

Mount McKinley National Park
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SURVEY OF BACKCOUNTRY USERS
IN MOUNT MCKINLEY NATIONAL PARK, ALASKA:
A REPORT FOR MANAGEMENT

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SUMMARY OF FINDINGS

Two major conclusions are suggested based on the results from the survey of backcountry users at Mount McKinley National Park in 1978. First, backpackers were overwhelmingly supportive of the Park Service's regulations governing use of the backcountry. Second, although there is some empirical support for the sociological assumptions (on crowding and satisfaction) contained in McKinley's backcountry management plan, most of these assumptions are not substantiated by the survey's findings. Based on this second conclusion, three broad options are available to the Park Service: (1) rewrite the management plan; (2) increase the capacities; or (3) a combination of the first two options.

The specific findings presented in this report can be summarized as follows:

A. Description of Backpackers

McKinley's backpackers in 1978 can be described as follows:

- (1) They tend to be in their twenties (average age of 25 years) and are more often males (70 percent).
- (2) They come from 49 states (plus the District of Columbia) and 22 foreign countries. The highest proportion of the hikers reside in Alaska (28 percent), followed by the western coastal states of California (13 percent) and Washington (6 percent).
- (3) They tend to be well educated and hold professional or technical jobs.

- (4) They tend to be "one-time" visitors, with few having camped in McKinley's backcountry on more than one occasion (14 percent).
- (5) Most of them have had some backpacking experience prior to visiting McKinley (87 percent), although their level of experience does vary.
- (6) Overall, they prefer to recreate in roadless areas compared to more developed outdoor recreation areas.
- (7) Most of them took only one backpacking trip during their visit to McKinley, although half of them also day hiked during their visit.
- (8) Almost all of the backpackers had planned to hike overnight before arriving at McKinley (in contrast to day hikers, who are more spontaneous in their decision).

8. Backcountry Use Patterns

- (1) Overnight backcountry use in 1978 was not distributed evenly among the various zones; but rather, certain zones were more popular (i.e., used more often) than others.
- (2) McKinley's backcountry was significantly underutilized (by about 50 percent) in 1978, given capacities determined by management.
- (3) Backpackers did not use McKinley's backcountry evenly throughout the summer; but rather, backcountry use peaked in late August and on holiday weekends.

C. Crowding and Satisfaction

- (1) For most of the hikers surveyed, the ratio of sightings to density was less than one. That is, it is not necessarily true that the parties assigned to a zone for the same day will see each other at some time during that day. It is possible, therefore, for backcountry zones to have larger capacities (i.e., more hikers allowed to camp on any day) without necessarily resulting in the sighting of more than two parties on any day by those in the zone.

- (2) Solitude is an important feature of the backcountry trip. Furthermore, there is a relatively strong positive relationship between number of parties seen and crowding. That is, as the number of parties sighted increases, the degree of crowding is likely to increase. Also, the most reasonable crowding threshold based on the data is seeing two parties. However, this is not to say that all backpackers who see more than two parties during a day in the backcountry will feel crowded. It is conceivable for a hiker to see one party and feel crowded or for a hiker to see four parties and not feel crowded. In other words, McKinley's backpackers are a heterogenous group. The perception of crowding is due to one's preference and expectation for sightings and one's response to seeing resource impacts, as well as to the number of parties sighted. Therefore uniformly limiting the number of parties in a zone is not the only management option for controlling crowding. Rather,

management can assign a variety of densities to the different zones, thus providing prospective backpackers with a choice ranging from zones with a low-sighting potential to zones with a high-sighting potential.

- (3) Given what they saw, hikers were not necessarily "bothered" by seeing human impact to the resource; or if they were bothered, it was generally "somewhat" rather than "very bothered." Hikers were more apt to be "very bothered" by seeing litter or human waste, and they were more likely to be "not bothered" when seeing vegetation trampling and soil compaction.
- (4) It does not necessarily follow that those who felt crowded or reacted negatively to seeing resource impacts were more likely to become dissatisfied with their backcountry trip. Rather, satisfaction with the trip was due primarily to conditions of the natural environment (e.g., weather, river crossings, rugged terrain) and personal preparation (e.g., equipment, stamina).

D. Management Opinions

Those who backpacked in McKinley's backcountry in 1978 gave their overwhelming support for the regulations governing backcountry use.

However, a couple of changes were suggested:

- (1) That some permits be provided on an advanced reservation basis; and
- (2) That the capacities be based on parties, instead of individuals, with some control for large parties.

Furthermore, a large majority of the backpackers were against any additions (in the form of developments) to the backcountry.

E. Day Hiking

- (1) There are more day hikers than overnight hikers at McKinley. Furthermore, day hikers use (measured in hiker-days) McKinley's backcountry more than overnight hikers.
- (2) Day hikes take place in a limited area of the park. Most day hikes in the backcountry take place in a few zones, usually those near a campground or visitor center.

F. Permit Compliance

- (1) About one-third of those backpackers with a permit in 1978 did not follow all of the instructions on the permit (i.e., they were partial compliers).
- (2) About ten percent of McKinley's backpackers camped in the backcountry without a permit (i.e., they were noncompliers).
- (3) Most of the noncompliers and about half of the partial compliers did not follow the permit system because they did not agree with existing regulations or because they did not like the zones that were available. Furthermore, it does not follow that those who support the permit system will necessarily comply with it.
- (4) About half of the partial compliance was the result of situations which the backpacker had not expected and which forced him or her to alter the itinerary set up by the permit; for example,

bad weather, rugged terrain, poor planning, injury, or equipment failure. Good information might be one way to decrease the extent of partial compliance.

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BACKGROUND

Chapter 1. Introduction

During the summer of 1978, staff from the Cooperative Park Studies Unit, College of Forest Resources, University of Washington, surveyed the universe of hikers camping (with a permit) in the backcountry of Mount McKinley National Park. The survey was done at the request of the Superintendent of McKinley who was concerned with the correctness of, and support for, the management plan governing use of the backcountry. The objectives of the survey were four:

- (a) to develop a profile of persons camping in the backcountry;
- (b) to test the sociological assumptions stated in the management plan for the backcountry;
- (c) to document the opinions of the hikers toward existing regulations and alternative policies for the backcountry; and
- (d) to gather some information about the relationship between people and wildlife.¹

The survey was done in conjunction with similar surveys of backcountry users at Glacier Bay National Monument and Katmai National Monument.²

In addition to the backcountry survey, two exploratory studies were undertaken: (1) a survey of day hikers; and (2) a survey of permit

¹The data on people and wildlife will be presented in a separate report.

²In 1976, staff from the CPSU surveyed hikers on the Chilkoot Trail, which is part of Klondike Gold Rush National Historical Park.

compliance. The backcountry survey only included overnight hikers because the management plan for the backcountry, and consequently the permit system, were geared primarily toward this group. The assumption had been made in the management plan that "day use does not seem to be heavy at this time, in backcountry areas..."³ In fact, however, no systematic information was available on the extent of use of the backcountry by day hikers. Therefore, with the approval of the Superintendent, we gathered data in order to answer two basic questions: (1) how many day hikers were at McKinley?; and (2) how often and where did they day hike? A summary of the findings of the study of day hikers is presented in Chapter 8.

Another concern was the lack of systematic information on whether or not backpackers were complying with the permit system. Again, the assumption, based on reports from the backcountry rangers, was that there were few cases of backpacking parties not following their permit, or of parties camping in the backcountry without a permit. Furthermore, we were interested in obtaining reliable data on this latter group (i.e., persons camping in the backcountry without a permit) because of the assumption, critical to this study, that all backpackers could be contacted when they obtained a permit (i.e., that all overnight hikers entered the backcountry with a permit). Therefore, with the approval of the Superintendent, permit compliance was studied. A summary of the findings of the study of permit compliance is presented in Chapter 9.

³See page 23 of the management plan for McKinley's backcountry.

The purpose of this report is to document how the backcountry survey was conducted and what was learned. In addition to this chapter, and chapters 8 and 9, the report is organized into the following six chapters:

- (1) In Chapter 2, Mount McKinley National Park, focusing on the backcountry, is described.
- (2) In Chapter 3, the methods used to gather the data are explained.
- (3) In Chapter 4, a description of the backpacking public is provided.
- (4) In Chapter 5, figures which indicate the extent of use of the backcountry in 1978 are presented.
- (5) In Chapter 6, information on the trip into the backcountry, specifically addressing the sociological assumptions of the management plan, is provided.
- (6) In Chapter 7, the opinions of the hikers toward management policy are documented.

The report ends with some concluding remarks. Various appendices which are mentioned in the report can be found at the end of the report. A summary of the findings of the backcountry survey is presented at the beginning of the report.

Chapter 2. Research Setting

A. Overview of McKinley

Mount McKinley National Park is located in Alaska, about halfway between Anchorage and Fairbanks (the state's largest cities) and about midpoint in the 600-mile long Alaska range, the chain of mountains that spans central Alaska (see Figure 1 for a map of Alaska). Set aside by Congress as a national park in 1917, and later expanded to its present 3,030 square miles, this vast wilderness area constitutes one of the largest parks in the national park system (see Figure 2 for a map of the park).¹

The park's natural attractions include huge areas of unspoiled backcountry, towering mountains, blue-white glaciers, wide-braided rivers, rolling northern tundra, and abundant wildlife. Grizzly bear, moose, caribou, and wolves roam the tundra, and dall sheep dot the craggy rock faces. The southern portion of the park is rugged and precipitous. The northwestern corner is flat and of low elevation. The northeastern section consists of rough foothills and, at the extreme eastern section, forested valleys. Most of the vegetated area of the park is open tundra: knee-to-hip high brush growing in spongy hummocks. Spruce, aspens, and alders line many of the lower rivers and creeks. A multitude of lakes and ponds can be found in the flat northwestern end

¹At the end of 1978, President Carter signed a proclamation establishing Denali National Monument. This new monument totals 3,890,000 acres and will be part of Mount McKinley National Park.

Figure 1. Map of Alaska

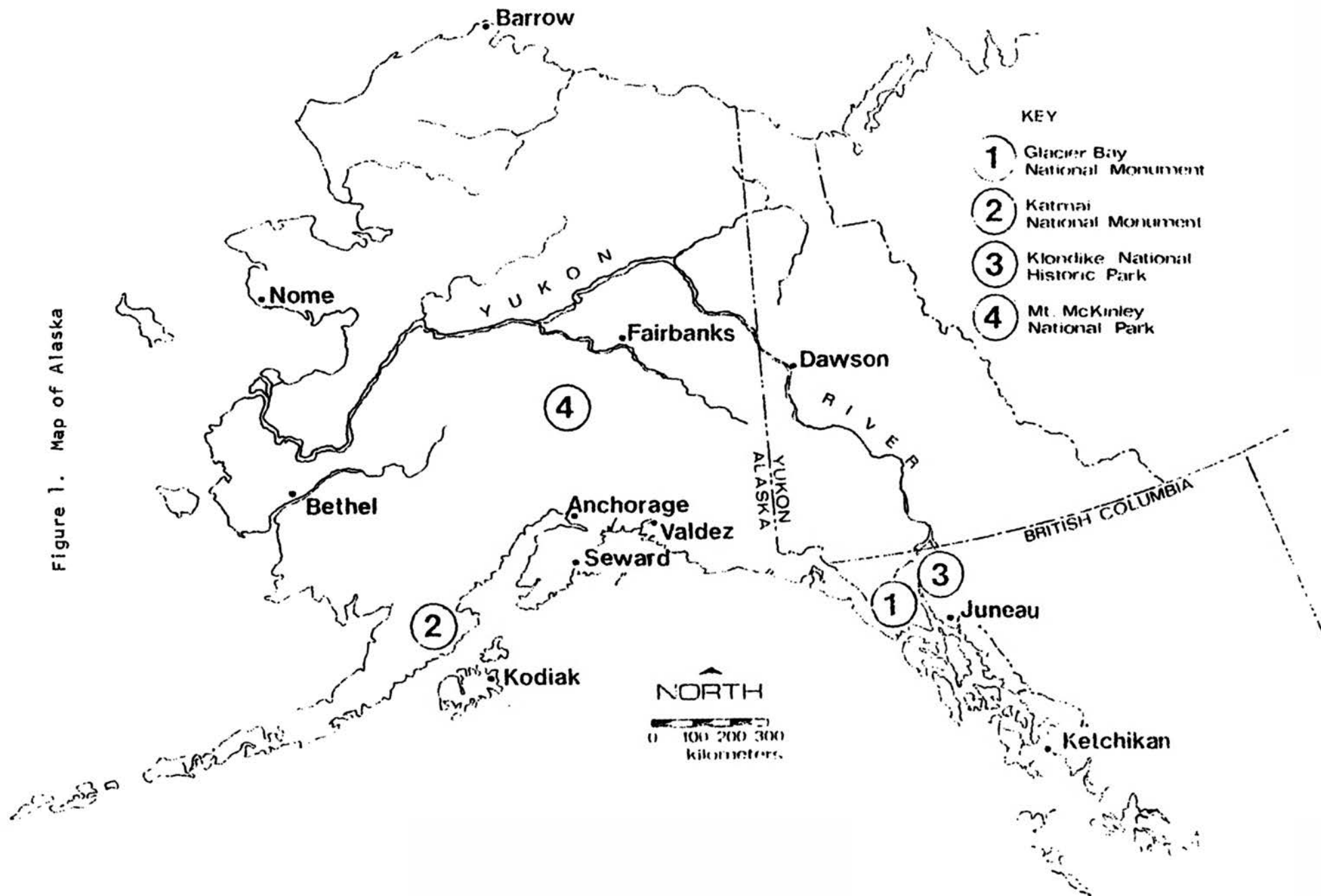
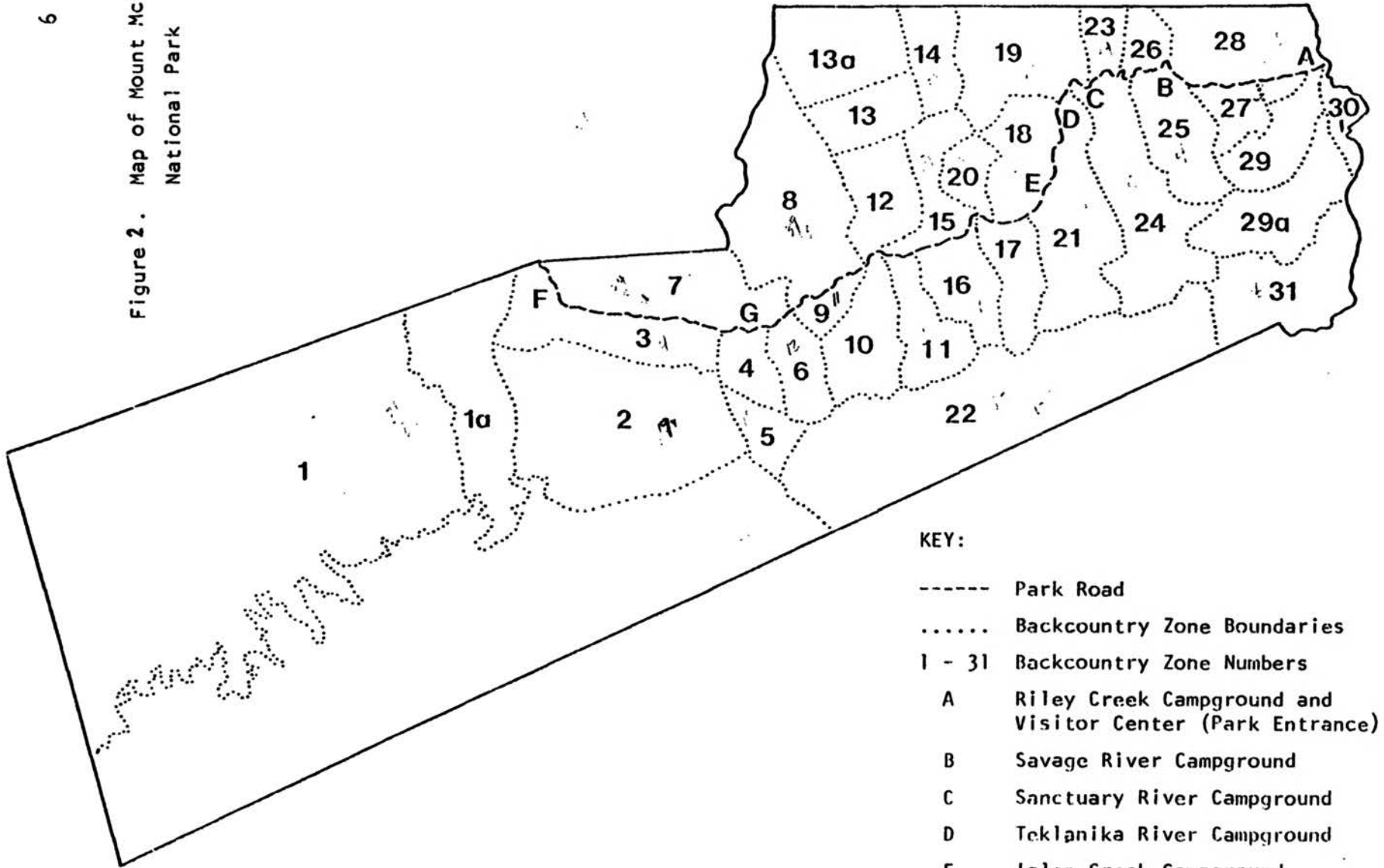


Figure 2. Map of Mount McKinley
National Park



KEY:

- Park Road
- Backcountry Zone Boundaries
- 1 - 31 Backcountry Zone Numbers
- A Riley Creek Campground and Visitor Center (Park Entrance)
- B Savage River Campground
- C Sanctuary River Campground
- D Teklanika River Campground
- E Igloo Creek Campground
- F Wonder Lake Campground
- G Eielson Visitor Center

of the park. Elevations range from about 1,500 ft along portions of the northern boundary to the 20,320-ft summit of Denali (or Mount McKinley).

Extensive glacier systems cover most of the high mountain areas of the park along the crest of the Alaska range. Throughout the summer, these glaciers provide a high output of silty meltwater which feeds the major rivers. Most waterways are braided streams with numerous channels which meander over wide gravel bars. The flow of the rivers and streams can be quite strong and undergoes daily and seasonal fluctuations.

The weather changes often and quickly. It is said that the mountain creates its own weather. Although the park is open year around, it is fully staffed with all its facilities open only for the summer season, from late May to early September. The ambience during the summer is generally cool and moist, with average temperatures for the daytime in the 60s and at night in the 40s. Rainfall is frequent, and snowfall is possible in early and late summer. The summer season has extremely long days and short nights, with virtually 24 hours of dayling during the first half of summer.

An 88-mile road bisects the eastern portion of the park, connecting the entrance to the park with Wonder Lake. The road is paved for the first 14 miles (as far as Savage River), and beyond that it is surfaced with gravel. Automobiles are restricted to the first twelve miles of the park road, except for those in transit to and from a reserved site in one of the campgrounds farther into the park. The majority of visitors to the park, therefore, travel along the park road on a shuttle bus provided by the National Park Service, free of charge. The shuttle buses are yellow school buses which operate on a schedule between Riley

Creek Visitor Center and Eielson Visitor Center (one-way trip about three and one-half hours) and between Eielson Visitor Center and Wonder Lake (one-way trip about one hour). During the busy periods, the buses are usually full, thus requiring some visitors to wait for the next scheduled bus. Such waiting is especially common for parties of day hikers or backpackers who have just returned from a hike and wish to catch a bus to the eastern end of the park. There are five auto campgrounds, a visitor center, and a walk-in campground along the park road. The auto campgrounds at Savage River, Sanctuary River, Teklanika River, Igloo Creek, and Wonder Lake have a limited number of sites: 116 in all. The walk-in campground at Wonder Lake is a small one, for use only by those people who have arrived at Wonder Lake too late in the evening to begin their backcountry trip.

All other facilities and developments are located at the eastern end of the park, which serves as the entrance to the park. The main highway connecting Anchorage and Fairbanks passes through the eastern end of the park. Visitors arriving at the park in an automobile generally stop at Riley Creek Visitor Center, which is the informational center for the park. It is here that arrangements are made to reserve one of the auto campground sites. Nearby, there is a 102-site auto campground, the largest in the park. The visitor center also houses the backcountry desk, where information about the backcountry, as well as a permit to camp in the backcountry, can be obtained.

The railroad station is located next to Riley Creek. Each day, two trains traveling between Anchorage and Fairbanks, one in each direction, stop to disembark and load passengers. A youth hostel, store, gas

station, hotel, and Morino walk-in campground are next door to the train Morino campground is a relatively large area used primarily by hikers before and after their trip into the backcountry. The headquarters for the park are located about a mile from the train depot.

8. The Backcountry

According to the management plan for McKinley's backcountry, the backcountry is defined as "those areas one half mile or more away from the park road, and used on an overnight basis."² Also excluded from the backcountry are those areas around the park entrance and Wonder Lake and the southern portion of zone 20 which is known as "Ram Country." These areas are designated as "administrative areas," which means that camping is restricted to campgrounds. Hiking, however, is allowed. Hiking and camping are not permitted in what is known as Sable Pass Wildlife Area, which is the northern portion of zone 17 and the southern portion of zone 18, bordering the park road. Based on this definition, most of Mount McKinley National Park is managed as backcountry.

Since the completion of the Anchorage-Fairbanks Highway in 1971, visitation to the park has burgeoned. Similarly, use of the backcountry has increased dramatically. Historically, travel by foot in the backcountry was rare. Travel in the backcountry was limited to horse or wagon parties, usually miners involved in prospecting ventures. In 1974, 2,469 hikers camped in the backcountry. Four years later (1978),

²See page 9 of the management plan for McKinley's backcountry.

the number of backpackers more than doubled to 5,187 persons (see Figures 3 and 4).³

Given, then, this increase in the number of hikers camping in the backcountry, the National Park Service became concerned with resulting "impacts on the natural resource and on visitor satisfaction." In order to ensure that these impacts did not "exceed levels determined to be acceptable," the Park Service developed a management plan for the backcountry which was based on various biological and sociological assumptions⁴ and which outlined regulations to restrict use of the backcountry by overnight hikers.⁵ In 1972, the management plan was implemented, and all overnight hikers were required to obtain a permit prior to entering the backcountry.

The backcountry is divided into 34 zones, ranging in size from 430,272 acres (zone 1) to 9,216 acres (zone 20), and averaging about 48,704 acres per zone (see Figure 2).⁶ The Park Service estimates that only about eight percent of the 1,488,500 acres defined as backcountry is likely to be used by hikers because most of the backcountry is inaccessible due to rugged terrain. There are very few developed

³Data for Figures 3 and 4 were obtained from the backcountry permits.

⁴As we stated in Chapter 1, one of the objectives of the backcountry survey was to test the sociological assumptions of the management plan for the backcountry. This is done in Chapter 6. We have not addressed the biological assumptions because these are outside our area of expertise. These assumptions are being studied by other researchers.

⁵Day hikers are allowed to hike anywhere in the backcountry whenever they want, except when a zone is partially or completely closed to hikers.

⁶See Table 90 in Appendix 11 for the size of each backcountry zone.

Figure 3. Backcountry use at McKinley since 1974 (number of overnight hikers).

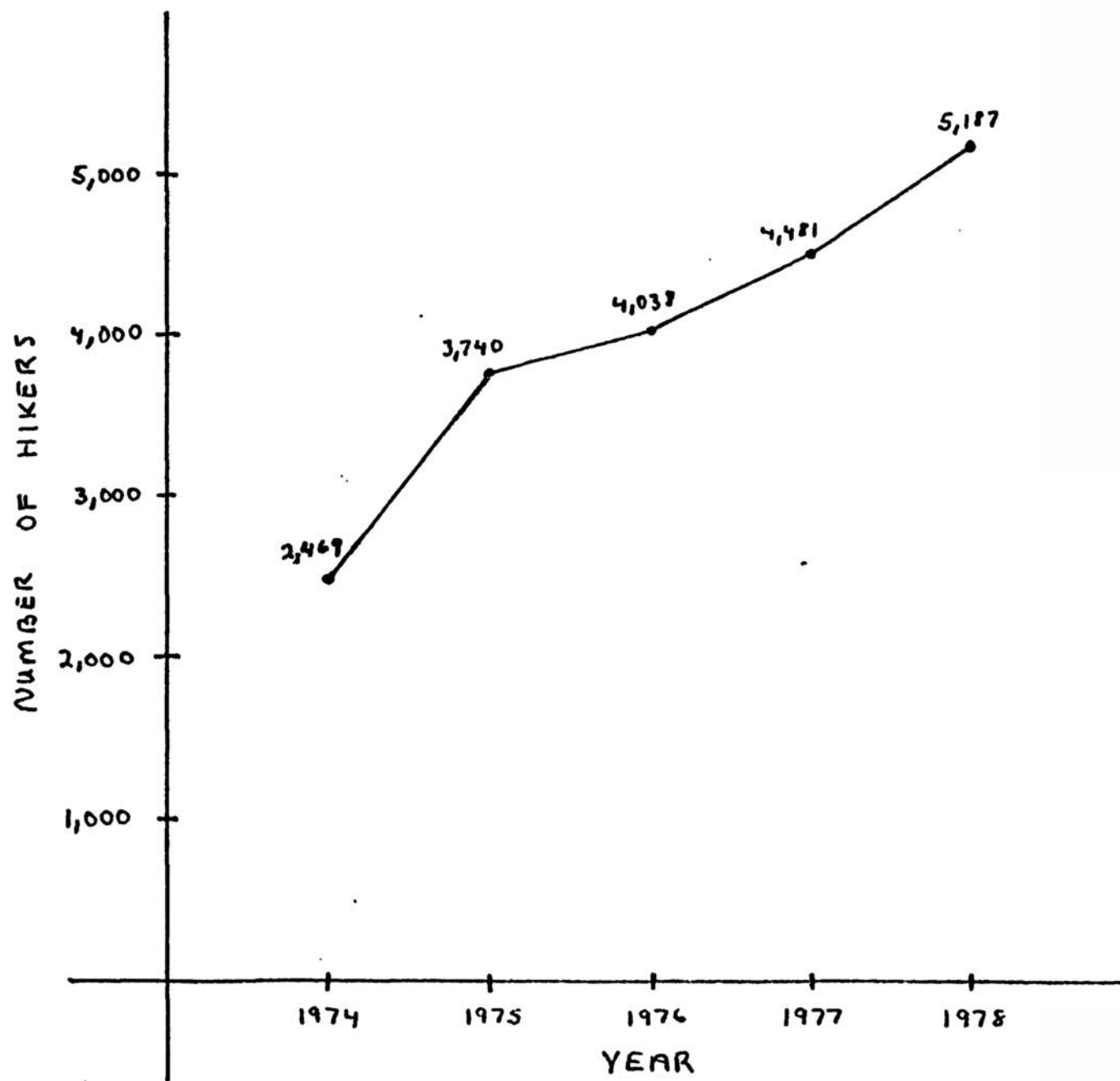
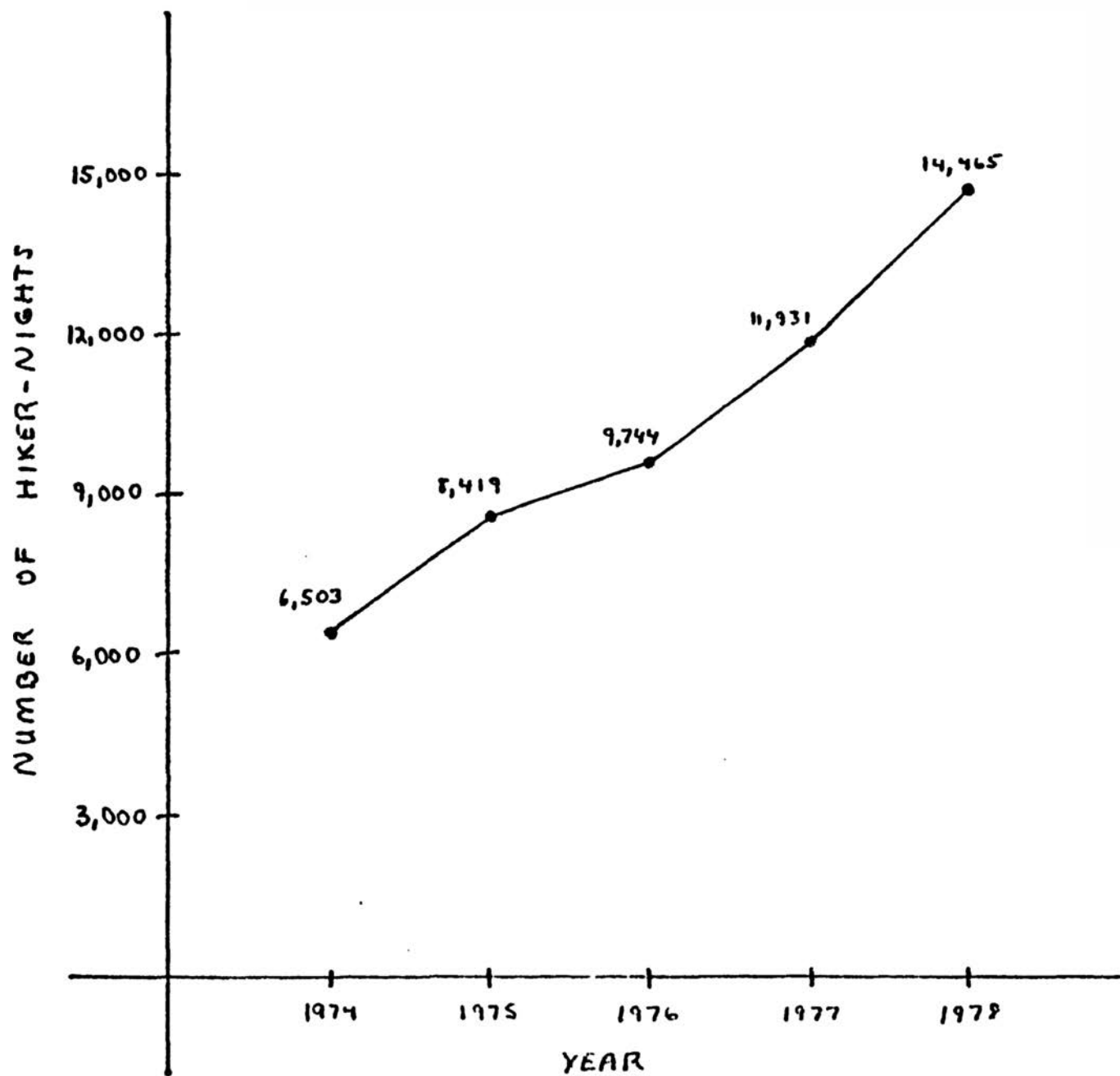


Figure 4. Backcountry use at McKinley since 1974 (number of hiker-nights).



trails in the backcountry, so hikers must follow the natural routes of river drainages, ridges, and wildlife trails. Each zone has been assigned a capacity, ranging from two to twelve hikers, with most zones having a capacity of six hikers (see Table 19 in Chapter 5 for the capacities for the zones). Two of the remote zones (zones 1 and 13a) do not have capacities (i.e., unlimited camping is allowed). The capacity for a zone represents the maximum number of hikers allowed to camp on any night. Overnight hikers are allowed to hike anywhere in the backcountry, but they must camp in the zone and on the night written on their permit. A backcountry zone can be partially or completely closed to all hiking activity either to protect wildlife and their habitat or to protect hikers from unpredictable wildlife.

Backcountry permits can be obtained at Riley Creek and Eielson Visitor Centers or from a park ranger. Most permits are distributed from the backcountry desk at Riley Creek Visitor Center. Backpackers are free to choose in which zones they want to camp, as long as there is space available. A permit is made out to a hiking party. It can be obtained no more than 24 hours in advance of the first effective night, and it has a maximum length of 14 nights. Upon returning from their backcountry trip, backpackers are asked to return their permit to one of the visitor centers.

Once in the backcountry, hikers are asked to follow a few regulations in addition to the zones and dates written on the permit. These are: (1) campfires are not allowed in the backcountry; (2) campsites must not be visible from the park road; and (3) vegetation and wildlife must not

be harmed. There are no developments in the backcountry, such as shelters, bridges, signs, or trails, so backpackers are on their own once they begin their trek.⁷

⁷ Besides the few trails already mentioned, there are a few cabins operated by and for the Park Service.

Chapter 3. Methodology

The field stage of the survey of McKinley's backpackers covered the period from May 26 through September 10, 1978. Our intent was to contact all backpackers (including concessionaire employees but excluding Park Service personnel) using the backcountry during this period. In order to accomplish this, the study population was contacted about the survey and asked to fill out certain forms at the time they obtained a backcountry permit. According to park regulations, all overnight hikers had to secure a permit before entering the backcountry (see Chapter 2 for more information on the backcountry permit system). Backcountry permits were issued at one of three places: (1) at Riley Creek Visitor Center; (2) at Eielson Visitor Center; and (3) by park rangers. Almost all of the permits were filled out at one of the two visitor centers, with most of these issued at the backcountry desk in Riley Creek Visitor Center.

Four full-time field workers were hired to carry out the survey at McKinley.¹ In addition, they were responsible for managing the backcountry desk at Riley Creek Visitor Center. At least one of them was stationed at the backcountry desk every day from 7:00 a.m. to 7:00 p.m., which was the time when most permits were issued. Since Riley Creek Visitor Center was open from 5:00 a.m. to 11:00 p.m., Park Service personnel handled the permit and survey forms when the field workers were off duty. At Eielson Visitor Center, Park Service personnel took

¹The four field workers were: Georgiana Dix, Arthur Loder, Lezlie Murray, and Anna Plager.

care of all of the permit and survey forms. This was also the case for those park rangers who, at times, were asked to issue a permit.²

A. Research Instruments

Data for the survey were obtained using five instruments: (1) backcountry tally sheet; (2) backcountry permit; (3) pre-trip questionnaire; (4) party form; and (5) mail questionnaire. The latter four directly involved the backpacking public. Furthermore, since the field workers lived, worked, and hiked in McKinley for the entire summer, they were able to provide useful insights and information regarding backcountry use at McKinley based on their observations.³

Backcountry tally sheet. Each day (usually in the morning), the field worker on duty wrote in the tally sheet the number of hikers and hiking parties who had supposedly camped in each of the 34 backcountry zones on the preceding day (see Appendix 1 for a copy of the backcountry tally sheet). This information was obtained from the backcountry reservation cards at Riley Creek Visitor Center. Data from the tally sheet represent the most accurate figures available on actual backcountry

²During the general orientation sessions held in May, all Park Service personnel who might possibly be involved in issuing a backcountry permit were trained on how to handle the various survey forms. Throughout the summer, especially during the first few weeks, the field workers monitored the work of Park Service personnel related to permit and survey forms in order to ensure that these were being filled out correctly.

³Some of these observations were communicated to McKinley's managers in a report written soon after the field season had ended" Georgiana Dix et al. "Observations on Backcountry Management at Mount McKinley National Park," October 1978.

use. Insofar as backpackers reported to the permit desk that they had returned early from their backcountry trip or they did not use their permit at all, numbers on the tally sheet and reservation cards were changed accordingly. Based on data from the mail questionnaire, 42 percent of the study population ($N = 3,324$) either did not use their permit or returned early. Of those who returned early or did not use their permit ($N = 1,383$), 58 percent indicated that they informed Park Service personnel (which includes the field workers) of the vacancy in the zone(s) in time for others to possibly use (see Chapters 5 and 9 for a more detailed discussion of this).

The tally sheet was used for two reasons. First, it provides a more accurate profile of backcountry use patterns in 1978 than does information compiled from the backcountry permits. A discussion of the results from the tally sheet can be found in Chapter 5. Second, for the analysis in Chapter 6 where we compare the number of hiking parties sighted with the number of parties supposedly in the zone, it was necessary to know how many hiking parties were in each backcountry zone on each day.

Backcountry permit. As noted in Chapter 2, the Park Service requires all hiking parties planning to camp in McKinley's backcountry to obtain a backcountry permit prior to entering the backcountry (see Appendix 2 for a copy of the backcountry permit). The permit specifies in which backcountry zones and on which dates a party can camp in the backcountry. This information was also written on pages 3 and 4 of the mail questionnaire where there were various questions dealing with each day of the backcountry trip. This was done to help the respondent remember some of the specifics of his or her backcountry trip.

The permit was in triplicate: the original was given to the hiking party; one copy went to the data processor; and the other copy (pink in color) was kept at McKinley. Prior to beginning the survey, the permits were numbered on the back of the pink copy, giving each permit a unique number (beginning with 1). This permit number was also written on the pre-trip questionnaires of those party members obtaining the permit. The permit number served two purposes. First, when sending reminders (along with another questionnaire) to nonrespondents, the permit number enabled us to trace the pink copy of the permit belonging to the nonrespondents. In this way we were able to provide the correct permit information on pages 3 and 4 of the new questionnaire being supplied. Second, the permit number, in effect, became the party number, thus enabling us to reconstruct the parties when analyzing the data.

Pre-trip questionnaire. While the backcountry permit was being filled out by the permit officer, each member of the party obtaining the permit was asked to fill out a pre-trip questionnaire (see Appendix 3 for a copy of the pre-trip questionnaire).⁴ There were two reasons for this questionnaire. First, it allowed us to gather some data on the hikers' expectations for their upcoming hike. Second, it enabled us to compare those who did and did not respond to the mail questionnaire to see if the population of respondents was representative of all hikers. Attached to the pre-trip questionnaire, there was an index card on which

⁴A few times, not all of the party members were present. In such instances, we asked the party members present to give a pre-trip questionnaire and mail questionnaire to each of the absent party members. Whenever possible, we had the party members present fill out an address card for each of the absent party members.

the hiker wrote his or her mailing address (see Appendix 4 for a copy of the address card). The address was used to send reminders to nonrespondents as well as a summary of the findings to those requesting such. Upon completing the pre-trip questionnaire, each party member was given a mail questionnaire which had a unique number.⁵ The questionnaire number was written on the pre-trip questionnaire and the address card, thus enabling us to identify the nonrespondents and to combine the data from the pre-trip and mail questionnaires. Furthermore, the permit number was written on the address card. The hiking party was then given its permit, and the members were on their way.

Mail questionnaire. Each overnight hiker participating in the survey was given a questionnaire to be filled out after the backcountry trip and to be returned either by mail or at the park. Each questionnaire had a unique number (beginning with 1), which was printed on the back side. Along with the questionnaire, each hiker was given a stamped, addressed envelope in which to return the completed questionnaire. Since there were more questions than we felt any one hiker should have to answer, two questionnaires were prepared, one yellow and the other green (see Appendix 5 for a sample of the questions in the mail questionnaire). The first 43 questions dealing with the backcountry trip, management opinions, and socio-demographic characteristics were common to both questionnaires. The last set of questions in each questionnaire

⁵A few hikers did not have the time to fill out the pre-trip questionnaire on the spot. So we asked them to at least complete the address card and then to fill out and return the pre-trip questionnaire whenever possible.

differed: in the yellow questionnaire, the questions concerned the respondent's backcountry experience, while in the green one the questions dealt with the respondent's experience with wildlife and his or her background with animals in general. The yellow questionnaires were numbered from 1 to 2999, while the green ones were assigned numbers from 3000 to 5999. These questionnaires were given to all of those on their first overnight hike of the summer. We alternated in distributing them, so that at the end of the summer, we had two randomly selected samples. A shorter version of the questionnaire, which was labeled the "repeater" questionnaire, was prepared for those hikers preparing for their second (or more) backcountry trip of the season. This questionnaire only contained those questions dealing with the backcountry trip (questions #2 through 34 of the main questionnaire). These repeaters were also asked to fill out the pre-trip questionnaire. Those repeaters who had already taken three overnight hikes during the summer were not asked to participate in the survey, although some repeat hikers got tired of filling out survey forms after their first or second trip.⁶

We distributed 4,135 mail questionnaires and received 3,324 completed questionnaires, for a response rate of 79 percent. We set up a drop box at two locations in the park to encourage hikers to fill out their mail questionnaire while at McKinley: at Morino campground and at the train depot. We also encouraged the hikers to leave their completed questionnaires at Riley Creek Visitor Center or with one of the Park Service

⁶ Most of the repeaters were concessionaire employees who lived at McKinley for the summer and took numerous overnight hikes. See Table 91 in Appendix 11 for the number of repeaters who were surveyed.

personnel. About one-fourth of the completed questionnaires were returned at the park (see Table 1).

Table 1. How the completed questionnaires were returned and the number of reminders sent out (N = 3,324).

How returned and number of reminders	Percentage	
Returned at the park	24	
Returned by mail	76	
- No reminders		-40
- One reminder		-21
- Two reminders		-12
- Three reminders		- 3

In order to ensure a reasonable response rate, mailing addresses were used to send reminders to nonrespondents. About one-third of the completed questionnaires were returned by mail after at least one reminder had been sent out. A maximum of three reminders were mailed to the nonrespondents. Each reminder included another questionnaire (with the original number) and a stamped, addressed envelope along with a letter (see Appendix 6 for a copy of the reminder letters). The first reminder was sent a couple of weeks after the original questionnaire had been distributed. The second and third reminders were mailed in early and late fall, respectively. For the third reminder, we added a different twist by including in the packet a one-page questionnaire for nonrespondents (see Appendix 7 for a copy of the nonrespondent questionnaire). The purpose of this questionnaire was to acquire some additional data

(primarily management opinions) by which to compare respondents and nonrespondents, as well as to determine why they did not fill out the mail questionnaire. In our letter, we encouraged the nonrespondent to complete either the mail questionnaire or the nonrespondent questionnaire. Of the 772 nonrespondents, 45 of them completed the nonrespondent questionnaire, for a response rate of 6 percent.

When using the survey method (such as the mail questionnaire), there is always the question as to the validity of the data. In the McKinley situation, the validity of the data can be questioned on two accounts: (1) the respondent's memory; and (2) the respondent's honesty. First, the hikers were encouraged to complete the mail questionnaire as soon after the hike was possible. Based on the figures in Table 1, 24 percent of the completed questionnaires were returned at the park, and an additional 40 percent were returned by mail before the first reminder was sent out. In fact, over three-fourths of the completed questionnaires were returned before the second reminder was sent out in early fall. This means that most of the respondents filled out the questionnaire relatively soon after their trip, while their memory of the trip was reasonably accurate. We conclude, therefore, that the validity of the data in terms of the memory of the respondents is good. Second, the hikers were guaranteed by the Superintendent in a letter at the beginning of the mail questionnaire that their "responses will be held confidential." Only a few of the questions in the mail questionnaire (those dealing with permit compliance) were in any way sensitive and thus subject to misleading answers. As discussed in Chapter 9, the study of permit compliance was partly undertaken to address this potential

methodological problem. Given the findings in Chapter 9 as to the validity of the data on permit compliance, we conclude that the validity of the data in terms of honesty is good.

Party form. The idea for the party form was to have the field worker (or Park Service employee on duty) collect some information about the hiking party by means of observation and interviewing (see Appendix 8 for a copy of the party form). It turned out that in many instances this form was not completed properly, mainly because there were already too many forms. Therefore, the data from the party form must be treated with some caution. On the back side of the party form, the survey person was able to document those backpackers not participating in the survey. Although our intent was to contact all of the backpackers, regardless of age, participation in the survey was voluntary. Some backpackers chose not to participate for a variety reasons: (1) too young; (2) foreigner, so unable to read and write English; (3) did not wish to cooperate with the survey; and (4) a repeater who was tired of being surveyed or who had already been surveyed on three different occasions. A few backpackers were not told about the survey because the survey person forgot to tell them. For all of these nonparticipants, information about their age, sex, residence, and reason for not participating was written on the back side of the party form.

B. Study Population

Universe. The goal of the backcountry survey was to contact the universe of overnight hikers who obtained a backcountry permit; that is, to encourage all overnight hikers (excluding Park Service personnel but

including concessionaire employees),⁷ visiting McKinley's backcountry from May 26 through September 10, 1978, to participate in the backcountry survey.⁸ Our records show that we contacted 4,447 hikers during the study period. Results from the backcountry permits indicate that the universe of overnight hikers during the study period was 4,883 overnight hikers,⁹ which means that we contacted 91 percent of the universe.

There are four factors which help to explain why we missed contacting the universe by nine percent. First, some of the 436 hikers we missed could have been Park Service personnel. Park Service personnel were not defined as part of the study population, although they were required to obtain a backcountry permit. Part of our plan was to identify all of the permits for Park Service personnel and total these at the end of the summer. We counted 74 permits obtained by Park Service personnel, representing 141 hikers and 326 hiker-nights. Although the study of permit compliance indicates that many Park Service employees did not obtain a backcountry permit, it is difficult to believe that only 74 permits were filled out by some one hundred Park Service employees

⁷Park Service personnel are required to obtain a backcountry permit prior to camping in the backcountry. However, they can camp in any of the backcountry zones regardless of whether there is space available.

⁸The study period of May 26 through September 10, 1978, was chosen because this was the period when backcountry permits were distributed at Riley Creek Visitor Center. According to figures obtained from the backcountry permits, there were a total of 5,187 hikers who received a backcountry permit in 1978. Ninety-seven percent of them (or 5,024 hikers) were in the park during the study period.

⁹The backcountry permits were analyzed by the National Park Service office in Washington, D.C. The actual total was 5,024 hikers, but we subtracted 141 hikers whom we knew for sure were Park Service personnel.

during the course of the summer (see Chapter 9 for more information on the study of permit compliance). In other words, some of the permits which belonged to Park Service personnel were not labeled as such, and so they were never included in our count.

Second, some hikers were told or already knew about the backcountry survey but did not participate in the backcountry survey (i.e., did not fill out the forms) either because they were repeaters, or foreigners, or children, or because they did not wish to participate. In such cases, certain information was supposed to be provided on the back side of the party form. We believe that at times this was not done, especially when a Park Service employee was in charge. We believe that this generally occurred with the concessionaire employees (about 144 of them) who were part of the study population and who took numerous hikes throughout the summer. At some point, they ceased participating in the survey, either because they were getting tired of the surveys or because they had already been surveyed on three backcountry trips, which was the limit.

Third, some of the 436 hikers were never told about the backcountry survey. As we mentioned at the beginning of the chapter, Park Service personnel assisted in handling both the permits and survey forms. At times, they might have forgotten or not had the time to fill out the survey forms or been unsure how to handle the survey forms.

And fourth, at times a backcountry permit was filled out, but then the visitors decided not to use the permit. They were not included as part of the study population, but somehow the white copy of their permit was counted. This might account for a small percentage of the 436 hikers we missed.

An issue which needs to be addressed is whether the universe of McKinley's overnight hikers is reasonably represented by the results of the backcountry permits. In other words, did all overnight hikers in McKinley's backcountry in 1978 obtain a backcountry permit? According to the study of permit compliance which is presented in Chapter 9, seven percent of those overnight hikers sampled ($N = 475$) camped in the backcountry without a permit. Another issue is whether some of McKinley's visitors decided not to camp in the backcountry because they could not obtain a permit for their preferred zone(s). In other words, how many prospective hikers were there who never went into the backcountry because they could not obtain a permit for certain zones? We do not have quantitative evidence to answer this question; but based on our observations from a summer behind the backcountry permit desk at Riley Creek Visitor Center, visitors interested in obtaining a permit rarely, if ever, left the Visitor Center without one.

In summary, given this discussion on the universe, we feel reasonably confident that our study population of 4,447 hikers approaches the universe of overnight hikers at McKinley from May 26 through September 10, 1978. One additional point must be made pertaining to the nature of the study population. It represents (almost) the universe of overnight hikers who visited McKinley in 1978. It remains problematic whether this study population is representative of overnight hikers of previous years or future years. Furthermore, we cannot speak to those persons who might have come to McKinley in 1978 to camp in the backcountry but did not do so because of their dislike for existing backcountry regulations. All surveys of visitors suffer from this weakness. In other

words, the study population represents a unique group of people, and so one must be careful when attempting to generalize the findings beyond the study population.

Respondents and nonrespondents. Of the 4,447 hikers comprising the study population, 262 of them (6 percent) did not participate in the survey. These included the following:

- (a) 69 foreign hikers who could not read or write English;
- (b) 63 backpackers who were on their second or third backcountry trip of the summer and were tired of filling out survey forms;
- (c) 53 hikers who had already taken at least three hiking trips and so no longer had to participate in the survey;
- (d) 42 hikers who did not wish to be surveyed;
- (e) 19 backpackers who did not participate because of their young age; and
- (f) 16 hikers who were not informed about the survey.

The pre-trip questionnaire was filled out by all 4,185 participants in the survey, although 197 of them (5 percent of the participants) did not complete it adequately. A yellow questionnaire was given to 1,923 participants; and 1,534 were returned, for an 80 percent response rate. A green questionnaire was given to 1,905 participants; and 1,522 were returned, for an 80 percent response rate. And 357 participants were given a repeater questionnaire; and 268 were returned, for a 75 percent response rate.

Table 2. Response rate for the yellow, green, and repeater questionnaire.

Questionnaire	Number distributed	Number returned	Response rate
Yellow	1,923	1,534	80%
Green	1,905	1,522	80%
Repeater	357	268	75%
Total	4,185	3,324	79%

According to Table 2, overall 4,185 mail questionnaires were distributed and 3,324 of them were filled out, for a total response rate of 79 percent.

Given that there is a nonresponse rate of 20 percent (we are not including the figures for the repeater questionnaire), is the study population of questionnaire respondents representative of the universe of overnight hikers? In other words, do the respondents and nonrespondents differ in terms of various variables? These questions are answered in Tables 3 and 4 where we have documented some data from the pre-trip questionnaires and the mail questionnaires, respectively.

Table 3. Comparison between respondents and nonrespondents based on data from the pre-trip questionnaire.

Variable	Respondents (N = 3,056)	Nonrespondents (N = 772)
Average age	25.7	24.6
Sex		
- Male	69%	73%
- Female	31%	27%
Residence		
- Alaska	26%	32%
- Other U.S. states	69%	60%
- Foreign country	5%	8%
Average response to the question: About how many hiking parties, if any, do you think you are likely to see each day on your upcoming hike in the McKinley backcountry?	2.3	1.9
Average response to the questions: How would you feel if you saw the following number of parties (average size of 2) in the McKinley backcountry? ¹⁰		
- No parties per day	1.5	1.6
- 1 party " "	1.7	1.8
- 2 parties " "	2.1	2.2
- 3 parties " "	2.7	2.7
- 4 parties " "	3.2	3.2
- 5 parties " "	3.7	3.6
- 7 parties " "	4.1	4.0
- 9 parties " "	4.4	4.3
- 15 parties " "	4.7	4.5
- 20 parties " "	4.8	4.6

¹⁰The possible answers ranged from 1 ("very pleasant") to 5 ("very unpleasant").

Table 3. (Continued)

Average response to the question: How important is each of the following factors to your having¹¹ an enjoyable trip in the McKinley backcountry?

- Views of Mount McKinley	2.4	2.3
- Solitude	2.0	1.9
- Seeing wildlife	1.7	1.7
- Fellowship with party members	2.5	2.5
- Avoiding certain wildlife	3.5	3.4
- Physical challenge	3.0	2.9
- Hiking on tundra	3.3	3.4
- Hiking on glacier or snow	3.8	3.6
- Observing wildflowers and other vegetation	2.2	2.3
- Seeing other parties	4.6	4.4
- Wildness	1.7	1.7

The information in Table 3 is suggestive that there is little difference between respondents and nonrespondents in terms of the data obtained from the pre-trip questionnaire. There are, however, proportionally more Alaskans and foreigners among the nonrespondents, although the difference is not large. We are also able to compare respondents and nonrespondents on the basis of certain items in the mail questionnaire. As we explained in the first part of the chapter, six percent of the nonrespondents returned a special nonrespondent questionnaire; and it remains problematic whether this six percent are representative.

¹¹The possible answers ranged from 1 ("very important") to 5 ("not important").

Table 4. Comparison between respondents and nonrespondents based on data from the mail questionnaire and nonrespondent questionnaire.

Variable	Respondents (N = 3,056)	Nonrespondents (N = 45)
Average response to the question: Overall, how would you rate this backcountry trip? ¹²	3.8	3.4
Average response to the question: What are your feelings about each of the following regulations that govern backcountry use in Mount McKinley National Park? ¹³		
- Backcountry travel permits only may be obtained 24 hours in advance of one's trip.	2.5	2.9
- Overnight hikers only may <u>camp</u> in the backcountry zones specified by their permit	1.9	2.6
- Backcountry campsites must not be visible from the park road.	1.5	1.9
- Campfires are not allowed in the backcountry.	1.9	2.3
Average response to the question: About how many overnight backcountry trips (including winter trips) did you take <u>during the 12 months</u> prior to this visit to McKinley?	5.5	4.1

Again, the figures in Table 4 are evidence that the population of respondents is representative of the universe of overnight hikers at McKinley in 1978. In other words, the nonrespondents are not necessarily those hikers who had an unusually bad experience in the backcountry or who are opposed to the park's regulations. In fact, only 14 percent of the nonrespondents (N = 45) indicated that they opposed the policy

¹²The possible answers ranged from 1 ("poor") to 5 ("perfect").

¹³The possible answers ranged from 1 ("strongly support") to 5 ("strongly oppose").

whereby "backcountry zones have set capacities for the number of overnight hikers allowed on any given night." Furthermore, 14 percent of these nonrespondents informed us that they never took their backcountry trip. Although they were supposed to fill out the mail questionnaire even if they decided not to camp in the backcountry, some hikers did not return their questionnaire for this very reason.¹⁴ In other words, this might account for some of the nonresponse. In answer to the question why they did not fill out the mail questionnaire, the two predominant reasons were: (1) "questionnaire was too long" (67 percent); and (2) "did not have time" (62 percent).¹⁵ In conclusion, the evidence we have provided in Tables 3 and 4 allows us to assume that the survey's nonresponse of 20 percent does not bias the data provided by those who completed the mail questionnaire.

C. Experimental Zones

Thirty-two of McKinley's 34 backcountry zones have a capacity for the number of campers allowed on any night. For most of them, the capacity is 6 hikers, although there are a few zones where the capacity is 2, 3, or 12. (The reader should turn to Chapters 2 and 5 for more information on this matter.) Consequently, the number of sightings of other hiking parties while in the backcountry would always be relatively low. We were concerned about this because one of the survey's objectives

¹⁴Ten percent of the respondents (N = 3,324) indicated that they did not use their backcountry permit.

¹⁵See Table 92 in Appendix 11 for the reasons why nonrespondents did not return the mail questionnaire.

was to analyze the phenomenon of crowding in the backcountry. The ideal would be to have the study population exposed to a range of sightings (i.e., from zero to some large number; for example, 20 or 30 parties sighted on any day) in order to see how this variation in sightings might influence variation in the perception of crowding. Following a discussion of this issue, McKinley's managers agreed to a higher capacity for some of the zones, which we refer to as "experimental" zones. The following, then, are the experimental zones with the experimental capacities allowed (see Table 5). The dates in parentheses represent when the experimental capacity was in effect. The term "traditional capacity" means the capacity normally enforced by the Park Service.

Table 5. Capacities for the experimental zones.

Zone number (and name)	Traditional capacity	Experimental capacity (and date when in effect)
4 (Mount Eielson)	6	30 (5/26 to 6/5) 20 (6/6 to 8/16)
6 (Sunset/Scotts Peak)	6	30 (5/26 to 6/5) 20 (6/6 to 8/16)
15 (Lower East Fork)	6	20 (7/25 to 9/10)
23 (Lower Sanctuary)	4	20 (6/9 to 9/10)

The four zones were chosen because: (a) they were representative of McKinley's backcountry zones in terms of natural features; and (b) they were popular enough to attract a large number of hiking parties.

What we had here was a quasi-experiment. The fact that some of the zones had experimental capacities was not made known to the hiking public so as not to create a bias in the type of hiking parties who entered these zones. Because the zones were relatively popular, it was not difficult to fill these zones on a voluntary basis. However, the experiment had its difficulties. First, some of the experimental zones were closed to all hikers for part of the summer because of fragile wildlife habitats and because of problems with bear (see Table 17 in Chapter 5). Second, some of the experimental capacities were lowered and then dropped all together because of concern on the part of the managers for the effect the large number of hikers was having on the resource. Third, the assumption that assigning a large number of parties to a zone would necessarily result in a large number of sightings was incorrect, as shown in Chapter 6. The analysis of the data from this quasi-experiment can be found in Chapter 6.

ANAYSIS OF THE DATA

An analysis of the survey's data is organized into four chapters. First, a description of the backpackers is presented. Second, the data from the backcountry tally sheet are analyzed in order to document the patterns of use of the backcountry. Third, the backcountry trip is described, focusing on the issues of crowding and satisfaction with the trip. And fourth, the opinions of the hikers toward the regulations governing use of the backcountry are documented.

Most of the data are presented in tables using percentages and averages (means). When two bars () are found instead of a percentage, it means that the percentage is less than 0.5 percent. If for any table the percentages add up to more than 100 percent, this means that a respondent could have checked more than one response. When it is necessary to indicate the strength and direction of the relationship between two variables, Pearson correlations are used. When analyzing the relationship between various independent variables and one dependent variable, multiple regression is used. An explanation for how to interpret these statistical measures is presented in Appendix 9. Unless otherwise noted on the table, all relationships between variables are statistically significant at the 0.05 level (i.e., that the relationship is due to chance five percent of the time, at most).

The title for most tables is written exactly as the question (to which the table refers) was worded in the questionnaire. A sample of the questions can be found in Appendices 3 and 5.

When studying the tables, the reader should note the study population (N) to which the table refers. For almost all of the tables, one of the following study populations is used:

- (1) the study population of 4,447 backpackers, representing the universe of McKinley's overnight hikers in 1978;
- (2) the study population of 3,988 backpackers who filled out the pre-trip questionnaire;
- (3) the study population of 3,324 backpackers who completed either the yellow, green, or repeater questionnaire;
 - (a) 2,984 of whom actually camped in the backcountry;
 - (b) 2,829 of whom actually camped in the backcountry and correctly answered the questions pertaining to each day of the trip;
- (4) the study population of 9,648 niker-days, representing information provided by the 2,829 questionnaire respondents for each day of their backcountry trip;
- (5) the study population of 1,534 hikers who completed the yellow questionnaire;
- (6) the study population of 1,522 hikers who completed the green questionnaire;
- (7) the study population of 3,056 backpackers who completed either the yellow or green questionnaire.

We read all of the comments (of which there were many) written in the questionnaire. Some of the comments were used to illustrate a point or suggest an idea. If the comments were used as direct evidence, they were coded and quantified using categories suggested by the nature of the comments. A sample of the comments can be found in Appendix 10.

Chapter 4. A Description of the Backpackers

A. Socio-demographic Characteristics¹

Age. Overnight hikers at McKinley ranged in age from two to sixty-five years, with the average being about twenty-five years of age.

Table 6. Age of the backpackers (N = 4,447).

Age	Percentage
14 or less	2
15 to 24	45
25 to 34	37
35 to 54	7
55 or more	1
No information	8
Range: 2 to 65 years	
Average: 25.3 years	

Sex. Male hikers (70 percent) far outnumbered female hikers (30 percent) at McKinley in 1978.

¹ Socio-demographic characteristics of visitors to a park are more useful if one can compare them with similar information from previous years, or from other parks, or from the general population. By doing this, one is able to discuss differences between parks and trends in visitation. We intend to do this sort of analysis using data from all of the Alaskan backcountry surveys.

Residence. Almost all of the backpackers resided in the United States (93 percent). These American hikers (N = 4,130) came from 49 of the 50 states (Delaware was not represented) plus the District of Columbia. Alaska (30 percent), California (14 percent), and Washington (6 percent) had the largest representation.²

Table 7. Residence of the American hikers (N = 4,130).

Region ³	Percentage
Alaska	30
Pacific states	24
Mountain states	7
North Central states	18
Northeastern states	10
Southern states	9
No information	2

²According to data from the backcountry permits for 1975 and 1976, 40 and 45 percent, respectively, of the permits were given to Alaskan residents. Similar information is not available for 1977 and 1978. It could be that data from the permits overestimate the percentage of hikers who are Alaskan residents (i.e., party leaders, those who fill out the permit, are more often Alaskans).

³The five regions are comprised of the following states, with the number in parentheses representing the number of respondents from that particular state:

- a. Pacific states: Washington (250), Oregon (124), California (584), Hawaii (8).
- b. Mountain states: Montana (29), Idaho (16), Wyoming (15), Utah (21), Colorado (145), Arizona (28), New Mexico (24), Nevada (9).
- c. North Central states: North Dakota (4), South Dakota (9), Minnesota (135), Iowa (36), Missouri (31), Nebraska (14), Kansas (16), Wisconsin (121), Michigan (138), Illinois (108), Indiana (34), Ohio (117).
- d. Northeastern states: Maine (10), New Hampshire (15), Vermont (15), Massachusetts (57), Connecticut (33), Rhode Island (6), New York (153), New Jersey (61), Pennsylvania (76).
- e. Southern states: Washington, D.C. (20), Maryland (36), West Virginia (6), Virginia (44), North Carolina (24), South Carolina (14), Georgia (24), Florida (48), Kentucky (16), Tennessee (17), Alabama (5), Mississippi (1), Arkansas (7), Louisiana (9), Oklahoma (10), Texas (97).

Of the Alaskan hikers (N = 1,224), three-fourths of them came from either Anchorage or Fairbanks, the two major cities of Alaska. The next area with the most representation was McKinley Park, primarily because of the concessionaire employees.

Table 8. Residence of the Alaskan hikers (N = 1,224).

Area	Percentage
Anchorage	40
Fairbanks	33
McKinley Park	9
Other areas of Alaska	18

Finally, there were backpackers from 22 foreign countries (N = 317), with two-thirds of them coming from either Canada (22 percent), West Germany (21 percent), Japan (11 percent) or Sweden (10 percent).⁴

Education. More than three-fourths of the backpackers had completed at least one year of college education. The average completed year was 15.3, which is the junior year of college.

⁴See Table 93 in Appendix 11 for a list of the residence of the foreign hikers.

Table 9. What is the highest year of school you have completed?

Highest year of school completed	Percentage of entire study population (N = 3,056)	Percentage of study population not presently attending school (N = 1,999)
Elementary (1-6)	--	--
High school (7-12)	18	15
College (13-16)	52	50
Post college (17-20+)	29	34
No information	1	1
Average	15.3	15.8

The results in Table 9 do not differ appreciably regardless whether the entire study population is considered, or only those no longer attending school.

Occupation. McKinley's backpackers were asked a question regarding their employment status. Over one-half of them were employed and 35 percent of them were attending school.

Table 10. Which of the following describe your present situation? (N = 3,056).

Situation	Percentage
Homemaker	4
Student	35
Employed	58
Unemployed	17
Retired	1
Other ⁵	3
No information	1

⁵Almost all of those who checked "other" indicated that they were in a stage of transition or were travelers. Some examples are: "adventurer," "freelance network," "existentialist," "writing," "itinerant backpacker," "wanderer," "between jobs," "traveler," "volunteer."

They were then asked to describe their present, or most recent, occupation. "White collar" occupations were mentioned most often, regardless whether the entire study population is considered, or only those no longer in school.

Table 11. Please list your present, or most recent, occupation by describing the work you do or did.⁶

Occupation	Percentage of entire study population (N = 3,056)	Percentage of study population not presently attending school (N = 1,999)
White collar occupations	52	65
- professional and technical	- 39	- 50
- manager and administrator	- 5	- 7
- sales	- 3	- 3
- clerical	- 5	- 5
Blue collar occupations	26	23
- craftsmen	- 7	- 7
- operators	- 6	- 5
- laborers	- 5	- 4
- farmers	- 1	- 1
- service	- 7	- 6
Other	20	9
- student	- 13	- 0
- military	- 5	- 6
- homemaker	- 1	- 1
- unable to code ⁷	- 1	- 2
No information	2	3

⁶Occupations were categorized based on categories used by the U.S. Bureau of the Census, Alphabetical Index of Industries and Occupations (Washington, D.C., 1971).

⁷Some of the "occupations" did not fit in with the categories suggested by the Bureau of the Census. Some examples are: "employed as The Culligan Man," "trapper of fur animals," "gondalier," "teach high risk fun," "thief," "observer of world," "volunteer anti-nuke worker."

The figures in Table 11 clearly indicate that a significant group of McKinley's backpackers were or had been employed in a professional or technical occupation.

Income. Finally, hikers were asked for information about their family income. Close to two-thirds of them were members of families earning less than \$20,000 a year. The average family income was about \$13,503.⁸

Table 12. What was your family income before taxes (last year, 1977)? (N = 3,056).

Income	Percentage
Less than \$10,000	32
\$10,000 to \$19,999	28
\$20,000 to \$29,999	16
\$30,000 to \$49,999	10
\$50,000 or more	6
No information	8
Average: \$13,503 ⁸	

⁸The income average was computed by recording the various response categories as follows:

Less than \$ 5,000	= \$ 5,000
Between \$ 5,000 and \$ 9,999	= \$ 7,500
Between \$10,000 and \$14,999	= \$12,500
Between \$15,000 and \$19,999	= \$17,500
Between \$20,000 and \$24,999	= \$22,500
Between \$25,000 and \$29,999	= \$27,500
Between \$30,000 and \$39,999	= \$35,000
Between \$40,000 and \$49,999	= \$45,000
\$50,000 or more	= \$50,000

B. Backcountry Experience⁹

The vast majority of McKinley's backpackers were backpacking in the park for the first time.

Table 13. Had you ever hiked overnight in the McKinley backcountry before this visit to McKinley? (N = 1,534).

Response	Percentage
Yes	14
No	85
No information	1

If the results in Table 13 are extrapolated to previous and future years, then McKinley's backpacking clientele can be characterized, overall, as "one-time" rather than "repeat" visitors.¹⁰ Of those on their first overnight hike at McKinley (N = 1,297), about 40 percent of them were also hiking in grizzly or brown bear country for the first time; and close to 30 percent of them had never hiked cross-country (i.e., hiked without following trails) prior to this visit to McKinley. Of those with previous backpacking experience at McKinley (N = 211),

⁹ Measures of backcountry experience are more useful when comparing hiking populations of different parks or when comparing hiking populations of the same park over the years. Furthermore, backcountry experience can be used as an independent variable to possibly explain differences in behavior or attitudes.

¹⁰ The results in Table 13 suggest one potential type of analysis where we ask the question: do "one-time" and "repeat" visitors differ in their perceptions of crowding? (Nielsen et al. 1977).

they had backpacked at McKinley for an average of 2.2 years (excluding 1973), with the range being from 1 to 20 years; and they averaged 4.3 backpacking trips during their previous visits, with the range being from 1 to 50 trips.

Eleven percent of McKinley's backpackers were on their first overnight hike ever.

Table 14. Had you ever traveled overnight in any backcountry area (including McKinley) before this visit to McKinley? (N = 1,534).

Response	Percentage
Yes	87
No	11
No information	2

Those with previous backpacking experience (N = 1,328) had participated in this activity for an average of 7.4 years, with the range being from less than 1 year to 48 years. During the 12 months prior to this visit to McKinley, they had taken an average of 5.5 overnight backcountry trips (including winter trips), with the range being from 0 to 71 trips. These backcountry trips totaled an average of 14.3 nights-out, with the range being from 0 to 95 nights.

Finally, we asked the respondents to rank the following types of recreational areas according to their personal preference, with 1 meaning most preferred, and 4 meaning least preferred:

- (a) Highly developed campgrounds or picnic areas with many facilities such as paved roads, flush toilets, water faucets, tables, permanent fireplaces, and sometimes electricity and/or faucets;
- (b) Minimally developed campgrounds or picnic areas with only rustic facilities such as outhouses, tables, fireplaces, and water at a few central locations;
- (c) Dispersed road recreation areas where informal campsites have been established, but there are no official facilities;
- (d) Roadless, backcountry or wilderness areas, where the only access is by hiking.

Table 15. Please rank by writing in 1, 2, 3, or 4 the following types of recreation areas according to your personal preference (N = 1,534).

Recreational area	Percentage			
	1 (most preferred)	2	3	4 (least preferred)
Highly developed	2	3	6	83
Minimally developed	10	19	55	10
Dispersed road	11	56	18	9
Roadless	77	11	4	2
No information: 6 percent				

As would be expected, three-fourths of McKinley's backpackers most preferred roadless areas (backcountry or wilderness). However, a few of them indicated otherwise.

C. Visit to McKinley¹¹

McKinley's backpackers were asked a few questions regarding their visit to McKinley. Almost three-fourths of the respondents (71 percent) made only one visit to McKinley during the summer of 1978. Of those who made more than one visit to McKinley in 1978 (N = 792), they averaged three visits during the summer, with the range being from two to ten plus visits. In terms of "this visit to McKinley" (i.e., the one when they received their questionnaire), McKinley's backpackers spent an average of 4.8 nights at the park (with the range being from 0 to 97 nights), and about two-thirds of the visit was spent in the backcountry (average of 3.0 nights in the backcountry, with the range being from 0 to 80 nights). About 80 percent of the backpackers obtained only one backcountry permit during "this visit" to the park. Of those who obtained more than one permit (N = 562), they averaged 2.6 permits during "this visit," with the range being from two to ten plus permits. One-half of the backpackers also participated in day hikes during "this visit to McKinley," and they (N = 1,431) averaged 2.1 day hiking trips, with the range being from one to ten plus hikes (see Chapter 3 for a detailed discussion of day hiking at McKinley). Close to 90 percent of McKinley's backpackers had planned to hike overnight in the park before their arrival at the park. In other words, overnight hiking was a planned activity, in contrast to day hiking, which was more spontaneous.

¹¹ Concessionaire employees (N = 63) were excluded from this section of the analysis.

D. Summary

In summary, McKinley's backpackers in 1978 can be described as follows:

- (1) They tend to be in their twenties (average age of 25 years) and are more often males (70 percent).
- (2) They come from 49 states (plus the District of Columbia) and 22 foreign countries. The highest proportion of the hikers reside in Alaska (28 percent), followed by the western coastal states of California (13 percent) and Washington (6 percent).¹²
- (3) They tend to be well-educated and hold professional or technical jobs.
- (4) They tend to be "one-time" visitors, with few having camped in McKinley's backcountry before 1978 (14 percent).
- (5) Most of them have had some backpacking experience prior to visiting McKinley (87 percent), although their level of experience does vary.
- (6) Overall, they prefer to recreate in roadless areas compared to more developed outdoor recreation areas.
- (7) Most of them took only one backpacking trip during their visit to McKinley, although half of them also day hiked during the visit.
- (8) Almost all of the backpackers had planned to hike overnight before arriving at McKinley (in contrast to day hikers, who were more spontaneous in their decision).

¹²The N for these percentages is the universe of 4,447 overnight hikers.

Chapter 5. Backcountry Use Patterns of Overnight Hikers¹

A. Introduction

The purpose of this chapter is twofold. First, figures will be presented which describe how the backcountry was used by overnight hikers during the summer of 1978. Specifically, we intend to address the following three issues:

- (1) the popularity of the different zones (i.e., which zones were used most often);
- (2) the extent to which the zones were filled to capacity; and
- (3) weekly and monthly variations in visitation to the backcountry.

Second, it will be shown how information from the backcountry permits overestimates use of the backcountry. The backcountry tally sheet will be offered as a more accurate and more useful management tool for monitoring backcountry use. Data for the chapter originated primarily from the backcountry tally sheet (see section A of Chapter 3 for a description of the tally sheet), although some also came from the mail questionnaires and backcountry permits. Throughout the chapter, the figures used cover the study period from May 26 through September 10, 1978.

Data from the tally sheet and backcountry permit are valid as long as backpackers complied with the permit system. However, based on the study of permit compliance, which is reported in Chapter 9, some backpackers failed to follow the permit system. They were either "noncompliers"

¹Chapter 5 is based on the following report, which was prepared by Peter Womble in November 1978: "Report on Backcountry Use Patterns at Mount McKinley National Park: Summer 1978."

in that they camped in the backcountry without a permit, or "partial compliers" in that they obtained a permit but: (a) did not use the permit, or returned early from the backcountry, and did not report such to Park Service personnel; (b) camped in the wrong zone; (c) stayed out longer than the permit authorized; and/or (d) party size was larger or smaller than the permit authorized. The degree of accuracy of the data, therefore, depends on the extent to which these instances of noncompliance and partial compliance occurred.

There is another weakness with the figures obtained from the tally sheet and backcountry permit. Given that the permit system only specifies in which zone a hiker must camp, the unit of measurement for use (and thus, the unit of analysis for this chapter) can only be hiker-night (rather than hiker-day). The day a hiker leaves the backcountry (i.e., the last day of the trip) is never counted.² Consequently, backcountry use by overnight hikers will be underestimated. Furthermore, hikers do not have to hike only in the zone where they must camp. In fact, 18 percent of the study population ($N = 3,324$) hiked in at least one zone other than where camped. This discrepancy means that the figures of use for any specific zone do not necessarily reflect the actual use in that area. It seems to us that a more accurate measure of backcountry use would be hiker-day. In order for such a measure (i.e., hiker-day) to be used with a certain degree of accuracy, McKinley's permit system would have to be changed in such a way that backpacking parties would be told in which zone they could hike (and thus camp) for each day of their trip.

²Using the backcountry permits, the total number of hiker-days of use by overnight hikers in 1978 (or any other year) can be figured out by adding 14,465 hiker-nights and 5,187 hikers for a total of 19,652 hiker-days.

3. An Overview of Backcountry Use

Based on the tally sheet, use of McKinley's backcountry by overnight hikers during the 108-day study period from May 26 through September 10, 1978, totaled 11,644 hiker-nights, for a daily average of 106.8 hiker-nights. This total figure, however, must be adjusted given the instances of partial compliance and noncompliance with the permit system. These adjustments, which are summarized in Table 16, are as follows:

1. Ten percent of the study population ($N = 3,324$) did not use their permit; and 48 percent of those who did not use their permit ($N = 340$) did not inform Park Service personnel of this. Using these percentages and the universe of 4,883 hikers,³ it is estimated that, during the summer of 1978, 488 hikers did not use their permit and that 234 of them did not inform Park Service personnel, which means that the tally sheet has an overestimation of 632 hiker-nights.⁴

³Based on information from the backcountry permits, there were 5,024 hikers at McKinley during the study period. The figure for the universe of 4,883 was calculated by subtracting the known 141 hikers who were Park Service personnel. Park Service personnel were excluded from the universe because the study population for the backcountry survey did not include Park Service employees (although it does include concessionaire employees). Also, the assumption was made, as we calculated all of these over- and underestimations, that those Park Service personnel who obtained a permit followed its instructions.

⁴Based on information from the backcountry permits, the average permit was made out for 2.7 nights. The figure of 632 hiker-nights was obtained by multiplying 2.7 nights times 234 hikers.

2. Thirty-two percent of the study population ($N = 3,324$) camped for fewer nights (an average of 1.6 nights) than reserved by the permit; and 41 percent of those who camped for fewer nights ($N = 1,076$) did not inform Park Service personnel of this early exit from the backcountry. Using these percentages and the universe of 4,883 hikers, it is estimated that, during the summer of 1978, 1,563 hikers came out of the backcountry before their permit expired, and that 641 of them failed to inform Park Service personnel, which means that the tally sheet has an overestimation of 1,026 hiker-nights.⁵

3. Three percent of the study population ($N = 3,324$) stayed out longer (an average of 1.4 nights longer) than the permit allowed. Using this percentage and the universe of 4,883 hikers, it is estimated that, during the summer of 1978, 146 hikers stayed out longer; which means that the tally sheet has an underestimation of 204 hiker-nights.⁶

4. Three percent of the study population ($N = 474$)⁷ increased the size of their party an average of 1.4 persons more than authorized by their permit; while two percent of the study population decreased

⁵The figure of 1,026 hiker-nights was obtained by multiplying 1.6 nights times 641 hikers.

⁶The figure of 204 hiker-nights was calculated by multiplying 1.4 nights times 146 hikers.

⁷The study population of 474 is from the study of permit compliance. It does not include those Park Service employees who were sampled. They are excluded based on the assumption stated in the third footnote.

their party's size an average of 1.3 hikers less than stated on their permit. Using these figures and the universe of 4,883 hikers, it is estimated that, during the summer of 1978, party sizes increased by 77 persons, which means that the tally sheet has an underestimation of 208 hiker-nights.⁸

5. Ten percent of the study population (N = 514) camped in the backcountry without a permit and averaged 2.1 nights per trip. Using this information and the universe of 5,024 hikers, it is estimated that there were 576 hikers in the backcountry without a permit, which means that the tally sheet has an underestimation of 1,210 hiker-nights.⁹

By adding these figures of over- and underestimation, it is calculated that the total figure of 11,644 hiker-nights from the tally sheet is overestimated by 36 hiker-nights. In other words, the over- and under-estimations resulting from noncompliance and partial compliance cancel

⁸The figure of 208 hiker-nights was calculated as follows:

- a. $4,883 \times 0.03 = 146$ hikers
 $146 \times 1.4 = 204$ additional hikers
- b. $4,883 \times 0.02 = 98$ hikers
 $98 \times 1.3 = 127$ less hikers
- c. $204 - 127 = 77$ additional hikers
- d. $77 \times 2.7 = 208$ additional hiker-nights.

⁹The study population of 514 is from the study of permit compliance. It includes Park Service personnel. For this reason, the universe is 5,024 hikers (which includes Park Service employees), rather than 4,883 hikers. The figure of 1,210 hiker-nights was obtained by multiplying 576 hikers by 2.1 nights.

each other out. We conclude, therefore, that the backcountry tally sheet does a good job of estimating overall actual use of McKinley's backcountry.

Table 16. Adjustment of¹⁰ total figure for backcountry use based on the tally sheet.

Original figure:	11,644 hiker-nights
Adjusted figure:	11,608 hiker-nights

Overestimation:	632 hiker-nights by those who did not use permit (and not inform)
	<u>1,026</u> hiker-nights by those who returned early (and not inform).
	1,658 hiker-nights (total)
Underestimation:	204 hiker-nights by those who stayed out longer
	208 hiker-nights by those who changed their party's size
	<u>1,210</u> hiker-nights by those without a permit
	1,622 hiker-nights (total)

Based on information from the backcountry permits, the total figure for backcountry use during the study period is 13,352 hiker-nights, which is 1,708 hiker-nights (or 15 percent) more than the figure calculated from the tally sheet. This difference between these two informational gathering instruments is due to the fact that the permit officer was able to adjust the figures in the tally sheet for those either not using

¹⁰The calculations for over- and underestimation found in Table 16, although reasonably accurate, have the weakness of counting some partial compliers more than once. In other words, according to the data in Tables 87 and 88 of Chapter 9, a small percentage of the partial compliers were involved in more than one type of partial compliance.

their permit or returning early from the backcountry who reported such at the backcountry desk. A similar adjustment, however, was not made to the permits that were sent to the data processors. We conclude, therefore, that the backcountry tally sheet is a more accurate estimator (by 15 percent) of actual use of the backcountry than is the backcountry permit.

C. Use of Each Backcountry Zone: Which are the Popular Zones?

Before proceeding with a discussion of use of each backcountry zone based on data from the tally sheet, three points should be made. First, there are some inaccuracies in the tally sheet based on one type of partial compliance: hikers camping in zones other than those scheduled on their permit. Based on the backcountry survey, 18 percent of the study population ($N = 3,324$) averaged 1.3 nights camped in zones other than those scheduled on their permit. Given these figures and the universe of 4,833 hikers, it is estimated that 879 hikers were camped in the wrong zone for 1,582 nights. That is, 14 percent of the total of 11,644 hiker-nights have been assigned inaccurate zones on the tally sheet. In Table 17 some figures obtained from the backcountry survey have been presented which show the extent to which each zone was camped in less or more than required by the permit. We asked the hikers participating in the survey to indicate in which zone they camped for each day they were in the backcountry, and we compared this information

with where they were supposed to camp according to their permit. The study population (N) for Table 17 represents hiker-nights.¹¹

Table 17. Extent to which each backcountry zone was camped in less or more than required by the permit (N = 6,821).

Backcountry zone		Percentage increase (+) or decrease (-)
1	(N = 35)	-37
1a	(N = 198)	-14
2	(N = 205)	+ 2
3	(N = 237)	+24
4	(N = 337)	+ 6
5	(N = 115)	+ 3
6	(N = 361)	+ 3
7	(N = 359)	0
8	(N = 438)	+ 2
9	(N = 37)	0
10	(N = 308)	-19
11	(N = 221)	+ 9
12	(N = 203)	+ 5
13	(N = 37)	-57
13a	(N = 4)	0
14	(N = 17)	-59
15	(N = 581)	0
16	(N = 291)	-24
17	(N = 180)	+ 3
18	(N = 271)	+ 6
19	(N = 217)	- 6
20	(N = 89)	+ 6
21	(N = 225)	+ 2
22	(N = 80)	-63
23	(N = 303)	- 4
24	(N = 285)	- 6
25	(N = 154)	+ 5
26	(N = 70)	+36
27	No information	
28	(N = 38)	- 8
29	(N = 154)	+ 6
29a	(N = 52)	+27
30	(N = 140)	0
31	(N = 39)	-10

¹¹ Questionnaire respondents were asked to answer some questions for each day of their trip into the backcountry. This resulted in a study population of 9,643 hiker-days, 2,827 of which represent the last day (or day hiked out). The study population of 6,821 for Table 17 represents the difference between 9,643 and 2,827 or the hiker-days which include a night camping the backcountry.

What is interesting to note in Table 17 is that zones 1, 13, 14, and 22, which are difficult to reach because of their distance from the park road, were not used as much as they were supposed to be.

Furthermore, there are those noncompliers (i.e., without a permit) and partial compliers (i.e., stayed out longer or different party size) mentioned in the previous section for whom there is no information on the zones in which they camped.¹² One can assume that they camped randomly throughout the backcountry, or more likely, they tended to camp in the more "popular" zones. The point is that the reported figures representing the levels of use for each backcountry zone (whether obtained from the tally sheet or permits) are somewhat distorted (although not greatly so) by the reported behavior of partial compliers and noncompliers. One would expect, therefore, that the less popular zones received less use than is in fact documented and that the more popular zones received more use than is in fact recorded on the tally sheet or the permits.

Second, the figures in this section represent hiker-nights; that is, the discussion of use of each zone is limited to where hikers camped. It is conceivable, and indeed perfectly permissible, that some hikers, on any given day, spent time hiking in another zone(s) besides the one in which they camped. We sampled 6,821 hiker-nights (see footnote 11) and found that 15 percent of these hiker-nights were spent hiking in another zone besides the one used for camping. Using this percentage and the universe of 11,644 hiker-nights, we estimate that there were

¹²One must also keep in mind those partial compliers who did not use their permit or returned early and did not report such to the permit officer.

1,747 hiker-days where hikers traveled in at least one zone other than the one in which they camped. In other words, some backcountry zones received more use than indicated by the information from the tally sheet or the permits.

And third, as we have already shown, figures from the backcountry permits are not as accurate as those from the tally sheet. A comparison of figures of use from the permits and tally sheet indicates: (1) that figures from the permits overestimate use by as much as 42 percent for 28 zones; (2) that figures from the permits underestimate use for one zone; (3) that figures from the permits and tally sheet are similar for two zones; and (4) that information from the permits shows no use for zones 9, 23, and 27, which is not the case according to the tally sheet. Here again, evidence is provided showing that the backcountry permits might not provide as accurate information on backcountry use as does the tally sheet.

As discussed in the second chapter, McKinley's backcountry is divided into 34 zones (see Figure 2 for a map of the park). As shown in Figure 5, use of the backcountry in 1978 was distributed unevenly among the 34 zones. Zone 15 received by far the greatest amount of use, followed by zones 7, 8, 4, and 6, respectively. Zones such as 13, 13a, 14, 27, and 31 were rarely visited by backpackers. This is not, however, a complete picture. As indicated in Table 18, some zones were closed to hikers for certain periods throughout the summer.

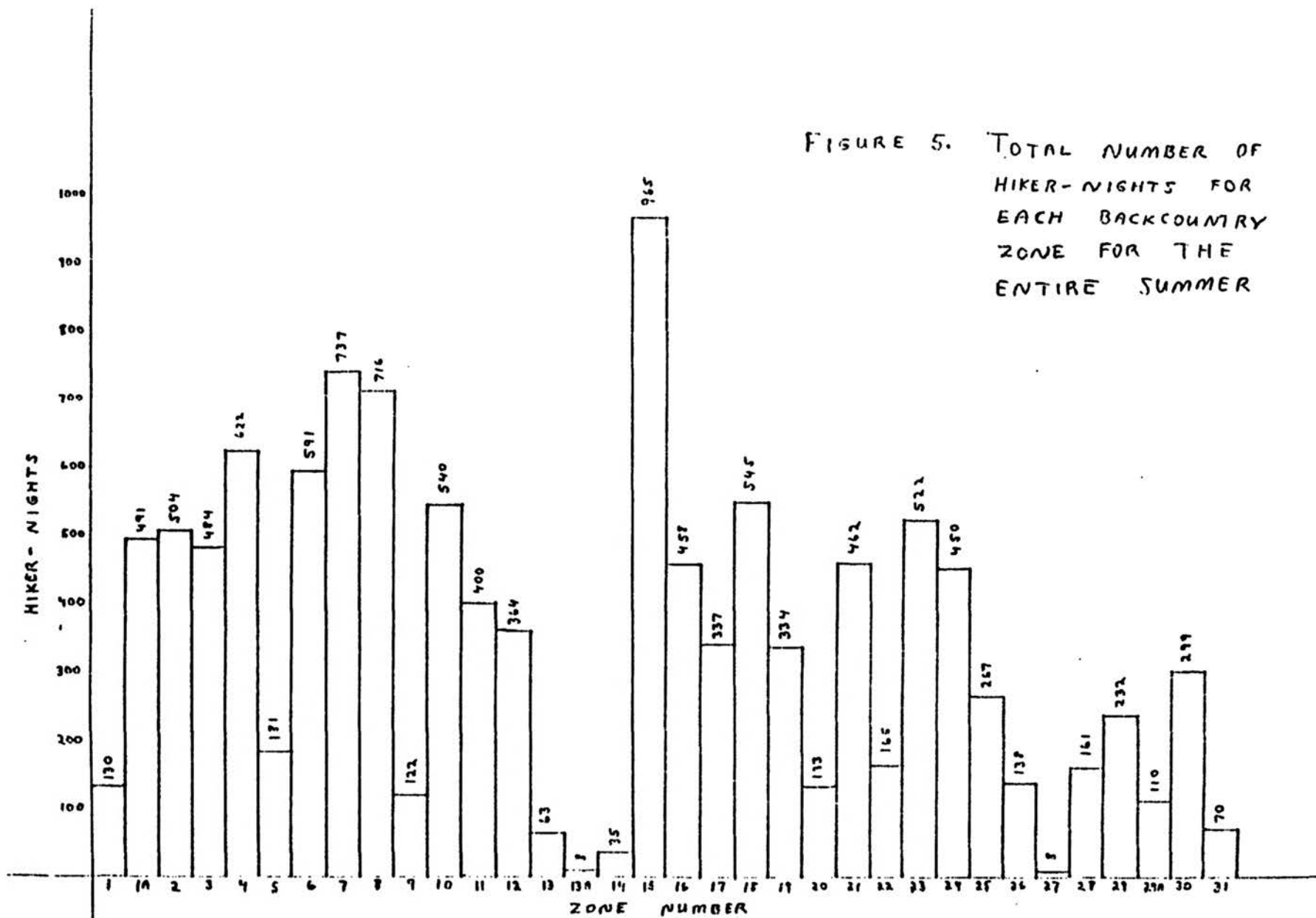
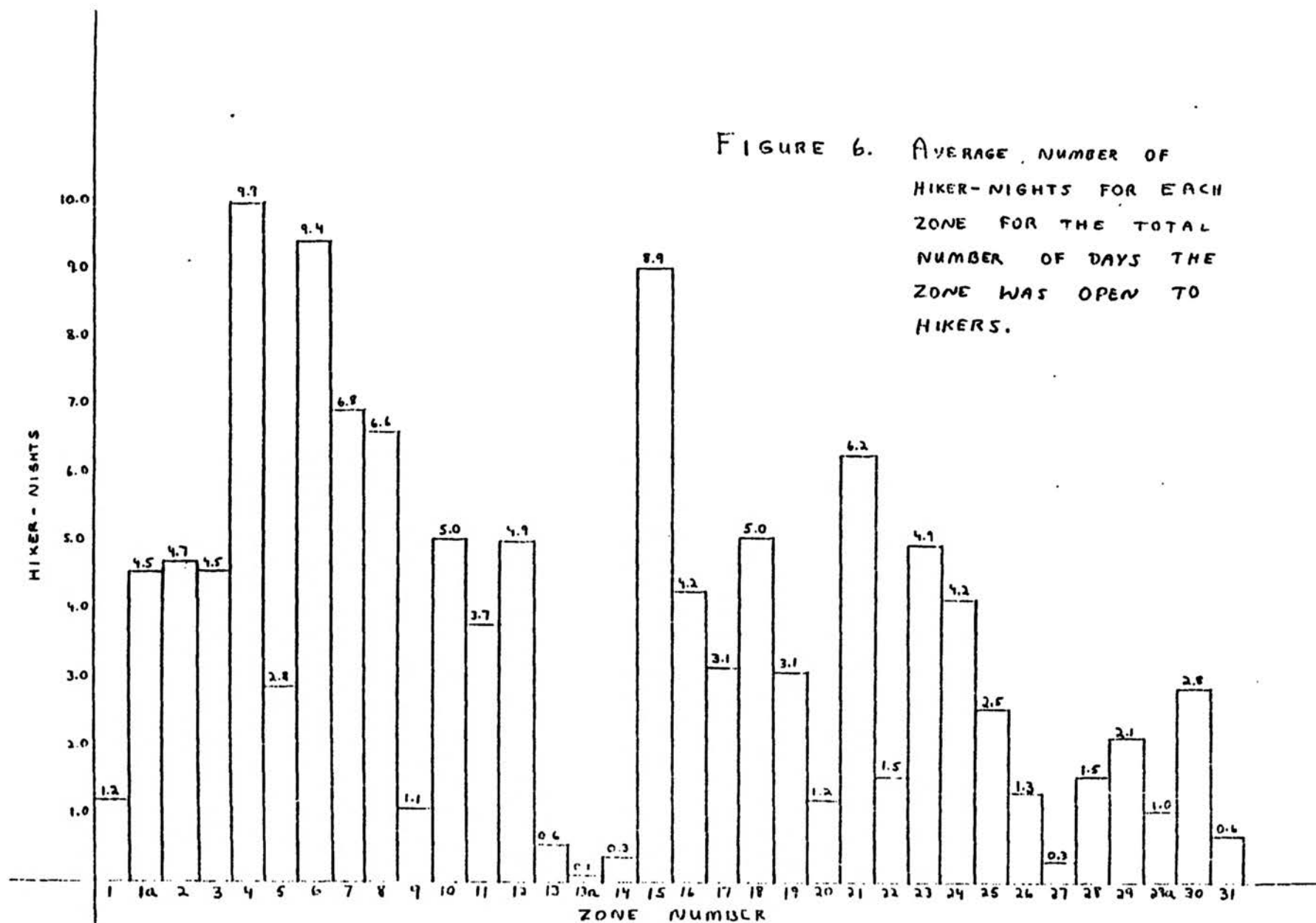


Table 13. When backcountry zones were closed.

Zone	Dates closed	Number of days closed
4, 6	July 25 - August 16	23
	August 20 - September 10	22
	(Total for summer)	(45)
5	July 26 - August 16	22
	August 20 - September 10	22
	(Total for summer)	(44)
12, 21	May 26 - June 28	34
25, 26, 28	September 9 - 10	2
27	May 26 - June 29	35
	July 25 - August 8	15
	August 10 - September 10	32
	(Total for summer)	(82)
30	May 29 - 30	2

If we take these closures into consideration, then the ranking for the most used zones changes. This change is shown in Figure 6, indicating the daily average number of hiker-nights for each zone for the total number of days the zone was open to hikers. In this case, zone 4 had the highest average daily use, followed by zones 6 and 15, respectively.

There is still another factor which could be considered when discussing the relative use-levels for backcountry zones. Each zone (except for zones 1 and 13a) has been assigned by the Park Service a capacity for the number of hikers allowed to camp on any night. For



purposes of this report, these capacities are labeled "traditional." As part of the backcountry survey, the capacities for zones 4, 6, 15, and 23 were increased for certain days of the summer to allow for higher use-levels.¹³ These capacities are labeled "experimental." A list of the various capacities is provided in Table 19. For the experimental capacities, dates are indicated for when these capacities were in effect.

Table 19. Capacities for each backcountry zone.¹⁴

Zone number (and name)		Traditional capacities	Experimental capacities (dates when effective)
1	(West End)	Unlimited	
1a	(McLeod Lake)	8	
2	(Clearwater Creek)	6	
3	(McKinley Bar)	6	
4	(Mount Eielson)	6	30 (5/26-6/5) 20 (6/6 -8/16)
5	(Glacier Creek/Anderson Pass)	8	
6	(Sunset/Scotts Peak)	6	30 (5/26-6/5) 20 (6/6 -8/16)
7	(Moose Creek)	8	
8	(Lower Stony)	8	
9	(Upper Stony)	2	
10	(Upper Toklat, West)	6	
11	(Upper Toklat, East)	6	
12	(Lower Toklat)	6	
13	(North Toklat)	6	
13a	(Stampede)	Unlimited	
14	(North East Fork)	6	
15	(Lower East Fork)	6	20 (7/25-9/10)
16	(Polychrome Glacier)	6	
17	(Upper East Fork)	6	
18	(Tattler/Big Creek)	6	
19	(Shushana/Lower Teklanika)	8	

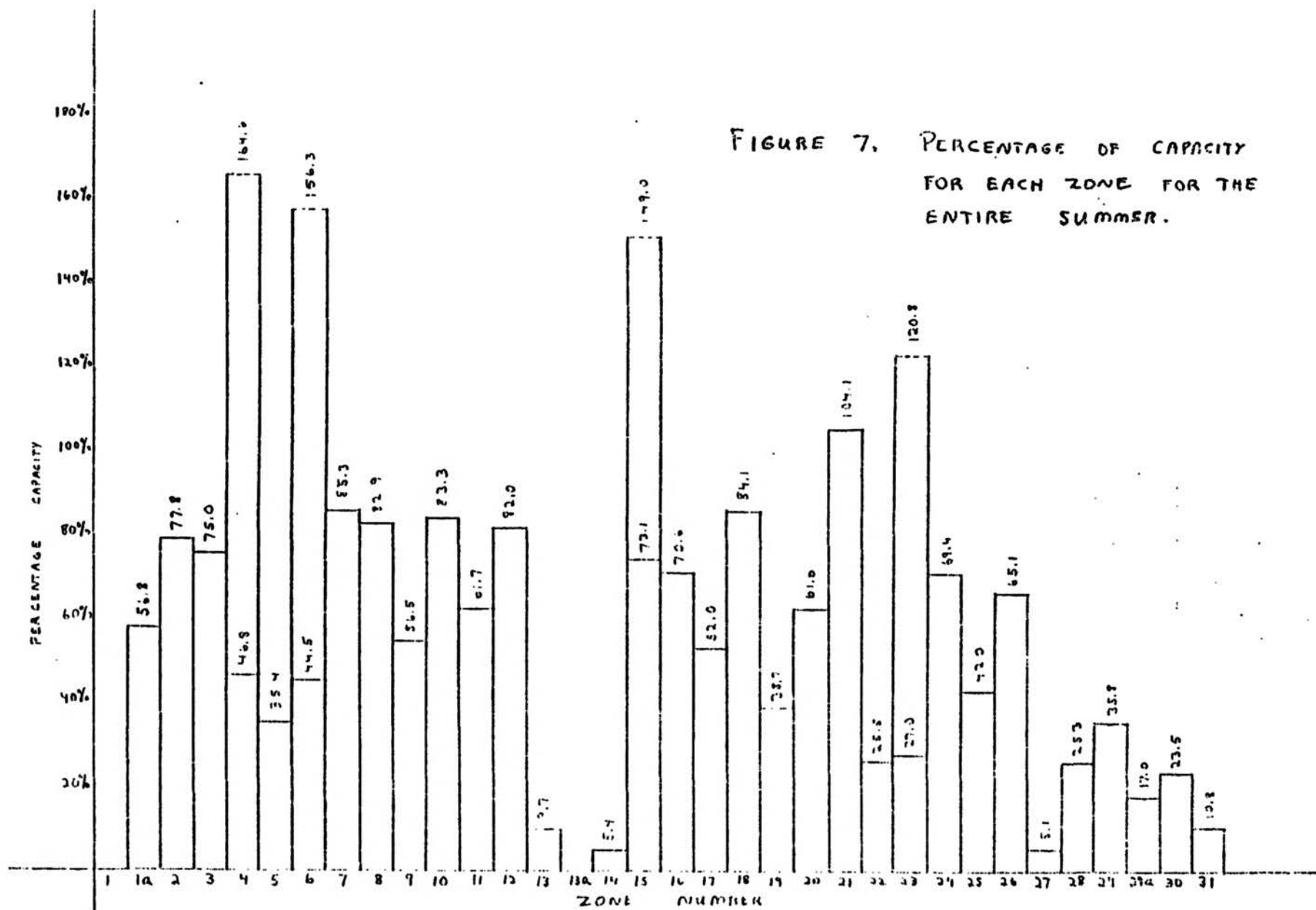
¹³ See the discussion of the experimental zones in section C of Chapter 3.

¹⁴ See Table 90 in Appendix 11 for the size of each of the backcountry zones.

Table 19. (Continued)

Zone number (and name)	Traditional capacities	Experimental capacities (dates when effective)
20 (Tributary Creek)	2	
21 (Upper Teklanika)	6	
22 (Foggy Pass/Easy Pass)	6	
23 (Lower Sanctuary)	4	20 (6/9-9/10)
24 (Upper Sanctuary)	6	
25 (Upper Savage)	6	
26 (Lower Savage)	2	
27 (Jenny Creek)	6	
28 (Mount Healy)	6	
29 (Riley Creek)	6	
29a (Upper Riley Creek)	6	
30 (Triple Lakes)	12	
31 (Windy Creek)	6	

Capacities establish a limit for how much any zone can be used. Any zone might conceivably get more use than it, in fact, received if it were not for the capacities. For example, the experimental zones, given higher capacities than usual, were used far beyond their traditional use levels (see Figure 7). So another way to rank which zones were used most often is outlined in Figure 7. With Figure 7, we show the extent to which each zone was able to fill its available hiker-nights over the entire summer. In other words, for any given zone, we are able to calculate the total number of hiker-nights available over the entire summer (we do not count the nights the zone was closed). This capacity number is divided into the total number of used hiker-nights, resulting in the percentage of use relative to what was available. For the experimental zones (4, 6, 15, and 23), Figure 7 has two percentages: (1) the solid line (and the smaller number) is based on the experimental



capacity; while (2) the dash line (and the larger number) is based on the traditional capacity. Excluding the experimental zones, zone 21 was the only zone to attain capacity over the entire summer (In this case, it was over 100%). There were a number of zones to reach the 80 percent level. One must remember, however, that this kind of analysis gives an advantage to more popular zones with lower capacities.

What does all of this say about zone popularity? Not very much. Given the presence of capacities for zones, it is impossible to determine without a doubt which zones are most popular. We can, however, make certain generalizations about the relative use of zones based on the information provided in Figures 5, 6, and 7.

- (1) The zones which do not border the park road (1, 5, 13, 13a, 20, 29, and 31) were used less often.
- (2) The unlimited zones (1, 13a) were rarely used.
- (3) The zones near the park entrance (25, 26, 27, 28, 29, 29a, 30, and 31) were used less often.
- (4) The zones "near" the mountain (or into the park) received the greatest use.

These generalizations are even more reasonable given the earlier discussion on noncompliance and partial compliance and how these distort figures of use for the different zones.

D. Over- and Underutilization of the Backcountry¹⁵

The next issue to be considered is whether McKinley's backcountry was used at the level allowed by the various capacities. In other words, was McKinley's backcountry filled up throughout the summer; or was there room for even more backpackers, given the capacities established by management? The issue of over- and underutilization of the backcountry can be discussed in several ways. These are:

- (a) the entire backcountry in terms of the entire summer;
- (b) the entire backcountry in terms of each day of the summer;
- (c) each backcountry zone in terms of the entire summer; and
- (d) each backcountry zone in terms of each day of the summer.

Entire Backcountry in Terms of the Entire Summer. If we look at the entire backcountry, ignoring the two unlimited zones (1 and 13a), we come up with two figures representing the available units (i.e., hiker-nights) for the entire summer (May 26 through September 10, 1978). These two figures include only those capacities for the days each zone was open (see Table 13 for when zones were closed). These two figures are:

- (1) if we consider the traditional capacities, then there were
19,108 hiker-nights available.

¹⁵When reading this section, the reader should remember the issue of noncompliance and partial compliance outlined in section C. When interpreting figures for overutilization (or zone overloads), the reader should be aware that National Park Service employees obtaining permits to backpack are allowed to visit any zone regardless whether there is space available. So Park Service employees accounted for some, but not all, zone overloads. Our records show that permits obtained by Park Service employees totaled 74 and consisted of 141 persons and 326 hiker-nights. This means that, if Park Service employees accounted for zone overloads, it was minimal.

- (2) If we change the capacities of the experimental zones to their appropriate experimental capacities, then there were 23,184 hiker-nights available.

According to the data in Table 20, regardless of which total capacity is used, only about one-half of the available hiker-nights in McKinley's backcountry were actually used.

Table 20. Percentage of capacity for the entire backcountry for the entire summer.

Hiker-nights available	Hiker-nights used ¹⁶	Percentage of capacity
23,184	11,506	50
19,108	11,506	60

Entire Backcountry in Terms of Each Day of the Summer. If we consider the capacity for each day of the summer for the entire backcountry (see Table 21), we find that almost all of the days had openings for backpackers (and this does not include zones 1 and 13a). In fact, about two-thirds of the days had at least 30 percent availability. When determining the percentage of capacity in Table 21, for any given day, we counted only the capacities for those zones that were open. That is, the traditional daily capacity for McKinley's backcountry is 194 hiker-nights (excluding zones 1 and 13a). This total, however, varies depending

¹⁶This figure does not include totals for zones 1 and 13a.

on experimental capacities and closed zones (see Tables 18 and 19).¹⁷

Furthermore, the total number of hiker-nights used for each day does not include the figures for zones 1 and 13a.

Table 21. Number of days with percentage of capacity for the entire backcountry.

Percentage of capacity	Number of days based on traditional capacities	Number of days based on experimental capacities
00-09	1	3
10-19	8	9
20-29	5	11
30-39	17	15
40-49	8	11
50-59	9	20
60-69	19	15
70-79	13	14
80-89	12	6
90-99	10	4
100-109	5	0
110-119	1	0
Total days	108	108

¹⁷The available capacity of any given day, using traditional capacities, ranged from 154 to 194 hiker-units, depending on which zones were closed. The available capacity for any given day, using experimental capacities, ranged from 134 to 246 hiker-night units, depending on which zones were closed and which experimental capacities were in effect.

There were only six days when there were more backpackers in the entire backcountry than would have been allowed using the traditional capacities for all of the opened zones (not counting zones 1 and 13a).¹⁸ However, there was never a day in the summer when the backcountry was full to capacity (again excluding zones 1 and 13a).

Each Backcountry Zone in Terms of the Summer. Turning now to each backcountry zone, Figure 7 shows that, in terms of the entire summer, all of the zones (except for zone 21) were underutilized. However, if we take into consideration the traditional capacities for the experimental zones, then these four experimental zones were at least 20 percent overutilized. In Figures 8 and 9, we show the percentage of the number of open-days (usually 108 except for those mentioned in Table 17) that each zone was underutilized (Figure 8) or full to capacity or overutilized (Figure 9). For the experimental zones, the solid line is based on the experimental capacities, while the dash line is based on the traditional capacities. The vast majority of the zones (about 80%) were underutilized for at least half of their open days.¹⁹

Each Backcountry Zone in terms of Each Day of the Summer. Finally, if we study the situation in terms of zone-days (i.e., each zone is counted once for each day it was open, for a total of 3,164 zone-days), again ignoring zones 1 and 13a, then we learn in reading Table 22 that over two-thirds of the zone-days were underutilized.

¹⁸ July 29 (110 percent); September 3 (109 percent); August 23 and 24 (7 percent); August 4 (102 percent); and September 2 (102 percent).

¹⁹ A weakness in this discussion is that we are unable to talk about the extent to which any zone was underutilized for any particular day (i.e., the number of vacant units). We are able to obtain such information, but this would require additional computer work.

FIGURE 8. PERCENTAGE OF OPEN-DAYS
WHERE ZONES WERE
UNDER-UTILIZED.

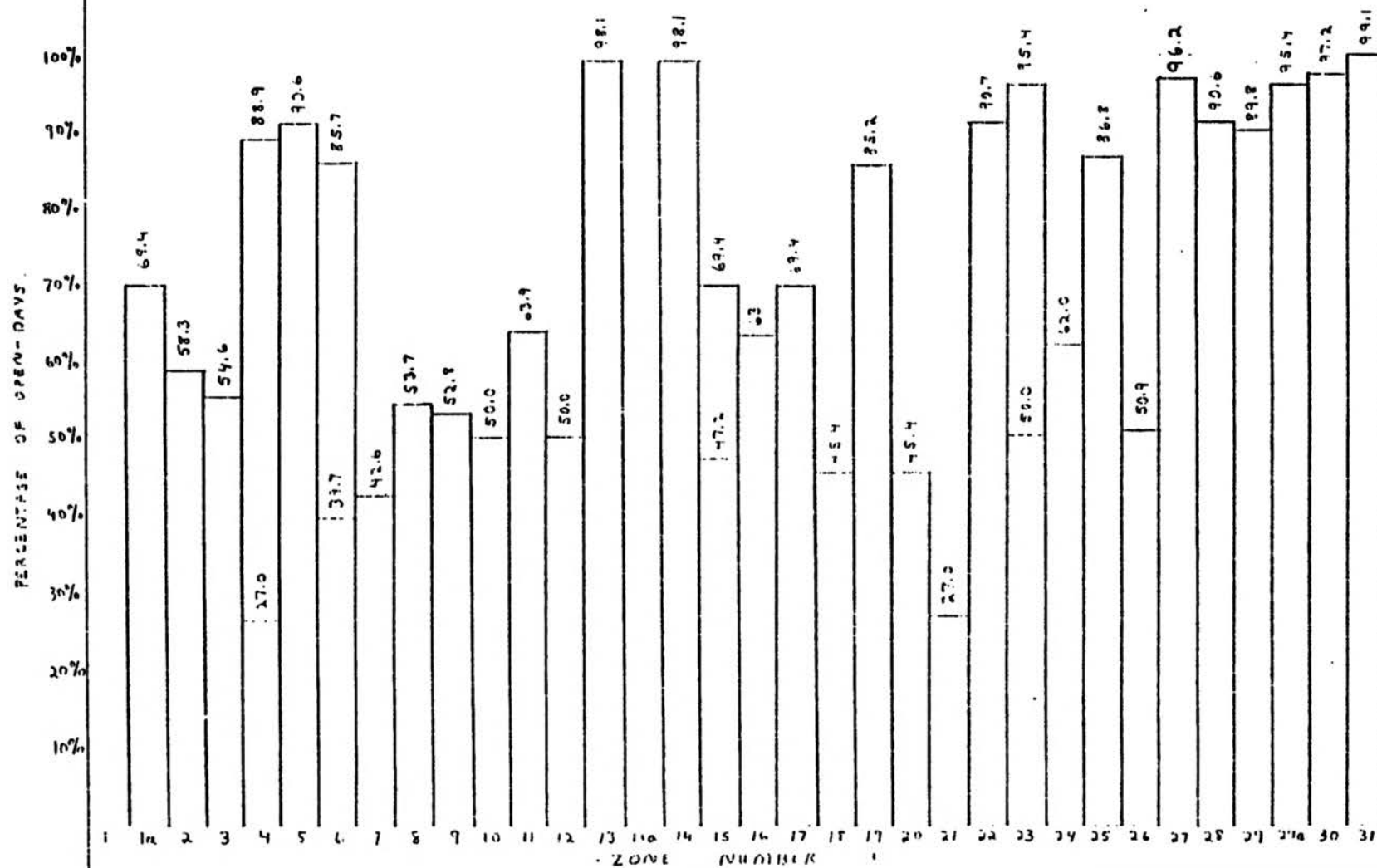


FIGURE 9. PERCENTAGE OF OPEN-DAYS WHERE ZONES WERE FULL TO CAPACITY AND OVER-UTILIZED.

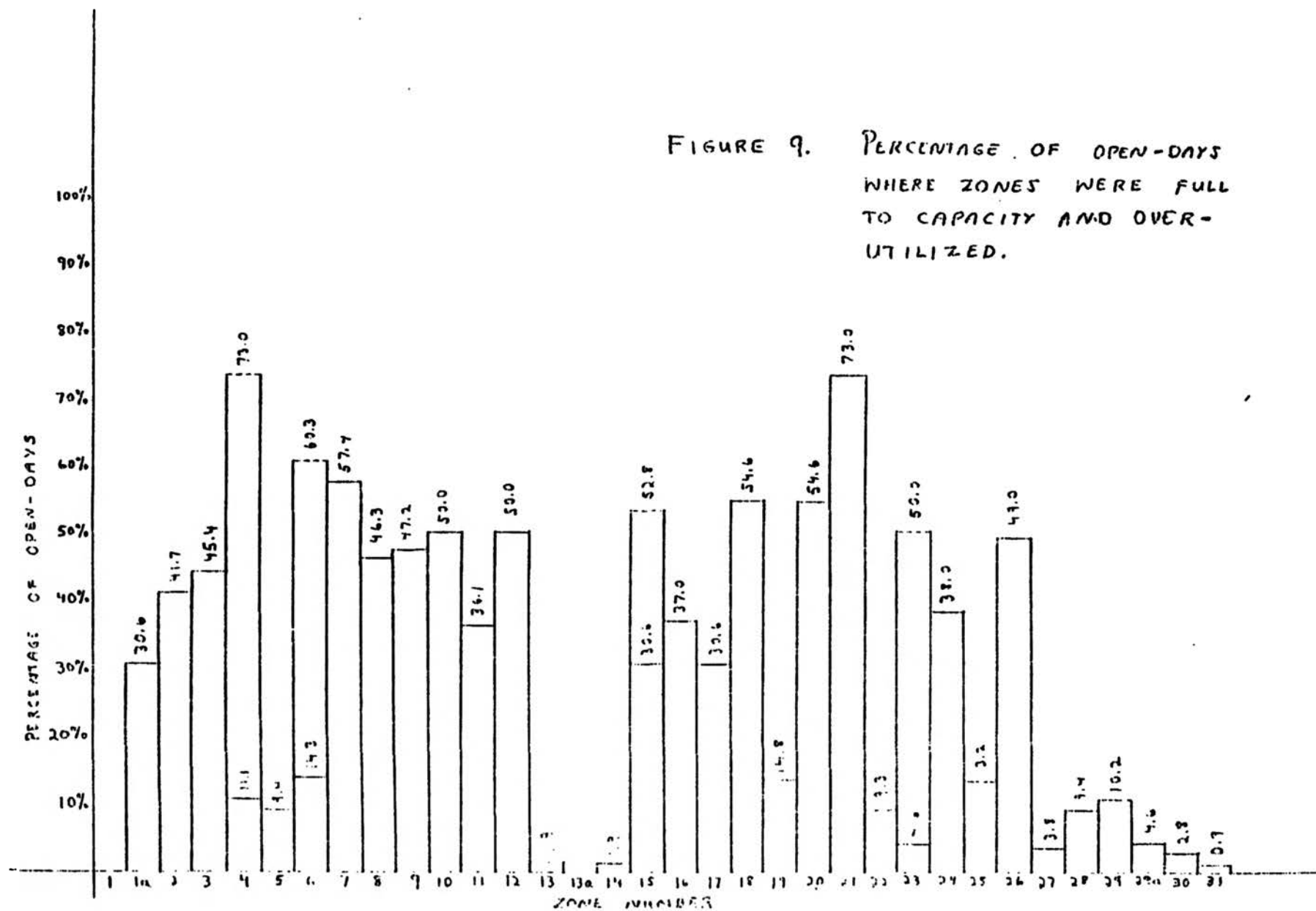


Table 22. Percentage of zone-days under- and overutilized and full to capacity (N = 3,164).

Status	Percentage based on traditional capacities	Percentage based on experimental capacities
Underutilized	67	72
Full to capacity	18	18
Overutilized	15	10
Total	100	100

However, this says nothing about the extent of overutilization for any zone-day.

To summarize this discussion, regardless of the measure used to analyze backcountry utilization, the fact remains that McKinley's backcountry was not even close to being used to its full capability (as defined by management's capacity for each zone) in 1978.

E. Visitation Patterns of Backpackers

In this section, we are interested in seeing if use of the backcountry by overnight hikers fluctuated depending on day of the week, period of the summer, or holidays. In Figure 10, we clearly show that weekends are not busier in terms of backcountry use averaged over the entire summer than other days of the week.²⁰ Saturday had the highest average use, but it was only slightly higher than Thursday and Wednesday. If we consider Figure 11, however, there is a distinctive visitation

²⁰ This does not mean that there are less people obtaining a permit on Fridays and Saturdays. This is entirely possible. This report only deals with hiker-nights--not with individual hikers obtaining permits.

FIGURE 10. AVERAGE NUMBER OF HIKER-NIGHTS FOR EACH DAY OF THE WEEK.

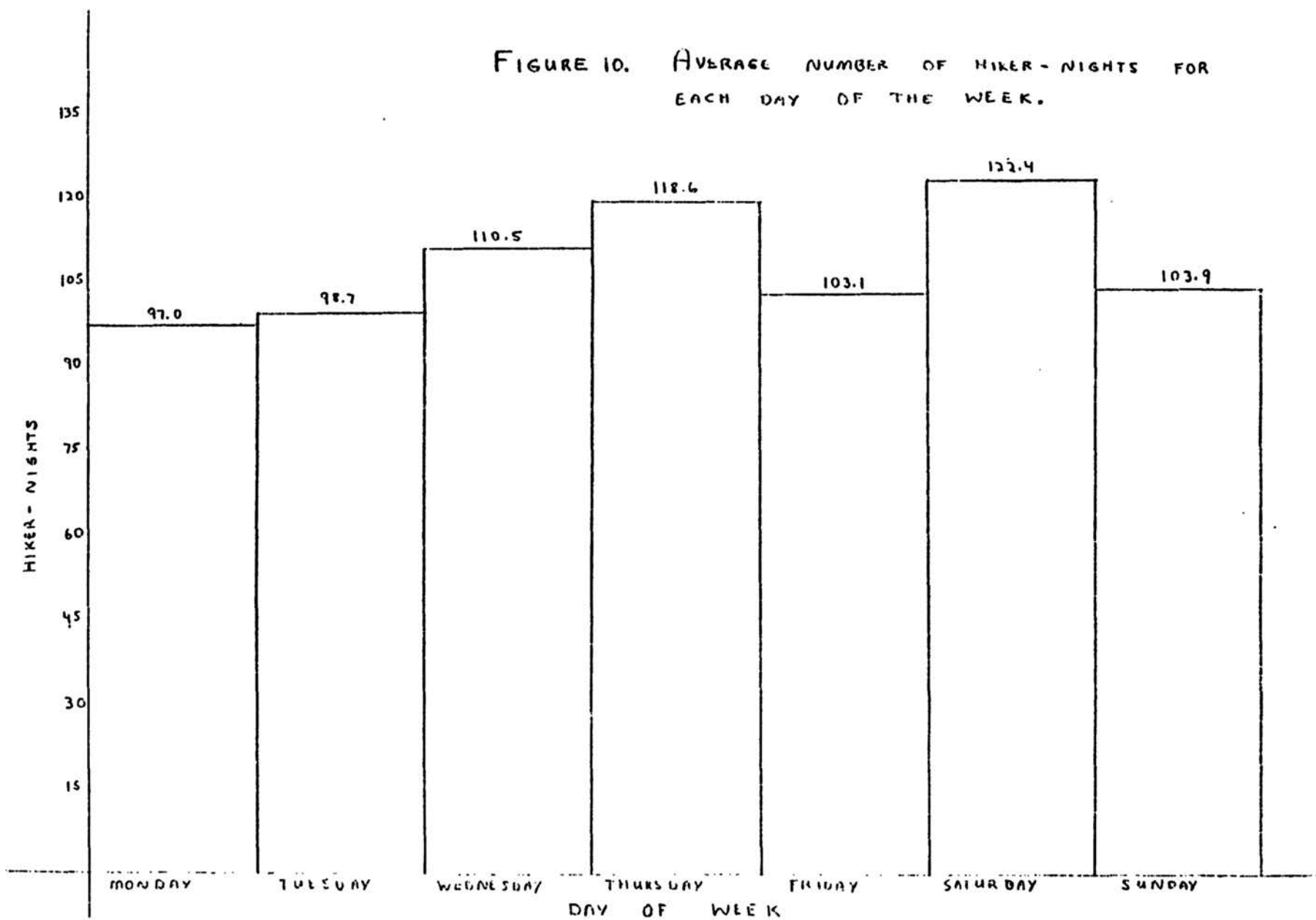
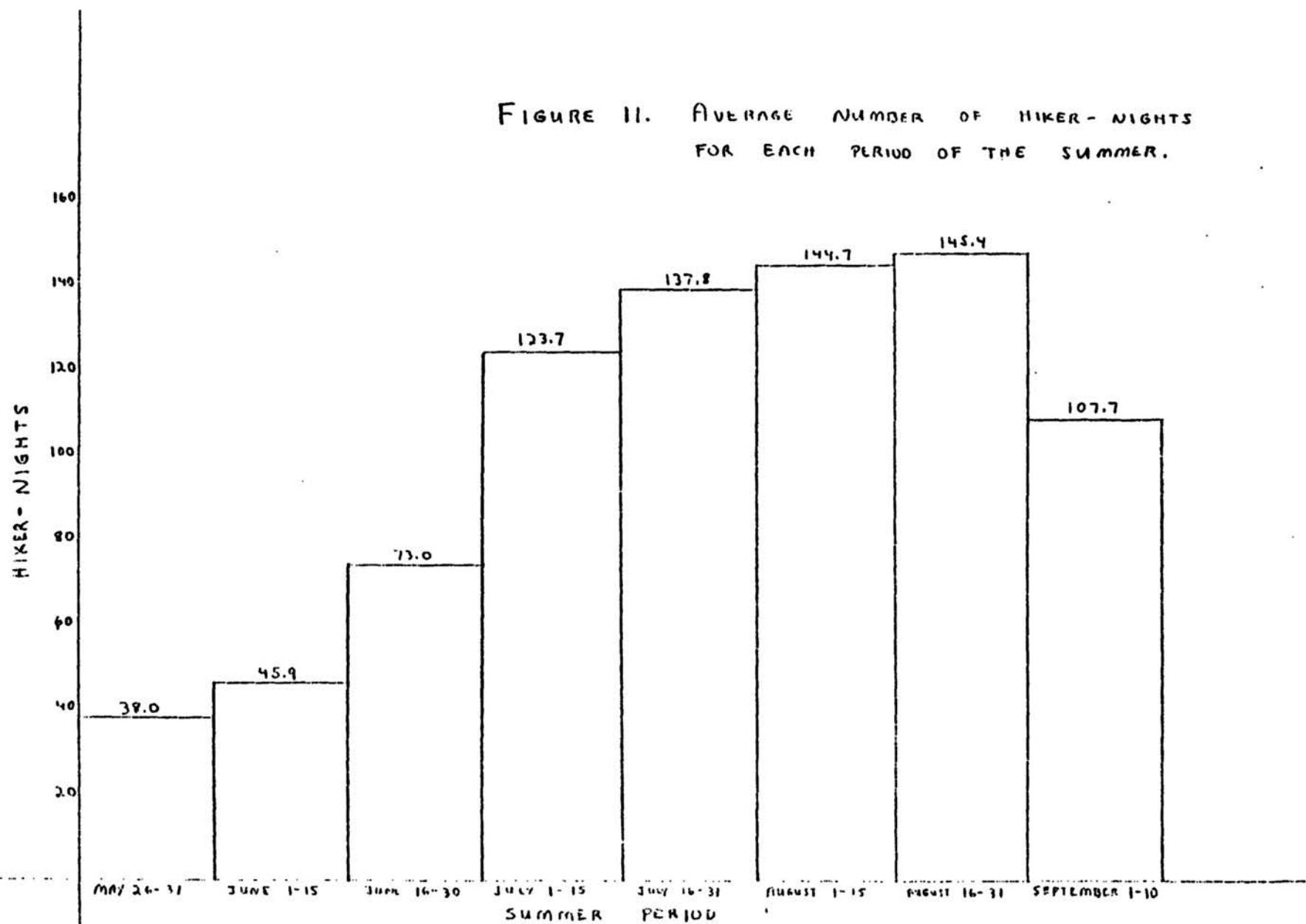


FIGURE 11. AVERAGE NUMBER OF HIKER-NIGHTS
FOR EACH PERIOD OF THE SUMMER.



pattern: late July and all of August were the busiest days. Rather than a steady increase with a peak around mid-summer and then a steady decrease, there was a steady increase up through the end of August and then a sudden drop in backcountry use. The five busiest days were the following: Saturday, July 29, and Sunday, September 3, with 138 hiker-nights; Thursday, August 24, with 133 hiker-nights; Saturday, August 19, with 132 hiker-nights; and Wednesday, August 23, with 130 hiker-nights. Memorial Day, July Fourth, and Labor Day weekends were busy days, but not unusually so. However, the three holiday weekends did show a higher use level than the days just before and after.

In summary, backpackers did not visit McKinley's backcountry evenly throughout the summer. This difference is explained primarily by the period of the summer and holiday weekends.

F. Summary

Our purpose has been to document various statistics portraying overnight backcountry use at McKinley in 1978. Three general observations can be made about overnight use based on these figures.

- (1) Overnight backcountry use was not distributed evenly among the various zones; but rather, certain zones were more popular (i.e., used more often) than others.
- (2) McKinley's backcountry was significantly underutilized, given capacities determined by management.
- (3) Backpackers did not use McKinley's backcountry evenly throughout the summer; but rather, backcountry use peaked in late August and on the holiday weekends.

The figures in the chapter, however, are of limited value. They become more meaningful insofar as we are able to compare them with similar figures from previous summers (as well as future summers). It is only then that we are able to talk about trends in backcountry use patterns and thus become aware of and understand the changes occurring in the park. In other words, insofar as the information in the chapter is useful to management, we encourage managers to continue this effort in the future.

Finally, we would like to recommend the continued use of the backcountry tally sheet as a tool for gathering information on backcountry use. It is more useful than the backcountry permit for three reasons. These are:

- (1) The tally sheet provides more accurate information on use than does the permit.
- (2) The tally sheet allows management to monitor backcountry use at any time during the summer.
- (3) The tally sheet can be analyzed faster than the permits.

Chapter 6. The Backcountry Trip:
An Analysis of Crowding and Satisfaction

A. Introduction

The principal purpose of the backcountry survey was to test the sociological assumptions contained in the management plan which, along with the biological assumptions, serve as the basis for the policies which presently regulate use of McKinley's backcountry.¹ These assumptions can be found in a 57-page document entitled "Backcountry Management Plan: Mount McKinley National Park." This document was used in designing the survey and will therefore be referred to throughout the chapter. The purpose of this chapter is to describe the trip into the backcountry, focusing on those aspects of the trip which pertain to the sociological assumptions stated in the management plan: factors which contribute to crowding and satisfaction. Specifically, these sociological assumptions will be examined using data about actual experiences while in the backcountry which were provided by backpackers responding to the questionnaire.

The management objective for the backcountry is stated as follows: "The backcountry management objective for Mount McKinley, then, is to provide for backcountry use of that optimum level and character such that impact on the natural resource and on visitor satisfaction does not

¹The survey is limited to the sociological dimension of backcountry use. It is not within our area of expertise to speak to the equally important biological dimension. Research projects have been and will continue to be undertaken to investigate the impact of backpackers on the natural resource.

exceed levels determined to be acceptable."² There are, therefore, two dimensions to the management objective: (1) biological and (2) sociological. Protection of the natural resource (i.e., biological dimension) is defined in terms of wildlife, vegetation, soils, and water quality, with emphasis on impacts to the vegetation because most of the available biological information refers to vegetation. As for the objective of "visitor satisfaction" (i.e., sociological dimension), which is the focus of the survey, the management plan can be paraphrased as follows. Solitude and a pristine environment are essential features of the visitor's experience in McKinley's backcountry. This means that the perception of crowding and of evidence of human use are critical determinants of whether backpackers are satisfied with their trip into the backcountry. The openness of the terrain and the resulting visibility mean that all the hiking parties assigned to a particular zone on any day will sight each other at some point during the day. Using the results of a survey by Stankey (1973), the crowding threshold was determined to be two parties: "about 70 percent of over 400 people sampled indicated that encountering more than two other parties per day on their trip would adversely affect their satisfaction."³ Thus, given that the maximum number of parties in a zone on any day should be three (i.e., one's own party plus the other two parties being sighted) and given that the average party size at McKinley is 2.1 to 2.2 persons, the capacity for

²See page 17 of the backcountry management plan.

³See page 31 of the backcountry management plan.

each zone based on these sociological assumptions is 6.5 hikers.⁴ Combining this capacity with that derived from biological data,⁵ the final capacity for a zone is six hikers. This capacity of six is then adjusted upwards or downwards for some of the zones, depending on certain characteristics such as the degree of openness of the terrain and the fragility of the environment.

In order to test the sociological assumptions of the management plan for McKinley's backcountry, the following five questions will be answered, using data from the backcountry survey.

- (1) Do hiking parties see all of the other hiking parties assigned to the same backcountry zone on the same day?
- (2) Is solitude an essential feature of the visitor's experience while in McKinley's backcountry? How does solitude rate relative to other possible features of the backcountry trip?
- (3) Is the perception of crowding brought about by seeing more than two other parties on any given day? What other factors might contribute to crowding?
- (4) How do hikers respond to seeing evidence of human use in the backcountry?
- (5) To what extent do perceptions of crowding and resource impacts influence whether hikers are satisfied with their trip into the backcountry? What other factors might contribute to the degree of satisfaction with the trip?

⁴It is also assumed "that the likelihood of encountering day users is minimal in most backcountry areas." The reader should refer to Table 23 in this chapter and to Chapter 3 for more information on this matter.

⁵On page 26 of the backcountry management plan, it is concluded that five hikers "is the limit suggested by trail formation data."

8. Do Hiking Parties See All of the Other Hiking Parties Assigned to the Same Backcountry Zone on the Same Day?

A major assumption of the management plan for McKinley's backcountry is that hikers will probably sight all of the other overnight hiking parties assigned to the same zone on the same day.⁶ The assumption is based on two factors: (1) that the travel of parties is channelled by physiographic or vegetational conditions, which means that use tends to concentrate on a small fraction of the total area of a zone; and (2) that the scarcity of forest cover allows for maximum visibility. In operational terms, based on this assumption, the Park Service posits that the ratio of number of parties sighted to number of other parties in the zone is one. This ratio is then adjusted (i.e., less than one) for some zones, depending on the (a) size of the zone, (b) degree of channelling, and (c) presence of visual barriers.

Those hikers participating in the survey were asked how many parties they sighted for each day they were in backcountry, as well as the zone where they camped (and therefore hiked).⁷ The person distributing the questionnaires had already written in the appropriate dates for each day of the backcountry trip. A total of 2,329 hikers provided such information for a total of 3,648 days. The most accurate data available on the number of hiking parties who camped in each zone on each day of the

⁶ See pages 29, 31, and 32 of the backcountry management plan.

⁷ Eighteen percent of the study population of hikers (N = 3,324) hiked in at least one zone other than where camped. Fifteen percent of the study population of hiker-nights (N = 6,821) involved hikers traveling in another zone besides the one used for camping. These data are presented more thoroughly in Chapter 5.

summer was obtained from the backcountry tally sheet.³ These data from the tally sheet were combined with the file of hiker-days ($N = 9,648$) as follows: given a date and a zone by a respondent, the appropriate "density" from the tally sheet (i.e., the number of parties assigned to the zone on that date minus one, which represents the respondent's party) was supplied. Two densities are used in the analysis: (1) minimum density which represents those other parties assigned to the zone on the same day, and (2) maximum density which represents those other parties assigned to the zone on the same day and the day before.⁹

The data that are to be used in the analysis have three potential sources of bias. First, one can never be sure of the accuracy of the number of sightings reported by the respondents. However, we assume that poor memory is not a problem and that therefore the data on sightings are accurate because: (a) sightings of other parties were rare, and (b) most questionnaires were returned soon after the trip had ended (see Table 1 in Chapter 3). Second, data from the tally sheet are not entirely correct, as shown in Chapter 5. However, we believe that the data from the tally sheet are valid enough for our purposes because partial compliance and noncompliance with the permit system were minimal and had a balancing effect in terms of actual backcountry use. And third, some of the parties sighted were day hiking parties. The respondents

³ See Chapter 5 for a discussion of the validity of the data from the backcountry tally sheet.

⁹ The issue of how many parties are in a zone (i.e., density) is more complex than suggested by this discussion. However, the discussion suffices for purposes of the analysis.

were asked to estimate how many of the parties they saw on their trip were day hikers.

Table 23. Of the hiking parties you saw on this backcountry trip, about how many were day hiking parties? (N = 2,829).

Response	Percentage
Did not see hiking parties	26
Were unable to distinguish day hiking parties from other parties	12
None	29
About one-fourth	8
About one-half	9
About three-fourths	4
All	9
No information	3

Based on the figures in Table 23, we must conclude that for some of the respondents, their information on sightings does include day hiking parties as well as overnight hiking parties. For this analysis, we are interested only in sightings of overnight hiking parties, since the figures for density are based on overnight hiking parties. Therefore, in order to take into account some of the contamination of the data on sightings by day hiking parties, the following was done: (a) those respondents who reported that about one-half or three-fourths of their sightings involved day hikers (N = 369) were excluded, reducing the number of hiker-days to 8,322, and (b) for those respondents who stated that all of their sightings were of day hikers (N = 255), their data on

sightings were changed to zero. The little contamination that might remain only means that the analysis is biased in favor of the assumption of the management plan.

Table 24 contains the distribution of densities, both minimum and maximum, for the 8,322 days for which respondents provided information on sighting or not sighting backpacking parties.

Table 24 Minimum and maximum densities: number of other backpacking parties in the zone (N = 8,322).

Number of other parties in the zone	Percentage	
	minimum density	maximum density
0	26	21
1 - 2	19	13
3 - 4	22	23
5 - 7	22	21
8 - 19	11	17
Range	0 - 11 parties	0 - 19 parties
Average	2.4 parties	4.7 parties

By excluding those cases where the density is zero (i.e., there were no other parties in the zone, according to the tally sheet, which means that the only parties they might have seen were day hikers or those backpackers not following their permit), the study population of respondent-hiker-days was reduced to 6,188 (based on minimum density) or 6,583 (based on maximum density).

In Table 25, the distribution of sightings of backpacking parties for those cases where the density is greater than zero is shown.

Table 25. Distribution of sightings of backpacking parties.

Number of sightings	Percentage (N = 6,188)	Percentage (N = 6,588)
0	53	53
1	24	22
2	9	9
3 - 8	5	6
No information ¹⁰	9	10
Range	0 - 7 parties	0 - 3 parties
Average	0.6 parties	0.7 parties

By comparing the data in Tables 24 and 25, and given that that 53 percent of the cases in Table 25 reported not seeing other parties, we surmise that the assumption of a ratio of one for parties sighted to parties present is not empirically valid. For Table 26, a ratio of the number of sightings (see Table 25) to the number of other parties in the zone (see Table 24) was calculated.

¹⁰The relatively large percentage of "no information" is due to the fact that some respondents failed to provide data for the last day of their trip (i.e., the day they hiked out of the backcountry).

Table 26. Distribution of the ratio of sighting to density.

Ratio	Percentage	
	minimum density (N = 6,188)	maximum density (N = 6,588)
0	53	53
0.01 to 0.49	14	25
0.50 to 0.99	11	7
1.00 ¹¹	13	5
No information	9	10
Average	0.25	0.15

At most, only 13 percent of the cases supported the assumption of a ratio of one (where the minimum density was used). Based on the figures in Table 26, we conclude that, on the average, a backpacker will see no more than one-fourth of the other parties assigned to the zone.

There is one difficulty in interpreting the data in Table 26: the meaning of a ratio of zero. A ratio of zero means that, although the number of sightings is zero (and constant), the density ranges from 1 to 19 parties. And, of course, there is a significant difference between a ratio of zero where the density is 1 party and where the density is 19

¹¹ For a very small percentage of the cases, the ratio was actually greater than 1.00 (i.e., more parties were sighted than were supposed to be in the zone). In order to simplify the analysis, the ratio for these cases was changed to one.

parties.¹² One way of getting around the notion of a ratio of zero while still using the concept of a ratio is to divide the average number of sightings for all cases by the average density for all cases. The results, which are reported in Table 27, reinforce the finding that the assumption that a hiker will sight all other backpacking parties in the zone on the same day is incorrect (i.e., that the ratio of sighting to density is one).

Table 27. Ratio of average sighting to average density.

Density used	Average sighting	Average density	Ratio
Minimum density (N = 6,133)	0.63	2.96	0.21
Maximum density (N = 6,538)	0.66	5.42	0.12

In fact, the ratio based on empirical evidence (either 0.21 or 0.12) is not even close to one.

The next question is whether the ratio of sighting to density differs by backcountry zone. The same procedure used for Table 27 was used to obtain a ratio for each backcountry zone (see Table 28).

¹²See tables 34 through 36 in Appendix II for more insight into this problem.

Table 28. Ratio of average sighting to average density, for each zone of the backcountry.

Zone number	Ratio based on minimum density	Ratio based on maximum density
1	0.25 (N = 9)	0.14 (N = 10)
1a	0.20 (N = 175)	0.12 (N = 169)
2	0.24 (N = 182)	0.15 (N = 202)
3	0.30 (N = 337)	0.18 (N = 373)
4	0.29 (N = 438)	0.16 (N = 451)
5	0.56 (N = 77)	0.39 (N = 39)
6	0.25 (N = 429)	0.13 (N = 432)
7	0.09 (N = 465)	0.05 (N = 485)
8	0.23 (N = 512)	0.13 (N = 537)
9	0.31 (N = 27)	0.21 (N = 36)
10	0.28 (N = 308)	0.17 (N = 320)
11	0.33 (N = 237)	0.19 (N = 259)
12	0.27 (N = 215)	0.14 (N = 227)
13	0.14 (N = 5)	0.27 (N = 9)
13a	(N = 0)	(N = 0)
14	(N = 0)	(N = 0)
15	0.17 (N = 614)	0.09 (N = 635)
16	0.19 (N = 233)	0.11 (N = 245)
17	0.14 (N = 162)	0.20 (N = 170)
18	0.16 (N = 322)	0.10 (N = 357)
19	0.09 (N = 173)	0.06 (N = 193)
20	0.25 (N = 4)	0.17 (N = 6)
21	0.17 (N = 263)	0.10 (N = 273)
22	0.08 (N = 25)	0.04 (N = 29)
23	0.14 (N = 291)	0.08 (N = 327)
24	0.13 (N = 266)	0.07 (N = 231)
25	0.33 (N = 118)	0.22 (N = 152)
26	0.69 (N = 14)	0.57 (N = 22)
27	(N = 0)	(N = 0)
28	0.01 (N = 51)	0.00 (N = 50)
29	0.24 (N = 95)	0.22 (N = 120)
29a	0.16 (N = 25)	0.13 (N = 32)
30	0.37 (N = 94)	0.26 (N = 105)
31	0.00 (N = 12)	0.00 (N = 12)

Based on the figures in Table 28, the zones have different ratios, although these ratios are almost all less than 0.40. It is difficult to assess whether these differences are due to characteristics of the zone

(i.e., size, degree of channelling, or extent of openness) or the size or peculiarity of the sample. Those persons more familiar with the characteristics of McKinley's backcountry zones might be better able to interpret the different ratios in Table 28.

Finally, it could be argued that backpackers tend to see other parties more often on the first and last days of the trip (i.e., days hiking into and out of the backcountry) than on other days when in the backcountry (see Table 29); and consequently, the ratios of sighting to density differ depending on the day of the trip (see Table 30).

Table 29. Average number of parties sighted, by day of the trip (N = 3,322).

Day of trip	Average number of parties sighted
First day or day hiked in (N = 2,460)	0.7
Last day or day hiked out (N = 2,451)	0.6
Other days (N = 3,411)	0.6

This argument is not plausible based on the evidence in Tables 29 and 30. Based on the figures in Table 29, the average number of parties sighted does not differ relative to the day of the trip being considered.

Table 30. Ratio of average sighting to average density, by day of the trip.

Day of trip	Ratio based on minimum density	Ratio based on maximum density
First day or day hiked in	0.21 (N = 2,211)	0.13 (N = 2,229)
Last day or day hiked out	0.20 (N = 1,630)	0.11 (N = 1,862)
Other days	0.22 (N = 2,347)	0.12 (N = 2,497)

Similarly, according to Table 30, the ratio of sighting to density is about the same, regardless of which day of the trip is analyzed.

In summary, the backcountry management plan's assumption that a backpacker will probably see all the other parties assigned to the same zone on the same day is not supported by the empirical evidence. That is, the ratio of sighting to density was one for only 13 or 5 percent of the cases (depending on which density is used). Overall, the ratio was somewhere between 0.25 and 0.12, depending on the density used and the method of calculation. We must conclude therefore that, overall, a zone can hold more than three backpacking parties without necessarily resulting in sightings of more than two parties. The ratios calculated for Tables 27 and 28 can be used by McKinley's managers to approximate the number of parties that would be sighted given a range of parties assigned to a zone.

C. Is Solitude an Essential Feature of the Visitor's Experience While in McKinley's Backcountry? How Does Solitude Rate Relative to Other Possible Features of the Backcountry Trip?

On page 31 of the backcountry management plan, the statement is made that "solitude is defined as an essential feature of the backcountry experience at Mount McKinley" Although the term, solitude, is a subjective concept (i.e., its meaning differs from person to person), it is generally acknowledged to mean being alone or in the presence of a "few" people. Of course, there remains the question as to the meaning of a "few." According to the management plan, feelings of crowding result in the loss of solitude; and that crowding is perceived when more than two parties are sighted. The discussion on crowding will continue in the next section of this chapter. For now, we want to assess whether solitude (however defined) is an important feature of the trip into McKinley's backcountry.

In One of the questions in the pre-trip questionnaire, hikers were asked to rank the relative importance of various factors for having an enjoyable trip in McKinley's backcountry.

Table 31. How important is each of the following factors to your having an enjoyable trip in the McKinley backcountry? (N = 3,983).

Factor	Average	Percentage			
		Very Important (1)	Somewhat Important (3)	Not Important (5)	No Information
Seeing wildlife ¹³	1.7	31	16	1	2
Wildness	1.7	80	14	2	4
Solitude	1.9	72	23	2	3
Observing wildflowers and other vegetation	2.2	64	30	3	3
Views of Mount McKinley	2.4	50	39	8	3
Fellowship with party members	2.5	53	30	12	5
Physical challenge	2.9	33	53	11	3
Hiking on tundra	3.3	25	50	22	3
Avoiding certain wildlife	3.5	25	31	35	9
Hiking on glacier or snow	3.3	16	43	37	4
Seeing other parties	4.6	3	22	70	5
Other ¹⁴	2.0	7	1	1	91

¹³About one-half of those who responded to the question "how important was seeing wildlife during this backcountry trip compared to other overnight hikes (anywhere) that you have made?" indicated that seeing wildlife was more important on the hike in McKinley than on other hikes.

¹⁴There was a range of answers by those who indicated other; for example: "photography," "equipment testing," "getting away from a screwed-up world," "Northern Lights," "away from city," "clean air," "mental challenge," "fishing," "birding," "getting back alive," "berries," "collect my thoughts," "geology," and "stars."

Based on the data in Table 31, the management plan is correct in asserting that solitude is an important feature of backpacking in the backcountry. However, this does not help us define the meaning of solitude. This will have to wait until the analysis of the data on crowding. In contrast, "seeing other parties" was ranked last with only three percent of the backpackers rating it as "very important" and almost three-fourths of them indicating that it was "not important." In general, it is clear from the evidence in Table 31 that the backpacking trip is a resource-oriented experience. For a large majority of hikers, "seeing wildlife" was the most important factor in having an enjoyable hike. The "wildness" of McKinley's backcountry was an equally important factor, although this concept, like solitude, is subject to many interpretations. Some clues as to the meaning of wildness can be found in Tables 56 and 57 of this chapter, where hikers respond to seeing evidence of human use in the backcountry, and Table 79 of the next chapter, where hikers give their opinions on development of the backcountry.

3. Is the Perception of Crowding Brought About by Seeing More Than Two Other Parties on any Given Day? What Other Factors might Contribute to Crowding?

In the management plan for McKinley's backcountry, the Park Service argues that crowding has an adverse impact on the satisfaction of visitors. Furthermore, the Park Service goes on to cite a study of hikers in three wilderness areas in the Rocky Mountains which suggests that for 70 percent of those sampled "encountering more than two other parties per day on their trip would adversely affect their satisfaction (Stankey 1973)."¹⁵

¹⁵ See page 31 of the backcountry management plan.

In the pre-trip questionnaire, we replicated the question used by Stankey (1973) in his wilderness survey. The hikers were asked how they would feel if they saw different numbers of parties per day in McKinley's backcountry.

Table 32. Listed below are some numbers of hiking parties (average size of 2) that might be seen in the McKinley backcountry. How would you feel if you saw: (N = 3,988).¹⁶

Number of parties seen per day	Percentage			
	Pleasant	Neutral	Unpleasant	No information
No parties	62	10	3	5
1 party per day	83	11	2	4
2 parties per day	69	21	6	4
3 parties per day	44	31	20	5
4 parties per day	23	35	37	5
5 parties per day	12	30	53	5
7 parties per day	5	18	72	5
9 parties per day	3	10	82	5
15 parties per day	2	4	39	5
20 parties per day	2	3	90	5

The distribution of responses by McKinley's backpackers to the question in Table 32 is similar to the one for Stankey's (1973) sample of wilderness users. Furthermore, in choosing the crowding threshold of two parties, the Park Service searched for the largest difference in the percentage

¹⁶ See Table 97 in Appendix 11 for a distribution of size of McKinley's backpacking parties.

who responded "pleasant" to the range of sightings. Following this logic, the largest difference in percentage in Table 32 is between two and three parties (i.e., difference of 25 percent). We must conclude, therefore, that the Park Service's use of the data from Stankey's survey in order to establish a crowding threshold is correct; that is, the results in Table 32 are similar to those in Stankey's study.

However, there are two problems with the analysis used by the Park Service and Stankey. These are:

1. One could argue that concern should be with those having an "unpleasant" experience. In other words, how does one interpret those who responded as feeling "neutral"? Following this argument, and the Park Service's logic, the crowding threshold would be five parties, since the largest difference (19 percent) in percentage for those responding with "unpleasant" is between five and seven parties.

2. The question is presented in terms of a hypothetical situation. There is evidence which suggests that people respond differently when presented with real situations (Wicker 1969). In other words, how do hikers respond to actually seeing other parties while in the backcountry? This second problem, of course, is a principal reason why we were asked to do the survey. In analyzing this problem, we will use a multiple regression analysis so as to answer two questions. These are:

- (1) Which independent variables help explain variation in the dependant variable, crowding?

- (2) What is the relative importance of each independent variable in explaining variation in the dependent variable?

Dependent Variable. "Crowding" is considered a measure of whether a person found solitude (i.e., if crowded, no solitude; if solitude, not crowded); and it is also a measure of "social satisfaction" (i.e., satisfaction with the social environment). Hikers were asked whether they felt "crowded" during their backcountry trip; and if so, to what extent.

Table 33. To what extent did you feel "crowded" during the backcountry trip? (N = 2,984).

Response	Percentage
Not crowded at all (1)	77
Crowded	21
- slightly (2-3)	- 17
- moderately (4-5)	- 3
- extremely (6-7)	- 1
No information	2
Range: 1 to 7	
Average: 1.4	

Based on the data in Table 33, crowding was experienced by only one-fourth of the hikers; and of those who did experience crowding, it was mostly "slight."

Independent Variables. Nine independent variables have been identified as possible predictors of crowding. These are:

- (1) average number of parties seen per day (see Table 35);
- (2) ratio of days parties were seen to days of the trip (see Table 36);
- (3) largest number of parties seen on any day of the trip (see Table 37);
- (4) ratio of parties with whom interacted to parties seen (see Table 38);
- (5) proportion of day hiking parties seen (see Table 41);
- (6) average number of campsites seen (see Table 43);
- (7) preference for number of parties seen (see Table 44);
- (8) expectation for number of parties seen (see Table 45); and
- (9) resource impact score (i.e., response to seeing evidence of human use) (see Table 46).

A brief explanation will be made of each independent variable, before proceeding with the multiple regression analysis.

Overall, hikers reported seeing few parties while in the backcountry.¹⁷ This was so even though we attempted to operate some experimental zones for the purpose of exposing some hikers to a large number of sightings (see Chapter 3 for an explanation of the experimental zones). This quasi-experiment never worked properly because: (a) the ratio of sighting to density is low; (b) the experimental zones were closed for portions of the summer; and (c) the experimental capacities were lowered

¹⁷The following instruction was stated in the mail questionnaire: "Please list only sightings of, and contacts with, other hiking parties that were made once you left the road."

during the summer. Hikers reported seeing only an average of 2.6 parties during their entire stay in the backcountry.¹³

Table 34. Total number of parties seen during the backcountry trip (N = 2,829).

Total number of parties seen		Percentage
0		26
1		21
2		17
3 - 4		19
5 - 85 ¹³		16
No information		1
Range	0 - 85 parties	
Average	2.6 parties	

A difficulty in interpreting Table 34 is that the total number of parties sighted is related to the length of the trip. So if we divide the total number of parties sighted (see Table 34) by the number of days

¹³The data in Tables 34, 35, 36, and 37 are based on questions involving each day of the backcountry trip. These data are incomplete in that 39 percent of the respondents did not provide information for all of the days of their trip. However, the vast majority of those who provided incomplete data missed only one day, and usually it involved the day they hiked out of the backcountry. And, according to the figures in Table 29, the number of parties sighted does not differ relative to the day of the trip being considered.

¹⁴We double checked those cases with a high number of total sightings (e.g., 35 parties). We can never be sure, however, whether the respondent meant "number of hikers" instead of "number of parties" (which was what the question had asked for).

of the trip,²⁰ we arrive at the average number of parties seen per day (see Table 35).

Table 35. Average number of parties seen per day (N = 2,329).

Average number of parties seen per day	Percentage
0	26
Less than 0.5	18
0.5 to 0.9	24
1.0	12
1.1 to 1.9	10
2.0 to 12.7	8
No information	5
Range	0 - 12.7 parties per day
Average	0.7 parties per day

According to the figures in Table 35, McKinley's backpackers, on the average, saw less than one party per day while in the backcountry in 1973. In fact, hikers saw parties on only 1.4 days of their trip, or 41 percent of their days in the backcountry (see Table 36).

²⁰See Table 93 in Appendix II for a distribution of the number of days each respondent was in the backcountry.

Table 36. Ratio of number of days parties were seen to total number of days of the trip (N = 2,829).

Ratio	Percentage
0 (no parties seen)	26
0.01 to 0.49	26
0.50	19
0.51 to 0.99	17
1.00	11
No information	1
Range	0 to 1.00
Average	0.41

Only 11 percent of the hikers saw at least one party on every day of their trip (i.e., ratio of one in Table 36). As shown in Tables 34 through 37, more than one-fourth of the hikers never saw another party while in the backcountry. Finally, in Table 37, we provide figures indicating the largest number of parties sighted on any day of the backcountry trip.

Table 37. Largest number of parties seen on any day of the backcountry trip (N = 2,829).

Largest number of parties seen	Percentage
0	26
1	32
2	21
3	12
4 - 20	8
No information	1
Range:	0 to 20 parties
Average:	1.6 parties

About one-fifth of the backpackers saw three or more parties on at least one day of their trip into the backcountry. Based on the backcountry management plan, one would assume that most of the hikers from this group experienced crowding while in the backcountry. This assumption is examined in Table 33 of this chapter.

Two points can be made regarding the nature of the sightings of parties while in the backcountry: (1) about half of them involved some distance; and (2) about half of the backpackers who saw parties reported seeing day hikers. First, if we assume that a hiker will interact (i.e., "talk to or exchange greetings, either verbal or nonverbal");²¹ with those parties he or she sees, if they are close enough to do so (Lee 1977), then we conclude, based on the data in Tables 33 and 39, that about half of the sightings while in McKinley's backcountry were of a distant nature; that is, distant enough to make interactions impossible. We asked the hikers to report with how many of the parties they saw did they interact. They provided information for a total of 9,642 days; and they reported seeing at least one party during 5,073 of these days. For Table 33, we calculated a ratio of number of parties with whom interacted to number of parties seen.²²

²¹This is the way "interaction" was defined in the questionnaire.

²²This high percentage of 26 is due to two factors: (1) many hikers did not provide information for their last day; and (2) some hikers did not answer the questions as to the number of interactions, although they did answer the question on the number of sightings.

Table 33. Ratio of number of parties with whom interacted to number of parties sighted (N = 5,073).

Ratio	Percentage
0	32
0.01 to 0.49	4
0.50 to 0.99	10
1.00	28
No information ²³	26
Range 0 - 1.00	
Average 0.47	

For 32 percent of the cases (i.e., hiker-days), the hikers did not interact with the parties they saw, while for 28 percent of the cases, the hikers interacted with all of the parties they saw. On the average, hikers interacted with about half of the parties they saw (i.e., average ratio of 0.47).

Furthermore, this ratio of interaction to sighting does not differ markedly based on the day of the trip (see Table 39).

Table 39. Ratio of average number of interactions to average number of sightings, by day of the trip (N = 5,073).

Day of trip	Ratio
First day or day hiked in (N = 2,450)	0.47
Last day or day hiked out (N = 1,320)	0.47
Other days (N = 343)	0.41
For entire sample	0.45

²³ For another version of Table 33, see Table 99 in Appendix 11. This other table is the one actually used in the multiple regression analysis.

The conclusion that many of the sightings were of a distant nature (which is substantiated by the data in Tables 38 and 39) is not surprising given the fact that travel in McKinley's backcountry is cross-country. There are few trails, which means that backpackers will travel most anywhere in the backcountry, although they do follow certain natural features such as river drainages, ridges, or wildlife trails.

One might wonder if the ratio of interaction to sighting differs by backcountry zone. In other words, are sightings in some backcountry zones of a less distant nature than in other zones? Based on the data in Table 40, we must conclude that there are some differences among the backcountry zones in terms of their ratio of interaction to sighting.

Table 40. Ratio of average number of interactions to average number of sightings, by backcountry zone (N = 5,073).

Backcountry zone		Ratio
1	(N = 22)	0.73
1a	(N = 118)	0.46
2	(N = 128)	0.68
3	(N = 316)	0.49
4	(N = 389)	0.40
5	(N = 90)	0.59
6	(N = 397)	0.38
7	(N = 203)	0.53
8	(N = 343)	0.44
9	(N = 61)	0.54
10	(N = 189)	0.51
11	(N = 193)	0.34
12	(N = 121)	0.44
13	(N = 4)	0.14
13a	(N = 0)	
14	(N = 3)	0
15	(N = 517)	0.35
16	(N = 137)	0.29
17	(N = 113)	0.40
18	(N = 232)	0.50
19	(N = 73)	0.35
20	(N = 75)	0.37
21	(N = 133)	0.44
22	(N = 11)	0.43
23	(N = 215)	0.37
24	(N = 122)	0.49
25	(N = 115)	0.46
26	(N = 97)	0.63
27	(N = 0)	
28	(N = 46)	0.61
29	(N = 84)	0.59
29a	(N = 46)	0.49
30	(N = 157)	0.70
31	(N = 18)	0.54
For entire sample		0.45

It is difficult to assess whether these differences are due to characteristics of the zone (i.e., size or degree of channelling) or the size or peculiarities of the sample. Persons who are more familiar with the characteristics of McKinley's backcountry zones might be better able to interpret the different ratios in Table 40. We do know, however, that there are trails in zones 2, 26, 28, and 30; and these are four of the five zones with a ratio greater than 0.60.

Second, in the first section of this chapter, we discussed the fact that some of the parties seen were comprised of day hikers (see Table 23). If we consider only those hikers who reported seeing at least one party while in the backcountry ($N = 2,106$), 41 percent of them saw day hikers (and 15 percent of them could not distinguish between day and overnight hikers).

Table 41. Of the hiking parties you saw on this backcountry trip, about how many were day hiking parties? ($N = 2,106$).

Response	Percentage
Was unable to distinguish day hiking parties from other parties	15
None	39
About one-fourth	11
About one-half	12
About three-fourths	6
All	12
No information	5

We can conclude, therefore, based on the figures in Table 41, that about half of those backpackers who saw parties saw at least one party of day hikers.²⁴

The next step is to determine the percentage of total sightings that were of parties made up of day hikers. In so doing, one must remember that the responses to the question in Table 41 were approximations rather than exact figures. One must first exclude those who could not distinguish between day and overnight hikers (15 percent) and those who did not respond to the question (5 percent), resulting in a study population of 1,570 hikers. For Table 42, the study population is divided into five groups:

- (1) those who did not see day hikers (N = 322);
- (2) those who said that about one-fourth of the parties they saw were day hikers (N = 237);
- (3) those who said that about one-half of the parties they saw were day hikers (N = 114);
- (4) those who said that about three-fourths of the parties they saw were day hikers (N = 242); and
- (5) those who said that all of the parties they saw were day hikers (N = 242).

²⁴Table 23 is actually the one used in the multiple regression analysis.

Table 42. How many of the total number of parties seen were made up of overnight and day hikers (N = 1,670).

Group	Total number of parties seen	Total number of day hiking parties seen	Total number of overnight hiking parties seen
None were day hikers (N = 322)	2,174	0	2,174
About one-fourth were day hikers (N = 237)	1,406	352	1,054
About one-half were day hikers (N = 255)	984	492	492
About three-fourths were day hikers (N = 114)	628	471	157
All were day hikers (N = 242)	533	533	0
Total (N = 1,670)	5,725	1,843	3,377
Percentage of total	100%	32%	68%

According to the results in Table 42, about two-thirds of the total number of parties seen in McKinley's backcountry in 1973 were comprised of overnight hikers. At first, the relative infrequency of backpackers sighting day hikers might seem contradictory given the estimates in Table 30 of Chapter 2 of there being more day hikers than overnight hikers in the backcountry. This discrepancy can be explained in two ways: (1) day hikers used only a few of the backcountry zones; and (2) day hikers did not penetrate very far into the backcountry (see Chapter 5).

Another measure of sightings of people in the backcountry is sightings of established campsites.²⁵ One-half of the hikers never saw "campsites with tents" while on their backcountry trip, and most of those that did, saw only one or two during their entire trip. The data in Table 43 represent the average number of campsites seen per day.

Table 43. Average number of campsites seen per day (N = 2,329).

Average number of campsites seen per day		Percentage
0		51
0.1 to 0.5		34
0.6 to 1.0		11
1.0 to 5.0		3
No information		1
Range	0 to 5.0 campsites per day	
Average	0.3 campsites per day	

Clearly, campsites were seen far less often than other hiking parties.²⁶

²⁵One of the concerns expressed by some of those involved with managing McKinley's backcountry is the affect of brightly colored tents on the visitor's experience. Given limited space in the questionnaire, we did not deal with this issue, except for the number of campsites sighted.

²⁶For most of the nights in the backcountry (average of 2.1 nights out of a possible 2.6 nights), the backpackers "camped completely away from and out of sight of other parties."

Hikers were asked to compare the number of parties they sighted with two personal standards: (1) what they would have preferred, and (2) what they had expected. The assumption here is that most hikers arrived at McKinley and entered the backcountry with a preference and expectation for number of parties to be sighted.

Table 44. How did you feel about the number of hiking parties you saw on this backcountry trip? (N = 2,329).

Response	Percentage
Saw too many, preferred seeing none (1)	11
Saw too many, preferred seeing less (2)	9
Saw about the right number (3)	62
Saw too few, preferred seeing a few more (4)	4
Saw too few, preferred seeing many more (5)	1
Did not matter one way or the other	7
No information	6

According to the data in Table 44, most of the hikers saw about the right number, while 11 percent of them saw too many, preferring to have seen none; and 7 percent of them did not have a preference.

Table 45. How did the number of hiking parties you saw compare with the number you thought you would see? (N = 2,329).

Response	Percentage
A lot less than expected (1)	13
Less than expected (2)	31
About as expected (3)	34
More than expected (4)	11
A lot more than expected (5)	2
Had no expectations about the number to be seen	8
No information	1

As for expectations, about one-third of the hikers saw about as expected, while 13 percent of them saw more than expected; and 2 percent of them did not have an expectation (see Table 45).²⁷

The last independent variable concerns the sighting of evidence of human use. Hikers were asked whether they saw each of eight types of evidence of human use (see Table 56); and if they did, how did they react to seeing such evidence (see Table 57). The eight types of evidence of human use are: (1) human waste, (2) toilet paper, (3) campfire rings, (4) litter, (5) horse waste, (6) cut bushes or trees, (7) hiker-made trails, and (8) hiker-made campsites. Using the information in Tables 56 and 57, a "resource impact score" was constructed (see Table 46). For each of the eight types of evidence, a respondent was given a score of 1 (did not see such evidence), 2 (did see such evidence, but not bothered), 3 (did see such evidence and somewhat bothered), and 4 (did see such evidence and greatly bothered). These scores were added up for each respondent for a possible score of 8 to 32.

Table 46. Distribution of human impact score (N = 2,384).

Human impact score	Percentage
3	28
9 - 10	31
11 - 12	17
13 - 29	19
No information	5
Range 8 - 29	
Average 10.6	

²⁷In the pre-trip questionnaire 3,989 hikers responded to the question: "About how many hiking parties, if any, do you think you are likely to see each day on your upcoming hike in the McKinley backcountry?" One-quarter of the respondents responded that they "had no idea." Of those that did have an expectation, their average response was 2.4 parties.

A low score means no evidence of human use was sighted, or some evidence was sighted but the hiker was not bothered. A high score means that all or most evidence of human use was sighted and that the hiker was greatly bothered.²⁸

Multiple Regression. The analysis of the relationship between the nine independent variables and the dependent variable will be presented in two parts. First, a forward stepwise regression analysis will be considered, whereby the inclusion of the independent variables into the regression equation will be in terms of how well the various variables explain variance in the dependent variable. The independent variable that explains the greatest amount of variance will be entered first, followed by the variable that explains the greatest amount of variance in conjunction with the first, and so on. Second, the standardized regression coefficients for each of the independent variables will be studied. These coefficients tell us the relative importance of each of the independent variables in explaining change in the dependent, controlling for the other independent variables. The reader is encouraged to review Appendix 9 for a more detailed explanation of these statistical procedures.

²⁸ In developing the "human impact score," for those cases where information was not provided for some or all of the eight types of evidence of human use, the following procedure was followed:

- (a) If information was not provided for one or two of the types of evidence, then these were given a score of three;
- (b) If information was not provided for three or more of the types of evidence, then the case was dropped (i.e., "no information").

But before proceeding with the regression analysis, Pearson correlations between the various independent variables and the dependent variable, crowding, are presented.²⁹

Table 47. Pearson correlations between crowding and various dependant variables (N = 2,329).

Correlation of crowding with:	r	r ²
Preference for number of sightings (Table 44)	-0.45	0.20
Expectation for number of sightings (Table 45)	0.42	0.18
Average number of parties seen per day (Table 35)	0.40	0.16
Largest number of parties seen on any day (Table 37)	0.40	0.16
Resource impact score (Table 46)	0.29	0.08
Ratio of days parties seen to days of trip (Table 36)	0.27	0.07
Average number of campsites seen per day (Table 43)	0.26	0.07
Ratio of parties with whom interacted to parties seen (Table 38)	0.09	0.01
Proportion of day hiking parties seen (Table 41)	0.09	0.01
Missing cases:	692 ³⁰	

²⁹See Table 100 in Appendix II for the intercorrelations of the independent variables.

³⁰This large number of missing cases is due to: (1) listwise deletion of missing cases for regression analysis; and (2) those cases without a preference or an expectation were excluded from the analysis.

According to the correlations in Table 47, preference, expectation, and number of sightings (whether the average number or the largest number) have the highest correlations with crowding. The proportion of day hiking parties seen and the distance of the sightings (i.e., ratio of interaction to sightings), on the other hand, have the weakest correlations.

The nine independent variables used in the regression analysis explain 36 percent of the variance in crowding (see Table 48).

Table 48. Forward stepwise regression with crowding as the dependent variable (N = 2,820).

Independent variables	Multiple R	r^2
Preference for number of sightings (Table 44)	0.45	0.20
Average number of parties seen per day (Table 35)	0.53	0.29
Expectation for number of sightings (Table 45)	0.57	0.33
Resource Impact score (Table 46)	0.59	0.35
Ratio of days parties seen to days of trip (Table 36)	0.59	0.35
Average number of campsites seen per day (Table 43)	0.60	0.36
Ratio of parties with whom interacted to parties seen (Table 33)	0.60	0.36
Proportion of day hiking parties seen (Table 41)	0.60	0.36
Largest number of parties seen on any day (Table 37)	0.60	0.36
Missing cases	692	

Based on the data in Table 48, almost all of the 36 percent explained variance can be attributed to the first four independent variables: preference, average number of sightings, expectation, and human impact score. The contribution of the other five variables is already accounted for by the first four variables.

A similar conclusion can be made if we consider the standardized regression coefficients (see Table 49).

Table 49. Standardized regression coefficients with crowding as the dependent variable (N = 2,829).

Independent variables	Standardized regression coefficients
Preference for number of sightings (Table 44)	-0.23
Average number of parties seen per day (Table 35)	0.23
Expectation for number of sightings (Table 45)	0.20
Human impact score (Table 46)	0.16
Ratio of days parties seen to days of trip (Table 36)	-0.10
Average number of campsites seen per day (Table 43)	0.07
Ratio of parties with whom interacted to parties seen (Table 38)	-0.05
Proportion of day hiking parties seen (Table 41)	--- ^a
Largest number of parties seen on any day (Table 37)	--- ^b
Multiple R: 0.60	
R ² : 0.36	
Missing cases 692	
^a Coefficient is less than 0.01 and $p < 0.90$.	
^b Coefficient is less than 0.01 and $p < 0.92$.	

The following conclusion can be made based on the results in Tables 43 and 49: whether or not a hiker experienced crowding in McKinley's backcountry in 1979 depended not only on the number of parties sighted but on his or her personal preference and expectation for these sightings as well as his or her reaction to seeing evidence of human use. Seeing campsites or day hikers did not have an independent effect on crowding.

In other words, those who preferred seeing less than they actually saw or those who saw more than they had expected were more apt to experience crowding while in the backcountry (see Tables 50 and 51).

Table 50. Relationship between crowding and preference (N = 2,929).

	Preferred seeing less	Saw about as preferred	Preferred seeing more
Did not feel crowded	41%	90%	95%
Did feel crowded	59%	10%	5%
Total	100% (N = 553)	100% (N = 1,731)	100% (N = 123)
r = -0.47 Missing cases: 417			

Table 51. Relationship between crowding and expectation (N = 2,829).

	Saw less than expected	Saw about as expected	Saw more than expected
Did not feel crowded	92%	78%	35%
Did feel crowded	8%	22%	62%
Total	100% (N = 1,251)	100% (N = 946)	100% (N = 370)
r = 0.42 Missing cases: 262			

Similarly, as the number of parties sighted increased, there was more of a likelihood that hikers experienced crowding while in the backcountry (see Tables 52 and 53).

Table 52. Relationship between crowding and average number of parties seen (N = 2,329).

Average number of parties seen	Did not feel crowded	Did feel crowded	Total
0	94%	6%	100% (N=719)
0.1 to 0.4	88%	12%	100% (N=450)
0.5 to 0.9	82%	18%	100% (N=665)
1.0	71%	29%	100% (N=340)
1.1 to 1.5	64%	36%	100% (N=235)
1.6 to 2.0	54%	46%	100% (N=159)
2.1 to 3.0	39%	61%	100% (N=127)
3.1 to 4.0	30%	70%	100% (N= 30)
4.1 to 5.0	46%	54%	100% (N= 11)
5.1 to 12.7	29%	71%	100% (N= 7)

$r = 0.33$

Missing cases: 36

Table 53. Relationship between crowding and largest number of parties seen on any day (N = 2,323).

Largest number of parties seen	Did not feel crowded	Did feel crowded	Total
0	94%	6%	100% (N=704)
1	36%	14%	100% (N=883)
2	74%	26%	100% (N=533)
3	59%	41%	100% (N=325)
4	53%	47%	100% (N=131)
5	37%	63%	100% (N= 57)
6 to 7	40%	32%	100% (N= 27)
8 to 20	33%	62%	100% (N= 27)

$r = 0.35$

Missing cases: 32

in studying the percentages in Tables 52 and 53, one can notice that the largest shift in the percentages occurs between two and three parties sighted. This observation gives credence to the Park Service argument outlined in the discussion of Table 32.

However, some reservations need to be made. First, there are other factors associated with crowding other than sighting parties, as shown in the regression analysis. There are, therefore, other ways, besides limiting the number of hikers, for the Park Service to minimize crowding; for example, provide hikers with thorough information on the number of parties in a zone (both actual and potential), and let them decide which zone to visit based on their preference for sightings. Also, regardless of which zone they entered, they would have a fairly realistic expectation of the possible number of sightings they will experience. Second, some backpackers who saw more than two parties (either on the average or on at least one day) did not feel crowded. In other words, the backpacking public at McKinley in 1978 was a heterogeneous group, rather than homogeneous (i.e., these hikers are not all the same, neither in their behavior nor in their attitudes). And third, most of the crowding ratings were in the "slight" and "moderate" range, in that order (given a range from one to seven). That is, the crowding that did occur was generally not of a serious nature (see Table 33).

One might appropriately ask why the nine independent variables only explain 36 percent of the variance in the dependent variable, crowding. An answer to this question can be found in the comments written by those who felt crowded. About 40 percent of those who felt crowded ($N = 616$) wrote comments in response to the question "what contributed to your

feeling crowded?" About half (53 percent) of those who wrote comments (N = 255) mentioned that seeing buses, facilities, or people on the road contributed to crowding while in the backcountry. The remainder of those writing comments mostly dealt with seeing too many hikers on their trip (see Appendix 10).

E. How do Hikers Respond to Seeing Evidence of Human Use in the Backcountry?

Another sign of the presence of other people in the backcountry, besides direct sightings, is the evidence of their presence that is left behind: litter, human waste, trampling of vegetation. On page 19 of the management plan, the statement is made that "perceived resource impact" is a determinant of visitor satisfaction:

"Impact not having a great ecological significance might nevertheless be important if highly visible to users. Litter and campfire scars are especially critical. Campsites and trails also detract from the traditional backcountry experience available in most areas of Mount McKinley."

The purpose of this section is to assess the validity of this statement. But first, some information will be provided indicating how the backcountry was used, thus enabling managers and researchers to learn a little more about potential impacts to the resource (some of this has already been done in Chapter 5).³¹

³¹ Using some data from the study of permit compliance (see Chapter 9), we found that about 11 percent of the backpackers (N = 474) built campfires and about 4 percent of them cut bushes or trees.

Hikers were asked how often they camped in an area where there was evidence of previous use.

Table 54. How many nights, if any, did you camp where there was evidence of previous use (for example, fire ring, soil compaction or vegetation trampling the to tents)? (N = 2,984).

Number of nights	Percentage
0	76
1	16
2	5
3 to 10	2
No information	1
Range	0 - 10 nights
Average	0.4 nights

The average of 0.4 nights in Table 54 is about 15 percent of the average number of nights in the backcountry (2.6 nights). Therefore, according to information provided by the hikers themselves, they seldom camped in an area that apparently had been used before by other backpackers. But this can be explained by the fact that only 13 percent of the respondents reported seeing evidence of hiker-made campsites (see Table 56).

Most of McKinley's backcountry zones extend more than six miles from the park road. However, based on reports from the backpackers

which are summarized in Table 55, backpackers usually traveled in a six-mile corridor along the park road.³²

Table 55. How many nights did your party camp near the park road? (N = 2,334).

Distance from the park road	Total number of hiker-nights	Percentage of total
Camped 1 miles or less from the road	1393	13
Camped more than 1 mile, but less than 3 miles, from the road	2118	28
Camped 3 miles or more, but less than 6 miles, from the road	2076	28
Camped 6 miles or more from the road	1967	26
TOTAL	7554	100

About one-fourth of the reported hiker-nights were spent camped more than six miles from the park road.

Turning now to sightings of human impact, based on reports from the backpackers, McKinley's backcountry is a relatively pristine environment in that hikers saw little evidence of human use (see Table 56).

³²The figures in Table 56 are based on each hiker's estimation as to the number of miles he or she camped away from the park road. In other words, these estimations are subjective, rather than objective, measures.

Table 56. Did you see any evidence of human use on this backcountry trip? (N = 2,384).

Type of evidence of human use	Percentage		
	Yes	No	No information
Hiker-made trails	48	43	4
Litter	27	69	4
Campfire rings	25	71	4
Hiker-made campsites	18	77	5
Cut bushes or trees	9	86	5
Toilet paper	8	88	4
Horse waste	7	88	5
Human waste	5	91	4

Most of the evidence seen involved trails made by hikers, although a number of hikers commented that it was difficult to determine whether a trail was made by hikers or by wildlife. A weakness of the data in Table 56 is that they say nothing of the amount or extent of the evidence seen.³³

Of those who saw evidence of previous human use, they were asked to evaluate these sightings.

³³ Most of McKinley's backpackers had expectations about the amount of evidence of human use they would see in the backcountry (N = 2,645), and a few of them (3 percent) saw more than expected. The others saw less than or about as, expected.

Table 57. If you saw any evidence of human use, about how much, if at all, did this evidence of human use bother you?

Type of evidence of human use	Percentage			
	Not bothered	Somewhat bothered	Very bothered	No information
Hiker-made trails (N = 1,440)	73	20	5	2
Hiker-made campsites (N = 523)	58	32	9	1
Campfire rings (N = 735)	47	34	17	2
Horse waste (N = 206)	45	33	20	2
Cut bushes or trees (N = 271)	38	39	20	3
Human waste (N = 135)	35	21	43	1
Toilet paper (N = 244)	14	37	48	1
Litter (N = 300)	10	34	55	1

The results presented in Table 57 are instructive in two ways. First, overall, given the evidence of human use they saw, McKinley's backpackers were not strongly bothered by this. Second, hikers were more bothered by "indirect" impacts to the resource (e.g., litter, human waste, toilet paper) than by "direct" impacts (e.g., hiker-made trails or campsites, campfire rings). In other words, McKinley's backpackers were more accepting of trampled vegetation or bare ground, possibly because these are, to a certain extent, "unavoidable," than they were of such things as litter and toilet paper, which can be packed out. As a general proposition it could be argued, based on the results in Table 57, that the more a certain type of evidence of human use can be avoided, the more likely those seeing such evidence will be bothered.³⁴

³⁴A similar finding was made by Lee (1975) in a survey of back-country users in Yosemite National Park.

F. To What Extent do Perceptions of Crowding and Resource Impacts Influence Whether Hikers are Satisfied with their Trip into the Backcountry? What other Factors Might Contribute to the Degree of Satisfaction with the Trip?

As we stated in the beginning of the chapter, McKinley's management plan for the backcountry is partially predicated on enhancing the satisfaction of the hiker with his or her trip into the backcountry. Each hiker was asked to rate, overall, his or her trip into the backcountry.

Table 58. Overall, how would you rate this backcountry trip? (N = 2,984).

Response	Percentage
Poor (1)	1
Fair, it just didn't work out very well (2)	5
Good, but I wish a number of things could have been different (3)	22
Excellent, only minor problems (4)	56
Perfect (5)	15
No information	1
Range 1 - 5	
Average 3.8	

Based on the figures in Table 58, we must conclude that, in general, McKinley's backpackers enjoyed their trip into the backcountry.

However, we are interested in explaining the variation that does exist in Table 58. Why did some of the hikers (28 percent) rate their hike as "poor" or "fair" or "good"? Why did they not all rate their

trip as "perfect"? What, then, contributed to a less than "perfect" rating? On pages 19 and 20 of the backcountry management plan, the Park Service lists five factors as influencing "visitor satisfaction." These are:

- (1) Crowding. The satisfaction of hikers will diminish if they feel crowded (i.e., see too many people).³⁵
- (2) Resource Impact. The satisfaction of hikers will diminish if they see too much evidence of human use in the backcountry (i.e., loss of a pristine environment).
- (3) Regulations. The satisfaction of backpackers will diminish if the backcountry is over-regulated, thus inhibiting spontaneous behavior and trip planning.
- (4) Information. A balance must be found between providing too much (i.e., loss of challenge or adventure) and too little (i.e., familiarity with natural hazards) information.
- (5) Intergroup conflicts. The satisfaction of hikers will diminish if they see large parties or day hikers or horse groups or aircraft.

Crowding. Using the rating of the trip as the dependent variable (see Table 33), the question is asked whether the independent variables of crowding (see Table 33) and seeing parties (see Tables 34, 35, and 37) explain any of the variation in the dependent variable.

³⁵The argument can be made that, because McKinley's backcountry is a "wilderness study area" and therefore subject to the Wilderness Act until final determination is made and because "solitude" is an important ingredient of the wilderness experience as stated in the Wilderness Act, the Park Service should manage the backcountry in such a way that hikers do not experience crowding (where crowding is a measure of whether or not hikers found solitude).

Table 59. Pearson correlations between satisfaction with trip and crowding and number of parties sighted (N = 2,329).

Correlation of trip satisfaction with:	r	r ²	Missing cases
Crowding	-0.04	--	63
Total number of parties seen	-0.01 ^a	--	63
Average number of parties seen per day	-0.07	--	68
Largest number of parties seen on any day	-0.03 ^b	--	74

^ap < 0.40

^bp < 0.07

According to the correlations in Table 59, there is a negative relationship between satisfaction and feeling crowded and between satisfaction and seeing parties; that is, satisfaction diminishes as the extent of crowding increases or as the number of parties sighted increases. However, the strength of the relationships is negligible (i.e., r² is less than one percent). In other words, feeling crowded or seeing parties had no effect on whether hikers enjoyed their trip into the backcountry (see Table 60).

Table 60. Relationship between whether or not felt crowded and evaluation of the trip (N = 2,329).

Evaluation of the trip	Did not feel crowded	Did feel crowded
Poor	1%	1%
Fair	6%	5%
Good	21%	25%
Excellent	56%	59%
Perfect	16%	10%
TOTAL	100% (N = 2,173)	100% (N = 533)
r = -0.04		
Missing cases: 63		

This finding is similar to that of the Grand Canyon study (Mileisen and Shalby 1977) and confirms what is in the literature which suggests that crowding is only one of the many factors influencing the recreational experience (Heberlein 1977).

Resource Impact. If we correlate the human impact score (Independent variable), which is presented in Table 46, with the rating of the trip (dependent variable), we find that there is not a statistically significant relationship; that is, the correlation of -0.01 is due to chance.

Table 61. Pearson correlation between trip satisfaction and evidence score (N = 2,984).

Correlation of trip satisfaction trip	r	r ²	Missing cases
Evidence score	-0.01 ^a	--	164
^a p < 0.02			

In other words, according to Table 61, whether hikers saw evidence of human use and whether they reacted negatively to such, this did not affect their enjoyment of their trip.

Regulations and Information. In Table 72 of the next chapter, we present the opinions of the hikers on the different regulations governing use of McKinley's backcountry. In order to test the assumption that overregulation affects satisfaction, we correlated opinions on management policy (Independent variables) with evaluation of the trip (dependent variable).³⁵

³⁵The Independent variables in Table 62 are coded as follows: strongly support (1), support (2), neutral (3), oppose (4), strongly oppose (5).

Table 52. Pearson correlations between evaluation of trip and opinions on backcountry regulations (N = 2,748).

Correlation of trip satisfaction with:	r	r ²	Missing cases
Opinions on the following regulations governing backcountry use:			
- All overnight hiking parties must obtain a backcountry travel permit	-0.07	--	50
- Backcountry travel permits only may be obtained in the Park	-0.07	--	53
- Backcountry travel permits only may be obtained 24 hours in advance of trip	-0.12	0.01	61
- Overnight hikers only may <u>camp</u> in the backcountry zones specified by their permit	-0.12	0.01	60
- Overnight hikers only may <u>camp</u> in the backcountry on the nights specified by the permit	-0.10	0.01	61
- Overnight hikers may <u>hike</u> in zones other than those specified by their permit for camping	-0.03 ^a	--	61
- Day hikers do not need travel permits	-0.02 ^b	--	58
- Hiking parties may camp most anywhere within their scheduled backcountry zones	-0.06	--	61
- Backcountry campsites must not be visible from the park road	-0.11	0.01	55
- Campfires are not allowed in the backcountry	-0.14	0.02	61
- Some areas of the backcountry are permanently closed to overnight hikers in order to protect fragile wildlife habitats	-0.06	--	54
- Capacities for backcountry zones are determined on the basis of <u>individual hikers</u> rather than by <u>hiking parties</u>	-0.09	0.01	91
^a p < 0.11			
^b p < 0.12			

The correlations in Table 62 are in the expected direction (i.e., those who opposed the regulations tended to enjoy their trip less than those who supported the regulations), but they are extremely small (i.e., r^2 is less than three percent).

Hikers were asked to indicate the extent to which they were satisfied or dissatisfied with certain aspects of their backcountry trip (see Table 63).

Table 63. How dissatisfied or satisfied were you with the following aspects of this backcountry trip? (N = 2,984).

Aspects	Percentage			
	Satisfied (5)	Neutral (3)	Dissatisfied (1)	No information
Your experience in obtaining a backcountry travel permit	72	14	13	1
The shuttle bus service ³⁷	78	9	10	3
The amount of wildlife you saw	79	9	11	1
The variety of wildlife species you saw	76	12	11	1
Information on:				
Backcountry rules and regulations	76	16	6	2
Descriptions of backcountry zones	61	21	16	2
Day-to-day use levels for backcountry zones	68	22	8	2
River crossing hazards	65	34	8	3
Wildlife hazards	70	25	3	2
This research project	58	30	8	4

³⁷The shuttle bus service received the highest percentage for "very satisfied": 49 percent.

Most of the dissatisfaction centered on information describing the backcountry zones (16 percent) and the process required for obtaining a permit (13 percent). Most of the hikers were satisfied with the bus system (73 percent), the wildlife they saw in the backcountry (79 percent for amount and 76 percent for variety), and information on backcountry rules and regulations (76 percent). Most of the dissatisfaction with information had to do with there not being enough. If we correlate the items in Table 65 (independent variables) with trip satisfaction (dependent variable), we find that the relationships are positive but weak (i.e., r^2 is less than six percent) (see Table 64).

Table 64. Pearson correlations between trip satisfaction and satisfaction with various aspects of the backcountry trip (N = 2,334).

Correlations of trip satisfaction with:	r	r^2	Missing cases
Your experience in obtaining a backcountry travel permit	0.13	0.02	66
The shuttle bus service	0.09	0.01	120
The amount of wildlife you saw	0.22	0.05	55
The variety of wildlife species you saw	0.21	0.04	59
Information on:			
Backcountry rules and regulations	0.14	0.02	69
Description of backcountry zones	0.20	0.04	72
Day-to-day use levels for backcountry zones	0.17	0.03	93
River crossing hazards	0.18	0.03	108
Wildlife hazards	0.16	0.03	82
This research project	0.13	0.02	136

Based on the correlations in Tables 62 and 64, we conclude that the management plan's assumption that regulations and information affect satisfaction is correct, although the correlations are quite small.

That is:

- (a) those who opposed the existing regulations tended to enjoy their trip less than did those who supported the regulations; and
- (b) those who were dissatisfied with existing information about McKinley's backcountry (mostly not enough information) tended to enjoy their trip less than did those who were satisfied with existing information.

Intergroup Conflicts. Large parties, horse groups, and aircraft were rarely seen in the backcountry. If any of the respondents did see these while in the backcountry, there is little indication in the comments written in the questionnaire that such sightings resulted in crowding or dissatisfaction with the trip. There is, however, some data in the next chapter which provide some insight on the opinions of backpackers regarding large parties (see Table 76) and horse groups (see Table 77).

Turning to day hikers, we have already shown that: (a) day hikers were seen by at least half of the backpackers who reported seeing people in the backcountry; and (2) seeing day hikers did not have much of an effect on crowding. If we divide the study population of those who saw parties into those who did not see day hikers ($N = 322$) and those who did ($N = 343$), we ask the question whether these two groups (independent variable) differed in their evaluation of their trip (dependent variable).

Table 65. Relationship between trip satisfaction and whether day hiking parties were seen (N = 1,670).

Evaluation of the trip	Day hiking parties were not seen	Day hiking parties were seen
Poor	1%	1%
Fair	6%	4%
Good	23%	22%
Excellent	57%	59%
Perfect	13%	14%
TOTAL	100% (N = 917)	100% (N = 342)
$r = 0.04$		
$p < 0.07$		
Missing cases: 11		

The relationship in Table 65 is not statistically significant; that is, any difference between the percentages is due to chance.

So far, in testing the assumptions of the management plan, we have been unable to explain much of the variation in Table 53 (rating of the backcountry trip). If we turn to the comments concerning the trip in general, we find that 79 percent of those who wrote comments (N = 637) indicated how they were dissatisfied with their trip. Of those who were somewhat dissatisfied (N = 644), 42 percent of them mentioned bad weather as the reason for a less than perfect trip, 25 percent of them had difficulties with the terrain (including river crossings), and 33 percent of them attributed their difficulties to a personal problem (i.e., injury, equipment failure, poor planning). Hikers were specifically asked whether certain aspects of McKinley's backcountry environment detracted from the enjoyment of their trip (see Table 66).

Table 66. Did the following detract from your enjoyment of this backcountry trip? (N = 2,934).

Factor	Percentage		
	Yes (1)	No (2) ³³	No information
Bad weather	31	63	1
Mosquitoes	20	73	2
Difficult river crossings	10	38	2
Rugged terrain	6	92	2
Unpredictable wildlife	5	92	3

For some hikers, McKinley's backcountry was a harsh environment, especially bad weather (31 percent), the presence of mosquitoes (20 percent), and difficult river crossings (10 percent).

The question is then asked whether there is a relationship between the items in Table 66 (independent variables) and rating of the trip (dependent variable).

Table 69. Pearson correlations between trip satisfaction and whether certain features of the backcountry environment detracted from enjoying the trip (N = 2,934).

Correlation of trip satisfaction with:	r	r ²	Missing cases
Bad weather	-0.30	0.09	55
Rugged terrain	-0.23	0.05	65
Difficult river crossings	-0.20	0.04	77
Mosquitoes	-0.15	0.02	72
Unpredictable wildlife	-0.12	0.01	105

³³ Those categorized as "no" were those who answered either "not a factor" or "contributed" or "neutral."

Based on the correlations in Table 69, one can conclude that those who encountered some difficulty with the natural environment (especially rugged terrain, bad weather, and river crossings) while in the backcountry were more likely to give a lower rating to their trip than those who did not have such difficulty.

In summary, the overall rating of the trip by hikers (i.e., "visitor satisfaction") was affected by the hikers' experience with the natural environment and by personal factors (i.e., injury, inadequate preparation). These factors tend to be outside the control of Park Service managers. There is, however, one way managers can assist backpackers in having a good trip in the backcountry--provide them with the best possible information about what they can expect while in the backcountry and the equipment they need. In this way, backpackers are better able to choose the appropriate zone for hiking, based on what they feel they are capable of doing. The Park Service, however cannot guarantee whether all hikers will receive the correct information or whether they will heed the information.

3. Summary

Based on an analysis of the data from the backcountry survey, we conclude that there is some support for the sociological assumptions contained in McKinley's backcountry management plan, but that none of the assumptions are entirely correct. Specifically:

- (1) For most of the hikers surveyed, the ratio of sightings to distance was less than one. That is, it is not necessarily true that the

parties assigned to a zone for the same day will see each other at some time during that day. It is possible, therefore, for the backcountry zones to have larger capacities (i.e., more hikers allowed to camp on any day) without necessarily resulting in the sighting of more than two parties on any day by those in the zone.

(2) Solitude is an important feature of the backcountry trip. Furthermore, there is a relatively strong positive relationship between number of parties seen and crowding. That is, as the number of parties sighted increases, the degree of crowding is likely to increase. Also, the most reasonable crowding threshold based on the data is seeing two parties. however, this is not to say that all backpackers who see more than two parties during a day in the backcountry will feel crowded. It is conceivable for a hiker to see one party and feel crowded or for a hiker to see four parties and not feel crowded. In other words, McKinley's backpackers are a heterogeneous group. The perception of crowding is due to one's preference and expectation for sightings and one's response to seeing resource impacts, as well as to the number of parties sighted. Therefore, uniformly limiting the number of parties in a zone is not the only management option for controlling crowding. Rather, management can assign a variety of densities to the different zones, thus providing prospective backpackers with a choice ranging from zones with a low-sighting potential to zones with a high-sighting potential.

(3) Given what they saw, hikers were not necessarily "bothered" by seeing human impact to the resource; or if they were bothered, it was

generally "somewhat" rather than "very bothered." Hikers were more apt to be "very bothered" by seeing litter or human waste, and they were more likely to be "not bothered" when seeing vegetation trampling and soil compaction.

(4) It does not necessarily follow that those who felt crowded or reacted negatively to seeing resource impact were more likely to become dissatisfied with their backcountry trip. Rather, satisfaction with the trip was due primarily to conditions of the natural environment (e.g., weather, river crossings, rugged terrain) and personal preparation (e.g., equipment, stamina).

Given these conclusions, it appears to us that the Park Service has three broad options for its management program for McKinley's backcountry: (1) rewrite the management plan; (2) increase the capacities; or (3) a combination of the first two options. As the Park Service considers these various options, it might be useful to present a short analysis of the quasi-experiment, whereby the capacities for some zones were increased as much as five times (see Table 5 in Chapter 3). The question we want to answer is as follows: did those hikers (the experimental group) who camped in the experimental zones when the experimental capacities were in effect ($N = 853$) have a different experience than those hikers (the control group) who only camped in the zones with the traditional capacities ($N = 1,976$)? As might be expected, the experimental group saw, on the average, more parties per day than did the control group (0.9 to 3.7 parties). The small difference, however, is partly due to the small ratio of sightings to density.

Table 70. Relationship between whether or not in the experimental zones and crowding (N = 2,329).

Feelings of crowding	Experimental group	Control group
Did not feel crowded	71%	82%
Did feel crowded	29%	18%
TOTAL	100% (N = 836)	100% (N = 1,946)

$r = -0.10$

Missing cases: 47

Table 71. Relationship between whether or not in the experimental zones and trip satisfaction (N = 2,329).

Rating of the trip	Experimental group	Control group
Poor	--	1%
Fair	5%	6%
Good	22%	22%
Excellent	57%	57%
Perfect	16%	14%
TOTAL	100% (N = 840)	100% (N = 1,962)

$r = -0.03$

$p < 0.10$

Missing cases: 27

Comparing these two groups in terms of whether or not they felt crowded (see Table 70) and the rating of their trip (see Table 71), we find that: (1) there were proportionately more hikers in the experimental group who felt crowded, although only a difference of 10 percent; and (2) these groups did not differ in how they rated the backcountry trip. In other words, if the Park Service were to raise the capacities of some of the zones, it would not necessarily mean that those camping in zones with higher capacities would feel crowded or become dissatisfied with their trip.

Chapter 7. Opinions of the Backpackers on Management Policy for the Backcountry

In the second chapter, we outlined the regulations governing use of the backcountry at McKinley in 1978. In this chapter, we intend to document the extent of support for, and opposition to, these regulations on the part of the backpackers, as well as to assess their awareness of these regulations and their opinions on alternative regulations.

A. Knowledge of Backcountry Regulations

Backpackers who filled out questionnaires (N = 3,056) were asked whether they were aware of various management regulations before arriving at McKinley. Emphasis was on "before" because we felt that a lack of information about McKinley's backcountry regulations upon arrival at the park could lead to frustration or confusion on the part of backpackers. Our assumption is that visitors, while planning a visit to a park, need to have some understanding of what regulations they can expect in order that they might make more realistic decisions concerning such a visit. Of the eleven regulations presented, at least half of the backpackers indicated that they were unaware of nine of these prior to their arrival at the park (see Table 72). Only two of the eleven regulations were widely known: 77 percent said they knew about the shuttle bus, and 69 percent said they knew about backcountry permits for overnight hikers. Even so, 30 percent of the backpackers, upon arrival at McKinley, did not know that they would need a permit to enter the backcountry.

Table 72. Before arriving at McKinley, were you aware of the following management regulations? (N = 3,056).

Regulation	Percentage		
	Yes	No	No information
That there is a free shuttle bus transportation system	77	22	1
That the backcountry is divided into travel zones	38	61	1
That a permit is required for overnight travel in the backcountry	69	30	1
That only a certain number of hikers are permitted <u>to camp</u> in most zones on any given night	45	54	1
That an unlimited number of hikers are permitted <u>to hike</u> in any zone	27	71	2
That there are 2 zones open to unlimited overnight use	6	93	1
That day hikers are not required to have travel permits	45	54	1
That certain areas of the backcountry are <u>permanently</u> closed to overnight backcountry use	29	70	1
That hikers are <u>sometimes</u> prohibited from <u>entering</u> certain backcountry zones	39	60	1
That campfires are not allowed in the backcountry	49	50	1
That backcountry campsites must not be visible from the park road	39	60	1

More important, based on the figures in Table 72, the Park Service can expect that many backpackers will arrive at the backcountry permit desk without a thorough familiarity with backcountry regulations. There is a need, therefore, for some kind of simple yet comprehensive exhibit at Riley Creek and Eielson Visitor Centers, which outlines the various regulations governing use of the backcountry and which includes information on how to obtain a permit. One might expect that some backpackers will not comply with all of the backcountry regulations because of their lack of information about these regulations.

B. Opinions on Existing Regulations

The figures in Tables 73 through 75 provide a clear message of overall support on the part of McKinley's backpackers for the National Park Service's regulations governing use of the backcountry. The regulations listed in Table 72 received varying amounts of support, although they all received more than 50 percent support and no more than 24 percent opposition. What is instructive about Table 73, given that all of the regulations received the support of the majority of the hikers, is to ask the question: why did these regulations receive varying amounts of support? The regulation with the most support (92 percent) was that which permanently closed certain areas of backcountry to hikers in order to protect fragile wildlife habitats. It should be noted that the regulation whereby backcountry zones are temporarily closed in order to protect hikers from unpredictable wildlife received less support (80 percent). The requirement of a permit for all overnight hiking parties ranked second in support with 91 percent. A

"nonregulation" was tied for third place with 88 percent; hiking parties may camp anywhere within their scheduled zones. The regulation with least support (54 percent) and greatest opposition (24 percent) was the one whereby permits can be obtained only 24 hours in advance of one's trip. The other two regulations with least support (71 and 72 percent, respectively), relatively speaking, were: capacities for the zones are determined on the basis of individual hikers rather than hiking parties, and day hikers do not need permits.

Table 73. What are your feelings about each of the following regulations that govern backcountry use in Mount McKinley National Park? (N = 3,056).

Regulation	Percentage			
	Support	Neutral	Oppose	No information
(a) Some areas of the backcountry are permanently closed to overnight hikers in order to protect fragile wildlife habitats	94	3	1	2
(b) All overnight hiking parties must obtain a backcountry travel permit	91	5	3	1
(c) Hiking parties may camp most anywhere within their scheduled backcountry zones	88	7	3	2
(d) Backcountry campsites must not be visible from the park road	88	7	3	2
(e) Some backcountry zones are temporarily closed to hikers in order to protect hikers from unpredictable wildlife	88	6	4	2

Table 73. (Continued)

Regulation	Percentage			
	Support	Neutral	Oppose	No information
(f) Overnight hikers may <u>hike</u> in zones other than those specified by their permit	79	12	7	2
(g) Overnight hikers only may <u>camp</u> in the backcountry on the nights specified by their permit	77	13	8	2
(h) Overnight hikers only may <u>camp</u> in the backcountry zones specified by their permit	76	14	8	2
(i) Backcountry travel permits only may be obtained in the Park	75	13	11	1
(j) Campfires are not allowed in the backcountry	75	11	12	2
(k) Day hikers do not need travel permits	72	18	8	2
(l) Capacities for backcountry zones are determined on the basis of <u>individual</u> hikers rather than by <u>hiking parties</u>	71	16	10	3
(m) Backcountry travel permits only may be obtained 24 hours in advance of one's trip	54	20	24	2

About one-fourth of the respondents wrote comments pertaining to their opinions of those items in Table 73. For the most part, these comments reinforced the opinions circled. Most of the comments referring to regulations "i" and "m" (those having to do with where and when a

permit can be obtained) were written by those in opposition. Their comments indicated a preference for advance reservations in order to facilitate planning a trip into the backcountry. This preference is also stated in the figures in Table 78. The comments for regulations "g" and "h" (those restricting when, date, and where, zone, hiking parties may camp) were of two kinds: (1) that weather, terrain, or the level of the rivers might make following these regulations difficult; and (2) that these regulations restricted flexibility and spontaneity. The comments regarding regulation "k," which concerns day hikers, were various: (a) day hikers should register for safety reasons; (b) concern for the impacts on the resource by day hikers; (c) need to monitor the amount of day use; (d) day hikers may be the cause of problems in the future; and (e) day hikers need information on zones that are closed. As for regulation "j" involving the restriction of campfires, most of the comments were written by those in opposition, and they included four topics: (1) allow small fires on gravel bars or other nonfragile areas; (2) allow fires where wood is plentiful; (3) campfires should be allowed when there is an emergency or when there is difficulty with the weather; and (4) campfires are part of a "good camping trip." Some of those opposing regulation "e," which closes zones to protect hikers from unpredictable wildlife, commented that the Park Service should "just warn the hikers" and "let the hikers risk the danger." Finally, most of the comments dealing with regulation "l" were written by those opposing the fact that capacities were determined on the basis of individual hikers rather than hiking parties. These comments, which include some written by those supporting the regulation, included the following issues:

- (1) that parties and individuals have the same effect on the resource;
- (2) that capacities should be based on the number of tents;
- (3) that one large party could close a zone given the present arrangement;
- (4) that capacities should be based on parties, but that there should be a limit on party size;
- (5) that there should be flexibility with allowing a small party in a zone when there is one space;
- (6) that small parties should not be broken up; and
- (7) that it impairs planning.

These issues were also stated in the comments written for Table 78.

About two-thirds of the backpackers agreed with the Park Service's policy of allowing, on the average, about six hikers to camp in most of McKinley's zones on any given night (see Tables 74a and 74b).

Table 74a. Generally speaking, do you agree or disagree with the present policy of allowing, on the average, about 6 hikers to camp in most McKinley backcountry zones on any given night? (N = 3,056).

Response	Percentage
I agree	67
I disagree	22
Don't know or don't care	9
No information	2

Table 74b. If you disagree, generally speaking, about how many hikers should be allowed to camp in an average backcountry zone on any given night? (N = 684).

Response	Percentage
No overnight use should be allowed	--
1 to 5	9
7 to 9	25
10 to 15	35
16 or more	7
Unlimited use	5
Don't know	8
No information	10
Average: 10.7 hikers per zone ¹	

Of the 22 percent who disagreed with the policy of an average capacity of six hikers per zone (see Table 74a), the vast majority (72 percent of 684 hikers) were in favor of a larger capacity. Even so, the capacities that they favored were still relatively small in that only 12 percent of them indicated a preference for either "16 or more" or "unlimited use" (see Table 74b). The average response of those with a numbered response was 10.7 hikers, which is slightly less than double the existing average capacity of six hikers per zone. Most of the comments relating to Tables 74a and 74b dealt with seven topics, in order of frequency:

¹This average was obtained by including only those who specified a number (N = 525). The various response categories were recorded as follows:

No overnight use should be allowed	
1 to 2	= 0
3 to 5	= 1.5
7 to 9	= 8
10 to 15	= 12.5
16 to 21	= 18.5
22 to 27	= 24.5
28 or more	= 28

- (1) zone capacities should be based on the size, terrain, and environmental features of each zone;
- (2) zone capacities should depend on such factors as size of party, time of summer, available routes in each zone, and degree of fragility of each zone;
- (3) zone capacities should be based on parties;
- (4) zone capacities should be flexible;
- (5) as demand increases, so should zone capacities;
- (6) do not turn anyone away; and
- (7) allow for larger families and parties such as Boy Scouts.

In 1978, two of McKinley's 34 backcountry zones were available for unlimited use: zones 1 and 13a. However, as indicated in Chapter 5, these zones were rarely used because they are inaccessible to most hiking parties. We asked the backpackers whether they agreed or disagreed with the policy of opening two backcountry zones to unlimited use and found that 59 percent agreed with the policy (see Table 75a).

Table 75a. Generally speaking, do you agree or disagree with the present policy of allowing 2 backcountry zones in McKinley to be open to unlimited overnight use? (N = 3,056).

Response	Percentage
I agree	59
I disagree	20
Don't know or don't care	19
No information	2

Table 75b. If you disagree, generally speaking, about how many backcountry zones, if any, should be open to unlimited overnight use? (N = 597).

Response	Percentage
None	74
1	5
3 to 6	9
7 to 34	7
Don't know	3
No information	2
Average: 2.0 zones ²	

Although 20 percent disagreed with this policy (N = 597), three-fourths of them did so because they preferred that none of the zones be open to unlimited use (see Table 75b). Most of those writing comments pertaining to Tables 75a and 75b stated that they "didn't know there were two open zones." Others mentioned that: (a) these open zones should be monitored for damage to the resource; (b) these open zones should be rotated; (c) such a policy allows everyone an opportunity to camp if the backcountry is full; and (d) rather than unlimited zones, the Park Service should establish higher capacities for some of the zones.

²This average was obtained by including only those who specified a number (N = 564). The various response categories were recorded as follows:

None	= 0
1	= 1
3 to 6	= 4.5
7 to 12	= 9.5
13 to 18	=15.5
19 to 24	=21.5
25 to 33	=29
all 34	=34

The message from the backpacking public at McKinley in 1978 is clearly one of general support for the Park Service's regulations for the backcountry. However, this support is not 100 percent. A review of Tables 73 through 75, as well as the comments, will provide managers with some ideas for how the regulations might be modified to better serve the public.

C. Opinions on Alternative Regulations

Given the capacities for McKinley's backcountry zones, the effective maximum party size is six; although for a few zones, it is two or four or eight or twelve. Almost three-fourths of the backpackers felt that there should be maximum party size for the backcountry (see Table 76a).

Table 76a. Generally speaking, do you feel there should be a maximum party size for the McKinley backcountry?
(N = 3,056).

Response	Percentage
Yes	72
No	20
Don't know or don't care	6
No information	2

Table 76b. If yes, what should be the maximum party size?
(N = 2,188).

Response	Percentage
1 to 4	17
5 to 7	44
8 to 10	26
11 to 40	6
No information	7
Range 1 to 40 hikers	
Average 7.1 hikers	

Of those responding affirmatively to a policy of a maximum party size (N = 2,188), their average response was a maximum size of 7.1 hikers for a party, which is close to the effective maximum size of six hikers.

On the issue of horse travel in the backcountry, most backpackers (85 percent) opposed allowing horses in all of the backcountry zones. However, 57 percent of them supported a policy whereby horses would be restricted to some backcountry zones (see Table 77).

Table 77. How strongly do you oppose or support each of the following management options for the McKinley backcountry? (N = 3,056).

Management option	Percentage			
	Support	Neutral	Oppose	No information
Horse travel would be allowed in all backcountry zones	5	10	83	2
Horse travel would be restricted to some backcountry zones	57	18	22	3
Backcountry rangers would patrol the backcountry				
- Frequently	33	26	29	12
- Seldom	34	28	19	19
Travel permits only would be used to provide hikers with information about current use levels, and not to control use	12	16	68	4

Of those respondents commenting about horse travel, most indicated either: "no horse travel at all" or "only a limited amount of horse travel." The general concern was the potential for damage to the resource by horses.

There is no clearcut opinion on the frequency of backcountry patrols, as indicated in Table 77 by the high percentage of those who answered neutral or did not answer and by the similarity in the percentages of those in favor and those opposed. It was evident from reading the comments that few of the hikers came into contact with a backcountry patrol during their stay in the backcountry. Those who did mention having met a patrol were unflinching in their praise for the manner of the contact and the attitude of the rangers. The comments regarding backcountry patrols were of two kinds: (1) a dislike for the feeling of being policed or watched over, which was incompatible with traveling in the wilderness; and (2) that patrols should occur often enough to ensure public safety and to monitor the resources.

Finally, according to the figures in Table 77, only 12 percent of the respondents supported the idea of requiring backcountry permits only to provide hikers with information about current use, and not to control use. This finding, along with those in Tables 73 and 78, are proof that the vast majority of those backpacking at McKinley in 1978 support the idea of a permit to control use.

In 1978 backcountry permits were issued at the park on a first-come first-served basis, only 24 hours in advance. Those filling out a questionnaire were asked which of various rationing methods they preferred for distributing permits. Most hikers (81 percent) supported the present method of first-come, first-serve (see Table 78).

Table 78. Do you support or oppose each of the following management policies for rationing use in the McKinley backcountry? (N = 3,056).

Rationing policy ³	Percentage			
	Support	Neutral	Oppose	No information
Issue a limited number of permits on a first-come, first-served basis	81	9	8	2
Issue a limited number of permits through an advance reservation system	37	14	46	3
Issue a limited number of permits to those who can demonstrate a certain level of knowledge and skill	26	21	49	4
Charge an entrance or use fee	11	18	68	3
Issue a limited number of permits on a drawing or lottery basis	7	15	75	3
Allow use without rationing	5	7	85	3

Furthermore, about one-third of them indicated support for an advance reservation system.³ This would be expected given the relatively smaller percentage of support for regulations "i" and "m" (which deal with where and when a permit can be obtained), as documented in Table 73. The

³The advanced reservation system is not really a distinct rationing policy; rather, it represents when a rationing policy goes into effect. For example, the policy of first-come, first-served can be instituted either at the park or by mail or some combination of the two. The same can be said for the policy based on a lottery or level of skill.

least support was for the lottery method of rationing (7 percent), which received less support than the idea of charging an entrance fee (11 percent). And as would be expected, only 5 percent of the backpackers supported the policy of allowing use in the backcountry without rationing.

About one-fourth of the respondents commented on the question of rationing. Most of them either stated support for the present policy or the need to include an advance reservation system along with the present policy of distributing permits. Of those who wrote comments directly referring to the method of first-come, first-serve, most felt that it was the fairest way. Most of those commenting on the lottery mentioned that it was unfair. In terms of the advance reservation system, those writing comments felt that this system was fair for those traveling a long distance and that it allowed for better planning and preparation. Some of the hikers' writing comments indicated that they were aware of the problem of "no shows" and suggested either a confirmation deadline or a deposit which could be refundable only to those using their reservation. There was concern for how the method of rationing by skill would actually work. Some of those who supported this technique stated in their comments that this technique should be used only for difficult areas of the backcountry. For those in favor of an entrance fee there were two types of comments: (1) keep the fee low; and (2) use the money for park maintenance.

Finally, the backpackers were asked whether they supported any of a variety of physical improvements as additions to McKinley's backcountry. In general, there was little support (at the most, 26 percent) for any of these additions. hiking trails, food caches for bear protection, and

bridges received the most support (see Table 79). It is interesting to note that "developed hiking trails" received the greatest support (26 percent).

Table 79. Do you support or oppose each of the following additions to the McKinley backcountry? (N = 3,056).

Addition	Percentage			
	Support	Neutral	Oppose	No information
Developed hiking trails	26	12	60	2
Food catches for bear protection	22	22	54	2
Bridges over rivers	20	19	59	2
Interpretive signs	18	18	62	2
Designated campsites	14	11	73	2
Fire rings	13	11	74	2
Shelters	11	11	76	2
Toilets	9	10	79	2
Tables	4	7	87	2

Of the 37 percent who wrote comments to the question on development, about one-half of them reemphasized their opposition to development: "leave it like it is," "let those who want development go elsewhere," "additions would destroy natural beauty and feeling of wilderness," "I hike in McKinley to get away from development." Others used their comments to qualify their opinions: (1) additions might help protect the resource (for example, develop a trail or campsite where use is high); and (2) additions might ensure public safety (for example, bridges for the dangerous rivers and food caches where there are bear problems).

D. Summary

Those who backpacked in McKinley's backcountry in 1978 have given their overwhelming support for the regulations governing backcountry use. Furthermore, a large majority of the backpackers are against any additions (in the form of developments) to the backcountry. However, there are a couple of suggested changes based on an analysis of the percentages and comments. These are:

- (a) that some permits be provided on an advance reservation basis;
and
- (b) that the capacities be based on parties, instead of individuals,
with some control for large parties.

In interpreting the data in this chapter, the reader is reminded of two points. First, the backcountry was underutilized in 1978 (see Chapter 5). In other words, one might expect less support for management if the backcountry was generally filled to capacity and hikers were being turned away. Second, many of the partial compliers and noncompliers were supportive of the permit system (see Chapter 9). In other words, some hikers said they supported the Park Service's regulations, but went ahead and disregarded some of them. Therefore if backcountry use continues to increase, the Park Service might experience less public support for the permit system as well as increasing noncompliance and partial compliance with the permit system.

EXPLORATORY STUDIES

As discussed in Chapter 1, two exploratory studies were carried out in order to complement and strengthen the backcountry survey (i.e., to provide a more complete picture of use and users of McKinley's backcountry) as well as to provide McKinley's managers with some necessary information. Chapter 8 contains the results of the study of day hikers, while Chapter 9 is a summary of the study of permit compliance. A separate and more detailed report is available for each of these studies (Loder and Womble 1979; Plager and Womble 1979).

Chapter 8. Day Hiking at McKinley¹

A. Introduction

As discussed in the first chapter, one of the limitations of the backcountry survey (and for that matter the permit system) is that it only focuses on the population of overnight hikers. Consequently, McKinley's managers do not have accurate information on day hiking at the park: who are the day hikers? how many are there? how often do they day hike? where do they day hike? and what percentage of the day hikes take place in the backcountry? In fact, in the management plan for the backcountry, it is stated that "day use does not seem to be heavy at this time, in backcountry areas, and seems to contribute proportionately less to most types of impact than overnight use."²

A review of the literature on outdoor recreation shows that there is little information on day hikers in backcountry (or wilderness) areas. Studies involving day hikers have been concerned primarily with estimating use-figures for various backcountry (or wilderness) areas. A common finding is that at least one-half of the visitors to these areas may be visiting for only one day. (Lucas et al. 1971; James and Schreuder 1971; Lucas 1974; Murray 1974; Lucas 1975; and Stankey et al. 1976.) There is one study which has specifically investigated the attributes or activities of day hikers. In a study of users of three wilderness areas

¹Chapter 8 is based on the following report prepared by Arthur Loder and Peter Womble in June 1979: "Day Hiking and Day Hikers in Mount McKinley National Park: An Exploratory Study."

²See page 23 of McKinley's backcountry management plan.

in the Pacific Northwest, Hendee and associates (1968) concluded that day users did not differ from backpackers and horse users in terms of their attitudes.

During the summer of 1978, an exploratory study was undertaken under the direction of Arthur Loder to provide some answers to these questions on day hiking at McKinley. For purposes of the study, day hikes and day hikers were defined as follows:

- (a) a day hike was defined as any hike for the "day" over one half hour occurring anywhere in the park, except within a campground or in the immediate vicinity of the hotel and park headquarters; and
- (b) a day hiker was defined as any person who had day hiked or planned to day hike while visiting McKinley.

Three types of findings are presented in this chapter. These are:

- (a) estimates as to the number of day hikers and hiker-days of day hiking at McKinley during the summer of 1978; and how these estimates of day hiking compare with figures for overnight hiking;
- (b) a description of the day hikes, primarily their location and length; and
- (c) a description of the day hikers.

B. Methodology

Study Population. The methodology of the study is based on the assumption that day hikers spend at least one night inside Mount McKinley National Park. This assumption is reasonable because:

- (a) the park is located at a great distance from population centers; and
- (b) there are few sleeping facilities nearby from which visitors can come into the park for the day.

It is highly unlikely, therefore, for those who might visit the park for one day to have time to explore the developed areas of the park, much less participate in a day hike. This assumption means that the sampling sites would be those places within the park where visitors stay overnight: six auto campgrounds, Morino walk-in campground, youth hostel, and hotel. Given our limited resources, we only sampled the auto campgrounds. The study population, therefore, is a sample of McKinley's auto campground parties (and its members). We do not consider the exclusion of the other possible sampling sites as a serious limitation to the study. Most of those staying at Morino or the youth hostel are overnight hikers, and so the survey of overnight hikers will indicate the extent of their day hiking activities. Furthermore, the exclusion of Morino and the hostel from the sampling plan means that the estimates of day hiking are conservative. Our observation in and around the hotel indicates that the guests are not oriented toward hiking. They tend to be older people and are generally members of a tour group (see Figure 12 for an illustration of the study population).

Research Instruments. Three instruments were used for the collection of data: (1) party interview schedule; (2) trip profile; and (3) day hiker questionnaire. The party interview schedule was designed primarily to distinguish between camping parties that had members who were day hikers and those that did not. If any member of a party had participated

in a day hike, the day hike(s) was described using an interview (i.e., trip profile). The assumption was made that an interviewer, using a good map of the park and standardized questions, could elicit an accurate description of a day hike: location and duration of the hike, sightings of other hiking parties. A self-administered questionnaire was distributed to all members of each camping party who were day hikers (i.e., either had taken a day hike or planned on taking one).

Sampling Design. A stratified sampling design was used for the study. Given that the study population was comprised of McKinley's auto campground parties (and its members), the park's six auto campgrounds provided convenient strata from which to sample the study population (see Figure 2 for a map of McKinley). The six campgrounds (with the number of campsites in parentheses), in order of location beginning at the park entrance and going into the park, are as follows:

Riley Creek (102)

Savage River (29)

Sanctuary River (7)

Teklanika River (50)

Igloo Creek (7)

Wonder Lake (23)

On every other day, from June through August, 1978, parties in one of the six campgrounds were randomly sampled. The objective of the sampling design was to obtain proportional samples for each campground. The final sample, however, was disproportional to actual use of the campgrounds during the study period.³ We were able to correct this situation using

³We were able to determine this by tallying the information from the auto campground permits.

statistical weights (Kish 1967). A weighting procedure was included as part of the computer program used to analyze the data.

C. Findings

Estimates of Day Hiking. There are two ways of measuring recreational use: (1) number of visitors or users; and (2) the amount of time a visitor spends at a park. The second unit of measurement can be a visitor-day, a visitor-hour, or any other unit of time a manager or researcher finds useful. Our estimates of day hiking at McKinley are presented in terms of the number of day hikers and hiker-days. We intend to compare these estimates with similar figures for overnight hiking at McKinley.⁴ We are interested in documenting the relative contribution of use of McKinley's backcountry by day and overnight hikers. In so doing, we recognize that hiker-day is not the best measure of backcountry use, especially since a hiker-day of day hiking is not necessarily comparable to a hiker-day of backpacking. Clearly, the management problem being considered will dictate the proper measure of use in terms of time. Given, however, the exploratory nature of the study, hiker-day is the best measure available to us.

Of the 918 campers who were members of the 276 auto campground parties we sampled, one-third were day hikers. Information from the auto campground registration forms indicates that there were 37,442 campers at McKinley's auto campgrounds during the summer of 1978. We

⁴Figures for overnight hiking at McKinley in 1978 are obtained from the backcountry permits.

estimate, therefore, that approximately 12,206 of McKinley's auto campground visitors were day hikers. We also know that about 8 percent of the sample of day hikers were also overnight hikers, which means that 976 of McKinley's auto campground users were both day hikers and overnight hikers and which means that there were 11,230 auto campground users who only day hiked (12,206 minus 976). Results from the back-country survey indicate that 50 percent of the study population of overnight hikers ($N = 3,056$) participated in at least one day hike during their visit to McKinley. Given that there were 5,187 overnight hikers in 1978, we estimate that 2,594 of them were also day hiked, 2,594 visitors who only overnight hiked, and 2,594 visitors who did both. We conclude, therefore, that there were approximately 16,417 hikers at McKinley in 1978 and that 68 percent of them were day hikers, 16 percent of them were overnight hikers, and 16 percent of them were both. Clearly, there are far more day hikers than overnight hikers at Mount McKinley National Park in 1978 (see Table 80).

Table 80. Estimate of the number of day and overnight hikers at McKinley in 1978.

Type of hiker	Estimates	Percentage of total
Hikers who only day hiked	11,230	68
Hikers who only overnight hiked	2,594	16
Hikers who both overnight hiked and day hiked	2,594	16
TOTAL	16,417	100

We are also interested in estimating the amount of use by day hikers. The unit of measurement is the hiker-day, which represents one day of hiking by one person. We found that the sample of day hikers took an average of 3.8 day hikes during their visit to McKinley. Results from the backcountry survey indicate that those overnight hikers who also day hiked averaged about 2.1 day hikes while visiting McKinley. Using the figures for the number of day hikers in McKinley, we estimate that those who only day hiked participated in 42,674 hiker-days of day hiking (11,230 day hikers multiplied by 3.8 day hikes), while those who both day hiked and overnight hiked participated in 5,447 hiker-days of day hiking (2,594 hikers multiplied by 2.1 day hikes). Adding these two estimates, we arrive at a total figure of 48,121 hiker-days of day hiking at McKinley in 1978. By definition, not all of the day hikes took place in McKinley's backcountry.⁵ Given that 65 percent of the day hikers who participated in day hikes that we sampled traveled in the backcountry,⁶ we estimate that there were 31,279 hiker-days of day hiking in McKinley's backcountry in 1978. Given that there were 19,652 hiker-days of overnight hiking in 1978,⁷ we conclude that McKinley's backcountry was used about one-third more by day hikers than by overnight hikers. That is, 61 percent of the use of McKinley's backcountry

⁵Backcountry was defined as beginning one-half mile from the park road. Other than the backcountry, day hikes in the park took place in the administrative areas of Wonder Lake and the park entrance and along the park road.

⁶We sampled 164 day hikers (comprising 476 hikers) of which 104 (comprising 308 hikers) took place in the backcountry.

⁷The figure of 19,652 hiker-days of overnight hiking was obtained by adding 14,465 hiker-nights and 5,187 overnight hikers.

(N = 50,931) in 1978, measured in terms of hiker-days, was by day hikers (see Table 81). Once again, we would like to caution the reader as to the difficulty in making direct comparisons between a hiker-day of day hiking and of overnight hiking. We do so only because it is the only measure presently available.

Table 81. Estimate of the number of hiker-days of day and overnight hiking at McKinley in 1978.

Type of hiking	Estimate		Percentage of total	
	overall	backcountry	overall	backcountry
Day hiking	48,121	31,279	71	61
Overnight hiking	19,652	19,652	29	39
TOTAL	67,773	50,931	100	100

Clearly, from the point of view of managing McKinley's backcountry, these estimates suggest that day hikers represent an equally important sector of the people using the backcountry resource. This conclusion becomes more apparent when we consider the fact that day hikers use a small part of the backcountry, whereas overnight use is more spread out: (a) that day hikers tend to hike in those backcountry zones near campgrounds and visitor centers; and (2) that day hikers tend to penetrate no more than two miles into the backcountry. These points are tempered by the fact that day hikes averaged about three and one-half hours, while overnight hikers tend to spend a greater part of the day (and night) in the backcountry.

Description of Day Hikes. We sampled 164 day hikes, 33 percent of which took place in the administrative areas and 67 percent in the backcountry. Based on the interviews of day hikers who participated in these day hikes, certain patterns were found which characterize most day hikes in McKinley. These are:

1. Over 80 percent of the day hikes began at a developed area of the park, other than the park road. And most of these began either at a campground or visitor center.
2. About half of the hikes began at the campground where the hikers were staying.
3. Although day hikers could hike in any of the backcountry zones, they generally used only those zones next to campgrounds and visitor centers.
4. The decision by day hikers as to where to hike was influenced by where they are camping. Day hikers camping in campgrounds located in the eastern part of the park (near the entrance to the park), for the most part, hiked in the eastern section of the park. As we consider campgrounds located farther west from the park entrance, campers traveling to the start of their day hike, for the most part, traveled into the park (i.e., westward). Campers at the farthest campground from the park entrance, Wonder Lake, hiked primarily in that area.
5. Day hikes averaged about three and one-half hours in length.
6. Day hikes in the backcountry penetrated an average of two miles into the backcountry.

7. Day hikers rarely saw other hiking parties during their hikes in the backcountry (average of 1.1 parties sighted). Other day hiking parties were sighted by day hikers about three-fourths more often than overnight hiking parties. One would expect, therefore, that day hiking parties have little effect on the experience of overnight hikers while in the backcountry.⁸

These findings strongly suggest that day hikers use only a small area of the park for their day hikes.

Description of Day Hikers. We sampled 253 day hikers by providing them with an on-site questionnaire. Several points can be made in describing the population of day hikers at McKinley. These are:

1. Day hiking was not the primary purpose for visiting McKinley for most day hikers. This might suggest the possibility that day hiking, for many, was a spontaneous event, or at least, it was not a carefully planned activity.
2. The vast majority of day hikers were satisfied with their day hikes in McKinley. The "wildness" and natural features of McKinley were the main factors contributing to an enjoyable day hike.
3. There was general support on the part of day hikers for existing regulations in McKinley, especially those pertaining to transportation. This includes the fact that two-thirds of the day hikers were in favor of there not being a permit for day hikers.
4. The age of day hikers ranged from six to seventy-one, with an average of 34.4 years.

⁸This conclusion is confirmed in Chapter 6.

5. There was an even breakdown between males and females, with 52 percent male and 48 percent female.
6. Alaskans comprised 38 percent of the day hikers, with 56 percent residing in the other states and 6 percent in a foreign country.
7. Most day hikers were not overnight hikers (92 percent). However, about half of the overnight hikers were also day hikers.

D. Summary

Three main conclusions regarding day hiking at Mount McKinley National Park are suggested in the discussion of the study's results. These are:

- (1) There are more day hikers than overnight hikers in McKinley. Furthermore, day hikers use (measured in hiker-days) McKinley's backcountry more than overnight hikers.
- (2) Day hikes take place in a limited area of the park. Most day hikes in the backcountry take place in a few backcountry zones, usually those near a campground visitor center.
- (3) Day hikers do not tend to be overnight hikers, although many overnight hikers are also day hikers. The question whether day and overnight hikers are members of distinct populations requires further investigation.

The reader should be cautious in generalizing these findings to other backcountry or wilderness areas. McKinley is a unique hiking area. There are few trails in McKinley. Furthermore, the presence of grizzly bears provides a new dimension in hiking for many visitors. These facts, plus the fact that most hikers in McKinley are visiting the

park for the first time, might explain the large number of day hikers: hikers in McKinley are apt to be cautious and prefer day hiking over overnight hiking. Even so, the study's results emphasize the need for managers and researchers to become more aware of the population of day users in backcountry or wilderness areas. We believe that the findings presented in this chapter add a new dimension to the discussions of management policy for McKinley, specifically policy dealing with the backcountry resource.

Chapter 9. Permit Compliance at McKinley¹

A. Introduction

The purpose of this chapter is to determine how well the permit system at McKinley operated in 1978 (see Chapter 2 for a description of the permit system at McKinley). Specifically, we intend to provide figures showing what percentage of the backpackers did not obtain a permit and what percentage of them did not follow their permit. Since its inception in 1974, the managers of McKinley have not had reliable information as to the effectiveness of the permit system.

A review of the literature indicates that studies of permit compliance are limited to whether a permit was obtained (Fazio and Gilbert 1974, Lime and Lorence 1974, Hays 1975, Godin and Leonard 1977). However, the issue of permit compliance has another equally important side: whether the permit was followed. Specifically, the terms compliance, partial compliance, and noncompliance are used as follows:

- (1) Compliance means the visitor obtained a permit and complied with all of its instructions; or having obtained a permit, the visitor did not use all of the dates scheduled on the permit but reported such change to appropriate park personnel in order to allow other hikers to camp in the vacant zone.
- (2) Partial compliance means the visitor obtained a permit but failed to comply with at least one of its instructions by:

¹Chapter 9 is based on the following report prepared by Anna Plager and Peter Womble in December 1979: "Permit Compliance in Mount McKinley National Park."

- (a) returning early (or not using the permit at all) and not reporting such behavior to park personnel; or
 - (b) camping in zones other than those scheduled on the permit; or
 - (c) camping in the backcountry beyond the date authorized by the permit; or
 - (d) camping in the backcountry with a party larger or smaller than authorized by the permit.
- (3) Noncompliance means that the visitor camped in the backcountry without a permit.

B. Methodology

The data for this chapter originated from either the backcountry survey or the study of permit compliance. We have already outlined the methodology for the backcountry survey in Chapter 3. The study of permit compliance was undertaken in the summer of 1978, under the direction of Anna Plager. A 6-page, on-site questionnaire was developed for the study of permit compliance and was filled out by 513 backpackers representing a sample of three groups: (1) the general public (N = 451); (2) concessionaire employees (N = 23); and (3) Park Service employees (N = 39). The general public was sampled by contacting backpackers after the completion of their hike at places unassociated with the permit process and in an unofficial and anonymous fashion. These places of contact included the following: (a) the train depot; (b) the shuttle bus; and (d) campgrounds at Riley Creek, Morino, and Savage River. The sampling period was from June 19 through September 6, 1978. Four field

workers worked on the study. They were not in uniform and made it clear that the study was not an official Park Service investigation, but rather a graduate student project.

The two groups of employees were sampled differently from the general public. In mid-August, a questionnaire was distributed to all of the employees through their respective employers. A cover letter accompanied the questionnaire which made it clear that the survey was anonymous and unassociated with their employment status. Forty percent of the Park Service employees ($N = 90$) and 16 percent of the concessionaire employees ($N = 144$) returned a completed questionnaire. For purposes of this chapter, the samples of the general public and the concessionaire employees have been combined ($N = 474$) because this was the strategy used for the backcountry survey. The sample of Park Service employees is usually mentioned in the footnotes.

Two methodological problems need to be addressed before proceeding with a discussion of the findings. First, we must assess whether the sample for the study of permit compliance is representative of McKinley's backpackers (excluding Park Service employees). Second, we must determine whether the data on permit compliance obtained from the backcountry survey are valid (i.e., that the answers to the sensitive questions on permit compliance are correct).

The answer to the first methodological problem is provided in Table 82. In this table, we compare the study populations of the backcountry survey (which we assume is representative of McKinley's backpackers in 1978) and the study of permit compliance in terms of selected characteristics.

Table 82. Comparison between study populations of backcountry survey and study of permit compliance in terms of selected characteristics.

Characteristic	Backcountry survey (N = 4,447)	Study or permit compliance (N = 474)
Average age	25.3	25.0
Sex		
- Female	30%	31%
- Male	70%	69%
Residence		
- Alaska	28%	15%
- Other U.S. states	65%	79%
- Foreign country	7%	6%
Had you ever hiked overnight in the McKinley backcountry before this visit to McKinley? ^a		
- Yes	14%	18%
- No	86%	82%
Had you ever traveled overnight in any backcountry area (including McKinley) before this visit to McKinley? ^a		
- Yes	88%	88%
- No	12%	12%

^aFor these two questions, the N for the backcountry survey is 1,534.

In terms of age, sex, and previous backcountry experience, these two study populations are similar. However, in terms of residence, Alaskans are under-represented in the study of permit compliance. This was expected since we were unable to adequately sample those backpackers who

traveled by automobile (mostly Alaskans).² We conclude, therefore, that the sample for the survey on permit compliance is reasonably representative of McKinley's backpacking population in 1978.

Turning now to the second methodological problem, we will determine the validity of the data from the backcountry survey pertaining to permit compliance. Because of the sensitive nature of the questions dealing with permit compliance (i.e., those who do not comply with the permit system can legally be issued a citation), it is possible that the data from a mail questionnaire which did not ensure anonymity (although we did guarantee confidentiality) might not be valid; that is, those who did not comply with the permit system responded that they did (i.e., they lied). The data from the backcountry survey will be validated by comparing it with similar data from the study of permit compliance. We are assuming that the data from the study of permit compliance are more valid because this study was an unofficial research project which guaranteed anonymity. If the data are similar, we can conclude that the data from the backcountry survey are accurate (i.e., those who did not comply provided honest answers).

²See Table 101 in Appendix 11 for a comparison between the backpacking public and the study population of the permit compliance survey in terms of mode of transportation to and from McKinley.

Table 83. Comparison of data on permit compliance obtained from the backcountry survey and the study of permit compliance.

Question on permit compliance	Backcountry survey (N = 2,984) ^a	Study of permit compliance (N=441) ^a
Did you return early from the backcountry?		
- Yes	36%	44%
- No	64%	56%
Did you stay out longer in the backcountry?		
- Yes	3%	6%
- No	97%	94%
Did you camp in zones other than those scheduled on your permit?		
- Yes	20%	27%
- No	80%	73%

^aThese study populations of 2,984 and 441 represent those hikers who went into the backcountry with a permit.

Based on the figures in Table 83, we conclude that the data from the backcountry survey are reasonably accurate in terms of the information they provide on permit compliance. If anything, data from the backcountry survey underestimate the extent of partial compliance, as would be expected.

C. Findings

In presenting information on compliance, partial compliance, and noncompliance with the permit system, data will originate from either the backcountry survey or the study of permit compliance, depending on

which one has the appropriate data. If both have the appropriate data, then data from the backcountry survey will be used. Information from the study of permit compliance represents the respondents' most recent trip into the backcountry, while information from the backcountry survey is based on the backcountry trip for which the questionnaire and permit were given.

Noncompliance. Only 7 percent of the study population (N = 474) camped in the backcountry without a permit (see Table 84).

Table 84. Did you (or your party) obtain a backcountry travel permit for the hiking trip? (N = 474).

Answer	Percentage
Yes	92
No	7
No information	1

If we include Park Service employees, then 10 percent of the study population (N = 513) were without a permit while in the backcountry.³ All of those in Table 83 who camped in the backcountry without a permit (N = 33) gave reasons for this behavior. The vast majority of them (over 70 percent) indicated that their behavior was a conscious action: their desired zone was not available; they did not support the regulations;

³See Table 102 in Appendix 11 for a comparison of noncompliance by the public, concessionaire employees, and Park Service employees.

they wanted greater flexibility; or they just did not care. Over half of them did not even attempt to obtain a permit. Other reasons for not obtaining a permit were split evenly (about 8 percent each) between the following three: (1) bad weather, (2) poor personal planning, and (3) uninformed about what to expect.

Partial Compliance. In the introduction to this chapter, we described four factors which represented partial compliance. In Table 85, the figures indicate the extent to which each of these four factors occurred.

Table 85. Partial compliance with the permit system.⁴

Partial compliance	Percentage
Returned early from the backcountry (or did not use permit) and did not report such to park personnel (N = 3,324)	18
Camped in zones other than those scheduled on the permit (N = 3,324)	18
Camped in the backcountry beyond date authorized by the permit (N = 3,324)	3
Camped in the backcountry with a party larger or smaller than authorized by the permit (N = 441)	5

Of those who returned early from the backcountry and did not report such (N = 441), their trip averaged about 1.6 nights less than authorized by their permit. Of those who camped in zones other than scheduled on the

⁴See Table 103 in Appendix 11 for a comparison of partial compliance by the public, concessionaire employees, and Park Service employees.

permit (N = 598), they averaged about 1.8 nights camped in the wrong zone. Of those who stayed out in the backcountry, longer than authorized by their permit (N = 100), they camped an average of about 1.4 nights longer. And of those who were members of a party whose size was different than specified on the permit (N = 23), for 65 percent of them the size of their party increased an average of 1.4 hikers, while for the rest of them their party's size decreased an average of 1.3 hikers.

For those who returned early from the backcountry, regardless of whether they reported such (N = 1,338), their reasons for an early return are listed in Table 86.

Table 86. Reasons for returning early from the backcountry or not using permit (N = 1,338).

Reason	Percentage ⁵
Poor personal planning	46
Bad weather	37
Did not like the zone	18
Injury or exhaustion	10
Uninformed, inexperienced	6
Did not care to follow regulations	4
Other (got lost, bus problems)	4

A difficulty in interpreting Table 86 is that the reasons are for returning early and not for why they did not inform Park Service personnel

⁵The total adds up to more than 100 percent because some hikers gave more than one reason.

of their early out. In Table 87, we provide the reasons why some hikers (N = 566) camped in zones other than those scheduled on their permit.

Table 87. Reasons for camping in zones other than scheduled on permit (N = 566).

Reason	Percentage ⁵
Found a more attractive zone or did not like the zone assigned	43
Poor personal planning	32
Bad weather	16
Chose not to follow the regulations	15
Misinformed, inexperienced	15
Injury or exhaustion	7
Other (got lost or bus problems)	5

The reason most often cited in Table 87 represents a conscious act: "found a more attractive zone or did not like the zone assigned" (43 percent). Three main reasons were given by those hikers who stayed out for more nights than scheduled on their permit.⁶ Over one-third indicated it was because they did not choose to follow the regulations; either they did not get their preferred zone(s) or they did not support the

⁵The total adds up to more than 100 percent because some hikers gave more than one reason.

⁶This information was obtained from the study of permit compliance, since in the backcountry survey we never asked why hikers stayed out more nights.

restrictions. Almost another third mentioned poor planning: misjudged their route and took longer than expected. And another third said that they encountered difficulties with the terrain of the zone to which they were assigned, so they changed to a more attractive zone, thus prolonging their trip. Finally, for those changing their party's size, the reason was either a chance meeting with others who were interested in joining the hike or someone dropped out because of a change in plans or injury or discouragement.

Given the four types of partial compliance outlined in Table 85, we ask the question how many hikers were involved in only one, or in two of them, or in three of them, and consequently, how many were total compliers? Neither the backcountry survey nor the study of permit compliance have information on all types of partial compliance. The backcountry survey lacks information on party size, while the study of permit compliance did not obtain data on reporting early returns. Given, then, this deficiency, Tables 88 and 89 provide some figures on the extent of partial compliance or total compliance by McKinley's hikers. For Table 88, the types of partial compliance are identified as follows:

- (a) did not use permit or returned early and did not report such;
- (b) camped in the wrong zone;
- (c) stayed out longer.

Table 88. Extent of partial compliance based on (1) not using permit or returning early and not reporting such; (2) camping in the wrong zones; and (3) staying out longer (N = 3,324).

Partial compliance	Percentage
Only (1)	12
Only (2)	13
Only (3)	2
Both (1) and (2)	3
Both (2) and (3)	1
Total compliance	69

For Table 89, the types of partial compliance are identified as follows:

- (a) party's size was larger or smaller;
- (b) camped in the wrong zone;
- (c) stayed out longer.

Table 89. Extent of partial compliance based on: (1) party size being larger or smaller; (2) camping in the wrong zone; (3) staying out longer (N = 441).

Partial compliance	Percentage
Only (1)	4
Only (2)	23
Only (3)	1
Both (1) and (2)	--
Both (1) and (3)	1
Both (2) and (3)	3
All three	--
Total compliance	67

Based on the data in Tables 88 and 89, we conclude that: (1) those involved in partial compliance were usually involved in only one type, and (2) about one-third of McKinley's backpackers with permits were partial compliers.

Comparisons. Compliers, noncompliers, and partial compliers were compared in terms of three factors: (1) socio-demographic characteristics; (2) backcountry experience; and (3) opinions on management policy.

Those without a permit differed from those with a permit in four ways:

- (1) There were proportionately more Alaskans (24 percent) and less foreign visitors (0 percent) among those without a permit than those with a permit (14 percent and 5 percent, respectively).
- (2) Those without a permit were more likely to have backpacked before in McKinley (30 percent) than those with a permit (20 percent).
- (3) Those without a permit were less likely to have known that McKinley's backcountry was patrolled infrequently (53 percent) than those with a permit (73 percent).
- (4) Those without a permit were less supportive of being required to obtain a permit (average score of 1.7) and more opposed to being able to obtain a permit only at the park (average score of 2.3) than were those with a permit (average score of 1.1 and 1.6, respectively).⁷

There were no significant differences between those who followed and those who did not follow the permit. There were fewer foreigners

⁷Opinions were scored as follows: 1 for support, 2 for neutral, 3 for oppose.

who were partial compliers, and partial compliers had less advanced knowledge of the permit system. What is interesting to note is that partial compliers were just as supportive of management policy as were those following their permit.

D. Summary

Although the incidence of noncompliance with McKinley's permit system was quite low (7 percent), the rate of partial compliance was considerably higher. About one-third of McKinley's backpackers committed at least one of four possible violations, with most of them either (1) returning early (or not using the permit) and not informing Park Service personnel of such, and/or (2) camping in unscheduled zones. This finding is not only useful to managers, but it is also a significant addition to a field in which prior studies have focused only on noncompliance.⁸

There are three general conclusions, with implications for management, that can be made based on the findings of this chapter. These are:

1. The over- and underutilization of the backcountry brought about by partial compliance and noncompliance have a balancing effect. In Chapter 5, we documented how the total figures of use for the backcountry, whether based on the permits or the tally sheet, remained unchanged after accounting for increases and decreases due to partial compliance and noncompliance. However, partial compliance and noncompliance tend to distort figures of use when these are broken down by zone.

⁸Jan Van Wagtendonk has been doing some research on partial compliance at Yosemite National Park.

2. Most of the noncompliers, and about half of the partial compliers, did not follow the permit system because they did not agree with existing regulations or because they did not like the zones they were given. At present, most of the backpackers are supportive of management policy (see Chapter 7), and the backcountry has not been used to capacity (see Chapter 5). However, if these conditions change (i.e., less support for management and less vacancy in the backcountry), the McKinley's managers might expect these rates of partial compliance and noncompliance to increase. Furthermore, although hikers say they support the permit system, it does not necessarily follow that they will comply with the system.
3. The high percentage of partial compliers dwarfs the small percentage of noncompliers. Although some of the reasons given for partial compliance were intentional violations, at least one-half of the partial compliance is the result of situations which the backpacker had not expected and which forced him or her to alter the itinerary set up by the permit; for example, bad weather, rugged terrain, poor planning, injury, or equipment failure. One way, therefore, to possibly cut back on the number of partial compliers is to better inform the prospective backpackers as to what they can expect in McKinley's backcountry and provide them with a list of necessary equipment. Information about the terrain, the weather, the physical features, and some specifics about each zone would help the hikers better plan their trip and thus increase the likelihood of following the permit schedule.

The key to an effective permit system, however, as expressed repeatedly by the hikers in their comments, is to maintain a high degree of flexibility and the minimize the amount of restriction for backcountry travel.

CONCLUDING REMARKS

Two main conclusions are suggested by the findings presented in this report. They are:

- (1) McKinley's backpackers in 1978 were overwhelmingly supportive of the Park Service's regulations governing use of the backcountry.
- (2) There is some support for the sociological assumptions contained in McKinley's backcountry management plan; but none of the assumptions are entirely correct.

Therefore, the Park Service has three broad options: (1) rewrite the management plan, (2) increase the capacities; or (3) a combination of the first two options.

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Appendix 1. Backcountry Tally Sheet

A copy of the backcountry tally sheet can be found on the following three pages.

ZONE NUMBER ↓	DATE →				
1	# of Hikers				
	# of Hiking Parties				
1A	# of Hikers				
	# of Hiking Parties				
2	# of Hikers				
	# of Hiking Parties				
3	# of Hikers				
	# of Hiking Parties				
4	# of Hikers				
	# of Hiking Parties				
5	# of Hikers				
	# of Hiking Parties				
6	# of Hikers				
	# of Hiking Parties				
7	# of Hikers				
	# of Hiking Parties				
8	# of Hikers				
	# of Hiking Parties				
9	# of Hikers				
	# of Hiking Parties				
10	# of Hikers				
	# of Hiking Parties				

ZONE NUMBER ↓	DATE →					
11	# of Hikers					
	# of Hiking Parties					
12	# of Hikers					
	# of Hiking Parties					
13	# of Hikers					
	# of Hiking Parties					
13A	# of Hikers					
	# of Hiking Parties					
14	# of Hikers					
	# of Hiking Parties					
15	# of Hikers					
	# of Hiking Parties					
16	# of Hikers					
	# of Hiking Parties					
17	# of Hikers					
	# of Hiking Parties					
18	# of Hikers					
	# of Hiking Parties					
19	# of Hikers					
	# of Hiking Parties					
20	# of Hikers					
	# of Hiking Parties					
21	# of Hikers					
	# of Hiking Parties					

ZONE NUMBER ↓	DATE →					
22	# of Hikers					
	# of Hiking Parties					
23	# of Hikers					
	# of Hiking Parties					
24	# of Hikers					
	# of Hiking Parties					
25	# of Hikers					
	# of Hiking Parties					
26	# of Hikers					
	# of Hiking Parties					
27	# of Hikers					
	# of Hiking Parties					
28	# of Hikers					
	# of Hiking Parties					
29	# of Hikers					
	# of Hiking Parties					
29A	# of Hikers					
	# of Hiking Parties					
30	# of Hikers					
	# of Hiking Parties					
31	# of Hikers					
	# of Hiking Parties					

Appendix 2. Backcountry Permit

**U.S. DEPARTMENT
OF THE INTERIOR**
NATIONAL PARK SERVICE

Form 10-404A (11-76)



BACKCOUNTRY USE PERMIT

When signed, this single-visit permit authorizes:

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

1	2	3	4	5
6	7	8	9	

To visit _____

and to build campfires in accordance with regulations.

Give best estimate of start
and finish dates

FROM
MO/DAY

THROUGH
MO/DAY

10	11	12	13
14	15	16	17
18	19	20	
21	22	23	
24	25		
26	27		
28	29		
30	31		

Location of entry _____

Location of exit _____

Primary method of travel _____

Number of people in group _____

Number of pack or saddle stock _____

Number of watercraft or other craft _____

USE MAP

List all zones to be traversed, in sequence of travel, and the number of nights to be spent in each zone.

ZONE		NT		ZONE		NT		ZONE		NT		ZONE		NT		ZONE		NT	
32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71

REMARKS _____

77 78

I agree to abide by all laws, rules, and regulations which apply to this area.
I will do my best to see that everyone in my group does likewise.

DATE _____

(VISITOR'S SIGNATURE) _____

79 80

DATE _____

(ISSUING OFFICER'S SIGNATURE)

To Data Processing

Appendix 3. Pre-trip Questionnaire

A copy of the pre-trip questionnaire can be found on the following two pages.

PRE-TRIP QUESTIONNAIRE

We would like to ask you a few questions before beginning your trip into the McKinley backcountry.

- 1) About how many hiking parties, if any, do you think you are likely to see each day on your upcoming hike in the McKinley backcountry?

CIRCLE NUMBER: 0 1 2 3 4 5 6 7 8 9 10+

_____ Have no idea

-) Listed below are some numbers of hiking parties (average size of 2) that might be seen in the McKinley backcountry. How would you feel if you saw:

Please circle the appropriate response code for each possible sighting. The response codes are defined as follows:

VP means Very Pleasant

P means Pleasant

N means Neutral

U means Unpleasant

VU means Very Unpleasant

No other parties per day,.....	VP	P	N	U	VU
1 party per day,.....	VP	P	N	U	VU
2 parties per day,.....	VP	P	N	U	VU
3 parties per day,.....	VP	P	N	U	VU
4 parties per day,.....	VP	P	N	U	VU
5 parties per day,.....	VP	P	N	U	VU
7 parties per day,.....	VP	P	N	U	VU
9 parties per day,.....	VP	P	N	U	VU
15 parties per day,.....	VP	P	N	U	VU
20 parties per day,.....	VP	P	N	U	VU

-) During this hike into the backcountry, which of the following wildlife species, if any, do you expect to see?

_____ Ptarmigan

_____ Wolf

_____ Caribou

_____ Golden Eagle

_____ Grizzly Bear

_____ Red Squirrel

_____ Beaver

_____ Moose

_____ Jaeger

_____ Red Fox

_____ Dall Sheep

_____ Hoary Marmot

_____ Other

(Specify: _____)

_____ Do not expect to see wildlife

4) Why are you taking this trip into the McKinley backcountry? _____

5) How important is each of the following factors to your having an enjoyable trip in the McKinley backcountry? (Please circle the appropriate number for each factor.)

		<u>Very</u> <u>Important</u>	<u>Somewhat</u> <u>Important</u>	<u>Not</u> <u>Important</u>	
a) Views of Mount McKinley.....	1	2	3	4	5
b) Solitude.....	1	2	3	4	5
c) Seeing wildlife.....	1	2	3	4	5
d) Fellowship with party members.....	1	2	3	4	5
e) Avoiding certain wildlife.....	1	2	3	4	5
(Specify species: _____)					
f) Physical challenge.....	1	2	3	4	5
g) Hiking on tundra.....	1	2	3	4	5
h) Hiking on glacier or snow.....	1	2	3	4	5
i) Observing wildflowers and other vegetation.....	1	2	3	4	5
j) Seeing other parties.....	1	2	3	4	5
k) Wildness.....	1	2	3	4	5
l) Other.....	1	2	3	4	5
(Specify: _____)					

6) What is your age? _____

7) Are you: Male _____; or Female _____?

8) Where is your permanent residence?

_____ United States → a) Zip Code: _____

or

Town/City: _____

State: _____

_____ Other Country → b) Name of Country: _____

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix 4. Address Card

PERMIT # _____ QUESTIONNAIRE # _____

NAME _____

PERMANENT
MAILING ADDRESS _____

NOTE: Your name and mailing address only will be used:
1) to remind you to send your completed question-
naire (if you have not done so); and 2) to send
you a summary of the survey's findings.

Appendix 5. Mail Questionnaire

A sample of some of the pages from the mail questionnaire can be found on the following four pages. The titles of most of the tables in the text are similar to the questions in the questionnaire.



United States Department of the Interior

NATIONAL PARK SERVICE

Mount McKinley National Park
Post Office Box 9
McKinley Park, Alaska 99755

IN REPLY REFER TO:

May 26, 1978

Dear Hiker:

Welcome to Mount McKinley National Park!

We have asked the College of Forest Resources (University of Washington, Seattle) to undertake a survey of backcountry users. The purpose of this survey is threefold: 1) to document your evaluation of your trip in the McKinley backcountry; 2) to document your opinions about backcountry regulations; and 3) to gather certain background information. By filling-out this questionnaire, completely and correctly, you will be assisting us in developing a good management program for the McKinley backcountry. We need to have accurate information from all backcountry users. Your responses will be held confidential and will be used in statistical analyses only. If the space provided is not sufficient for your written comments, please write on the margins or continue at the end of the questionnaire.

This questionnaire has been designed to be filled-out upon completion of your backcountry trip. It should take you no more than 30 minutes to fill it out. A stamped and addressed envelope is included so that you can conveniently mail back your completed questionnaire right away. If you complete your questionnaire while still at McKinley, you can deposit your completed questionnaire in special drop-boxes located at Morino Campground or the Train Depot, or you can return it to Riley Creek Visitor Center.

Thank you for your interest and cooperation. I hope you have enjoyed your visit to Mount McKinley National Park.

Good Hiking!

Daniel R. Kuehn
Superintendent

P.S. If you would like to receive a summary of the survey's findings, please check the box. ☐

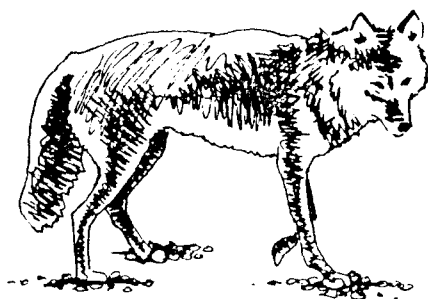
PERMIT INFORMATION _____

DAY: 1 2 3

→ DATE: _____ _____ _____

ZONE: _____ _____ _____

- 12) In which backcountry zone did your party camp on this day? (List zone number for each day. If you did not camp, place an X.).....
- 13) In which backcountry zone(s) did your party hike on this day? (List zone number(s) for each day. If you did not hike, place an X.).....
- 14) How many hiking parties did you see on this day? (List number of hiking parties seen for each day; use 0 if none.).....
- 15) With how many hiking parties did you interact (for example, talk to or exchange greetings, either verbal or non-verbal) on this day? (List number of hiking parties interacted with each day; use 0 if none.).....
- 16) How did you feel about the number of hiking parties you saw on each day? (Please circle the appropriate letter for each day, even if no parties were seen. If you did not see hiking parties, and this was your preference, circle c. If you did not see parties, but preferred seeing some, circle d or e.)
- | | | | |
|--|---|---|---|
| a) Saw too many, preferred seeing none..... | a | a | a |
| b) Saw too many, preferred seeing less..... | b | b | b |
| c) Saw about the right number..... | c | c | c |
| d) Saw too few, preferred seeing a few more..... | d | d | d |
| e) Saw too few, preferred seeing many more..... | e | e | e |
| f) Did not matter one way or the other..... | f | f | f |



- 28) How did the number of hiking parties you saw affect your overall enjoyment of this backcountry trip? *(Please check the appropriate response even if you did not see hiking parties.)*

☐ Greatly added to enjoyment
☐ Somewhat added to enjoyment
☐ Had no affect
☐ Somewhat reduced enjoyment
☐ Greatly reduced enjoyment

- 29) Did you see any evidence of human use on this backcountry trip? *(Please check Column A.)*

IF YES, about how much, if at all, did this evidence of human use bother you? (Please check the appropriate response in Column B for those types of evidence of human use you saw.)

	<u>Column A</u>			<u>Column B</u>		
	<u>No</u>	<u>Yes</u>		<u>Not Bothered</u>	<u>Somewhat Bothered</u>	<u>Very Bothered</u>
a) Human waste.....	☐	☐	→	☐	☐	☐
b) Toilet paper.....	☐	☐	→	☐	☐	☐
c) Campfire rings.....	☐	☐	→	☐	☐	☐
d) Litter.....	☐	☐	→	☐	☐	☐
e) Horse waste.....	☐	☐	→	☐	☐	☐
f) Cut bushes or trees..	☐	☐	→	☐	☐	☐
g) Hiker-made trails....	☐	☐	→	☐	☐	☐
h) Hiker-made campsites. (for example, soil compaction or vegetation trampling due to tents.)	☐	☐	→	☐	☐	☐

Comments: _____

- 37) What are your feelings about each of the following regulations that govern backcountry use in Mount McKinley National Park?

Please circle the appropriate response code for each regulation. The response codes are defined as follows:

SS means Strongly Support

S means Support

N means Neutral

O means Oppose

SO means Strongly Oppose

- | | | | | |
|--|---|---|---|----|
| a) All overnight hiking parties must obtain a backcountry travel permit.....SS | S | N | O | SO |
| b) Backcountry travel permits only may be obtained in the Park.....SS | S | N | O | SO |
| c) Backcountry travel permits only may be obtained 24 hours in advance of one's trip.....SS | S | N | O | SO |
| d) Overnight hikers only may <u>camp</u> in the backcountry zones specified by their permit....SS | S | N | O | SO |
| e) Overnight hikers only may <u>camp</u> in the backcountry on the nights specified by their permit.....SS | S | N | O | SO |
| f) Overnight hikers may <u>hike</u> in zones other than those specified by their permit for camping.....SS | S | N | O | SO |
| g) Day hikers do not need travel permits.....SS | S | N | O | SO |
| h) Hiking parties may camp most anywhere within their scheduled backcountry zones.....SS | S | N | O | SO |
| i) Backcountry campsites must not be visible from the park road.....SS | S | N | O | SO |
| j) Campfires are not allowed in the backcountry...SS | S | N | O | SO |
| k) Some areas of the backcountry are permanently closed to overnight hikers in order to protect fragile wildlife habitats.....SS | S | N | O | SO |
| l) Some backcountry zones are temporarily closed to hikers in order to protect hikers from unpredictable wildlife.....SS | S | N | O | SO |

Appendix 6. Reminder Letters

A copy of the three letters sent out as reminders to non-respondents can be found on the following three pages. The letters were mailed in the order that they appear.



United States Department of the Interior

198

NATIONAL PARK SERVICE

Mount McKinley National Park

Post Office Box 9

McKinley Park, Alaska 99755

IN REPLY REFER TO:

L3419
(MOMC)

Dear

A few weeks ago, you were given a questionnaire concerning your trip in the McKinley backcountry. Possibly you have lost the questionnaire, or it just slipped your mind. We encourage you to fill out the questionnaire in order that the survey's results may be representative of the user public. In this way, you will be assisting us in developing a good management program for the McKinley backcountry.

We have enclosed another questionnaire along with an addressed and stamped envelope. On page 4 of the questionnaire (page 1 if you have a shorter version of the questionnaire), you will find the permit information for the backcountry trip in question. We remind you that all completed questionnaires are strictly confidential.

If you have already completed and returned your questionnaire, please disregard this letter.

Thank you for your cooperation.

Sincerely yours,

Daniel R. Kuehn
Superintendent

Enclosure



IN REPLY REFER TO:

United States Department of the Interior

199

NATIONAL PARK SERVICE

Mount McKinley National Park
Post Office Box 9
McKinley Park, Alaska 99755

Dear

Before throwing away this letter, please hear us out. Those of us here at Mount McKinley National Park who are responsible for managing the backcountry would like to know your thoughts about how the McKinley backcountry should be managed in the future. The enclosed questionnaire has been prepared for this purpose. It is not a graduate student project. Rather, it has been developed for use by our management staff.

Anna, Art, Georgiana, and Lezlie, who worked behind the backcountry permit desk this summer, will be reading and analyzing all of the information in the questionnaires. Your comments will not be just a number in a report. They will pass on the results of the survey to us in order that we might make more informed decisions. Your responses will be held confidential.

The effectiveness of this survey depends on the participation of all of those given a questionnaire this summer. We encourage you to take the time to fill-out the questionnaire. This way, the survey's results will be representative of those using the McKinley backcountry.

If you have already returned your questionnaire, please disregard this letter.

Thank you for your cooperation. We look forward to having you visit the park once again.

Sincerely yours,

Daniel R. Kuehn
Superintendent

P.S. Please fill out the questionnaire even if you never took a back-country trip.

If you want a copy of the survey's findings, please check the box found at the bottom of the cover letter inside the questionnaire.

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

*College of Forest Resources
U.S. National Park Service
Cooperative Park Studies Unit*

November 1, 1978

Dear

This is our final plea for you to fill-out the questionnaire — even if you never used your backcountry permit (see instructions at the bottom of page 2 of the questionnaire). We realize that there might be some difficulty in remembering certain parts of your backcountry trip at this late date, but please answer these questions the best you can.

We are committed to analyze the survey's information in an objective manner and to give the survey's results to the managers of McKinley. Even though the response rate is about 75%, we remain concerned that the survey's results are representative of the McKinley backpacking public. This is why we have been so persistent in sending-out reminders. However, if you do not want to fill-out the enclosed main questionnaire, could you please complete and return the one-page, yellow form. Information from this form will enable us to determine whether the survey's non-respondents differ from the respondents on certain key questions.

We assure you once again that all information from the questionnaire is confidential. We are committed to do an excellent job for this survey. So again, please help us out by at least filling-out the yellow form.

Thanks for your help!

Sincerely,



Peter Womble
Project Coordinator

P.S. If you've already filled-out the main questionnaire, we apologize for bothering you.

Appendix 7. Nonrespondent Questionnaire

A copy of the nonrespondent questionnaire can be found on the following two pages.

McKINLEY BACKCOUNTRY SURVEY

If you choose not to fill-out the main questionnaires, can you please answer these four questions. This will allow us to determine whether the information from the returned questionnaires is biased in any way.

Thank-you.

1) Overall, how would you rate your backcountry trip?

- ☐ Did not go on a backcountry trip
☐ Poor
☐ Fair, it just didn't work out very well
☐ Good, but I wish a number of things could have been different
☐ Excellent, only minor problems
☐ Perfect

Comments:

2) What are your feelings about each of the following regulations that govern backcountry use in Mount McKinley National Park?

Please circle the appropriate response code for each regulation. The response codes are defined as follows:

SS means Strongly Support

S means Support

N means Neutral

O means Oppose

SO means Strongly Oppose

- | | | | | | |
|---|----|---|---|---|----|
| a) Backcountry travel permits only may be obtained 24 hours in advance of one's trip.... | SS | S | N | O | SO |
| b) Overnight hikers only may <u>camp</u> in the backcountry zones specified by their permit... | SS | S | N | O | SO |
| c) Backcountry campsites must not be visible from the park road..... | SS | S | N | O | SO |
| d) Campfires are not allowed in the backcountry.. | SS | S | N | O | SO |
| e) Backcountry zones have set capacities for the number of overnight hikers allowed on any given night..... | SS | S | N | O | SO |

Comments:

OVER

OVER

OVER

OVER

OVER

OVER

Appendix 8. Party Form

A copy of the party form can be found on the following two pages.

1) Party type:

- ☐ Alone
☐ Family
☐ Friends
☐ Family and Friends
☐ Organized Group
(Specify: _____)

2) Permit # _____

3) Party Size: _____

4) Did this party have any preference for backcountry zones?

- ☐ Don't know
☐ No
☐ Yes

a) IF YES, did they get what they wanted?

- ☐ Don't know
☐ None
☐ Some
☐ All

5) When was this party formed?

- ☐ Before leaving home for this visit
☐ While en route to McKinley for this visit
☐ While at McKinley on this visit

6) Is this party part of a larger party?

- ☐ No
☐ Yes a) IF YES, what is the size of the larger party? _____

COMMENTS (especially on zone selection and party formation):

REASONCHARACTERISTICS

A) Too young

AgeSexResidence

— Individual 1

— Individual 2

— Individual 3

— Individual 4

B) Did not want to cooperate

— Individual 1

— Individual 2

— Individual 3

— Individual 4

C) Cannot read English

— Individual 1

— Individual 2

— Individual 3

— Individual 4

— Individual 5

— Individual 6

COMMENTS:

Appendix 9: Statistical Measure of Association

When we need to indicate the strength and/or direction of the relationship between two or more variables, two statistical procedures are used: (1) Pearson correlation; and (2) multiple regression.

(1) Pearson correlation is used when we are concerned with a bivariate relationship (i.e., relationship between two variables). The correlation coefficient (r) ranges in value from -1 to +1, with either of the extremes representing a perfect correlation and with 0 representing no correlation. The minus or plus sign tells us the direction of the relationship. By squaring the correlation coefficient, we obtain the percentage of variation (r^2) in the dependent variable explained by the independent variable. Although most of the variables are truly ordinal measures (rather than interval), and some dichotomies, we decided to use Pearson correlations instead of Spearman rank-order correlations because: (a) the correlation coefficients for bivariate relationships were similar in magnitude and direction regardless whether we used Pearson or Spearman; (b) Pearson correlation does indicate the proportionate reduction in error (r^2); and (c) we wanted to use, as much as possible, a consistent correlation measure throughout the report.

(2) Multiple regression is used when we are interested in doing a multivariate analysis (i.e., the relationship between one dependent variable and various independent variables). This procedure allows us to: (1) to assess how well the independent variables together are able

to explain variation in the dependent variables (R^2); and (2) the relative importance of each independent variables in explaining variation in the dependent variable having controlled for the other independent variables (standardized regression coefficient).

Appendix 10. Sample of Comments Written in the Questionnaires

Almost every respondent wrote some type of comment in the questionnaire. We have read these comments and incorporated them into the body of the report. The following is a sample of some of these comments.

"I strongly agree with the management policies of McKinley Park. The control of people and protection of the park is the priority. This can be accomplished while still allowing enough freedom for people to learn and enjoy the park."

"I like the regulations even if its tough to get a permit."

"I feel that the fact that we were able to walk in on a Saturday night in August and get our second choice (and excellent) hike indicates that the present system is not overly restrictive. The system's effect on the quality of the experience is outstanding."

"Some balance must be struck with regards to overregulation."

"I feel the environment and wildlife should be protected at all cost. If this means I can't camp at all I am willing to accept this."

"It seems that some of the limitations (which are for the park's good) detract from the spontaneity of backpacking."

"If you don't regulate now, Alaska will end up like parts of Washington State."

"Your restrictions are inhibiting, artificial, and counter-creative; are you running an amusement park?"

"Some of the rules may prevent hikers, who came to McKinley from a long distance, from following their planned route."

"Although I strongly support controls, I myself refuse to have my life run by the government (NPS). Fortunately, not everyone has this attitude."

"Although I oppose regulations, in principle, in a wilderness area I can understand and respect (them)."

"For out-of-state people there should be an information and reservation system (with deposit) to guarantee availability of a BC permit."

"I would like to see a permit reservation system by mail (old Grand Canyon) but with permit issued in the park."

"Permits available in the park only...can make preplanning difficult but I can understand the need for this."

"Permits only 24 hr in advance limits planning on BC trip for several days in combination with staying in a campground."

"Sometimes camping in a particular scheduled zone is difficult if delays are encountered."

"The trouble with assigned areas on nights decreases the flexibility of the traveler."

"A backpacker should be allowed to camp in another area if emergency or circumstances require it at the last minute."

"Day hikers should register simply for records and safety."

"Day hikers trample more vegetation than does a tent. Day hiking needs to be limited through it seems difficult to think of a simple, fair scheme."

"Park road should not be visible from the backcountry!"

"In much of the area we were hiking it was impossible to find a campsite out of sight of the road. This could lead to severe overuse of fortuitously placed campsites in such areas."

"You should allow campfires in gravel bars, river beds, etc."

"Campfires should be allowed for certain occasions, such as bad weather."

"Campfires make for a good camping trip."

"No fires is a great idea."

"Fires are ok where they don't do any damage."

"The boundaries of closed wildlife areas are hard to determine."

"Closed areas must advertise where wolves are denning."

"Fragile areas are everywhere--some do need more protection though."

"Why not let hikers risk the danger of unpredictable wildlife. That's part of the experience."

"The functions of management is to protect the BC from me and my actions, not to protect me from the country or my own stupidity."

"Provided hiking parties are not large I do not feel one or two extra people would hurt. Allow a party of 3 in a zone with two openings."

"It depends on the size of the area and what draws people. However, they should be a limit for each area to avoid too frequent encounters with other hikers."

"I agree but some arrangement should be made for more hikers in a zone so that some people may camp when and where they want without having to wait 3 months."

"Number of people in a zone should depend on routes and possible impacts."

"Need more flexibility in determining number of hikers."

"Base on parties--one party of 2 affects the BC less than 2 parties of one."

"Unlimited zones are ok if they can handle the number of people."

"Rotate unlimited zones often."

"Need one zone for large groups."

"Large groups don't belong in wilderness."

"Party size should depend on what area can handle."

"Base on parties but allow a maximum # per party."

"Larger parties, like us Boy Scouts, need a chance too."

"Regulations are a necessary evil."

"Less regulations the better."

"Use horses for ranger patrols only."

"I hate walking in horseshit."

"I think that if people want to see the backcountry that they should get there on their own--not using horses at all."

"Horses give a new BC experience--pioneers used them all the time."

"Some compromise is needed here--patrolling is necessary but needs to be done sensitively!"

"Patrolling distracts from getting away from people."

"I don't like the idea of having a ranger always looking over my shoulder."

"If you're gonna patrol--use a low profile approach."

"Patrol enough to make sure use is right but not necessarily to intercept every party to check permits."

"Rangers here were A-ok."

"It's nice to see a ranger when things go wrong."

"McKinley is the most beautiful park I've ever seen--and I've traveled a bit. It would indeed be very sad if it became overdeveloped. Once you start adding tables and toilets, concession stands won't be far behind."

"If I were dedicated to the wilderness I would not really want any of these. For my kind of hiking, I'd like all of chase--but I can go elsewhere to find it, so don't ruin it for those who love it the way it is now."

"Don't let McKinley become too developed like Shenandoah and others. Sometimes we make it too easy for people to think they are enjoying themselves."

"I would never forgive the NPS for developing the backcountry."

"I go to McKinley to enjoy natural surroundings, hazards included."

"You don't belong here if you don't want to rough it."

"Addition would totally destroy this beautiful park."

"I wouldn't want these additions all over the park. Maybe in certain areas for the inexperienced hiker or for people who like a few more comforts."

"All of these might be ok in a small part of the backcountry."

"I support these as long as they don't become over present in the park."

"I hope to see McKinley National Park preserved in as near a wilderness state as possible. I think the Park Service has done an excellent job in maintaining and protecting the wilderness values of the park and I would like to see present policies regarding park usage continued. My only question is the level of use. Obviously, pressure for use will grow, and in as far as such use can be accommodated, it should. By 'accommodated' I mean usage at a level just under that which leads to environmental damage beyond the healing capacity of the land. Have such levels of usage been determined? Unless such study has been done, perhaps zones 'typical' of the park could be identified as research units, subjected to various levels of use, overtime, and conclusions regarding such use be factored into the formation of policy. Of course research by itself is not enough. Public perception is vital too. If there is evidence to show that the maximum carrying capacity of the park is, on the average, six persons overnight per zone, then perhaps the Park Service could place greater emphasis on such research in its efforts to educate the public to the sensitivity to human use of these fragile environments."

"Our trip was unrealistic (length and travel time). The ranger who advised us should have known better and given better guidance."

"I feel that if a zone could hold 8 people according to Park Service then one more person if the group as a whole is traveling together shouldn't make that much difference. Hiking together is very much a part of sharing and learning and I don't think rules should be so rigid that they force people to break them to be together."

"The only thing I regretted was having to leave the backcountry and getting on crowded buses, having to wait hours for buses, etc."

"Due to hot weather, river crossings were very hazardous. This was not explained. Backcountry information service needs expansion so as to give each party more individual attention."

"Not really dissatisfied. But perhaps a better individual breakdown of the zones' general description of interests, such as wildlife visibility, geological features, etc. This might help folks in picking the area with most interest or avoiding an area which might most offer the change of an unpleasant situation."

"How about a guide with 3 or 4 'suggested hikes' in each zone. Then those wishing a more wilderness experience could head off over less utilized areas."

"I understand the need for the control of permit, but it is a pain in the neck! I would have liked to know ahead of time how many others would be in our area. Maybe there could be high use and low use areas; these could be rotated; people could be given options as to where they would like to go."

"After backpacking for two days in the rain and cold, I hiked to the road to be picked up to go to my next zone. I timed it perfectly so I wouldn't have to wait long in the cold. And the bus was full, I think that each bus should save about 5 seats to pick up people along the road. We were looking forward to a dry bus and had to wait another hour. That is very unfair. We--those that go into the backcountry--have as much right to the bus as those that come to just look. In fact, we have more right since it is our only form of shelter."

"On any backcountry trip, I would prefer to see no other hikers or evidence of human use. However, I realize that in the areas I visited (less than 6 miles from the road), this is essentially impossible, without greatly restricting backcountry use. All in all, I was satisfied with park backcountry policy. Compared to other national parks, evidence of human use was minimal."

Appendix 11. Some Additional Tables

The following are some additional tables which are referenced in the footnotes.

(1) Footnote 6, Chapter 3, and Footnote 14, Chapter 5.

Table 90. Size of each backcountry zone.

Backcountry zone number	Size: areas in acres
1	430,272
1a	74,240
2	127,360
3	42,803
4	12,595
5	16,384
6	18,944
7	53,760
8	81,920
9	9,318
10	31,744
11	26,112
12	26,419
13	26,172
13a	46,122
14	25,552
15	26,726
16	26,521
17	19,148
18	25,395
19	55,091
20	9,216
21	58,470
22	58,572
23	12,288
24	72,704
25	34,202
26	11,161
27	16,083
28	47,411
29	45,056
29a	21,504
30	14,438
31	52,224

(2) Footnote 6, Chapter 3

Table 91. Number of repeaters who participated in the survey (N = 4,447).

Which backcountry trip	Number of hikers	Percentage
First trip	4,090	92
Second trip	285	6
Third trip	28	1
Fourth trip	7	--
Fifth trip	2	--
Sixth trip	1	--
No information	34	1

(3) Footnote 15, Chapter 3

Table 92. How important are each of the following reasons for why you decided not to fill out the main questionnaire? (N = 45).

Reason	Very important	Somewhat important	Not important	No information
Questionnaire was too long	47	20	13	20
Did not have time	38	24	18	20
Can't adequately express my views in a questionnaire	20	22	38	20
Dislike government's nosiness	11	27	40	22
Survey's results will not be used by the managers of McKinley	11	13	51	25
Offended by some of the questions	11	11	53	25
Doubt whether questionnaire is truly confidential	9	4	64	23
Questionnaire is not anonymous	4	7	67	22
Survey is not objective	2	20	53	25

(4) Footnote 4, Chapter 4

Table 93. Residence of the foreign hikers (N = 317).

Foreign country	Percentage
Canada	22
West Germany	21
Japan	11
Sweden	10
France	7
Great Britain	5
Switzerland	5
New Zealand	4
Holland	2
Australia	2
Denmark	2
Israel	1
Austria	*
Belgium	*
Honduras	*
Mexico	*
South Africa	*
Italy	**
Korea	**
Rhodesia	**
Saudi Arabia	**
Tanzania	**
No information	3

*Less than one percent, because only two hikers.

**Less than one percent, because only one hiker.

(5) Footnote 12, Chapter 6

Table 94. Distribution of difference between density and sighting.

Difference between density and sighting	Percentage	
	Using minimum density (N=6,188)	Using maximum density (N=6,588)
0	13	5
1	24	10
2	22	13
3	14	13
4	8	12
5	3	9
6 - 19	7	28
No information	9	10
Range:	0 - 10 parties	0 - 19 parties
Average:	2.3 parties	4.7 parties

Table 95. Comparison between minimum density and number of other parties sighted (N = 6,188).

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NUMBER OF PARTIES SIGHTED

	0	1	2	3	4	5	6	7	8
1	952 (17.0%)	463 (8.3%)	0	0	0	0	0	0	0
2	1017 (18.1%)	390 (7.0%)	227 (4.0%)	0	0	0	0	0	0
3	633 (11.3%)	226 (4.0%)	101 (1.8%)	79 (1.4%)	0	0	0	0	0
4	319 (5.7%)	137 (2.4%)	87 (1.6%)	32 (0.6%)	14 (0.2%)	0	0	0	0
5	121 (2.2%)	99 (1.8%)	42 (0.7%)	10 (0.2%)	12 (0.2%)	5 (0.1%)	0	0	0
6	35 (0.6%)	28 (0.5%)	14 (0.2%)	10 (0.2%)	5 (0.1%)	0	0	0	0
7	90 (1.6%)	74 (1.3%)	45 (0.8%)	35 (0.6%)	11 (0.2%)	8 (0.1%)	1 (0.1%)	0	0
8	34 (0.6%)	28 (0.5%)	24 (0.4%)	14 (0.2%)	6 (0.1%)	0	0	0	0
9	56 (1.0%)	23 (0.4%)	22 (0.4%)	11 (0.2%)	2 (0.1%)	2 (0.1%)	0	0	0
10	29 (0.5%)	12 (0.2%)	9 (0.2%)	15 (0.3%)	1 (0.1%)	1 (0.1%)	0	0	0
11									
12									
13									
14									
15									
16									
17									
18									
19									

MISSING CASES : 577

DENSITY (NUMBER OF OTHER PARTIES IN ZONE)

Table 96. Comparison between maximum density and number of other parties sighted (N = 6,588).

NUMBER OF PARTIES SIGHTED

	0	1	2	3	4	5	6	7	8
1	376 (6.3%)	155 (2.6%)	0	0	0	0	0	0	0
2	579 (9.8%)	191 (3.2%)	72 (1.2%)	0	0	0	0	0	0
3	520 (8.4%)	170 (2.9%)	66 (1.1%)	38 (0.6%)	0	0	0	0	0
4	585 (9.9%)	229 (3.9%)	81 (1.4%)	45 (0.8%)	20 (0.3%)	0	0	0	0
5	386 (6.5%)	166 (2.8%)	55 (0.9%)	30 (0.5%)	6 (0.1%)	2 (0.1%)	0	0	0
6	323 (5.4%)	123 (2.1%)	46 (0.8%)	17 (0.3%)	4 (0.1%)	0	3 (0.1%)	0	0
7	220 (3.7%)	96 (1.6%)	43 (0.7%)	16 (0.3%)	4 (0.1%)	2 (0.1%)	1 (0.1%)	4 (0.1%)	0
8	115 (1.9%)	54 (0.9%)	35 (0.6%)	10 (0.2%)	3 (0.1%)	0	1 (0.1%)	0	0
9	94 (1.6%)	65 (1.1%)	40 (0.7%)	17 (0.3%)	6 (0.1%)	1 (0.1%)	0	0	1 (0.1%)
10	82 (1.4%)	47 (0.8%)	28 (0.5%)	21 (0.4%)	8 (0.1%)	4 (0.1%)	1 (0.1%)	0	0
11	29 (0.5%)	30 (0.5%)	15 (0.3%)	9 (0.2%)	1 (0.1%)	5 (0.1%)	0	0	0
12	37 (0.6%)	28 (0.5%)	18 (0.3%)	12 (0.2%)	9 (0.2%)	0	0	1 (0.1%)	0
13	26 (0.4%)	14 (0.2%)	10 (0.2%)	5 (0.1%)	0	3 (0.1%)	0	0	0
14	34 (0.6%)	21 (0.4%)	25 (0.4%)	10 (0.2%)	2 (0.1%)	2 (0.1%)	0	0	0
15	31 (0.5%)	31 (0.5%)	29 (0.5%)	22 (0.4%)	9 (0.2%)	5 (0.1%)	0	0	0
16	25 (0.4%)	13 (0.2%)	7 (0.1%)	4 (0.1%)	0	1 (0.1%)	0	0	0
17	21 (0.4%)	11 (0.2%)	9 (0.2%)	5 (0.1%)	0	0	0	0	0
18	7 (0.1%)	0	2 (0.1%)	1 (0.1%)	0	0	0	0	0
19	25 (0.4%)	10 (0.2%)	5 (0.1%)	9 (0.2%)	1 (0.1%)	0	0	0	0

MISSING CASES : 652

DENSITY (NUMBER OF OTHER PARTIES IN ZONE)

(6) Footnote 16, Chapter 6

Information for the following table was obtained from the backcountry permits for 1978.

Table 97. Size of backpacking parties (N = 2,289).

Size of parties	Percentage
1	27
2	52
3	11
4 - 5	8
6 - 15	2
Average: 2.1 hikers per party	

(7) Footnote 20, Chapter 6

Table 98. Length of backcountry trip in days (N = 2,829)

Number of days	Percentage
1	1
2	35
3	28
4	16
5 - 6	12
7 - 25	8
No information	--
Range : 1 - 25 days	
Average: 3.6 days	

(8) Footnote 23, Chapter 6

The ratios for Table 99 were calculated as follows. A ratio of number of parties with whom interacted to number of parties sighted was calculated for each case for each day of the trip. These ratios were then added together and divided by the number of days for which there was a ratio.

Table 99. Ratio of number of parties with whom interacted to number of parties sighted (N = 2,829).

Ratio of interactions to sightings	Percentage
0	48
0.01 to 0.49	29
0.50 to 0.99	16
1.00	5
No information	2

Range: 0 to 1.00

Average: 0.23

(9) Footnote 29, Chapter 6

The variables in the correlation matrix are labeled by their table number.

Table 100. Correlation matrix (N = 2,829).

T35	-0.26								
T45	-0.40	0.35							
T46	-0.21	0.17	0.17						
T38	-0.09	0.36	0.13	0.13					
T43	-0.14	0.44	0.23	0.14	0.17				
T36	-0.27	0.73	0.32	0.17	0.52	0.34			
T41	-0.08	0.26	0.07	0.09	0.27	0.01	0.27		
T37	-0.29	0.88	0.36	0.21	0.30	0.39	0.59	0.29	
T33	-0.45	0.40	0.42	0.29	0.09	0.26	0.27	0.09	0.40
	T44	T35	T45	T46	T38	T43	T36	T41	T37

Missing cases: 692

(10) Footnote 2, Chapter 9

Table 101. Comparison between backpacking public and study population of study of permit compliance in terms of mode of transportation to and from McKinley.

Mode of transportation	Percentage	
	Backpacking public (N = 1,917) ^a	Study of permit compliance (N=474)
Automobile	38	1
Train	28	84
Other	19	15
No information	15	

^a Information was obtained from the backcountry permits.

(11) Footnote 3, Chapter 9

Table 102. Permit noncompliance.

Group	Percentage
Backpacking public (N = 451)	6
Concessionaire employees (N = 23)	23
Park Service employees (N = 39)	51
Total (N = 513)	10

(12) Footnote 4, Chapter 9

Table 103. Permit partial compliance.

Partial compliance	Percentage		
	Backpacking public (N=422)	Concessionaire employees (N=17)	Park service employees (N=19)
Returned early from the backcountry ^a	44	41	16
Camped in zones other than those scheduled on the permit	27	18	5
Camped in the backcountry beyond date authorized by the permit	6	0	0
Camped in the backcountry with a party larger or smaller than authorized by the permit	5	12	5

^a It is not known whether they informed Park Service personnel of their early return.