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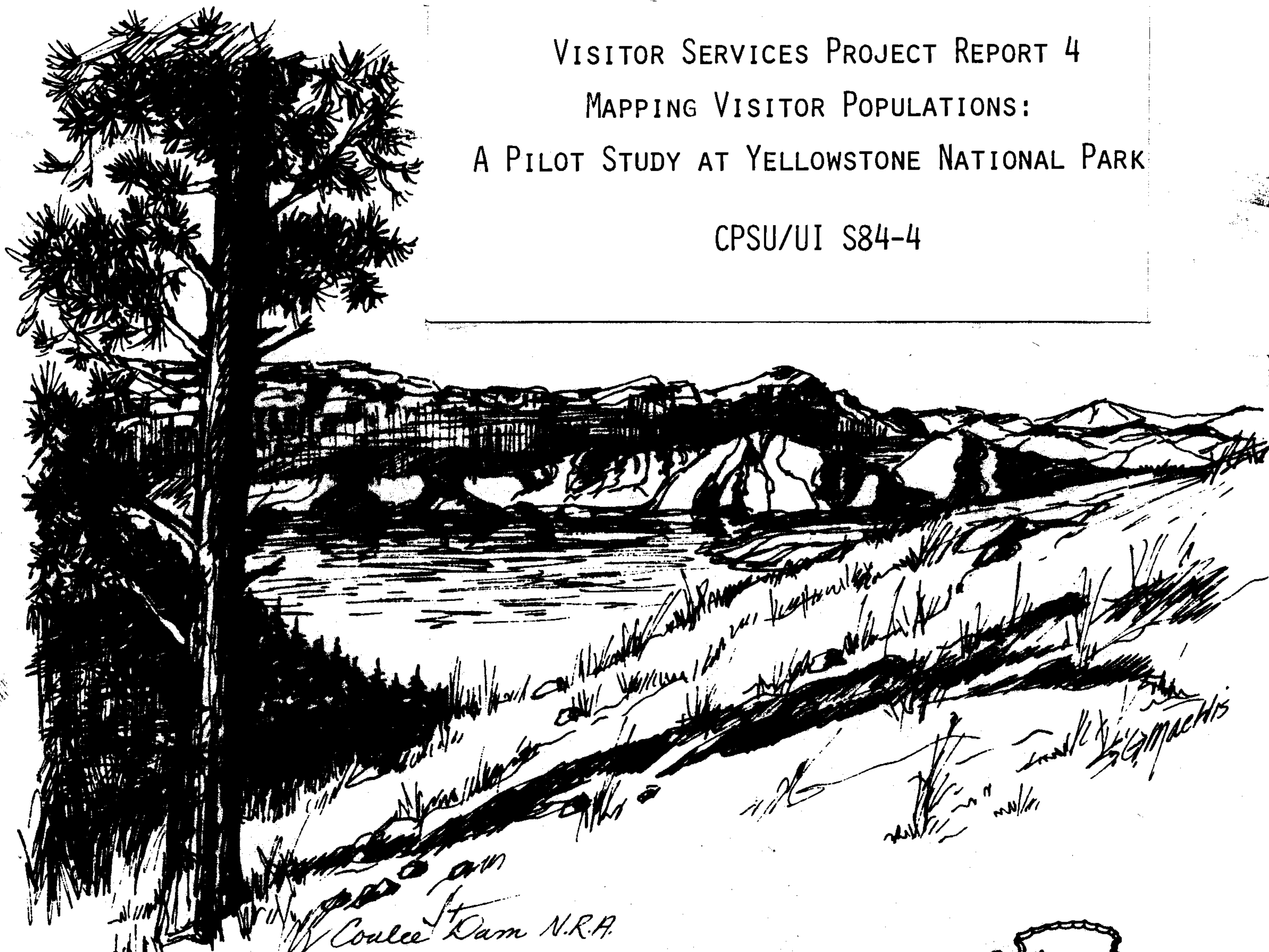
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VISITOR SERVICES PROJECT REPORT 4

MAPPING VISITOR POPULATIONS:

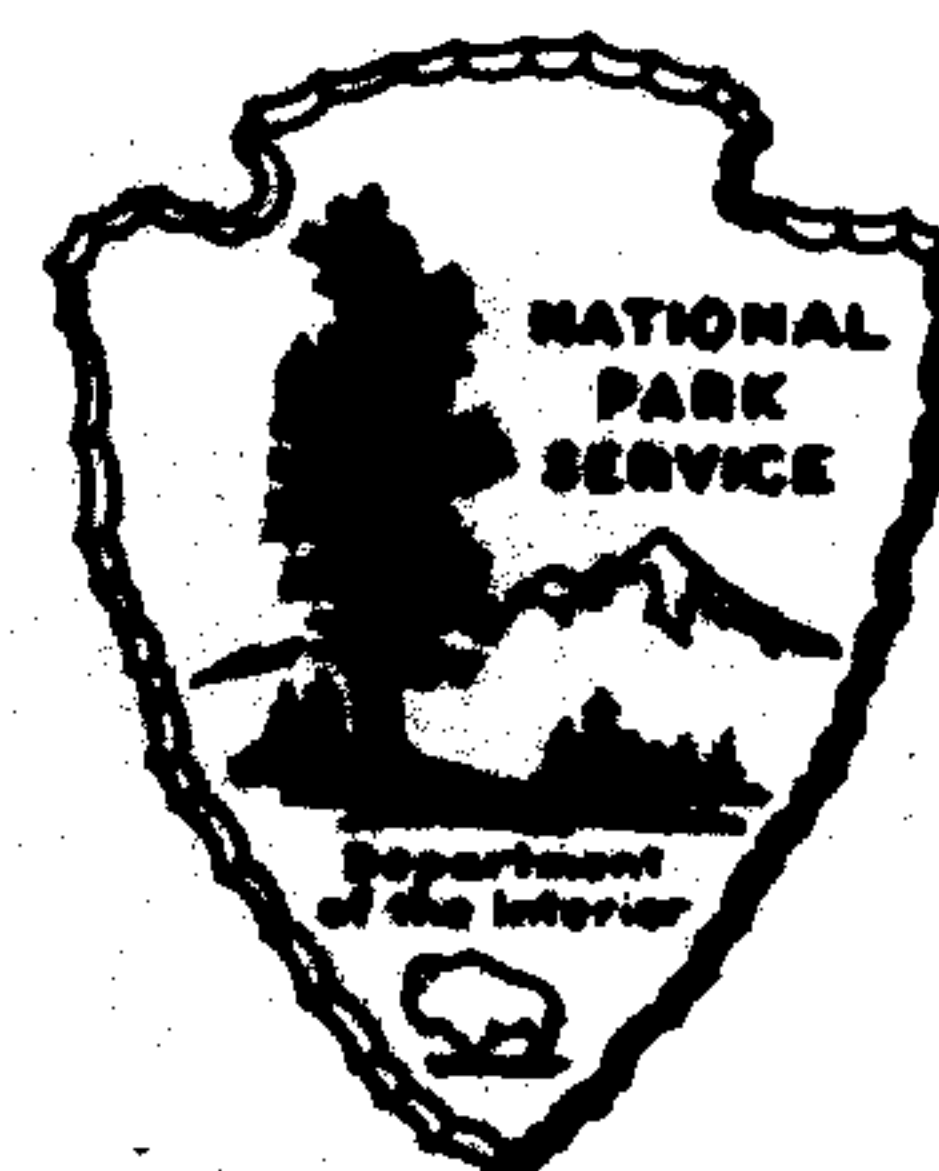
A PILOT STUDY AT YELLOWSTONE NATIONAL PARK

CPSU/UI S84-4



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VISITOR SERVICES PROJECT REPORT 4
MAPPING VISITOR POPULATIONS:
A PILOT STUDY AT YELLOWSTONE NATIONAL PARK

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by

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Summary

- The general trends of more visitors, more services and more complex management create the need for information about the people who visit units of the National Park System.
- This report describes a pilot effort to design a practical technique for gathering useful management information about visitors. The effort is part of a wider Visitor Services Project being conducted by the University of Idaho Cooperative Park Studies Unit.
- Because the technique can display visitor information in map form, it is called 'visitor mapping.'
- Visitor mapping has several benefits for park managers; it can help evaluate current level of services, distribution of personnel, and concentrations of visitors. It can be useful in dealing with critical resource problems, long-range planning, and monitoring changes in visitor patterns.
- A review of empirical studies reveals little research on visitor mapping; time-budget surveys are a plausible technique.
- Three variables seem important: space (where visitors go), activity (what visitors do) and time (when they participate). Data should be collected for each variable simultaneously.
- The pilot study was conducted at Yellowstone National Park July 26 through August 1, 1983. Visitors were contacted at three of Yellowstone's five entrances. Five hundred and one, or 98 percent of the visitors accepted a questionnaire; 255, or 51 percent returned the questionnaire.
- To illustrate the uses of the mapping method, selected data for the Yellowstone sample are displayed in tables, maps, and figures.
- The data profile the respondents (age, group type, residence, previous visits, length of visit and type of accommodations). Information is provided about where the respondents went in the park (by day of visit and time of day), and what activities in which they participated.
- A 'menu' of additional data tables is provided.
- Recommendations for improving the visitor mapping technique are presented, including refining the questionnaire, testing for non-response bias, trying additional sampling techniques, and developing a flexible computer program to analyze the data.

INTRODUCTION

The management of park resources has increasingly involved the management of people. The growing number of visitors and use of parks, historic sites, and recreation areas requires more and more management attention. Visitor services such as interpretive programs, roadways, hotels, backcountry trails, campgrounds, restaurants, visitor centers, and so forth have grown dramatically since WW II (Everhart 1983). The administration of these services has become increasingly complex; detailed policies, regulations, evaluations, and cost-benefit analyses have all become more common (Ise 1979).

These general trends—more visitors, more services and more complex management—create a need for information about visitors. Managers of visitor services (concessioners and NPS alike) need to know who visitors are, where they go, what they do and so forth. This report describes a pilot effort to design a practical technique for gathering useful management information about visitors. The technique was tested at Yellowstone National Park during the summer of 1983. Because it describes the distribution of visitors throughout the park, and often displays the data in map form, the technique is called 'visitor mapping.' This visitor mapping study is part of a larger, multi-year project to develop a practical method of providing decision makers with useful information on interpretive services, the kinds of audiences they serve or might serve, and the effectiveness of such efforts (see Machlis et al. 1983; Van Every 1983; Ham et al. 1984).

The report is divided into several sections. The Introduction describes the management problem, and the role of this study in the larger, multi-year

project. The potential benefits of visitor mapping also are described. Next, a brief Literature Review discusses previous research conducted on mapping visitor populations. While other efforts have examined where visitors go, what they do and similar questions, a practical management tool for gathering such data has not been developed.

We then outline the Theoretical Framework that guides the research. Parks are described as interdependent systems, with visitors a key component, and the variables of space (where visitors are), activities (what they do), and time (when they participate) are seen as having important management implications. The Method used to gather the data—a survey given to visitors as they entered the park—is then discussed, along with its limitations. Next, the Results of field work at Yellowstone National Park are detailed. Specific Recommendations are then offered for improving the mapping technique, and for using the pilot study's findings at Yellowstone. An Appendix includes literature cited, a copy of the survey, and additional information.

Overview of the Visitor Services Project

There are three major kinds of sociological information useful to decision makers concerned with interpretive services in national parks. The first is knowledge about the kinds of services, activities, and opportunities available to the public. The second is knowledge about visitors--who they are, where they go, and what they do. The third is knowledge about the relationship *between* interpretive services and visitors, i.e. are such activities enjoyable, effective, desired, and so forth. Hence, developing techniques for mapping interpretive services, mapping visitor populations, and

evaluating effectiveness are key components of the project. Since the adoption and subsequent usefulness of these techniques are the measure of the project's success, developing a program for Implementation (training materials, computer software, workshops, etc.) is also critical. Figure 1 outlines the Visitor Services Project. Previous reports have dealt with mapping interpretive services (see Machlis et al. 1983; Ham et al. 1984; Van Every and Machlis 1984). This report focuses on the development of a technique for mapping visitor populations.

	<u>Development</u>	<u>Refinement</u>	<u>Pilot Use</u>	<u>Service-wide Use</u>
Mapping Interpretive Services	.	.	.	.
Mapping Visitor Populations	A	.	.	.
Evaluating the Effectiveness of Interpretive Services	.	.	.	.
Implementation	.	.	.	.

Figure 1. Outline of Visitors Services Project. (Focus of the present study is indicated by "A".)

The Management Benefits of Mapping Visitors

Mapping visitor populations may have several potential benefits to park managers. First, the diversity of visitors, and their distribution throughout the park, can be described. By knowing the distribution of visitors, managers can compare where and when services are

offered with needs and behaviors of visitors. If the mapping data shows visitors to be traveling throughout a park in the early hours of the morning, interpretive services, ranger patrols, and concession hours can be adjusted. For concessioners, such data may point out new markets, locations, and times for concession services. For the NPS, maintenance rounds, law enforcement schedules, and interpretive programming could also benefit.

Just as the diversity and distribution of services can be evaluated, the efficient management of personnel can be aided by visitor mapping data. Do some areas of the park have few interpreters on duty at times when visitor numbers are high? Are foreign visitors a significant population, and is a bilingual staff necessary at specific locations of the park? Visitor mapping data can help answer these kind of management questions.

Third, the mapping data can help locate key places and times within a park that visitor concentrations occur--and where visitor numbers and use may influence significant resource problems. The data may also help in decisions regarding strategies for managing such problems. For example, knowledge of travel patterns and lodging may help in choosing particular campgrounds or picknicking areas for rehabilitation or closure. Hence, visitor mapping data may be useful in the development and update of resource management plans.

Fourth, mapping visitor populations may be useful for other kinds of planning--the design of new visitor facilities, regional and interagency efforts to coordinate management activities, and so forth. The data may also be useful in computing cost-benefit analyses of particular services (will the market for a visitor service justify its expense?) and social impact assessments (if a service is curtailed, how will visitors be affected?).

Finally, the collection of such data can serve as an important baseline with which to monitor change. Collected at different points in time, the information can help answer important management questions. Are more visitors staying longer in the park and requiring different services? Are certain activities or attractions rising in popularity and others declining? Has a facility redesign, resource management program, interpretive display, or backcountry plan had intended results? Visitor mapping data can help monitor a range of trends—accident rates, crime reports, resource impacts, labor needs—and so forth. Hence, a practical technique for gathering such data may be of use to park managers.

LITERATURE REVIEW

A review of empirical studies reveals little research on visitor mapping. The few studies which have mapped visitors have focused on one or two variables--travel patterns, visitors' attitudes and length of stay are examples (see Table 1).

Table 1. Representative Studies that Deal with Mapping Visitors.

Author	Year	Study Variable
Lucas	1964	recreational carrying capacity
Mercer	1971	attitudes; behavior
Gilbert <u>et al.</u>	1972	travel behavior; visitors' length of stay
James <u>et al.</u>	1972	travel behavior
Rugg	1973	activities; travel behavior
Driver and Brown	1975	recreation demand; recreation behavior
Mednick	1975	spatial travel characteristics
Daniel <u>et al.</u>	1977	scenic beauty of forest environments
Brown <u>et al.</u>	1978	consumer experiences; setting attributes
Machlis <u>et al.</u>	1983	interpretive services.

Lucas (1964), during his survey on recreation carrying capacity, plotted the routes followed by canoeists in the Boundary Waters Canoe Area in northern Minnesota. Rugg (1973) used 'itinerary' maps to record the activities and location of visitors to Stokes State Forest in Kittatiny, New Jersey. Application of the itinerary analysis was used for classifying and analyzing types of recreational behavior and comparing facility costs with user benefits. In a similar study on travel behavior using an 'itinerary'

analysis, James et al. (1972) showed that forest recreationists utilize the same routes to reach their destination and return to their point of origin. During a study in the Boundary Waters Canoe Areas, Gilbert et al. (1972) collected data on length of stay in any given zone of the park, the number of moves made between zones and the distribution of visitors.

Together, these studies are useful in that they map the visitors' activities, travel, length of stay and behavior. But when viewed individually, each is limited in its application. James (1972) studied visitors' travel behavior, but without further correlation to other variables such as activity or length of stay, the results are not as useful to administrators as a study using more than one variable.

A useful approach may be the time-budget survey. The time-budget survey is a research method that can obtain information on the amount of leisure time a person has, the length of time devoted to an activity, and the various temporal patterns of individuals (Szbillo et al. 1979). Time-budget analysis is an old research technique with a long history of development (see Burch et al. 1984); more recently several authors have suggested its potential in outdoor recreation research.

Archer and Shea (1975) discuss tourists' behavior in terms of time, arguing the length of time spent in an area will influence recreation behavior. Wenderoth (1982) states that the amount of time available to an individual "seems to be a critical variable for the organization of leisure," and concurred with Mercer (1977) that in leisure activities, time and timing are of 'critical' importance. Driver and Tocher (1970) argue that recreation planning would benefit if more time-budget studies were utilized.

A few studies have focused on the actual time budgets of park visitors. For example, Machlis and Wenderoth (1982) studied the time-budget patterns of foreign visitors in one-day tour groups at Grand Canyon National Park. Traveling constituted one-third of the tour, one-third was spent in restaurants, and one-third in park oriented activities. Significantly, the time-budget data allowed the authors to make numerous management recommendations.

Knudson and Reyburn (1980) studied factors that affected attendance at interpretive programs in five Indiana State Parks. The results suggested that time of day was a major factor in influencing attendance at programs. Morning programs recorded attendance at 14.5 percent. From noon until 6 p.m. attendance dropped to 9 percent. After 6 p.m., visitor attendance reached 76.5 percent. Thus, visitor services and visitor populations may exhibit predictable daily patterns.

In summary, there are not a large number of studies that have attempted to map visitor populations. Most examples treat one or two variables at a time. Time-budget surveys are a plausible technique to collect such data, and while time-budget research has a long history, its use in outdoor recreation research has been limited.

THEORETICAL FRAMEWORK

National parks can be considered human ecosystems (Machlis *et al.* 1981). Figure 2 illustrates that each park is a combination of biophysical environments (including plant and animal populations, ecosystem processes (structures and so forth), organizations (such as private concession corporations and the NPS), and visitor populations. These interacting components—social as well as environmental—are what define parks as special places.

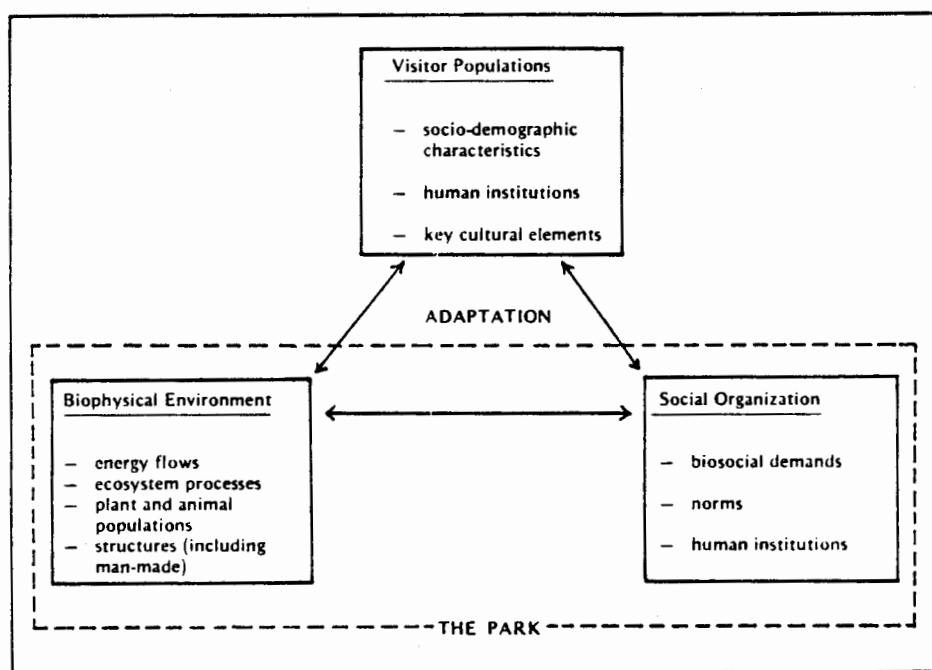


Figure 2. A View of the Park Ecosystem.

While many variables influence the role visitors play in the park ecosystem, at least three seem critical for mapping visitor populations. The first variable is *space*. Parks have a variety of spaces--visitor centers, parking lots, hotels, hiking trails and so forth. The distribution of visitors within parks often has distinct spatial patterns, with some visitors attracted to particular areas and in varying densities. This differential use of space may heavily influence park operations such as

information services, interpretation and visitor protection. Hence, it may be useful to divide a park into various 'sections' and examine the distribution and flow of visitors among and between these sections. The criteria for choosing park sections is arbitrary, yet the selection should provide management with useful information. Administrative sub-units, management zones, and watershed districts, all seem reasonable choices.

The second variable is *visitor activities*. Knowing what visitors do in a park is as critical to management as knowledge of their geographical distribution. Major activities range from common-place behaviors—sleeping, eating, and travel, to unique, 'park-inherent' activities—nature study, attending interpretive programs, viewing historic sites and so forth. When visitors enter a park, many of the day-to-day activities can take on special meanings. Meal preparation and shelter-building can become symbolic gestures (Burch 1964; Machlis 1975), and auto travel can quickly be transformed to sightseeing. Some of these activities are also often necessary behaviors—'demands'—placed upon visitors that must be met if their visit is to continue (Machlis et al. 1981). Hence, a wide range of activities should be considered as potentially important to managers seeking to understand the role of visitors in park ecosystems.

The third variable is *time*. As the literature review noted, time is a crucial resource to most visitors; it is a 'fixed stock,' and how individuals use it is an important behavioral measure (Burch et al. 1984). Seasonal, holiday and weekly cycles of recreation participation have been widely documented (Cheek and Burch 1976), and may influence the flow of visitors to a recreation site. A park visit may also have a temporal pattern, with certain activities occurring in sequence (Clawson and Knetsch 1966; Koth et al. 1981). For example, visitors may alter their activities

as their park visit progresses, first visiting an interpretive center, then shopping, then traveling to a new site, and so forth.

Daily cycles may also exist. Certain periods of the day may be associated with particular activities--sleeping and mealtimes being obvious examples. Furthermore, these periods may be of inequal social importance and length (Machlis and Wenderoth 1982). For the manager and visitor alike, the six hours from 11 p.m.-5 a.m. may be socially 'similar'--mobility and the range of activity is reduced. Yet the six hours from 2 p.m. to 8 p.m. may be used in a diversity of ways and in a diversity of places within the park. Hence, the sequence of activities and the time-budget of visitors should be considered and might be usefully measured in social time periods, rather than hours.

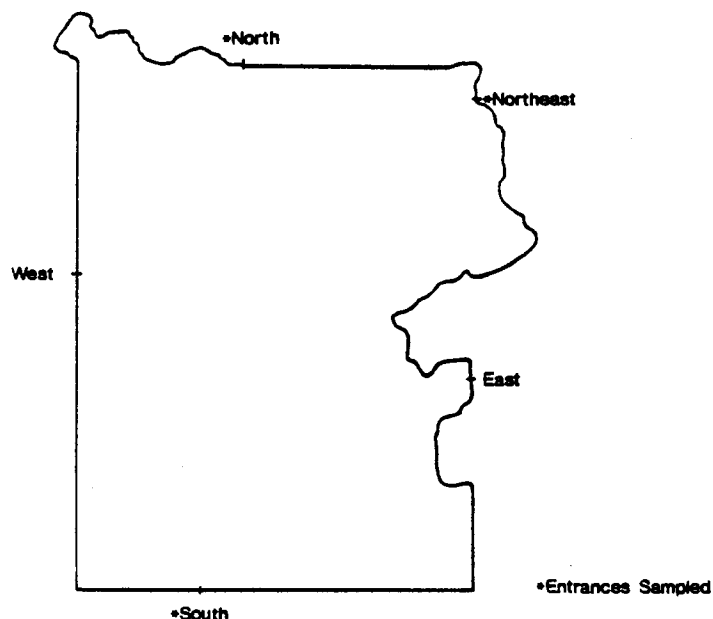
The human ecological perspective and the earlier review of key literature suggest that these three variables--*space*, *visitor activities*, and *time*--be examined simultaneously. That is, managers need to know how visitors are distributed among sections of a park, what activities are occurring in each of these sections, and how the distribution of visitors and activities change in each section over different time periods. Mapping visitor populations is an effort to document in space and time the number of visitors and the kinds of visitor activities that occur within a park, recreation area or historic site.

Based on this theoretical framework, the objectives of this pilot study were to:

- 1) Develop a technique capable of collecting data on the geographic distribution of visitor activities and time-budgets.
- 2) Test this technique at a National Park Service area.
- 3) Evaluate the usefulness of such data for managers; and,
- 4) Recommend improvements in the technique.

METHODS

The pilot study was conducted at Yellowstone National Park July 26 through August 1, 1983. The general strategy was to distribute mailback questionnaires to randomly selected visitors entering the park during the study period. Since time and staff limitations precluded sampling at all five entrances, three (the south, north, and northeast gates) were chosen (see Map 1).



Map 1. Questionnaire Distribution Points at Yellowstone National Park.

Design of the Questionnaire

The questionnaire asked visitors to keep track of where they went and their activities during several time periods for each day spent in the park (see Appendix A for a copy of the questionnaire). A park map and list of activities was provided for each day of the park visit,¹ and respondents indicated their primary location and major activities for each of six time periods (see Table 2). An estimated ten minutes were required to fill out the questionnaire for each day. Additional information was

¹Operational definitions of key variables are in Appendix B. In this pilot study, information was only requested for the first seven days of a park visit.

requested about the respondent's overnight accommodations, age, group type, zip code, and number of previous trips made to Yellowstone. A space was also provided for comments about the trip and the survey. Inside was a self-addressed envelope for return of the completed questionnaires.

Table 2. Time Periods Used in the Questionnaire.

Period	Actual Hours
Sunrise	5 am - 8 am
Morning	8 am - 12 pm
Afternoon	12 pm - 5 pm
Dusk	5 pm - 7 pm
Evening	7 pm - 11 pm
Overnight	11 pm - 5 am

The Concept of Period Visits

There are numerous ways to measure the number of visitors that enter a national park or historic site; Table 3 shows several examples from the literature. In this study, a somewhat different measure was used, since one objective was to gather data on where visitors were and what they were doing during the major time periods of the day.

Table 3. Examples of Units of Measurement used in Outdoor Recreation Research.

Unit	Definition
Visit	the entry of a person into an area.
Visitor-hours	the presence of one visitor for one hour in an area.
Visitor-day	the presence of one visitor for 12 hours, or any combination that equals 12 visitor-hours in an area.
Recreation-day	the presence of one person for any part of the day in an area.

-Adapted from Hendee et al 1978.

Hence, much of the data is reported as period-visits. A period-visit represents one of the respondents recording that they spent most of a specific time period (sunrise, morning, afternoon, dusk, evening or over-night) in a section of the park. For example, if a respondent visited Yellowstone for one day, arriving during the sunrise period (5-8 am) and leaving in the evening (7-11 pm), he/she would have spent five time periods in the park (sunrise, morning, afternoon, dusk and evening). If most of the sunrise, morning and afternoon periods were spent in the Mammoth section, Mammoth would have received three period visits. If most of the visitor's afternoon period was spent hiking, then that activity category would have received one period visit.

As the questionnaire in Appendix A shows, respondents were asked to determine their location and activity for most of the time period. The actual percentage of time will vary from visitor to visitor. Likewise, the

time periods are not of equal length; the overnight period is six hours' long, dusk only two hours. So period visits cannot be used to represent the number of hours spent in a location or activity.

Administration of the Questionnaire

In this pilot study, a random sample was taken at each of the three selected entrances. The general rule was to stop one vehicle every 12 minutes, explain the study and request that a questionnaire be filled out. Sampling began each day at 10:00 a.m. and typically continued until 3:00 p.m.

The 12-minute sampling interval was based on the desire to evenly distribute approximately 500 questionnaires over the seven-day period. This required that about 24 questionnaires be distributed at each entrance, each day. With approximately five hours per day available for sampling, and with the average contact 5-7 minutes, the 12-minute sampling interval allowed time for each contact.

Upon agreeing to participate in the study, drivers were asked to turn into a pull-over area where the questionnaire was handed out, and further instructions were given. Specifically, one adult member of the group was requested to fill in the diary each day.

Limitations

The research has several limitations, primarily due to its major objective of testing the visitor mapping method. First, the survey asks visitors to record their location and activities, and it is not possible to know whether their responses reflect actual behavior. This disadvantage is applicable to all time-budget studies (see Burch et al. 1984 for a review), and is reduced by having visitors fill out the survey as they visit the park.

Second, the data describes use patterns of only those visitors who entered the park between 10:00 a.m. and about 3:00 p.m. via the south, north or northeast gates between July 26 and August 1, 1983. Results do not apply to visitors from other entrances, other times of the day, or to other seasons at Yellowstone.

Third, information was not collected beyond the seventh day of a park visit, and data on extended visits is not included. Consequently, length-of-stay figures cannot be meaningfully computed, nor can inferences beyond a seven-day park visit be made.

Fourth, respondents could indicate only their two most time consuming activities for each time period, and the data presents a simplified picture of actual activity. Visitors may be involved in several additional activities during a particular time period. Similarly, the data on location simplifies visitors' behavior, for park goers may visit more than one section of the park in a given time period.

Fifth, data on non-response was not collected in this pilot test. That is, we cannot know if those visitors who returned the questionnaire differed from those who did not complete the survey. As the mapping technique is further developed, such data will be critical in judging the reliability of the information collected from the visitors.

Nevertheless, the pilot testing of the mapping method at a large, complex park like Yellowstone is a useful first step, and can highlight the kinds of information that can be generated and improvements that can be made in the technique.

RESULTS

Who Was Contacted?

Over the seven-day pilot study, 538 visitors were contacted and asked to participate. Ninety-three percent of those visitors (501) agreed and were given questionnaires and further instructions. Table 4 shows the acceptance rate for each of the entrance gates sampled. The north gate had the highest acceptance (98%).

Table 4. Visitor Contacts by Gate.

Gate	Total Contacts n	Acceptance n	Refusal n	Acceptance Rate %
North	168	165	3	98
Northeast	174	168	6	97
South	196	168	28	86
TOTAL	538	501	37	93

Who Responded?

Of the 501 visitors who agreed to participate in the study, 255, or 51 percent, returned the questionnaire. This is an average response rate for mail-back surveys without follow-up contacts (Dillman 1978). Table 5 shows that the response rate varied from gate to gate. The north gate sample had the highest response rate (59%), the south gate the lowest (40%). This variation could be due to different techniques for contacting visitors. At the north gate, the researcher offered to take

pictures of the visitors as they entered the park. This 'reward' may have heightened response rate, as rewards have been shown to do (Dillman 1978).

Table 5. Responses by Gate (n=255).

Gate	Accept Questionnaire n	Returned Questionnaire n	Response Rate %
North	165	97	59
Northeast	168	75	45
South	168	67	40
Unknown ^a	---	16	--
TOTAL	501	255	51

^aThe gate identification number was detached from 10 of the returned questionnaires.

Profile of Respondents

The mapping technique can provide a general profile of visitors that return the questionnaire. As Table 6 shows, respondents ranged widely in age. Twenty-two percent were 30 years of age or younger, while 59 percent were between 31 and 55 years. Eighteen percent were 56 years of age or older. The modal category (with the largest number of respondents) was 36-44 years. Since the survey was limited to teenagers and older, data on the number of children were not collected.

Table 6. Age Distribution of Respondents (n=250).

Age	n	%
13-18	6	2 ^a
19-25	24	10
26-30	26	10
31-35	46	18
36-44	55	22
45-55	48	19
56-65	31	12
66-78	14	6

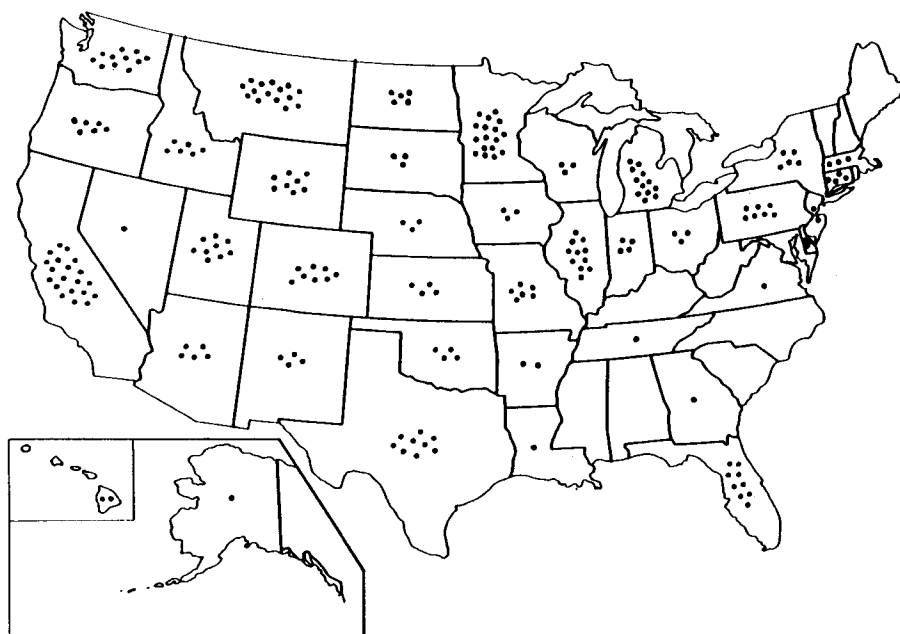
^aBecause of rounding, percentages do not add to 100.

Seventy-five percent of the respondents were traveling in family groups (see Table 7), and 11 percent were in friendship groups. Family-friendship groups and visitors traveling alone accounted for 6 percent each. Two percent were traveling with organized tours.

Table 7. Respondents by Group Type (n=251).

Group	n	%
Alone	16	6
Family	188	75
Family & Friends	15	6
Friends	28	11
Organized Tour	4	2

Map 2 shows the distribution of visitors based on their state of residence. Respondents came from 41 states and overseas; the South and New England were the least-represented regions. As the zip code was used to gather this information, more detailed maps could be developed, showing the distribution of visitors within states, or even within major urban centers.



Map 2. Respondents' Residence by State.

Forty-six percent of the respondents were making their first trip to Yellowstone during the study period (see Table 8), and 44 percent had been there at least once but not more than four times previously. Ten percent had visited Yellowstone five or more times.

Table 8. Previous Visits to Yellowstone (n=254).

Number of Visits	n	%
0	117	46
1-4	112	44
5-10	17	7
11 or more	8	3

Table 9 shows the largest percentage of visitors to Yellowstone were day users (36%), followed by those on two-days visits (25%) and three-day visits (17%). Percentages gradually declined between 3 and 6 days, with a slight increase for visits 7 days and longer.

Table 9. Length of Visit (n=255).

Number of Days	n	%
1	93	36 ^a
2	65	25
3	43	17
4	25	10
5	11	4
6	4	1
7+	14	5

^aBecause of rounding, percentages do not add to 100.

Respondents accounted for 430 overnight stays (see Table 10). Of these, 37 percent stayed in a cabin or hotel, 35 percent in a park campground, and 1 percent in the backcountry. The 'other' category (27%) includes visitors who stayed outside the park but returned the following day.

Table 10. Type of Overnight Stay (n=430).

Type	N	%
Cabin or Hotel	158	37
Park Campground	151	35
Backcountry	5	1
Other	116	27

Hence, the mapping technique can provide a general profile of visitors--their age, group type, residence, experience, length of visit and other such variables. In addition, the data can be organized around any of the key variables--tables could be produced that compare length of visit among young people with that of senior citizens; the number of period visits could be tabulated for locals and foreign tourists; different types of groups could be compared according to their type of overnight accommodations, and so forth.

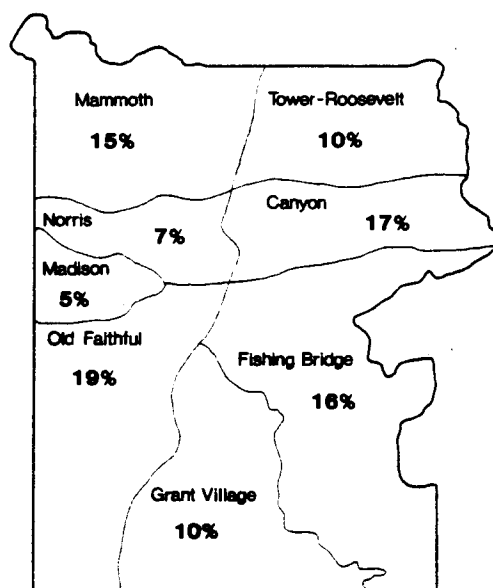
Where Did Visitors Go?

Table 11 shows the period visits for each section. Old Faithful had the most (19%), followed by Canyon (17%), Fishing Bridge (16%), and Mammoth (15%). Each of the other sections accounted for 10 percent or less of the period visits. Map 3 illustrates these data.

Table 11. Period Visits by Section (n=2527).

Section	n	%
Mammoth	384	15 ^a
Norris	183	7
Madison	128	5
Old Faithful	472	19
Grant Village	260	10
Fishing Bridge	407	16
Canyon	428	17
Tower-Roosevelt	265	10

^aBecause of rounding, percentages do not add to 100.



Map 3. Percent of Period Visits by Section.

Table 12 shows the relative amount of period visits at each location for each day of the visit. Although variation exists, both Norris and Madison account for a small proportion of period visits, regardless of the day, whereas visits at Mammoth fluctuate until Day 6 when it sharply declines. The distribution of visits at Old Faithful is greatest for Days 1-3 and 6-7, and lowest for Days 4-5 (see Figure 3). Use at Fishing Bridge increases with day of visit, with a low of 12 percent for Day 1 and a high of 40 percent for Day 7.

Table 12 also shows that period visits can be compared by section for each day of a visit. Among the respondents, the first day in the park found Old Faithful receiving the highest visitation (21%), followed by Mammoth (19%), and Canyon (16%). Grant Village and Fishing Bridge both had 12 percent and Tower-Roosevelt 11 percent. Norris and Madison had the lowest percentage of visitation (6% and 5% respectively). Similar comparisons can be made for Day 2, 3, and so forth.

Table 12. Distribution of Period Visits Through Days of Visit by Area Visited (n=2527).

Park Location	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Mammoth	163	(19) ^a	98	(13)	55	(13)	34	(14)	26	(19)	8	(9)	0	(0)
Norris	51	(6)	59	(8)	34	(8)	24	(10)	11	(8)	4	(5)	0	(0)
Madison	39	(5)	38	(5)	28	(7)	11	(5)	7	(5)	3	(3)	2	(3)
Old Faithful	173	(21)	157	(22)	77	(18)	23	(10)	17	(13)	12	(14)	13	(18)
Grant	97	(12)	75	(10)	42	(10)	17	(7)	12	(9)	10	(11)	7	(10)
Fishing Bridge	100	(12)	114	(16)	71	(17)	49	(21)	26	(19)	18	(21)	29	(40)
Canyon	127	(16)	121	(17)	77	(18)	51	(21)	18	(13)	19	(22)	15	(21)
Tower	90	(11)	65	(9)	44	(10)	29	(12)	18	(13)	13	(15)	6	(8)
TOTALS	840		727		428		238		135		87		72	

^aBecause of rounding, percentages do not add to 100.

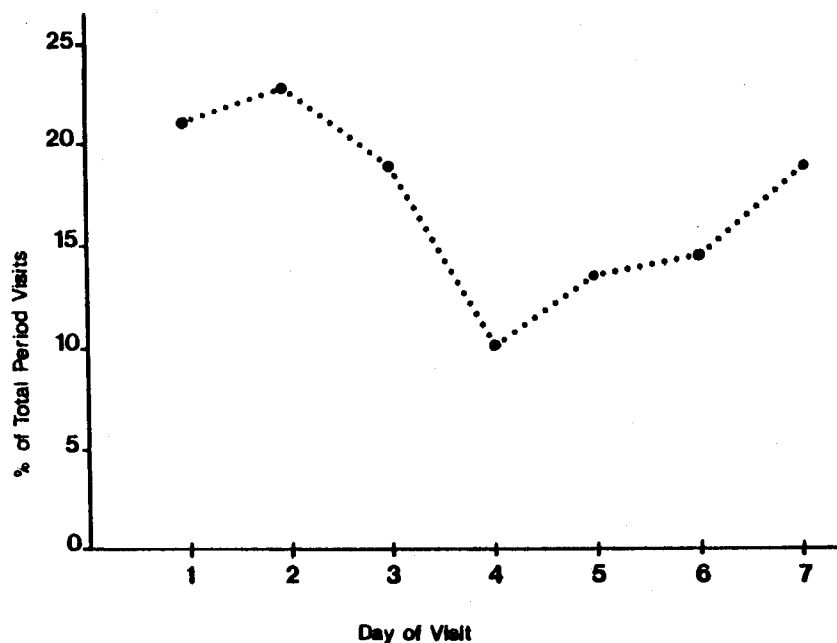


Figure 3. Percent of Total Period Visits, Old Faithful, by Day of Visit.

In addition to daily totals, the mapping method can provide data for each of the time periods described earlier. The data can be provided in table, chart or map form. Table 13 shows the period visits by section for each time period. Canyon and Mammoth had their highest percentage of period visits overnight (22% and 17% respectively), while the period visits for Old Faithful peaked in the afternoon (24% [see Figure 4]). Both Fishing Bridge and Madison had their lowest percentage

of period visits in the afternoon (12% and 3% respectively). The percentage of period visits for most sections were fairly constant throughout the day. Maps 4 through 9 illustrate the period visits by section for each time period.

Table 13. Period Visits by Section for each Time Period (n=2527).

Section	-----Time Period-----									
	Sunrise n %	Morning n %	Afternoon n %	Dusk n %	Evening n %	Overnight n %	Total n %			
Mammoth	50 (15) ^a	75 (16)	89 (16)	51 (11)	61 (16)	58 (17)	384 (15)			
Norris	23 (7)	42 (9)	44 (8)	33 (7)	22 (6)	19 (5)	183 (7)			
Madison	15 (5)	24 (5)	18 (3)	31 (7)	23 (6)	17 (5)	128 (5)			
Old Faithful	47 (15)	83 (18)	134 (24)	96 (21)	64 (17)	48 (14)	472 (19)			
Grant Village	34 (10)	53 (11)	56 (10)	44 (9)	40 (10)	33 (10)	260 (10)			
Fishing Bridge	55 (17)	74 (16)	69 (12)	82 (18)	68 (18)	59 (17)	407 (16)			
Canyon	66 (20)	56 (12)	74 (13)	81 (18)	75 (19)	76 (22)	428 (17)			
Tower-Roosevelt	31 (10)	59 (13)	72 (13)	41 (9)	31 (8)	31 (9)	265 (10)			
Total Period Visits	321	466	556	459	384	341				

^aBecause of rounding, column percentages may not add to 100.

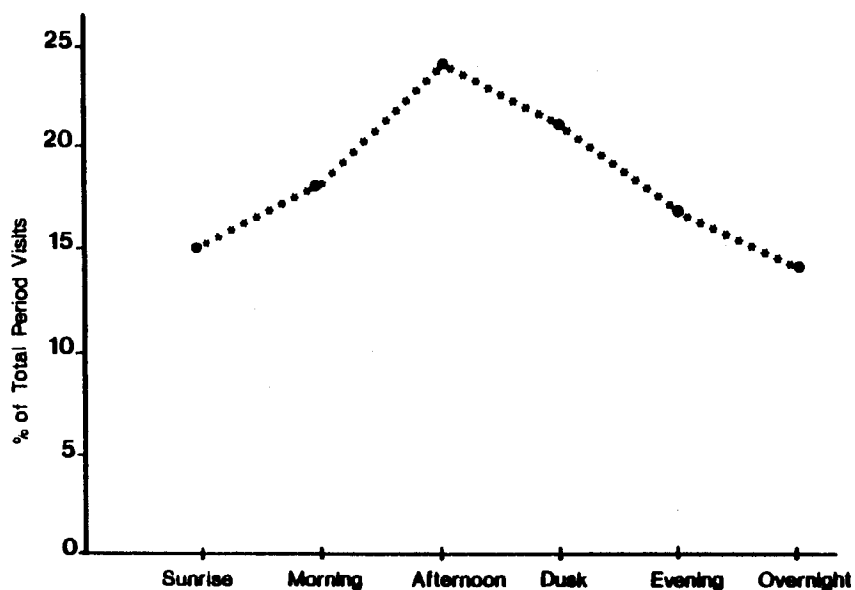
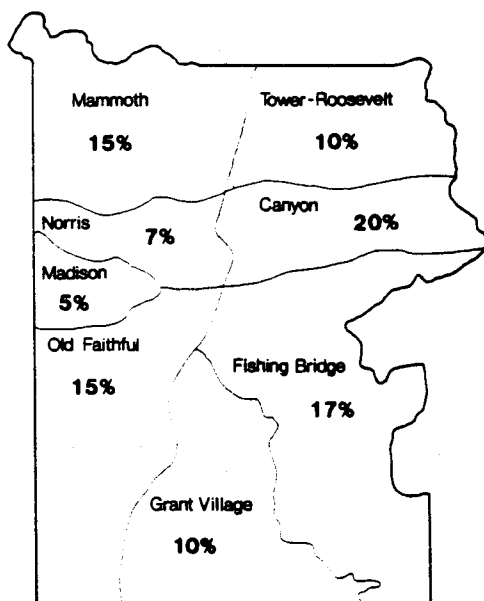
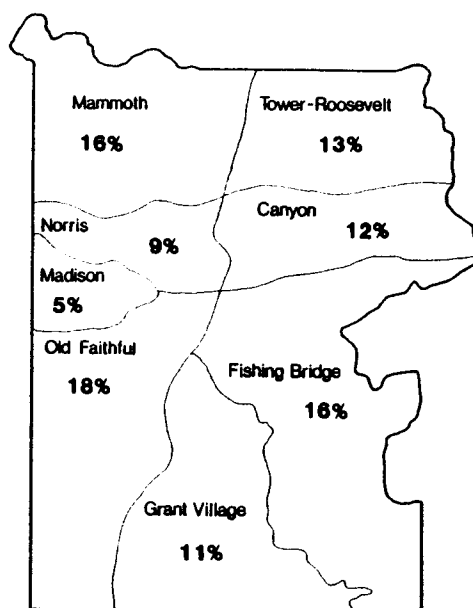


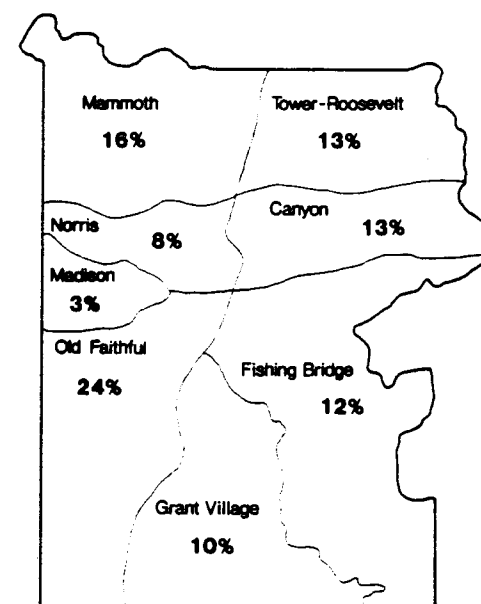
Figure 4. Percent of Total Period Visits, Old Faithful, by Time Period.



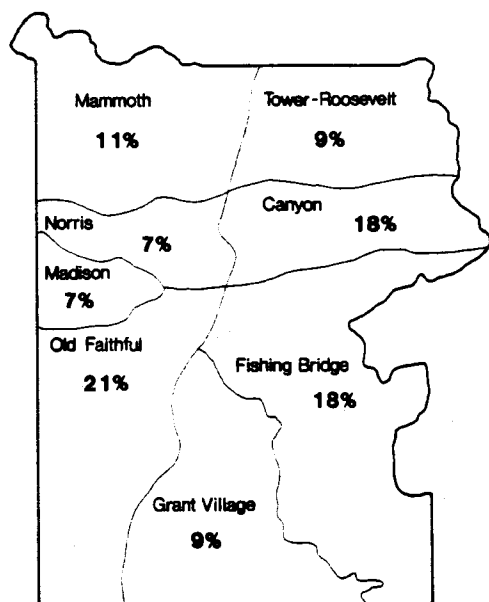
Map 4. Percentage of Period Visits, Sunrise.



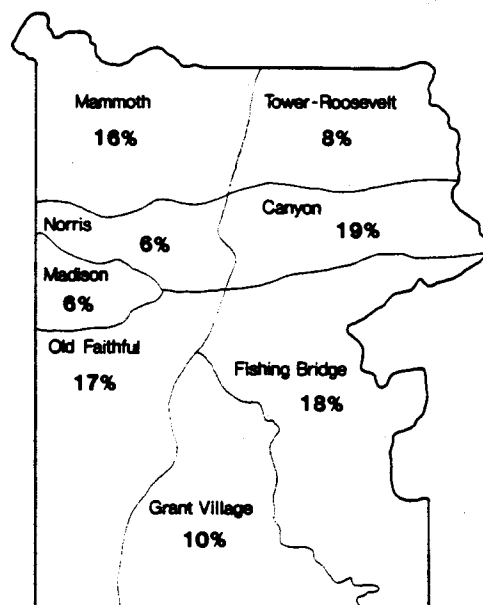
Map 5. Percentage of Period Visits, Morning.



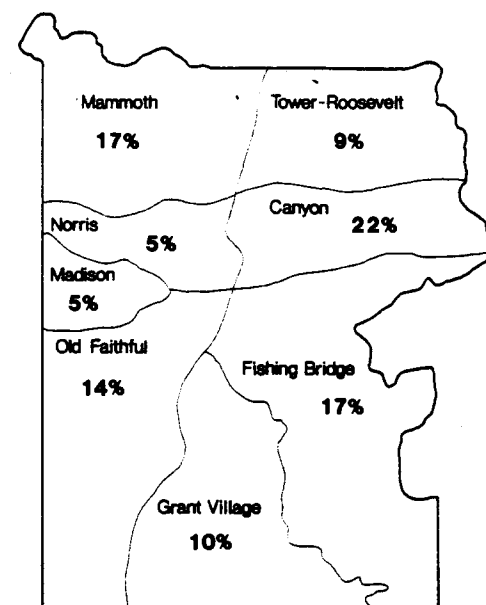
Map 6. Percentage of Period Visits, Afternoon.



Map 7. Percentage of Period Visits, Dusk.



Map 8. Percentage of Period Visits, Evening.



Map 9. Percentage of Period Visits, Overnight.

Hence, the mapping method can provide a great deal of information on the distribution of visitors. Relatively simple maps, tables and charts can be prepared illustrating the location of visitors for the whole study period, day of visit, time of day and so forth, as shown in this portion of the report. Additional material can be generated--the distribution of visitors by day of week for example. And combining this information with the descriptive data on visitors, maps, tables and charts can be prepared that compare the distribution of families and tour groups, locals and visitors from afar, young, old and so forth.

What Did Visitors Do?

The period-visits by type of activity is shown in Table 14.² Motorized travel on park roads was the most common activity (30% of the period-visits), followed by sleeping (22%). Eating and meal preparation comprised 12 percent of the total and hiking or walking 10 percent. The remaining activities ranged from 7 percent to 1 percent.

Table 14. Period Visits by Type of Activity (n=2523).

Activity	n	%
Motorized Travel on Park Roads	754	30 ^a
Sleeping	556	22
Eating and Meal Preparation	293	12
Hiking or Walking	257	10
Resting or Relaxation	187	7
Viewing Interpretive Facilities	95	4
Nature Study or Photography	93	4
Attending Interpretive Programs	72	3
Fishing	55	2
Personal Care	54	2
Shopping	44	2
Swimming	8	1
Boating and Rafting	8	1
Bicycling	7	1
Other	40	2

^aBecause of rounding, percentages do not add to 100.

²Only the primary activity as noted by the respondents is used in this analysis.

Table 15 represents the distribution of activities for each day of a visit. On Day 1 respondents spent 41 percent of their period visits in motorized travel. This activity decreases steadily throughout the visit, dropping to 15 percent by Day 7. Time spent in personal care increases throughout a visit, as does resting and relaxing and fishing. Swimming and bicycling are greatest the first three days of a visit. Figure 5 shows that the percent of period-visits spent viewing interpretive facilities and attending interpretive programs were fairly constant the first days of a visit and then declined somewhat. Similar figures could be prepared for each activity.

Table 15. Period Visits by Type of Activity for each Day of Visit (n=2523).

Activity	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sleeping	126	(15) ^a	173	(23)	115	(27)	61	(25)	34	(26)	29	(34)	18	(27)	556	(22)
Eating and Meal Preparation	86	(10)	98	(13)	43	(10)	31	(13)	15	(12)	10	(12)	10	(15)	293	(12)
Motorized Travel on Park Roads	334	(41)	205	(27)	112	(26)	61	(25)	23	(18)	9	(11)	10	(15)	754	(30)
Personal Care	7	(1)	13	(2)	8	(2)	8	(3)	9	(7)	5	(6)	4	(6)	54	(2)
Shopping	21	(3)	11	(1)	5	(1)	3	(1)	3	(2)	0	(0)	1	(1)	44	(2)
Resting or Relaxing	61	(7)	37	(5)	37	(9)	21	(9)	17	(13)	11	(13)	3	(4)	187	(7)
Hiking or Walking	70	(8)	105	(14)	39	(9)	21	(9)	7	(5)	7	(8)	8	(12)	257	(10)
Fishing	9	(1)	13	(2)	10	(2)	6	(2)	6	(5)	7	(8)	4	(6)	55	(2)
Swimming	2	(1)	2	(1)	4	(1)	0	(0)	0	(0)	0	(0)	0	(0)	8	(1)
Boating and Rafting	2	(1)	2	(1)	0	(0)	2	(1)	0	(0)	0	(0)	2	(3)	8	(1)
Nature Study or Photography	30	(4)	35	(5)	14	(3)	8	(3)	5	(4)	0	(0)	1	(1)	93	(4)
Bicycling	2	(1)	2	(1)	3	(1)	0	(0)	0	(0)	0	(0)	0	(0)	7	(1)
Attending Interpretive Programs	22	(3)	26	(3)	14	(3)	5	(2)	2	(2)	2	(2)	1	(1)	72	(3)
Viewing Interpretive Facilities	35	(4)	32	(4)	15	(3)	7	(3)	5	(4)	0	(0)	1	(1)	95	(4)
Other	12	(1)	5	(1)	6	(1)	6	(3)	3	(2)	5	(6)	3	(4)	40	(2)

^aBecause of rounding, column percentages may not add to 100.

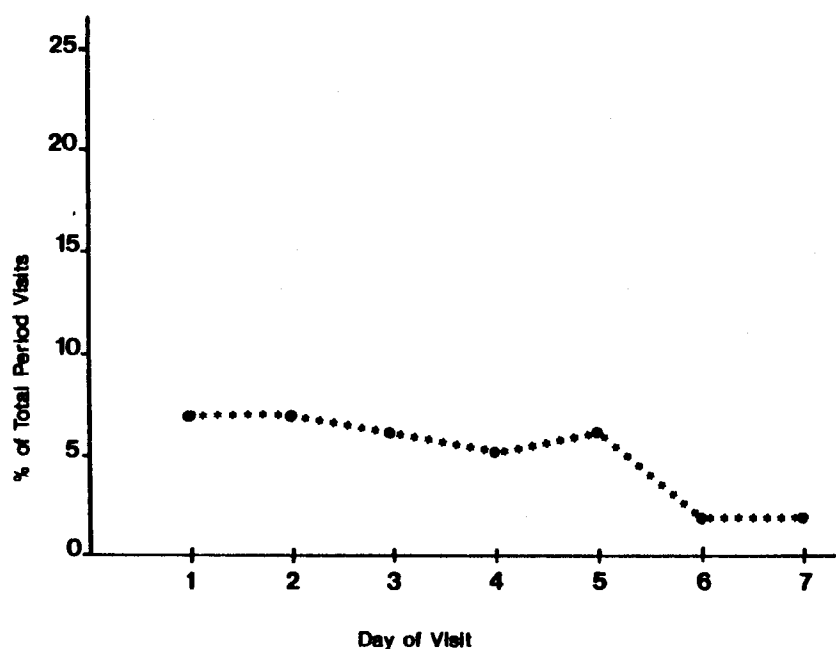


Figure 5. Percent of Total Period Visits, Viewing Interpretive Facilities, and Attending Interpretive Programs, by Day of Visit.

Table 16 shows the types of activity participated in for each time period. As one would expect, sleeping was the most common activity overnight (95%) and at sunrise (67%), whereas eating and meal preparation was most common at dusk (22%) and in the evening (22%). Motorized travel on park roads was the most common activity in the morning (54%), afternoon (49%) and dusk (34%). It then dropped to 19 percent in the evening. Hiking and walking had its largest share of period-visits in the afternoon (17%), as did viewing interpretive facilities (8%). Attendance at interpretive programs was highest in the evening (9%). The remaining activities showed little variation throughout the day.

Table 16. Type of Activity for each Time Period (in period visits).

Activity	Time Period					
	Sunrise n %	Morning n %	Afternoon n %	Dusk n %	Evening n %	Overnight n %
Sleeping	214 (67)	2 (1)	3 (1)	5 (1)	7 (2)	318 (95)
Eating and Meal Preparation	55 (17)	40 (9)	14 (3)	100 (22)	82 (22)	2 (1)
Motorized Travel on Park Roads	24 (7)	249 (54)	267 (49)	151 (34)	71 (19)	4 (1)
Personal Care	17 (5)	17 (4)	8 (1)	8 (2)	6 (2)	0 (0)
Shopping	0 (0)	8 (2)	9 (2)	15 (3)	12 (3)	0 (0)
Resting or Relaxing	1 (1)	8 (2)	18 (3)	40 (9)	114 (30)	6 (2)
Hiking or Walking	5 (2)	55 (12)	94 (17)	42 (9)	23 (6)	0 (0)
Fishing	1 (1)	7 (1)	21 (4)	18 (4)	8 (2)	0 (0)
Swimming	0 (0)	0 (0)	5 (1)	2 (1)	0 (0)	0 (0)
Boating and Rafting	0 (0)	2 (1)	4 (1)	1 (1)	0 (0)	1 (1)
Nature Study or Photography	1 (1)	21 (5)	38 (7)	26 (6)	8 (2)	1 (1)
Bicycling	0 (0)	2 (1)	3 (1)	0 (0)	2 (1)	0 (0)
Attending Interpretive Programs	0 (0)	13 (3)	14 (3)	11 (2)	34 (9)	0 (0)
Viewing Interpretive Facilities	1 (1)	22 (5)	42 (8)	23 (5)	8 (2)	0 (0)
Other	2 (1)	13 (3)	9 (2)	8 (2)	5 (1)	3 (1)
Total Period Visits	321	458	549	450	380	335

Figure 6 shows the number (not the percentage) of period visits in each time period for hiking, nature study and photography, attending interpretive programs and viewing interpretive facilities. With the exception of attending interpretive programs, all activities were most common in the afternoon. Attendance at interpretive programs was highest in the evening. Similar figures could be prepared for other activities, or combinations of activities. The data could also be organized by the descriptive variables of age, group type, residence and so forth.

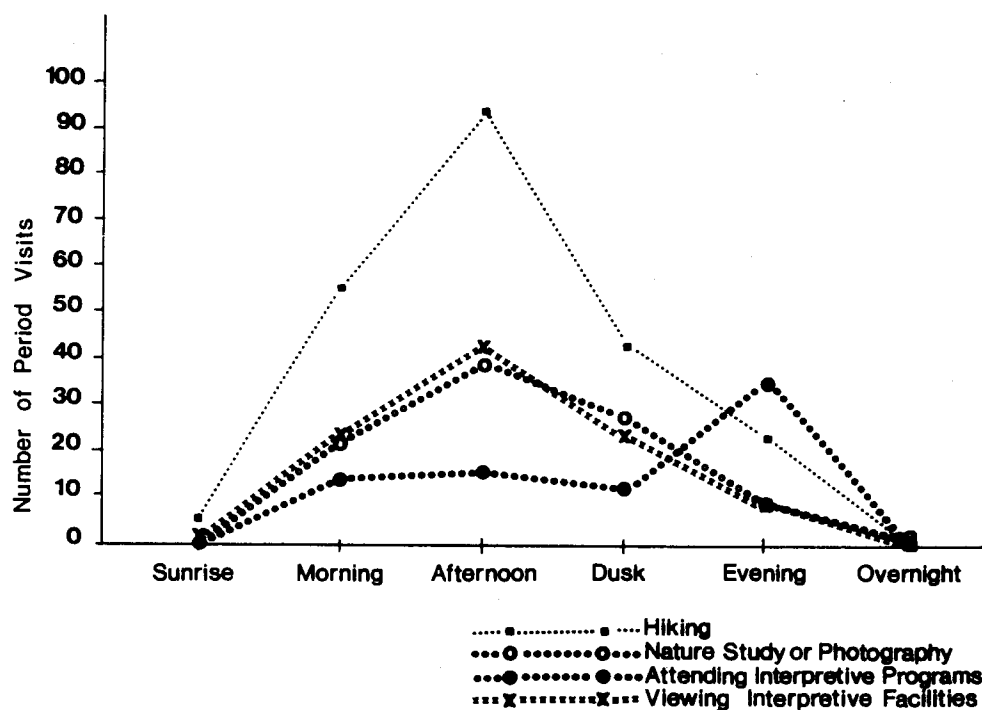


Figure 6. Number of Period Visits for Selected Activities, by Time Period.

Table 17 shows the percentage of period visits for each major activity by section. Activities like motor travel were well distributed throughout the park. Others are more concentrated: shopping was concentrated in the Old Faithful and Fishing Bridge sections (47% of the total period-visits); 42% of the fishing activities were in the Fishing Bridge section. The mapping method allows this data to be organized in more detail--by day of visit, time of day, or various characteristics of the visitors.

Table 17. Period Visits for each Section by Activity (n=2480).

Activity	Section							
	Mammoth	Norris	Madison	Old Faithful	Grant Village	Fishing Bridge	Canyon	Tower-Roosevelt
Sleeping								
n	84	34	26	78	60	92	117	53
%	(15)	(6)	(5)	(14)	(11)	(17)	(21)	(10)
Eating & Meal Preparation								
n	39	17	16	41	30	59	64	26
%	(13)	(6)	(5)	(14)	(10)	(20)	(22)	(9)
Motor Travel								
n	126	50	49	115	107	117	90	110
%	(16)	(6)	(6)	(15)	(14)	(15)	(12)	(14)
Personal Care								
n	9	3	2	6	4	10	19	3
%	(16)	(5)	(4)	(11)	(7)	(18)	(34)	(5)
Shopping								
n	5	2	4	12	3	9	8	1
%	(11)	(4)	(9)	(27)	(7)	(20)	(18)	(2)
Reading or Relaxing								
n	27	15	14	28	27	20	41	15
%	(14)	(8)	(7)	(15)	(14)	(11)	(22)	(8)
Hiking or Walking								
n	34	24	5	58	10	26	43	18
%	(16)	(11)	(2)	(27)	(5)	(12)	(20)	(8)
Fishing								
n	3	5	3	5	0	23	1	15
%	(5)	(9)	(5)	(9)	(0)	(42)	(2)	(27)
Swimming								
n	2	0	0	2	0	3	0	0
%	(29)	(0)	(0)	(29)	(0)	(43)	(0)	(0)
Boating or Rafting								
n	2	1	0	0	1	4	0	0
%	(25)	(12)	(0)	(0)	(12)	(50)	(0)	(0)
Nature Study or Photography								
n	13	9	2	41	2	7	13	6
%	(14)	(10)	(2)	(44)	(2)	(7)	(14)	(6)
Bicycling								
n	1	0	0	1	1	3	0	1
%	(14)	(0)	(0)	(14)	(14)	(43)	(0)	(14)
Interpretive Programs								
n	12	8	2	19	3	10	14	4
%	(17)	(11)	(3)	(26)	(4)	(14)	(19)	(6)
Interpretive Facilities								
n	14	8	2	41	6	12	6	6
%	(15)	(8)	(2)	(43)	(6)	(13)	(6)	(6)
Other								
n	8	4	2	14	1	3	4	2
%	(21)	(10)	(5)	(37)	(3)	(8)	(10)	(5)
Total								
n	379	180	127	461	255	398	420	260
%	(15)	(7)	(5)	(19)	(10)	(16)	(17)	(10)

General Comments

The last question of the questionnaire asked visitors "Is there anything else you would like to tell us about your trip to Yellowstone, or about this survey?". Over half of the respondents wrote in answers, varying from a few words to several pages. The responses are reproduced in a separate appendix to this report. Most comments dealt with the park, road conditions, scenic opportunities, visitor services, opportunities for viewing animals and so forth. Several visitors made specific suggestions for improving park management; others complimented park staff.

A Menu for Further Data Analyses

Because the mapping method collects data on location, time of day and activity simultaneously, large amounts of information on visitors can be made available to the interested park manager. This report provided only the most basic data in table, figure or map form. The following 'menu' illustrates the kind of additional information that is available. The key variable (primary activity) can be examined in detail by ordering the table corresponding to the manager's interest. For example, if an interpreter would like to know what sections of the park have young people hiking in the morning, he/she would find the column "where, when and by whom" and choose Table 35 (activity by section by age by time period).

Table 18. Sample Menu of Data Tables for Interpretive Mapping. (Circle numbers of tables desired).

Variable of Concern	Table Number	When	Table Number	Where
PRIMARY ACTIVITY	1	By Day of Visit	4	By Section
	2	By Time Period		
	3	By Time Period by Day of Week		

Variable of Concern	Table Number	Who	Table Number	When and Where
PRIMARY ACTIVITY	5	By Type of Group	9	By Day of Visit by Park Section
	6	By Residence	10	By Section by Time Period
	7	By Number of Previous Visits	11	By Section by Time Period of Day of Visit

Table 18.—*Continued.*

Variable of Concern	Table Number	When and By Whom	Table Number	Where and By Whom	Table Number	Where, by Whom and When
PRIMARY ACTIVITY	12	By Day of Visit By Type of Group	24	By Section By Type of Group	28	By Section By Type of Group By Day of Visit
	13	By Day of Visit By Residence	25	By Section By Residence	29	By Section By Residence By Day of Visit
	14	By Day of Visit By Number of Previous Visits	26	By Section By Number of Previous Visits	30	By Section By Number of Previous Visits By Day of Visit
	15	By Day of Visit By Age	27	By Section By Age	31	By Section By Age By Day of Visit
	16	By Time Period By Type of Group			32	By Section By Type of Group By Time Period
	17	By Time Period By Residence			33	By Section By Residence By Time Period
	18	By Time Period By Number of Previous Visits			34	By Section By Number of Previous By Time Period
	19	By Time Period By Age			35	By Section By Age By Time Period
	20	By Day of Visit By Type of Group				
	21	By Day of Visit By Residence				
	22	By Day of Visit By Number of Previous Visits				
	23	By Day of Visit By Age				

RECOMMENDATIONS

The purpose of this study was to pilot test a method for inexpensively gathering useful information about visitors to NPS units. Several recommendations regarding design of the questionnaire, its administration, the data analysis and display are listed below.

Improving the Questionnaire

1. The general structure and design of the questionnaire seems to work well. Response was average even without a follow-up reminder, and the low amount of missing data suggests few visitors were confused. Only a few visitors commented on the questionnaire--most expressed enthusiasm for participating. Nevertheless, several improvements should be made in the questionnaire.

- a. The instructions for completing the questionnaire can be expanded to more clearly orient the visitor to what is required.
- b. The activities (sleeping, shopping, hiking and so forth) need to be more carefully defined (perhaps with examples), and additional activities need to be considered. To examine if each visitor is perceiving specific activities as belonging in the same general category, some test of reliability should be attempted.
- c. The questionnaire should be expanded to include which section of the park involved the second most amount of time during a specific period. This would allow for the many cases where visitors spent nearly equal amounts of time in several sections.

- d. Several questions, such as those dealing with entry into the park and overnight accommodations, can be made more specific.
- e. Collecting additional information to examine group type needs to be considered (e.g., ages of all members in the group).

2. Many of the visitors used the comments page to express detailed views about the park. Such public input may be useful to managers, and the questionnaire could be expanded to include a current policy question of interest to park staff.

Administering the Questionnaire

1. In the pilot test, the sampling technique was designed to evenly distribute the questionnaire among the three entrances and over the day. When used to gather information on location and entry time, a different technique will be required. Stratified, cluster, interval sampling and some combination of these techniques should be considered.

2. The pilot test gathered data for one week. Generalizing to other weeks, months and seasons will be difficult and perhaps unreliable. The technique should be designed for use over a variety of study periods, so that it can be used in a variety of settings. In the refinement stage, a different length study period should be considered.

3. While 51 percent of those given questionnaires returned them, the non-response is large enough to require careful examination. Entry interviews, follow-up surveys and phone interviews could be used with a sub-sample of the visitors. A detailed test for non-response bias should be included in the next phase.

4. The response rate, while average, may be improved upon by follow-up reminders, photographs and incentive or rewards. Ways to improve overall response rate should be considered.

5. To make the mapping method cost effective, the staffing of sampling locations should be examined with an eye to reducing extra costs. Students, interns, VIPs, park staff and others might prove useful partners in administering the survey.

Analyzing the Data

1. While the coding of mapping method data is relatively easy, the many kinds of analysis that can be performed make computer programming and coding extremely important. An efficient computer program should be designed to analyze the data, and the program should be inexpensive, fast, and flexible for use on various computer systems.

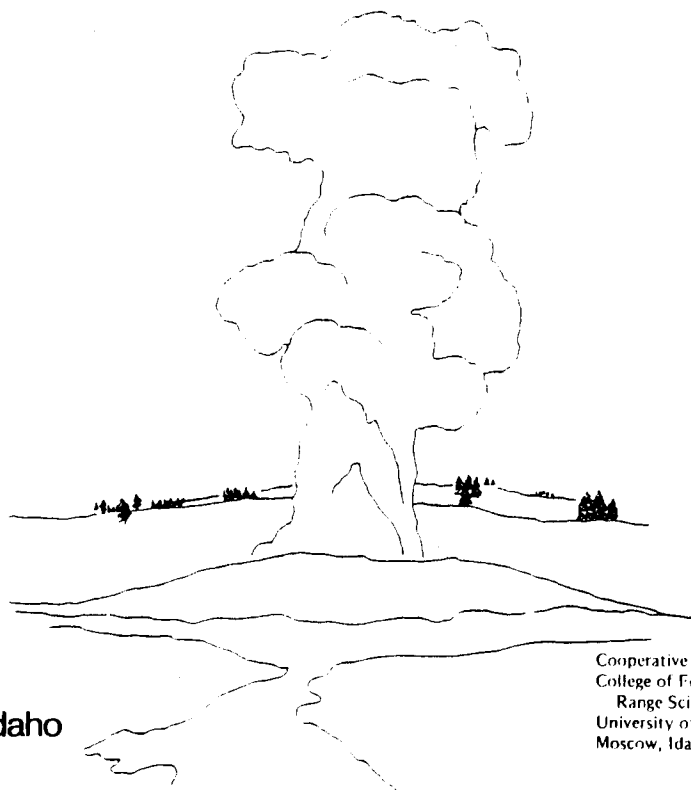
2. The mapping method can generate hundreds of tables, charts and maps. Not all are useful, and none are useful to managers unless clearly displayed. The tables, charts and maps from the technique should be standardized, and improved graphic displays should be explored.

3. Since the mapping method's purpose is to gather data useful to managers in both the public and private sectors, managers need to be involved in the data analysis. The 'menu' of tables provides a convenient way for managers to gain the data they need, yet other approaches should be explored. A workshop with Yellowstone Park service and concession staff should be conducted to show how managers can use the mapping data.

4. The visitor mapping method is being designed to be comparable with the interpretive services data described in earlier reports. This will allow direct comparison of the distribution of visitor services and visitors, for both location within the park and period of the day. In the refinement stage, the visitor mapping data should be combined with interpretive services data, so that the full utility of the mapping techniques can be assessed.

APPENDIX A
QUESTIONNAIRE

YELLOWSTONE VISITOR SERVICES STUDY



University of Idaho

Cooperative Park Studies Unit
College of Forestry, Wildlife and
Range Sciences
University of Idaho
Moscow, Idaho 83843



July 1983

Dear Visitor:

Thank you for participating in this study. Our goal is to learn about the activities that Yellowstone visitors enjoy, and the places they visit within the park. The information will be useful to managers and concessioners in improving the visitor services at Yellowstone National Park. Your input is important!

This survey is being given to a select number of visitors. It asks about your activities for each day of your visit to Yellowstone. You might want to record each day's activities during the evening, or as they occur. This should take only a few minutes each day. When your visit is over, be sure to complete the survey and mail it to the return address. We have attached a prepaid envelope.

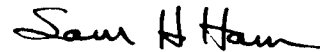
Please be assured all the information is confidential, and do not write your name on the survey form or envelope. If you have any questions, feel free to write us at the address above.

We look forward to learning from you and appreciate your help in improving visitor services at Yellowstone National Park.

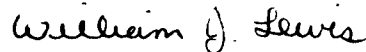
Sincerely,



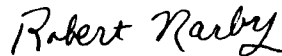
Dr. Gary E. Machlis
Sociology Project Leader
Cooperative Park Studies Unit



Dr. Sam H. Ham
Assistant Professor



Dr. William J. Lewis
Professor



Mr. Robert Narby
Research Assistant

DIRECTIONS

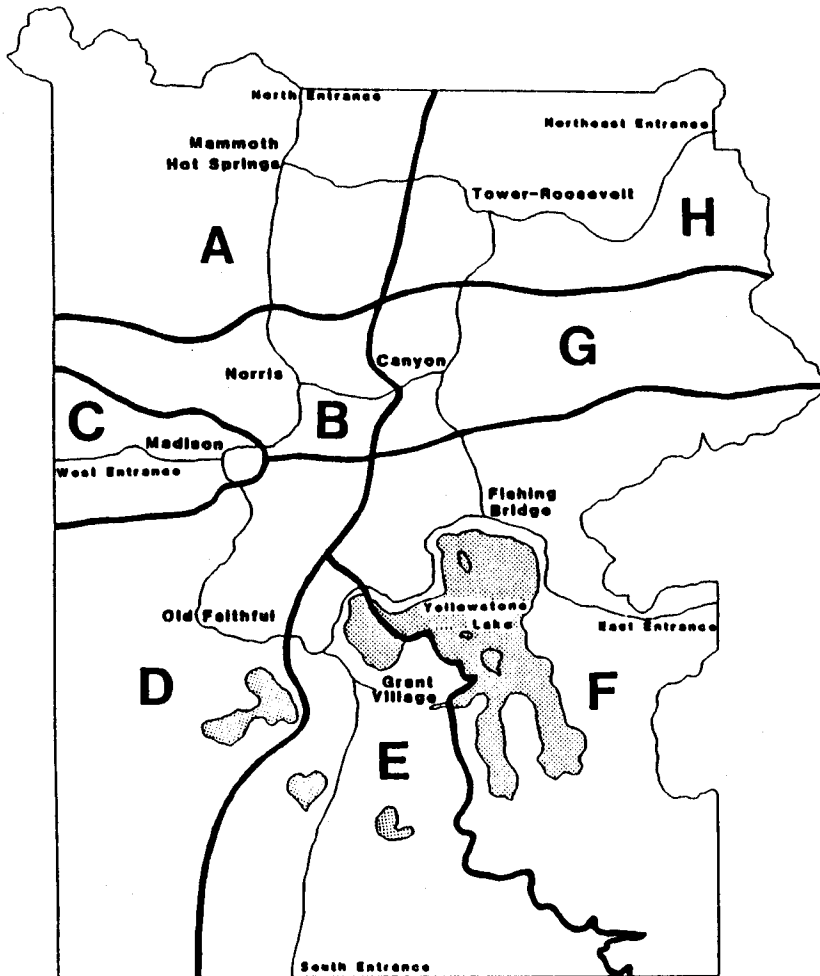
For each day of your visit there is a separate page to record your location within the park and your activities. Each day is divided into six time periods. Please use the map and list of activities provided on the next page (and repeated throughout the survey) to answer the questions. A sample entry might look like this:

SAMPLE ENTRY

	Q 1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q 2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q 3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	<u>E</u>	<u>1</u>	<u>2</u>
Morning (8 am - 12 pm)	<u>E</u>	<u>7</u>	<u>11</u>
Afternoon (12 pm - 5 pm)	<u>B</u>	<u>8</u>	<u>9</u>
Dusk (5 pm - 7 pm)	<u>B</u>	<u>2</u>	<u>6</u>
Evening (7 pm - 11 pm)	<u>F</u>	<u>6</u>	<u>13</u>
Overnight (11 pm - 5 am)	<u>F</u>	<u>1</u>	<u>15</u>

When you have finished your park visit, please complete the survey and mail it to the CPSU, using the attached, prepaid envelope.

YELLOWSTONE NATIONAL PARK



ACTIVITIES

1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

DAY **1** OF YOUR VISIT

1. When did you enter the park?

_____ DAY OF THE WEEK

_____ TIME OF DAY

☐ a.m. ☐ p.m. (check one)

2. Beginning with the time period that you entered the park, please answer the following questions, for each time period of the day. Please use the map and list of activities on the opposite page.

	Q-1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q-2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q-3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
Morning (8 am - 12 pm)	_____	_____	_____
Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

3. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

- ☐ CABIN OR HOTEL
- ☐ PARK CAMPGROUND
- ☐ BACKCOUNTRY CAMPSITE
- ☐ OTHER

IF OTHER, PLEASE DESCRIBE _____

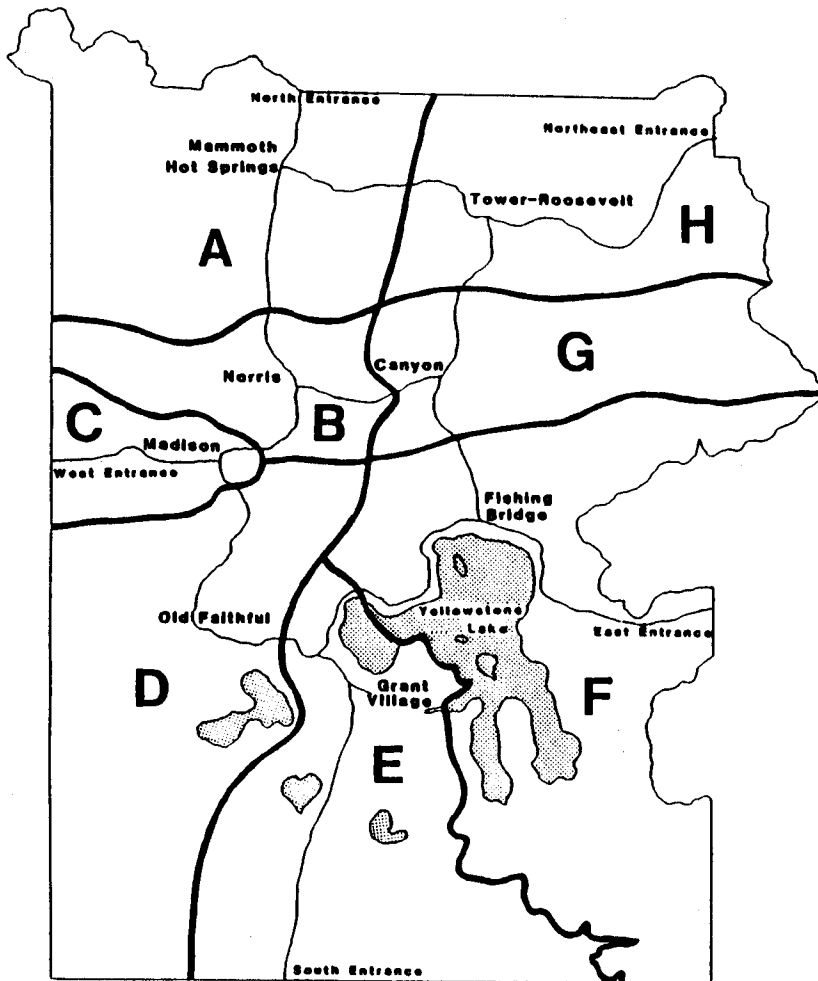
4. Was this your last day in the park?

☐ YES☐ NO

SKIP TO PAGE 17

GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK



ACTIVITIES

1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

5. Please answer the following questions for each time period of the day.

	Q-1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q-2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q-3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
Morning (8 am - 12 pm)	_____	_____	_____
Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

6. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

☐
☐
☐
☐

CABIN OR HOTEL
 PARK CAMPGROUND
 BACKCOUNTRY CAMPSITE
 OTHER

IF OTHER, PLEASE DESCRIBE _____

7. Was this your last day in the park?

☐
☐

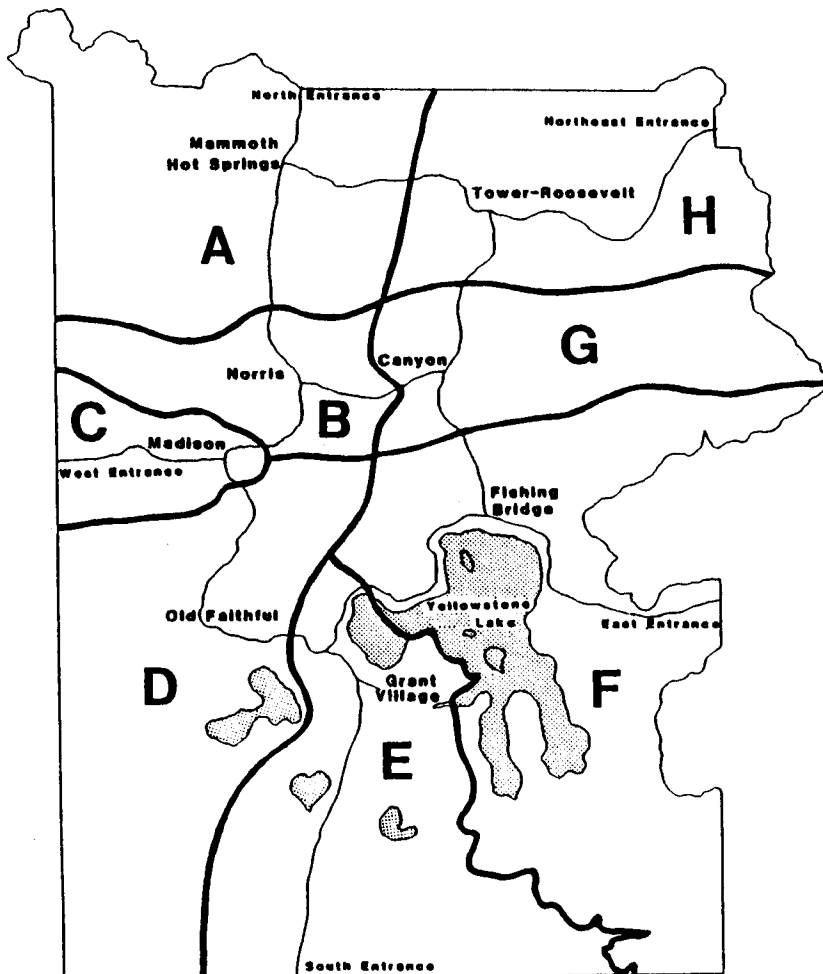
YES

NO

SKIP TO PAGE 17

GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK



ACTIVITIES

1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

8. Please answer the following questions for each time period of the day.

	Q-1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q-2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q-3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
Morning (8 am - 12 pm)	_____	_____	_____
Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

9. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

- ☐ CABIN OR HOTEL
☐ PARK CAMPGROUND
☐ BACKCOUNTRY CAMPSITE
☐ OTHER

IF OTHER, PLEASE DESCRIBE _____

10. Was this your last day in the park?

☐

YES



SKIP TO PAGE 17

☐

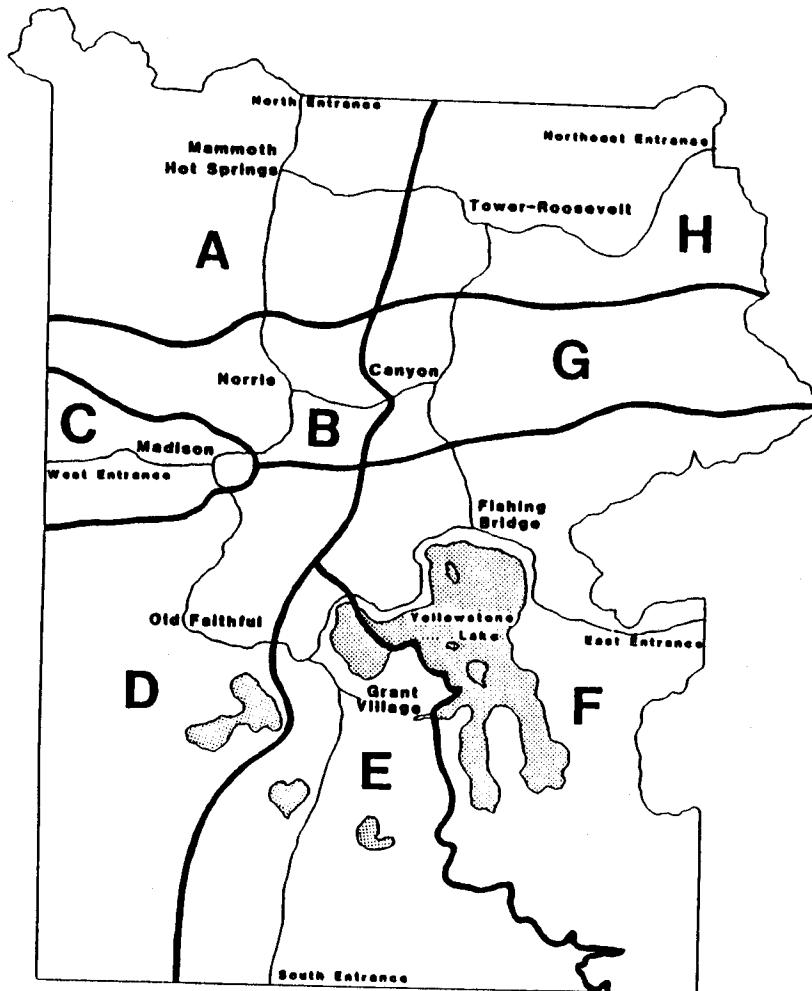
NO



GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK

ACTIVITIES



1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

11. Please answer the following questions for each time period of the day.

	Q 1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q 2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q 3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
Morning (8 am - 12 pm)	_____	_____	_____
Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

12. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

☐
☐
☐
☐

CABIN OR HOTEL
 PARK CAMPGROUND
 BACKCOUNTRY CAMPSITE
 OTHER

IF OTHER, PLEASE DESCRIBE _____

13. Was this your last day in the park?

☐
☐

YES



SKIP TO PAGE 17

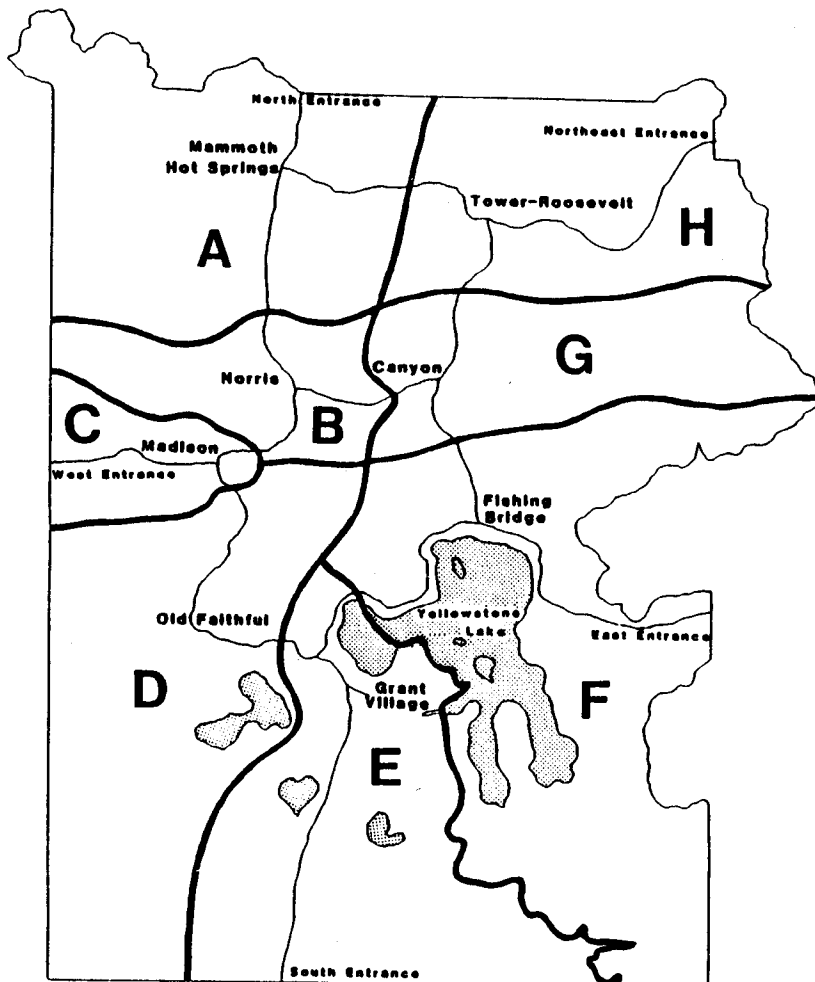
NO



GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK

ACTIVITIES



1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

14. Please answer the following questions for each time period of the day.

	Q-1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q-2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q-3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
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Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

15. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

☐
☐
☐
☐

CABIN OR HOTEL

PARK CAMPGROUND

BACKCOUNTRY CAMPSITE

OTHER

IF OTHER, PLEASE DESCRIBE _____

16. Was this your last day in the park?

☐
☐

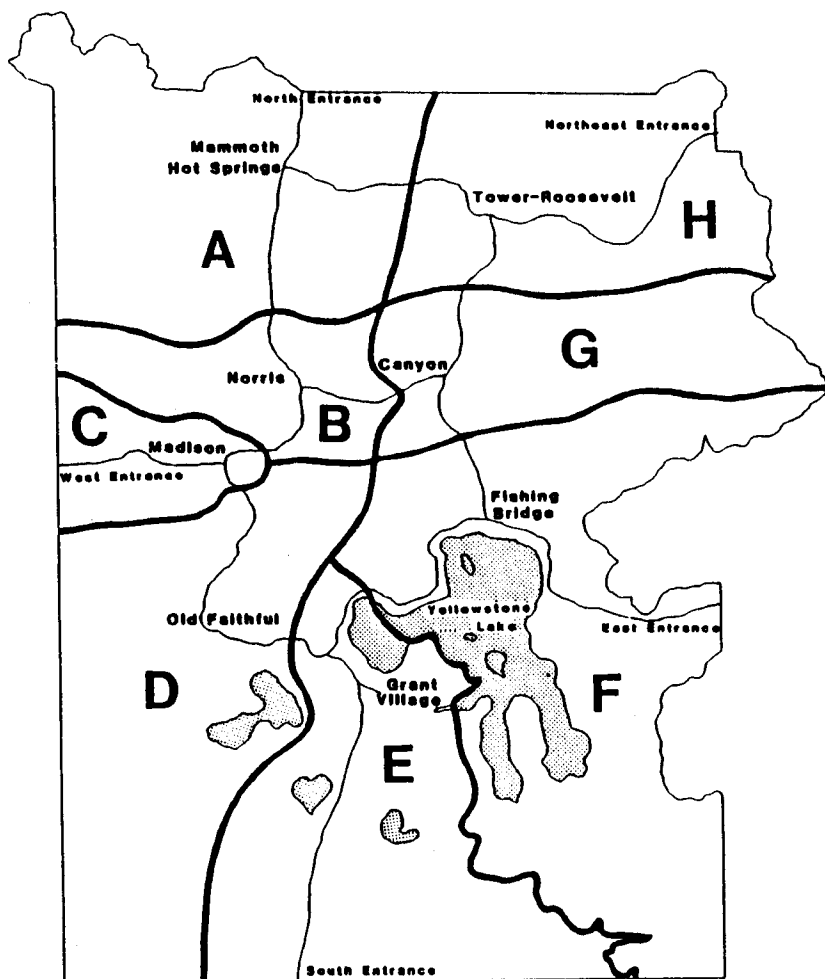
YES

NO

SKIP TO PAGE 17

GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK



ACTIVITIES

1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

17. Please answer the following questions for each time period of the day.

	Q-1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q-2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q-3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
Morning (8 am - 12 pm)	_____	_____	_____
Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

18. Where did you stay overnight (11 pm - 5 am) this day of your visit? (check one)

☐
☐
☐
☐

CABIN OR HOTEL

PARK CAMPGROUND

BACKCOUNTRY CAMPSITE

OTHER

IF OTHER, PLEASE DESCRIBE _____

19. Was this your last day in the park?

☐
☐

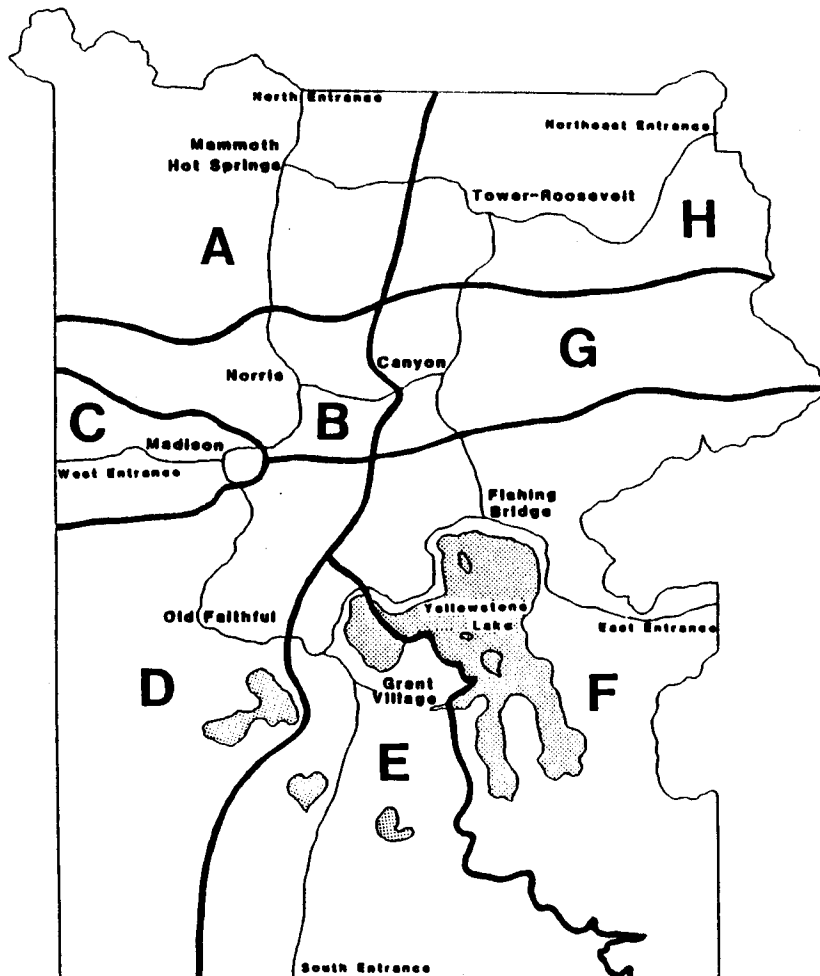
YES

NO

SKIP TO PAGE 17

GO TO NEXT PAGE

YELLOWSTONE NATIONAL PARK



ACTIVITIES

1. sleeping
2. eating and meal preparation
3. motorized travel on park roads
4. personal care
5. shopping
6. resting or relaxing
7. hiking or walking
8. fishing
9. swimming
10. boating and rafting
11. nature study or photography
12. bicycling
13. attending interpretive programs (guided walks, talks and so forth)
14. viewing interpretive facilities (visitor centers, exhibits, and so forth)
15. other

20. Please answer the following questions for each time period of the day.

	Q 1 Which zone of the park were you in for most of each time period? (Be sure to write the letter of the correct zone.)	Q 2 In which activity did you spend most of each time period? (Be sure to write the number of the correct activity.)	Q 3 In which activity did you spend the second most amount of each time period? (Be sure to write the number of the correct activity.)
Sunrise (5 am - 8 am)	_____	_____	_____
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Afternoon (12 pm - 5 pm)	_____	_____	_____
Dusk (5 pm - 7 pm)	_____	_____	_____
Evening (7 pm - 11 pm)	_____	_____	_____
Overnight (11 pm - 5 am)	_____	_____	_____

21. Even if you intend to stay in the park longer than 7 days, please turn to page 17.

We hope you enjoyed your visit to Yellowstone National park. Below are several questions that will help us learn about the people who participated in the study. Please complete these questions before mailing the survey.

22. How old were you on your last birthday? _____

23. What kind of group are you traveling with? (check one)

☐

ALONE

☐

FRIENDS

☐

FAMILY

☐

ORGANIZED TOUR

☐

FAMILY & FRIENDS

24. What is the Zip Code of your home address? _____

If you are from a country other than the USA, what is the name of your country? _____

25. How many times have you visited Yellowstone National Park, not including this trip? _____

26. Is there anything else you would like to tell us about your trip to Yellowstone or about this survey?

APPENDIX B
REFERENCES CITED

REFERENCES CITED

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