USE PATTERNS AND VISITOR CHARACTERISTICS, ATTITUDES AND PREFERENCES IN NINE WILDERNESS AND OTHER ROADLESS AREAS

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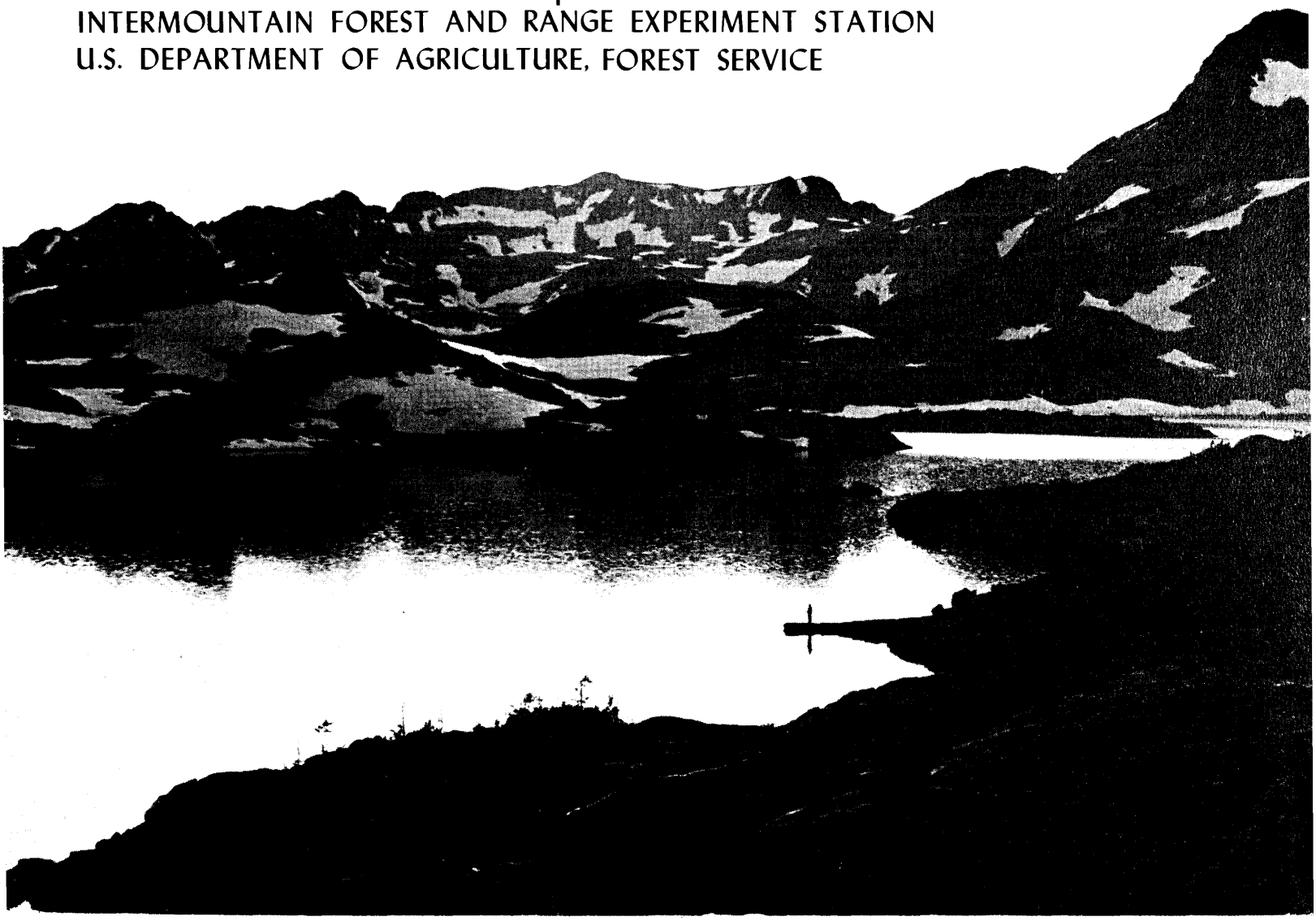
USDA Forest Service Research Paper INT-253
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE



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July 1980

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RESEARCH SUMMARY

A comparison of use patterns and visitor characteristics among nine wilderness and other roadless areas showed similarities for many characteristics and sharp differences for others. Differences were most pronounced for use patterns, such as length of stay, method of travel, and activities, and were least noticeable for visitors' attitudes and preferences. Overall, satisfaction was high, but many visitors felt that conditions were deteriorating. Use controls and only minimal levels of development were supported. Visitors to the heavily-used California study area showed some adjustment of preferences for solitude levels compared to visitors to the relatively lightly-used Northern Rocky Mountains areas. The overall pattern of responses suggests a need for a range of dispersed recreation opportunities outside wilderness, and for wilderness management that emphasizes managing use.

CONTENTS

INTRODUCTION

Wilderness is intended to preserve natural conditions and outstanding opportunities for solitude. For areas classified under the Wilderness Act (Public Law 88-577) this is a legal requirement.

Sustained, rapid growth in the recreational use of wilderness lands threatens the preservation of both naturalness and solitude. Many, if not most, areas have locations where impacts on soil and vegetation are severe and where visitors sometimes are crowded beyond any possible definition of solitude.

Visitor management is increasingly essential in this situation. Within the wilderness system, extensive development of structures and facilities to handle growing use pressures is inappropriate. The main approach must be through management of use, including such things as modifying numbers of visits, lengths of stay, timing of use, geographical distribution of use, party size, method of travel, activities, and visitor behavior (Lucas 1973).

Knowledge of visitors and their use of wilderness is essential for management. This is especially true if management attempts to be as light handed and unobtrusive as possible. In contrast, authoritarian regulations could be imposed without much knowledge of visitors' activities and desires. For example, a manager could determine the maximum numbers of campers at each camping location and just assign visitors to camp at particular places to match the established capacities. If managers, however, seek to preserve as much visitor freedom as possible--a basic principle of wilderness management (Lucas 1973)--then understanding visitors becomes more necessary. For example, the managers might establish the same camping capacities mentioned, but try to influence and encourage visitors to shift use patterns by providing them with information on congestion, on alternative places to camp, and on other times to visit the area. To make this type of wilderness management work, knowledge of use patterns, timing of use, and of attractions that draw visitors would be necessary. This information might indicate that controls would still be needed at some times and places, but regimentation would not be imposed except where it was unavoidable.

Thus, better knowledge can increase the professionalism of wilderness management and raise the quality of the services that wilderness provides the public.

Knowledge of wilderness use, however, has been sketchy. Information has been available only for a few areas and for widely separated time periods. Most use surveys cover only summer use. Much of the data on wilderness visitors has been based on small samples, often with weak or undefined sampling designs. Some studies have described individual visitors and others, groups. Comparability has been further reduced by wide variation in kinds of data collected, definitions used, and categories for classifying responses. For example, almost every study has reported data on visitor incomes, but each has used different income categories (Stankey 1970).

BASELINE SURVEY CONCEPT

The shortcomings in needed wilderness-user information just described led to the planning of this baseline visitor survey. The objective of the survey was to collect comprehensive, comparable data on visitors to a number of wildernesses and to some similar areas not classified as wilderness.

Information to be collected included:

1. Types of use--characteristics of the visit itself, including such factors as activities, methods of travel, season of use, length of stay, distance traveled, and camping practices.

2. Characteristics of visitors--for example, types of groups, previous experience, residence, and socioeconomic descriptions.

3. Visitor attitudes, such as reasons for wilderness visits, satifaction and related factors, and desirability of various policies and management actions.

The survey was intended to serve five purposes:

1. To aid managers in planning for each study area;

2. To help develop overall management policies for wilderness based on knowledge of differences and similarities between areas;

3. To establish a base for future measurement of trends;

4. To aid in the selection of research problems and study areas; and

5. To help guide the application of results of future, more specific studies from the areas studied to other, similar areas.

These five objectives also are guiding plans for a similar survey of visitors to a nationwide sample of areas in the wilderness system, probably in 1983. Most of the areas that were included in this study will be studied again to capitalize on the information base that has been developed.

STUDY AREAS

The baseline survey has been completed on nine areas (table 1), all of which are within National Forests. Seven of the areas are now classified as Wilderness under the Wilderness Act--the Desolation, Bob Marshall, Cabinet Mountains, Selway-Bitterroot, Mission Mountains (a Primitive Area when the study was conducted), Great Bear, and Scapegoat. The last two were unclassified areas when they were studied, but were later designated as Wilderness. The Spanish Peaks, a Primitive Area, is awaiting possible classification as Wilderness. The Jewel Basin Hiking Area is a roadless recreation area classified by the Regional Forester under the Scenic Area authority.

Table 1.--*Size and recreational use of baseline survey study areas*

Area	Size	Recreational use	Visitor-days/acre
	(1,000 acres)	*(1,000 visitor-days)*[1]	
Desolation Wilderness (California)	64	299	4.67
Jewel Basin Hiking Area (Montana)	15	10	0.67
Mission Mountains Wilderness (Montana)	74	47	.64
Spanish Peaks Primitive Area (Montana)	51	15	.29
Cabinet Mountains Wilderness (Montana)	94	20	.21
Selway-Bitterroot Wilderness (Idaho-Montana)	1,244	196	.16
Bob Marshall Wilderness (Montana)	950	142	.15
Scapegoat Wilderness (Montana)	240	41	.17
Great Bear Wilderness (Montana)[2]	286	26	.07

[1]Use figures are for 1976 and are from annual Forest Service wilderness use reports, except use figures for the Great Bear Wilderness, which are for 1974 and are from the Forest Service's Northern Region (Region 1) files.

[2]Use data are based on a 374,000-acre study area.

All of the areas are in the Northern Rocky Mountains, except the Desolation Wilderness, which is in the Sierra Nevadas in California (fig. 1).

Figure 1.--The nine study areas.

Size

The areas vary greatly in many ways. In size, they range from two of the largest wildernesses in the system, to quite small (table 1). The Selway-Bitterroot and Bob Marshall are both around a million or more acres (about 400 000 hectares). Five areas are under 100,000 acres (about 40 000 hectares) and the Jewel Basin Hiking Area is only about 15,000 acres (6 000 hectares or less than 24 mi^2). Three areas--the Bob Marshall, Great Bear, and Scapegoat--are contiguous and together total over 1,475,000 acres (600 000 hectares).

Use

The intensity of recreational use varies enormously, from over one-third of a million visitor-days in the Desolation Wilderness down to 10 to 20 thousand visitor-days in several other areas. Because of the large variation in size between areas, total use per area is not a comparable figure; therefore, visitor-days per acre are presented to achieve comparability (table 1). Smaller areas have more use per acre than larger areas. The five most intensely used areas are all under 100,000 acres, whereas the four least intensely used are all over 200,000. The range of variation in use intensity is over 65 to 1. This is a tremendous range, even when differences in other factors between the areas, such as level of development of trail systems, numbers of camping sites per unit of area, and abundance of lakes, are taken into account. If intensity of use is related to types of use, characteristics of visitors, or visitors' attitudes, a comparison of these areas with their sharply varying use intensities should reveal it.

The type of use also varies considerably among the areas. This will be discussed in detail; but, for example, horse users are in the majority in one area, are common in several other areas, and are absent in one area. Some areas are used mainly on a day-use basis; others are used for longer trips. Several areas are major hunting grounds but several others have very little hunting.

Attractions

All of the areas contain high mountains and beautiful scenery. Figures 2 through 10 show fairly typical scenes of attractions in each area. All areas have lakes; they are common in the Desolation Wilderness, the Mission Mountains Wilderness, and the Jewel Basin Hiking Area and fairly common in the Spanish Peaks Primitive Area and Cabinet Mountains Wilderness. Lakes are found in large numbers in several parts of the Selway-Bitterroot Wilderness; but, in most of that area, as in most of the Bob Marshall, Scapegoat, and Great Bear Wildernesses, lakes are scarce. Good-sized rivers with some river-floating recreation are found in the Selway-Bitterroot, Bob Marshall, and Great Bear Wildernesses.

National Reputation

National awareness and recognition also varies widely. The Bob Marshall Wilderness probably is the most widely known of the nine study areas. It, along with the Boundary Waters Canoe Area, is one of the best known of all National Forest Wildernesses. The Selway-Bitterroot Wilderness probably is the next most widely recognized Wilderness, followed by the Desolation. At the other extreme, the Cabinet Mountains Wilderness and the Jewel Basin Hiking Area are not well known even in their own region. The other areas seem to be intermediate in national reputation.

Location Relative to Population

The Desolation Wilderness is within a 3- or 4-hour drive of millions of people in the San Francisco Bay area of California, and so has a potential for heavy use. The Montana-Idaho areas are far from population concentrations. Most of these areas are close to small cities (with populations of about 50,000) and to smaller towns. The Selway-Bitterroot is accessible to the Spokane, Washington, metropolitan area (with a population over 200,000).

Figure 2.--The Desolation Wilderness has much bare rock and open landscapes that make crosscountry travel relatively easy.

Figure 3.--The Selway-Bitterroot Wilderness has peripheral areas with attractive lakes, such as Big Creek Lakes seen here from near the Idaho-Montana border.

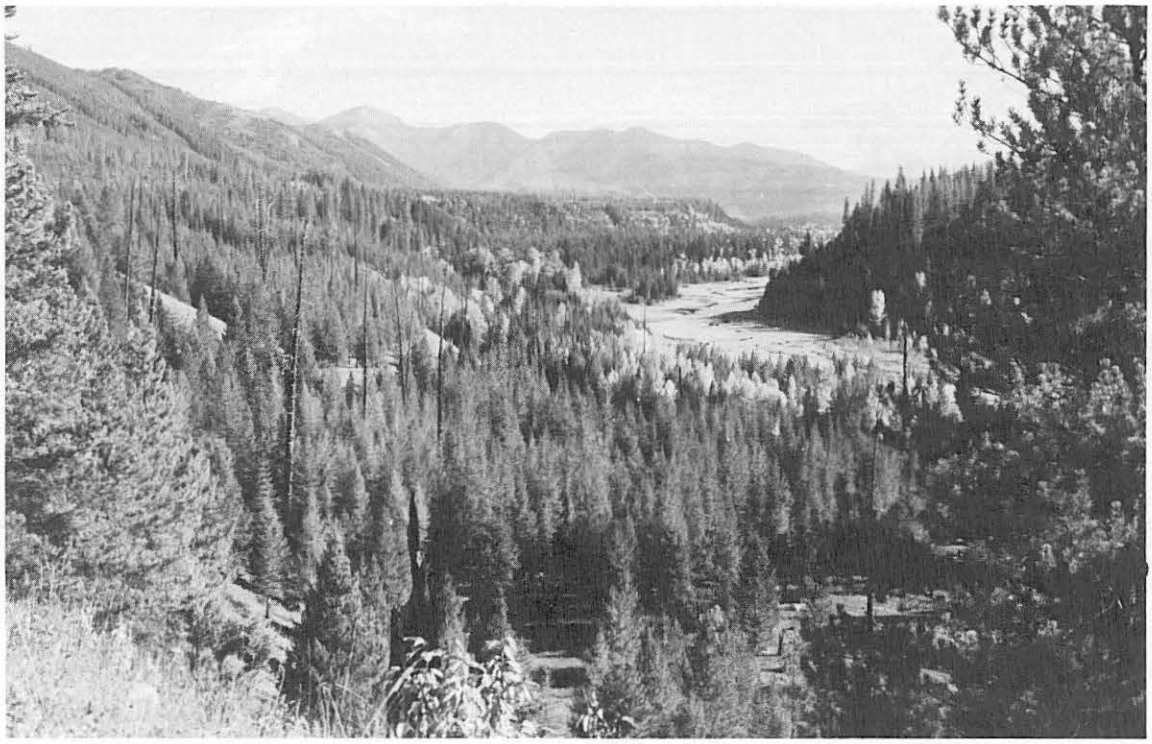

Figure 4.--The Bob Marshall Wilderness includes low elevation valleys, such as the South Fork of the Flathead River shown here, as well as high mountain peaks.

Figure 5.--The Cabinet Mountains Wilderness consists mainly of high mountain country, with lakes such as Wanless Lake, featured here.

Figure 6.--The Scapegoat Wilderness adjoins the Bob Marshall Wilderness and has similar landscapes.

Figure 7.--The Mission Mountains Wilderness is largely rugged, high mountain country, with many lakes, such as Turquoise Lake in this photo.

Figure 8.--The Spanish Peaks Primitive Area has much steep, high country and a number of lakes.

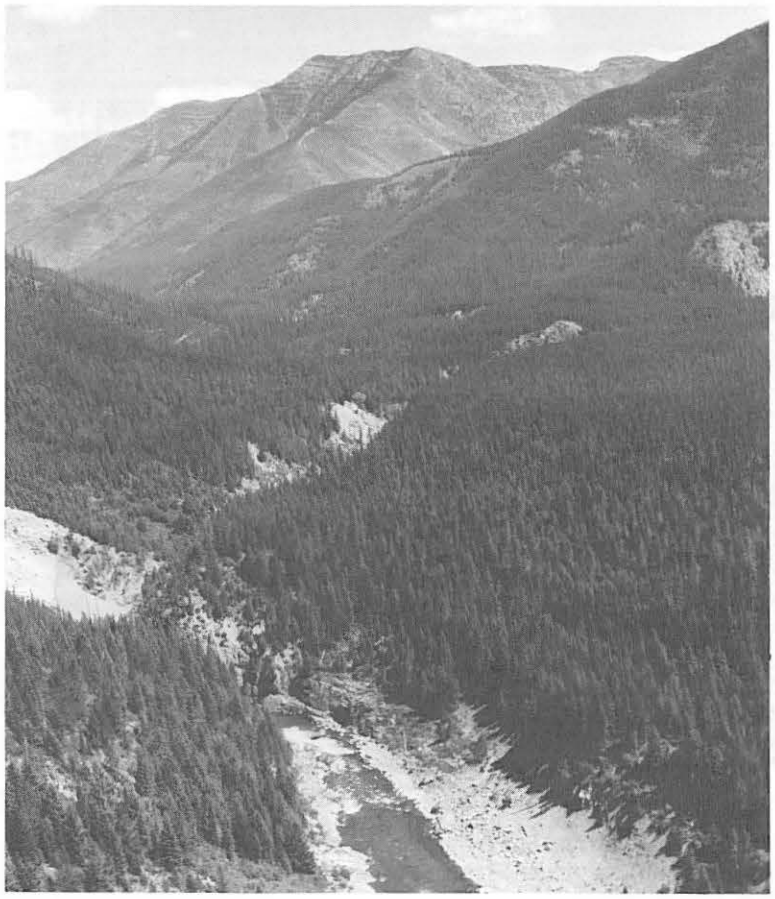

Figure 9.--The Great Bear Wilderness is centered on the Middle Fork of the Flathead River.

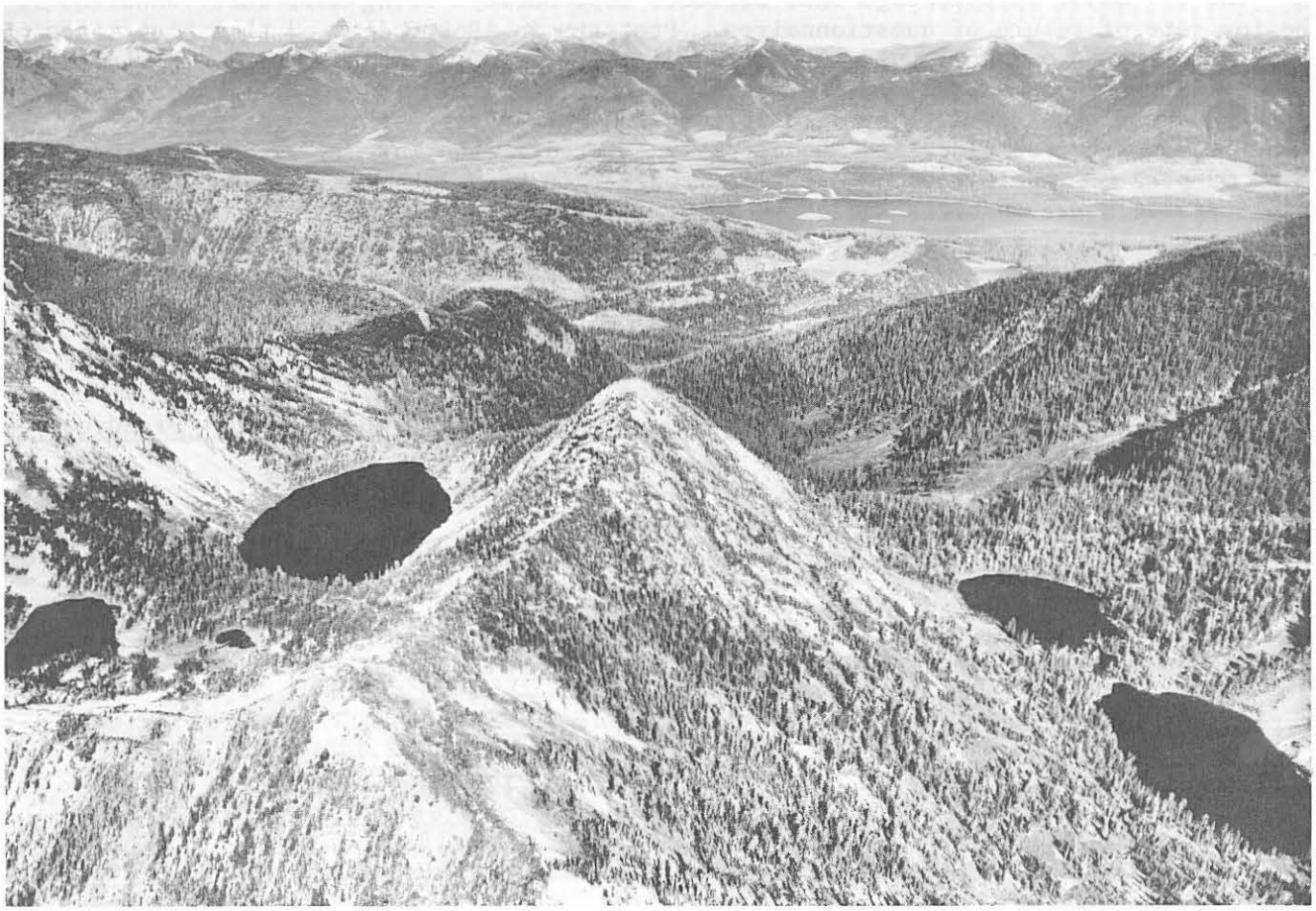

Figure 10.--The Jewel Basin Hiking Area contains numerous high mountain lakes. (Part of the Great Bear Wilderness is shown in the distance, to the east of the hiking area.)

STUDY METHODS

The baseline study relies on survey research methods specially adapted to the wilderness situation. The study covered summer and fall use, except in the Desolation Wilderness where the entire year was sampled. Except in Desolation, sampling began about the third week in June and continued until late November. The Desolation Wilderness was studied in 1972, the Selway-Bitterroot in 1971, and all other areas in 1970.

A copy of the questionnaire used in all areas is included in the appendix. There were only small changes in the questionnaire used in different areas. The term "back country" replaced "Wilderness" in references to areas not classified as Wilderness or Primitive Area; a map of the specific area was used; and a few questions were added or deleted in the section that investigated attitudes about management practices and policies. For example, in the Jewel Basin Hiking Area no horse use is allowed; so questions about horses were deleted. In the Selway-Bitterroot, where there are several public airplane landing fields, a question about them was added.

Mail questionnaires were chosen for this study. Mail questionnaires have several advantages and one major disadvantage. Advantages include larger samples at less cost; avoidance of demands for large amounts of respondents' time in the field when people are often tired and behind schedule and the weather may be uncomfortable; elimination of interviewer bias; better control of sample size than with field interviewing, and statistical efficiency because cluster sampling can be avoided or controlled (Lucas and Oltman 1971).

The one major disadvantage that afflicts most surveys using mail questionnaires is the low rate of return of questionnaires. Pretests in 1969 indicated that high rates of return (about 90 percent) could be attained in surveys of wilderness visitors (Lucas and Oltman 1971) and our experience in this study confirmed this (table 2). Rates of return, based on questionnaires delivered to persons who were part of the target population (that is, 16 years or older and who actually entered a study area), varied among areas from 87 to 95 percent (table 2). The overall average rate of return was 91 percent. Including undeliverable questionnaires and those returned by people outside the target population only lowered the rate of return to 89 percent.

Table 2.--*Rate of return of mail questionnaires and sample size*

Area	Number of questionnaires mailed	Number undeliverable[1]	Completed and returned	Percent deliverable returned
Desolation Wilderness	350	11	295	87
Selway-Bitterroot Wilderness	466	10	398	87
Bob Marshall Wilderness	143	4	125	90
Cabinet Mountains Wilderness	266	4	244	93
Scapegoat Wilderness	325	4	299	93
Mission Mountains Wilderness	375	12	341	94
Spanish Peaks Primitive Area	477	22	419	92
Great Bear Wilderness	84	0	78	93
Jewel Basin Hiking Area	291	5	271	95
TOTAL	2,777	72	2,470	91

[1]Questionnaires returned by post office.

Up to five mailings were sent if a response was not received earlier, but the first mailing produced returns from 59 percent of the sample visitors (table 3). Successive mailings contributed smaller and smaller additions to the response, but in total yielded returns from another third of the sample (table 3). Although the returns of the fourth and fifth mailings were small, they helped reduce bias caused by nonresponse. This seems to be particularly true because late respondents gave different answers to some questions than early respondents. For example, respondents to the final mailing were less well satisfied and less highly educated than earlier respondents. Whether this small reduction in bias is worth the added costs cannot be objectively determined, but at least three mailings seem to be desirable.

Table 3.--*Questionnaire returns by number of mailings required, all study areas combined*

Mailing	Number delivered[1]	Number returned	Return as a percent of mailing	Return as a percent of first mailing	Cumulative Return
1	2,705	1,598	59	59	59
2	1,107	519	47	19	78
3	588	206	35	8	86
4	382	82	21	3	89
5	300	65	22	2	91

[1]Questionnaires returned by the post office are omitted.

Source of Samples

Obtaining a list of wilderness visitors from which to draw a sample for a mail survey is difficult. At least five approaches can be used, but each has problems discussed below.

1. Self-registration stations on trails can be used, but they are ignored by many visitors and particularly by horse travelers; so an incomplete and biased list results (Lucas 1975). Thus, nonregistrants should be sampled in some way. Furthermore, one person registers for the entire group. Group leaders differ from other party members in many ways (for example, age, sex, experience, and occupation), although attitudes tend to be homogeneous in groups (Jubenville 1971).

2. Wilderness permits replace trail registers in some areas (the Desolation Wilderness was the only one of the nine study areas with a permit system at the time of the study). Permits usually result in a higher compliance rate and more unbiased representation of various types of visitors, such as horsemen, than trail registers. Permits, like trail registers, refer to only one person per party, not to individual visitors.

3. Commercial outfitters sometimes are required to keep lists of their guests who could be sampled, provided overlap with other sources can be avoided.

4. Personal contact in the field at trailheads results in most of the problems associated with personal interviews (small, uncontrolled highly clustered samples, and high costs), but avoids nonregistrant bias.

5. Personal contact at roadside checkpoints can enlarge the sample if one road provides access to several trailheads, but some traffic may not consist of wilderness visitors; so screening is necessary.

All of these methods or variations of them were used to some extent in the baseline survey, depending on variations in the situation, as described below.

SPECIAL REGISTRATION STATIONS

The most widely used approach was a special trail register. These registration stations were portable (fig. 11). Each had a sign that informed visitors that a research study was under way and requested each person 16 years of age or older to write his or her name and address on a card (one card per group) for possible inclusion in the study. The minimum age of 16 was set to assure sufficient reading skill to deal with a mail questionnaire, not because we lacked interest in the activities or attitudes of younger visitors.

Visitor cooperation was excellent and registration rates far exceeded those at conventional trail registers (Lucas, Schreuder, and James 1971; Lucas 1975). Sample observations indicated that about 94 percent of the hikers observed registered and about 67 percent of the horse travelers.

Nonregistrants were contacted on some trails on sample days to provide a basis for overcoming biases due to their absence from the special register lists. This bias could be serious. Pilot test results indicated that for some socioeconomic variables (education, age, and occupation), the nonregistrants differed significantly from the registrants at the 0.001 level as tested by chi-square.

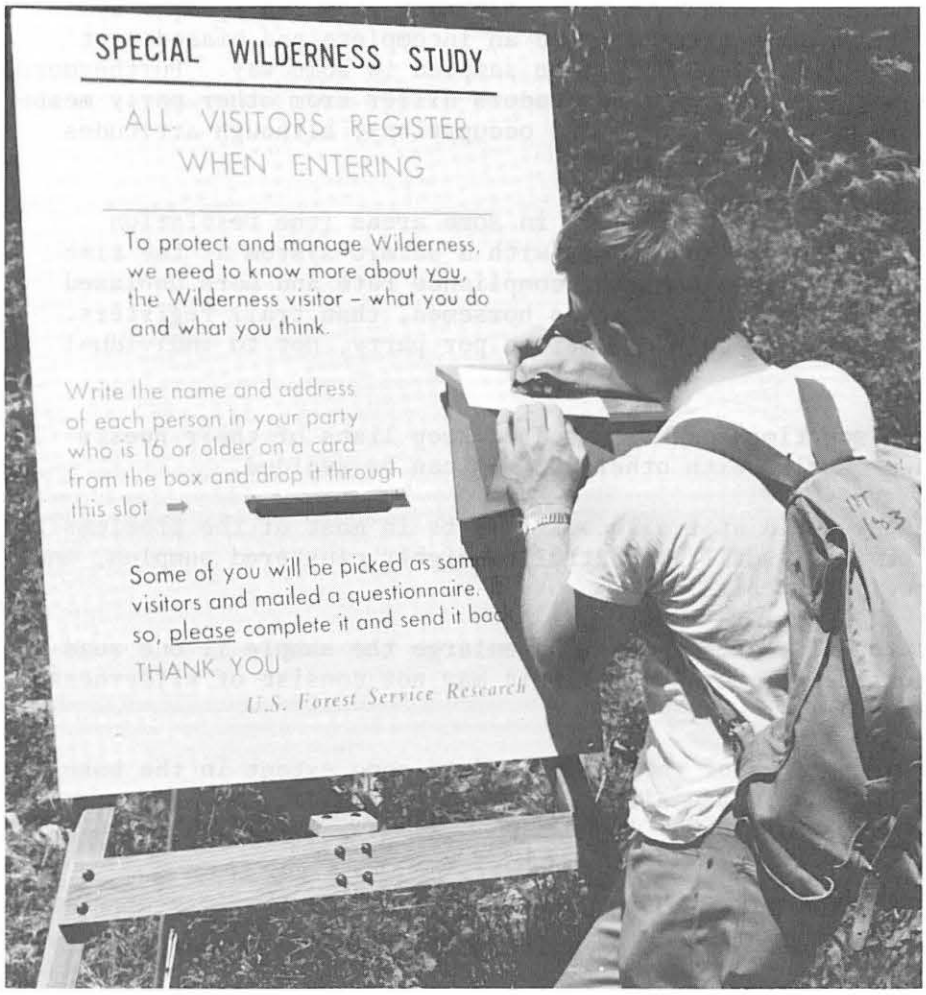

Figure 11.--A typical, portable registration station used in the study.

Observers sat alongside the trail far enough beyond the special registration station to be inconspicuous but close enough to allow them to see if visitors registered. If visitors did not register, the observer stopped the party and asked for names and addresses after explaining that a survey was being conducted. This procedure might seem likely to arouse some resentment from visitors but apparently, it did not; all visitors cooperated without apparent hostility.

The special registration stations were used at slightly different types of trailheads in 1970 than in 1971. In 1970, the special stations were used on all trails in Montana study areas where horse use was only a small proportion of all use. Because registration rates for horse users were poor in the pilot study (50 percent in the summer and only 12 percent in the fall), any trail that the area's managers estimated had at least 20 percent of the visitors using horses was sampled by personal contact. A field worker contacted every party entering or leaving at sample trailheads. Visitor cooperation was complete in this case also.

In 1971, in the survey of the Selway-Bitterroot Wilderness, the procedure was changed and special stations were used regardless of the level of horse use. There were two main reasons for the change. First, 1970 checks on registration responses where special stations were used indicated better compliance by horsemen than in the pilot test--66 percent compared to 18 percent in the pilot test. Second, 1970 experience with direct contacts in the field painfully emphasized how much effort was required for even small samples. We realized we could use the time that would have been spent making direct contacts to check on registration at special stations. Sample size would be increased substantially through visitor registrations at times when no one would have been present for direct contact. Also statistical efficiency gains could be made through reducing the degree of clustering in the samples.

DIRECT CONTACTS AT TRAILHEADS

Direct field contacts were used in 1970, where horse use was significant. Included were all trails into the Bob Marshall and the Great Bear Wildernesses, and some trails into the Scapegoat Wilderness and Spanish Peaks Primitive Area. A field worker, present at sample trailheads from about 8:00 a.m. to 4:00 p.m. on sample days, contacted every party entering or leaving to obtain names and addresses of all people 16 years of age or older. The field workers traveled and lived in a pickup camper. They often camped at trailheads and voluntarily contacted some parties that arrived before or after the checking period.

DIRECT CONTACTS ON ROADS

All trailheads along the southern boundary of the Selway-Bitterroot Wilderness are reached by one road, which has only minor nonrecreational traffic and a small amount of travel by recreationists who do not enter the Wilderness. Therefore, exiting traffic was checked on this road on a sample basis to obtain a list of visitors. Checking was normally done from about 11:00 a.m. to 6:00 p.m.; but some additional contacts were made with vehicles that left before or after checking hours. Warning signs alerted drivers to slow down and prepare to stop. This procedure worked well and drivers cooperated fully.

OUTFITTER GUEST LISTS

In the Selway-Bitterroot, outfitters entering through the Clearwater National Forest portion of the Wilderness (the northern edge) reported the names of their guests as part of the procedure for determining special use permit fees. They agreed to also provide addresses for the study. Outfitters and guests were excused from registering at the special registration stations to avoid sample overlapping. Some outfitters forgot to keep records, but generally the approach worked well.

WILDERNESS PERMITS

The Desolation Wilderness in California requires permits for all visits (the only study area to do so) and these permits were sampled. This sample source means information on the visitors to the Desolation Wilderness is not fully comparable to that from the other areas. The sample is based on groups only. As will be pointed out in the presentation of different types of visitor information, comparability is good for some variables, such as length of stay, party size, activities, and routes; fairly good for attitudes; but poor for personal and socioeconomic data. Permits were used as a compromise, although the loss of full comparability was recognized, because they were an efficient, inexpensive sample source and because resources for the special registration system and nonregistrant field checking were not available. Also, if permits are used more widely in the future, a shift to permits as a survey base seems likely. One major advantage is the ease of drawing simple, random samples for which confidence intervals are easy to calculate, as contrasted to complex, cluster samples for which confidence intervals are painfully difficult to calculate.

Desolation visitors who did not get permits were not sampled, so some unmeasured bias is probably present. (Compliance was estimated at about 60 percent.[1]) Certainly, if permits are used as a sampling source in the future, compliance should be field checked and a sample of noncompliers obtained, unless it is known that compliance is high. Because we were unable to check compliance in the Desolation, caution must be used in comparing results. Only substantial differences should be treated as meaningful.

Group and Individual Frames of Reference

For all the areas except the Desolation Wilderness, data can be presented either for individuals (16 years of age or over) or for groups. This was achieved by tagging one randomly selected respondent from each group and using only those respondents for basic descriptive data that logically refer to the group. Examples include group size, route of travel, length of stay, and method of travel. Other variables, such as personal socioeconomic data, activities, and attitude, were tabulated on an individual basis. A few variables, such as length of stay, are worth looking at from both perspectives. For the Desolation Wilderness, as previously mentioned, only a group frame of reference is possible.

Sample Design

The sample design is complex. The basic problems involved in sampling wilderness visitors unfortunately dictate complex sample designs (Lucas and Oltman 1971). The full details of the sampling design may be requested from the author.[2] The general plan was to give every visitor to each study area the same chance to be sampled as every other visitor to the same area. We did not try for the same intensity of sampling in every area; so the samples from different areas cannot be combined without weighting. Within any area, however, all visitors had an equal chance to be included in the survey. Comparisons between different parts of the sample (for example, comparisons of summer and fall visitors) are simple and straightforward.

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[1]Intensive permit compliance checking in 1974 produced estimates of 67 percent compliance overall, 40 percent by day-users, and 72 percent by overnight visitors. The Desolation managers felt that compliance was lower in 1972, when the permit system had been in effect only 2 years.

[2]Request "The Baseline Survey Sampling Design" from Robert C. Lucas, USDA Forest Service, Intermountain Forest and Range Experiment Station, Forestry Sciences Laboratory, Drawer G, Missoula, Montana 59806.

This sampling procedure required careful coordination where several different sources of visitors were being combined. For the Spanish Peaks sample, it was necessary to weight samples from trails checked in person rather than by means of special registration stations. Samples of nonregistrants, which turned out to be small, were also weighted to achieve balance with the primary sample.

The main sample design was a cluster sample, with paired selection of primaries from unequal-sized clusters, chosen with probabilities proportional to size (PPS) and subsampled with probabilities inversely proportional to size (Kish 1967, Chapter 7). The probability proportional to size concept used estimates of average weekly use by the managers of each area. For example, imagine two trailheads, one (A) estimated to have 100 people entering per week, the other (B) estimated to have 10 per week. Trail A is 10 times as likely as B to be sampled (to have the special registration station set up, or the road to it checked, or to receive direct, trailhead checking). This sampling method means important major trails are almost sure to be sampled and guards against much time being wasted to produce few or no sample visitors; but it does not give every visitor an equal chance to be sampled. To achieve that, the persons whose names and addresses were obtained in each cluster at the different trailheads were then subsampled with probabilities inversely proportional to size. In the example, this means that persons on the list at A have only one-tenth the chance of being subsampled as persons at B. The probabilities proportional to size cancel out and everyone has the same chance of being chosen. In other words, a visitor at A is 10 times as likely as a visitor at B to have his or her name requested, but a visitor who gives his or her name at B is 10 times as likely to be mailed a questionnaire.

The reason for this seemingly roundabout procedure was to try to produce final clusters of about the same size. In the example, if one-half of the trail B people were sampled and one-twentieth of the trail A people, each cluster would consist of five people if use was what it was estimated to be. Equal, or at least reasonably close, cluster sizes[3] are important to produce an efficient sample that will yield precise, unbiased estimates, given the size of the sample. (See Kish 1967.)

Trails were chosen from summer and fall strata and further subdivided into those with high and low estimated horse use. Groups of weeks were used as the basic time unit for sample selection. Usually, the sample selection formulas yielded about 40 clusters, each with a planned-for average size of about 12 people.

There were some exceptions to this procedure. In the Bob Marshall and Great Bear Wildernesses, because of high horse use, all contacts were made in person in the field. The first-stage sampling produced such small samples--122 in the Bob Marshall and 79 in the Great Bear--that subsampling was abandoned and everyone contacted was sampled. This means the samples for these areas tend to overrepresent visitors who entered at what were estimated to be more heavily used entries. In the Desolation Wilderness, a simple random sample was drawn from permits. After a random start, every 13th permit was sampled.

Because of differences between estimated use and actual use and chance variations, sample sizes varied from the sample-design goal of 480 to varying degrees (table 2).

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[3]Variation between actual use for a sample time period compared to the estimated use introduces some unavoidable variations in cluster size, of course.

Analysis

The analysis consists basically of cross tabulations of variables and comparisons for selected variables. For example, method of travel for day-users is compared with that for visitors who stay longer than 1 day. Comparisons between areas and within areas are based primarily on classification of visitors in terms of day-use or overnight visits, method of travel used, and summer or fall use. Correlation analysis was used for a few relationships, especially for satisfaction and aspects of the trip experience. The results will be interpreted in terms of management implications.

Statistical error terms have been calculated for selected important comparisons to indicate statistical significance or confidence levels for differences. Because of the difficulty of calculating error terms for complex, clustered samples this was not done for all comparisons. Nonparametric statistical tests such as chi-square generally have not been presented. With the large sample sizes, even small differences--too small to have substantive importance--are statistically significant, so there is nothing to be gained by such tests, especially in the absence of formal hypotheses to test.

USE--THE TRIP EXPERIENCE

Types of Use

Types of use, locational aspects of use, and expenses associated with use will be presented. This discussion will be followed by a brief summary of the importance of the day user.

LENGTH OF STAY

The typical visit is short (table 4). In about half of the areas, persons making 1-day visits are in the majority. Long trips are rare. In only two areas, the Bob Marshall and the Great Bear Wildernesses are more than 10 percent of the trips over 1 week in length. In about half of the areas, none of the sampled trips exceeded 1 week in length. The data for the Desolation Wilderness understate day-use because of low permit compliance by 1-day visitors, but they show the relative frequencies of longer trips. Other field data, collected in 1974, indicate about 40 percent of the visits to the Desolation Wilderness are for only 1 day and the average length of stay is about 2.3 days.

The estimates of average length of stay are statistically precise. The standard errors of the means are relatively small, ranging from 4 to 11 percent of the means for all areas.

Length of stay is related to area size. Large areas tend to have longer stays and small areas, shorter stays. If the study areas are ranked by size, they come close to being ranked by length of stay with only two important exceptions: the Desolation Wilderness where the average length-of-stay estimate is known to be too high, and the Selway-Bitterroot Wilderness. The Selway-Bitterroot is the largest of the nine areas, but with substantially shorter average visits than the Bob Marshall and Great Bear Wildernesses. Some accessible Selway-Bitterroot fringe areas are heavily used by people making short trips. These fringe areas have a number of attractive high lakes and are used much like the smaller areas, but, of course, they are a part of the total large Wilderness. (This mixture of long and short visits is the probable cause of the higher proportionate standard error.)

Table 4.--*Length of stay,*[1] *averages and frequencies, by area*

Area	Average stay	s.e.[2]	Percent of total for each length of stay (days)									
			1	2	3	4	5	6	7	8-10	11-21	22+
Desolation Wilderness	3.3	0.15	17	18	24	15	7	5	4	4	5	0
Selway-Bitterroot Wilderness	2.9	.31	48	13	12	6	4	3	7	6	3	0
Bob Marshall Wilderness	5.7	.41	14	10	13	11	3	7	0	20	15	0
Cabinet Mountains Wilderness	1.6	.14	67	17	8	5	1	1	0	0	0	0
Scapegoat Wilderness	2.9	.18	41	21	16	5	2	2	3	7	3	0
Mission Mountains Wilderness	1.7	.12	62	20	8	8	0	1	1	0	0	0
Spanish Peaks Primitive Area	1.9	.11	63	8	14	8	1	2	1	0	0	0
Great Bear Wilderness	4.9	.37	25	3	10	18	8	1	5	27	4	0
Jewel Basin Hiking Area	1.3	.06	80	12	6	1	1	0	1	0	0	0

[1]Lengths of stay are expressed in calendar days; for example, a visit from Monday through Wednesday is 3 days long.

[2]Standard error of the mean. There is approximately a 67 percent probability the true mean is within plus or minus one standard error of the estimated mean. For example, in the Desolation Wilderness there are about two chances out of three that the average length of stay is between 3.15 and 3.45 days. There is a 95 percent probability that the true mean is within plus or minus two standard errors of the mean.

Visits by people traveling with horses were longer than those by hikers, with an overall average for all areas (weighted to reflect different sampling rates) of 3.8 days for horse users and 2.2 days for hikers.

Visits averaged longer in the fall than in the summer, 3.0 days compared to 2.5 days, but average length of stay for individual areas varied widely. In most areas, summer trips averaged longer than fall visits (Desolation, Bob Marshall, Scapegoat, Mission Mountains Wildernesses, Spanish Peaks Primitive Area, and Jewel Basin Hiking Area). The areas with longer summer visits were offset by much longer fall visits in the Selway-Bitterroot and Great Bear Wildernesses.

Two management implications seem to emerge from these facts. First, limits on lengths of stay in wilderness appear unwarranted. There are so few long trips most places that eliminating them would produce no significant reduction in total use and it would end any possibility of an occasional extensive trip. Even the knowledge that such an adventure is possible may add to the satisfaction of some wilderness visitors. Longer trips often penetrate to little used portions of a wilderness and so proportionally have less impact on overuse and congestion problems. (A limit on how long a party can camp at one spot is another matter, and such a limit is probably desirable. Data on camping behavior will be presented later.)

Second, the abundance of short trips and of 1-day trips in particular implies, I think, a need for more opportunities for hiking, especially, outside of wilderness. There is also a need for other trail-based recreation opportunities outside wilderness, such as horseback riding. Much of this sort of experience could be provided elsewhere, at high levels of quality and visitor satisfaction. Attraction of large numbers of visitors to other areas could have a substantial impact on total wilderness use and congestion in the more accessible day-use and short-trip zones.

The idea which has sometimes been expressed that wildernesses can only be visited by people with large amounts of free time because visits are necessarily long is not supported. This fact has implications for availability of wilderness recreation opportunities that relate to classification decisions.

PARTY SIZE

Most parties are small (table 5). The average party size for the study areas ranges from 3.8 to 5.6 people. Only one area, the Scapegoat Wilderness, had over 10 percent of the parties with more than 10 people in them. A majority of the parties in every area contained fewer than five people. Lone individuals are scarce. In most areas, two-person groups are most common. In the Great Bear, however, four was the most common number and in the Bob Marshall, six.

Again, the standard errors are small relative to the mean, indicating relatively precise data. The largest standard error (14 percent of the mean) is for the Jewel Basin estimate. There one party, a church youth group, made up of 120 members was sampled, inflating the standard error.

These party sizes imply that many small potential campsites are usable by most parties. The prevalence of small parties may also suggest the reason why occasional large parties seem out of place to many visitors (Stankey 1973). Party size limits in the ranges usually considered would affect only a small proportion of groups and only a slightly larger proportion of the visitors.

Table 5.--*Party size by area*

Area	Average size	s.e.[1]	Percent of total[2] parties of indicated size							
			1	2	3	4	5-10	11-20	21-30	30+
Desolation Wilderness	3.8	0.01	10	33	13	20	18	4	0	0
Selway-Bitterroot Wilderness	4.5	.38	5	26	16	23	22	4	1	1
Bob Marshall Wilderness	4.7	.51	6	21	15	13	42	0	2	0
Cabinet Mountains Wilderness	4.0	.35	5	35	17	17	17	2	2	0
Scapegoat Wilderness	5.6	.67	6	27	18	15	20	9	3	2
Mission Mountains Wilderness	4.5	.19	5	29	15	12	31	4	0	1
Spanish Peaks Primitive Area	4.8	.07	8	25	16	15	27	5	1	0
Great Bear Wilderness	5.2	.57	0	21	14	28	26	7	0	0
Jewel Basin Hiking Area	5.4	.77	3	31	16	19	21	4	1	1

[1]Standard error of the mean.

[2]Party size information was missing from a few questionnaires. Here and in other tables, missing data are omitted so percents do not always add up to 100.

METHOD OF TRAVEL

Except for the Bob Marshall Wilderness, hiking is the most common travel method in all areas. A large majority of visitors in all areas, except the Bob Marshall and the Great Bear, walk (table 6). In the Desolation and Mission Mountains, although horses are permitted, virtually all visits are on foot. In most areas, the proportion of groups hiking is even higher than for individuals because hikers typically are in smaller groups. For example, in the Bob Marshall Wilderness 31 percent of the visits are by hikers, but 43 percent of the groups are hikers.

The statistical precision of the estimates is fairly high, as indicated by the small standard errors. Only the Bob Marshall, where the sample was one of the smallest and travel methods were diverse, had fairly large error terms. The error terms in table 6 are approximate indicators of the precision of most other tables, for example, of visitor characteristics and attitudes, where a variety of answers are possible.

Table 6.--*Method of travel,*[1] *by area*

Area	Percent of total individual visits						
	Hike	s.e.[2]	Horseback	s.e.	Hike with pack stock	s.e.	Other
Desolation Wilderness	99	0.6	0.3	0.3	0.7	0.5	0
Selway-Bitterroot Wilderness	70	4.6	20	3.7	6	1.3	5
Bob Marshall Wilderness	31	8.5	59	7.1	6	4.7	4
Cabinet Mountains Wilderness	90	3.0	7	1.8	2	1.6	1
Scapegoat Wilderness	69	2.8	18	3.8	12	3.9	1
Mission Mountains Wilderness	97	1.7	2	1.0	1	0.5	0
Spanish Peaks Primitive Area	72	2.6	20	6.2	7	2.5	1
Great Bear Wilderness	46	5.0	42	5.4	0	--	13
Jewel Basin Hiking Area[3]	91	6.4	4	1.1	0	--	5

[1]Primary method of travel--some parties (about 9 percent) used more than one method.

[2]Standard error of the mean.

[3]Prior to July 2, 1970, the year the survey was conducted in the Jewel Basin, horses and motorcycles were permitted. From July 2 on, only hiking was allowed. "Other" for the Jewel Basin consists entirely of motorcycles.

The "other" category includes motorcycles. Motorcycle use was legal at the time of study in the Great Bear and in part of the Scapegoat, both of which were then unclassified. Motorcycles were also legal in the Jewel Basin Hiking Area part of the season and in part of the Spanish Peaks area (outside of the existing Primitive Area but inside the present proposed Wilderness and within the study area). "Other" also includes boats and rafts on some large rivers (the South Fork of the Flathead in the Bob Marshall, the Middle Fork of the Flathead in the Great Bear, and the Selway in the Selway-Bitterroot) and airplanes in the Great Bear and Selway-Bitterroot. "Airplane" is listed as the primary means of travel only if the people remained in the airfield vicinity. Most air travelers stayed near the airfield in the Selway-Bitterroot, but fewer did in the Great Bear.

The potential for horse-hiker conflict exists everywhere there is significant horse use, because there are no areas where the proportion of hikers is not substantial. It seems likely that the proportion of visitors using horses is lower now than in earlier years, but data over time do not exist; so we cannot determine trends.

Method of travel is a basic variable with implications for resource impacts (Weaver and Dale 1978), trail design, campsite requirements, road-end facilities, and user conflicts. Method of travel is also a useful breakdown for examining visitor attitudes, activities, and characteristics.

OUTFITTER USE

Outfitter use was common only in the two horse-travel areas. In both the Bob Marshall and Great Bear Wildernesses about 35 percent of the visits were by people using outfitters or guides. All were traveling with horses. In all the other areas, the percent of visitors using outfitters was 8 percent or less. Only in the Spanish Peaks Primitive Area and Scapegoat and Selway-Bitterroot Wildernesses does the proportion exceed even 1 percent.

Outfitter use is much more important in the fall, during hunting season, than in the summer. For example, in the Selway-Bitterroot, the percent of visits served by outfitters rose from 4 percent in the summer to 23 percent in the fall. In the Bob Marshall, the proportion rose from 29 to 47 percent.

The idea sometimes expressed that only those who can afford outfitters can visit wilderness is false; most visitors do not use outfitters. It also follows that use management cannot concentrate just on outfitters; private parties must be reached by management efforts. Close to half of the visitors to the Bob Marshall Wilderness using horses were not with outfitters. (In contrast, only about 15 to 20 percent of the horse travelers in the Great Bear Wilderness were not with outfitters.)

ACTIVITIES

Wilderness trips are not usually single-purpose visits; most individuals participate in two or three activities (table 7). Hiking was the activity most often checked on the questionnaire in all but the two horse-use areas. (Some foot travelers did not check hiking, usually because they were making short, day trips, generally without a pack, and apparently considered these to be "walks" rather than "hikes.") Fishing and photography were the next most common activities everywhere, with the minor exception of the Desolation Wilderness area where "nature study" (such as bird watching, plant identification, and amateur geology) pushed fishing into third place. Swimming was also much more common in the Desolation Wilderness than elsewhere.

Once again, the standard errors are relatively small, in fact, uniformly small. This, together with the previously presented error terms, suggests generally good statistical precision overall; no other error terms will be presented.

Table 7.--*Activities participated in, by area*

Area	Percent of total visits involving activity									Average number of Activities
	Fish	s.e.[1]	Hunt	Hike	Photog-raphy	Nature study	Mountain Climb	Swim	Other[2]	
Desolation Wilderness	48	2.9	1	94	54	52	4	46	11	3.1
Selway-Bitterroot Wilderness	43	3.7	16	75	58	35	2	17	7	2.7
Bob Marshall Wilderness	61	4.6	34	58	58	28	0	11	18	2.7
Cabinet Mountains Wilderness	61	4.1	6	81	45	25	2	15	19	2.5
Scapegoat Wilderness	62	5.4	11	74	53	27	2	20	14	2.6
Mission Mountains Wilderness	74	4.2	2	79	56	31	2	18	8	2.7
Spanish Peaks Primitive Area	41	2.8	16	70	53	29	4	9	7	2.3
Great Bear Wilderness	62	8.5	43	54	53	15	0	4	16	2.5
Jewel Basin Hiking Area	50	5.4	9	76	53	37	0	4	14	2.5

[1]The standard error of the mean was calculated only for fishing to provide an indication of precision levels for these and similar data.

[2]"Other" was usually "ride horses," except in the Selway-Bitterroot and Desolation Wildernesses where "horseback riding" appeared on the list of activities to be checked. In the Selway-Bitterroot, 19 percent checked "horseback riding," and in the Desolation, 2 percent did.

Activities appear to follow three general patterns in the nine areas. The Desolation represents one pattern: hunting is low; hiking, swimming, and nature study are high; and other activities are about average. The Bob Marshall and Great Bear Wildernesses represent a different pattern: hunting is high, hiking is low. Other area patterns are intermediate; the pattern in the Mission Mountains Wilderness resembles that of the Desolation somewhat, hunting is low, and the pattern of the Spanish Peaks Primitive Area tends toward that of the Bob Marshall and the Great Bear.

Hunting is less common than might have been expected. Even during fall hunting seasons, there are many visitors who are not hunting--about 30 percent in the Selway-Bitterroot and over 80 percent in the Mission Mountains, for example. In some other areas, however, almost all fall visitors hunt; for example, about 90 percent of fall visitors to the Bob Marshall hunt. Wilderness does provide the setting for high quality hunting experiences, and offers the main remaining opportunity for an adventure involving travel by pack trains and isolated tent camp living. Important as this use is, however, it is not predominant in any of the study areas. Management cannot become so preoccupied with hunting use that other more common types of use are neglected.

Seasonal use patterns are clear and simple; hunting is almost entirely a fall activity, whereas all but one of the other activities are more common in the summer--fishing, hiking, photography, nature study, and swimming. Mountain climbing is uncommon, and although most of it occurs in the summer, a higher proportion of fall visitors report climbing mountains in about half of the areas. The average number of activities listed by summer visitors ranged from 2.5 to 3.0 at the nine areas and exceeded the average number of fall activities, which ranged from 1.6 to 2.6 in the areas.

Method of travel is associated with different patterns of activity. Hikers do more nature study and swimming than visitors using horses, and horsemen are much more involved in hunting. Photography was a little more common for horseback travelers. Fishing and other activities were not related to travel method. The average number of activities was about the same for hikers and horse users.

Day-users differed sharply from overnight camping visitors in activities. Day-users did less of almost everything. Only hunting (surprisingly) and nature study were done by about the same proportion of day-users and campers. Campers engaged in a larger number of activities, averaging 2.4 to 3.4 per area, compared with 2.1 to 2.5 for day-users.

FIRE USE

Almost all people who stay overnight build wood fires (table 8). Many, however, used gas-fueled camp stoves for cooking and the wood fires for warmth and as a center for conversation and sociability. The proportion using gas camp stoves varies from about 10 percent in the Cabinet Mountains to about half of all campers in the Desolation Wilderness. In both the Scapegoat and Great Bear Wilderness Areas, the proportion of visitors using gas camp stoves is about 15 percent. In all other areas, about one-fourth to one-third of the visitors use stoves.

Two implications can be drawn from this. First, should managers need to prohibit wood fires in some areas, a substantial proportion of visitors already have camp stoves and are familiar with their use. Second, wood fires are very appealing to all visitors who camp overnight, even those who do not need a cooking fire. Doing without wood fires runs counter to almost universal camper behavior. Certainly in places where wood is scarce,and as part of wilderness visitor contact and education programs everywhere, visitors could be encouraged to cook on camp stoves; could be educated about the impact fuel gathering can have on the ecosystem and esthetics, on picturesque silver snags, for example; and could be requested to use only down, dead wood and to use as little wood as possible, while still having a few flames to watch while visiting in the evening.

Table 8.--*Use of wood fires and gas camp stoves, by area, for all visitors and for those who remained overnight*

Area	Percent of total individuals (and overnighters)			
	No fire or stove	Wood fire only	Gas stove only	Both wood and stove
Desolation Wilderness	21 (4)	39 (48)	7 (9)	32 (39)
Selway-Bitterroot Wilderness	51 (6)	35 (68)	2 (4)	12 (22)
Bob Marshall Wilderness	16 (3)	65 (75)	3 (4)	16 (18)
Cabinet Mountains Wilderness	67 (0)	29 (90)	* (1)	3 (10)
Scapegoat Wilderness	46 (4)	48 (83)	2 (3)	6 (10)
Mission Mountains Wilderness	64 (3)	29 (77)	1 (1)	7 (19)
Spanish Peaks Primitive Area	63 (1)	22 (61)	1 (3)	13 (35)
Great Bear Wilderness	25 (5)	42 (56)	4 (5)	25 (34)
Jewel Basin Hiking Area	82 (0)	16 (85)	0 (0)	3 (15)

*Less than 0.5 percent.

WILDLIFE OBSERVATION AND HUNTING ACTIVITY

Wild animals are an important part of wilderness ecosystems and are an attraction for wilderness visitors. Wildlife sightings contribute to the enjoyment of many visits, whether hunting is involved or not. Sightings may also involve unintentional harassment of animals (Ream 1980). A majority of visitors reported seeing at least one of nine animal species listed on the questionnaire (table 9). The species chosen include large mammals, coyotes, and bald eagles. Most of the animals exist in all of the areas. The Selway-Bitterroot Wilderness and the Spanish Peaks Primitive Area are generally believed to lack grizzlies.[4] Of the listed animals, Desolation has only black bears, deer, coyotes, and bald eagles.

Visitors to the Great Bear reported the largest number of wildlife observations, partly because of the long stays in that Wilderness (table 4). Observation of wildlife is also high in the Bob Marshall, which is adjacent to the Great Bear. The Mission Mountains and Desolation Wildernesses and the Spanish Peaks Primitive Area had a low number of observations. Deer are the most commonly seen wildlife most places. Only the Great Bear is an exception. There moose were reported most often. Overall, opportunities to see wild animals in natural surroundings are good in these areas.

[4]Some people believe there are a few grizzlies in the Selway-Bitterroot, but visitors have essentially no opportunities to sight the big bears there. Grizzlies from the Yellowstone Park region could occasionally wander into the Spanish Peaks Primitive Area, also.

Table 9.--*Summer wildlife observation, by area*

Area	Percent of total visitors											
	Saw wild-life	Average number of species seen	Grizzly bears seen	Black bears seen	Bear, species unknown	Elk seen	Deer Seen	Moun-tain goat seen	Bighorn sheep seen	Moose seen	Coyote seen	Bald eagle seen
Desolation Wilderness	68	0.8	-[1]	1	-	-	31	-	-	-	4	3
Selway-Bitterroot Wilderness	58	1.1	-	11	2	11	21	7	1	14	3	4
Bob Marshall Wilderness	81	1.8	0	16	4	35	70	12	8	0	14	0
Cabinet Mountains Wilderness	54	.8	2	16	2	2	21	6	0	4	5	4
Scapegoat Wilderness	72	1.3	0	5	1	11	56	10	3	1	6	8
Mission Mountains Wilderness	38	.6	1	3	1	2	17	6	0	0	1	4
Spanish Peaks Primitive Area	44	.7	-	4	1	5	18	7	1	13	2	5
Great Bear Wilderness	82	2.0	0	25	5	32	50	9	2	66	7	7
Jewel Basin Hiking Area	53	.8	1	1	1	3	22	14	0	0	1	9

[1]Dash (-) indicates the animal is not found in the area.

In the fall, hunters are common in most areas (table 10, column 1). Elk were the main wilderness game sought; about 70 percent of the hunters sampled were hunting elk and about one-third, deer. Bighorn sheep were the next most common wilderness game animal sought, especially in the Spanish Peaks, where sheep hunting permits are not restricted in number as they are in all of the other study areas in which sheep are hunted. Grouse, bear, mountain goats, and moose follow, in that order, for the overall sample.

Wilderness hunting may be a great adventure, but it is not particularly productive. In only two areas did over 10 percent of the elk hunters succeed in taking an animal (table 10). The Great Bear had the highest elk harvest rate--41 percent of sampled elk hunters were successful--but it also was the area where hunters spent the most days hunting. About one-fourth of the Bob Marshall elk hunters got an elk. Many more elk hunters (about 25 to 75 percent in all areas except the Mission Mountains Wilderness) said they saw elk, but many took no shots. At the time of the study, either-sex hunting of deer and elk was legal. Most of those who had a chance for a shot got their animal. Deer hunting was a little more productive in most areas. Again, deer hunters saw far more animals than they tried to shoot.

Less commonly hunted species are not included in table 10. Grouse hunters had the best luck; two-thirds got birds. About one-third of the small sample of goat hunters was successful in taking a goat and one-fourth of the sheep hunters took home an animal. None of the limited number of bear hunters (19 in the total sample) got a bear, and all seven of the sampled moose hunters came back empty-handed. About half of the hunters hunted only one species, one-third hunted two species, and about 10 percent hunted three or four species.

The picture that emerges from these data of the difficulty of wilderness hunting, the hunters' selectivity in taking shots, and their apparently good markmanship diverges from some common, negative stereotypes of hunters.

Hunters in the large Wildernesses (Bob Marshall, Selway-Bitterroot, and Great Bear), concentrate on wilderness hunting, and few hunt outside of the wilderness. This seems to suggest a lack of substitutes for this activity. Mountain goat, bighorn sheep, and bear hunters also concentrated their activities in wilderness. For deer, moose, and grouse hunters, and in the smaller areas, wilderness hunting appears to have more substitutes.

Table 10.--*Fall wildlife observation and hunting activity*

	Hunted	Average number days hunted[1]	Elk hunting				Deer hunting			
			Saw	Shot at	Har-vested	Hunted outside wilder-ness[2]	Saw	Shot at	Har-vested	Hunted outside wilder-ness[2]
	Percent[3]		*Percent*							
Desolation Wilderness	5	-[4]	-	-	-	-	-[4]	-	-	-
Selway-Bitterroot Wilderness	79	4.1	37	25	17	39	28	11	11	86
Bob Marshall Wilderness	91	5.8	46	36	25	29	40	40	40	100
Cabinet Mountains Wilderness	42	1.4	25	0	0	100	50	0	0	100
Scapegoat Wilderness	87	2.1	27	5	5	57	83	33	25	100
Mission Mountains Wilderness	21	1.6	0	0	0	100	100	50	0	100
Spanish Peaks Primitive Area	63	1.9	31	13	7	100	84	39	0	100
Great Bear Wilderness	86	7.1	74	44	41	7	80	27	13	67
Jewel Basin Hiking Area	47	1.1	23	8	8	85	57	29	29	100

[1]Number of days hunters hunted.

[2]Based on numbers of total hunters who hunted elk (or deer) outside of the wilderness divided by numbers who hunted that animal in wilderness (not necessarily the same individuals).

[3]Percent of fall visitors who hunted.

[4]There were only two sampled hunters in the Desolation Wilderness (deer hunters), too few to make tabulations meaningful.

TIMING OF USE

Summer is the main use season in all areas and by a large margin everywhere except in the Great Bear (table 11). This is when wilderness managers and ranger station personnel have the greatest opportunities for contacting the public. The summer and fall periods surveyed were each about 3 months long. June accounted for a small part of summer use most places and November had a small share of fall use. Some areas had little use even in October. The Great Bear, in particular, showed a sharp peak in use the first week of the hunting season, and, for a time, the need for public contact was well above the less concentrated summer use. This may have been true in some other areas but, perhaps because of timing, sampling failed to reveal brief, sharp peaks. Either July or August was the heaviest month of use everywhere. Most places, the other month had the second greatest use. In the Bob Marshall and Great Bear, October came next in use after July.

Most visitors enter the nine areas studied on weekends and holidays. In most areas, two-thirds to three-fourths of all visitors enter on Fridays, Saturdays, Sundays, and the two summer holidays, July 4 and Labor Day. This suggests that it would be desirable for wilderness rangers and personnel who supply information or issue permits to arrange work schedules so that they can be on the job weekends.

Use Distribution

Uneven geographical distribution of use is characteristic of all the study areas. Entry points vary greatly in number of visitors, trails range from those with heavy traffic to others with almost none, and campsites receive widely varying amounts of use.

ENTRY POINT USE

A few trailheads account for most visitors in every area (table 12), as has been the case in almost all other areas studied to date. Often over half of all visitors converge on one entry point, and just three trailheads account for over half of the use everywhere except the Selway-Bitterroot. All of the areas had access points with such light use that they were used by none of the sampled visitors, and others were used by very few people. In some of the areas, horse users tended to concentrate at entry points more than hikers, but hiker use of access points was more concentrated than rider use in about half of those areas with significant amounts of both types of use.

Table 11.--*Time of entry, by season, weekday or weekend, and month*

Area	Percent of total visitors[1]										
	Summer[2]	Fall	Weekday	Weekend[3] Holiday	June	July	August	September	October	November	Other[4]
Desolation Wilderness	87	13	46	54	15	29	32	18	2	0	4
Selway-Bitterroot Wilderness	80	20	39	61	2	41	25	19	10	3	-
Bob Marshall Wilderness	63	37	34	66	2	47	11	18	20	2	-
Cabinet Mountains Wilderness	89	11	27	73	7	35	40	14	4	0	-
Scapegoat Wilderness	89	11	27	73	10	44	30	5	2	0	-
Mission Mountains Wilderness	94	6	43	57	6	39	41	11	2	1	-
Spanish Peaks Primitive Area	79	21	42	58	10	33	28	13	13	2	-
Great Bear Wilderness	56	44	24	76	1	34	20	23	24	3	-
Jewel Basin Hiking Area	83	17	34	66	13	38	27	16	5	1	-

[1]Visitor groups in the Desolation Wilderness.

[2]Summer was defined as June through Labor Day. Fall was all other dates. (In the Desolation, about 4 percent of all groups came in May and are included with "Fall" here.)

[3]Weekends were defined as Friday, Saturday, and Sunday; weekdays were all other days.

[4]Use was sampled for a full 12-month period in the Desolation; all other areas were sampled from early June through November, only.

Table 12.--*Cumulative percent of total use accounted for by varying numbers of entry points, ranked from most to least used, by area*

Entry points, ranked by number of visitors	Desolation Wilderness	Selway-Bitterroot Wilderness	Bob Marshall Wilderness	Cabinet Mountains Wilderness	Scapegoat Wilderness	Mission Mountains Wilderness	Spanish Peaks Primitive Area	Great Bear Wilderness	Jewel Basin Hiking Area
1	24	11	45	26	68	52	36	85	59
2	41	18	62	45	78	70	72	92	86
3	57	24	75	63	85	81	82	100	95
4	73	30	83	73	91	91	90	100	99
5	83	35	89	81	95	97	94	100	99
6	87	40	93	87	100	99	97	100	100
7	91	45	95	94	100	99	99	100	100
8	94	50	97	97	100	100	100	100	100
9	96	54	98	99	100	100		100	100
10	98	57	100	100	100	100		100	
11	99	61	100		100	100		100	
12	100	64	100		100	100			
13	100	68	100						
14	100	71	100						
15	100	74	100						
16	100	76	100						
17	100	79							
18		82							
19		84							
20		86							
Total number of entry points	17	69	16	10	12	12	8	11	9

ROUTES OF TRAVEL AND TRAIL USE

The very uneven use of entry points results in uneven use of the trails reached from the entry points. However, the unevenness of trail use is further accentuated by variation in the distance visitors travel and variable use of alternate routes at trail junctions. Figures 12-18 portray the flow of use through each of the study areas (except the Bob Marshall and Great Bear, where the small samples and the departure from the sampling plan made use maps inaccurate). Every area has a few trail segments with heavy flows and many miles of trail with light or very light use. The most lightly used areas are not always the most remote.

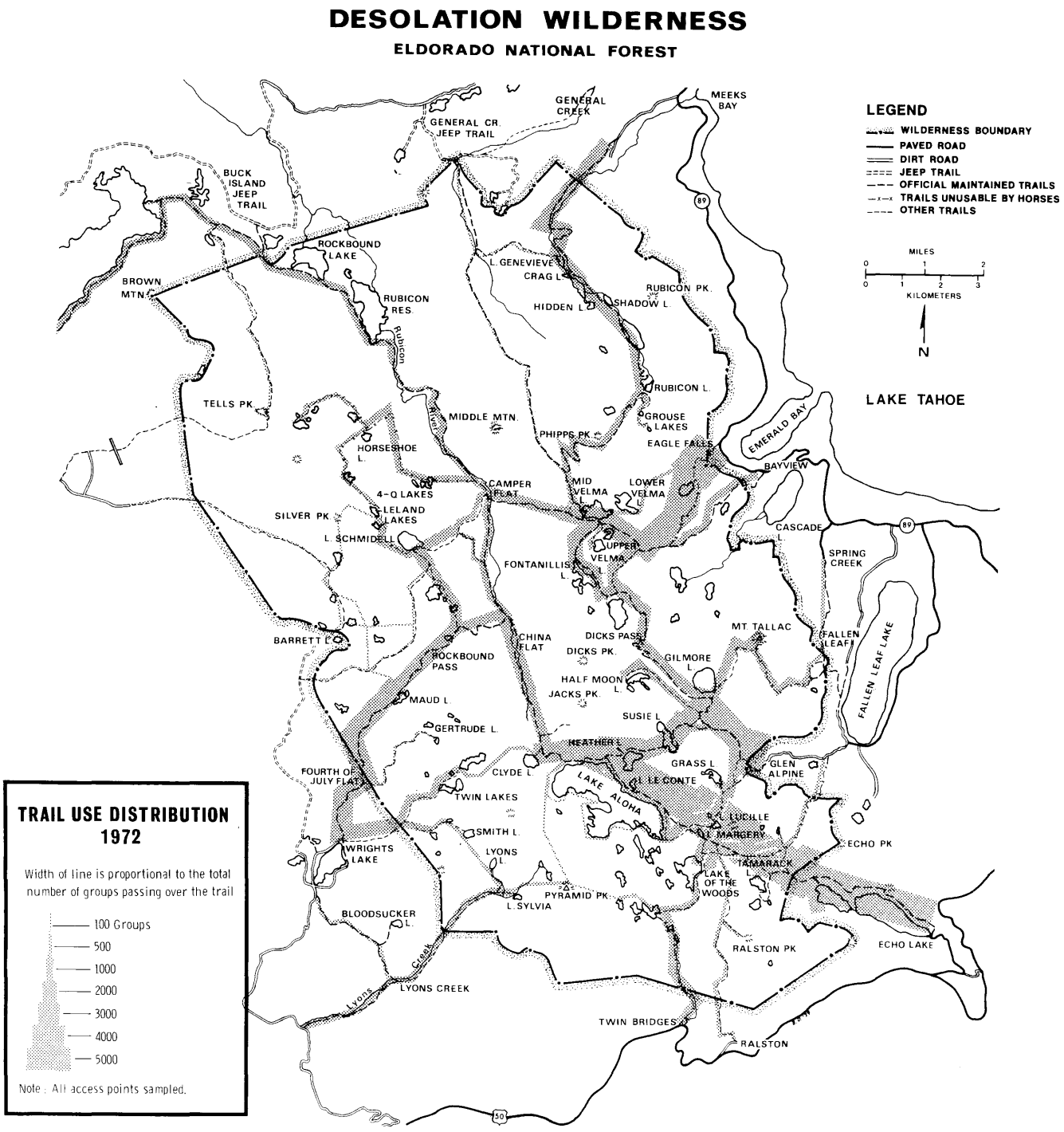

Figure 12.--The distribution of recreational use of the trail system in the Desolation Wilderness.

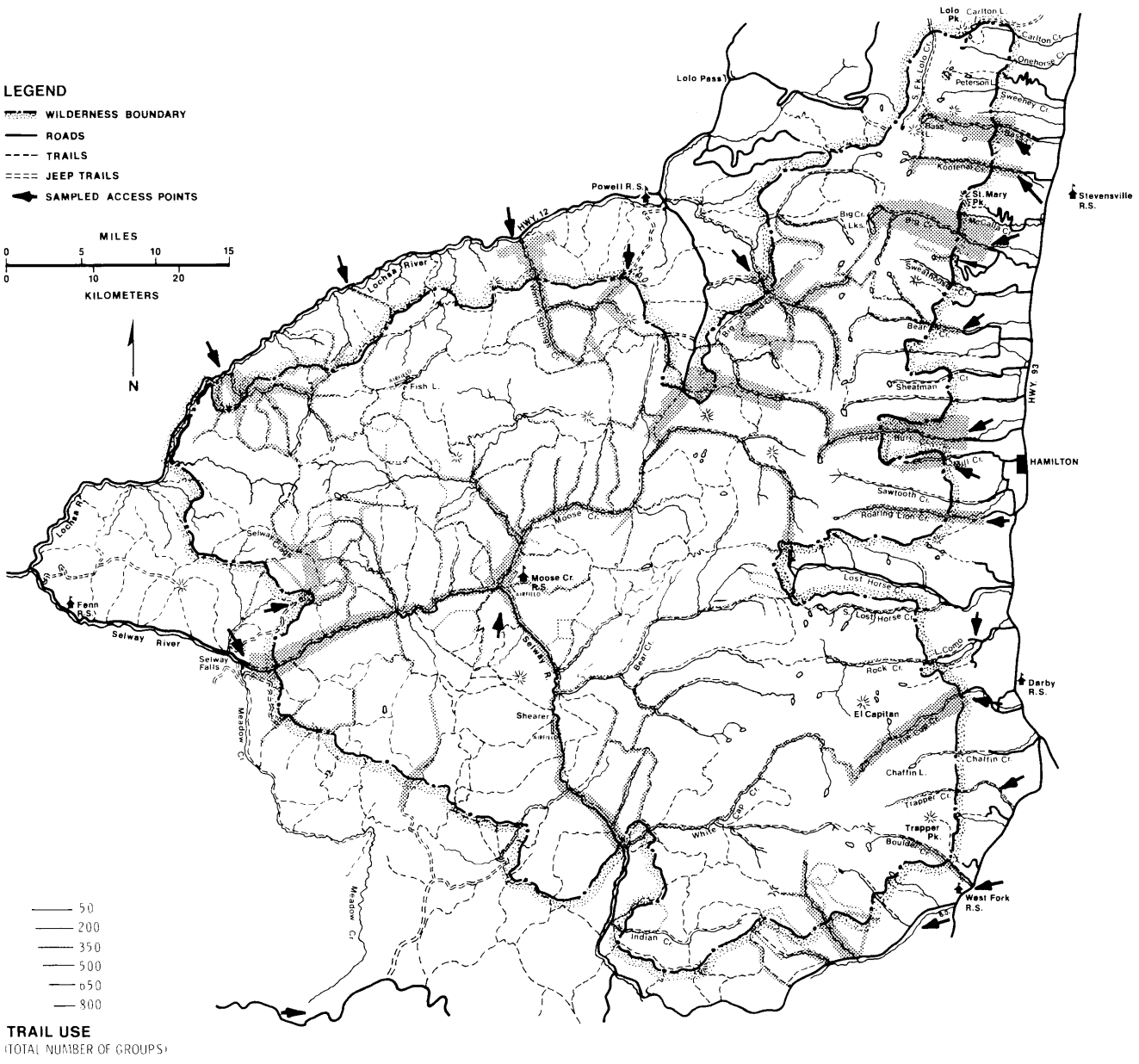

Figure 13.--The distribution of recreational use of the trail system in the Selway-Bitterroot Wilderness.

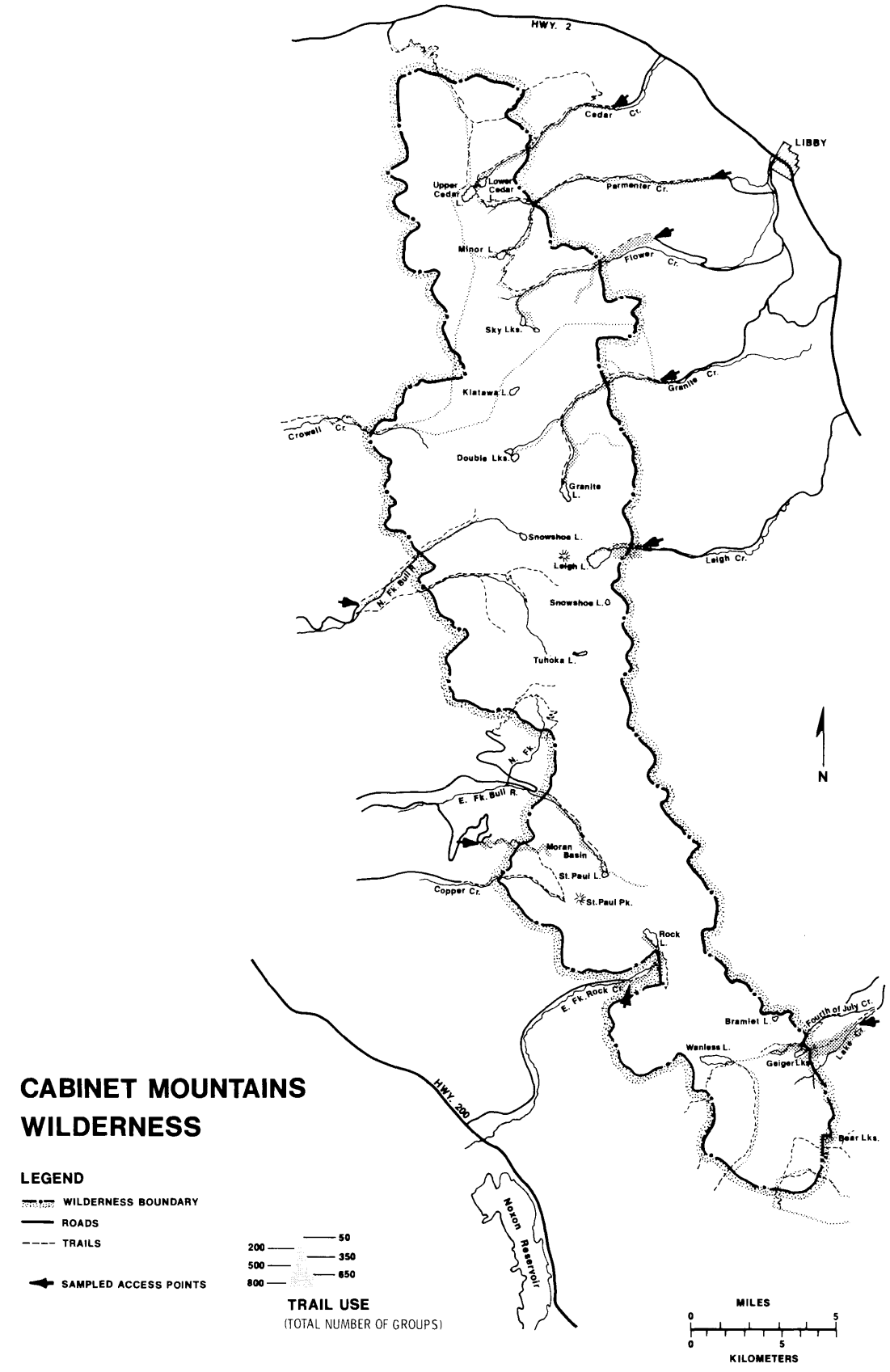

Figure 14.--The distribution of recreational use of the trail system in the Cabinet Mountains Wilderness.

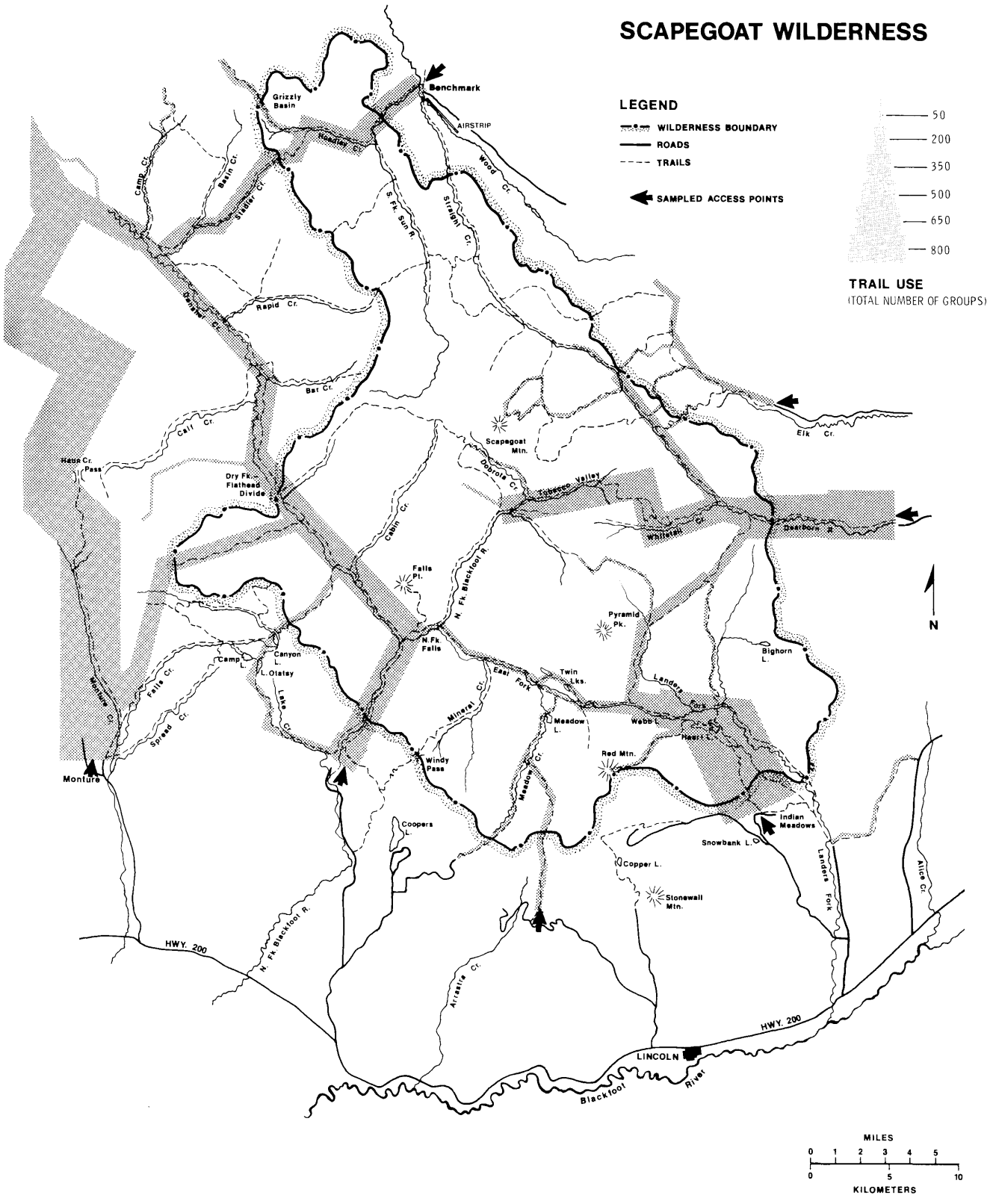

Figure 15.--The distribution of recreational use of the trail system in the Scapegoat Wilderness.

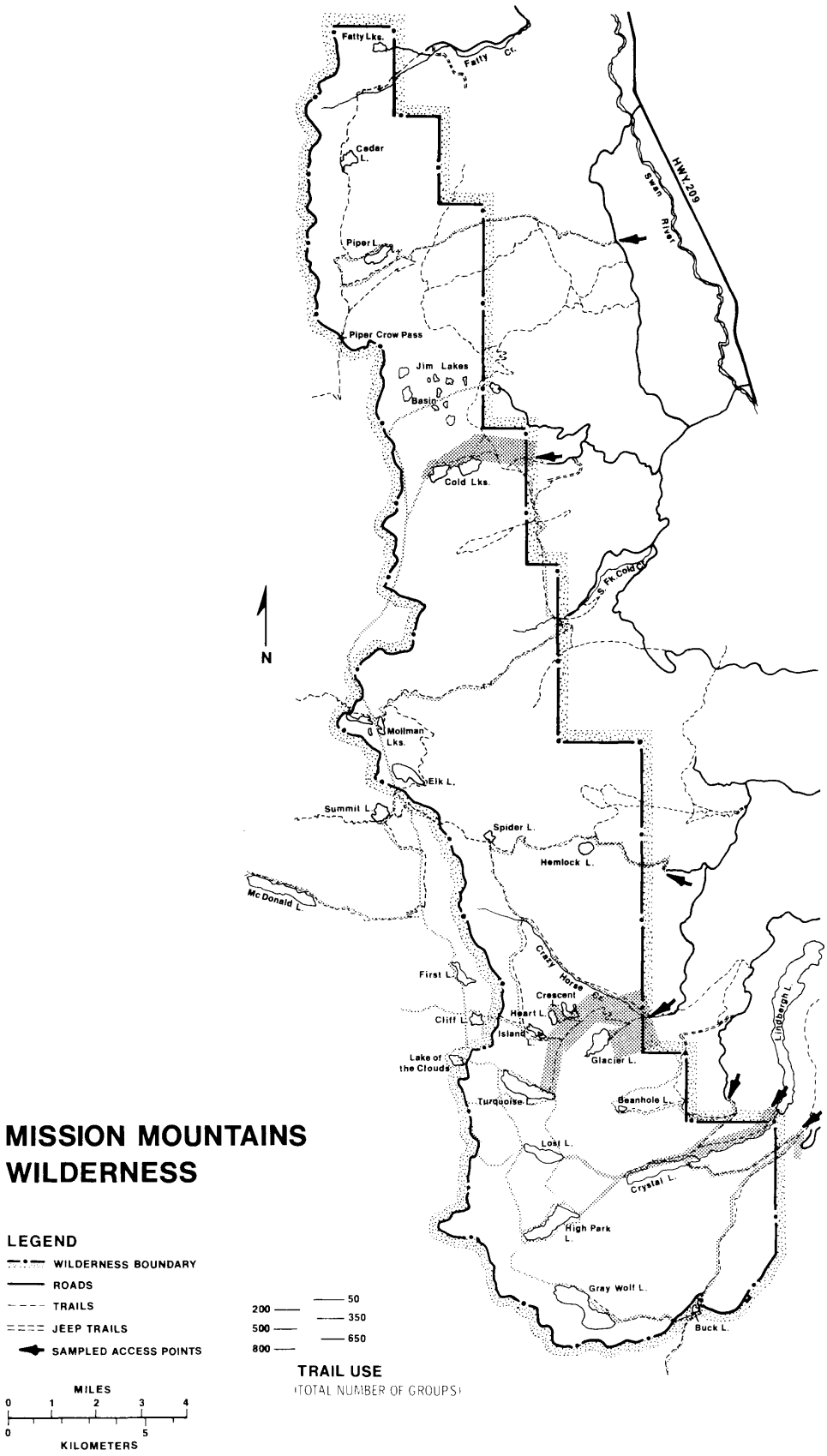

Figure 16.--The distribution of recreational use of the trail system in the Mission Mountains Wilderness.

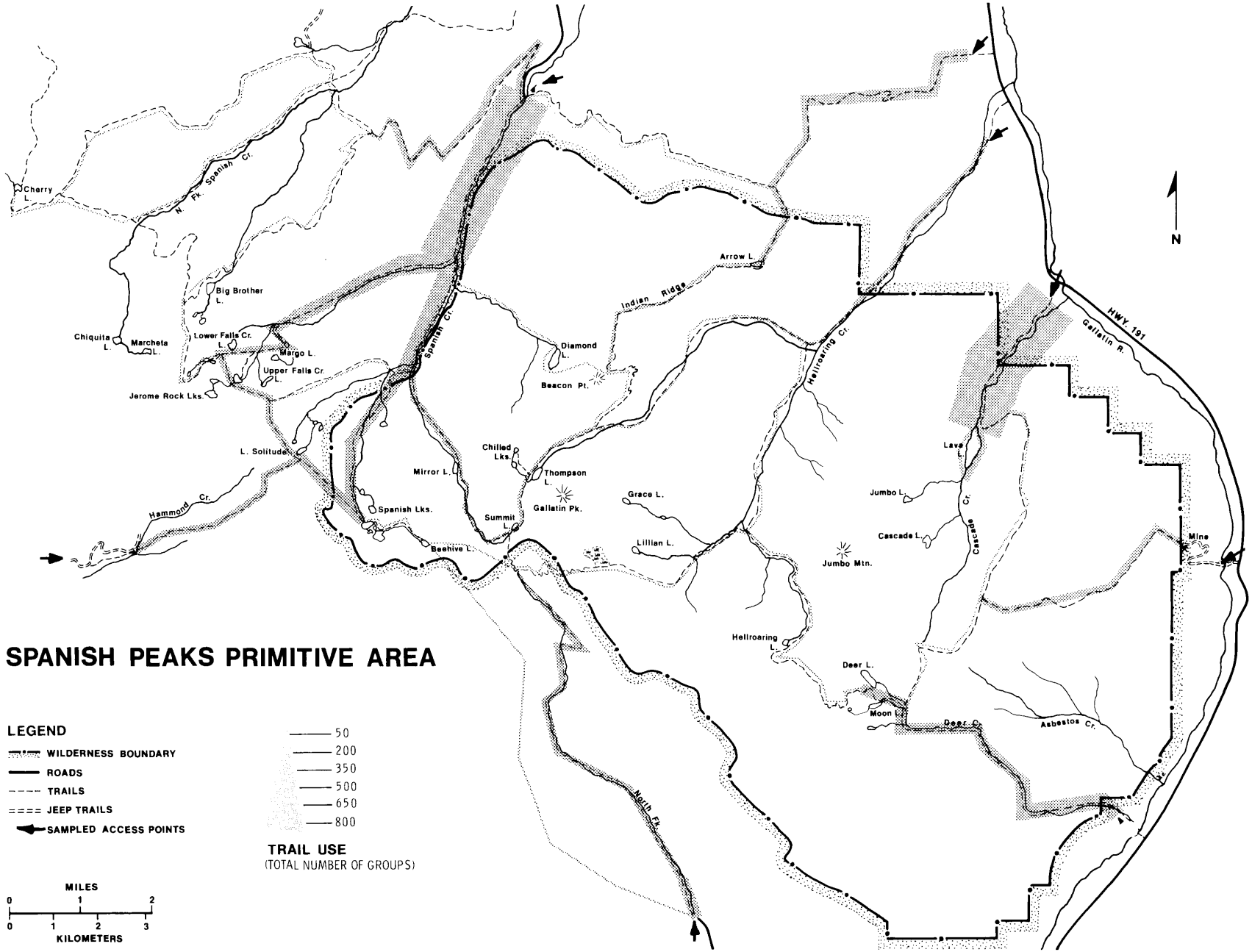

Figure 17.--The distribution of recreational use of the trail system in the Spanish Peaks Primitive Area.

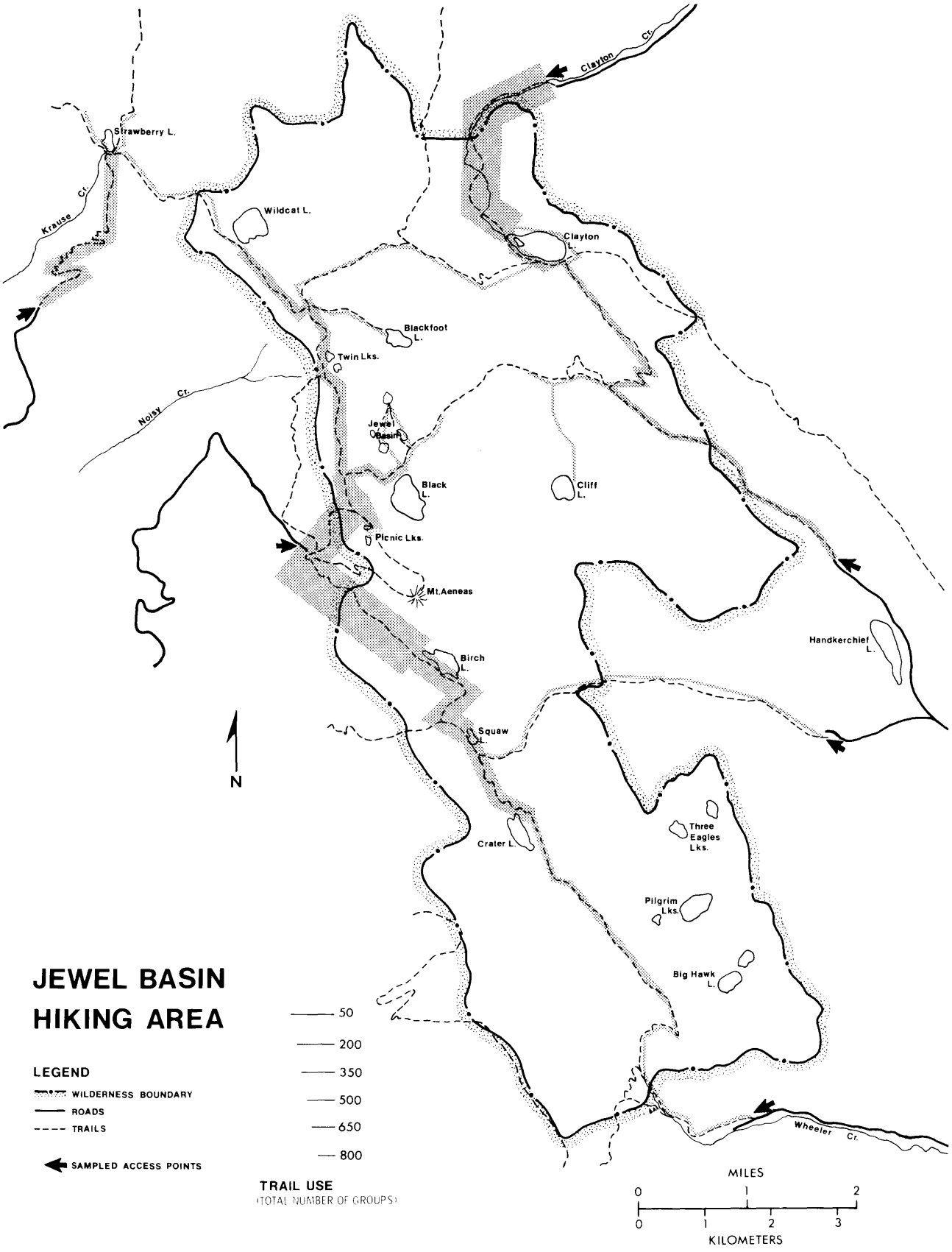

Figure 18.--The distribution of recreational use of the trail system in the Jewel Basin Hiking Area.

There appear to be general similarities in use distribution patterns from area to area, but variation in size, shape, and trail system make comparisons complicated. One way to enable comparison of different areas is to calculate a use concentration index number. The use concentration index number is determined by graphing use of the total trail system, starting with the most used trail segment, then taking the next most-used, and so on (Lucas 1974). As each segment is added, two things are determined for all the segments included: (1) what proportion of the total trail miles in the area have been included and (2) what proportion of trail visitor-miles of travel have been accounted for. For example, in the Spanish Peaks, the most-used 10 percent of the trail system accounts for slightly over half of all use in terms of visitor-miles of travel (fig. 19).

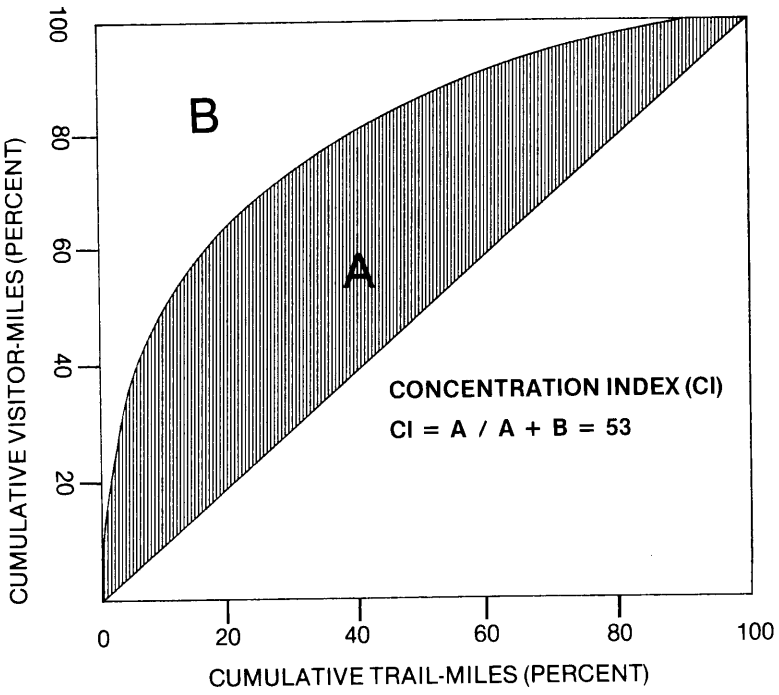

Figure 19.--Trail use concentration in the Spanish Peaks Primitive Area.

The more the curve on the graph rises above the 45° diagonal line, the more uneven and concentrated the use is. If every part of the trail system had the same use, the curve would be right on the diagonal, that is, 10 percent of the trail miles would account for 10 percent of the use, 50 percent of the trail miles would account for 50 percent of the use, and so on. A completely concentrated use pattern would consist of all use on one short trail segment and no use on the rest; this would produce a line on the graph headed almost straight up to 100 percent of total use and then extending to the right horizontally to 100 percent of the trail miles.

The concentration index is based on how great a proportion of the total area above the diagonal is enclosed by the curve representing use. The index can range from 0 (the perfectly even distribution with the curve on the diagonal and no area enclosed) to nearly 100, if one segment had all the area's use (fig. 19).

Trail use concentrations vary from 53 to 77 (table 13). The Bob Marshall appears to have even more concentrated use, although the need to depart from the sampling plan explained earlier makes this index low in reliability. The most even trail use is in the Spanish Peaks, although use there is still quite concentrated. Variation in trail use concentration does not appear to be related to area size or to intensity of use. Other factors, such as location of attractions in relation to the trail system, ease of road access to trailheads, and trailhead location relative to population centers, probably account for variations in trail use concentrations.

Table 13.--*Concentration indices for trail use, by area*

Area	Concentration index
Desolation Wilderness	60
Selway-Bitterroot Wilderness	67
Bob Marshall Wilderness	-[1]
Cabinet Mountains Wilderness	62
Scapegoat Wilderness	74
Mission Mountains Wilderness	77
Spanish Peaks Primitive Area	53
Great Bear Wilderness	-[1]
Jewel Basin Hiking Area	78

[1]The sample for these two areas was not geographically balanced, and the concentration indices for these areas are unreliable. At best, they might serve as only rough approximations. The trail use index value was calculated only for the Bob Marshall, and, at 85, was the highest concentration index.

Campsite use concentration can be expressed in the same way, based on the number of campsites and the use each received. Campsite concentration indices were calculated for the Desolation (51) and the Mission Mountains (56). Campsite use is less concentrated than trail traffic in these areas. This should not obscure the fact that use is still very uneven; for example, the most used 25 percent of the campsites in Desolation Wilderness account for over 60 percent of all use.

Most groups did not travel a great distance beyond the roads. Overall, about one-third of the trips, in and out, totaled 5 miles or less. About 60 percent were 10 miles or less, and only about 20 percent exceeded 20 miles round trip. There is great variation between areas, however (table 14). In three areas (the Cabinet, Mission Mountains, and Jewel Basin), about 60 percent of all trips were no more than 5 miles round trip and 90 percent or more were no more than 10 miles long. None of the sampled trips in these three areas exceeded 20 miles. At the other extreme, at least half of the trips in the Bob Marshall and Great Bear Wildernesses were over 20 miles in round trip length, and about 30 percent in the Selway-Bitterroot and Scapegoat were over 20 miles.

There is a strong association between length of trips and proportion of visitors riding horses. The correlation coefficient for proportion of trips over 20 miles long and proportion of horseback groups is 0.89. There is also an association between trip length and area size, with a correlation coefficient of 0.73 between size of study areas and proportion of trips over 20 miles long in each area.

Table 14.--*Total distance traveled beyond roads, by area*

Area	Distance, miles, round trips; percent of total groups[1]						
	5 or less	6-10	11-20	21-30	31-50	51 or more	Missing
Desolation Wilderness	10	38	37	11	3	1	10
Selway-Bitterroot Wilderness	20	19	33	17	8	3	10
Bob Marshall Wilderness	4	13	27	14	27	15	4
Cabinet Mountains Wilderness	58	32	12	0	0	0	8
Scapegoat Wilderness	1	31	39	12	11	6	7
Mission Mountains Wilderness	62	27	11	0	0	0	8
Spanish Peaks Primitive Area	32	25	30	4	1	0	8
Great Bear Wilderness	4	19	27	20	14	16	23
Jewel Basin Hiking Area	59	38	4	0	0	0	7

[1]Based on all groups that provided usable sketch maps of their routes. Percent missing is based on all groups that returned questionnaires.

In each case, one area is an exception to the general relationship and keeps the correlations from being even higher. In the association of trip length and horseback riding, the Desolation Wilderness has almost no horses, but fairly long trips. For size, the Selway-Bitterroot has relatively many short trips, despite its great size.

In many areas, the abundance of short trips means that management must contend with concentrated use on portions of trails close to trailheads and to more accessible attractions. Solitude often is rare the first few miles of trails and pressures on soil, vegetation, and wildlife are high. Overall restrictions on use in response to crowded peripheral conditions may excessively reduce use deeper in an area. Fortunately, carrying capacity research indicates most visitors expect and tolerate more encounters with other parties in the periphery (Stankey 1973).

The large number of short hikes also suggests there may be a need to provide hikers more trails, or more attractive trails, outside of wilderness, or to make them more aware of hiking opportunities in other locations. It is apparent that the Jewel Basin Hiking Area is an attractive alternative to several nearby wildernesses, as it is well-used for these short hikes.

In every area, almost all visitors at trailheads crossed the official boundary and entered the wilderness or other unit. From 86 to 99 percent of the sampled groups entered the established area.

This implies that the data reported in this paper do represent actual wilderness users. It also implies that trailhead locations for trail registers usually provide data primarily reflecting wilderness use, despite the large number of short trips.

Off-trail travel is uncommon everywhere except in the Desolation Wilderness. In the other eight areas, only 10 to 20 percent of the sampled groups showed any off-trail travel on their sketch maps and part of that shown was due to some people drawing routes rather sketchily. In the Desolation, almost half of the groups showed cross-country travel, which is much easier in the more open, gentle setting there (fig. 2). Desolation visitors may also be trying to avoid crowded areas in that intensely used wilderness. Everywhere, however, the distance covered off-trail was small. About half of the parties who got off the trails covered only 1 or 2 miles.

Trail systems control use patterns strongly. This implies that management of the trail system can be a powerful tool. Both the impacts of visitors on resources and much of the visitors' experience (for example, their viewing experience) can be determined by trail location and design.

Campsite use patterns do not conform to the image of a lengthy trip, which involves moving to a new camp about every night. Long trips are uncommon. In most areas, most visitor groups do not camp at all and a large majority of those who do camp use only one campsite. In most of the study areas, three-fourths or more of the campers used only one site; the Desolation Wilderness is the main exception. There, about 45 percent of the campers used one site; over 30 percent used two; and 25 percent used three or more. Again, this may be a response to much more intensive use there than in any of the other study areas. The two largest areas, the Selway-Bitterroot and Bob Marshall, also had more visitors using multiple campsites. In each, slightly more than one-third of the campers used more than one site. Parties using more than four campsites on a visit were rare everywhere; in most areas, none were sampled.

Expenses

Wilderness visits are sometimes thought to be expensive and beyond the means of many people. Therefore, sampled visitors were asked about their individual share of travel expenses and all other trip expenses (food, equipment purchased since the last trip, licenses, outfitters' fees, and so on).

TRAVEL EXPENSES

Most visitors spent relatively little on travel (table 15). This is a reflection of the fact that most visitors live fairly close to the wilderness they visit. Only in the three large areas (Selway-Bitterroot, Bob Marshall, and Great Bear) did over half of the visitors spend more than $10 on travel. The Great Bear stands out as by far the most expensive area for travel because many visitors took advantage of airplane access.

Horseback travelers usually incurred substantially higher travel expenses than hikers. For example, for the Bob Marshall Wilderness, 57 percent of the hikers spent $10 or less on travel, but only 27 percent of the horse users did. On the other hand, day users and campers differed little in travel expenses most places. The Great Bear was the only place where campers' travel expenses were appreciably higher than day users'.

Table 15.--*Travel expenses per person by area visited*

Area	Expenses (percent of total visitors)				
	$10 or less	$11-20	$21-50	$51 or more	Answer missing
Desolation Wilderness	61	19	8	3	9
Selway-Bitterroot Wilderness	48	12	10	15	15
Bob Marshall Wilderness	39	12	15	18	16
Cabinet Mountains Wilderness	65	5	4	3	21
Scapegoat Wilderness	65	13	8	4	10
Mission Mountains Wilderness	71	7	4	16	2
Spanish Peaks Primitive Area	62	8	7	9	14
Great Bear Wilderness	26	14	14	42	4
Jewel Basin Hiking Area	72	5	3	3	12

OTHER EXPENSES

Other expenses (for everything except travel) were greater than for travel, but still low (table 16). With the exception of the Bob Marshall and Great Bear, where outfitter use and horse travel are common, most travelers spent under $20 on their visit and, in most places, less than a tenth spent over $50.

Table 16.--*All expenses other than travel by area visited*

Area	Expenses (percent of total visitors)				
	$10 or less	$11-20	$21-50	$51 or more	Answer missing
Desolation Wilderness	48	24	13	6	9
Selway-Bitterroot Wilderness	45	9	9	16	21
Bob Marshall Wilderness	26	9	15	35	16
Cabinet Mountains Wilderness	56	8	6	3	27
Scapegoat Wilderness	49	12	10	4	24
Mission Mountains Wilderness	72	7	6	14	2
Spanish Peaks Primitive Area	53	9	14	7	17
Great Bear Wilderness	29	9	10	44	9
Jewel Basin Hiking Area	51	5	3	1	27

Horse users' other expenses exceeded hikers' by a wide margin. For example, 41 percent of Selway-Bitterroot horse users spent over $50, but only 9 percent of hikers did. This is apparently not due to more day use by hikers; day users and campers had similar expenditure patterns, except in the Great Bear where campers spent much more.

With the possible exception of outfitted trips or airplane access to those few areas where it is permitted, wilderness visits apparently would not exceed the budgets of most people with moderate incomes.

Importance of Day Users

The most conspicuous and perhaps unexpected conclusion that emerges from this review of wilderness use characteristics is the commonness of day use. In most areas, the typical visitor enters and leaves the same day and, even in the few wildernesses (usually very large) where they are in the minority, day users are still common.

A host of other use characteristics go with day use. Most day users hike into the wilderness, in the summer, and usually in small groups. They do not travel very far; they concentrate on a few popular stretches of trails; and they do not spend much on either travel or other expenses.

USER CHARACTERISTICS

The major characteristics of visitors to the nine study areas and of different types of visitors--day user and camper, hiker, and horse-user, summer and fall visitors--will be presented and, whenever appropriate, the management implications of these characteristics will be identified.

Residence

Although distant areas, such as California and the Northwestern States are fairly well represented in most northern Rocky Mountain study areas, most visitors to every area were from the State in which the area is located. (The Selway-Bitterroot is in both Idaho and Montana and almost two-thirds of all visitors to this wilderness were from these two States.) For many areas, the proportion of visitors from the home State is much above half--93 percent for the Desolation, 85 percent for the Scapegoat, and 79 percent for the Jewel Basin Hiking Area to name only a few.

Furthermore, within the home State, most visitors are from the region near the wilderness, as figure 20 shows for the Spanish Peaks Primitive Area, which is presented as an example. The area around Bozeman, Montana, only about 30 miles away, is the major source area for Spanish Peaks visitors.

One might expect that horseback travelers (many of whom employ outfitters), fall visitors, and overnight visitors would more often be from out-of-State. This was true of some areas (such as the Bob Marshall and Great Bear), but the opposite was true of other areas, such as the Scapegoat and Spanish Peaks.

The implication is that visitor information programs can be directed primarily at people within the region and still reach most of the target population. This means the communication task is not as difficult as originally thought and is a factor favoring aggressive use of information and education as management tools.

Although wilderness areas are commonly considered a national resource, their recreational function is predominantly regional. (Wilderness, of course, has other functions in addition to recreational.) In terms of classification and resource allocation issues, as well as public involvement, this residence pattern suggests that the regional population is the main group directly affected and has a large stake in decisions.

KEY:

7 Percent of Visitor Groups from the area indicated

* Less than 1/2 of 1 percent

Figure 20.--Most visitors to the Spanish Peaks Primitive Area live nearby, in southwestern Montana, although some visitors come from all parts of the country.

There is also the implication that opportunities for dispersed, roadless recreation (not necessarily all in classified Wilderness) should be widely distributed throughout the country to serve the public. Wilderness or similar areas in one region play only a small role in providing recreation to people living in other regions.

Urban/Rural Residence

Most visitors were urban residents (table 17). From 45 to 90 percent of the visitors to each of the study areas lived in urban areas (areas with over 5,000 people). Visitors to the Desolation Wilderness were most often from urban areas; those to the Great Bear and Cabinet Mountains were least often from urban areas.

Table 17.--*Area of residence for visitors, percent of total, by area*

Area	Visitor residence[1]											
	California	Idaho	Montana	Northern Plains, Western Lake States	Mountain States (except Montana and Idaho)	Washington, Oregon	Central Plains	Southern Plains	Eastern Lake States	South-east	North-east	Foreign
Desolation Wilderness	93	*	*	1	2	1	1	*	1	1	*	*
Selway-Bitterroot Wilderness	8	25	39	5	2	10	3	2	3	1	2	0
Bob Marshall Wilderness	4	1	64	6	8	7	2	0	2	2	4	0
Cabinet Mountains Wilderness	4	2	75	0	2	11	2	0	2	0	2	0
Scapegoat Wilderness	1	0	86	2	2	5	0	0	0	1	3	0
Mission Mountains Wilderness	5	1	74	3	1	4	2	1	2	3	3	1
Spanish Peaks Primitive Area	4	1	71	7	3	1	3	0	3	1	6	0
Great Bear Wilderness	3	0	53	8	0	0	1	11	11	9	1	3
Jewel Basin Hiking Area	2	1	79	5	1	3	1	1	4	1	1	0

[1]Northern Plains, Western Lake States includes North Dakota, South Dakota, Minnesota, Wisconsin, and Iowa. Mountain States (except Montana and Idaho) includes Wyoming, Colorado, Utah, Nevada, Arizona, and New Mexico. Central Plains includes Nebraska, Kansas, Missouri, and Illinois. Southern Plains includes Texas, Oklahoma, Arkansas, and Louisiana. Eastern Lake States includes Michigan, Indiana, Ohio, and Kentucky. The Southeast includes all states from Delaware, Maryland, and West Virginia to Tennessee and Mississippi. Northeast includes all states from New Jersey and Pennsylvania to Maine. Foreign is any address outside the United States.

*Less than 0.5 percent.

Horsemen were more often from rural areas than hikers everywhere except in the Great Bear. In a few places, especially the Spanish Peaks, the pattern was complex; horsemen were not only more often from rural areas but also more often from large cities--ordinarily with outfitters on trail rides. Fall visitors were more frequently from rural areas in most of the study areas, but the Great Bear and the Mission Mountains Wildernesses showed no relationship between season and residence. Length of stay (day use or camping) was not consistently related to residence. In about half the study areas, more day users were from rural areas than was true of campers, and in the other half, more campers were from rural areas.

Thus, most visitors had an urban perspective on wilderness conditions; for example, perhaps little familiarity with or tolerance for horse manure. There may also be a suggestion that temporary escape from urban conditions and pressures was a motivation for wilderness visits. Most visitors to all nine areas, however, were from small- to medium-sized cities (5,000 to 1,000,000) rather than large, metropolitan areas. Only the Desolation with 15 percent had over 10 percent of its visitors from cities with populations of more than 1,000,000 people.

The childhood residence of most visitors was much more rural than their current residence. A majority of visitors to every area, except the Desolation Wilderness, spent most of their childhood in rural surroundings. For the Desolation, 21 percent grew up in rural areas, compared to the 10 percent who lived in such places at the time of the study.

Some of this difference probably reflects a general rural-to-urban movement that has been going on for generations. For example, the proportion of the United States population living in rural areas dropped from 36 percent in 1950, when most of the visitors were in their childhood years, to 27 percent in 1970. But the shifts between childhood and current residences exceed the general population change at all areas except the Selway-Bitterroot (51 percent spent their childhood in rural areas, 44 percent now live in such areas). For example, 51 percent of the Mission Mountains visitors grew up in rural areas, but only 27 percent (the national average) lived in rural areas in 1970. This points to the possibility that a rural childhood background, especially if it is followed by a move to a city, tends to create or foster an interest in wilderness. One might hypothesize that for these people there is some nostalgia or longing for remembered rural settings and more dissatisfaction with urban conditions.

The American rural-to-urban migration is slowing down, simply because it has about run its course (although there is some migration back to smaller towns). This might mean that this influence on wilderness tastes may lessen in the future, but this is highly speculative.

Types of Groups

Family groups, including families with friends, are in the majority in every area studied, except the Great Bear, where groups of unrelated friends are most common (table 18). Groups of friends, usually male, are the second most common type of group everywhere, except in the Great Bear. Such groups make up from 29 to 37 percent of the groups visiting the other eight study areas. In most areas, about half the groups included children. Groups sponsored by such clubs or organizations as the Sierra Club, outings clubs, Boy and Girl Scouts, and churches accounted for from 0 (the Great Bear) to 8 percent of all groups per area. Lone individuals were even less common, ranging from 0 (the Great Bear) to 6 percent of the total.

Table 18.--*Type of group as a percent of total groups,*[1] *by area*

Area	Type of group						
	Family (all or part)	Family and friends	Friends (unrelated)	Club or organization	Alone	Missing[2]	Percent groups with children[3]
Desolation Wilderness	33	17	32	8	5	5	46
Selway-Bitterroot Wilderness	40	14	37	3	5	1	34
Bob Marshall Wilderness	43	15	30	2	6	4	40
Cabinet Mountains Wilderness	40	15	33	5	5	1	43
Scapegoat Wilderness	36	21	29	8	6	1	43
Mission Mountains Wilderness	46	17	29	2	2	5	48
Spanish Peaks Primitive Area	38	13	35	4	5	5	43
Great Bear Wilderness	24	14	62	0	0	0	24
Jewel Basin Hiking Area	46	14	32	4	2	1	48

[1]Tabulation based on one respondent per group.
[2]Includes some groups who checked "other".
[3]Under 16 years of age.

Group types varied by season, method of travel, and length of stay. Family groups were most common during the summer in every area and groups of friends were more common in the fall. Horsemen were more often friends in every area, except the Scapegoat. Finally, day users were more often families than were overnight campers, although a majority of campers were family groups in most places.

This group structure suggests that motives for wilderness visits include strengthening family ties, perhaps to a greater degree than male-dominated adventure and achievement motives.

The small role of organization-sponsored trips refutes notions that wilderness is a recreational preserve for certain clubs. In terms of wilderness classification decisions, this seems to be an irrelevant argument. It is also clear that use management efforts must reach the general public and family groups. Obviously, focusing on organized groups misses most visitors.

Sex

Most visitors are male. The Great Bear has the highest percent of male visitors--87 percent. In all other areas, between 70 and 80 percent of the visitors are male. The Desolation Wilderness data cannot be used here because only persons whose names appeared on permits were sampled, and these people were 90 percent male. In the fall, 82 to 100 percent of the sampled visitors are male.

Except during the fall in a few of the major big-game hunting areas, women are common wilderness visitors. Female wilderness rangers, employed many places now, are certainly not out of place. As the type-of-group information also suggested, the motives for wilderness visits and the benefits received clearly are not limited to stereotyped male status-seeking, "proving you are a he-man" sorts of reasons.

Age

Age often comes up in discussions of wilderness land classification. The idea that wilderness is inaccessible to older people is commonly mentioned. The data in table 19 enable one to judge how much truth there is to this argument.

Sometimes it is also stated that young children are excluded from wilderness. The data cannot be used to examine this idea; only persons 16 or older were sampled. The data on presence of people younger than 16 given in table 18 give some indication that children are common in wilderness, but provide no details on age distribution.

Younger adults are common (table 19). People in their 20's and early 30's form a larger proportion of wilderness visitors than of the general population, but people from 35 through 54 are still about equally represented among visitors and in the population. Only the 55 and older people are substantially under-represented in wilderness. Population figures for the States supplying most of the visitors (California, Idaho, and Montana) might show a slightly different picture than national population data.

Visitors riding horses were somewhat older than hikers in all areas. Campers tended to be younger than day users, although the differences were not great. There was no consistent association of age and season of year of visits.

Table 19.--*Age distribution as a percent of total visitors,*[1] *by area, and for the population of the United States*

Area	Age						
	16-20	21-24	25-34	35-44	45-54	55-64	65 and older
Desolation Wilderness	2	2	2	2	2	2	2
Selway-Bitterroot Wilderness	17	13	27	16	12	9	6
Bob Marshall Wilderness	12	8	23	28	16	8	5
Cabinet Mountains Wilderness	30	11	25	14	12	4	3
Scapegoat Wilderness	20	13	27	17	12	7	4
Mission Mountains Wilderness	15	13	26	22	15	7	3
Spanish Peaks Primitive Area	23	17	22	21	11	4	2
Great Bear Wilderness	1	4	30	33	19	9	4
Jewel Basin Hiking Area	22	10	26	22	13	4	3
United States population, 1970	11	9	18	17	17	14	14

[1]Based on persons 16 years or older only (including United States population percentages, also).

[2]Not applicable. Data available only for permit-holders (party leaders).

It does not appear that wilderness classification and management practices are markedly discriminatory. All types of outdoor recreation have lower participation by older people (Bureau of Outdoor Recreation 1972; ORRRC 1962a), and wilderness recreation fits a familiar pattern. The data imply, however, that restrictions on use of horses would affect older people adversely.

There is also an implication that, if current birth rate trends persist and the United States population structure shifts to more older people, future growth in wilderness use might be slowed (Marcin and Lime 1976). Recreation participation, however, is influenced by many factors that interact in complex, poorly understood ways. For example, as young people who now visit wilderness age, many may continue to visit wilderness. If this happens, the present decline in participation by older people could be sharply reduced.

Education

High educational levels are the most distinguishing social characteristic of wilderness visitors. Compared to other factors, such as age, educational differences between wilderness visitors and the general public are much wider (table 20). From a fourth to a half of the sampled visitors to each area are college graduates, compared to 11 percent of the general population at least 25 years old.

Table 20.--*Education level distribution as a percent of total visitors, by area, and for the population of the United States*

Area	Years of schooling completed					
	0 to 8	9-11	12	13-15	16	More than 16
Desolation Wilderness	*	5	12	29	11	42
Selway-Bitterroot Wilderness	3	10	27	23	9	27
Bob Marshall Wilderness	4	14	22	17	11	31
Cabinet Mountains Wilderness	3	22	26	24	8	15
Scapegoat Wilderness	4	13	30	24	9	18
Mission Mountains Wilderness	4	14	15	16	12	35
Spanish Peaks Primitive Area	2	10	21	26	8	30
Great Bear Wilderness	3	6	29	15	24	24
Jewel Basin Hiking Area	5	17	30	20	9	18
United States population 1970[1]	28	17	34	10	11[2]	

[1]Based on persons 25 years of age or older.
[2]The 11 percent national figure includes the two columns above (16 and more than 16).
*Less than 0.5 percent.

Because about 30 percent of the sampled visitors in most areas are under 25 and are still students (see table 21), educational attainments will rise; so the differences in the table are understated. From 15 to more than 40 percent of the sample by area are pursuing graduate studies or have in the past. In most areas, the proportion of visitors going beyond college graduation is greater than the proportion of the United State population that goes beyond high school.

Why this association is so strong is not known. Wilderness recreation is part of the university life-style for many. It is not known if interest in wilderness recreation is a result of the educational process itself, of the interests of people attracted to universities, or to some more complex interaction.

Areas vary substantially in educational levels. The Desolation Wilderness, where data refer only to party leaders, has the highest educational levels. Several of the less well-known Montana areas have the lowest educational levels reflecting population characteristics of nearby communities--small, forest industry towns, rather than university towns. Montana areas with lower education levels, however, are still above national averages. Backpackers have particularly high educational levels, higher than horseback riders, and summer visitors average more education than fall visitors.

Table 21.--*Occupational distribution as a percent of total visitors, by area, and for the population of the United States*

Area	Occupation[1]								
	Professional and technical	Students	Housewives	Craftsmen and operatives	Clerical sales and service workers	Business managers	Farm managers and workers	Military	All other including retired
Desolation Wilderness	39	30	1	7	11	1	*	3	8
Selway-Bitterroot Wilderness	26	22	9	14	10	4	5	*	10
Bob Marshall Wilderness	32	17	9	15	9	11	3	2	2
Cabinet Mountains Wilderness	20	31	9	16	7	2	2	2	11
Scapegoat Wilderness	23	26	9	10	9	6	6	7	4
Mission Mountains Wilderness	41	20	9	15	5	2	2	0	5
Spanish Peaks Primitive Area	31	34	7	10	8	5	5	1	2
Great Bear Wilderness	33	4	9	14	11	5	5	1	8
Jewel Basin Hiking Area	22	24	14	19	7	1	1	0	8
United States population,[2] 1970	6	5	25	22	28	3	3	1	7

[1]Based on the 1960 Census of Population Classified Index of Occupations and Industries (United States Department of Commerce, Bureau of the Census, 1960).

[2]Based on persons 16 years of age or older.

*Less than 0.5 percent.

These high educational levels imply that visitor information and educational programs could be particularly effective management tools. This seems fortunate, because educational programs offer an attractive nonauthoritarian management tool. It should be possible to communicate complex ideas at high levels, if necessary. It also suggests that explanations could be more effective than "do's" and "don'ts."

The sharp increase in United States educational levels following World War II appears to have ended. This might suggest a slowing down in the future growth of wilderness use.

Occupations

Occupational patterns are consistent with the high educational levels (table 21). The professional and technical occupations and students are five to seven times more common among the sampled wilderness visitors than for the general United States population. These two categories account for a majority of the visitors to most areas. If State occupation statistics were used, comparisons would not change appreciably. Clerical, sales, and service workers (most of whom are female) are the most underrepresented groups, followed by housewives. Proportions of other occupations do not diverge greatly from national figures.

Professional and technical persons and students made up a larger proportion of hikers than of horse travelers, who were more often "blue collar" craftsmen, laborers, and, in some areas, farmers. Students made up a larger percentage of campers than day users in almost all study areas. Professional and technical workers and, in many areas, housewives, were relatively more common in the summer than fall. Blue-collar craftsmen and laborers and, in a few areas, students made up a larger proportion of fall visitors.

This occupational pattern carries implications similar to education.

Income

Income patterns vary considerably between areas (table 22). A number of areas have income distributions close to national averages (Selway-Bitterroot, Cabinets, Scapegoat, Mission Mountains Wildernesses, Spanish Peaks Primitive Area, and Jewel Basin Hiking Area). The other three areas are distinctly above average in income. The Great Bear Wilderness, an area with airplane access, has the highest income. The Bob Marshall Wilderness, with the most horse and outfitter use, is also high, as is the Desolation Wilderness, the data for which are for 1972, reflecting some inflation relative to the other areas. Also, to some extent, this reflects the fact that average income in California was about 12 percent above the United States average. (Montana income averaged about 11 percent below the United States average.)

In general, the belief that wilderness visits are beyond the means of all but the wealthy is unsupported by the data, as pointed out before in connection with data on expenses. From one-third to more than half of the visitors to every area were from families with an annual income of under $10,000 at a time when the United States median income was about $9,000. (Because visitors tend to be younger than the United States average and well-educated, incomes would be expected to rise considerably with the passage of time, of course.) The income data suggest that most visitors could afford modest entry fees, if it were ever decided to charge for wilderness use.

Table 22.--*Distribution of family income as a percent of total visitors, by area, and for the population of the United States*

Area	Income				
	Less than $5,000	$5,000-$9,999	$10,000-$14,999	$15,000-$24,999	$25,000 or more
Desolation Wilderness	11	24	19	35	11
Selway-Bitterroot Wilderness	12	37	25	17	10
Bob Marshall Wilderness	6	30	23	29	14
Cabinet Mountains Wilderness	12	45	28	12	4
Scapegoat Wilderness	11	42	29	14	7
Mission Mountains Wilderness	15	32	26	16	11
Spanish Peaks Primitive Area	17	29	26	17	11
Great Bear Wilderness	9	19	22	30	20
Jewel Basin Hiking Area	11	46	28	14	1
United States population 1970 (families)	19	32	27	22[1]	

[1]Income data for the United States population was not reported separately for the two higher income categories in this study. The 22 percent figure refers to the proportion of families in the United States population that have an income of $15,000 or more.

Vacations

The lengths of visitors' vacations do not vary greatly among the study areas (table 23). In addition, the patterns of vacations do not appear to be much different from the general situation for the United States population. In all but two areas, a majority of the visitors report 2 weeks or less of vacation annually.

The statements sometimes made to the effect that only persons with unusual amounts of leisure time can visit wilderness are not supported by the data.

Table 23.--*Distribution of lengths of vacation received as a percent of total visitors, by area*

Area	Weeks of vacation				
	0	1-2	3-4	More than 4	Other[1]
Desolation Wilderness	18	26	41	7	8
Selway-Bitterroot Wilderness	22	29	29	8	12
Bob Marshall Wilderness	31	20	38	9	2
Cabinet Mountains Wilderness	29	27	39	3	2
Scapegoat Wilderness	31	26	38	6	0
Mission Mountains Wilderness	24	23	35	10	8
Spanish Peaks Primitive Area	18	19	36	9	18
Great Bear Wilderness	33	34	26	3	4
Jewel Basin Hiking Area	37	29	26	5	3

[1]Lengths of vacation that do not fit the general pattern of the United States, such as those for some students and for retired and unemployed people.

Previous Experience

Every visitor to a wilderness comes with a variable background of outdoor recreation and wilderness experience that shapes their preferences, reactions to area conditions and management actions, and their knowledge and skills. Most visitors to all areas have considerable previous experience (table 24). From 73 to 89 percent of the visitors have visited wilderness-type areas before, and 39 to 70 percent have visited the specific study area before.

Most of those with previous wilderness experience were introduced to wilderness at young ages--in most areas, about one-third to one-half made their first wilderness visit before their 16th birthday. Parents played an important role in introducing their children to wilderness, but the majority of visitors were introduced to wilderness by other persons or organizations. Most visitors had car-camped with their parents, however, suggesting influences that may have helped develop interests in the outdoors and nature. Only about 20 percent of the population car camps (Bureau of Outdoor Recreation 1972), so the fact that 50 to 60 percent of the parents of wilderness visitors camped suggests a significant role in the formation of leisure life styles. The car-camping boom of the 50's and 60's may be producing a fallout of wilderness visitors now.

Typically, visitors make three or four wilderness visits per year and spend 6 to 10 days in wilderness (table 24). (This is another indication of the prevalence of fairly short wilderness trips.)

The fact that most visitors make numerous wilderness trips and visit other wildernesses implies that reasonable uniformity in basic regulations, permit forms, and recommended practices is desirable. The frequent trips, often to the same area, suggest the possibility of carryover experiences influencing later behavior; for example, if a trail register is out of cards and pencils on one visit, visitors might ignore the registration station on their next visit.

Table 24.--*Wilderness and outdoor recreation experience, as a percent of total visitors, or averages, by area*

Area	Percent of total					Averages		Percent of total				
	Previous visits to study area				Previous visits to wilderness	Average number visits during previous 12 months	Average number days in wilderness during previous 12 months	Age at first wilderness visit			First trip with parents	Car-camped with parents
	0	1-2	3-5	6+				10 or less	11-15	16-25		
Desolation Wilderness	30	23	17	30	89	3.1	10.3	23	23	21	29	57
Selway-Bitterroot Wilderness	43	13	14	30	76	3.1	8.4	41	11	22	36	55
Bob Marshall Wilderness	37	20	21	22	80	2.6	10.6	11	16	22	25	46
Cabinet Mountains Wilderness	37	17	13	33	85	3.7	5.4	21	25	19	34	60
Scapegoat Wilderness	61	17	9	13	73	3.5	7.8	20	17	19	35	55
Mission Mountains Wilderness	45	21	13	21	80	3.6	7.1	17	14	25	33	54
Spanish Peaks Primitive Area	50	17	10	23	81	4.4	8.3	20	16	23	36	47
Great Bear Wilderness	61	13	7	19	75	3.8	9.5	18	8	24	27	46
Jewel Basin Hiking Area	49	21	12	18	87	3.4	5.9	24	21	19	36	50

Information Sources

Maps and guidebooks, which can be useful management tools, were carried by about half of the visitors. The percentages of visitors with maps or guidebooks varied, however, from 33 to 88 percent among the nine study areas (table 25). The lowest map usage was in the Cabinet Mountains Wilderness and Jewel Basin Hiking Area; the highest was in the Desolation and Bob Marshall Wildernesses. Differences in the quality and availability of maps from one area to another account for much of the variation. Many of the parties without maps were on short, day-use visits. There obviously is strong potential interest in maps, which makes them a useful way of attracting visitors' attention to other information, either on map-brochures or on bulletin boards at trailheads or registration stations. To attract visitors, maps must be good ones, capable of adding something beyond the excellent U.S. Geological Survey topographical maps now available for most wildernesses. This is suggested by our findings in the Spanish Peaks Primitive Area. At the time of the study, Forest Service maps were small, general, sketchy, and inaccurate in some places[5]; so Spanish Peaks visitors used fewer Forest Service maps and more USGS maps than visitors to any other area.

Table 25.--*Use of maps and guidebooks, as a percent of total visitors, by area*

Area	Had map (percent of total visitors)	Type of map-guide (percent of those with maps-guides)					
		Forest Service only	Forest Service and USGS	Forest Service and guidebook	USGS maps only	Guide-book only	Other[1]
Desolation Wilderness	88	28	9	3	25	4	18
Selway-Bitterroot Wilderness	52	58	9	1	15	0	7
Bob Marshall Wilderness	80	63	5	0	11	0	2
Cabinet Mountains Wilderness	33	79	1	0	9	0	0
Scapegoat Wilderness	48	63	8	0	11	0	3
Mission Mountains Wilderness	50	68	5	1	10	4	6
Spanish Peaks Primitive Area	44	35	6	0	52	1	2
Great Bear Wilderness	61	46	2	0	13	0	15
Jewel Basin Hiking Area	39	62	5	2	11	0	0

[1]"Other" includes other types of maps, and additional combinations, such as USGS maps and guidebooks.

[5]The present Forest Service Spanish Peaks Primitive Area map, which has a USGS contour map base, is excellent.

Club Membership

Only about one-fourth to one-third of wilderness visitors 16 years of age or older belong to conservation or outdoor recreation clubs (table 26). This proportion varies little among areas, but the types of clubs are highly variable. In three areas, the wilderness-oriented national organizations, primarily the Sierra Club and the Wilderness Society, account for over half of the club members--the Desolation Wilderness, 67 percent, and the Mission Mountains Wilderness and Spanish Peaks Primitive Area, both 55 percent. In the other areas, national conservation organizations without major wilderness emphasis and local outdoor recreation clubs, usually on the order of rod and gun clubs or outing clubs, accounted for most club members.

Overall about two-thirds of the club members belong to only one club, 20 percent belong to two, 8 percent to three, and less than 5 percent to more than three.

It is apparent that wilderness is not primarily a preserve for members of pro-wilderness clubs. At most, in the Desolation Wilderness, less than one-fourth of all visitors belonged to such clubs. This figure is derived from table 26, based on the fact that 35 percent of the visitors belonged to clubs and 67 percent of those belonged to wilderness-oriented clubs. They are a sizable minority and important contacts for information and education efforts and public involvement programs. Such contacts, however, cannot do the job alone.

Comparison to Other Studies

Similarities among the study areas are more common than differences. Generally the findings of other studies of wilderness visitors are similar as well. Areas are not uniform, however; there are a variety of unique combinations of use and user characteristics. The pattern of common, short visits by fairly small hiking groups has shown up in all wilderness use studies (ORRRC 1962b; Lucas 1964; Burch and Wenger 1967; Hendee and others 1968; Stankey 1971; Murray 1974; Towler 1977; Leonard and others 1978; Bratton and others 1977; Echelberger and Moeller 1977). The few studies with information on distribution of use (Lucas 1964; Lime 1977; Towler 1977; Leonard and others 1978) also show uneven use.

Other studies have also shown most use by people living in the surrounding region (Elsner 1972; Leonard and others 1978). Most of the user characteristics reported here are similar to those found elsewhere--predominantly urban residence, most commonly family groups, males in the majority, moderate overrepresentation of young adults, high educational levels (except in West Virginia, Echelberger and Moeller 1977), professional-technical occupations, slightly above-average incomes, near-average vacation lengths, considerable wilderness experience, and frequent short wilderness trips each year (ORRRC 1962b; Lucas 1964; Burch and Wenger 1967; Hendee and others 1968; Stankey 1971; Murray 1974; Towler 1977; Leonard and others 1978; Bratton and others 1977; Echelberger and Moeller 1977).

USER ATTITUDES

Attitudes have many important implications for wilderness management and policy and are most difficult for a manager to estimate from occasional contacts with visitors. Data will be presented for several general attitudes related to importance of wilderness and to the nature of wilderness appeals. These attitudes are relevant to broad policy issues. Other attitudes relate to carrying capacity and others to alternative management policies and actions.

Table 26.--*Membership in conservation and outdoor recreation clubs as a percent of total visitors, by area*

Area	No club membership (percent of total number of visitors)	Club memberships (percent of those belonging to a club)						
		Wilderness oriented clubs only[1]	Wilderness and national conservation clubs[2]	Wilderness and State and local clubs	National conservation clubs[2]	State and local conservation and recreation clubs	State and local outdoor recreation clubs	Other combinations of clubs
Desolation Wilderness	65	47	8	12	16	8	7	2
Selway-Bitterroot Wilderness	73	16	9	7	20	8	24	16
Bob Marshall Wilderness	70	13	13	3	24	5	26	16
Cabinet Mountains Wilderness	76	14	3	2	34	5	37	5
Scapegoat Wilderness	74	18	17	1	32	11	10	11
Mission Mountains Wilderness	73	36	9	10	7	31	1	6
Spanish Peaks Primitive Area	72	45	3	7	3	28	10	4
Great Bear Wilderness	62	3	10	0	23	3	32	29
Jewel Basin Hiking Area	82	8	6	6	35	18	16	11

[1]Sierra Club, Wilderness Society, and Friends of the Earth.

[2]National conservation clubs include the American Forestry Association, Audubon Society, National Parks and Conservation Association, and similar organization.

Attitudes indicate a tendency to respond to some situation or event in a particular way, either internally (such as satisfaction or dissatisfaction) or overtly (such as compliance or violation). Human behavior occurs in complex situations frequently requiring a response in the face of conflicting attitudes. Thus, a single attitude may not always predict actual behavior as precisely as we might like, but still can be useful to managers. For example, visitors may continue to visit a crowded wilderness even though they say they dislike heavy use. Is this inconsistent? Are people dishonest or hypocritical? Should managers conclude that heavy use is not undesirable?

The answer to all these questions is, "not necessarily." Visitors may feel the area is still beautiful; they may know of no other similar, more lightly used area; they may believe that staying away would do almost nothing to improve conditions in the area but would deprive them of any use of that area at all, and so on. Still, their expressed attitude may indicate correctly that they would enjoy their visits more if use somehow could be reduced.

Attitudes should be used by wilderness managers as an important factor in making management decisions, but not as the sole determinant. Resource capability, manpower and budget limits, legal and policy goals, and constraints must be combined with attitude and other use and behavioral data to make management choices. Wilderness management is a complex challenge, and cannot be based simply on attitudes as though they were votes. In some cases, managers may need to take actions that conflict sharply with visitor attitudes; knowing that such is the case could still be valuable to managers, helping them to recognize the need for explanation and justification to gain visitor acceptance.

General Attitudes

Most visitors said that wilderness (or "back country" for the nonwilderness study areas) was "extremely important" to them (67 to 81 percent). Over 90 percent said it was at least "very important" (table 27). Differences between areas are small--the Cabinet Mountains Wilderness and Jewel Basin Hiking Area visitors gave slightly lower than average importance ratings and the visitors to the Desolation and Bob Marshall Wildernesses gave higher than average importance ratings.

Table 27.--*Importance of wilderness to visitors, as a percent of total, by study area*

Area	Extremely important	Very important	Fairly important	Not very important	Not important at all
Desolation Wilderness	81	16	2	0	0
Selway-Bitterroot Wilderness	70	23	7	1	0
Bob Marshall Wilderness	78	19	2	1	0
Cabinet Mountains Wilderness	67	23	8	1	0
Scapegoat Wilderness	75	19	6	0	0
Mission Mountains Wilderness	77	17	6	1	0
Spanish Peaks Primitive Area	74	21	6	0	0
Great Bear Wilderness	73	20	5	1	0
Jewel Basin Hiking Area	65	27	9	0	0

Unfortunately, there is no basis for comparison with other types of outdoor recreation or recreation areas, but this level of perceived importance seems to be very high and helps explain the intensity of feeling about wilderness exhibited by many people. It also may suggest a high level of commitment that could be used to seek cooperation in using wilderness in ways that help to protect it.

Visitors were asked why they chose to visit a roadless wilderness instead of some other type of area. This was an open-ended question with no suggested responses. A content analysis technique was used to categorize responses. Up to three answers (the first three) were tabulated for each person, and three responses stood out (table 28). Wilderness qualities led the list, with 25 to 43 percent of the visitors citing attributes such as primitive, unmodified, virgin, natural, and roadless areas, solitude, isolation, and no motors. The Bob Marshall and Selway-Bitterroot Wildernesses were highest in wilderness attributes, followed by the Spanish Peaks, Mission Mountains, and Scapegoat Wildernesses. The Cabinet Mountains Wilderness was lowest in wilderness attributes along with the Desolation and Great Bear Wildernesses, and the Jewel Basin Hiking Area. The second most common reason for a wilderness visit was fishing, which ran from only 9 percent in the Desolation Wilderness and 18 percent in the Spanish Peaks Primitive Area and Bob Marshall Wilderness to 39 percent in the Mission Mountains Wilderness. Almost as common was "scenic beauty," which was rated around 25 percent, except in the Mission Mountains and Great Bear Wildernesses where fishing and hunting were high.

Hiking was in fourth place. Hunting was fairly low, except in the Great Bear Wilderness (32 percent) and Bob Marshall Wilderness (21 percent). Social reasons were very low everywhere and are excluded from table 28.

Table 28.--*Eight most cited reasons for choosing to visit a wilderness roadless area rather than some other type of recreation area, percent of total, by area*

Area	Wilderness qualities	Scenic beauty	To fish	To hunt	To hike	Other activities[1]	To escape civilization	To relax
Desolation Wilderness	28	26	9	1	19	22	46	3
Selway-Bitterroot Wilderness	42	23	18	15	13	19	9	7
Bob Marshall Wilderness	43	20	18	21	5	10	8	7
Cabinet Mountains Wilderness	25	32	31	4	18	14	7	5
Scapegoat Wilderness	37	24	25	8	12	14	11	10
Mission Mountains Wilderness	37	15	39	1	10	3	11	1
Spanish Peaks Primitive Area	38	24	18	16	15	15	7	5
Great Bear Wilderness	28	14	25	32	1	9	6	6
Jewel Basin Hiking Area	30	31	30	4	17	12	4	7

[1]Other activities include interests in specific activities, such as camping, horseback riding, mountain climbing, berrypicking, and nature study.

California's Desolation Wilderness stands in sharp contrast to all other areas in escape from civilization as a trip motive. Escape was only cited by 5 to 10 percent of the visitors in Montana and Idaho, but by 46 percent of the visitors in California. In fact, 46 percent was the highest frequency for any response category in any area. The obvious hypothesis for future testing is that the more urbanized, large-city environment of most California visitors, in contrast to the town and small-city residences of most Northern Rocky Mountain visitors, creates a greater need for periodic temporary escape.

Most other studies of wilderness visitors have found escape from civilization to be an important factor (Bultena and Taves 1961; ORRRC 1962b; Hendee and others 1968). None of the question formats were similar enough to permit quantitative comparisons, but it appears that the escape responses in the Desolation Wilderness may be roughly in line with other studies, which also involved visitors from highly urbanized areas. The low importance attached to escape motives in the Montana-Idaho areas is the unusual finding. In the Northern Rocky Mountains, wilderness visitors seem motivated overwhelmingly by the positive attractions of wilderness--the pull of wilderness, without a strong, negative push out of urban pressures.

Two areas that had not been designated wilderness at the time of the study (Jewel Basin and Scapegoat) have patterns of appeal much like the wildernesses, but the Great Bear Wilderness does have a different pattern, one strong in hunting and fishing attractions.

In general, it appears that primary wilderness qualities are a significant attraction, but that recreational opportunities not necessarily dependent on a wilderness setting are also major appeals. At least a good share of the fishing- and scenery-oriented people probably would be well pleased with a back country-type of area, that provided good opportunities for fishing, hunting, hiking, and horseback riding in a roadless setting.

Carrying Capacity

Overall satisfaction and the influence of crowding or use conflict factors upon satisfaction will be discussed first, followed by detailed information on important attitudes dealing with solitude and use rationing.

SATISFACTION

All visitors were asked how well satisfied they were. Answers were described both in adjectives and letter grades. Reported satisfaction levels were high (table 29). Responses of "A" (excellent) were most common everywhere and "A" and "B" (excellent and very good) accounted for 85 to 92 percent of the replies everywhere. Satisfaction varied little except for two areas. The Great Bear Wilderness had an unusually large proportion of highly satisfied visitors, but also had a relatively large proportion of low satisfaction responses, as did the Scapegoat Wilderness (table 29).

Only 1 to 5 percent of the visitors gave "D" or "F" grades to their experiences. It would be interesting to compare similar visitor satisfaction judgments for other types of outdoor recreation areas--auto campgrounds, for example. Does wilderness tend to produce unusually high levels of satisfaction, with possible implications for its value?

Table 29.--*Overall satisfaction and major reasons for satisfaction, percent of total, by area*

Area	Satisfaction level					Factors affecting satisfaction						
	A	B	C	D	F	Environment and scenery	Good trails and facilities	Poor trails and facilities	Solitude	Crowding	Good fishing and hunting[1]	Poor fishing and hunting[1]
Desolation Wilderness	54	37	7	2	0	62	5	0	16	13	5	2
Selway-Bitterroot Wilderness	58	30	8	3	1	61	10	4	11	4	8	4
Bob Marshall Wilderness	55	37	7	0	1	50	10	2	13	8	18	9
Cabinet Mountains Wilderness	54	36	7	2	1	50	18	6	12	2	15	6
Scapegoat Wilderness	48	38	11	2	1	42	15	3	12	7	13	8
Mission Mountains Wilderness	57	31	9	1	2	56	17	7	12	6	15	7
Spanish Peaks Primitive Area	60	32	7	0	1	60	10	4	16	3	8	5
Great Bear Wilderness	70	16	9	4	1	54	3	1	10	1	13	18
Jewel Basin Hiking Area	54	31	11	3	0	51	22	6	12	2	13	9

[1]For the Desolation and Selway-Bitterroot, good and poor fishing and hunting were tabulated separately. In the Desolation, "good fishing" was cited by 5 percent of the visitors, "good hunting" by none. "Poor fishing" and "Poor hunting" were each mentioned by one percent of the visitors. In the Selway-Bitterroot, 6 percent of the visitors mentioned "good fishing," 2 percent, "good hunting," 2 percent, "poor fishing," and 2 percent, "poor hunting."

Campers were less well satisfied than day visitors in about half of the study areas and there was no appreciable difference in the other areas. This might suggest that visitors who stay longer and penetrate farther see more problems and encounter more disappointments. It is also probable that the campers have different experience levels, expectations, and somewhat more demanding standards for wilderness than day visitors, some of whom use wilderness in a rather casual way and so may be rather easily satisfied.

Also, in about half the areas, hikers were better satisfied than horsemen. In the Spanish Peaks Primitive Area the reverse was true. Other areas had small differences. Summer visitors in every area were better satisfied than fall visitors. It may be that some fall visitors, who are more often horse users than are summer visitors, are seeking an experience that depends more on hunting success. For example, in the Bob Marshall Wilderness, 18 percent of fall visitors gave their experience C, D, or F but only 3 percent of the summer visitors did.

Next, visitors were asked why they felt that way about satisfaction. Up to three answers (the first three) were tabulated for each person. Some were compliments and some were complaints.

By far the most common reason everywhere for satisfaction was a favorable reaction to scenic beauty and the wild natural quality of the land; at least half of the wilderness visitors mentioned the environment in every area except the Scapegoat where 42 percent did.

Several reasons for satisfaction were clustered far behind the environment. In many areas, solitude was the next most common positive influence on satisfaction, mentioned by 10 to 16 percent of the visitors. Crowding, as a negative influence on satisfaction, varied from a high of 13 percent in the Desolation Wilderness to only 1 or 2 percent in the Great Bear and Cabinet Mountains Wildernesses, and Jewel Basin Hiking Area.

Good facilities, such as trails and campsites, were cited ahead of solitude in some areas and after solitude in others. The percentage of visitors citing good facilities ranged widely from 3 percent in the Great Bear Wilderness Area to 22 percent in the Jewel Basin Hiking Area, which is more developed than the other areas. Poor facilities were mentioned much less often, by from 0 to 7 percent of the visitors to each area.

Many places good fishing and hunting were cited second or third by from 5 to 18 percent of the visitors. (The Desolation was lowest, the Bob Marshall highest.) Poor fishing and hunting varied greatly as an influence on satisfaction. It was the second most-cited reason (by 18 percent) in the Great Bear, but by only 2 percent in the Desolation and by 4 percent in the Selway-Bitterroot. Of course, the strength of both compliments and complaints about fishing and hunting result from the interplay of two factors: fish and wildlife abundance and visitors' interest and expectations for fishing and hunting. Thus, the Great Bear Wilderness, which has excellent fish and wildlife populations and which attracts many visitors strongly oriented to hunting and fishing, had "good fishing" or "good hunting" given as reasons for satisfaction by 13 percent of the visitors. Eighteen percent of the visitors found the fishing and hunting "poor." The Desolation Wilderness Area, which has fair fishing and poor hunting had "good" comments about fishing from 5 percent and "poor" comments from 2 percent, probably because of lower expectations.

Rules and regulations were almost never mentioned as influences on satisfaction. Neither regulations nor facilities appear to be problems for managers.

Different types of visitors gave differing reasons for their satisfaction. The major differences were between day visitors and campers. The day visitors cited scenic beauty more often than campers and solitude (or crowding) much less often. In a few places, day users also complained more about fishing. The low importance that day visitors attached to solitude compared to campers is consistent with other wilderness social carrying capacity research (Stankey 1973). The finding also supports provisions for separating the encounter experiences of day visitors and campers in a wilderness travel simulation model that has been developed (Shechter and Lucas 1978). There is a suggestion here of a need for scenic areas in which to hike and fish that need not necessarily be designated wilderness.

Horseman/hiker differences were less pronounced. Hikers cited scenery a bit more than horsemen and complained about fishing a little more, but did not differ on solitude/crowding.

Summer and fall visitors did not differ appreciably or consistently on any of the key reasons for satisfaction. It was expected that fall visitors, who are often hunters, would stress hunting success over scenery or solitude, but this was not true.

NUMBER OF PARTIES ENCOUNTERED AND VISITOR REACTIONS

The degree of solitude visitors experienced and how they felt about the numbers of other parties they met on their trips varied sharply among study areas (table 30). Trips vary in length and in opportunities for encounters. The perception of the acceptability of any number of total encounters is influenced by the length of the trip; therefore, encounters are expressed in averages per day in table 30.

Table 30.--*Average number of other parties met per day on the trip and opinion of numbers met, percent of total, by area*

Area	Average number met per day					Opinion of numbers met			
	0	1-3	4-10	11-20	Over 20	Too few	About right	Too many	Other replies[1]
Desolation Wilderness	9	45	30	10	6	2	43	49	9
Selway-Bitterroot Wilderness	48	26	28	2	0	3	62	22	14
Bob Marshall Wilderness	53	39	8	0	0	1	52	31	16
Cabinet Mountains Wilderness	36	50	11	3	0	3	58	17	23
Scapegoat Wilderness	31	46	19	4	0	3	53	29	15
Mission Mountains Wilderness	25	50	21	4	0	4	57	28	11
Spanish Peaks Primitive Area	26	49	20	4	1	3	55	25	17
Great Bear Wilderness	61	29	10	0	0	1	65	14	21
Jewel Basin Hiking Area	35	54	11	1	0	4	59	13	23

[1]Includes three types of answers: "Didn't matter," "Don't remember," and "No answer." These respones made up about 12, 1, and 5 percent of the total, respectively, for all areas combined.

The Desolation Wilderness stands out as being different from the Northern Rocky Mountain wildernesses. Encounter levels there are much higher than in the other areas. Less than one-tenth of the Desolation visitors had complete solitude (an average of less than 0.5 encounters per day) compared to about one-fourth to over half of the visitors to the Northern Rocky Mountain areas. In the Desolation Wilderness, 16 percent of the visitors met over 10 parties per day compared to 0 to 5 percent elsewhere.

Desolation Wilderness visitors also much more often expressed the feeling that they met too many other visitors than did visitors to other areas. It was the only area where a majority of the visitors did not feel the number met was "about right." In the Desolation, about half the visitors said they met "too many" or "way too many" other visitors (these answers are combined in table 30, as are "too few" and "way too few").

Some studies, dealing with visitors to wild rivers (Nielsen and Shelby 1977; Heberlein 1977), have shown little or no association between satisfaction and feelings about numbers of other visitors observed and numbers of visitors encountered. Our data show associations that vary from weak to moderately strong, depending on the variables and areas considered (table 31). The associations are strongest between satisfaction and perception of crowding, site deterioration, and littering, and also between satisfaction and success in finding desired campsite solitude. The association between satisfaction and average encounters per day is weaker and virtually nonexistent in about half of the areas. Encounters with horse parties are a better predictor of satisfaction than total encounters.

Previous study has shown that many visitors would prefer not to meet large parties or those using horses (Stankey 1973). In most areas, a majority of parties saw no large groups, defined as more than 10 people, and most of those saw only one party. In the Desolation and Bob Marshall Wildernesses, 52 percent of the visitors reported seeing no large parties and 86 percent of the visitors to the Cabinet Mountains Wilderness Area met no large groups. The percentages of visitors encountering parties of horsemen varied widely, from zero percent in the Jewel Basin Hiking Area to 82 percent in the Bob Marshall Wilderness Area; however, most parties met only one or two groups using horses.

CAMPSITE SOLITUDE

Previous research has shown that visitors place a higher value on solitude at campsites than on the trail (Stankey 1973). This conclusion is supported by data from this study. An overwhelming majority of the visitors to all areas preferred to have no other parties camped within sight or sound of them (table 32).

Only in the Desolation Wilderness is there a substantial proportion (41 percent) of campers who prefer some company.

Despite more acceptance of other camper parties in the Desolation Wilderness, visitors there reported much less success in finding the degree of campsite solitude they preferred than was true elsewhere. At the time of the study, most campers in the Northern Rockies could find desired isolation every night.

Table 31.--*Association of satisfaction and measures of solitude, measured by Gamma,*[1] *by area*

Area	Association between satisfaction[2] and:						
	Average number of other parties met per day			Success in finding campsite solitude	Perception of:		
	All parties	Large parties	Horse parties		Numbers of parties met	Environmental conditions (wear and tear)	Litter in area
Desolation Wilderness	0.17	0.25	0.26	0.33	0.43	0.37	0.18
Selway-Bitterroot Wilderness	.21	.11	.18	.28	.41	.39	.18
Bob Marshall Wilderness	.26	.45	.39	.31	.57	.18	.01
Cabinet Mountains Wilderness	- .14	- .20	.56	.34	.19	.29	.14
Scapegoat Wilderness	.31	.22	.26	.36	.30	.44	.29
Mission Mountains Wilderness	.20	.18	.16	.59	.32	.39	.37
Spanish Peaks Primitive Area	.11	- .02	.03	.35	.40	.24	.44
Great Bear Wilderness	- .08	.17	.06	.02	.36	.38	.09
Jewel Basin Hiking Area	.08	.27	N/A	.65	.31	.49	.34

[1]Gamma is a measure of association between two variables measured on an ordinal (ranking) basis. It can be interpreted as the proportion of variance in one of the variables accounted for by the association with the other variable, similar to R^2.

[2]Satisfaction was coded with 1 for A, 2 for B, and so on. Thus, a positive gamma indicates that as encounters increase or opinions become more unfavorable, satisfaction declines.

Table 32.--*Number of other camps nearby desired by overnight visitors and success in finding such campsites, percent of total, by area*

Area	Camps desired				Success in finding desired campsite solitude		
	0	1	2	3 or more	Every night	Some nights	Never
Desolation Wilderness	59	13	16	12	42	46	12
Selway-Bitterroot Wilderness	82	9	4	5	78	17	6
Bob Marshall Wilderness	89	7	3	1	77	20	3
Cabinet Mountains Wilderness	79	14	6	1	82	17	1
Scapegoat Wilderness	72	13	9	6	66	20	14
Mission Mountains Wilderness	86	8	2	4	65	23	13
Spanish Peaks Primitive Area	86	6	6	2	69	17	14
Great Bear Wilderness	87	2	3	8	84	8	8
Jewel Basin Hiking Area	79	7	12	2	73	18	9

PERCEIVED CHANGES IN AREA QUALITY

People who have visited an area before are in a position to compare environmental conditions and solitude/crowding levels. Their perceptions of the direction of change--deterioration or improvement--provide some indication of the severity of carrying capacity problems. About half of the visitors to each area felt conditions were about the same as before, but in most areas, visitors who felt conditions were worse outnumbered those who felt they were better by 2, 3, or 4 to 1 (table 33). As for all other capacity related questions, the visitors to the Desolation Wilderness were the most dissatisfied, although the responses from the Bob Marshall Wilderness were almost as negative.

Table 33.--*Perceived change in area quality by repeat visitors, percent of total, by area*

Area	Area quality now compared to earlier			
	Better	About same	Worse	No opinion
Desolation Wilderness	9	48	37	6
Selway-Bitterroot Wilderness	14	45	31	10
Bob Marshall Wilderness	11	46	37	6
Cabinet Mountains Wilderness	21	52	21	6
Scapegoat Wilderness	8	55	35	2
Mission Mountains Wilderness	11	54	27	7
Spanish Peaks Primitive Area	10	57	29	4
Great Bear Wilderness	16	53	29	2
Jewel Basin Hiking Area	20	56	20	4

Two areas were exceptions; in both the Cabinet Mountains Wilderness and Jewel Basin Hiking Area, about 20 percent of the repeat visitors felt conditions were better than before, which was about as many as felt conditions had deteriorated. In Jewel Basin, this relatively positive response may be related to approval by hikers of the termination of motorcycle and horse use.

Thus, if experienced visitors' opinions of change are taken as a crude barometer, a storm may be gathering. If some visitors who perceive conditions as deteriorating badly have stopped visiting the area and so are not in the sample, the situation could be somewhat worse than table 33 indicates.

Visitors were also asked why they felt as they did about changes in area conditions. Many reasons, most of them complaints, were given, but of those reasons, two were common everywhere: more crowding and more worn and littered areas. This reinforces the conclusion that use in relation to capacity is a justified concern.

If there is substantial visitor concern about use levels and the effects of use on the land, how do people feel about possible ways of dealing with the problem, either by regulating use or adding facilities to accommodate increased use?

RATIONING AND USE CONTROL

The general idea of restricting visitor numbers when an area is being used beyond its capacity is strongly supported everywhere. In the Desolation Wilderness, 90 percent of the visitors said restricting use was desirable (61 percent said "very desirable"). In the other study areas, about 75 percent felt it was desirable and only 10 or 12 percent said it would be undesirable. Except for the Desolation, there was little variation in responses among areas.

Visitors were asked their opinions of several specific types of use restrictions. One, worded "issue trip permits so visitors could only camp each night in the area assigned to them," was strongly rejected. Apparently, it was viewed as taking away too much freedom. From two-thirds to three-fourths of the visitors to all areas viewed such a heavy-handed system as undesirable.

In contrast, party size limits were supported. A limit of 12 persons per party was considered desirable by close to half of the visitors to all areas except the Desolation Wilderness, where 72 percent favored a limit. About 15 to 25 percent of the visitors to each area thought a limit of 12 persons per party was undesirable, and 25 to 35 percent were neutral. Of course, most visitors were in small groups and probably saw party size limits as restricting others.

"Closing some areas to horses" was also well accepted, even in horse use areas. The degree of closure implied by the question is vague, but the general concept is considered desirable by nearly half of the visitors to most areas. Two areas, both with little horse use, had stronger reactions. In the Mission Mountains Wilderness, 65 percent of the visitors felt closing some areas to horses was desirable, and in the Desolation Wilderness this proportion rose to 73 percent. Some closures to horses were supported by a substantial proportion of horseback riders--30 percent, 21 percent, and 25 percent, respectively, of the riders in the Great Bear, Bob Marshall, and Selway-Bitterroot Wildernesses and 19 percent of the riders in the Spanish Peaks Primitive Area, the main horse use study areas.

FACILITIES AND STRUCTURES

Probably the major user facility or improvement in most wildernesses is the trail system. Trails are widely recognized as being consistent with wilderness, but decisions about what types of trails are appropriate are more controversial. Visitors favored low standard trails (described as being "somewhat like a game trail--narrow, grade varies, winding, not the shortest route") more than high standard trails ("wide, steady grades, fairly straight") (table 34). Only two areas had appreciably more "desirable" than "undesirable" responses on high standard trails--the Jewel Basin Hiking Area, not a designated wilderness, and the Bob Marshall Wilderness with predominantly horse use. (Horse users in each area, favored high standard trails more than hikers, but not by large margins.) In several areas, especially the Desolation Wilderness, high standard trails were considered undesirable by far more visitors than thought they were desirable.

In contrast, low standard trails were considered desirable by a majority of visitors everywhere, and "desirable" judgments outnumbered "undesirable" by from almost 4 to 1 to 16 to 1.

The largest group of visitors (over one-third) oppose high standard trails and favor low standard. About one-tenth favor low standard trails and are neutral on high standard trails. Another tenth favor high standard trails and oppose low standard, while still another tenth favor high standard trails and are neutral on low standard trails. About 15 percent favor both high and low standard trails, and only 2 percent find both types of trails undesirable.

Table 34.--*Visitor opinions of high and low standard trails, percent of total, by area*

Area	High standard			Low standard		
	Desirable	Neutral	Undesirable	Desirable	Neutral	Undesirable
Desolation Wilderness	14	22	64	79	15	5
Selway-Bitterroot Wilderness	28	27	45	58	27	15
Bob Marshall Wilderness	49	21	30	62	21	17
Cabinet Mountains Wilderness	38	26	36	50	31	19
Scapegoat Wilderness	38	25	38	62	25	13
Mission Mountains Wilderness	35	21	45	64	22	14
Spanish Peaks Primitive Area	29	22	49	69	19	12
Great Bear Wilderness	34	28	38	72	20	8
Jewel Basin Hiking Area	41	26	33	56	28	16

About 70 percent of the visitors to each area (80 percent in the Desolation) feel it would be desirable to leave some areas without trails.

Trees blown down across the trail (defined as "maybe 1 or 2 a mile") were not a concern to most visitors--40 to 50 percent said they were neutral, and "desirable"/ "undesirable" responses were fairly even. The Bob Marshall Wilderness was an exception--only 30 percent of visitors were neutral and "undesirable" responses exceeded "desirable" by 42 to 28. As expected, horse users generally reacted more negatively to down trees across trails than did hikers.

Bridges across large streams that are dangerous to cross are overwhelmingly considered desirable. Seventy to 80 percent of the visitors to each area except the Great Bear, where the figure was 55 percent, favored bridges across such rivers.

Bridges across small streams where a hiker would not be in danger, but could get wet feet wading, received mixed responses. In most areas, about 40 percent saw such bridges as desirable and about 35 percent saw them as undesirable. Twenty-five percent were neutral. Visitor responses in the Desolation and Great Bear Wildernesses were more negative; half or more of the visitors thought bridges on small streams were undesirable; only about one-fourth favored them.

Outhouses (pit toilets) drew a mixed response. About 30 to 40 percent of visitors consider them to be desirable and 30 to 45 percent consider them undesirable in all areas except the Desolation. In the Desolation Wilderness 66 percent of the visitors said "undesirable" against only 17 percent who said "desirable." Everywhere, those who were against outhouses felt more strongly than those who favored them, usually labeling them "very undesirable," in contrast to supporters, who generally said "desirable."

For both outhouses and bridges across small streams, the visitors were not generally opposed to a "purist" policy; still the spread of opinions points to a need for explanation if such a policy is adopted.

Fireplaces with cemented rocks and metal grates were considered undesirable by from 36 percent of the visitors in the Cabinet Mountains Wilderness to 77 percent in the Desolation Wilderness, a highly variable picture. Even in the Cabinet Mountains, only 36 percent of the visitors considered such fireplaces desirable. In contrast, the loose rock fire ring was well accepted everywhere (desirable ratings were about double the undesirable) except in the Bob Marshall Wilderness, where opinions of desirability and undesirability were about evenly matched. This acceptance may raise some questions about the practice in some areas of removing all fire rings.

Rustic, split-log, picnic tables were not wanted by many visitors. Only 8 percent of the visitors to the Desolation Wilderness considered them desirable. In most other areas, less than 25 percent of the visitors favored them. Only in the Great Bear, where many visitors camped near the airstrip in a campground with tables, was there much support (39 percent) for picnic tables.

Questions about pole horse corrals near camps resulted in very mixed responses. Many places, opinion split into three similar-sized groups for, against, and neutral. As one would expect, horseback travelers were most favorable to corrals, supporting them by more than 2 to 1. This majority is not as overwhelming as might have been expected, however.

REGULATIONS

Requiring all visitors to register is strongly supported. Only 8 to 15 percent of the visitors to each area consider this requirement to be undesirable.

"Prohibiting wood fires where firewood is scarce (requiring the use of gas stoves)" was more controversial. Only in the Desolation Wilderness did more visitors favor than oppose such a regulation. In the Desolation 66 percent of the visitors felt the requirement would be "desirable," and 20 percent felt it would be "undesirable." In more lightly used and more forested areas in Montana and Idaho, visitors were predominantly against the idea. Campers, especially, who would be the primary type of visitor affected by a no fire regulation, opposed it by nearly two to one. If such a regulation appears to be necessary in some places, it would seem to be essential to carefully explain the requirement. The campfire probably plays an important symbolic role in camps, and its absence would take getting used to for most visitors.

The possibility of requiring horse users to carry all feed and prohibiting grazing was strongly opposed by those who would be directly affected. Visitors using horses opposed such a rule by about 3 to 1. Supplemental feeding and limited grazing might be more acceptable.

Fishing and having a fish meal is probably a reasonable part of a wilderness experience, but perhaps it is not appropriate to catch large numbers of fish in wilderness to haul back out to the home freezer. A regulation to "allow visitors to catch fish to eat in the wilderness but not to bring back out" received only slightly more support than opposition overall, and it was rejected clearly in some areas, especially the areas with a large amount of fishing activity, such as the Mission Mountains. The Desolation was an exception again; there such a regulation was favored by 6 to 1.

MANAGEMENT POLICIES

Wilderness rangers patrolling the back-country are very well accepted. Only 4 to 15 percent of the visitors to the various study areas believe wilderness rangers are undesirable.

It has been pointed out (Hendee and Harris 1970) that wilderness visitors often accept administrative use of chain saws to build and clear trails better than managers expect. In all of the Montana and Idaho areas, visitor acceptance of such methods was about 2 to 1 and in the nonwilderness study areas about 5 to 1. This was not true in California, where two of every three visitors were against administrative chain saw use. Administrative restraint in chain saw use in wilderness is appropriate, but, restraint should be based mainly on wilderness philosophy and law, not visitor opposition.

A wilderness is intended to be a natural ecosystem, interfered with by man as little as possible. Stocking fish, especially in naturally barren wilderness waters, seems to be contradictory; however, many people do not object to this practice and agency policies permit it under certain conditions. Visitors to all study areas were opposed to a natural fishery policy by about 3 to 1. Most visitors apparently view wilderness as more of a recreation area than a natural ecosystem. This suggests both an educational challenge if ecosystem integrity is to be a dominant objective and a possible need for more intensive management of fisheries in roadless lands outside of wilderness.

Natural fire policies that permit fire to more nearly play its natural ecological role have become much more common since the early 1970's when these surveys were conducted. Even then, visitors were not as strongly opposed to such policies as might have been thought. About 15 to 30 percent of the visitors favored a natural fire policy, about one-third were neutral or undecided, and the remaining 40 to 60 percent thought such a policy undesirable. Education and exposure to the concept have continued since these responses were obtained, and I believe attitudes have probably become more favorable to natural fire policies.

SOURCES OF INFORMATION

Information can be a powerful influence on use patterns, on visitor behavior, and on the quality of visitors' experiences. Managers can use information as an important management tool. To do this, they need to know what information sources visitors are using and what their attitudes are about various means of providing information.

The appeal of maps and guidebooks is striking. In response to two questions about the desirability or undesirability of detailed maps and of a guidebook, almost everyone thought good maps were desirable and guidebooks were not far behind.

On-site information in the form of signs explaining natural features or historical events might seem to be inappropriate in wilderness, but a preponderance of visitors to all areas except the Desolation Wilderness felt that such signs were desirable. Still, from 15 to 35 percent (44 percent in the Desolation Wilderness) found interpretive signs undesirable.

ACCEPTABLE VISITOR BEHAVIOR

For a number of years, wilderness managing agencies have promoted the "pack-it-in, pack-it-out" concept for handling unburnable garbage. The approach replaced the older recommended practice of burying garbage. How well has the message reached visitors? Not very well, at least in the early 1970's. In the Desolation Wilderness Area, 77 percent of the visitors and 81 percent of the campers said burying garbage was undesirable, but in all of the other areas, except the Selway-Bitterroot Wilderness where a different question was asked, 50 to 67 percent of the visitors said burying garbage was desirable. Unlike answers to many other such policy questions, there were few neutral or "no opinion" answers. People thought they knew and answered very positively. Apparently, people want to do what is right, but many are misinformed.

A similar problem may exist for a number of outmoded but once accepted practices, such as building bough beds, blazing trees, ditching tents, and so on. The education challenge is large.

Finally, in a few areas where trail motorcycles were permitted, visitors were asked about their desirability. No question produced such a one-sided response. From 66 to 90 percent of the visitors felt trail bikes were "very undesirable." Almost the only dissenters were the motorbike riders themselves. The opposition to trail bikes poses a difficult issue for "back country," roadless lands managed for dispersed recreation. A place must be provided for mechanized recreationists, but if other visitors to such places react as negatively to trail bikes as the visitors we surveyed, mechanized use may have to be considered almost an exclusive use.

SUMMARY

Overall, there are many similarities as well as some sharp differences among the nine areas studied. The major differences against a background of broad similarities seem to be related to location. Areas in the Rockies were different than the study area in the California Sierras. Differences also were related to area size; to type of access, particularly the presence of a good public airfield in the heart of the Great Bear Wilderness; to variations in opportunities for different activities (especially hunting); and to varying intensity of use.

The nonwilderness areas (only the Jewel Basin Hiking Area now, but also the Scapegoat and Great Bear at the time of the study) do not differ greatly from the Wilderness, although the Jewel Basin Hiking Area has a uniquely high proportion of 1-day visits.

The strongest similarities apply to the appeals of wilderness and the importance attached to wilderness. Even here, uniformity is lacking. Wilderness attributes and scenic beauty are universal appeals, but the importance of hunting and fishing as appeals varies greatly among areas. The desire to "escape civilization" is strong as a wilderness appeal in California, but weak elsewhere.

Use patterns are broadly similar, but varying combinations of the different characteristics of use are found. In general, most visits are short in time and distance covered, but some larger areas, such as the Bob Marshall and Great Bear Wildernesses, have many trips that last a week or 10 days.

Party sizes are generally small with only minor variations in some areas.

Hiking is the predominant method of travel almost everywhere, but horseback riders are in the majority in the Bob Marshall Wilderness.

Multiactivity trips are the rule, but three general activity patterns characterize the nine study areas: areas with high participation in hiking, swimming, and nature study, but little hunting (the Desolation and Mission Mountains); areas with high hunting and horse use (the Bob Marshall and Great Bear); and an intermediate pattern (the other 5 areas).

Summer is the main use season everywhere, but the ratio of summer to fall use varies widely.

Uneven, highly concentrated use is found everywhere. A small part of every area receives most of the area's recreational use. Variation in this feature of use patterns is not great. Also, most visitors stick to trails everywhere, although this is much more true in the Rockies than Sierras. Everywhere expenses are low.

Although there is some variation, most visitors are from the section of the State around the area visited. Most are from urban areas, but often have had a rural upbringing.

Most visitors are in family groups, but a few areas have groups of nonfamily friends in the majority. Males outnumber females by about 3 to 1. Young adults are most common, but both children and older adults visit wilderness in substantial numbers.

Educational levels are high everywhere. This is the most distinguishing characteristic of wilderness visitors everywhere, although the educational attainments of visitors is more conspicuous in some areas than in others (for example, educational levels in the Desolation Wilderness are very high and in the Cabinet Mountains are relatively low, although still well above national averages).

Persons in professional and technical occupations and students are most common in most places, but the pattern is complex and variable.

Incomes are near average, but visitors to a few areas have incomes well above the national average.

Most visitors are experienced wilderness users and almost half have been to the study area before. Typically, these people make three or four visits (totalling 6 to 10 days) to wildernesses in a year. Most are not members of conservation, environmental, or outdoor recreation clubs.

Overall, visitors are quite well-satisfied with their visits. Satisfaction declines as crowding increases and isolated camp sites become harder to find, but the association of satisfaction with total numbers of encounters with other parties is weak most places.

About half of the visitors who have visited the area before feel conditions are about the same as they were earlier. Most of the others feel conditions are deteriorating, but visitors' opinions vary with area.

The general idea of use control is well accepted by visitors, but rigid, preplanned itineraries are unacceptable to them. On the other hand, party size limits and some no-horse areas are generally endorsed, although visitor opinions vary with area.

Low standard trails, bridges over large, dangerous streams, fire rings, and fish stocking in wilderness are considered appropriate by most visitors, but other facilities and developments have only limited support. Again, areas show differing responses.

The concept of relativity (attitudes and satisfactions adjust as use of an area intensifies) receives some partial support. The Desolation Wilderness provides a chance to test the hypothesis in a general way. It is clear some adjustment has occurred there. Perhaps, in part, more demanding visitors have been replaced by those more tolerant of heavy use. However, the adjustments have been rather small compared to the extreme differences in use. Norms for acceptable or desirable solitude/encounter levels are only moderately higher in the Desolation than in the Northern Rockies, and complaints about crowding and perceived area deterioration are much higher than in the other areas. On the other hand, overall satisfaction is almost as high as elsewhere. Still, the unusually strong support for restrictions on use supports the notion that encounter levels really do bother visitors in a significant way. Numbers of encounters are important but the type and location of the encounters are critical.

The overall measure of satisfaction may be too crude to accurately reflect visitors' feelings. Clearly, the issue of social carrying capacity is complex and some reexamination of existing conceptual frameworks seems to be in order.

MANAGEMENT IMPLICATIONS

Many specific management implications relative to survey results have been pointed out. Several more general management implications are suggested by broader response patterns.

First, the wilderness system seems to be just that. Although there are differences, the wildernesses studied here seem to be providing similar types of visitor experiences. There is little justification for substantially different overall management objectives for individual areas. Encounter goals, however, based on differences in visitor preferences, probably should vary somewhat between areas such as the Desolation and the Bob Marshall Wildernesses. It is possible, of course, that visitors with less tolerance for crowding have abandoned the Desolation Wilderness and other such areas because of heavy use and so are not represented in surveys of current users.

On the other hand, specific management policies designed to achieve objectives should be tailored to specific areas. Standardized plans for different areas would be inappropriate. The Northern Rocky Mountain areas show similar responses to possible management practices but the California study area responses differ substantially. Visitors to California areas reject facilities and accept regulations more than do visitors to the Montana and Idaho areas.

Capacity problems seem to be of some concern in all of the areas. Responses from visitors to the Desolation Wilderness show that heavy use does produce dissatisfaction and complaints. Continued growth of recreational use can be expected to intensify problems. The uneven use distributions suggest that overused trouble spots exist in all the areas.

There are a few indications of opportunities to increase area capacities. The characteristic of uneven use in all areas indicates that redistribution of some recreational use could result in areas accommodating more use; however, there is not much support for management to increase capacity by building facilities or hardening sites to accommodate more use. One exception might be trails. Most visitors stick to the trails, making the trail system a powerful management tool. Visitors also accept low standard, simple trails, but they also want some areas to be left without trails. There probably are opportunities in many areas for some expansion of the trail system and, consequently, of capacity.

Modification of use to fit capacity, rather than expansion of capacity, is the main approach suggested by uneven use patterns, and by attitudes valuing solitude, largely rejecting facilities, and substantially accepting regulations. Visitors seem to want information, which suggests an important management technique for modifying use. Modifying use while preserving as much freedom of movement as possible seems to be essential because of visitor attitudes rejecting rigid itineraries.

Visitors everywhere, but especially in the California study area, want wilderness to be only minimally developed. Visitors are not clamoring for higher standard trails or for more developed campsites. Policies that do not provide for comfort and convenience facilities seem to be reasonably consistent with visitor preferences.

Finally, throughout all the motivation and preference responses and data on activities there is a pattern pointing to a need for dispersed recreation management outside of wilderness. Here the goal would emphasize recreation, not perpetuation of natural unmodified ecosystems. Many visitors are strongly oriented toward fishing, which exceeded wilderness attributes as an appeal in several areas, and, in most all areas, over half of the visitors fished. The situation for hunting was similar. Both fishing and hunting could be provided better under more intensive management (such as intensive stocking and habitat improvement) than is appropriate in wilderness.

Scenery is a major appeal, but wilderness does not have a corner on scenery. Solitude is not a major value for many visitors, especially for the numerous day users. Although they are in the minority, many people want more development than most wilderness visitors. Administrative use of mechanical tools, which is fairly well accepted even in wilderness, could be general practice in roadless recreation areas. A more diverse set of roadless recreation settings, with distinctions clearly explained and publicized, could help more people find experience opportunities closer to their preferences, thus better serving the American people.

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APPENDIX

THE QUESTIONNAIRE USED IN THE NINE STUDY AREAS

(This example is the summer form used in the Mission Mountains Primitive Area, which is now a Wilderness.)

Form 1a

OMB No. 40-S-70057
Expires: March 31, 1973
Questionnaire No. ☐☐☐☐

FOREST SERVICE WILDERNESS STUDY

All of the following questions refer to the visit you made to _____

_____ about _____, 1970.

IMPORTANT! The term "wilderness" in this questionnaire means the roadless, undeveloped country reached only by trails or waterways. These questions refer only to the wilderness portion of your trip, not to places along the roads.

1. How many people were in your party in the roadless wilderness on this trip, including yourself? _____ How many were under 16? _____

   Were these people (skip if you were alone):

   ☐ A family or families

   ☐ A family plus friends

   ☐ Friends and acquaintances

   ☐ From an organization (Scouts, Club, etc.)

   ☐ Other (describe _____)

2. How did you travel in the wilderness (the roadless country) on this visit? (check all that apply, but if more than one, underline the way you traveled most)

   ☐ Hiked, carrying our equipment ourselves

   ☐ Hiked, leading horses, mules, or burros

   ☐ Horseback

   How many horses, mules, or burros did your party take? _____

   Were these animals turned out to graze? ☐ No ☐ Yes

   Was supplemental feed packed in? ☐ No ☐ Yes

   If yes: What kind of feed? ☐ Hay ☐ Grain ☐ Pellets

   ☐ Boat, canoe, raft, etc., with motor

   ☐ Boat, canoe, raft, etc., no motor

   ☐ Other (describe _____)

3. Which of the following things did you do in the wilderness (the roadless country) on this visit? (check only those things that you personally did)

- ☐ Fish
- ☐ Hunt
- ☐ Hike
- ☐ Take pictures
- ☐ Nature study (bird watching, identifying wildflowers, rock study, etc.)
- ☐ Mountain climb (using ropes, special equipment, etc., not just hiking up)
- ☐ Swim
- ☐ Other (describe _____)

4. Which of the following wildlife did you see in the wilderness (away from the roads)? (check all that you saw)

☐ Grizzly bear	☐ Elk	☐ Moose
☐ Black bear	☐ Deer	☐ Coyote
☐ Bear, not sure which kind	☐ Mountain goats	☐ Bald eagle
	☐ Bighorn sheep	☐ Other _____

5. Did your party stay out overnight in the wilderness country beyond the road on this visit?

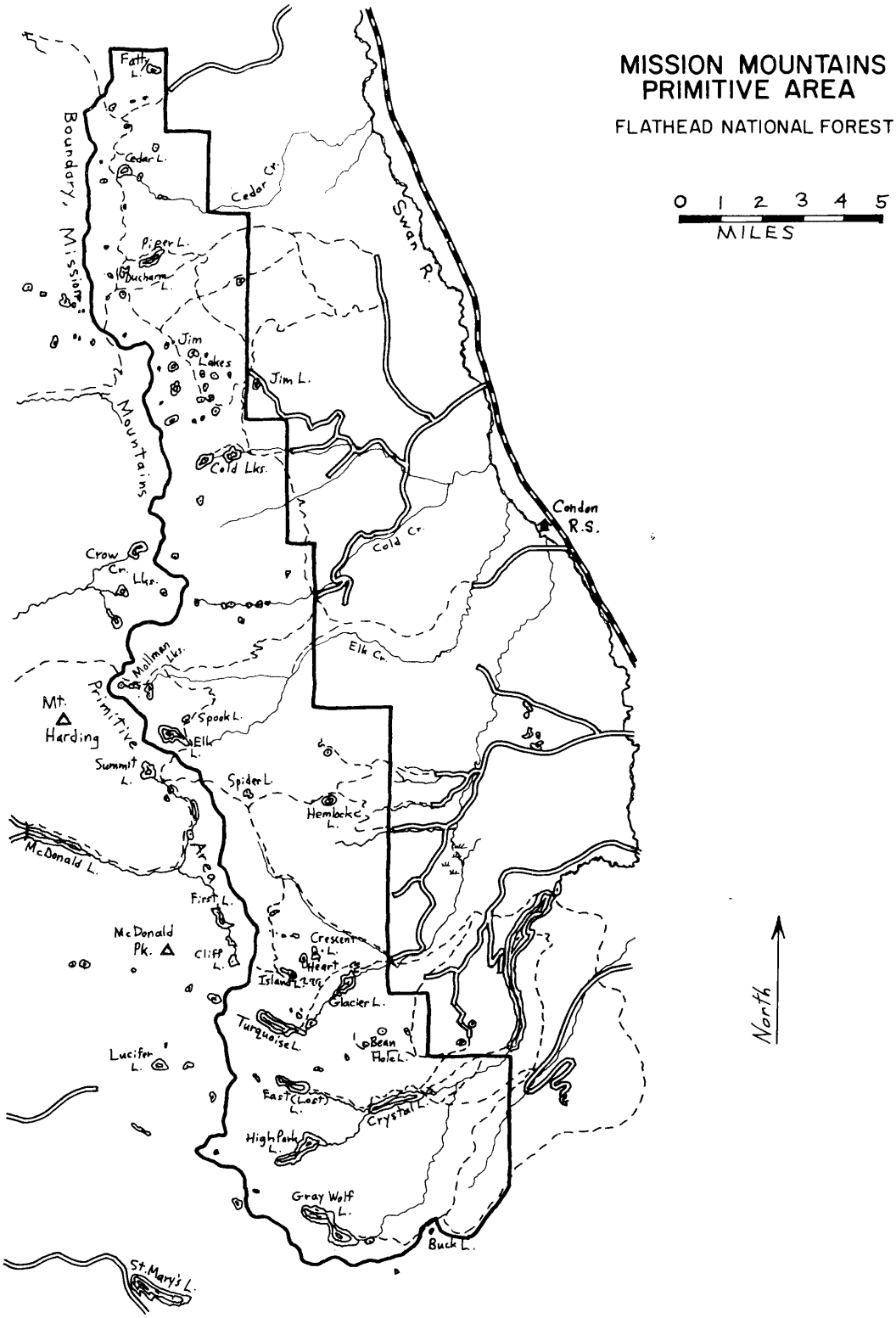
☐ No ☐ Yes → (Total number of nights _____. Did you build a woodfire ☐; or use a gas stove ☐; or both ☐?)

6. Did an outfitter or guide go with you?

☐ No ☐ Yes → (Was it a fully outfitted trip ☐; or a "spot pack" or "drop camp" (brought in and left) ☐)

On the map below please: (A) Draw an arrow ⟿ along your route (off the road). Include any off-trail travel. (B) Mark your campsites with an "X" and write the number of nights you spent at each campsite next to the "X".

6



7. Did your party have maps or guidebooks for the wilderness you visited?

   ☐ No ☐ Yes → (What kinds? _____

   _____)

8. Please estimate <u>your</u> <u>share</u> of the expenses for this wilderness trip for the two items below (whether or not you personally paid any part of the costs of the trip).

   a. Traveling to and from the wilderness (including meals and lodging while traveling) . . . . . $_____

   b. All other expenses (including outfitter's fees, licenses, film, food, and equipment bought for camping, hunting, or fishing). Do <u>not</u> include the cost of equipment used on previous trips. . . . . $_____

9. Was this your first visit to a roadless wilderness?

   ☐ Yes ☐ No → (At about what age did you first visit a wilderness? _____ Was this with your parents?
   ☐ Yes ☐ No)

10. Did you ever go car camping with your parents? ☐ Yes ☐ No

11. Have you visited this particular wilderness before?

   ☐ No

   ☐ Yes → (About how many times? _____)

   If <u>Yes</u>, would you say the quality of the area was:

   ☐ Getting better
   ☐ About the same → Any comments? _____
   ☐ Getting worse _____

12. Including this visit, how many <u>times</u> did you visit a roadless wilderness in the past 12 months? _____

    How many total <u>days</u> did you spend in the wilderness on all visits in the past 12 months? _____

The following questions ask for your personal opinion or attitude about the wilderness area. This information will assist the Forest Service to better manage the wilderness.

13. What was your main reason for choosing to visit this kind of area (a roadless wilderness) for this trip? _____

_____

14. How satisfied were you, personally, with this trip into the wilderness? (Just the country beyond the end of the road.) What kind of a grade would you give it? (check one)

- ☐ A, very good
- ☐ B, good
- ☐ C, fair
- ☐ D, poor
- ☐ F, very poor

What was there about this trip that made you feel this way? _____

_____

_____

_____

15. When you are camped in the roadless wilderness, about how many other parties would you like camped within sight or sound of your campsite? _____

On this trip into the wilderness, were you able to find this preferred kind of campsite:

☐ Every night ☐ Some of the time ☐ None of the time

16. How did you feel about the number of other people you saw in the roadless wilderness country on this visit? (check one)

- ☐ Saw way too few
- ☐ Saw too few
- ☐ About right
- ☐ Saw too many
- ☐ Saw way too many
- ☐ Did not matter to me one way or the other
- ☐ Do not remember

About how many other parties did you see in the wilderness on this trip? _____ How many of these were large parties (say, over 10 people)? _____ How many of the parties had horses or mules? _____

17. How did you feel about the condition of this roadless wilderness country in terms of wear and tear from use, causing erosion and loss of vegetation, and in terms of littering (check one box in each column).

	Wear and tear	Littering
A. Very good	☐	☐
B. Good	☐	☐
C. Fair	☐	☐
D. Poor	☐	☐
E. Very poor	☐	☐
F. Do not remember	☐	☐

→ Please describe what seemed wrong, if anything:

_____

_____

_____

_____

18. Thinking just about the roadless wilderness country, how desirable or undesirable do you think each of the following things is? (check one box after each item)

	Very undesirable	Undesirable	Neutral, neither desirable nor undesirable	Desirable	Very desirable
A. High standard trails (wide, steady grades, fairly straight)	☐	☐	☐	☐	☐
B. Low standard trails (somewhat like a game trail--narrow, grade varies, winding, not the shortest route)	☐	☐	☐	☐	☐
C. Leaving some areas with no trails	☐	☐	☐	☐	☐
D. A few trees blown down across the trail, maybe 1 or 2 a mile	☐	☐	☐	☐	☐
E. Bridges over creeks where hikers would otherwise get wet feet	☐	☐	☐	☐	☐
F. Bridges over rivers that are dangerous for hikers to wade	☐	☐	☐	☐	☐

(continued on next page)

	Very undesirable	Undesirable	Neutral, neither desirable nor undesirable	Desirable	Very desirable
G. Outhouses (pit toilets)	☐	☐	☐	☐	☐
H. Cemented rock fireplaces with metal grates	☐	☐	☐	☐	☐
I. Small, loose rock fireplaces	☐	☐	☐	☐	☐
J. Natural forest fires started by lightning	☐	☐	☐	☐	☐
K. Pole corrals at campsites for horses	☐	☐	☐	☐	☐
L. Closing some areas to use by horse parties	☐	☐	☐	☐	☐
M. Prohibiting wood fires where dead wood is scarce (requiring use of gas stoves)	☐	☐	☐	☐	☐
N. Split log picnic tables at campsites	☐	☐	☐	☐	☐
O. Restricting the number of visitors to an area if it is being used beyond capacity	☐	☐	☐	☐	☐
P. Eliminating grazing by visitors' horses (requiring carrying horse feed)	☐	☐	☐	☐	☐
Q. Requiring all visitors to register when entering	☐	☐	☐	☐	☐
R. A natural fishery--no stocking, and barren lakes left barren	☐	☐	☐	☐	☐
S. Limiting the size of parties to 12 people	☐	☐	☐	☐	☐

(continued on next page)

	Very undesirable	Undesirable	Neutral, neither desirable nor undesirable	Desirable	Very desirable
T. Signs along the trail explaining natural features or early history	☐	☐	☐	☐	☐
U. Burying unburnable garbage	☐	☐	☐	☐	☐
V. Use of chain saws by the administrators to clear trails of trees	☐	☐	☐	☐	☐
W. A guidebook to the wilderness	☐	☐	☐	☐	☐
X. A detailed, accurate map	☐	☐	☐	☐	☐
Y. Issue trip permits so visitors could only camp each night in the area assigned to them	☐	☐	☐	☐	☐
Z. Allow visitors to catch fish to eat in the wilderness but not to bring back out	☐	☐	☐	☐	☐
AA. Rangers or patrolmen in the backcountry	☐	☐	☐	☐	☐

Any comments on the items above? _____

_____

_____

19. How important or valuable are wilderness areas to you personally?

☐ Extremely important

☐ Very important

☐ Fairly important

☐ Not very important

☐ Not at all important

We would also like some background information about you. This information is needed to predict future use and to compare different kinds of recreation areas. We respect your privacy--all this information will be kept strictly confidential.

20. Do you belong to any conservation or outdoor recreation clubs?

☐ No

☐ Yes → (Which ones? _____

_____)

21. Where do you live? And where did you live most of your life before age 18? (check one box in each column) (If you live or used to live in a suburb, answer in terms of the whole metropolitan area.)

	Where do you now live?	Where did you live most of your life before age 18?
A. On a farm	☐	☐
B. Rural or small town (under 1,000 population)	☐	☐
C. Town (1,000 - 5,000 population)	☐	☐
D. Small city (5,000 - 50,000 population)	☐	☐
E. Medium city (50,000 - 1 million population)	☐	☐
F. Large city (over 1 million population)	☐	☐

22. What is the highest year of school you have completed? (circle)

Elementary	High School	College
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16 16+

Are you still a student? ☐ Yes ☐ No

23. What is your occupation? (If retired, show occupation before retirement)

A. What kind of work are you doing? _____

B. What are your most important activities or duties _____

_____

24. Please check the box that comes closest to your <u>total family</u> income, before taxes.

☐ less than $3,000
☐ $3,000 up to $5,000
☐ $5,000 up to $7,000
☐ $7,000 up to $10,000
☐ $10,000 up to $15,000
☐ $15,000 up to $25,000
☐ $25,000 and over

25. How many weeks of paid vacation does the head of your household receive each year? _____

26. Please check the box that applies to you.

☐ Male ☐ Female

27. Your age last birthday? _____

PLEASE MAIL THE COMPLETED QUESTIONNAIRE IN THE ENCLOSED SELF-ADDRESSED ENVELOPE. NO STAMP IS NEEDED; WE HAVE ALREADY PAID THE POSTAGE.

<u>THANK YOU VERY MUCH</u>

☆ U. S. GOVERNMENT PRINTING OFFICE: 1980—677-121/015 REGION NO. 8

Lucas, Robert C.
1980. Use patterns and visitor characteristics, attitudes, and preferences in nine wilderness and other roadless areas. USDA For. Serv. Res. Pap. INT-253, 89 p. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.

Presents a summary and analysis of data from a survey of visitors to eight wildernesses and related areas in the Montana and Idaho Rockies and to one wilderness in the California Sierra Nevadas. Basic data on use patterns, including types of groups, activities, travel behavior, visitor characteristics, motives for visits, satisfaction with conditions experienced, and preferences for management actions are described and compared among areas, between day-users and campers, horsemen and hikers, and summer and fall visitors. Management implications are discussed.

KEYWORDS: Wilderness, recreation, visitor characteristics, attitudes, use distributions, survey research, carrying capacity, California, Idaho, Montana

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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 231 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.

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

Provo, Utah (in cooperation with Brigham Young University)

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