pattern of concentrated use apparently was intensifying in the second year of the evaluation, which is the opposite of the expected growing effect of the brochure over time. We thought that by the second year more people would have obtained the brochure and more would have it during the decision phase.

This does not necessarily mean information is a useless tool for redistributing use. First, there was no experimental control so we don't know how use patterns might have shifted over the 2 years without the brochure. The changes could have been even worse.

Second, the crudeness of the use index must be taken into account. It is unlikely the brochure was in fact highly effective, given the pattern of trail register data for the 3 years. But there is at least some chance that the

marked deterioration suggested in 1975 was the result of changes in registration rates, not actual shifts in use.

Finally, visitor awareness, use, and evaluation of the brochure must also be considered before dismissing this information campaign as ineffective. These topics are covered next.

Visitor Responses to the Brochure

Visitors' responses to the brochure were probed with a mail questionnaire. With one followup mailing, we received an 82 percent return, or 503 of 611 mailed. Excluding questionnaires returned by the Postal Service as undeliverable raises the response rate to 86 percent, or 503 of 582. This high response creates considerable confidence in the representativeness of the results, at least for visitors who registered. Non-respondents were not contacted.

Reaching Visitors

Hypothesis: The proportion of visitors with a copy of the brochure will increase over time.

In order to have any possible effect, people first must be exposed to the brochure or other information device.

Most visitor groups had not seen the brochure when they entered the area: 54 percent said they did not have a copy, 46 percent did. The proportion exposed to the brochure increased from 44 percent in 1974 to 47 percent in 1975, which supports the hypothesis, although the difference is not statistically significant. The figures are reasonably consistent with observations in conjunction with checking trail register compliance. About 37 percent of the parties observed took a brochure from the dispenser on the trail register, which was where most visitors obtained the brochure. Some of these people observed may have already had another brochure. Others may not have noticed the brochure dispenser or simply not have chosen to take one.

Some visitors (13 percent) said they obtained brochures later, after the sampled trip. This proportion declined from 17 percent in 1974 to 10 percent in 1975 as more visitors already had the brochure before their visit.

The trailhead was by far the dominant source of the brochure when data from 1974 and 1975 are combined, as shown in the following tabulation:

Brochure obtained from:	Percentage
Trailhead, this trip	45
Trailhead, previous trip	32
Ranger Station	5
National Forest office	3
Regional office	4
By mail	1
From friends	6
Don't remember	4

Almost half of all visitors with brochures obtained them at the trailhead as their trip started. About one-third of visitors with brochures had obtained brochures at a trailhead on a previous trip. The next most important source was "from friends," but accounted for only 6 percent. The other sources, all of which involved contact with the managing agency, were low and were an even smaller proportion of all visitors. For example, only about 2 percent of all visitors obtained a brochure at the Stevensville Ranger Station, although it is less than 10 miles from several of the trailheads.

Hypothesis: The proportion of visitors who obtained brochures before reaching the trailhead will be higher at the lightly used trailheads than at the heavily used trailheads. (The brochures obtained early enough to influence choice of trailhead should result in more people choosing lightly used trails.)

The proportion of visitors with the brochure varied among the trailheads; the proportion who obtained the brochure **before** they reached the trailhead (about half of those with the brochure) was higher at the lightly used trailheads than at the heavily used trailheads. At lightly used trailheads, 35 percent of the visitor groups had a brochure before they reached the trail, compared to only 20 percent at the heavily used trails, a statistically significant difference.² This is consistent with the hypothesis.

²Chi-square equaled 18.08 with one degree of freedom, which is significant beyond the 0.001 level.

Hypothesis: The proportion of visitors who obtained brochures only at the trailhead will not differ between lightly and heavily used trailheads. (These brochures were obtained too late to be effective.)

The proportion of visitors who obtained brochures at the trailhead on the sampled trip was the same for heavily and lightly used trails, 21 percent in both cases. This supports the hypothesis.

This means that visitors exposed to the brochure early in the decision process, probably before they had committed themselves to a trailhead, were more likely to choose a lightly used trailhead than visitors in general, but that brochures obtained after arriving at the trailhead had no effect on that trip.

Certain types of visitors were more likely to have the brochure than others, but some hypothesized, expected differences were not found, and some unexpected differences were found (table 3).

Hypothesis: A smaller proportion of day users will have obtained brochures than will have campers. (Day users are less likely to register, and brochures were available at trail registers. Day users probably plan trips less carefully, with less information seeking and less contact with managers.)

As expected, campers were more likely to have the brochure than were day users, 48 percent compared to 43 percent (table 4). This difference is not significant at the 0.05 level, although it is at 0.10. Much day use is very brief and may not involve much effort in choosing a location with particular attributes. The field observations in 1974 showed that only 17 percent of weekend visitors, a very large proportion of whom were day users, took a brochure at trailheads, compared to 51 percent on weekdays, when campers were more common.

Hypothesis: A smaller proportion of horsemen will have obtained brochures than hikers. (Horsemen register less often, may be more often local people already familiar with the area, and may be more limited in choice of areas because some are not well suited to horse travel.)

As expected, a smaller proportion of horse users had brochures, but the difference was small and not significant (table 3). The sample of horse users was also small.

Hypothesis: A smaller proportion of local people will have brochures than nonlocal people. (Local people are more likely to be familiar with the area and have established trail preferences, and they may not seek additional information or contact the managers as often as other visitors. Some live close to particular trailheads.)

Contrary to expectations, local people from the lower Bitterroot Valley were more likely to have brochures than other visitors. For Montana visitors (over 80 percent of the total), exposure to the brochure dropped the farther from the study area the visitors lived.

Table 3.—Proportions of different types of visitors with the brochure at the time of the sampled trip

Type of visitor	Number	Percent with brochure	Significance ¹
Length of stay			
Day users	220	43	N.S.
Campers	383	48	
Method of travel			
Hikers	478	46	N.S.
Horse users	25	44	
Residence			
Local area	126	56	0.01
Missoula area	267	46	
Other Montana	20	36	
Out-of-State	90	40	
Experience with Selway-Bitterroot			
First trip	136	40	N.S.
Previous trips	367	48	
Experience with trailhead			
First trip	267	46	N.S.
Previous trips	236	46	

¹Considered not significant (N.S.) if not significant at the 0.05 level, at least, as tested by chi-square.

Table 4.—Proportion of different types of visitors with brochures reporting their choice of trailhead was influenced by the brochure

Type of visitor	Number ¹	Percent influenced ¹	Significance
Time brochure obtained			
Obtained brochure before trailhead	186	41	0.001
Obtained brochure only at trailhead	153	4	
Use level of trailhead			
Lightly used	176	30	0.02
Heavily used	161	19	
Method of travel			
Hiked	215	24	N.S.
Rode horses	9	32	
Hiked with packstock	4	50	
All horse users	13	36	
Residence			
Local area	61	26	N.S.
Missoula	121	23	
Other Montana	6	20	
Out-of-State	39	29	
Experience with Selway-Bitterroot Wilderness			
First trip	55	18	N.S.
Previous trips	176	26	
Experience with trailhead			
First trip	126	34	0.001
Previous trips	105	14	

¹Numbers shown are for the actual, raw sample, which was used for chi-square tests. The percentages, however, are based on properly weighted data. (Day users were sampled more lightly and had to be weighted to be comparable to campers.)

Hypothesis: A smaller proportion of visitors who have previously visited the Selway-Bitterroot, and especially the trailhead they visited, will have the brochure. (People familiar with an area may seek information less and already have established preferences for certain trails.)

Visitors making their first trip into the Selway-Bitterroot Wilderness had the brochure less often than people who had made previous visits (table 3), but the difference was not statistically significant. This does not support the hypothesis. We thought experienced visitors would be less motivated to obtain additional information, but apparently this is not the case. Experienced visitors may also have had more opportunities on earlier, recent trips to obtain the brochure.

There also was no difference in brochure exposure between persons making their first visit to the specific trailhead and visitors who were already familiar with the trailhead (table 3.) This is also contrary to the hypothesis, which was based on the belief that visitors going to a new trailhead would be more eager for information.

Influencing Visitors

Although reaching a large proportion of the visitors with the brochure was a necessary first step, it was not enough. Were visitors' choices influenced by that exposure to the brochure?

About one-fourth of the visitors who had the brochure reported that their choice of trailhead on the trip was influenced by it. However, this constituted only 11 percent of all sampled visitors. This percentage increased only slightly (from 11 to 12) from 1974 to 1975 even though there was a somewhat wider exposure to the brochure the second year. The proportion of visitors with the brochure who said it influenced their choice of trailhead did not change between the years.

Hypothesis: The proportion of visitors who report the brochure influenced their choice of trailhead will be higher among those who obtained the brochure before the trip than those who obtained it at the trailhead. (The assumption is that by the time visitors reach a trailhead, it is too late in the decision process to influence that trip.)

Visitors who obtained the brochure before they reached the trailhead were much more likely to report that the brochure influenced their choice than were those who did not get the brochure until they arrived at the trailhead—41 percent compared to only 4 percent (table 4). This difference is statistically significant at the 0.001 level and supports the hypothesis.

For those who reported that their choice of trailhead was influenced, the most commonly reported type of influence was "general information about the area," such as on the existence of trails, opportunities for loop trips, presence of lakes, and approximate distances (table 5). The next most common answer was "chose a less-used trailhead," given by 30 percent of the visitors who said they were influenced. This is 13 percent of all visitors who had the brochure before reaching the trailhead, but only about 3 percent of all visitors.

Hypothesis: The proportion of visitors who report that their behavior was influenced by the brochure will be higher on the lightly used trailheads than on heavily used trailheads.

The proportion of visitors to the lightly used trails who said their choice of trailhead was influenced by the brochure was higher than for visitors to heavily used trails (table 4). The difference between the two figures—30 and 19 percent—is statistically significant beyond the 0.05 level and supports the hypothesis.

Hypothesis: A smaller proportion of horsemen will report choices influenced by the brochure than will hikers.

The sample of horse users was small, but the proportion reporting that their choice of trailhead was influenced was higher than for hikers. This is the opposite of the hypothesis, although the differences fall short of statistical significance (table 5).

Hypothesis: A smaller proportion of local people will report choices influenced by the brochure than will nonlocal people.

The association of place of residence with strength of the brochure's influence was not particularly strong (table 5). The pattern repeats that for brochure exposure: high for local people, declining within Montana

Table 5.—Responses to open-ended questions—"Please explain how"—by visitors who reported their choice of trailhead was affected by the brochure¹

Type of influence on choice	Number ²	Percent of respondents ²
General information	24	48
Chose less-used area	17	30
Used "How-to-find trailhead" information	7	15
Information on attractions	5	9
Photographs of area	2	3
Other	8	14
No answer	3	5

¹All answers by each respondent were classified and tabulated (no one gave more than two answers). Thus, the number of responses (66) totals more than the number of respondents (57).

²The actual number of responses before weighting is shown, but percentages are based on weighted sample.

as people live more distantly, and rising again for out-of-State visitors. The differences are not statistically significant, but in any case, the hypothesis is not supported.

Hypothesis: A smaller proportion of visitors who are experienced with the Selway-Bitterroot, and especially with the trailhead they visited, will report choices influenced by the brochure.

More visitors who had made previous visits were influenced than first-timers (table 5). The difference was not quite great enough for statistical significance, however. The hypothesis was not supported for general experience with the area.

The hypothesis was supported, however, for experience with the trailhead chosen (table 5). Over a third of the visitors who had the brochure and had visited a trailhead new to them said they were influenced by the brochure. This was more than twice as great as the proportion of people who had been to the trailhead before who said they were influenced, and the difference is statistically significant. The pattern of answers for the two types of experience—general and specific trailhead—suggests that the more generally experienced visitors seek and use information more and often use it to go to new trailheads.

Hypothesis: The proportion of visitors who report that later trips were influenced will be higher than the proportion reporting that the original, sampled trip was influenced. (This assumes that information must be received by visitors before reaching the trailhead to be effective.)

There is a "delayed action" effect. About 13 percent of the respondents who did not have the brochure at the time of the trip said they got the brochure later, and over half of these people took trips again before they got a questionnaire. Over half (57 percent) of these said their later trips were influenced by the brochure. The sample size was too small to analyze the effect of where the brochure was obtained. The proportion of later trips influenced was higher than for the original, sampled trips (57 percent compared to 24), statistically significant at the 0.001 level. This supports the hypothesis.

Visitors who obtained the brochure at the trailhead on the sampled trip may also have been influenced on later trips, but this was not investigated.

Visitor Opinion of the Brochure

Visitors were asked to evaluate the two main types of information in the brochure: on how to find trailheads and on relative use levels. The perceived level of usefulness was very similar for both (table 6). Few visitors felt the information was of no use, and a majority found it "useful" or "very useful." Over one-fourth had no answer, probably because many of them had not read the brochure, although they said they had seen it.

Visitors were also asked why they rated the brochure as they did. The trailhead location information was described as "generally useful" by 45 percent; 16 percent said it was useful because signs were poor. About 19 percent said it was not useful to them because they already knew the way, and 12 percent said it was

Table 6.—Evaluation of usefulness of the brochure by visitors exposed to it

	Percent of total response	
	Information about trailhead location	Information about relative use
Useless	6	7
Some use	18	15
Useful	24	26
Very useful	26	25
No answer	26	29

Table 7.—Reasons given for choice of trailhead by visitors

Reasons	Number	Percentage ¹
Scenery	137	23
Convenience	123	22
Friend's advice	87	16
Good place to fish	81	14
Novelty, variety	73	14
Easy trail	68	12
Familiarity	57	10
"Right type of trail"	56	9
Less crowded	27	4
Good place to hike	17	3
Good place for nature study	21	3
Trail on ridge or to peak	20	3
Good place to hunt	11	3
Forest Service brochure	4	1
Other	88	16
No reason	3	1

¹Some visitors gave more than one reason; thus percentages add to more than 100.

not detailed enough.

The information on use levels was viewed as useful by 51 percent because it showed crowded areas, and by 3 percent because it had some horse use information. On the negative side, 12 percent said the use information was inaccurate, 7 percent said information on use levels was not important to them, and 3 percent said they had already made a choice of place to visit.

We also solicited open-ended comments about the brochure in general. About one-third of those who had seen the brochure commented, and almost all comments were positive or constructive. About 11 percent of those who had seen the brochure volunteered that it was good or helpful. About 13 percent wanted more detailed information, including distances, travel times, trail steepness, and other conditions. A few (2 percent) suggested the map cover a larger area. About 10 percent made other suggestions, such as to include information on fishing, cross-country skiing, and other activities.

Only 1 percent made negative comments such as

"waste of money." The request for open-ended comments also asked whether the brochure should be continued. Over 97 percent of those expressing an opinion favored continuation, although about 60 percent did not comment, which is not unusual for open-ended questions.

Factors in Visitor Location Choices

To provide a comparison with the factors stressed in the brochure, we asked visitors what influenced their choice of trailhead. The leading factors mentioned were scenery, convenience (closeness to home), advice of friends, fishing, easy trails, and two opposite reasons—novelty and familiarity (table 7).

Some of these factors are beyond direct Forest Service influence; they cannot be modified to alter use. Scenery, for example, cannot be changed within wilderness. Such features could still be described and used as appeals or repellents in information programs. Use levels, or crowding, by itself does not seem to be a major element, at least not in these volunteered comments. Fishing opportunities were cited by three times as many visitors as crowding.

DISCUSSION AND CONCLUSIONS

The effort by the managers to use information to redistribute visitors to the Selway-Bitterroot did not succeed in reducing the concentration of use on a few popular trails. The measure of use distribution changes is crude, and there are aspects of visitor opinions and reported behavior that should temper negative conclusions. However, the bottom line still is that the effort apparently did not achieve its objectives.

There are several reasons for the brochure's general ineffectiveness. Its distribution was limited—most visitors never saw it, and only about one-fourth had it before they reached the trailhead.

The content of the brochure had three weaknesses. First, it probably had too narrow a focus. It stressed use and crowding, which was not a major decision factor for many visitors. Fishing was not mentioned, and scenic quality was only touched on for two trails. Ease or difficulty of trails was mentioned in passing for only two trailheads.

Second, the information may have been too limited in detail. The use information only showed relative numbers entering at each trailhead and a few overused campsites. There was no information on camping use levels at destinations, such as lakes, or how use divided at forks in the trails. Especially in an area like this one with a large amount of day use, much of which is limited to the first few miles of trail, more detailed use distribution information might have influenced more visitors.

Third, a number of respondents indicated a lack of confidence in the accuracy of the use information. They commented on the low compliance at the trail registers, which seemed to be widely recognized. They were right; the use data were low in accuracy.

Many visitors felt the brochure could be improved. Most asked for more detailed information and for information on other aspects in addition to use levels.

The types of visitors common to the area probably made it more difficult to influence use patterns than in some other places. Most visitors lived nearby; for some, trailheads were almost in their backyards. The three heavily used trails are all in the northern half of the area, in the direction of Missoula, where over half of the visitors originated. Many visitors were already familiar with the area; new information could not be entered on a blank slate but had to compete with substantial, prior knowledge, some of which may have conflicted with information in the brochure.

On the positive side, most visitors who obtained the brochure found it useful, and almost all who expressed an opinion felt it should be continued. A higher proportion of groups who obtained the brochure before they reached the trailhead entered on lightly used trails compared to the total visitor population. About one-fourth of those with the brochure said they used it to choose a trailhead, and this proportion was higher on the lightly used trails than the heavily used ones. On lightly used trails, about 40 percent of those who had the brochure before they reached the trailhead reported their choices were influenced.

These types of desired location choices were apparently too small a part of total use, which grew rapidly during the study (an average increase of 26 percent per year, based on trail register data), to overcome trends toward greater concentration of use.

MANAGEMENT IMPLICATIONS

The results of this study, together with those of four other studies reviewed earlier (Schomaker 1975, Lime and Lucas 1977, Krumpe 1979, and Roggenbuck and Berrier 1980), indicate that the effect of information on wilderness use distributions can range from none to substantial. Information must be used in particular ways to be a useful management tool:

1. Information campaigns must be geared to management objectives. Managers must decide if they want to bring about a general redistribution (say from heavy to light use areas), or site-specific redistribution (probably a more appropriate objective), or help visitors match their desires and experiences better (a very appropriate objective and probably the easiest to achieve). Each objective or group of objectives needs to guide the design and conduct of the information campaign

2. The information must be delivered to a large proportion of visitors.

3. The information must be delivered early enough in the recreation location choice process to be of use to visitors. After people have arrived at an access point it is too late to influence that trip, although later trips might be affected.

4. Information provided should cover a variety of attributes of the environmental, use, and managerial setting. Different visitors have different objectives and will respond to varying types of information in different ways.

5. Considerable detail seems to be desired and perhaps necessary to compete with previous know-

ledge and advice of friends. More detailed information also may improve the credibility of information.

6. An information campaign cannot rely entirely on written material. Other research (Fazio 1979) has shown that brochures are often a much less important channel of communication than face-to-face communication. In the North Carolina Wilderness (Roggenbuck and Berrier 1980), personal contact was no more effective than a brochure alone for total use, but it did increase effectiveness with some types of visitors.

7. Some ethical issues of truth in information campaigns need to be faced. Some overused areas may, in fact, be very attractive, with good fishing, easy trails, and so on. Certainly, false information can never be used, but ethical guidelines are less clear on issues of selectivity, completeness, and emphasis.

8. Finally, managers must be sensitive to the danger of providing too much detailed information and taking away the sense of exploration and discovery that contributes to recreational experiences for many people.

Communication and education still look like promising tools for managing wilderness use. They are well worth the careful, skillful effort required for them to help achieve objectives of protecting wilderness and providing opportunities for wilderness recreational experiences.

PUBLICATIONS CITED

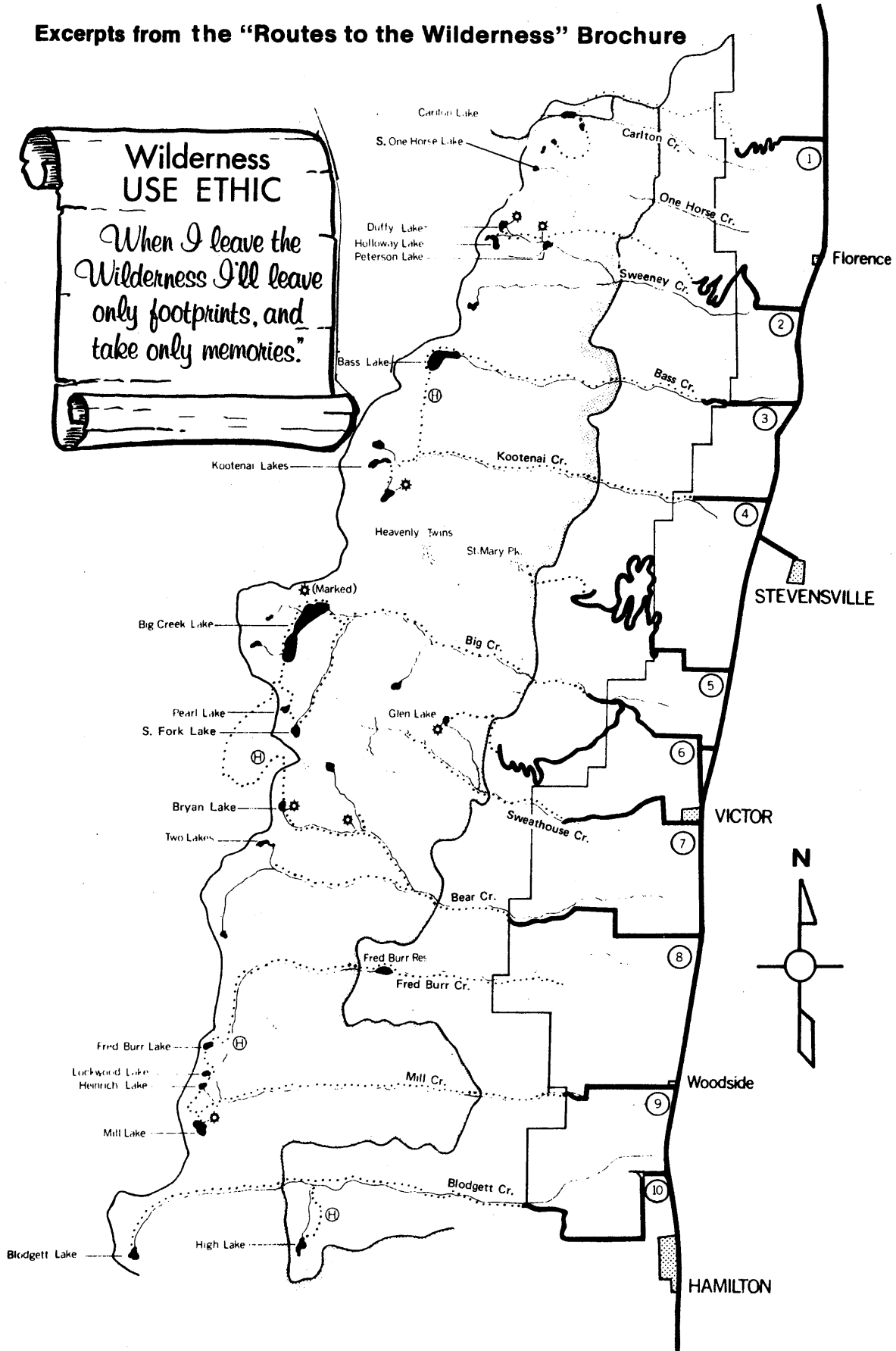
- Brown, Perry J., and John D. Hunt.
1969. The influence of information signs on visitor distribution and use. *J. Leisure Res.* 1(1):79-83.
- Canon, Lance Kirkpatrick, Steven Adler, and Raymond E. Leonard.
1979. Factors affecting dispersion of backcountry campers. *USDA For. Serv. Res. Note NE-276*, 6 p. Northeast. For. Exp. Stn., Broomall, Pa.
- Fazio, James R.
1979. Communicating with the wilderness user. *Univ. Idaho, Coll. For., Wildl. and Range Sci., Bull.* 28, 65 p. Moscow.
- Hendee, John C., George H. Stankey, and Robert C. Lucas.
1978. Wilderness management. *USDA For. Serv. Misc. Publ.* 1365, 381 p. Washington, D. C.
- Krumpe, Edwin Ellsworth.
1979. Redistributing backcountry use by a behaviorally based communications device. Ph.D. diss. *Colo. State Univ., Fort Collins.*
- Lime, David W., and Robert C. Lucas.
1977. Good information improves the wilderness experience. *Naturalist* 28(4):18-20.
- Lucas, Robert C.
1975. Low compliance rates at unmanned trail registers. *USDA For. Serv. Res. Note INT-200*, 6 p. Intermt. For. and Range Exp. Stn., Ogden, Utah.
- Roggenbuck, Joseph W., and Deborah L. Berrier.
1980. The effectiveness of information on dispersing wilderness campers: final report prepared for the Southeastern Forest Experiment Station. 114 p. *Dep. For., Virginia Polytech. Inst. and State Univ., Blacksburg.*
- Schomaker, John Henry.
1975. Effect of selected information on dispersal of wilderness recreationists. Ph.D. diss. *Colo. State Univ., Fort Collins*, 95 p.

APPENDIX

Excerpts from the "Routes to the Wilderness" Brochure

**Wilderness
USE ETHIC**

*When I leave the
Wilderness I'll leave
only footprints, and
take only memories."*



- 1 **CARLTON LAKE TRAIL . . .** The access road is located 5.4 miles south of Lolo and 4.8 miles north of Florence. It is 4.5 miles from the sign on Highway 93 to the jeep road. As indicated by the Wilderness Trail Graph, this area is used very little by visitors. What is shown on the map as a trail to Carlton Lake is actually a jeep road. From there, the Wilderness trail heads into One Horse Canyon, an area which provides excellent opportunities for cross-country exploring. Included in this area are two main lakes; Reed Lake and South One Horse Lake.
- 2 **SWEENEY CREEK TRAIL . . .** To locate this access road, look for the Sweeney Creek Store, approximately 1.3 miles south of Florence or 8 miles north of the Stevensville turn-off. There is a sign on the highway. This trail begins at the end of a logging road approximately 6.5 miles from Highway 93. The trail head is at 7,000 feet elevation. The trail leads to Peterson and Duffy Lakes. Campers should avoid using worn campsites which are shown on the map.
- 3 **BASS CREEK TRAIL . . .** The access road is about 4 miles south of Florence or 3.8 miles north of the Stevensville turn-off. A sign is located on the highway. From this sign follow the paved road to Charles Waters Campground, this is 2¼ miles. The trail head is at the west end of the Charles Waters Campground. A loop trip might be considered when planning your outing as Bass Creek and Kootenai Creek trails connect. We suggest the trip be made from Bass Creek to Kootenai Creek to reduce steep climbing.
- 4 **KOOTENAI CREEK TRAIL . . .** The access road to this trail is 7 miles south of Florence or ½ miles north of the Stevensville turn off. From the sign on the Highway, it is 2 miles to the trail head.
- 5 **ST. MARY PEAK TRAIL . . .** The access road is 3.4 miles south of the Stevensville turn-off and 4 miles north of Victor. From the sign on the Highway it is 12 miles to the trail head which is at an elevation of about 7000 feet. By trail it is 4 miles to St. Mary Peak where an outstanding view is offered of the Heavenly Twins and other peaks in the Bitterroot Mountain Range. This area is a good starting point for cross-country trips.
- 6 **BIG CREEK TRAIL - GLEN LAKE TRAIL . . .** The access road is located 6 miles south of the Stevensville turn-off, or 2 miles north of Victor. From the sign on the Highway it is 4½ miles to the trail head. This is the most heavily used trail on the District. To help restore overused sites, designated areas around Big Creek Lake are closed to overnight camping. Stock use is limited to through traffic and must remain on the trail. There are several possibilities for loop trips in this drainage either by trail or cross-country. To locate the Glen Lake Trail, take the same access road from Highway 93. Following the Forest Service signs, go past the Big Creek turnoff and continue for about 8 miles on the main road. The trail take-off is marked with a sign.
- 7 **SWEATHOUSE CREEK TRAIL . . .** This access route is in the town of Victor, one block south of the main street. Travel west for one mile and turn right at 'T' intersection. Then drive north for ½ mile and turn west. The access road passes through the yard of a private residence. From this point continue west, through a gate, for 1¼ miles (Do not cross Sweathouse Creek Bridge). You must walk up an old road from the parking (wide spot in road) area ¾ mile to the trail head. Entry to Sweathouse is through private land. Land owner permission is required to enter this canyon. Sweathouse Falls is located about one mile outside the Wilderness Boundary.
- 8 **BEAR CREEK TRAIL . . .** Location of the access road is 3 miles south of Victor or 4 miles north of Woodside. A sign marks the turn-off from Highway 93. The trail head is 6 miles from the Highway. Within Bear Creek, there are three drainages; South Fork, Middle Fork, and North Fork. The North Fork is the only tributary where travel may be difficult. These forks contain some of the most outstanding scenery on the District.
- 9 **MILL CREEK TRAIL . . .** Location of the access road is in the Town of Woodside. From the Woodside intersection on Highway 93, travel west for about 2.5 miles and turn left at the 'T' intersection. The Forest Service access road is a few hundred feet beyond the Mill Creek crossing. The trailhead is at the end of this road. A loop trip may be taken from Mill Canyon into the Fred Burr drainage. Entry to Fred Burr Canyon is through private land. Land owner permission is required to enter as there is a locked gate.
- 10 **BLODGETT CREEK TRAIL . . .** The access road is 2 miles north of downtown Hamilton or 2 miles south of Woodside. There is a sign on Highway 93. The road makes numerous turns before reaching the trailhead, so watch carefully for Forest Service signs giving direction. The trail head is 6½ miles from Highway 93.

E R R A T A

Lucas, Robert C. Redistributing wilderness use through information supplied to visitors. Res. Pap. INT-277. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1981. 15 p.

Research Summary (inside front cover)

Sentence beginning on tenth line should read:

Only about one-fourth had it before they reached the trailhead, and about 40 percent of these said they used the brochure to choose a trailhead, usually a lightly used one.

Page 8, column 2, line 27: Reference should be to table 3 instead of table 4.

Page 9, table 3: Number of campers should be 282, not 383.

Page 9, table 4: The first four numbers in the column "Number" should be 127, 104, 121, and 110. Numbers now shown are weighted numbers.

Page 12, column 2, lines 20 and 21

Last sentence in paragraph should read:

About 40 percent of those who had the brochure before they reached the trailhead reported their choices were influenced.

Lucas, Robert C.

1981. Redistributing wilderness use through information supplied to visitors. USDA For. Serv. Res. Pap. INT-277, 15p. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.

An evaluation was made of an attempt by the managers of a portion of the Selway-Bitterroot Wilderness to influence visitors to redistribute themselves to more lightly used trailheads through an informational brochure. Use patterns did not change in desired ways, although visitors who obtained the brochure before they arrived at the trailhead reported their choices of locations were influenced. Management implications are presented.

KEYWORDS: wilderness, recreational use, redistribution of recreational use, visitor information, Montana, indirect visitor management

The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 273 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

Field programs and research work units of the Station are maintained in:

Boise, Idaho

Bozeman, Montana (in cooperation with Montana State University)

Logan, Utah (in cooperation with Utah State University)

Missoula, Montana (in cooperation with the University of Montana)

Moscow, Idaho (in cooperation with the University of Idaho)

Provo, Utah (in cooperation with Brigham Young University)

Reno, Nevada (in cooperation with the University of Nevada)

