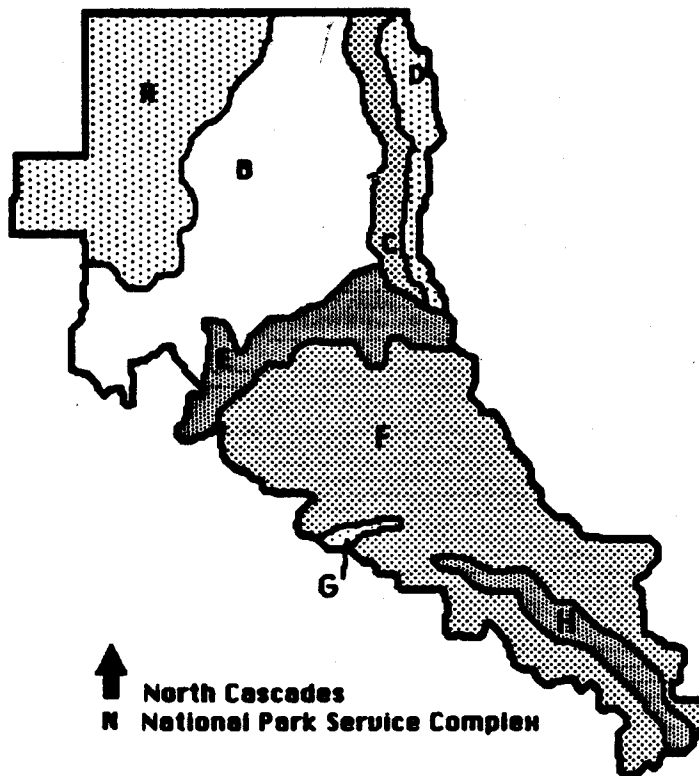


Visitor Services Project

Report 5

North Cascades National Park Service Complex

Volume 1 of 2



Cooperative Park Studies Unit
University of Idaho

Cooperative Park Studies Unit
University of Washington



VISITOR SERVICES PROJECT

Report 5

NORTH CASCADES NATIONAL PARK SERVICE COMPLEX

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Summary

- This report describes a visitor mapping study conducted in the North Cascades National Park Service Complex from July 28 to August 3, 1985. Data were collected separately in three areas--Hozomeen, Stehekin, and along the North Cascades Highway.
- Data were collected in period visits, which simultaneously measure visitor use by time, location (which zones of the park visitors use), and type (the activities visitors do).
- 217 questionnaires were returned from visitors contacted along the North Cascades Highway. 84 questionnaires were returned from visitors contacted at Stehekin, and 32 questionnaires were returned from visitors contacted at Hozomeen.
- Data on social characteristics indicated that most visitors to all three areas came in small family groups of 1-4 people. A wide variety of age groups and home residences were represented.
- Most visitors stayed only 1 day at Stehekin and the North Cascades Highway. Most visitors to Hozomeen stayed 3 days.
- North Cascades managers divided the park complex into zones they wished to study. Visitors were asked to report their locations, by zone, during each time period. Thus, maps showing the use of each zone are included.
- Necessary activities such as sleeping and eating accounted for many period visits in all three areas. Motorized travel was also a common activity for Highway visitors, hiking/walking for Stehekin visitors, and resting for Hozomeen visitors.
- Comparisons of use by the three key variables--time, location, and activity--are presented in maps, graphs, and tables in the results from each area.
- Data were collected on 15 variables. A menu of all two-way comparisons possible with the data is included so that managers can request special analyses of interest to them. Three-way comparisons may also be requested.
- Visitors were asked for suggestions for future planning for North Cascades and for additional comments. 574 separate comments were identified and summarized. These are presented in Appendices C, D, and E.

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INTRODUCTION

This report describes the results of a visitor mapping program undertaken at the North Cascades National Park Service Complex during the summer of 1985. The effort was part of an on-going project to develop practical techniques for collecting visitor data useful for park management; work has been done at Grand Teton, Mount Rushmore, Yellowstone, Glacier, and Crater Lake National Parks. The larger project--its purposes, rationale, theory, and methods, is described in detail in several publications (for a list of publications on the Visitor Services Project, contact the Cooperative Park Studies Unit at the University of Idaho).

For the North Cascades National Park Service Complex, (from now on written simply as North Cascades), a survey of visitors was conducted during late July and early August, 1985. Data were collected from visitors to three main areas of the park--the North Cascades Highway Corridor, the Hozomeen area, and Stehekin. Appendix A describes the methods used, including questionnaire design, sampling, questionnaire administration, missing data and reporting errors, data analysis, and the limitations of the data.

Period visits

The visitor mapping technique provides managers with visitor data in table, graph, and map form. Much of the data are 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, overnight) in

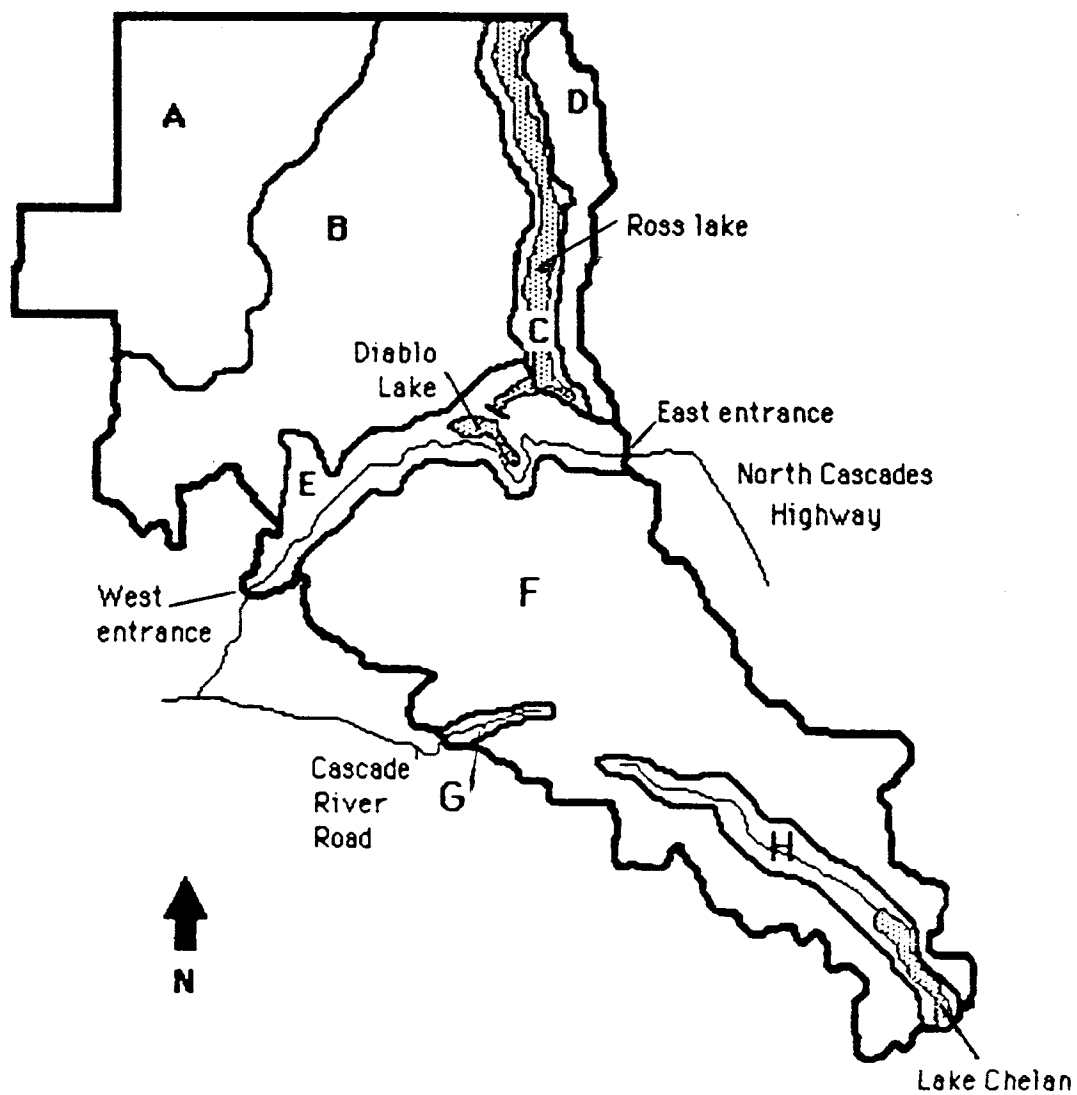
a particular zone of the park doing a particular activity.

For example, if a respondent visited North Cascades for one day, arriving during the sunrise period (5-8 a.m.) and leaving in the evening (7-11 p.m.), he or she would have spent five time periods in the park (sunrise, morning, afternoon, dusk, evening). If most of the morning and afternoon periods were spent in the Stehekin zone, that zone would have received five period visits. If most of that visitor's afternoon period was spent hiking, that activity would receive one period visit. Map 1.1 shows the zones used in this effort.

Period visits are an indicator of use, rather than a precise measure of the amount of use. They can provide a general profile of visitor distributions and activities, and are useful for comparing the major time periods of the day, such as morning, afternoon, and so forth. They cannot be converted directly to other time units, such as hours, or days.

After this Introduction, the Results from the North Cascades Highway, the Results from Stehekin, and the Results from Hozomeen are presented. Each of these chapters is similar; findings for each area are presented separately to simplify their use.

Next, a Menu for Further Analysis is provided to assist managers in requesting any additional analyses they desire. A Conclusion provides a summary of the mapping study at North



Map 1.1: Zone map of the North Cascades National Park Service Complex

Cascades. Finally, several Appendices provide additional information. Appendix A provides details of the methods used. Appendix B contains the questionnaire used. Appendices C, D, and E are located in a separate volume; they contain respondents' suggestions for the future of North Cascades and additional comments.

RESULTS FROM NORTH CASCADES HIGHWAY

Introduction

The North Cascades Highway is a major transportation route connecting northwest Washington with eastern Washington; it also is a tourist route through the heart of North Cascades. This chapter describes the results of the visitor survey conducted on this Highway.

Sampling

The study period was July 28 to August 3 1985. Two stations were established to distribute questionnaires, one at the entrance sign on the eastern border of the Complex, the other at mile marker 17, just inside the western border of the Complex. These stations were manned on alternate days so that both east-bound and west-bound traffic was included.

530 visitors were contacted and all but 20 (4%) agreed to participate; thus, the acceptance rate was 96%. On average, 22% of the vehicles traveling the Highway were contacted. 217 completed and returned their questionnaires for a 42% response rate.

A. Visitor profile

The returned questionnaires provide information on both the respondents and the groups they were with. Figure 2.1 shows the different group sizes, which ranged from 1 to 20 people. The most common group size (mode) was 2 people, while the average group size (mean) was 3. Over one-half of the visitors came in family groups, as shown in Figure 2.2.

Questions on the age, number of previous visits to North Cascades, and home zip code of each group member were included. Figures 2.3 through 2.6 illustrate the results. Visitors' ages were widely distributed, including many children. Most visitors had visited North Cascades at least once before, although many were on their first visit. Visitors came from several states and foreign countries. Washington residents came from many different counties within the state.

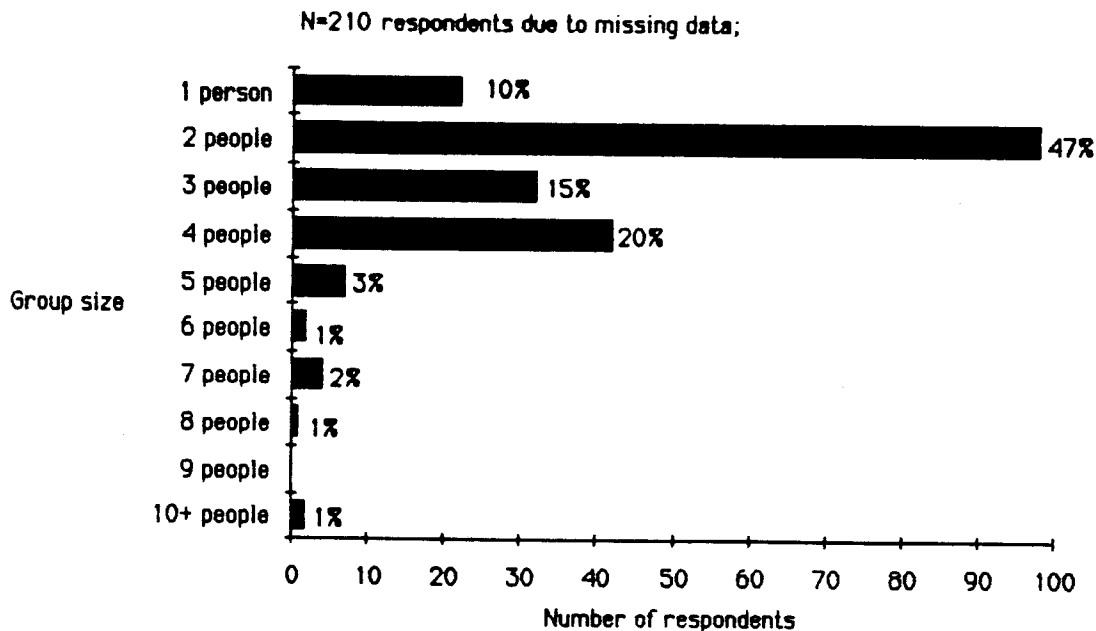


Figure 2.1: Highway visitors' group size

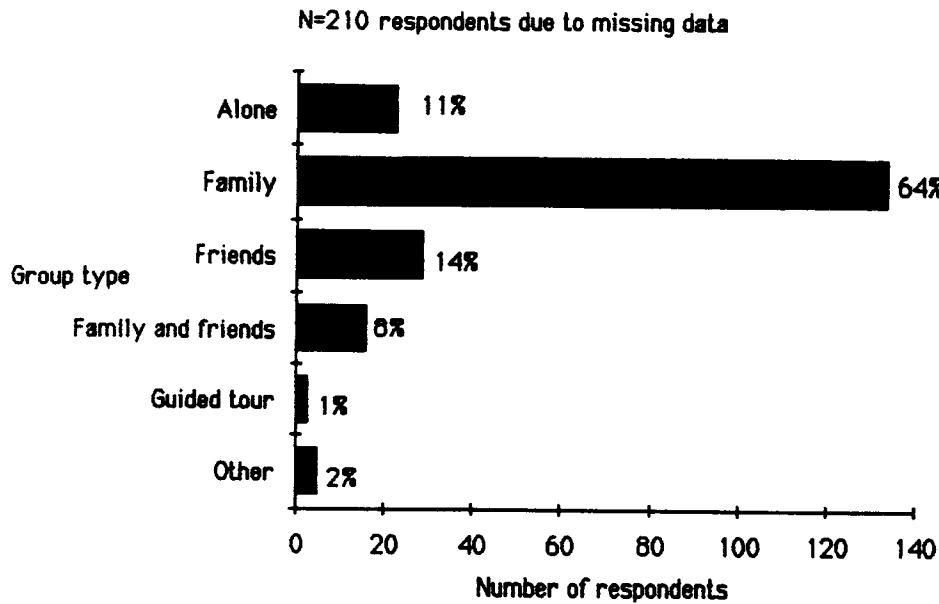


Figure 2.2: Highway visitors' group type

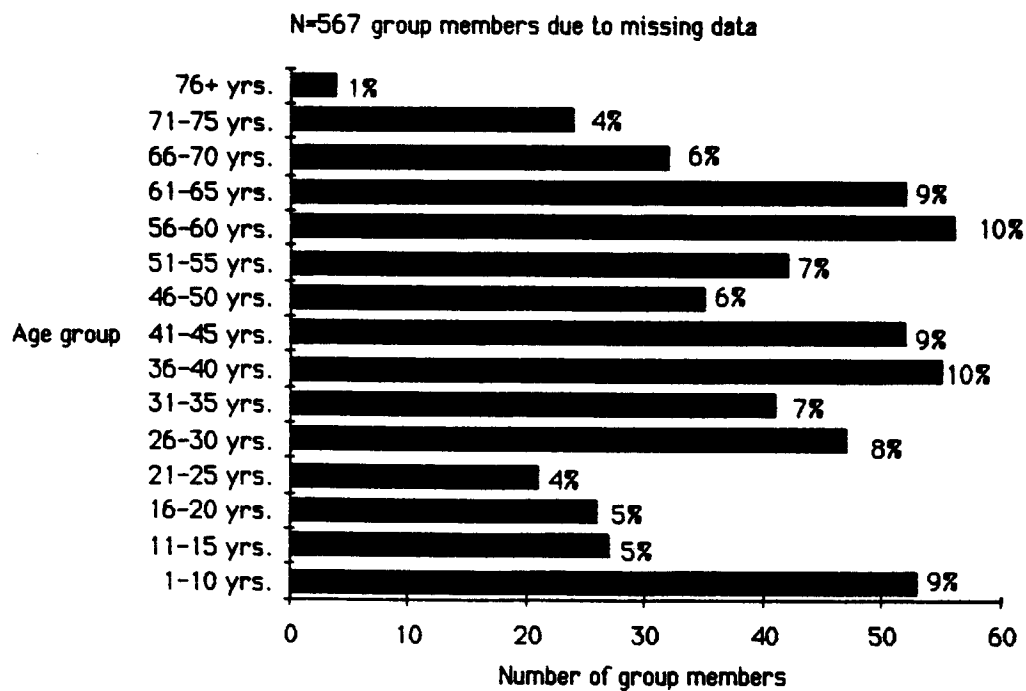


Figure 2.3: Ages of Highway visitors

A. Visitor profile

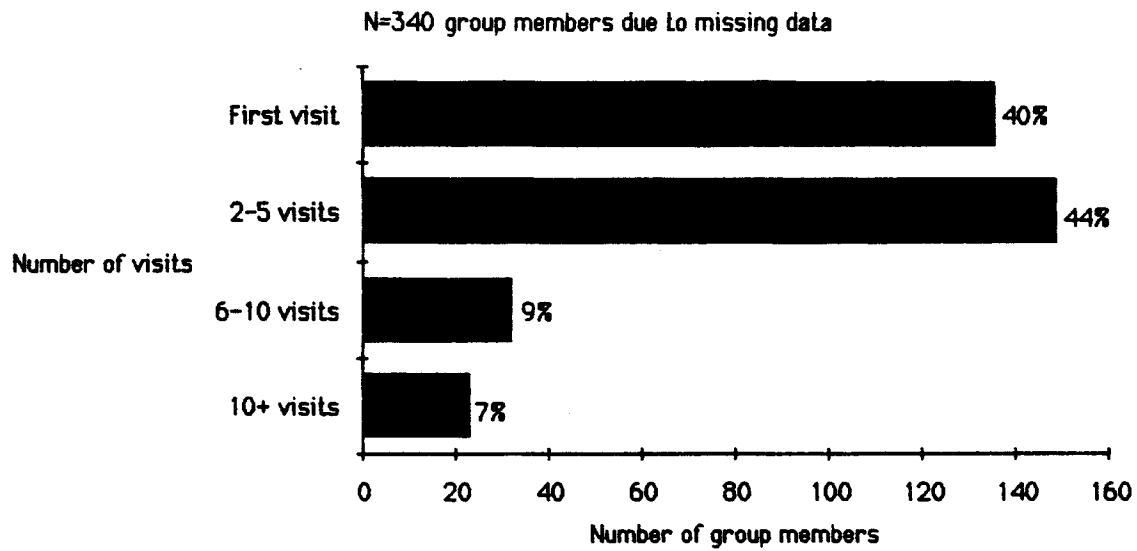


Figure 2.4: Highway visitors' previous visits to North Cascades

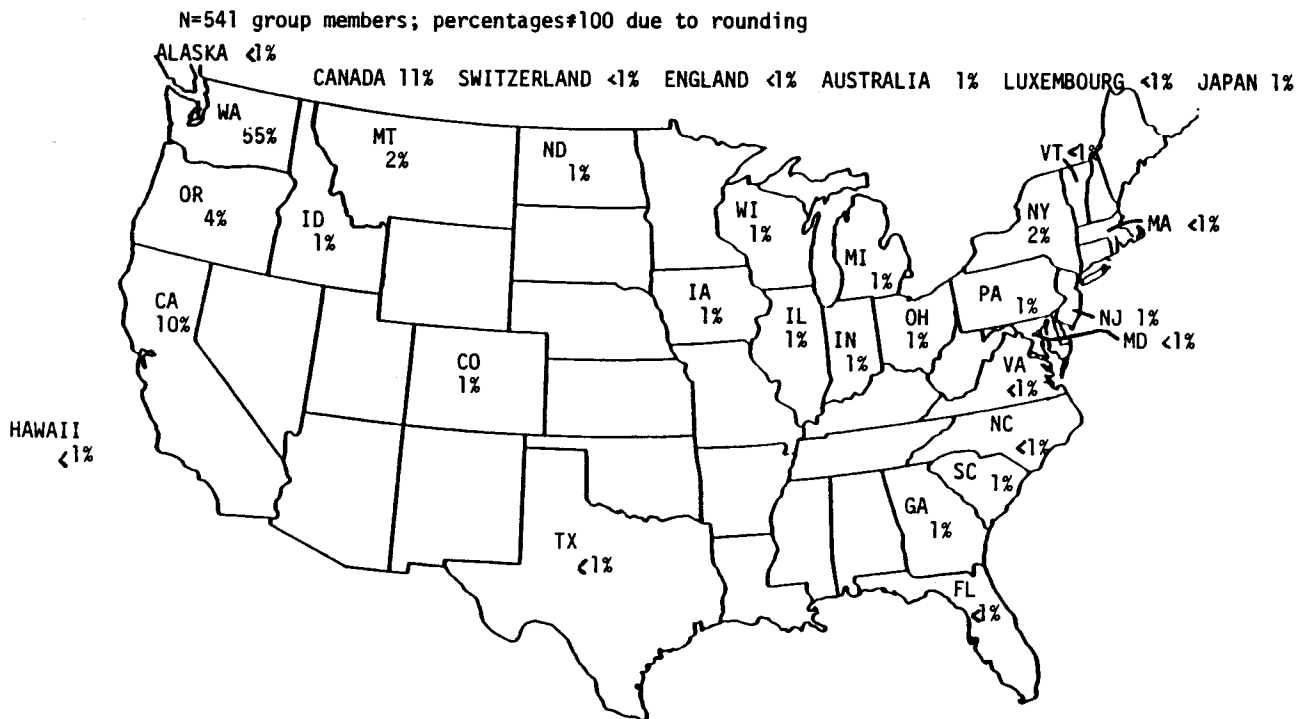


Figure 2.5: Proportion of Highway visitors from each state

N=269 group members; percentages≠100 due to rounding

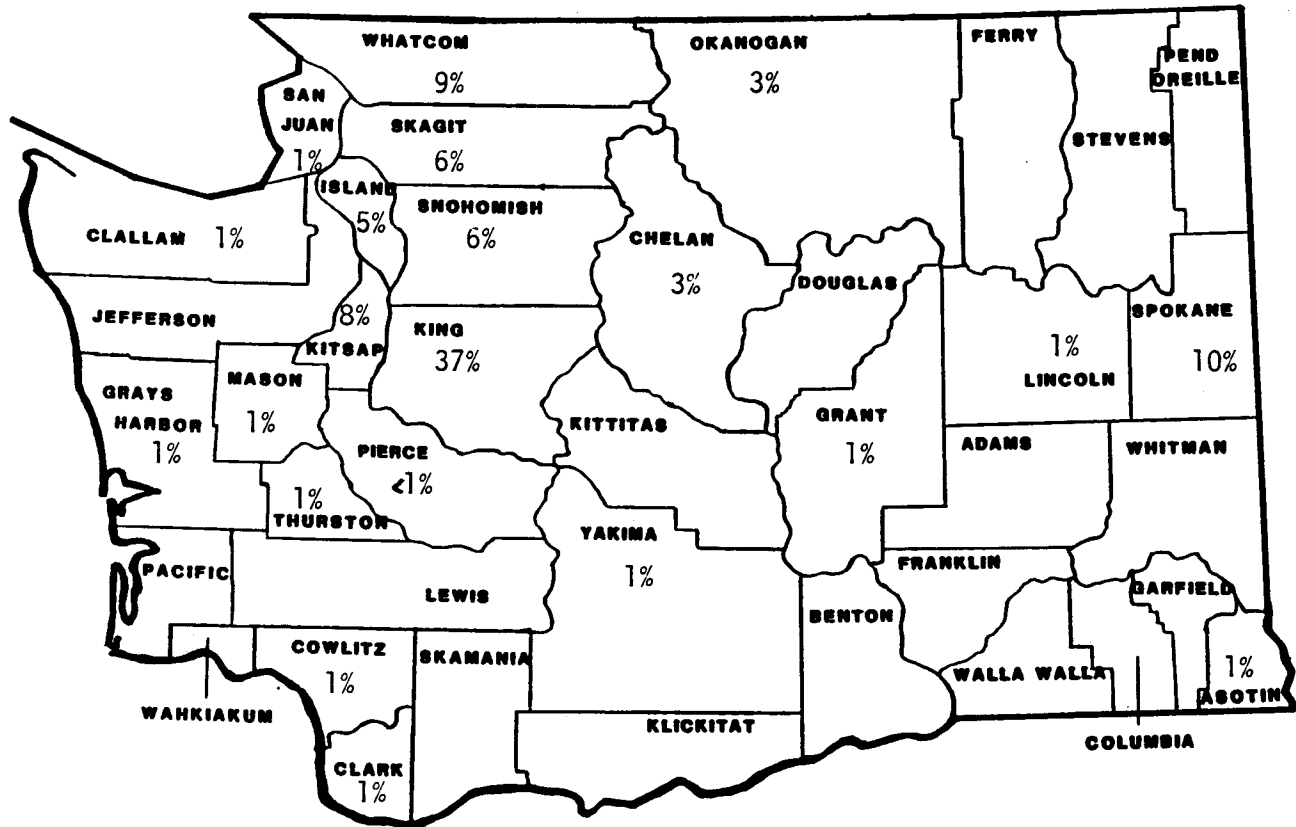


Figure 2.6: Proportion of Washington resident Highway visitors from each county

B. Visitors' use of time

Most Highway visitors entered the North Cascades during late morning or early afternoon, as shown in Figure 2.7. A majority stayed only one day, as shown in Figure 2.8.

Visitors' use of the area over time is measured in period visits (see Introduction), which represent one group in a particular zone engaged in a particular activity for a specific time period. The amount of period visits changed with the time period of the day, as shown in Figure 2.9. The largest portion of period visits occurred during the afternoon.

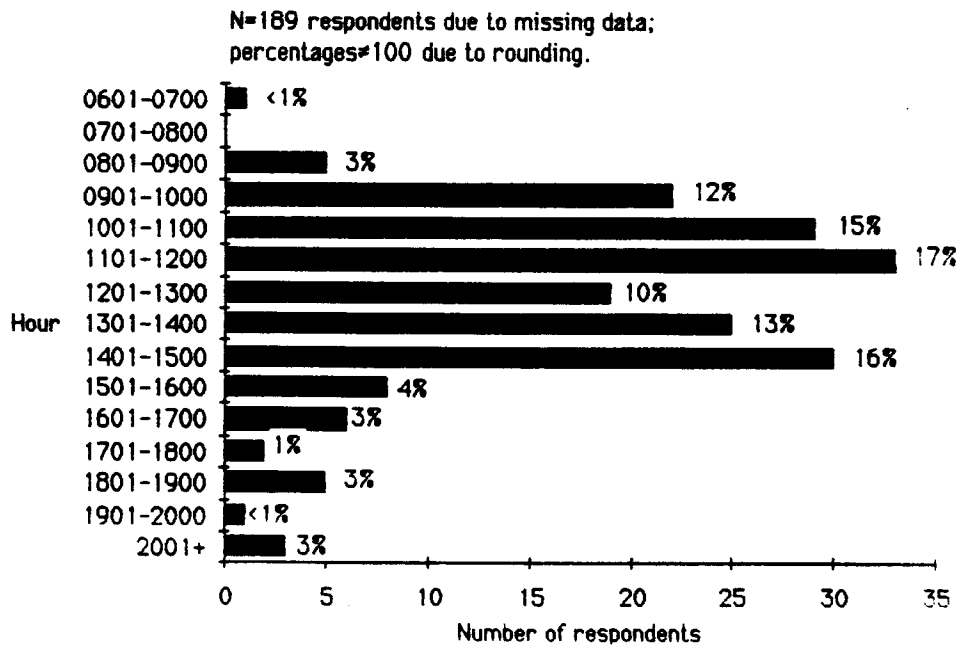


Figure 2.7: Number and percent of Highway visitors entering North Cascades each hour of the day

B. Visitors' use of time

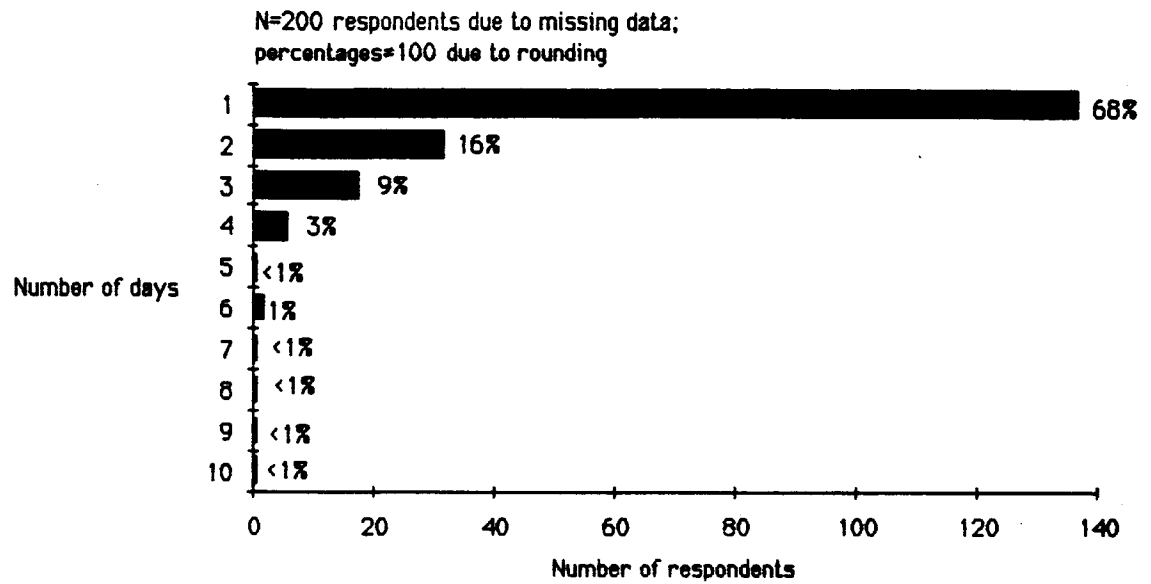


Figure 2.8: Number of days Highway visitors spent in North Cascades this visit

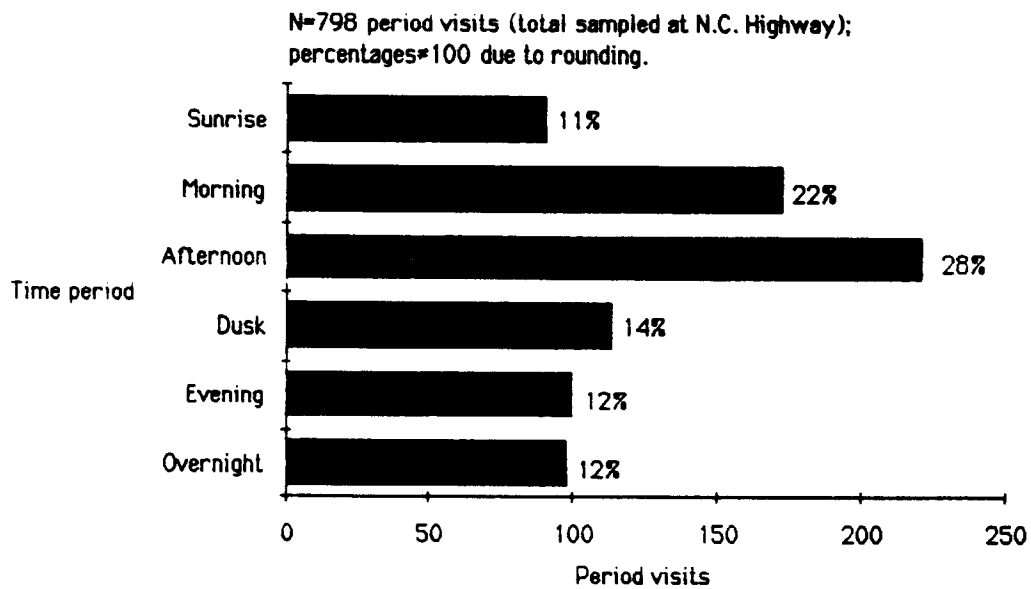
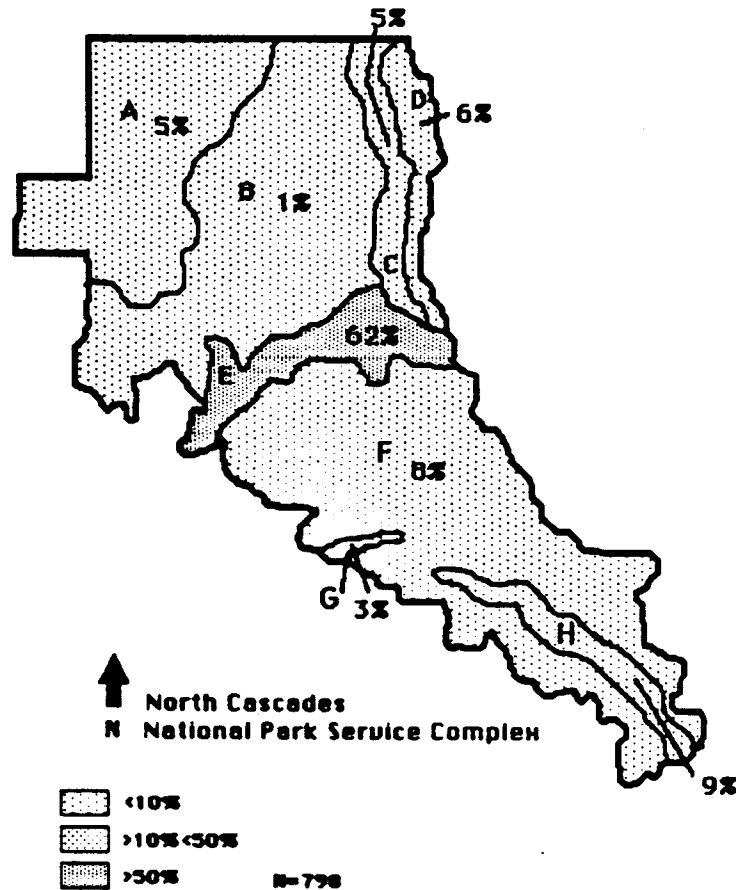


Figure 2.9: Period visits each time period--Highway visitors

C. Visitors' locations

While the Highway visitors spent most of their period visits in zone E, they also used other zones, as shown on Map 2.1. Each of the other zones received some use.



Map 2.1: Proportion of period visits to each zone by Highway visitors

D. Visitors' activities

Visitors engaged in the activities shown in Figure 2.9. (The total amounts of period visits to zones and for activities vary slightly due to recording errors.) They listed "other" for three percent of their period visits. Motorized travel, sleeping, and eating were the predominant activities; resting, hiking/walking, and nature study/photography were also popular.

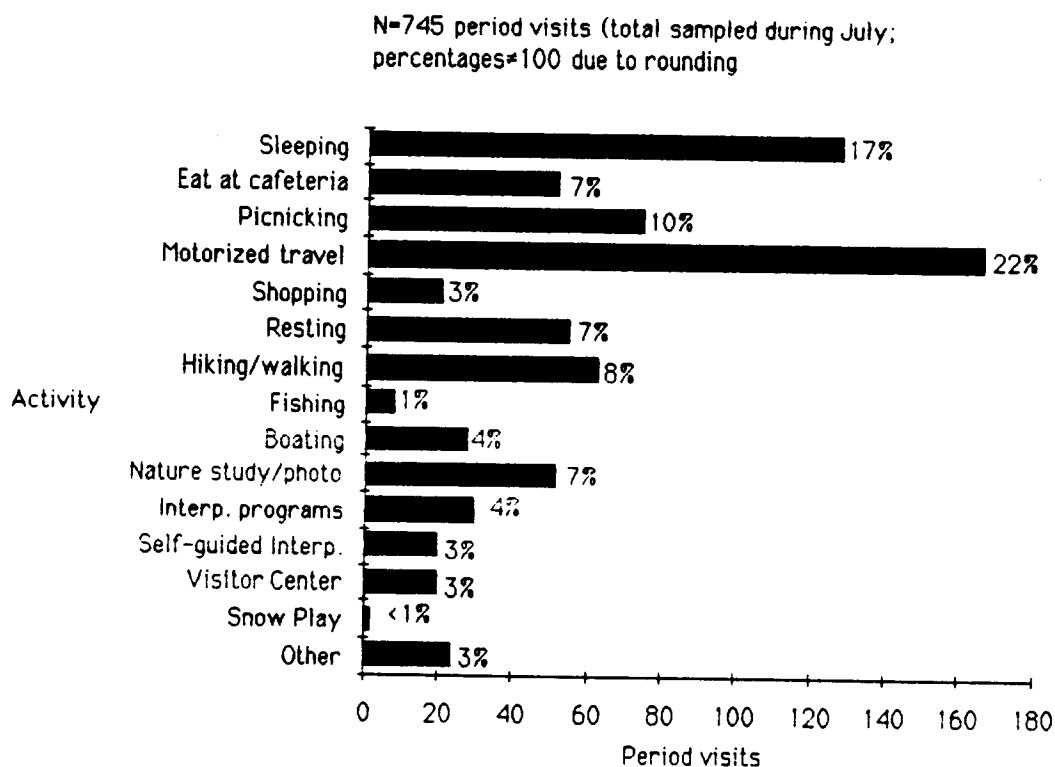
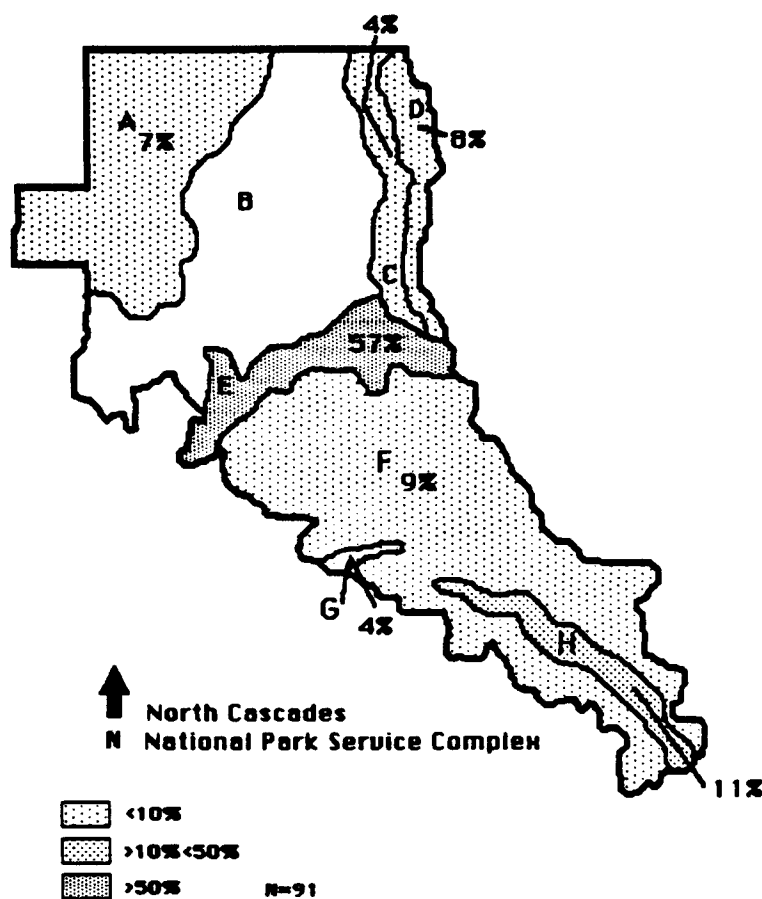


Figure 2.9: Total period visits each activity
--July visitors

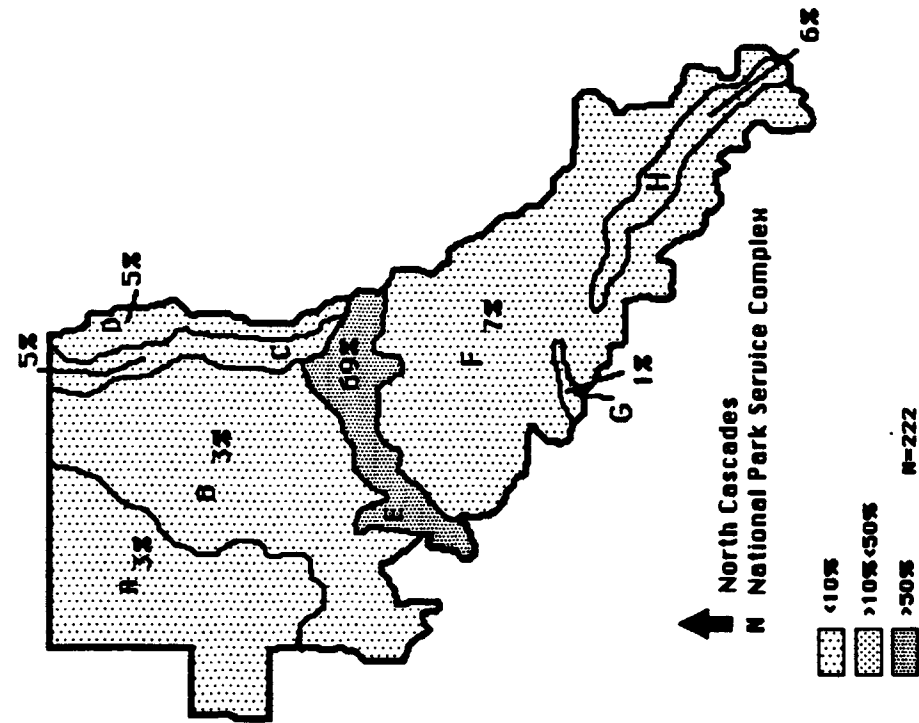
E. Visitors' locations and use of time combined

The Highway visitors' use of each zone changed with the different time periods, as shown on Maps 2.2 through 2.7. The proportion of use in zone E was greatest during all periods; use in other zones increased during the dusk, evening, and overnight periods. Maps 2.8 through 2.10 show the proportion of period visits to each zone by day of visit. In general, use in zone E decreased while use in other zones increased with each additional day of visit.

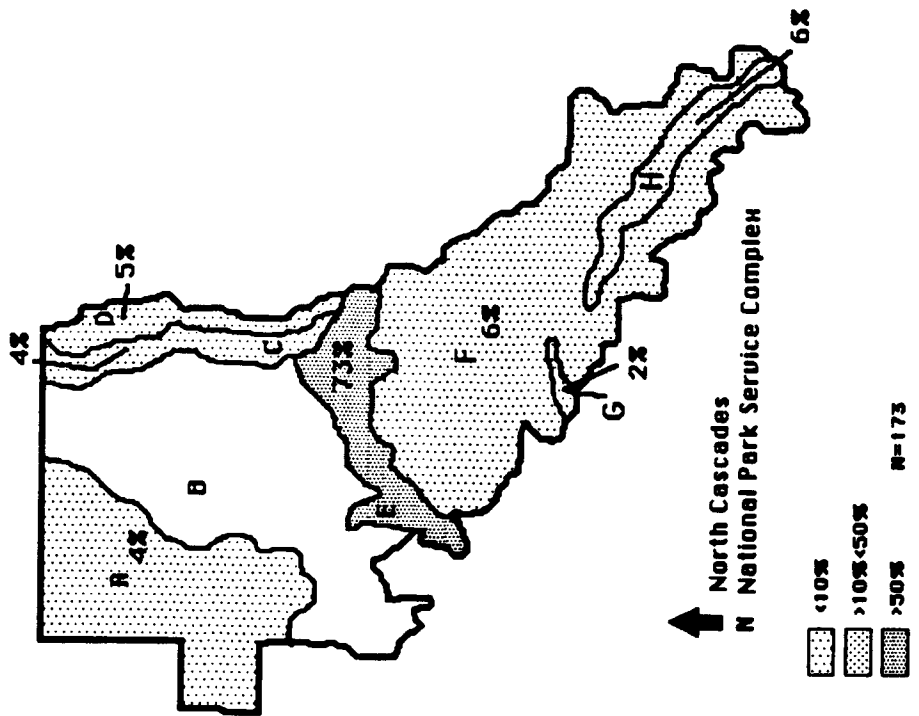


Map 2.2: Proportion of period visits to each zone by Highway visitors--sunrise period

Visitors' locations and use of time combined

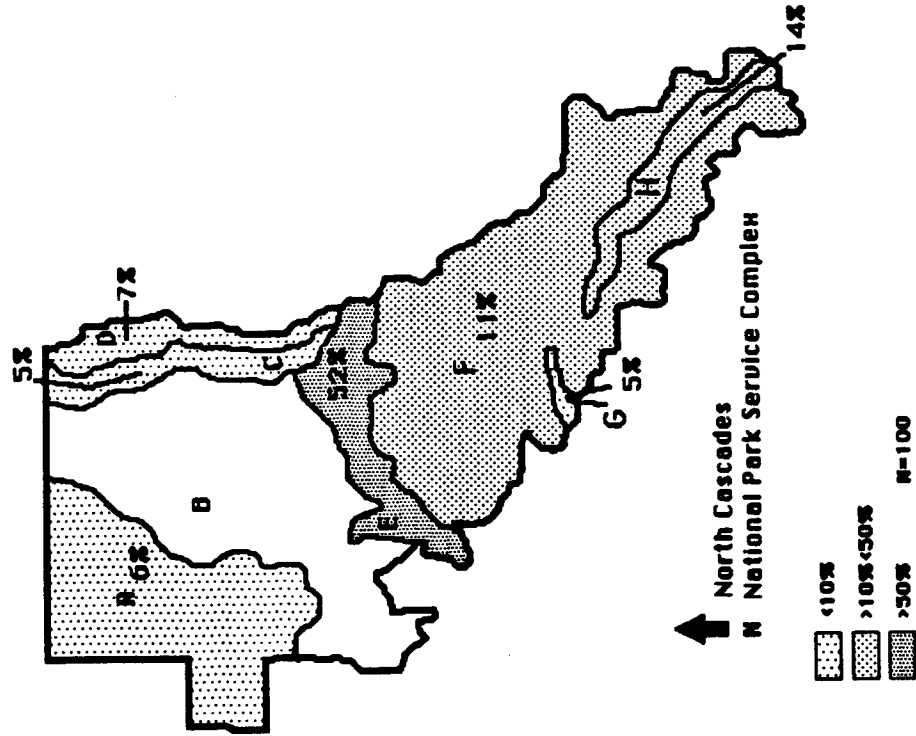


Map 2.3: Proportion of period visits to each zone by Highway visitors--morning period

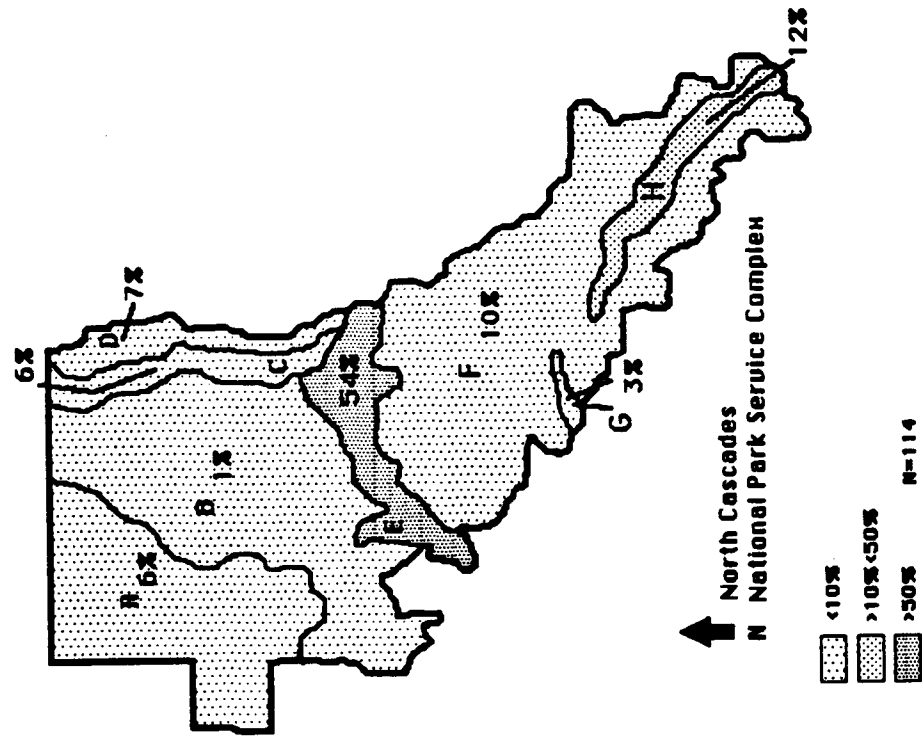


Map 2.4: Proportion of period visits to each zone by Highway visitors--afternoon period

E. Visitors' locations and use of time combined

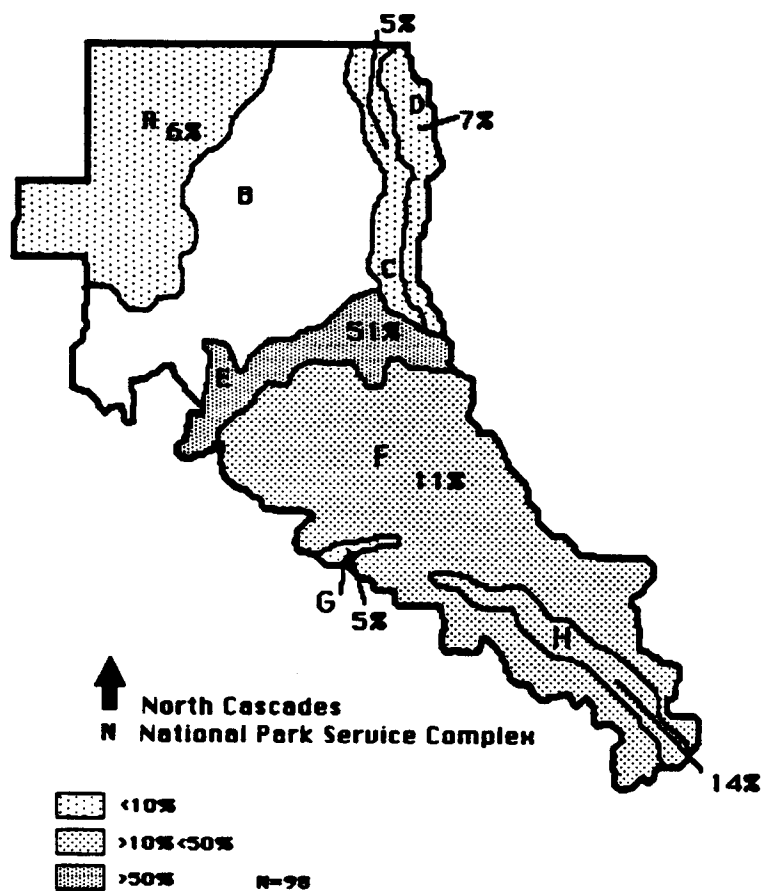


Map 2.5: Proportion of period visits to each zone by
Highway visitors--dusk period



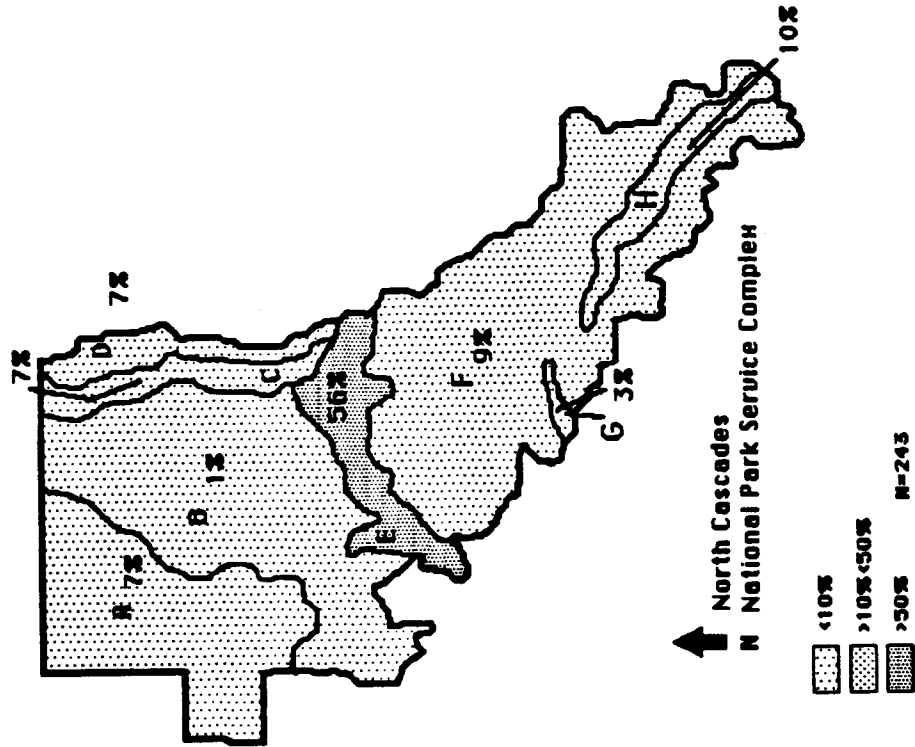
Map 2.6: Proportion of period visits to each zone by
Highway visitors--evening period

E. Visitors' locations and use of time combined

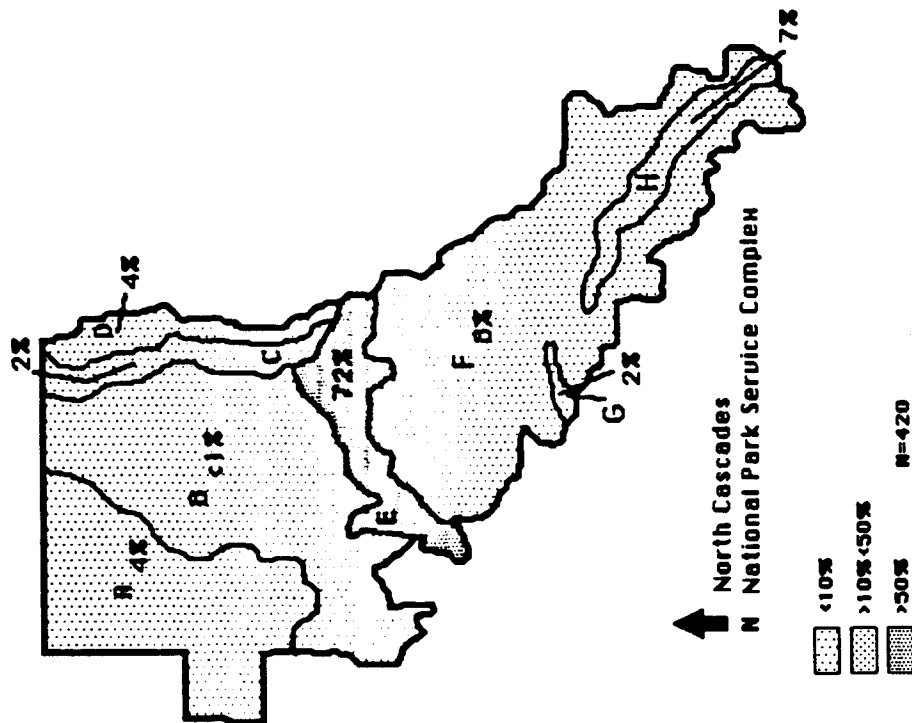


Map 2.7: Proportion of period visits to each zone by Highway visitors--overnight period

E. Visitors' locations and use of time combined

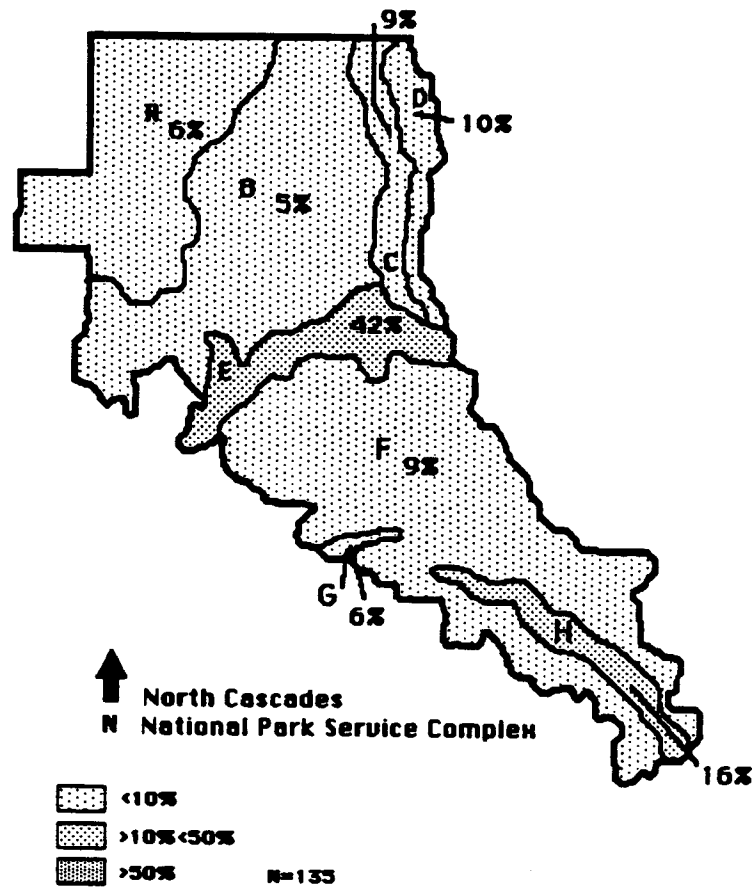


Map 2.8: Proportion of period visits to each zone by Highway visitors--day 1 of visit



Map 2.9: Proportion of period visits to each zone by Highway visitors--day 2 of visit

E. Visitors' locations and use of time combined



Map 2.10: Proportion of period visits to each zone by Highway visitors--day 3 of visit

F. Visitors' activities and use of time combined

Like the use of the different zones, Highway visitors' activities varied each time period, as shown in Figures 2.11 through 2.16. Sleeping was the predominant activity during overnight and sunrise periods, motorized travel during morning and afternoon, eating during dusk, and resting during the evening. Figures 2.17 through 2.19 show the amounts of period visits by day of visit. The distribution of activities varied little by day.

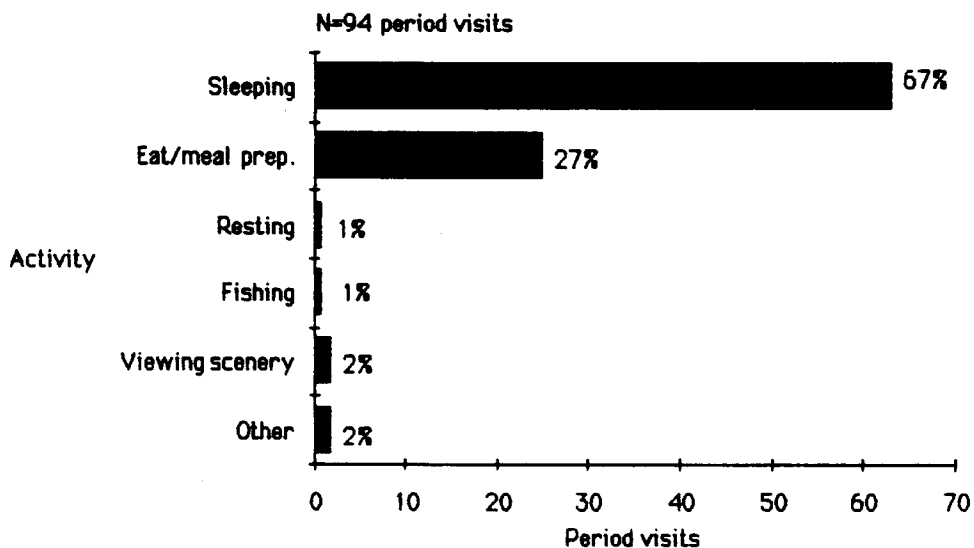


Figure 2.11: Period visits for activities of Highway visitors--
sunrise period

F. Visitors' activities and use of time combined

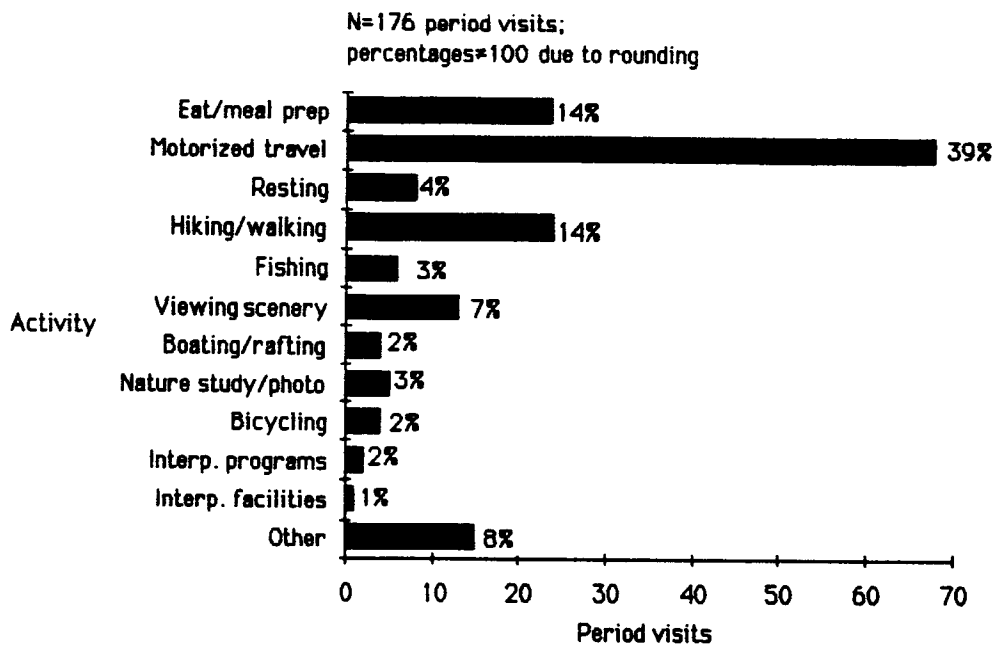


Figure 2.12: Period visits for activities of Highway visitors--
morning period

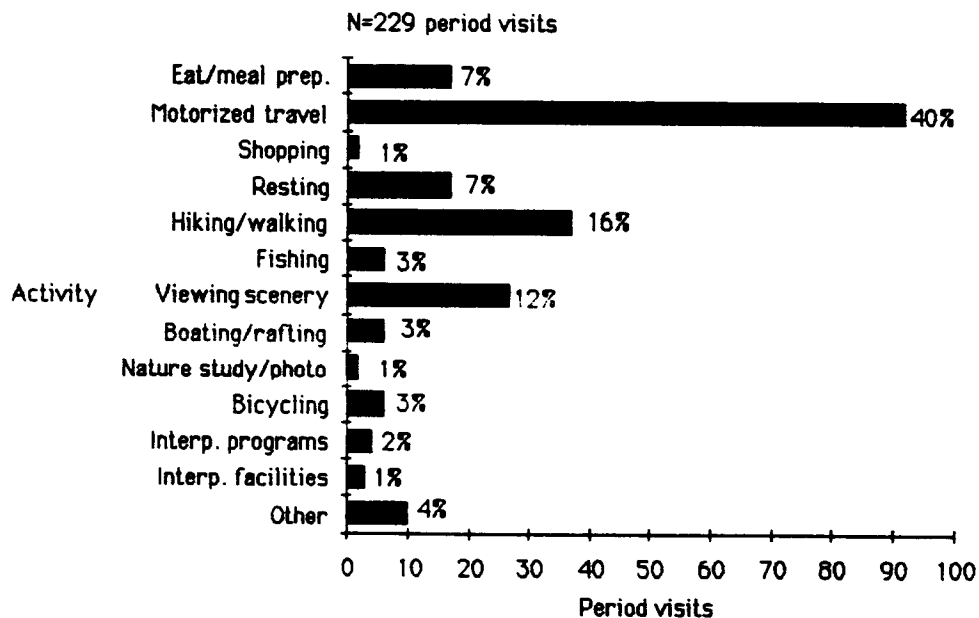


Figure 2.13: Period visits for activities of Highway visitors--
afternoon period

F. Visitors' activities and use of time combined

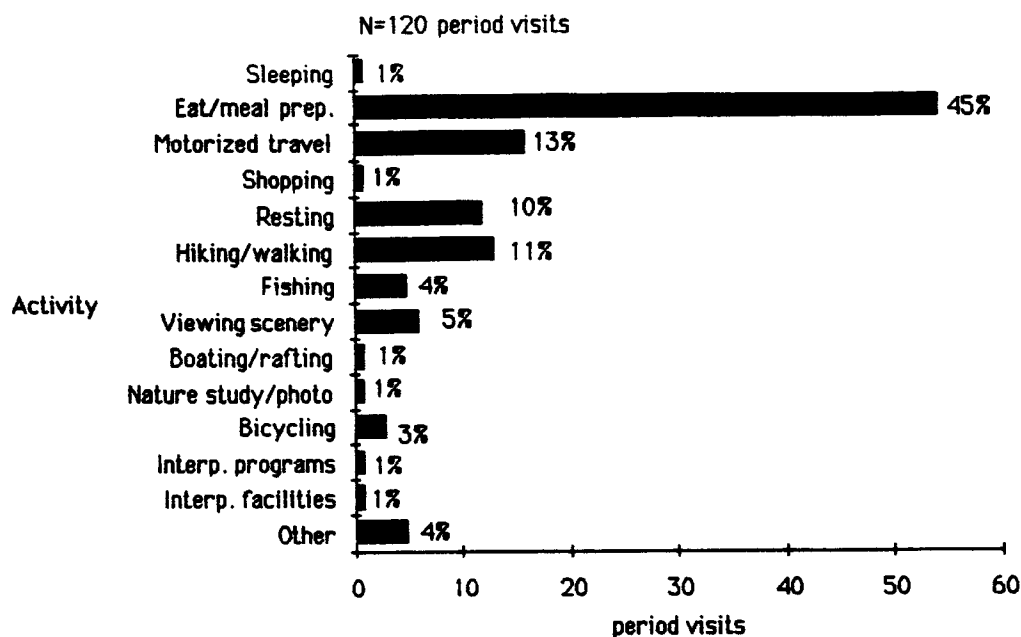


Figure 2.14: Period visits for activities of Highway visitors--
dusk period

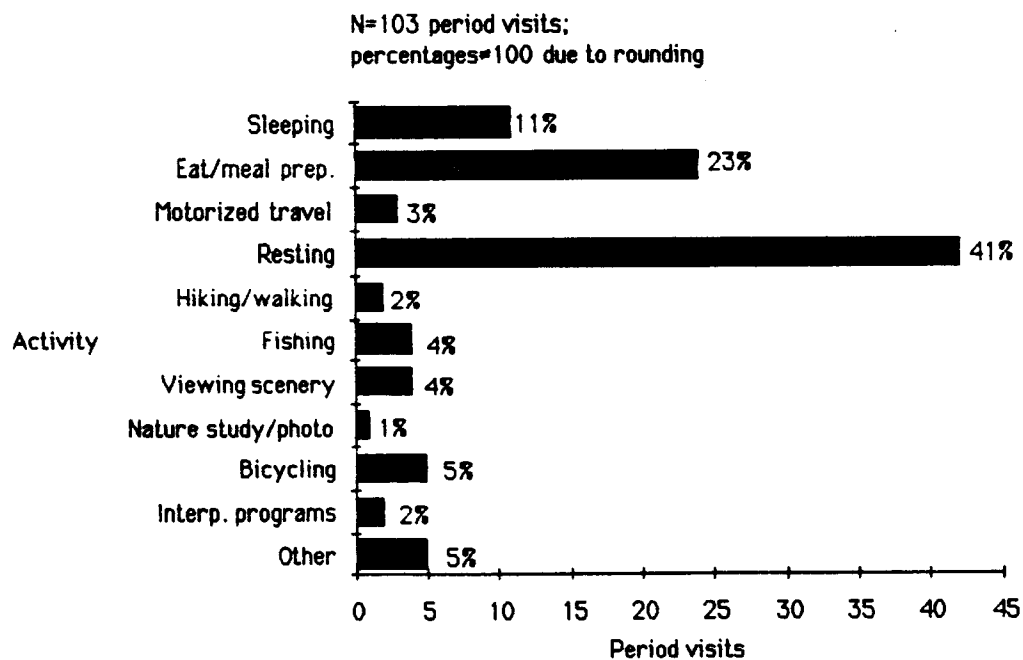
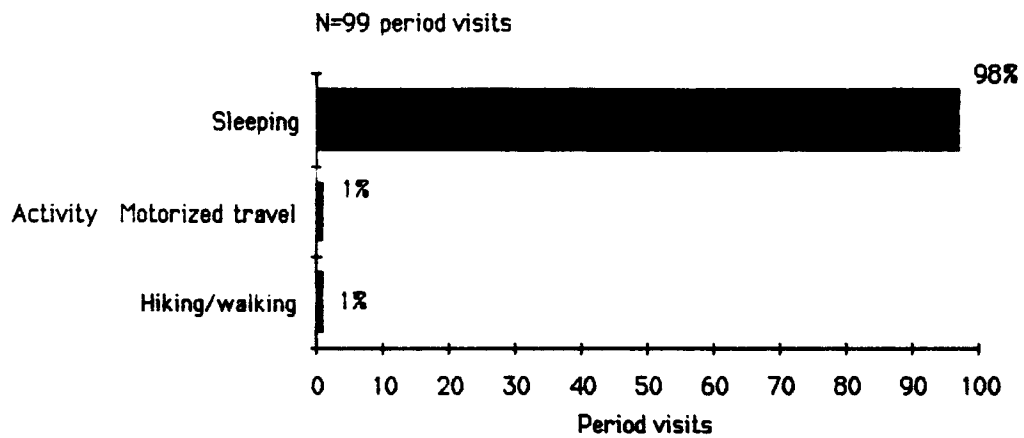


Figure 2.15: Period visits for activities of Highway visitors--
evening period

F. Visitors' activities and use of time combined



**Figure 2.16: Period visits for activities of Highway visitors-
-overnight period**

F. Visitors' activities and use of time combined

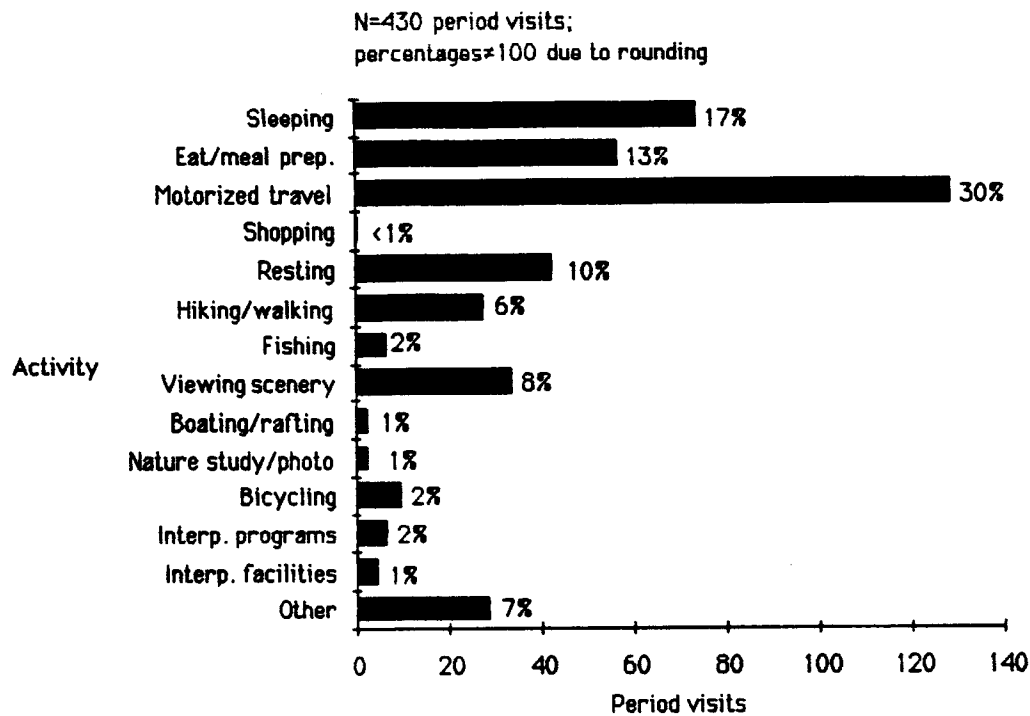


Figure 2.17: Period visits for activities of Highway visitors--
day 1 of visit

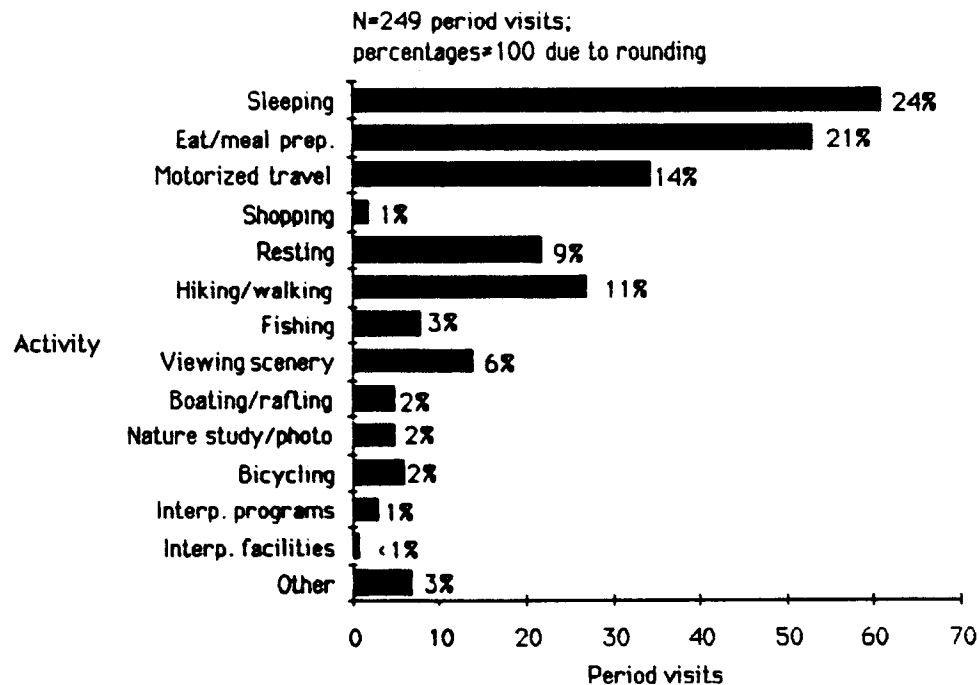


Figure 2.18: Period visits for activities of Highway visitors--
-day 2 of visit

F. Visitors' activities and use of time combined

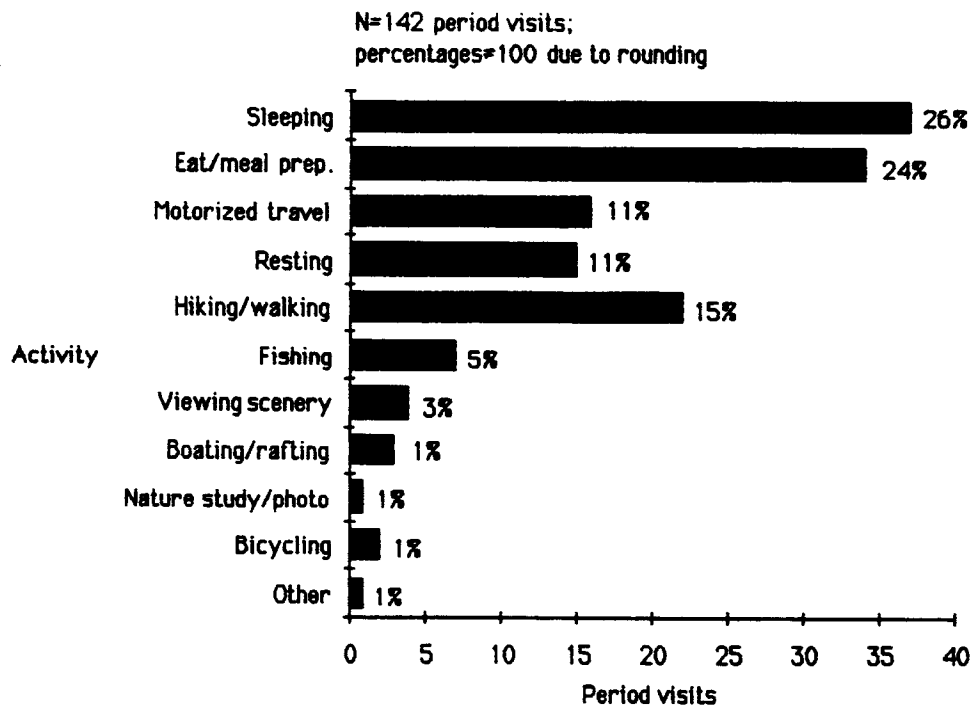


Figure 2.19: Period visits for activities of Highway visitors-
-day 3 of visit

G. Visitors' locations and activities combined

Highway visitors used the zones in different amounts and for different activities. That is, the relative proportions of activities varied from zone to zone, as shown in Table 2.1. (Due to reporting errors, small amounts of activities are shown occurring in zones where they cannot occur--for example, motorized travel in zone A, zone B, zone D, and zone F.) Some activities, such as shopping or motorized travel, were concentrated in particular zones, while other activities, such as hiking/walking, occurred in many zones.

G. Visitors' locations and activities combined

Table 2.1: Proportion of period visits for activities occurring in each zone, Highway visitors (%).

Activity	Zone							
	A %	B %	C %	D %	E %	F %	G %	H %
Sleeping (n=162)	9	-	5	7	51	12	4	12
Eat/meal prep. (n=141)	3	1	4	8	58	8	5	12*
Motorized travel (n=168)	1	1	2	2	90	2	1	1
Shopping (n=3)	-	-	-	-	100	-	-	-
Resting (n=77)	1	-	8	5	53	16	4	13
Hiking/walking (n=77)	13	6	3	12	30	19	5	12
Fishing (n=22)	-	-	9	-	73	-	-	18
Viewing scenery (n=51)	6	-	6	10	72	4	2	-
Boating/rafting (n=11)	-	-	36	-	18	-	-	45
Nature study/ photography (n=9)	11	-	-	-	55	11	11	11*
Bicycling (n=15)	-	-	-	-	67	13	-	20
Interp. programs (n=10)	-	-	10	-	70	10	-	10
Interp. facilities (n=6)	17	-	33	-	50	-	-	-
Other (n=31)	3	-	3	-	81	3	-	10

*Row percentages=100 due to rounding

H. Visitors' locations, activities, and use of time combined

By combining data on locations, activities, and use of time, a more detailed picture of Highway visitors' behavior is possible. Table 2.2 shows the proportion of period visits for activities during each time period for zone E. Certain activities, such as viewing interpretive facilities and nature study/photography, took place only during a few time periods.

Table 2.2: Proportion of period visits for activities of Highway visitors among each time period for ZONE E (%).[~]

<u>Activity</u>	<u>Time period</u>					
	Sunrise %	Morning %	A'noon %	Dusk %	Evening %	O'night %
Sleeping (n=82)	35	-	-	1	7	56*
Eat/meal prep. (n=82)	18	21	13	36	11	-*
Motorized travel (n=152)	-	39	51	7	2	1
Shopping (n=3)	-	-	67	33	-	-
Resting (n=41)	2	12	24	10	51	-*
Hiking/walking (n=23)	-	35	35	22	4	4
Fishing (n=16)	6	37	31	12	12	-*
Viewing scenery (n=37)	5	30	57	3	5	-
Boating/rafting (n=2)	-	-	50	50	-	-
Nature study/ photography (n=5)	-	60	40	-	-	-
Bicycling (n=10)	-	20	40	20	20	-
Interp. programs (n=7)	-	29	29	14	29	-*
Interp. facilities (n=3)	-	33	67	-	-	-
Other (n=25)	4	40	28	12	16	-

[~]Data presented with time periods combined over 3 days of visit.

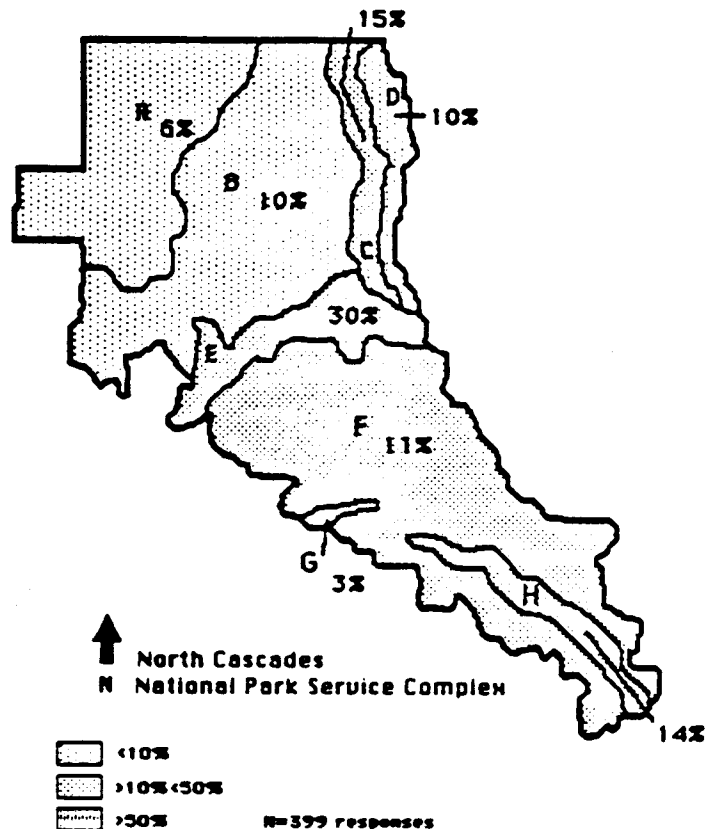
*Row percentages=100 due to rounding.

I. Special questions

Visitors to North Cascades were asked two specific questions about the park:

- 1) "If you plan to return to the North Cascades National Park Service Complex in the future, which zones would you visit?", and
- 2) "If you were planning for the future of the North Cascades National Park Service Complex, what would you propose?".

Visitors could list as many zones or make as many suggestions as they liked. All zones were listed; their distribution is shown on Map 2.11. Zone E, the Highway corridor, received the largest proportion of responses; zone H was also popular. Highway visitors' suggestions are listed in Appendix C.



Map 2.11: Zones Highway visitors would visit on their next trip to North Cascades

Introduction

The Stehekin community sits at the northern end of Lake Chelan, in zone H of the North Cascades National Park Service Complex. Most visitor access is via the lake, by excursion boat, private boat, or air service. The Stehekin community consists of residents (summer and year-round), concessioner employees, NPS employees, and visitors; the survey included only visitors. The following chapter presents the results from the Stehekin area.

Sampling

A contact person was stationed at the Stehekin landing from 9 a.m. until 5 p.m. each day of the study period (July 28, 1985 through August 3, 1985). Questionnaires were distributed to visitors arriving in planes or private boats throughout the day; they were distributed to excursion boat passengers as they boarded to leave Stehekin. This method was chosen because passengers appeared less rushed and anxious to disperse at this time; thus, more receptive to the study.

The results have two special limitations. First, private boat traffic may have been undersampled. However, based on observations made during the study period, this portion of the visitor population was small (less than 5%). Second, the method did not provide for sampling visitors who entered Stehekin on foot from other areas; this was also believed to be a small portion of visitors.

181 visitors were contacted and all agreed to participate; thus, the acceptance rate was 100%. 165 (91%) of the questionnaires were given to visitors arriving on the excursion boat, 16 (8%) to visitors arriving in planes, private boats, or on foot. On average, 17% of the excursion boat passengers were sampled each day. 84 visitors completed and returned their questionnaires, for a 43% response rate.

A. Visitor profile

The returned questionnaires provide information on both the 84 respondents and the groups they were with. Stehekin visitors came in groups of many different sizes and types. Figure 3.1 shows the group sizes, which ranged from 1 to 30 people. While the average (mean) group size was 4 people, the most common group size (mode) was 2. Over one-half of the visitors came in family groups, as shown in Figure 3.2.

Questions on the age, number of previous visits to North Cascades, and home zip code of each group member were included. Figures 3.3 through 3.6 report the results. Most Stehekin visitors were between 26 and 35 years old; over half of them were on their first visit. They came from several states and foreign countries. Washington resident visitors came from many different counties throughout the state.

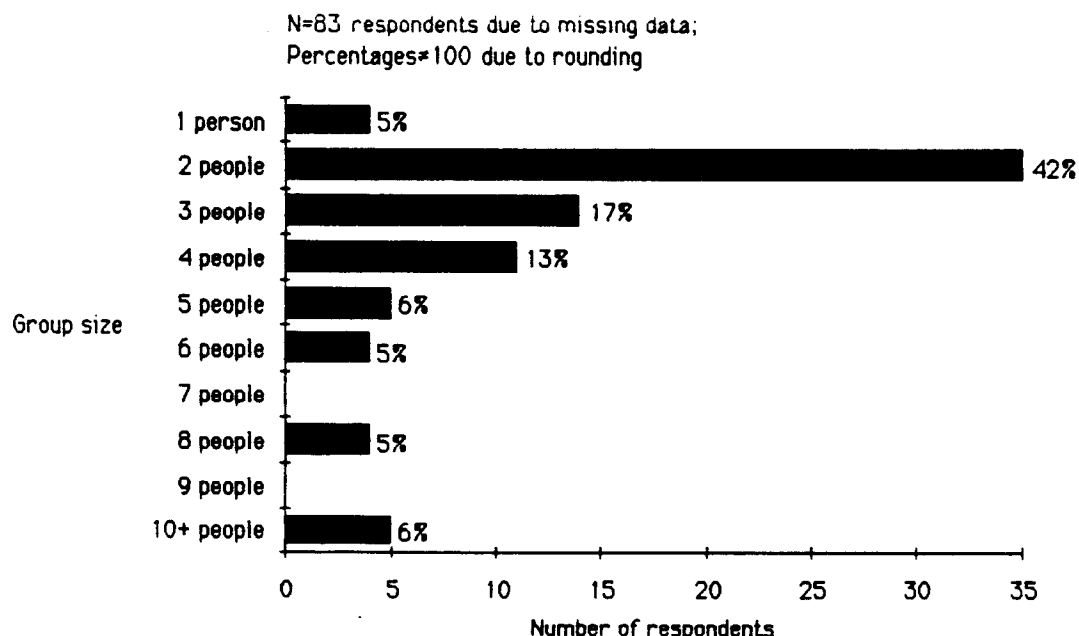


Figure 3.1: Stehekin visitors' group size

A. Visitor profile

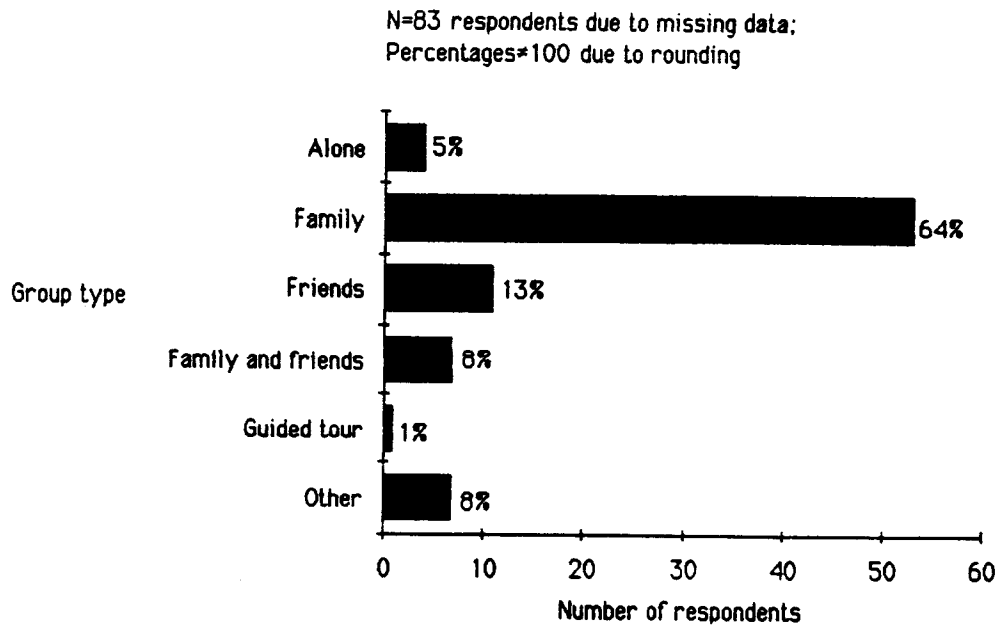


Figure 3.2: Stehekin visitors' group type

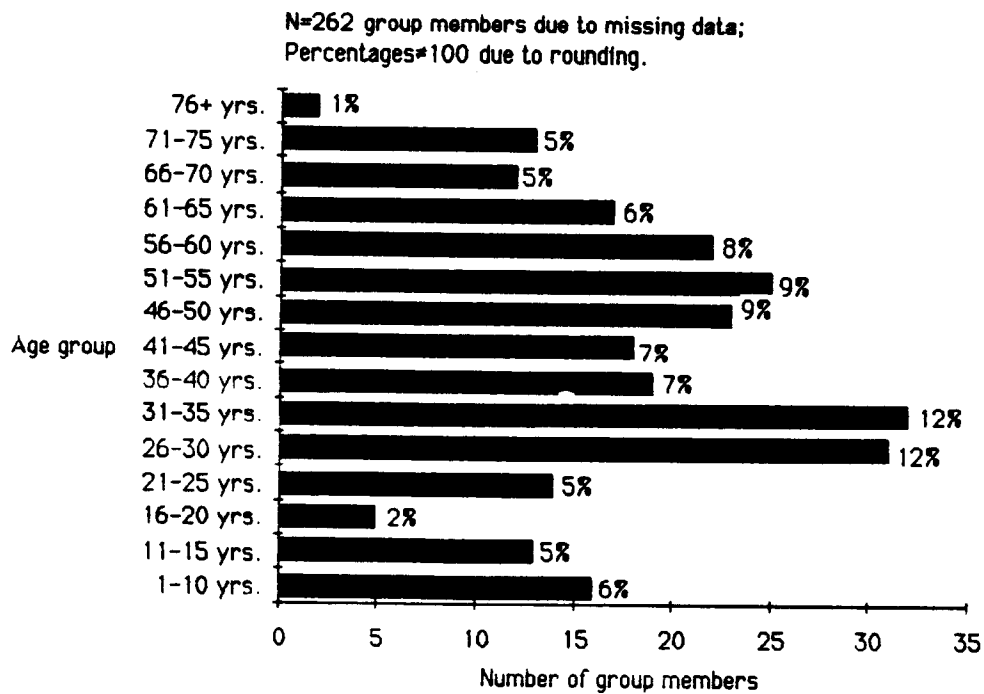


Figure 3.3: Ages of Stehekin visitors

R. Visitor profile

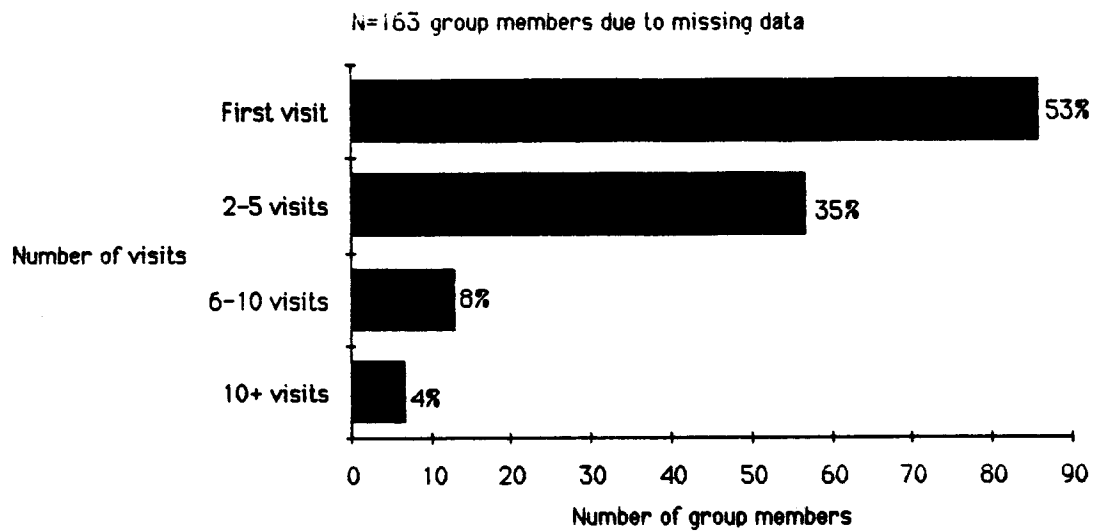


Figure 3.4: Stehekin visitors' previous visits to North Cascades

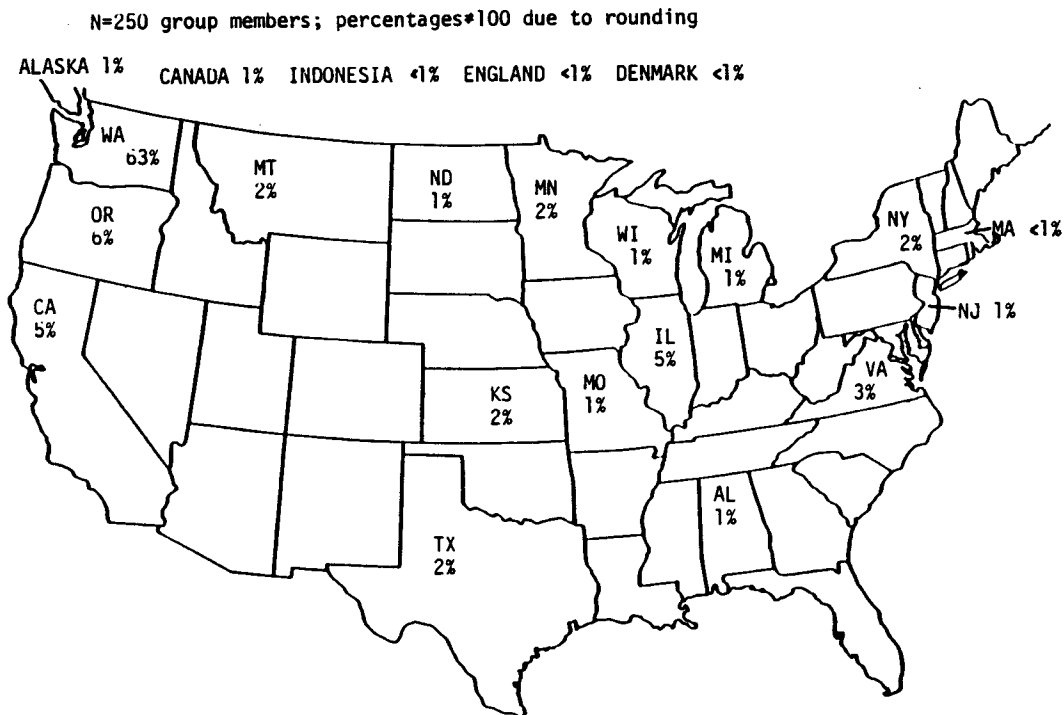


Figure 3.5: Proportion of Stehekin visitors from each state

N=149 group members; percentages≠100 due to rounding

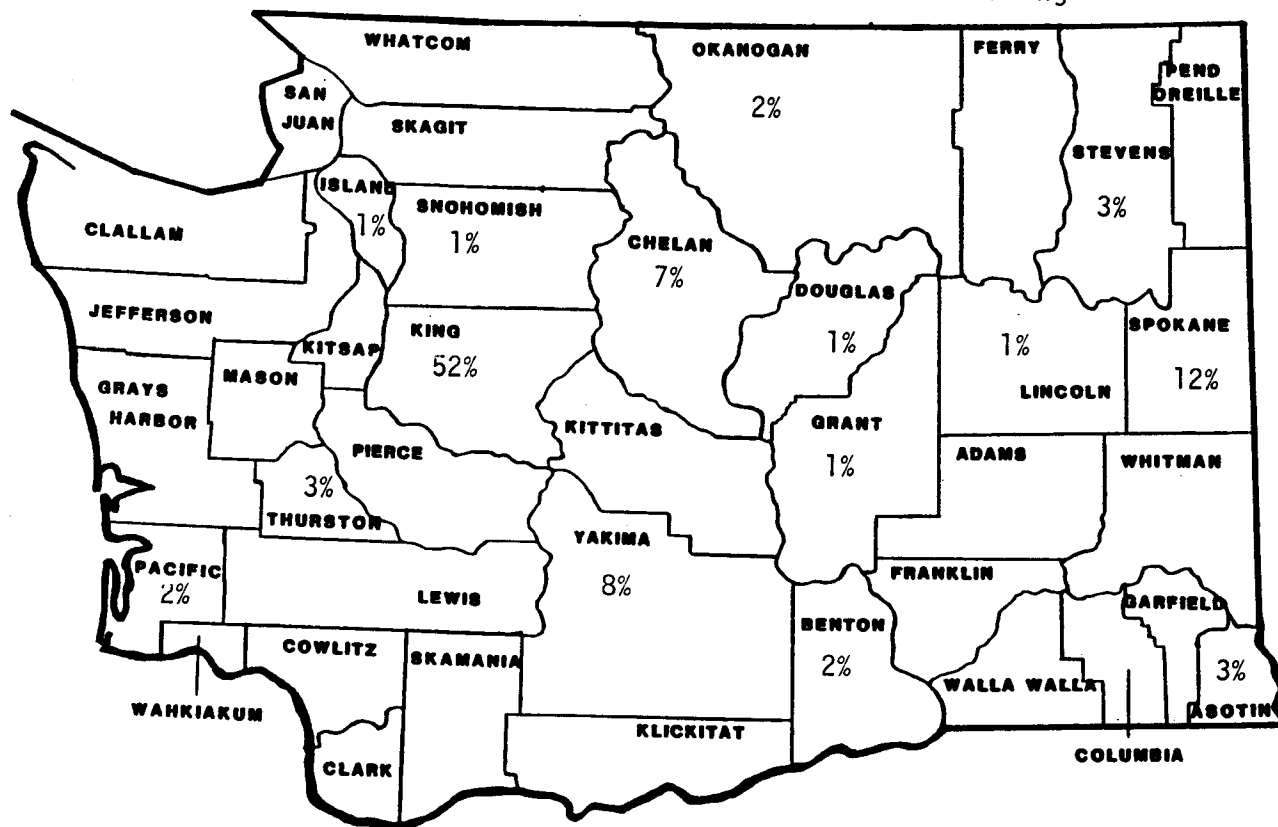


Figure 3.6: Proportion of Washington resident Stehekin visitors from each county

B. Visitors' use of time

Most Stehekin visitors entered North Cascades between 12:00 a.m. and 1:00 p.m., as shown in Figure 3.7.^A Most stayed in the area only one day, although some stayed as long as 11 days, as shown in Figure 3.8.

Visitors' use of the area over time is measured in period visits (see Introduction), which represent one group in a particular zone engaged in a particular activity for a specific time period. The amount of period visits changed with the major time periods of the day, as shown in Figure 3.9. The largest portion of period visits occurred during the afternoon.

A. Although Figure 3.7 shows a wider distribution, more than 93% of the visitors arrived on the excursion boat, which landed at Stehekin between 12:00 and 1:00 p.m. each day. This question was phrased: "When did you first enter the North Cascades National Park Service Complex?" This suggests that respondents interpreted the question in a number of ways. Some answered 8:30 a.m., when they boarded the boat; others 10:00 to 11:30 a.m., when the boat entered Lake Chelan NRA; and still others 12:00 to 1:00 p.m., when the boat landed at Stehekin.

B. Visitors' use of time

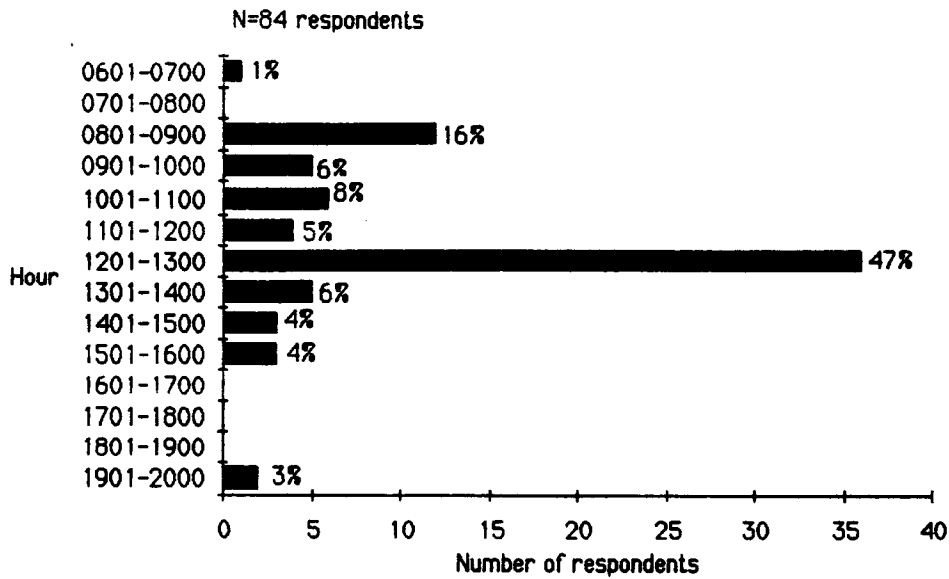


Figure 3.7: Number and percent of Stehekin visitors entering North Cascades each hour of the day

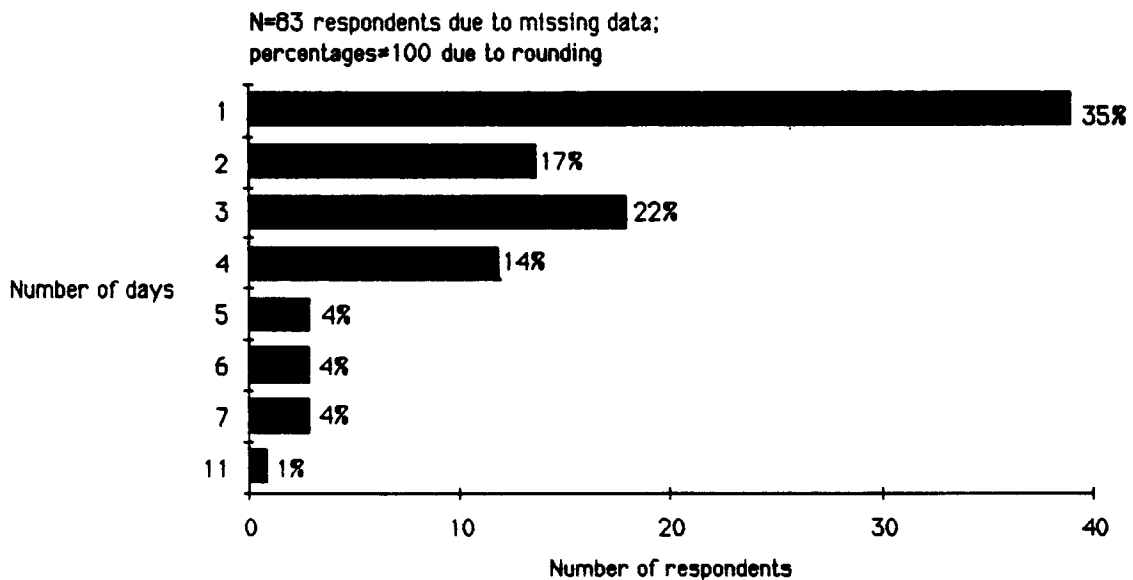


Figure 3.8: Number of days Stehekin visitors spent in North Cascades this visit

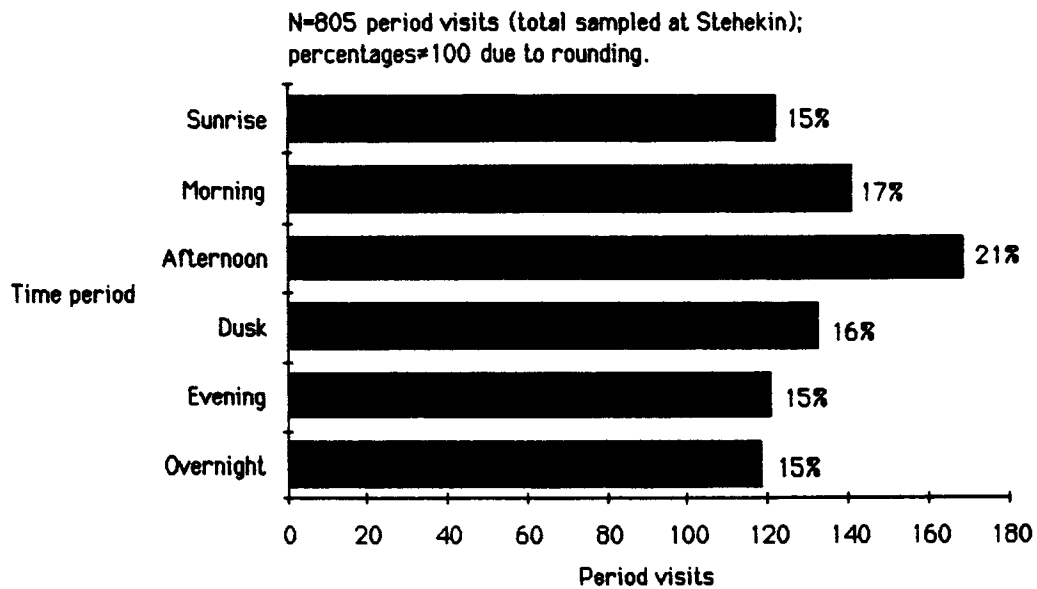
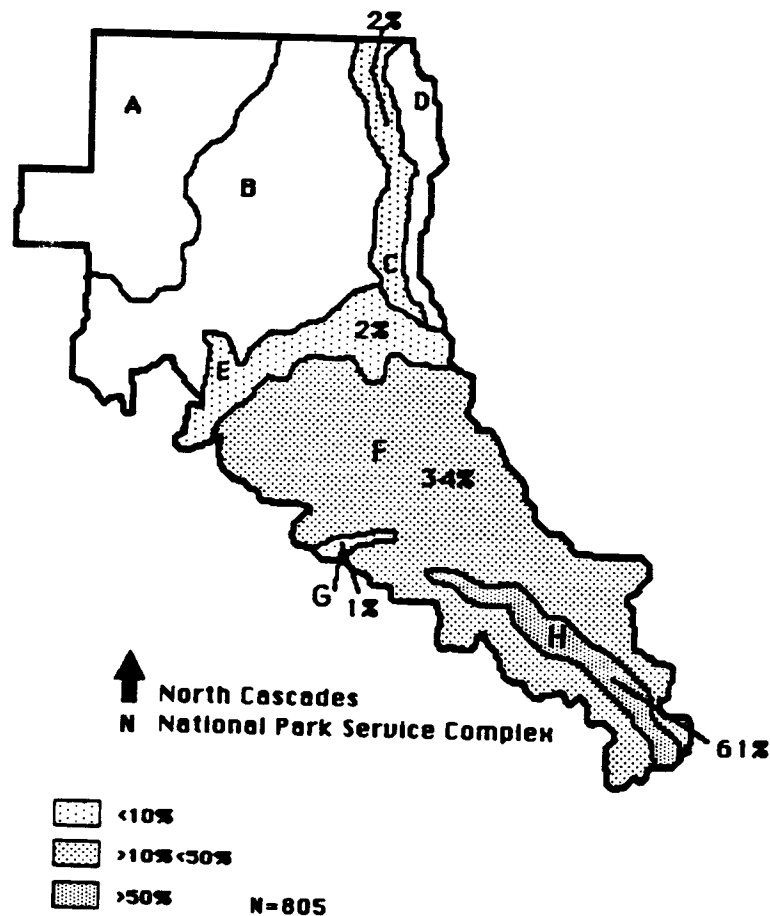


Figure 3.9: Period visits each time period--Stehekin visitors

C. Visitors' locations

While the Stehekin visitors spent most of their period visits in zone H, they also used other zones, as shown on Map 3.1. Aside from the use in zone H, a considerable amount of use occurred in zone F, and slight amounts in zones G, E, and C.



Map 3.1: Proportion of period visits to each zone by Stehekin visitors

D. Visitors' activities

The Stehekin visitors engaged in the activities shown in Figure 3.10. (The total amounts of period visits to zones and for activities vary slightly due to recording errors.) Visitors listed "other" for 6% of their period visits. While sleeping and eating were the predominant activities, other popular activities were hiking/walking, resting, and boating/rafting.

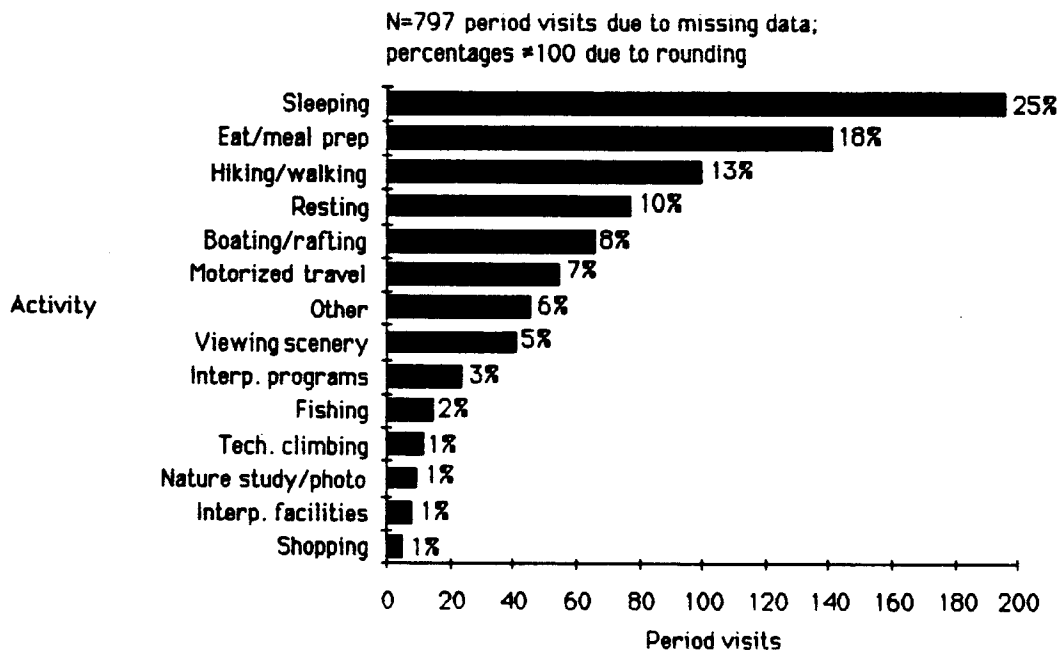
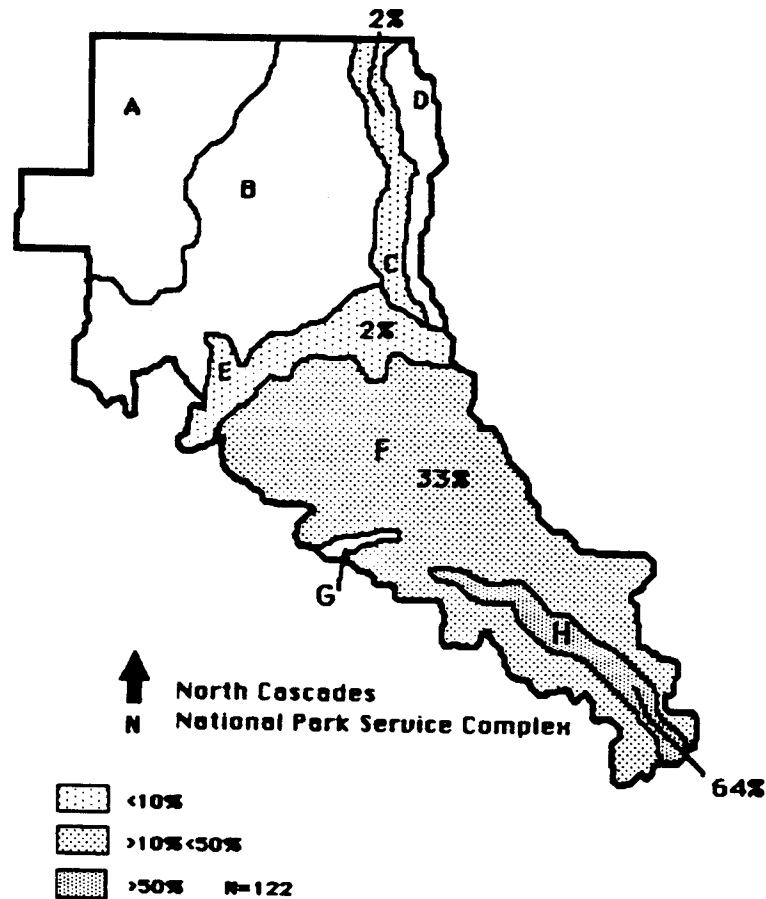


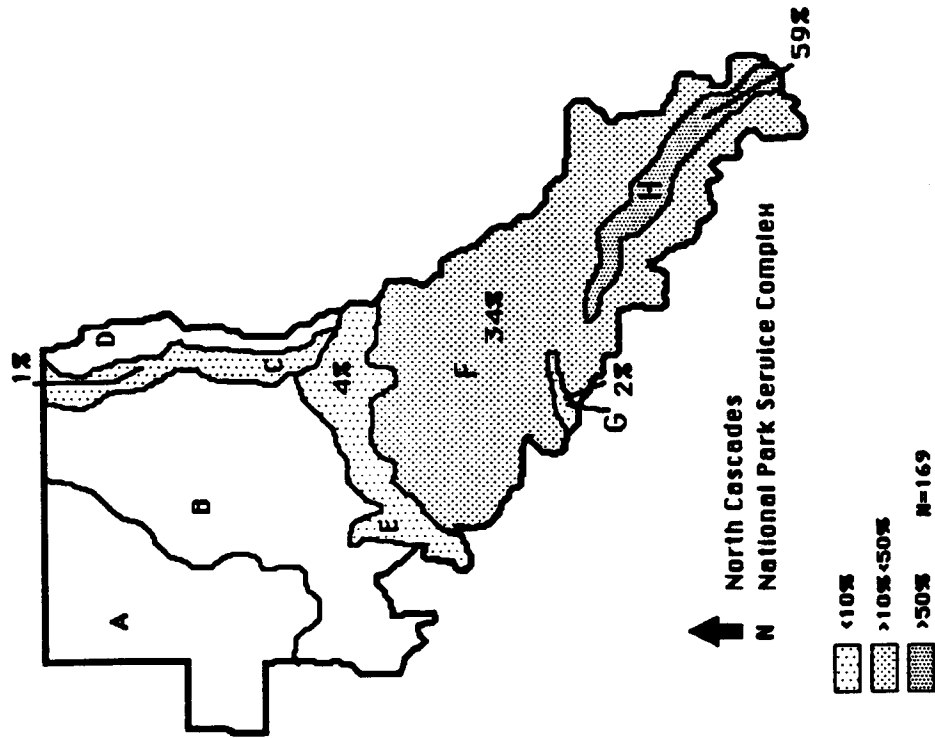
Figure 3.10: Total period visits for each activity--Stehekin visitors

E. Visitors' locations and use of time combined

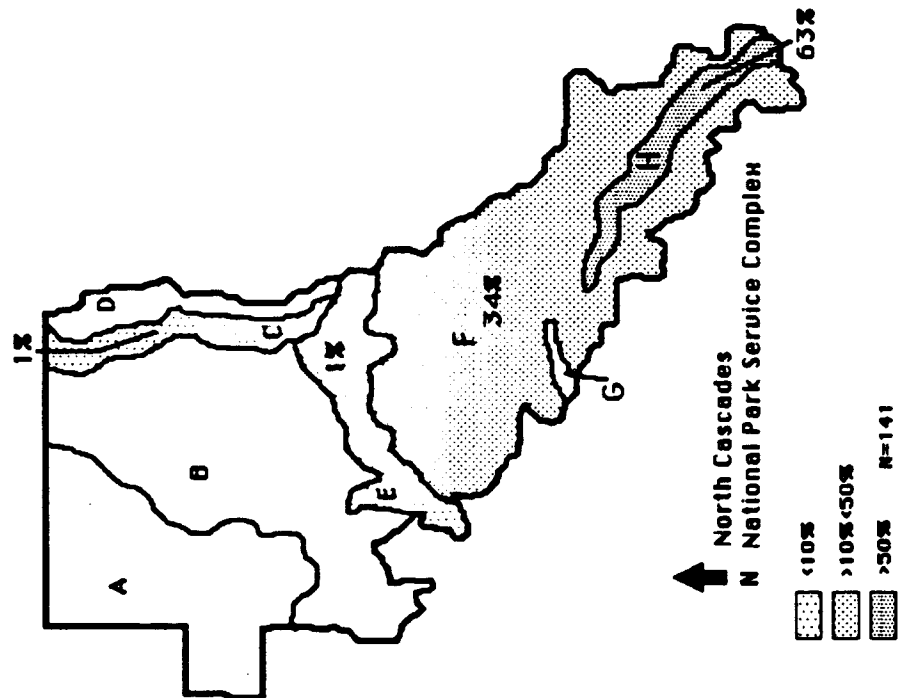
Stehekin visitors' use of each zone changed over time, as shown on Maps 3.2 through 3.7. The changes are small; use in zone H remained the greatest during all periods. Use in other zones increased during the dusk, evening, and overnight periods. Maps 3.8 through 3.10 show the proportions of period visits to each zone by day of visit. In general, use in zone H decreased slightly while use in other zones increased with each additional day of visit.



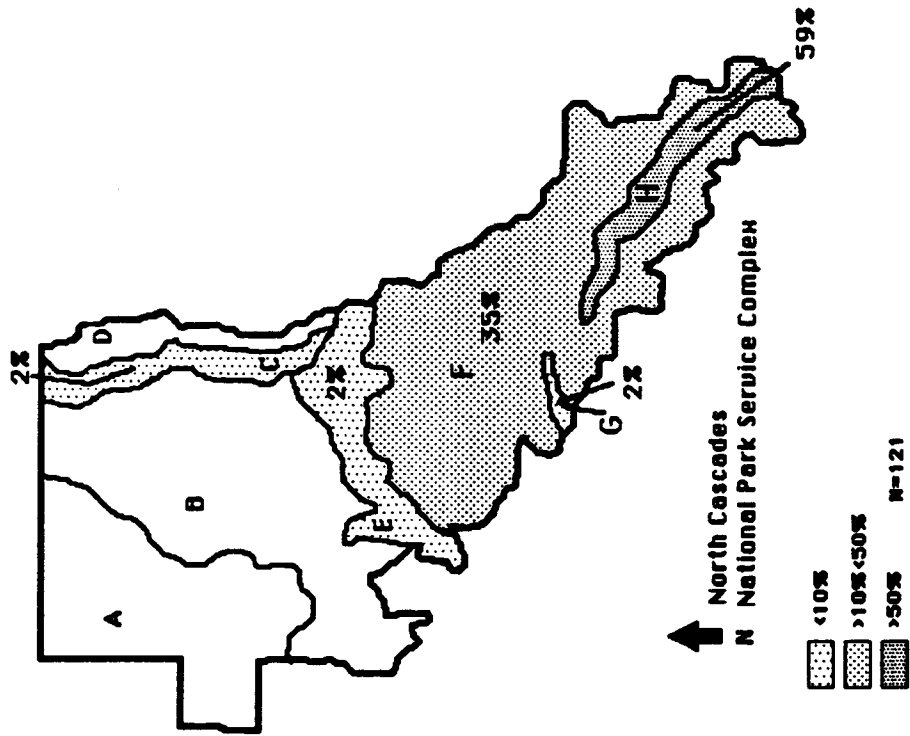
Map 3.2: Proportion of period visits to each zone by Stehekin visitors--sunrise period



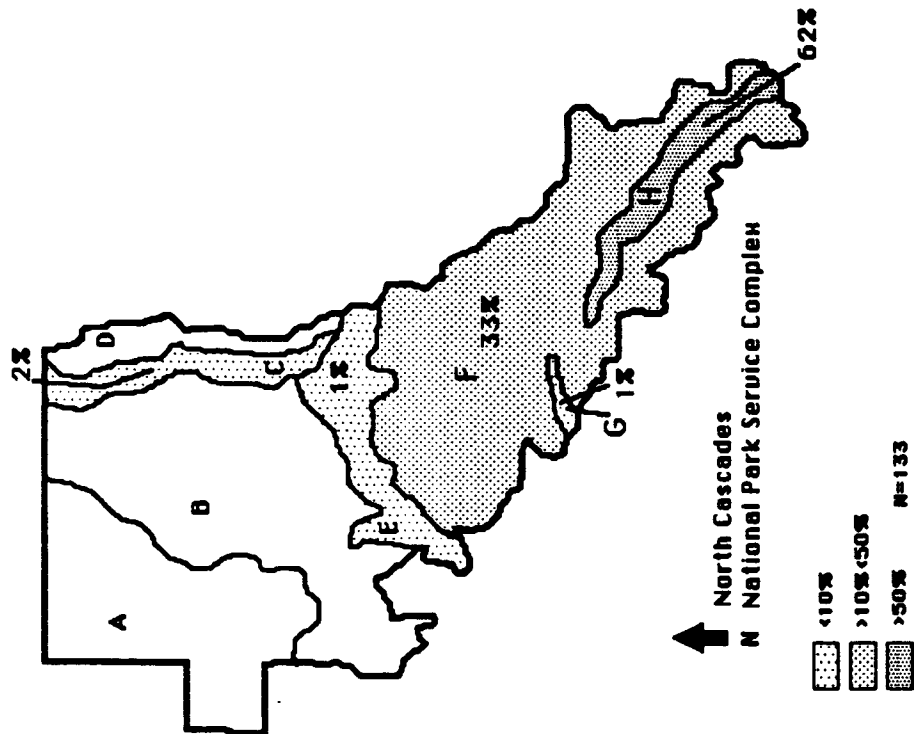
Map 3.4: Proportion of period visits to each zone by Stehekin visitors--afternoon period



Map 3.3: Proportion of period visits to each zone by Stehekin visitors--morning period

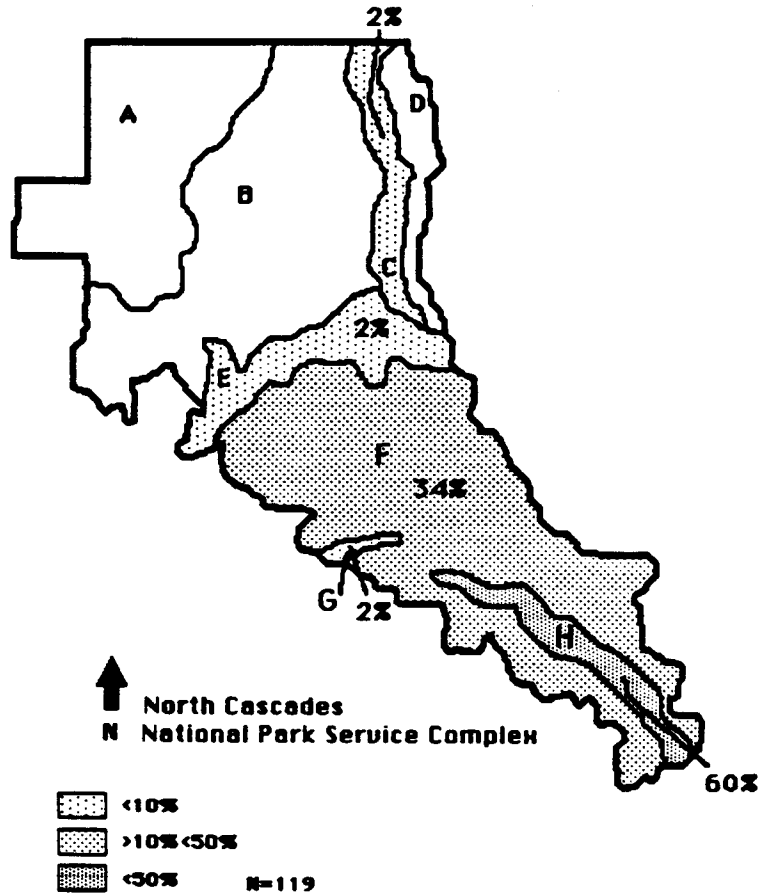


Map 3.6: Proportion of period visits to each zone by Stehekin visitors--evening period

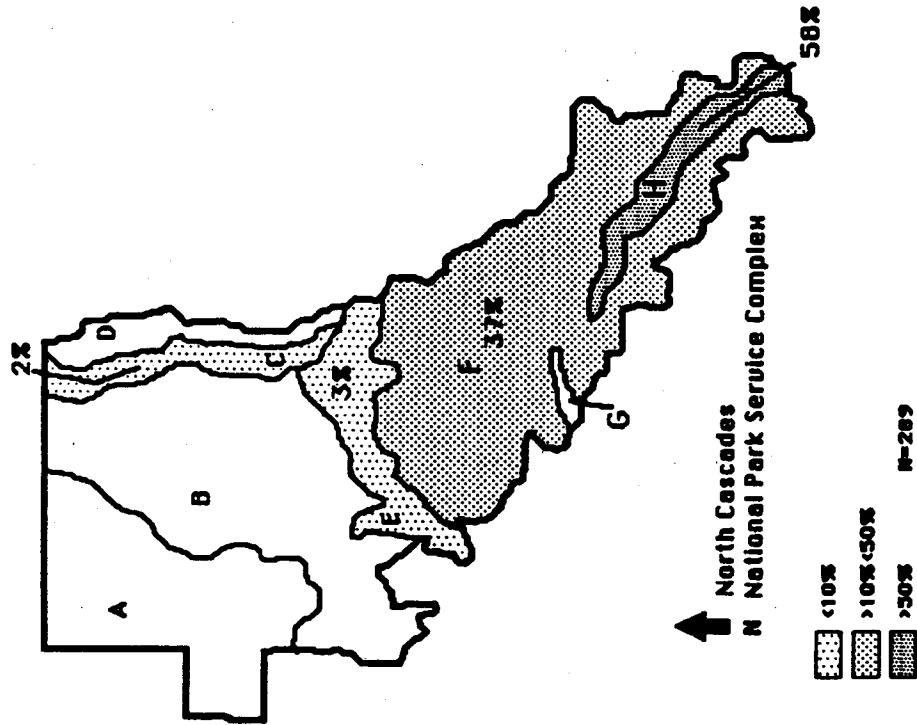


Map 3.5: Proportion of period visits to each zone by Stehekin visitors--dusk period

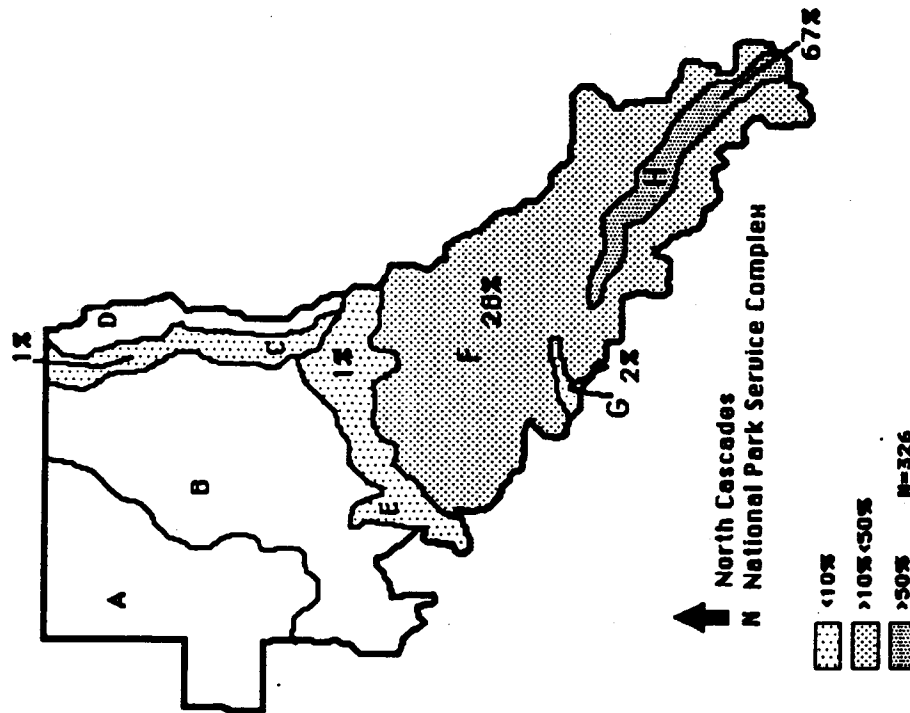
E. Visitors' locations and use of time combined



Map 3.7: Proportion of period visits to each zone by Stehekin visitors--overnight period

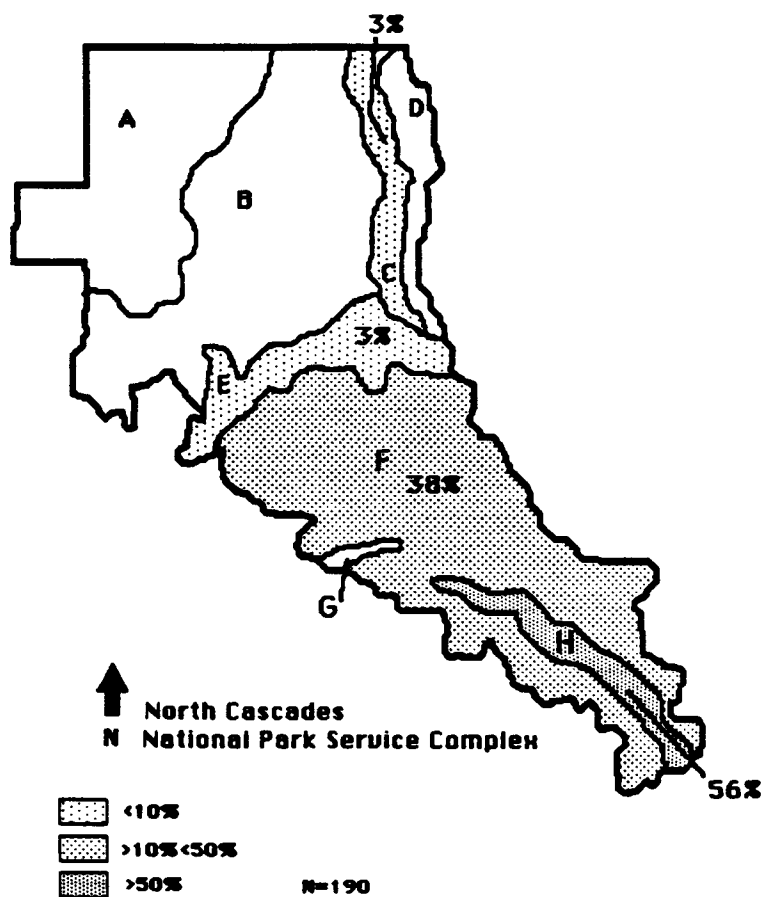


Map 3.8: Proportion of period visits to each zone by Stehekin visitors--day 1 of visit



Map 3.9: Proportion of period visits to each zone by Stehekin visitors--day 2 of visit

E. Visitors' locations and use of time combined



Map 3.10: Proportion of period visits to each zone by Stehekin visitors--day 3 of visit

F. Visitors activities and use of time combined

Like the use of different zones, Stehekin visitors' activities varied each time period, as shown in Figures 3.11 through 3.16. Sleeping and eating were the predominant activities during sunrise and again during the dusk, evening, and overnight periods, while hiking/walking was the main activity during the morning and afternoon. Figures 3.17 through 3.19 show the amounts of period visits for activities for each additional day of visit. The distribution of activities varied little by day.

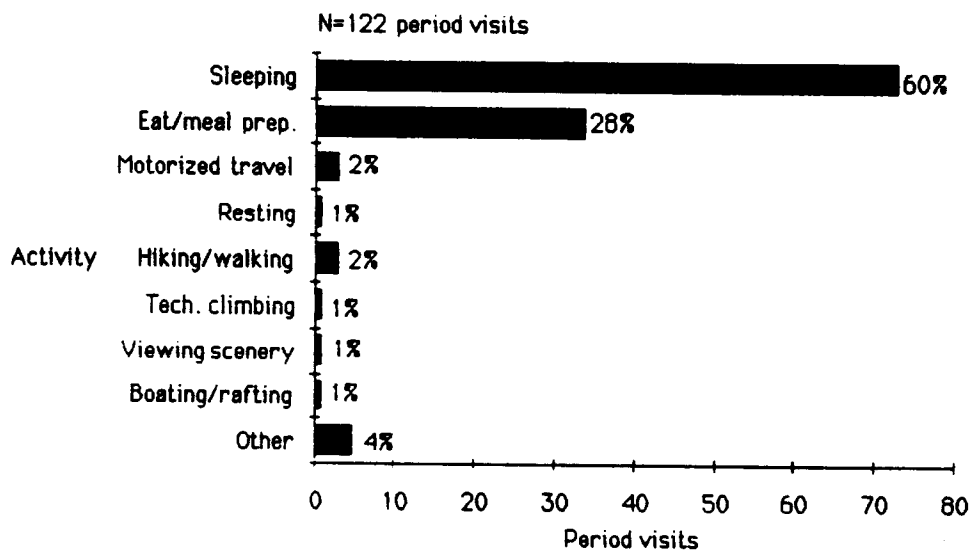


Figure 3.11: Period visits for activities of Stehekin visitors--sunrise period

F. Visitors' activities and use of time combined

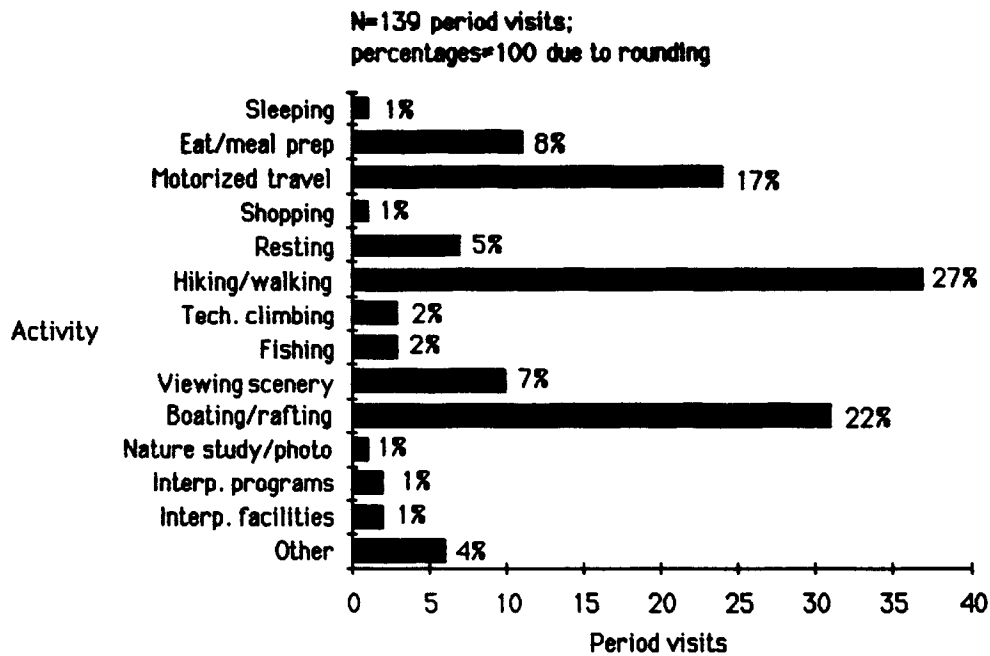


Figure 3.12: Period visits for activities of Stehekin visitors--
morning period

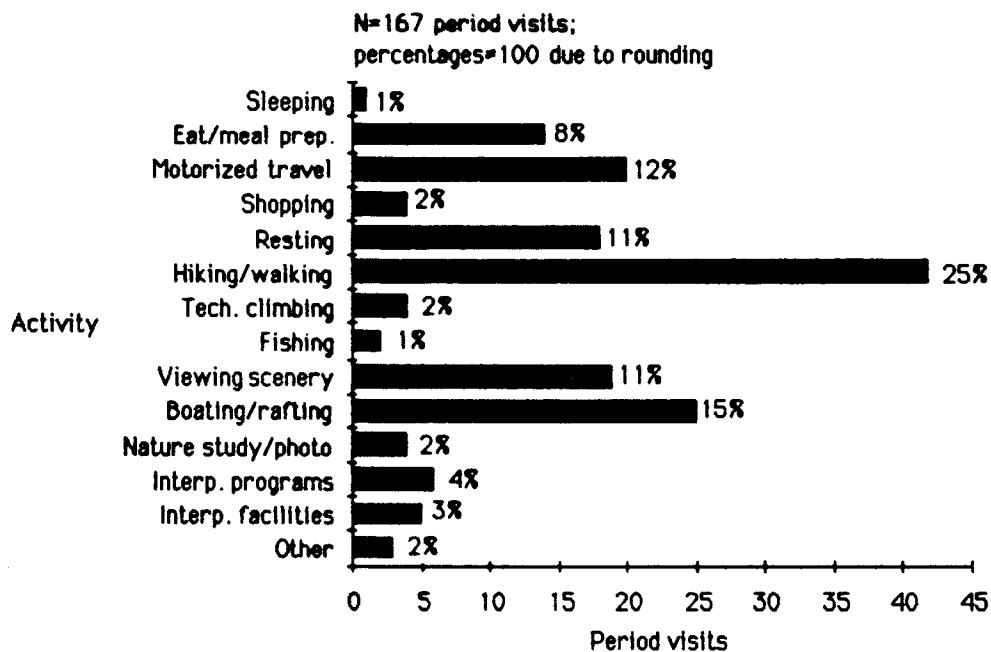


Figure 3.13: Period visits for activities of Stehekin visitors--
-afternoon period

F. Visitors' activities and use of time combined

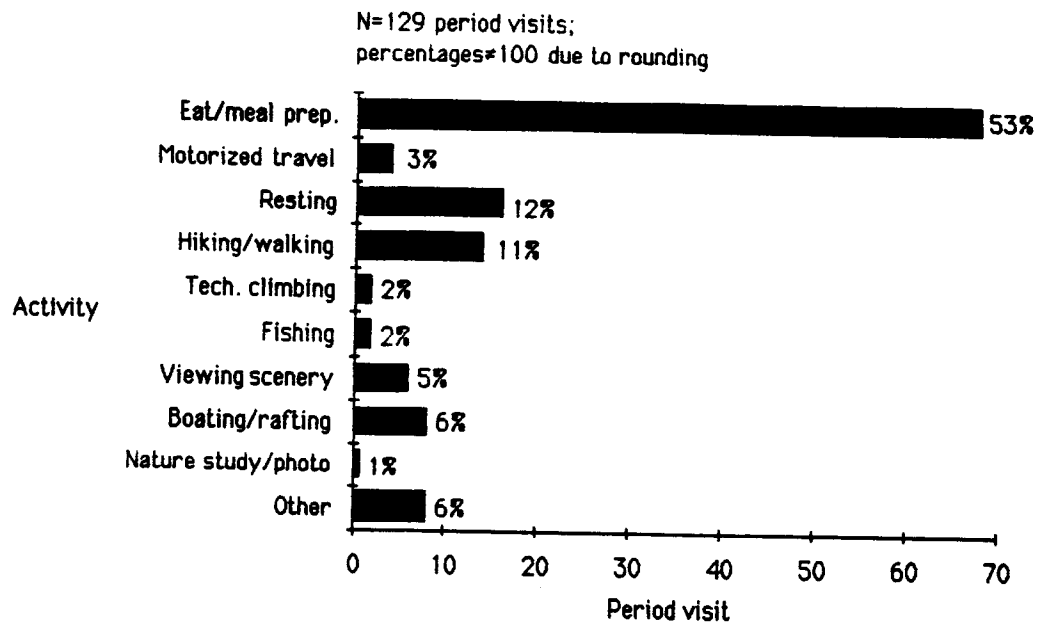


Figure 3.14: Period visits for activities of Stehekin visitors--
dusk period

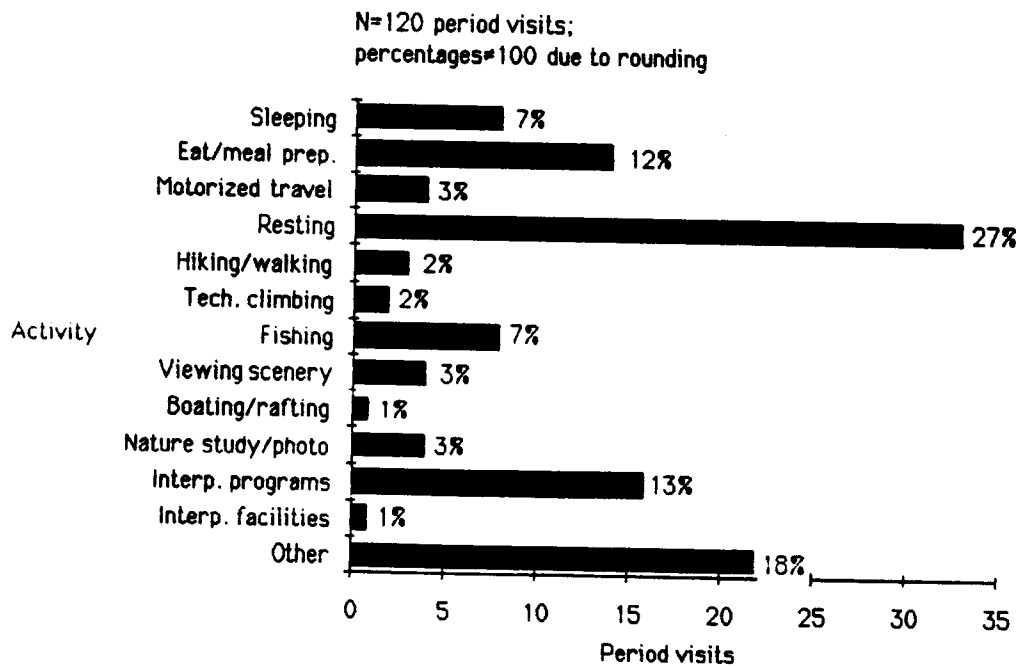


Figure 3.15: Period visits for activities of Stehekin visitors--
evening period

F. Visitors' activities and use of time combined

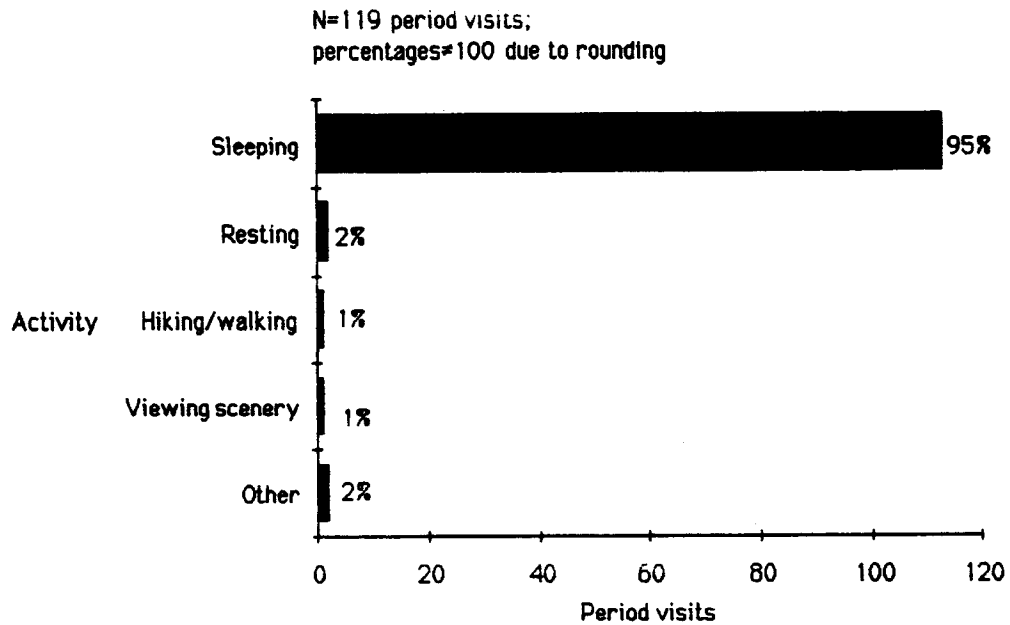


Figure 3.16: Period visits for activities of Stehekin visitors-
-overnight period

F. Visitors' activities and use of time combined

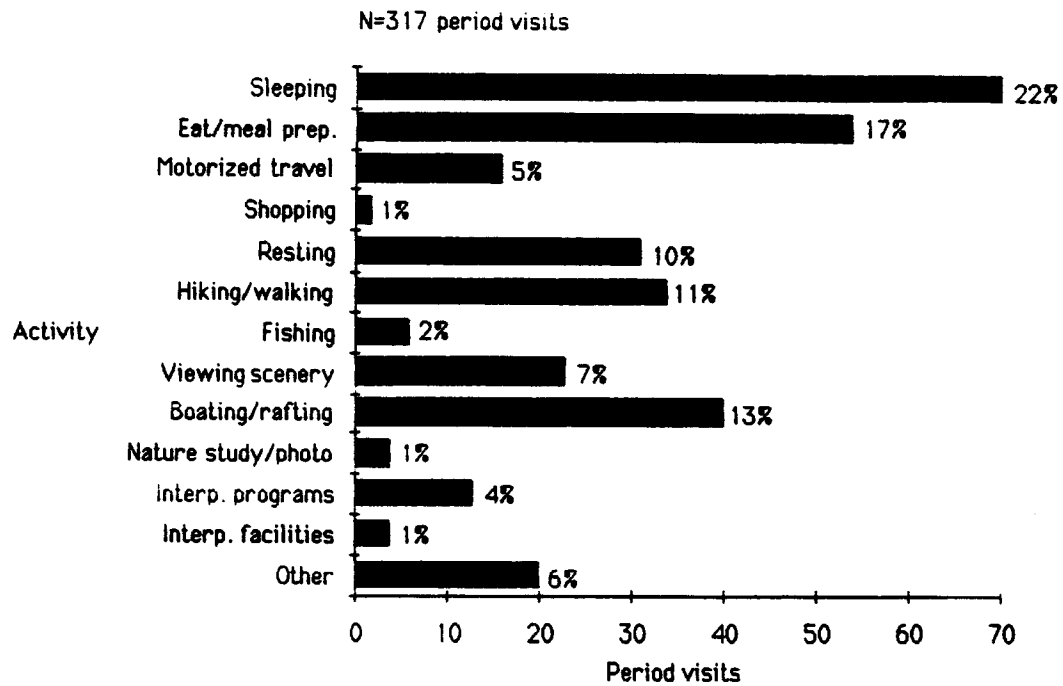


Figure 3.17: Period visits for activities of Stehekin visitors--
day 1 of visit

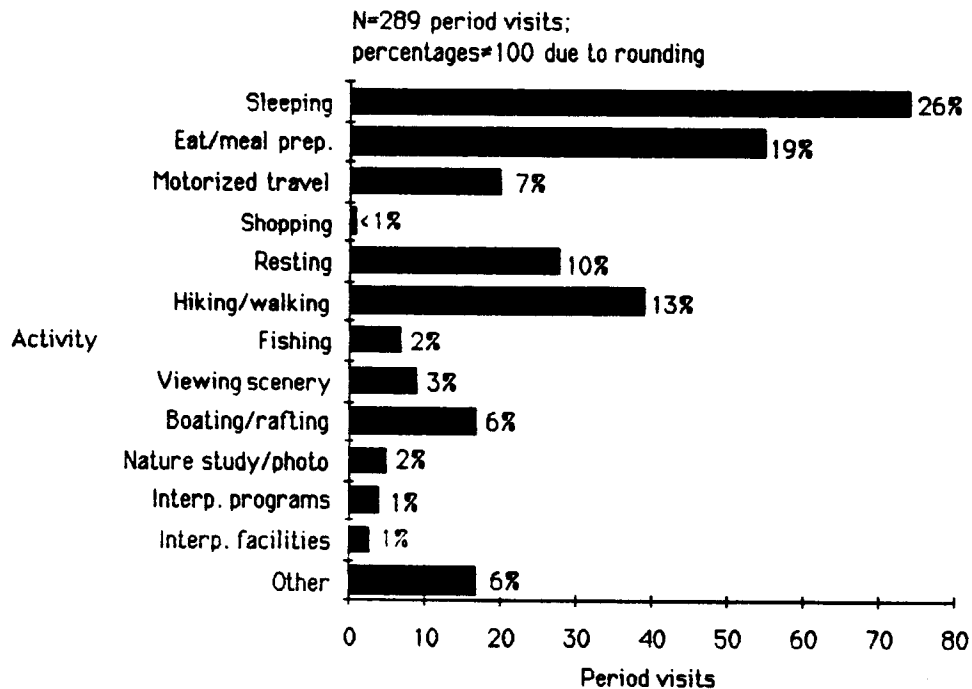


Figure 3.18: Period visits for activities of Stehekin visitors--
-day 2 of visit

F. Visitors' activities and use of time combined

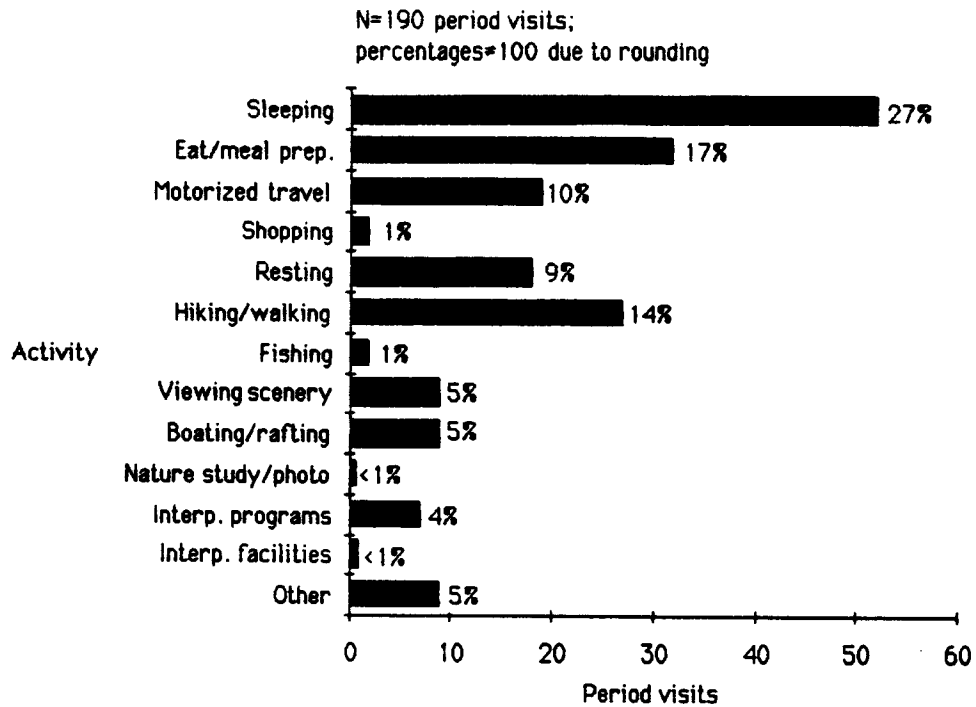


Figure 3.19: Period visits for activities of Stehekin visitors-
-day 3 of visit

G. Visitors locations and activities combined

Stehekin visitors used the zones in different amounts, and for different activities. That is, the relative proportions of activities varied from zone to zone, as shown in Table 3.1. (Due to recording errors, small amounts of activities are shown occurring in zones where they cannot occur--for example, motorized travel and shopping in zone F.) Some activities, such as resting or viewing scenery, occurred in all zones, while others (technical climbing, boating/rafting) were concentrated in particular zones.

G. Visitors' locations and activities combined

Table 3.1: Proportion of period visits for activities occurring in each zone, Stehekin visitors (%).

Activity	Zone				
	C %	E %	F %	G %	H %
Sleeping (n=195)	3	1	36	1	58*
Eat/meal prep. (n=138)	1	1	29	-	68*
Motorized travel (n=54)	-	13	18	2	67
Shopping (n=5)	-	-	20	-	80
Resting (n=77)	1	4	31	1	62*
Hiking/walking (n=100)	-	-	72	2	26
Tech. climbing (n=12)	-	-	100	-	-
Fishing (n=15)	-	7	20	-	73
Viewing scenery (n=41)	10	2	15	2	71
Boating/rafting (n=65)	5	-	3	-	92
Nature study/ photography (n=10)	-	-	30	-	70
Interp. programs (n=24)	-	-	37	-	62*
Interp. facilities (n=8)	-	-	12	-	87*
Other (n=44)	-	-	32	-	68

*Row percentages=100 due to rounding

H. Visitors' locations, activities, and use of time combined

By combining data on locations, activities, and use of time, a more detailed picture of Stehekin visitors' behavior is possible. Table 3.2 shows the proportion of period visits for activities during each time period for zone H. Certain activities, such as resting and viewing scenery took place during almost all time periods.

Table 3.2: Proportion of period visits for activities of Stehekin visitors among each time period for ZONE H (%).~

Activity	Time period					
	Sunrise %	Morning %	A'noon %	Dusk %	Evening %	O'night %
Sleeping (n=113)	40	1	1	-	-	58
Eat/meal prep. (n=94)	23	11	20	44	13	-8
Motorized travel (n=36)	6	44	31	11	8	-
Shopping (n=4)	-	25	75	-	-	-
Resting (n=48)	-	10	21	23	42	4
Hiking/walking (n=26)	-	38	46	15	-	-*
Fishing (n=11)	-	18	9	9	64	-
Viewing scenery (n=29)	3	28	41	17	7	3
Boating/rafting (n=60)	2	47	40	12	-	-*
Nature study/ photography (n=7)	-	14	43	14	29	-
Interp. programs (n=15)	-	-	27	-	73	-
Interp. facilities (n=7)	-	29	57	-	14	-
Other (n=30)	17	7	10	20	43	3

~Data presented with time periods combined over 3 days of visit.

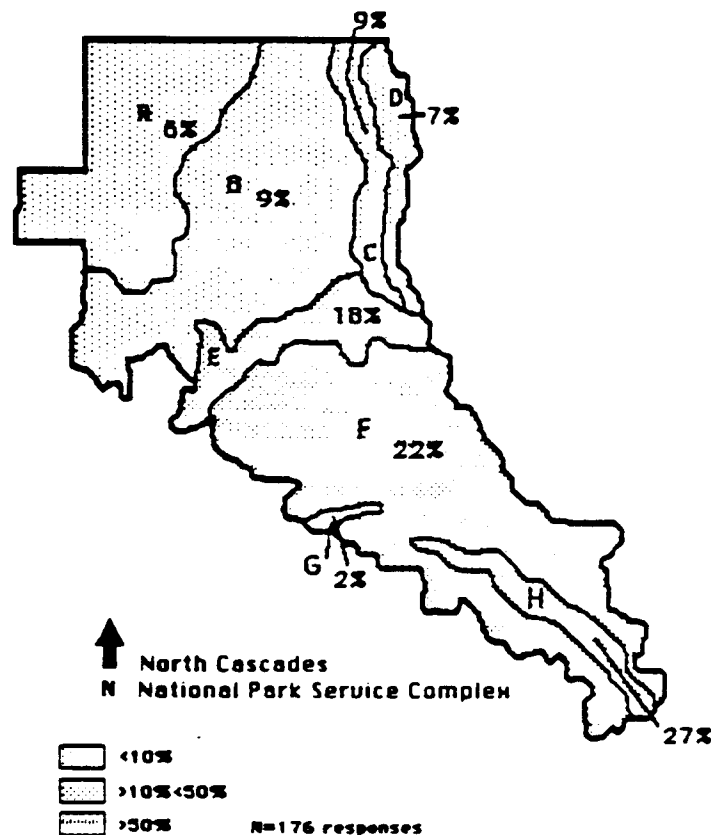
*Row percentages=100 due to rounding.

I. Special questions

Visitors to North Cascades were asked two specific questions about the park:

- 1) "If you plan to return to the North Cascades National Park Service Complex in the future, which zones would you visit?", and
- 2) "If you were planning for the future of the North Cascades National Park Service Complex, what would you do?".

Visitors could list as many zones or make as many suggestions as they liked. All zones were listed; their distribution is shown on Map 3.11. Zone H, the Stehekin area, received the largest proportion of responses, while zones F and E were also popular. Stehekin visitors' suggestions are listed in Appendix D.



Map 3.11: Zones Stehekin visitors would visit on their next trip to North Cascades

RESULTS FROM HOZOMEEN

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Introduction

The Hozomeen area is an isolated fishing and camping destination on Ross Lake. It is accessible via the lake or by road through British Columbia. The following chapter describes the results of the visitor survey conducted there.

Sampling

Visitors were contacted at Hozomeen from August 2, 1985 through August 8, 1985. Due to a forest fire, the selected study period differs slightly from that of the Highway corridor and Stehekin. Questionnaires were distributed by park volunteers to all groups camping at Hozomeen.

80 visitors were contacted, and 78 agreed to participate; thus, the acceptance rate was 98%. Different amounts of visitors were contacted each day of the study period. 32 visitors completed and returned their questionnaires, for a 41% response rate.

A. Visitor profile

The returned questionnaires provide information on both the 32 respondents and the groups they were with. Hozomeen visitors came in many different group sizes and group types. Figure 4.1 shows the group sizes, which ranged from 2 to 8 people. While the average group size (mean) was 4 people, the most common (mode) size was 2. Over one-half of the visitors came in family groups, as shown in Figure 4.2.

Questions on the age, number of previous visits to North Cascades, and home zip codes of each group member were included. Figures 4.3 through 4.6 illustrate the results. Children (1-15 years old), young adults (26 to 35 years old), and seniors (60 to 65 years old) were the most common ages; over one-half had visited North Cascades a few times before. Visitors came from 3 different states and Canada. Washington resident visitors came from 4 different counties within the state.

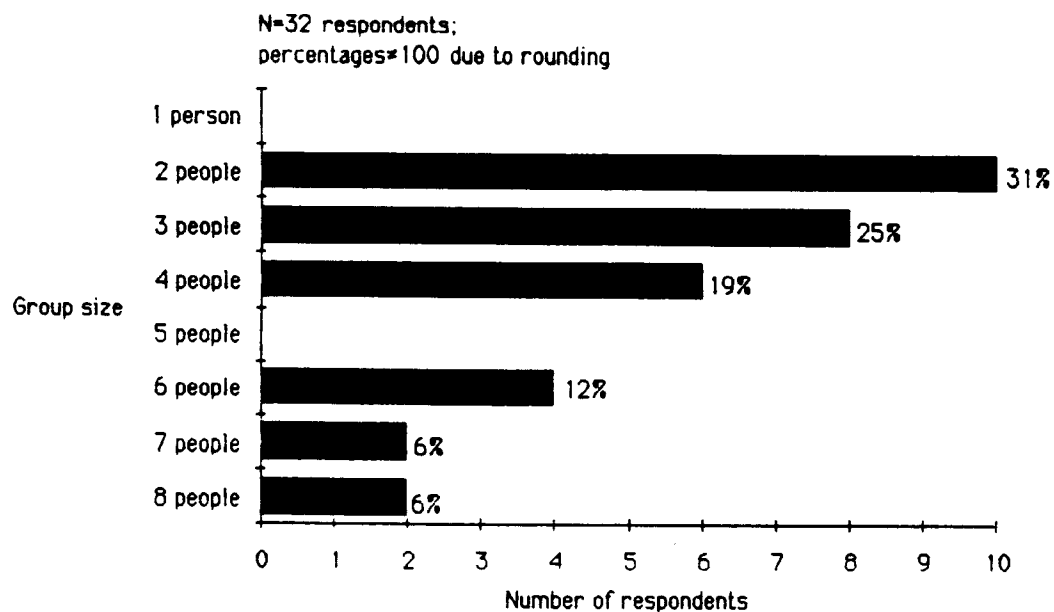


Figure 4.1: Hozomeen visitors' group size

A. Visitor profile

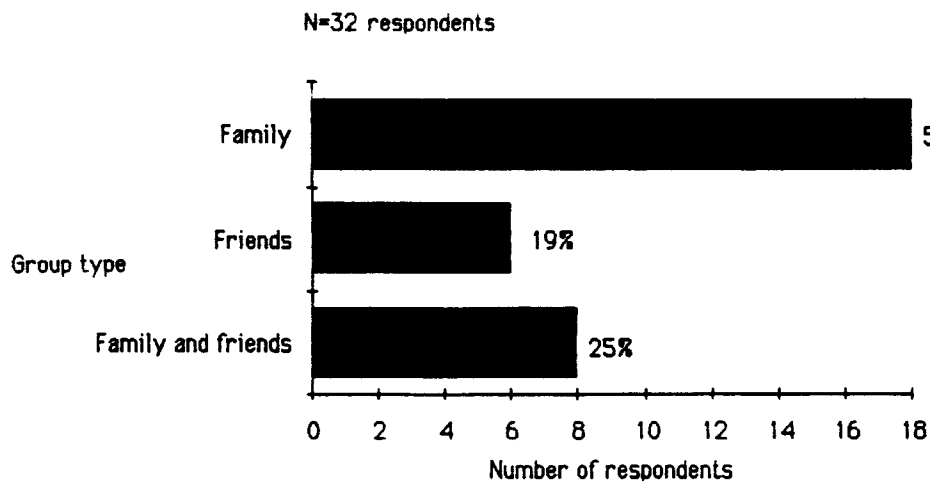


Figure 4.2: Hozomeen visitors' group type

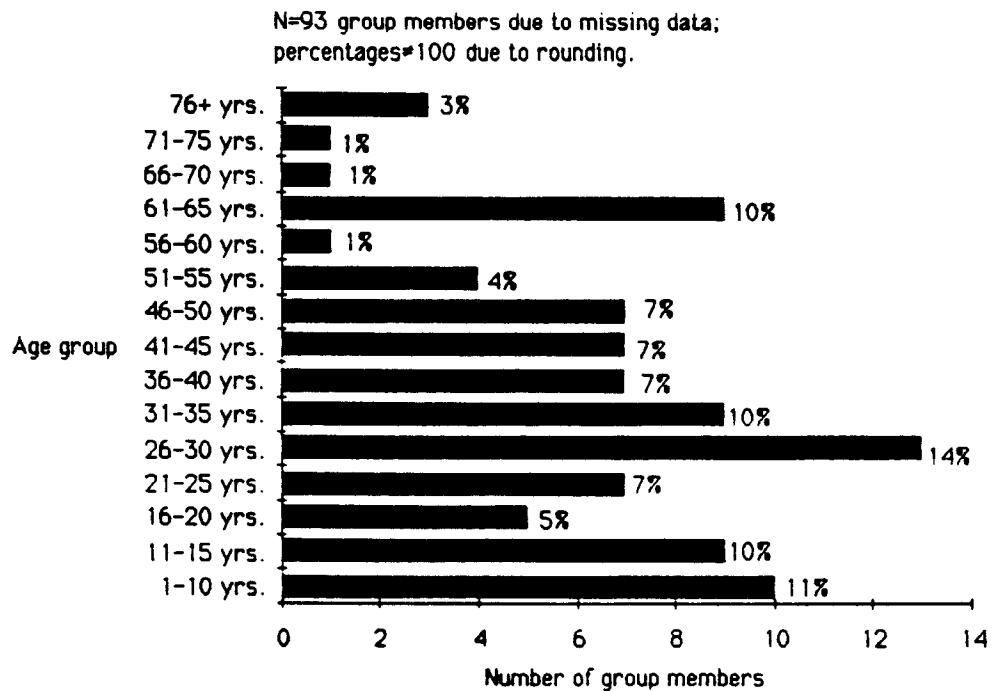


Figure 4.3: Ages of Hozomeen visitors

A. Visitor profile

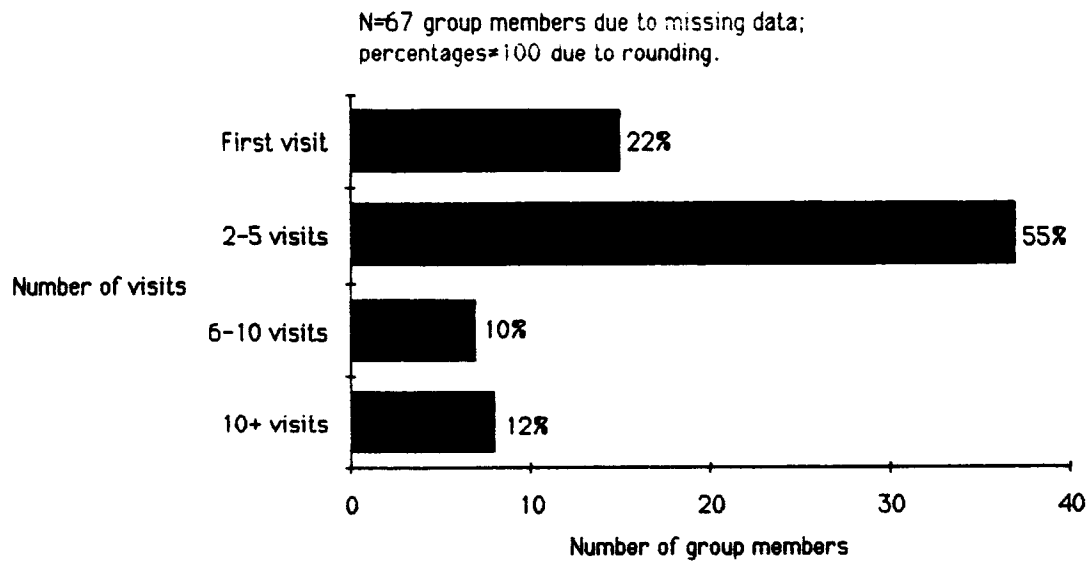


Figure 4.4: Hozomeen visitors' previous visits to North Cascades



Figure 4.5: Proportion of Hozomeen visitors from each state

A. Visitor profile

N=24 group members; percentages≠100 due to rounding

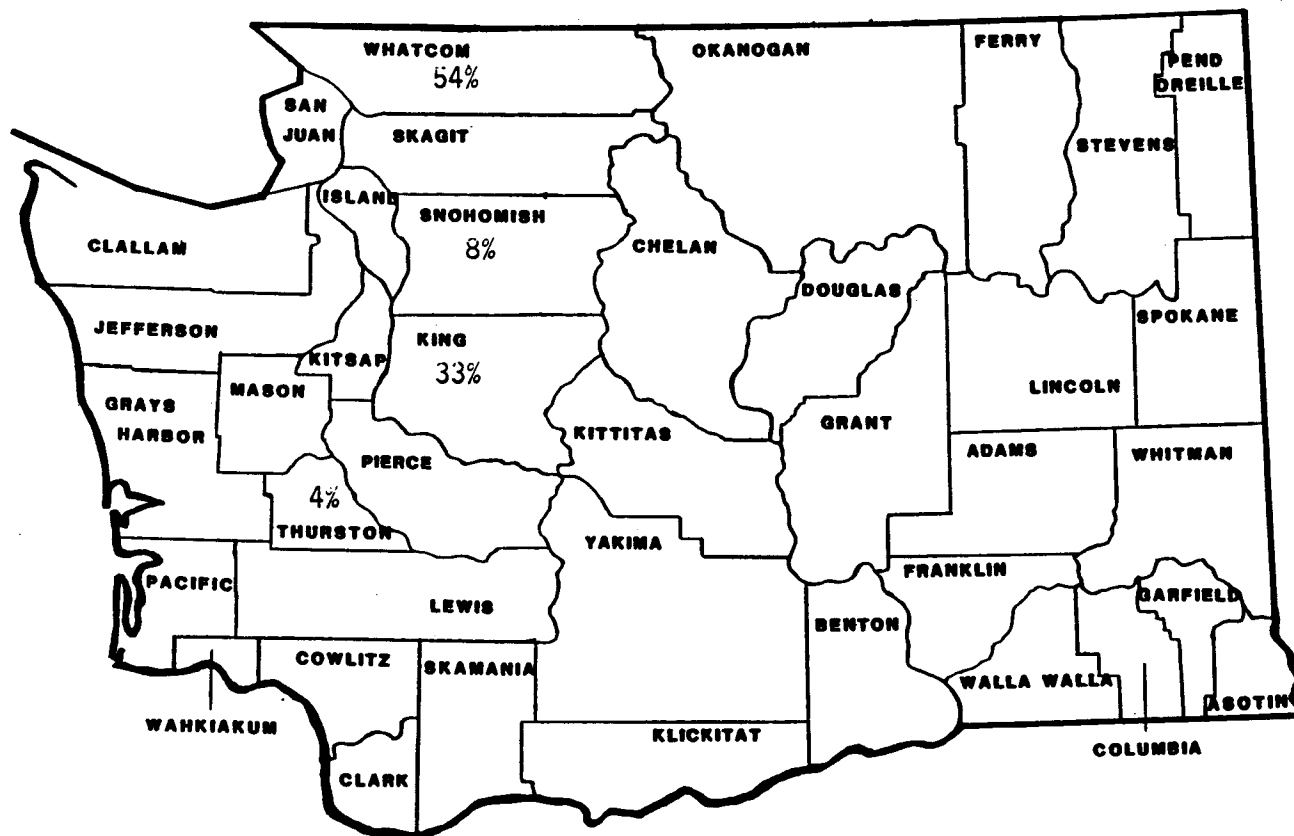


Figure 4.6: Proportion of Washington resident Hozomeen visitors from each county

B. Visitors' use of time

Most Hozomeen visitors entered North Cascades between 2:00 and 3:00 p.m., although other times were common, as shown in Figure 4.7. Most stayed 3 days, as shown in Figure 4.8.

Visitors' use of the area over time is measured in period visits (see Introduction), which represent one group in a particular zone engaged in a particular activity for a specific time period. The amount of period visits changed with the time period of the day, as shown in Figure 4.9. The largest portion of period visits occurred during the sunrise period.

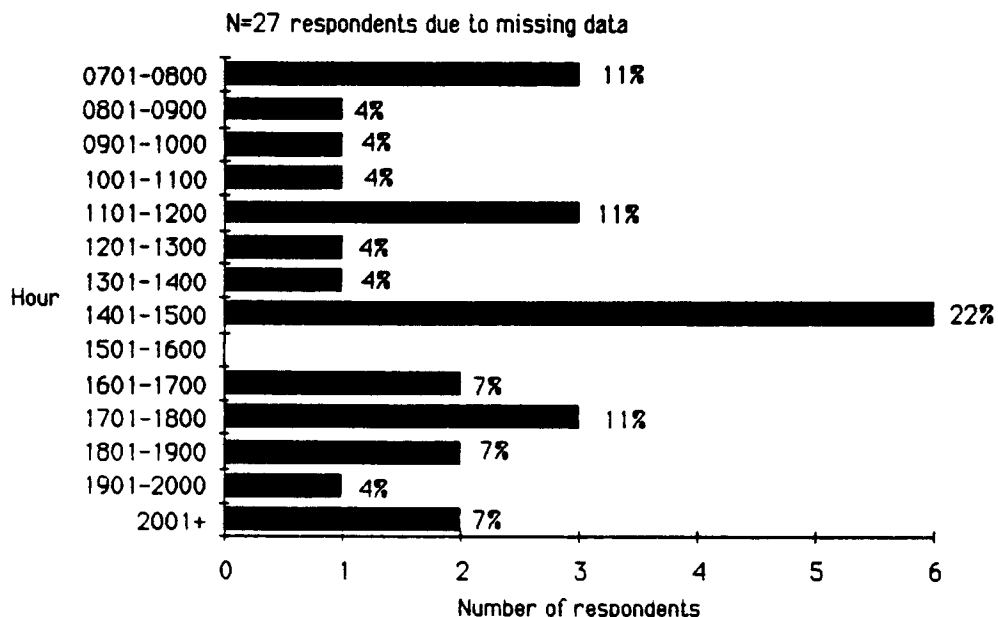


Figure 4.7: Number and percent of Hozomeen visitors entering North Cascades each hour of the day

B. Visitors' use of time

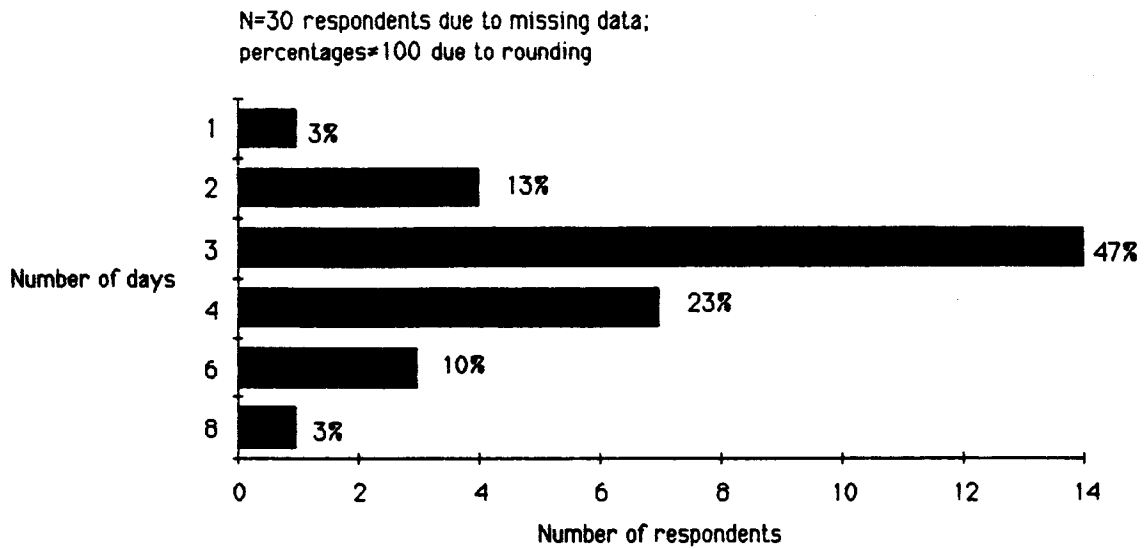


Figure 4.8: Number of days Hozomeen visitors spent in North Cascades this visit

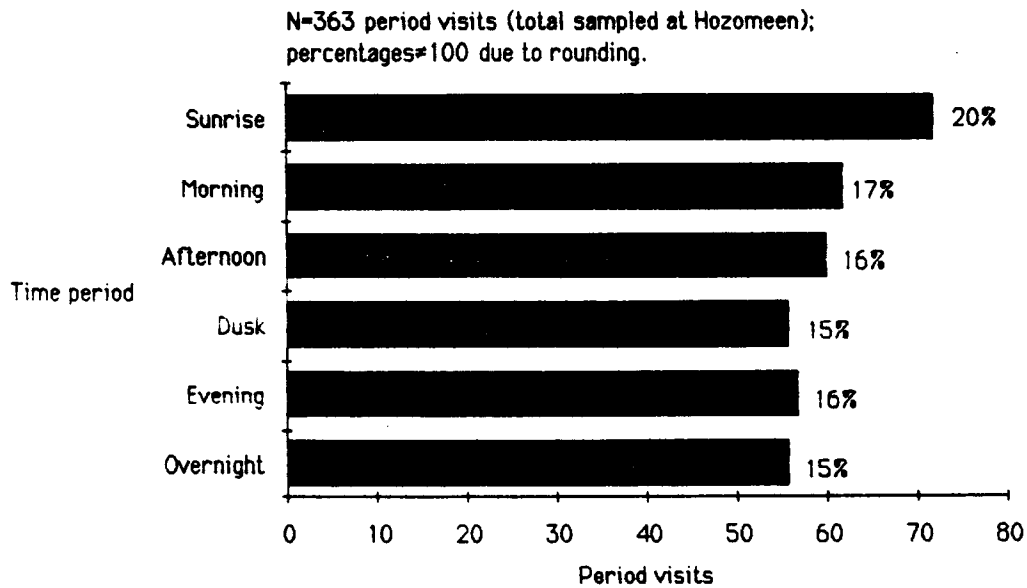
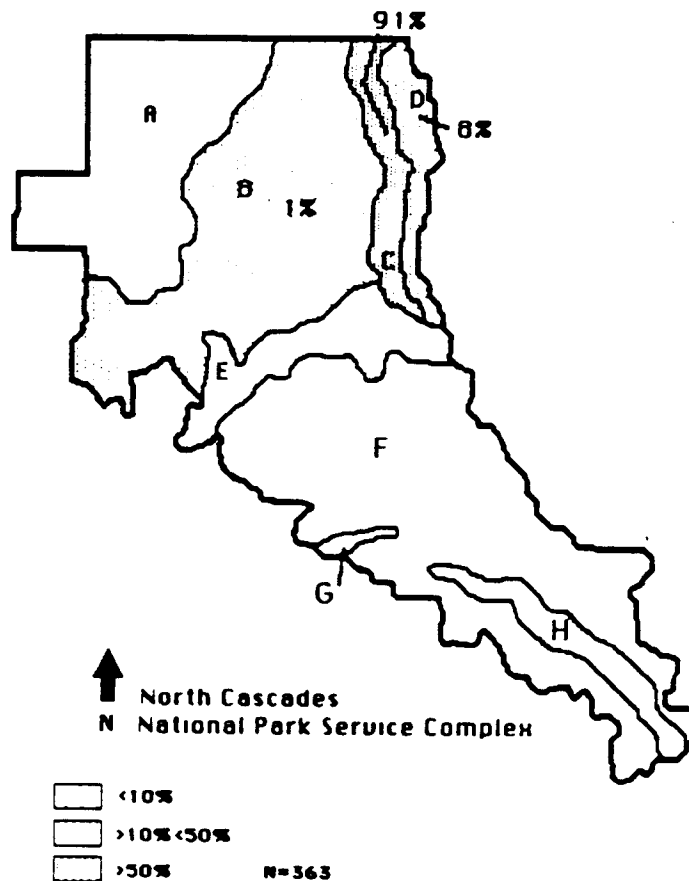


Figure 4.9: Period visits each time period--Hozomeen visitors

C. Visitors' locations

While Hozomeen visitors spent almost all of their period visits in zone C, they also used zones B and D, as shown on Map 4.1.



Map 4.1: Proportion of period visits to each zone by Hozomeen visitors

D. Visitors' activities

Hozomeen visitors engaged in the activities shown in Figure 4.10. (The total amounts of period visits to zones and for activities vary slightly due to recording errors.) Visitors listed "other" for 3% of their period visits. Eating and sleeping were the predominant activities, resting and fishing were also popular.

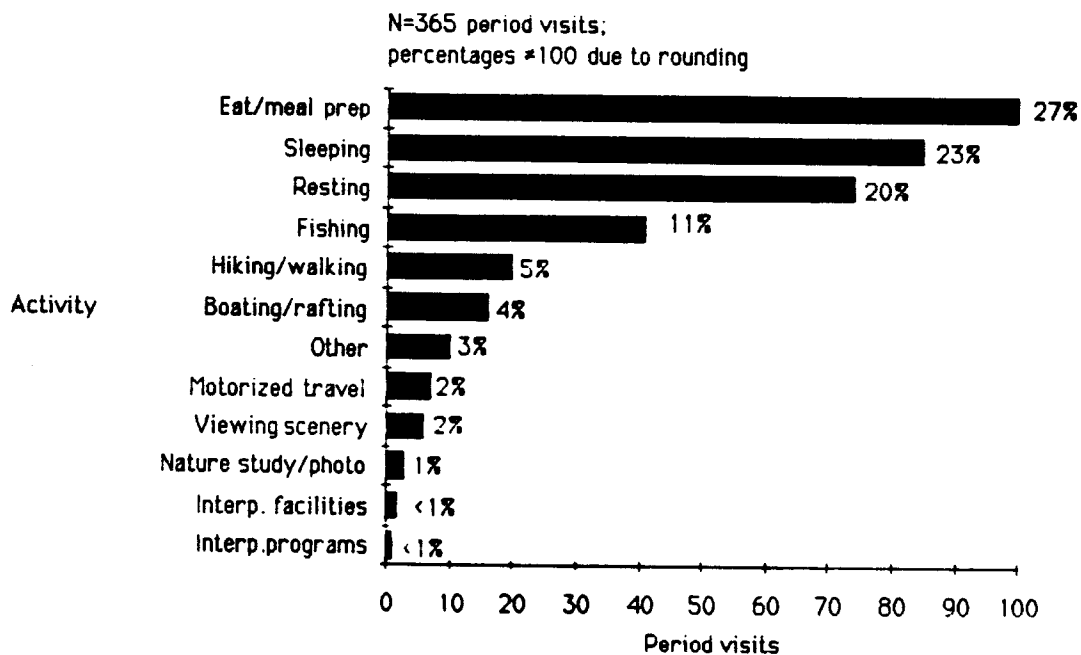
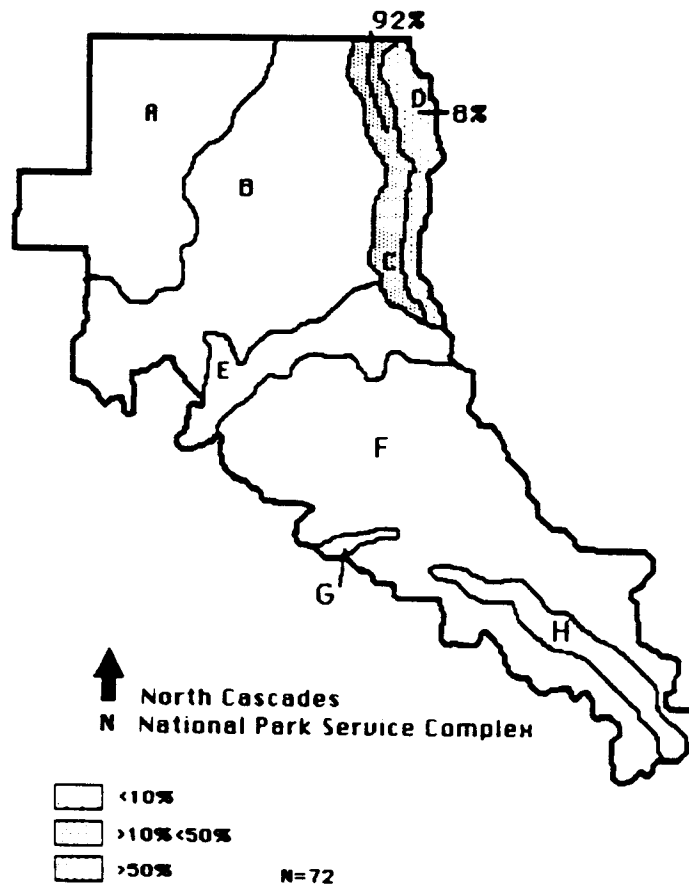


Figure 4.10: Total period visits for each activity--Hozomeen visitors

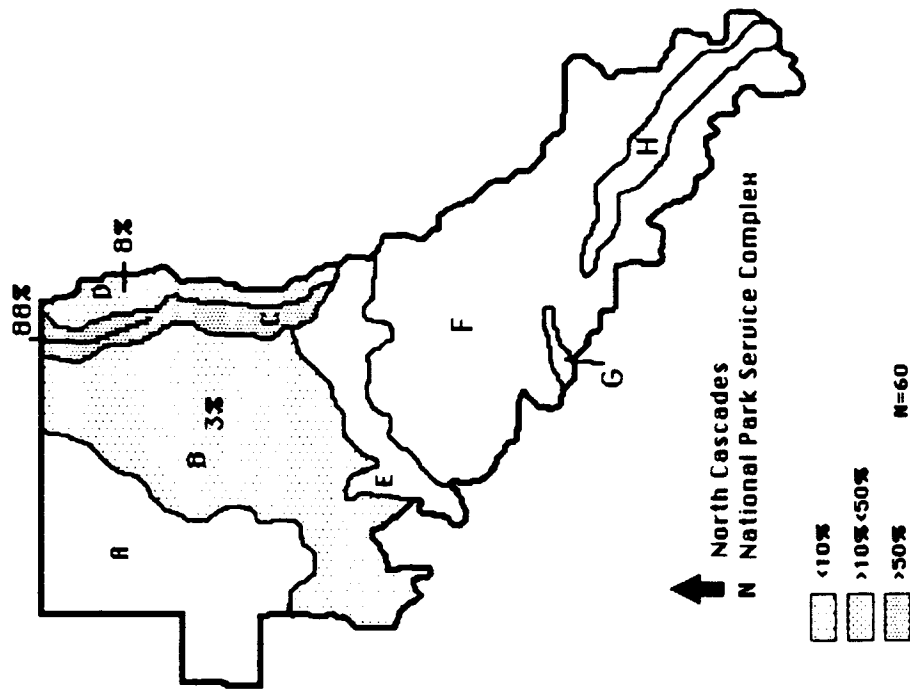
E. Visitors' locations and use of time combined

Hozomeen visitors' use of each zone changed with the different time periods, as shown on Maps 4.2 through 4.7. The proportion of use in zone C was greatest during all periods; use in zone B increased during the morning and afternoon periods. Maps 4.8 through 4.10 show the proportion of period visits to each zone by day of visit. In general, use in zone C decreased while use in zone D increased with each additional day of visit; use in zone B remained stable.

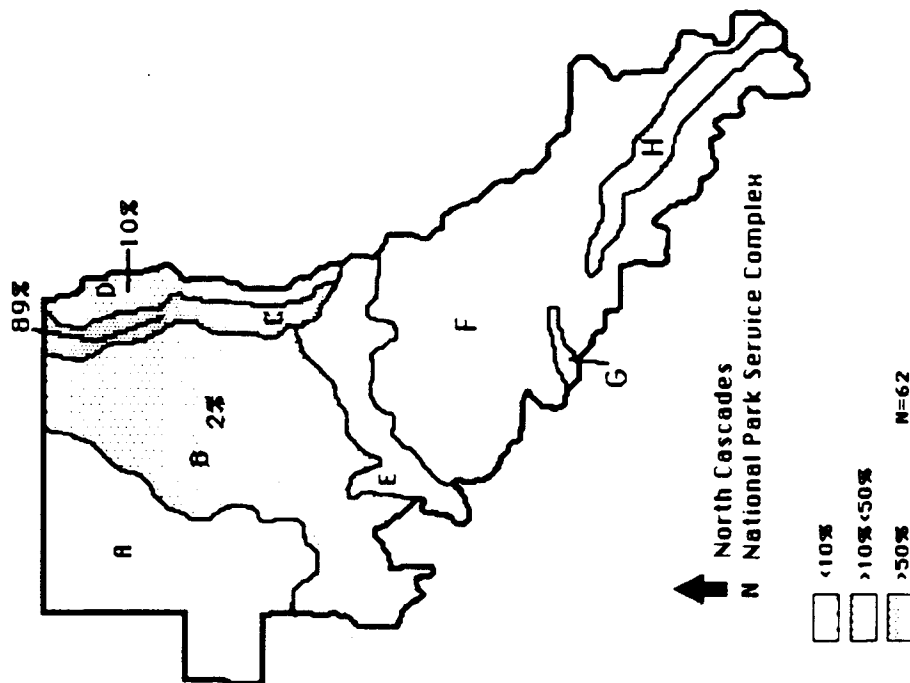


Map 4.2: Proportion of period visits to each zone by Hozomeen visitors--sunrise period

E. Visitors' locations and use of time combined

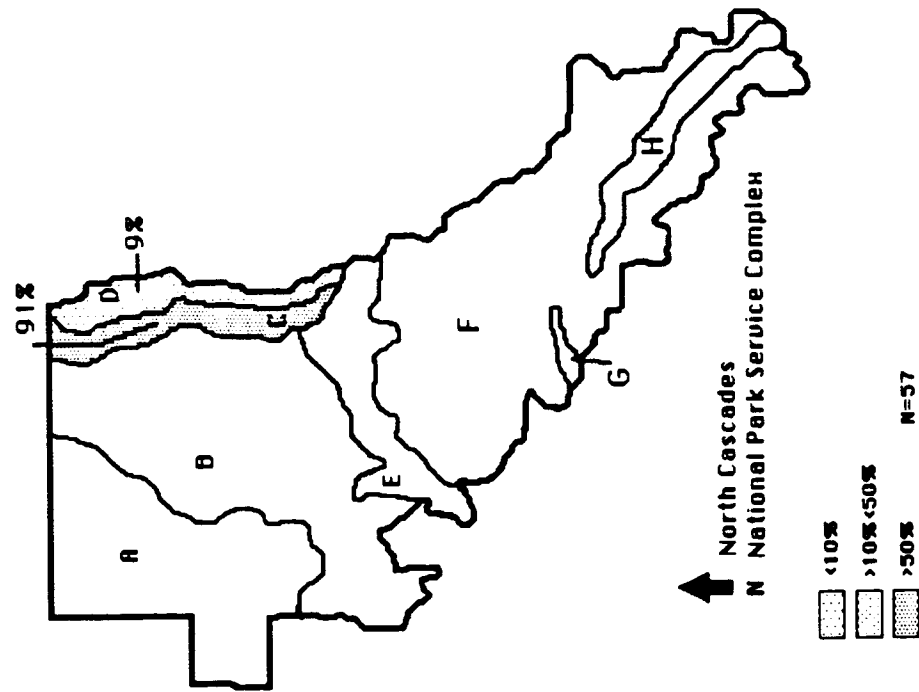


Map 4.3: Proportion of period visits to each zone by
Hozomeen visitors--morning period

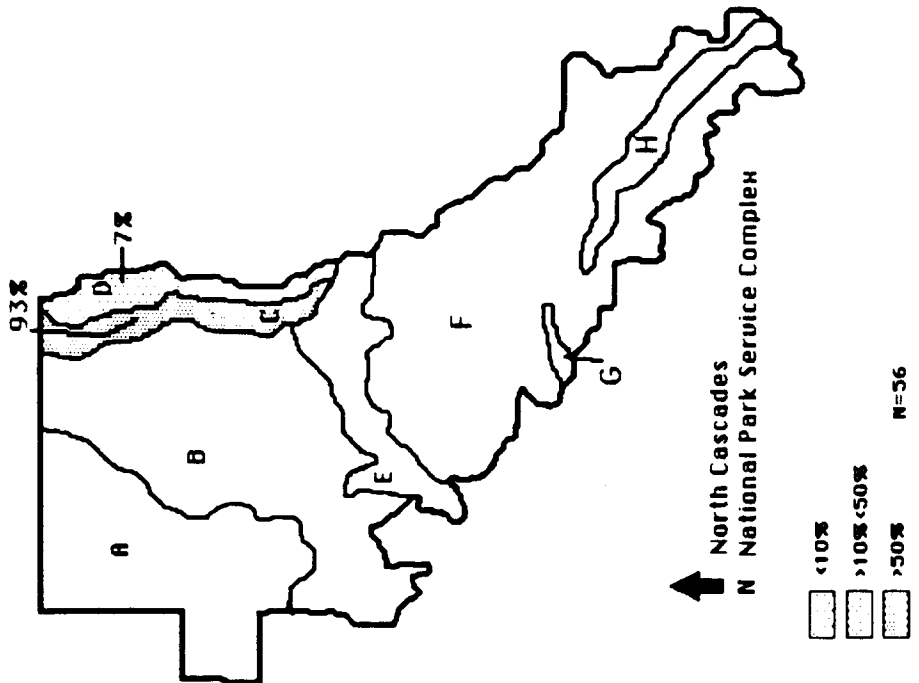


Map 4.4: Proportion of period visits to each zone by
Hozomeen visitors--afternoon period

E. Visitors' locations and use of time combined

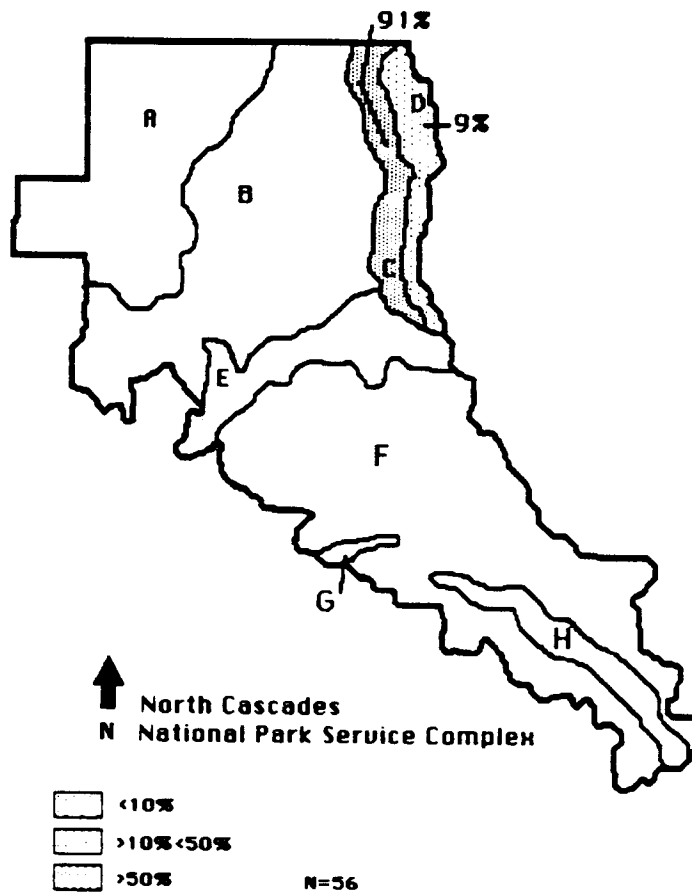


Map 4.6: Proportion of period visits to each zone by Hozomeen visitors--evening period

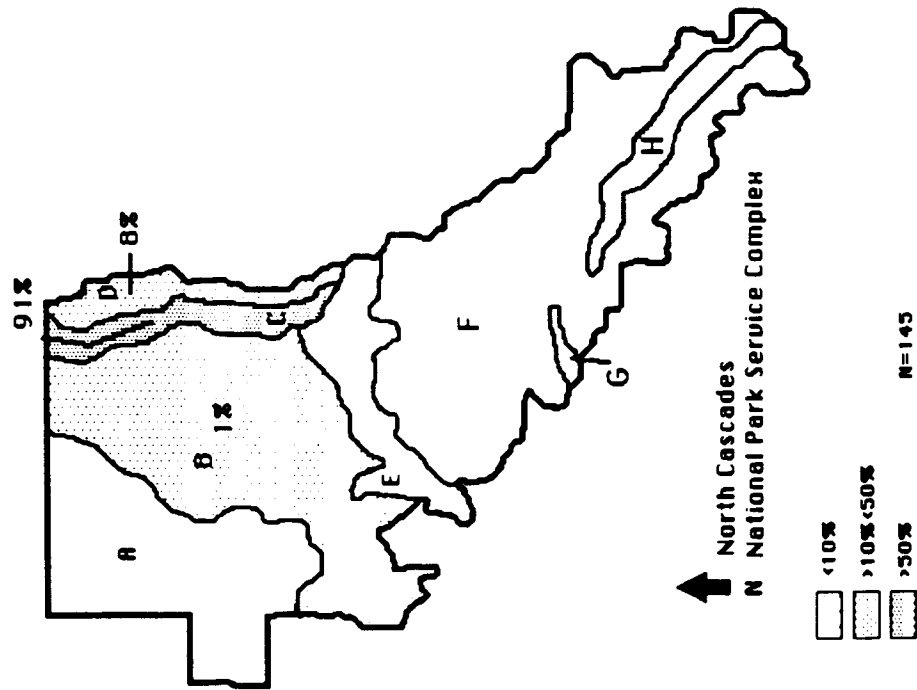


Map 4.5: Proportion of period visits to each zone by Hozomeen visitors--dusk period

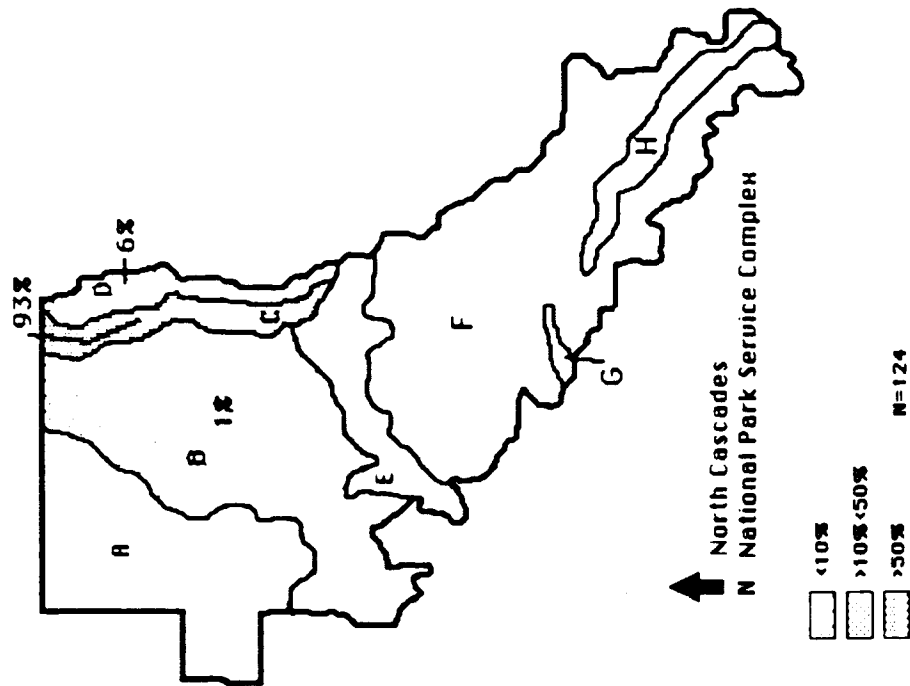
E. Visitors' locations and use of time combined



Map 4.7: Proportion of period visits to each zone by Hozomeen visitors--overnight period

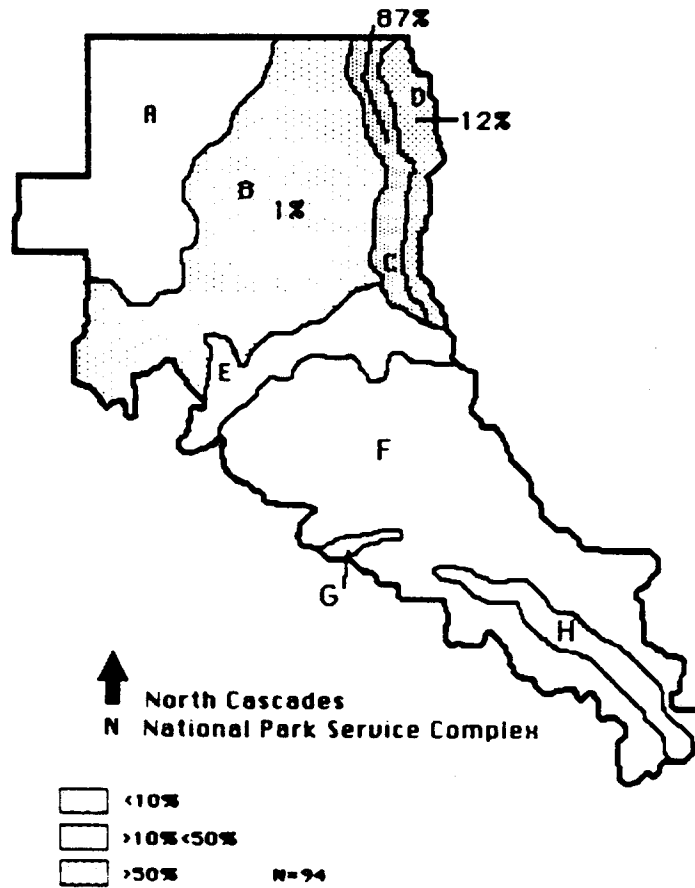


Map 4.9: Proportion of period visits to each zone by Hazomeen visitors--day 2 of visit



Map 4.8: Proportion of period visits to each zone by Hazomeen visitors--day 1 of visit

E. Visitors' locations and use of time combined



Map 4.10: Proportion of period visits to each zone by Hozomeen visitors--day 3 of visit

F. Visitors' activities and use of time combined

Like the use of different zones, Hozomeen visitors' activities varied each time period, as shown in Figures 4.11 through 4.16. Sleeping was the predominant activity during the sunrise and overnight periods, eating during morning and dusk, and resting during the afternoon and evening. Figures 4.17 through 4.19 show the amounts of period visits for each additional day of visit. The distribution of activities varied little by day.

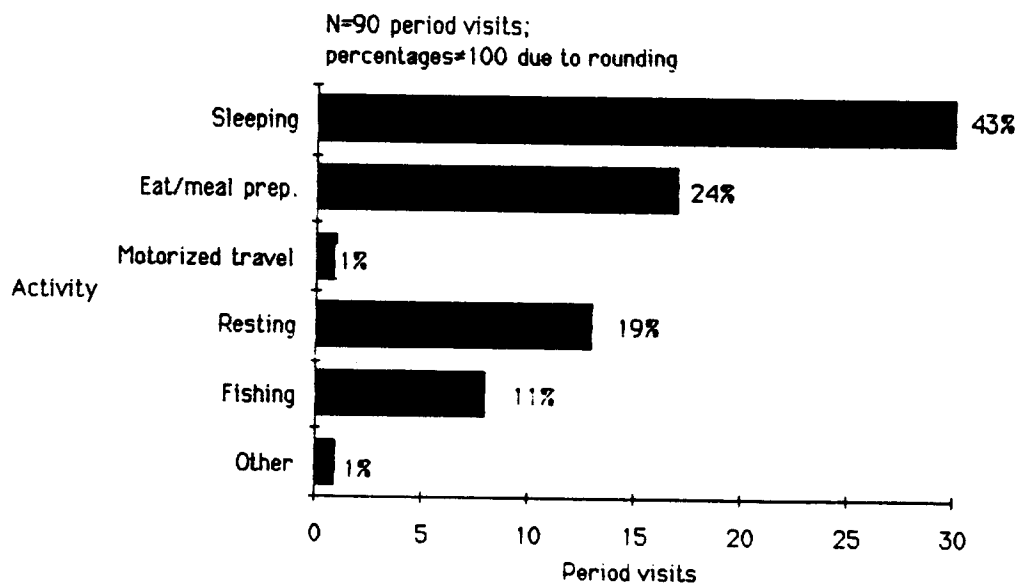


Figure 4.11: Period visits for activities of Hozomeen visitors--sunrise period

F. Visitors' activities and use of time combined

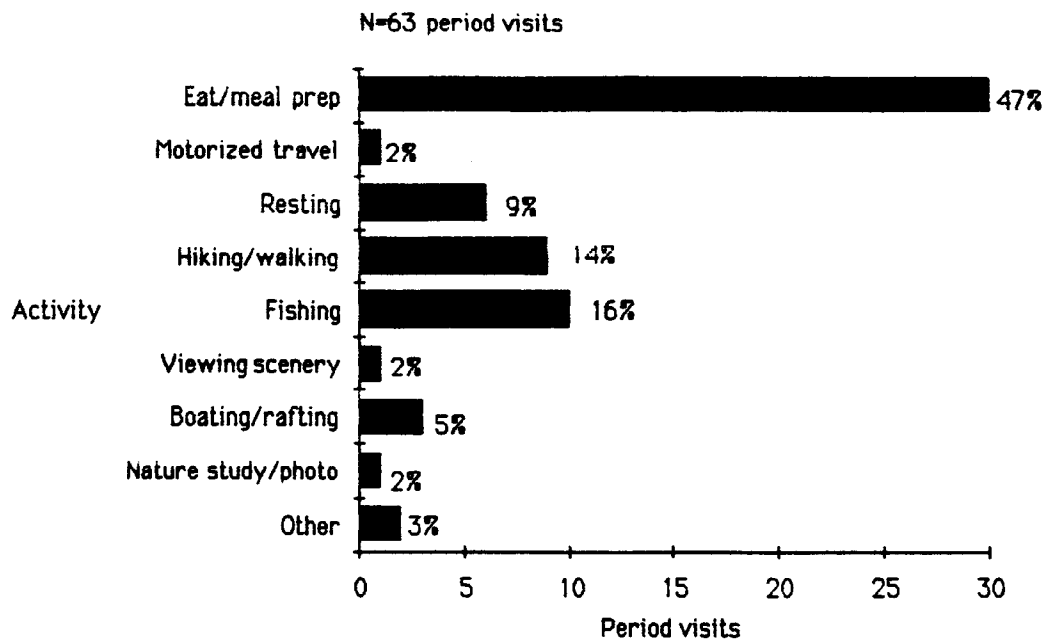


Figure 4.12: Period visits for activities of Hozomeen visitors--morning period

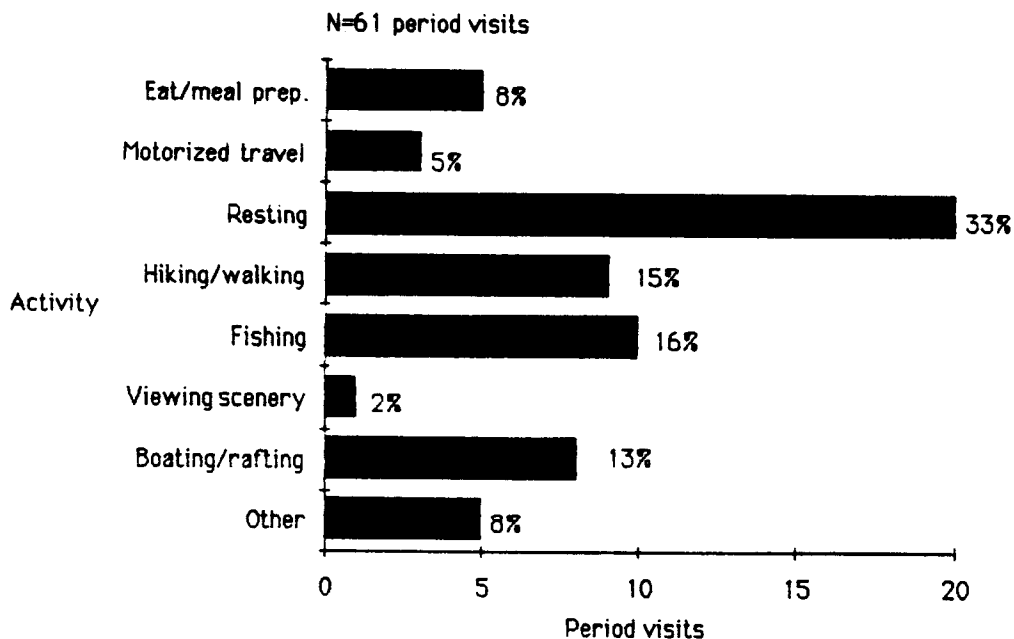


Figure 4.13: Period visits for activities of Hozomeen visitors--afternoon period

F. Visitors' activities and use of time combined

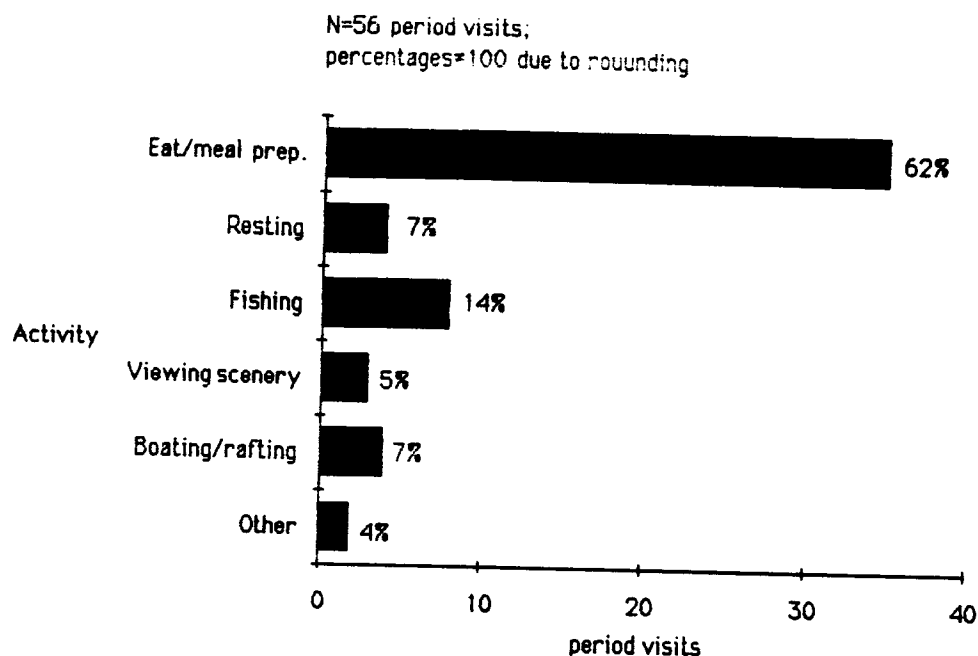


Figure 4.14: Period visits for activities of Hozomeen visitors--
-dusk period

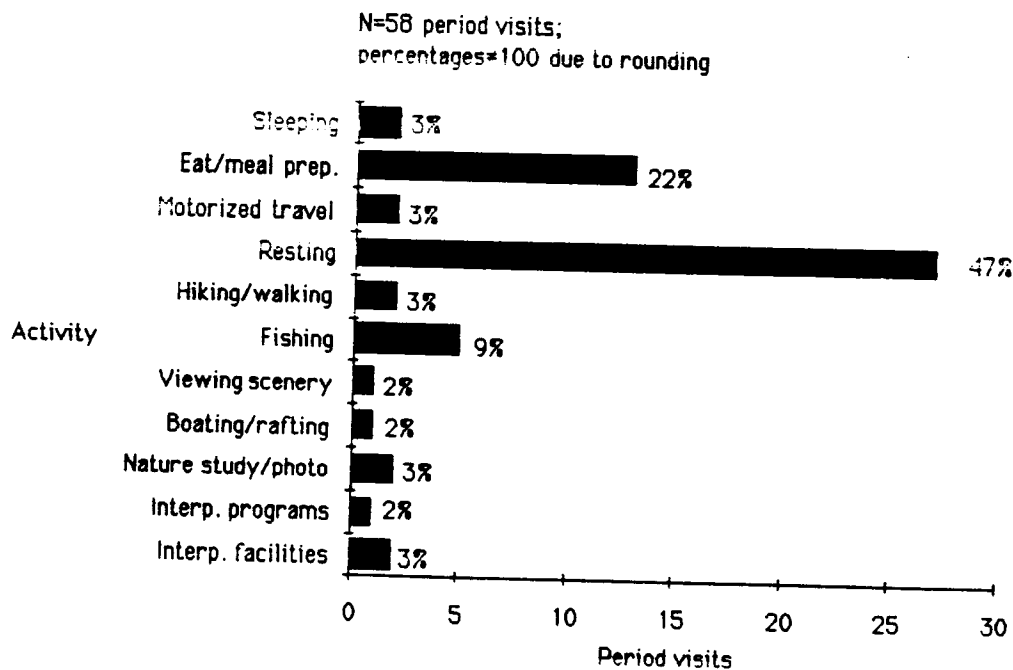


Figure 4.15: Period visits for activities of Hozomeen visitors--
evening period

F. Visitors' activities and use of time combined

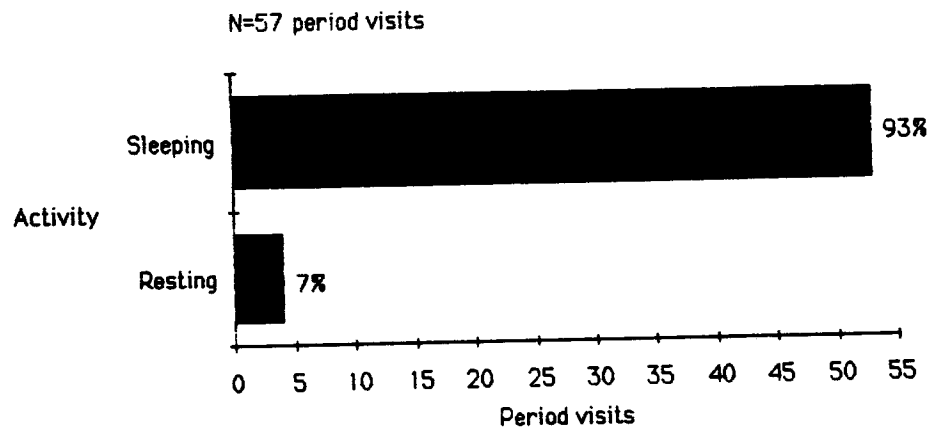


Figure 4.16: Period visits for activities of Hozomeen visitors--overnight period

F. Visitors' activities and use of time combined

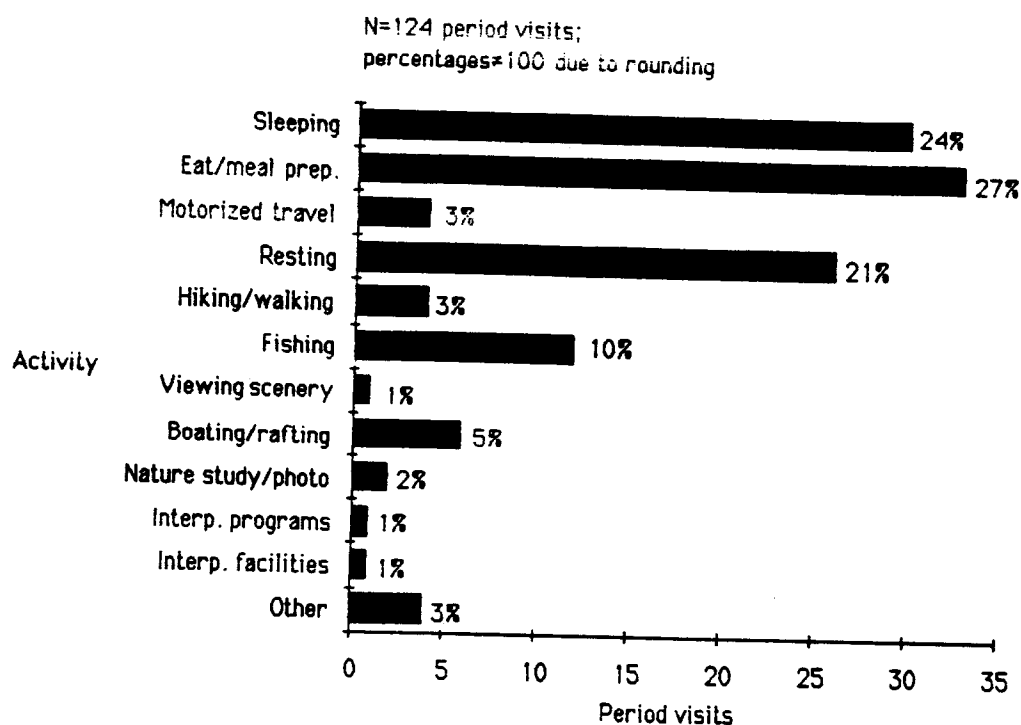


Figure 4.17: Period visits for activities of Hozomeen visitors--day 1 of visit

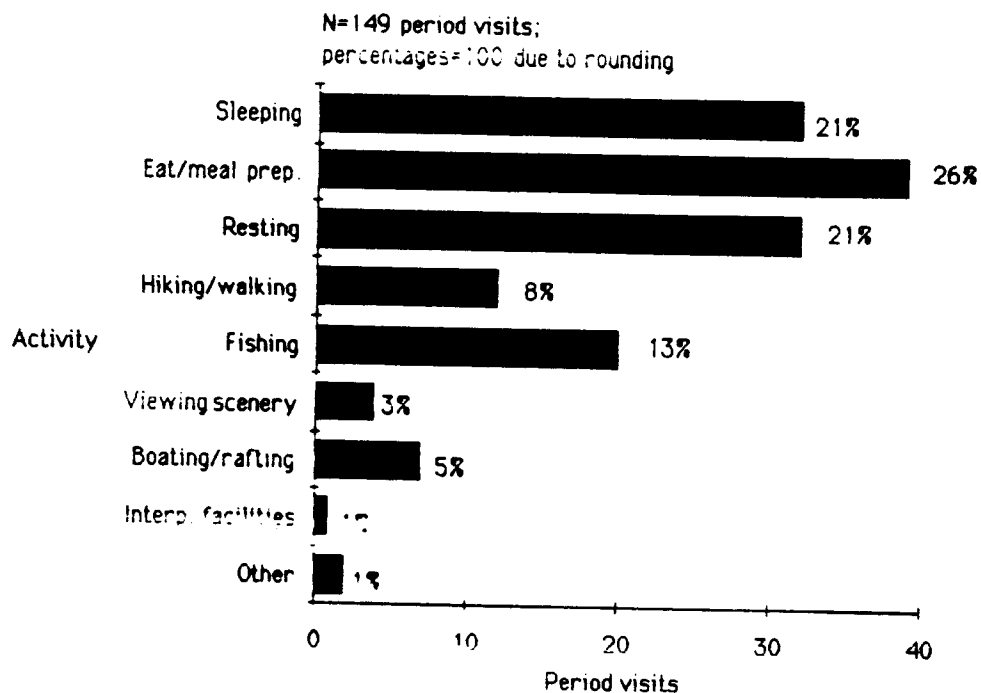


Figure 4.18: Period visits for activities of Hozomeen visitors--day 2 of visit

F. Visitors' activities and use of time combined

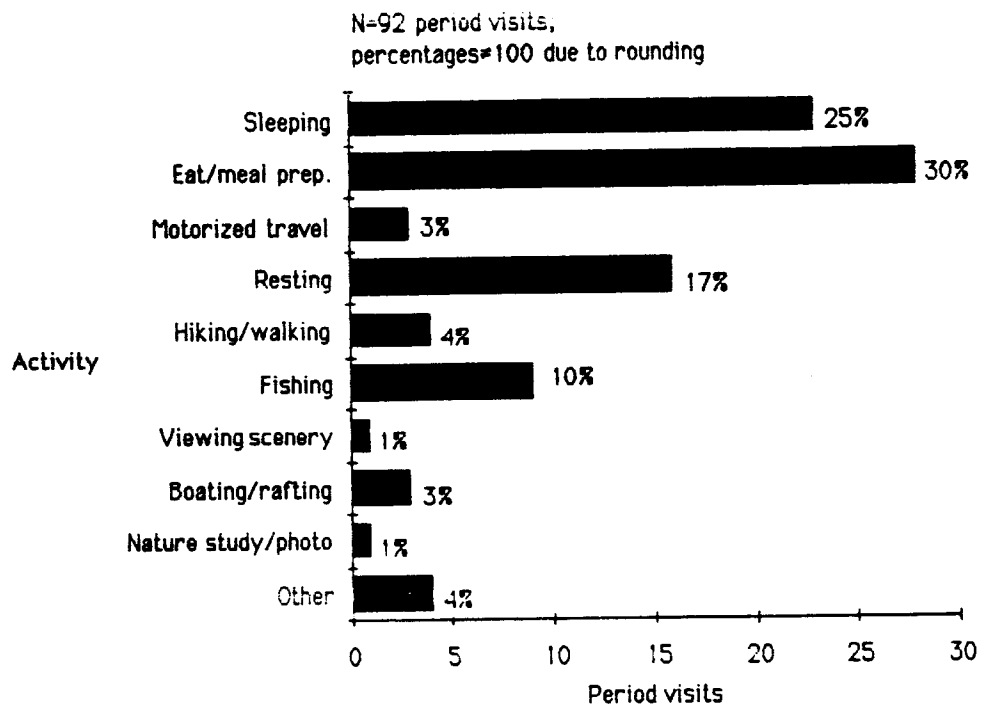


Figure 4.19: Period visits for activities of Hozomeen visitors--day 3 of visit

G. Visitors' locations and activities combined

Hozomeen visitors used the zones in different amounts and for different activities. That is, the relative proportions of activities varied from zone to zone, as shown in Table 4.1. (Due to recording errors, small amounts of activities are shown occurring in zones where they could not occur--for example, motorized travel in zone B.) Most activities were concentrated in zone C, although viewing scenery was popular in zone B.

G. Visitors' locations and activities combined

Table 4.1: Proportion of period visits for activities occurring in each zone, Hozomeen visitors (%).

Activity	Zone		
	B %	C %	D %
Sleeping (n=82)	-	94	6
Eat/meal prep. (n=96)	-	87	12*
Motorized travel (n=7)	29	71	-
Resting (n=73)	1	92	7
Hiking/walking (n=18)	-	83	17
Fishing (n=41)	-	93	7
Viewing scenery (n=5)	-	40	60
Boating/rafting (n=14)	-	100	-
Nature study/ photography (n=3)	-	100	-
Interp. programs (n=1)	-	100	-
Interp. facilities (n=2)	-	100	-
Other (n=10)	-	100	-

*Row percentages=100 due to rounding

H. Visitors' activities, locations, and use of time combined

By combining data on activities, use of time, and locations, a more detailed picture of Hozomeen visitors' behavior is possible. Table 4.2 shows the proportion of period visits for activities during each time period for zone C. Some activities, such as fishing, eating, and resting, took place during almost all time periods, while others, such as viewing interpretive programs or facilities, took place only at certain times.

Table 4.2: Proportion of period visits for activities of Hozomeen visitors among each time period for ZONE C (%).-

Activity	Time period					
	Sunrise %	Morning %	A'noon %	Dusk %	Evening %	O'night %
Sleeping (n=77)	35	-	-	-	3	62
Eat/meal prep. (n=84)	19	29	5	38	9	-
Motorized travel (n=5)	20	-	40	-	40	-
Resting (n=67)	19	9	27	6	37	1*
Hiking/walking (n=15)	-	53	33	-	13	-*
Fishing (n=38)	13	26	26	21	13	-*
Viewing scenery (n=2)	-	50	50	-	-	-
Boating/rafting (n=14)	-	14	50	29	7	-
Nature study/ photography (n=3)	-	33	-	-	67	-
Interp. programs (n=1)	-	-	-	-	100	-
Interp. facilities (n=2)	-	-	-	-	100	-
Other (n=10)	10	20	50	20	-	-

-Data presented with time periods combined over 3 days of visit.

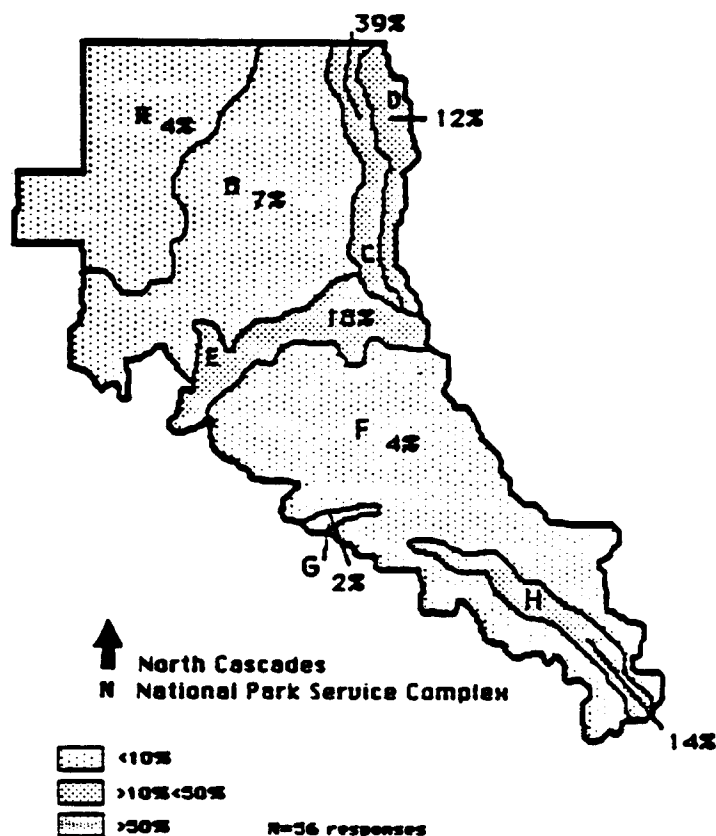
*Row percentages=100 due to rounding.

I. Special questions

Visitors to North Cascades were asked two specific questions about the park:

- 1) "If you plan to return to the North Cascades National Park Service Complex in the future, which zones would you visit?", and
- 2) "If you were planning for the future of the North Cascades National Park Service Complex, what would you do?"

Visitors could list as many zones or make as many suggestions as they liked. All zones were listed; their distribution is shown on Map 4.11. Zone C, the Hozomeen area, received the largest proportion of responses, while zones D, E, and H were also popular. Hozomeen visitors' suggestions are listed in Appendix E.



Map 4.11: Zones Hozomeen visitors would visit on their next trip to North Cascades

The surveys produced similar data for each area. Each results chapter is constructed so that the areas can be compared easily; the figures, maps, and tables are numbered in identical sequences. For example, Figures 2.1, 3.1, and 4.1 each present data on group sizes. Maps 2.2, 3.2, and 4.2 each show the proportion of period visits to each zone during the sunrise period.

Visitor characteristics were similar in all 3 areas, the Highway corridor, Stehekin, and Hozomeen. Most visitors came in small, family groups. Two was the most common group size at all three areas. Visitors of all ages came, but only a small portion were over 76 years old. Few older teenagers (16-20 years old) visited Stehekin, and few older adults (56 years and over) visited Hozomeen. Over one-half of the Highway and Stehekin visitors were Washington residents; over one-half of the Hozomeen visitors were Canadian residents. At Stehekin, over one-half of the visitors were there for the first time; most Highway and Hozomeen visitors has visited the area 2-5 times.

Visitors' use of time differed slightly from area to area. On the North Cascades Highway, visitors arrived at different times throughout the day, and most stayed only one day. At Stehekin, most arrived at mid-day, but a larger portion stayed longer than one day. At Hozomeen, most visitors stayed more than one day. Most period visits occurred during the afternoon along the Highway and at Stehekin, and during sunrise at Hozomeen.

Visitors' use of different locations also differed by area. Highway visitors spread out to all other zones of the park. Stehekin visitors used most other zones, and Hozomeen only two other zones.

Visitors' activities showed differences and similarities from area to area. Motorized travel was the predominant activity for Highway visitors, but accounted for smaller portions of Stehekin and Hozomeen visitors' time, as shown in Figure 5.1. Sleeping and eating accounted for large portions of time at all three areas; hiking/walking was the next most common activity by Stehekin visitors, while resting was the next most common activity by Highway and Hozomeen visitors. Interpretive programs and facilities only accounted for small portions of time at each area, as shown in Figure 5.2. A slightly larger proportion of period visits for interpretive programs occurred at Stehekin.

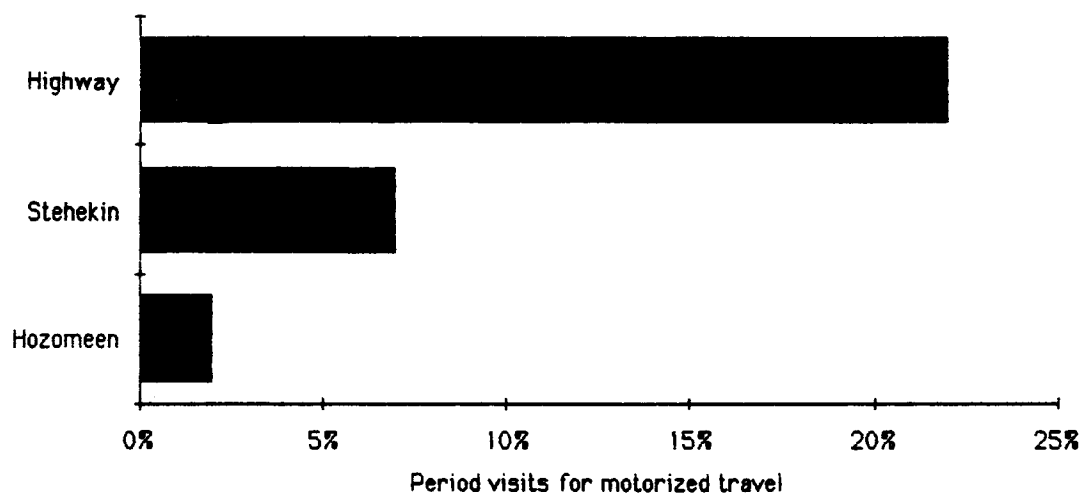


Figure 5.1: Proportion of period visits for motorized travel at each area

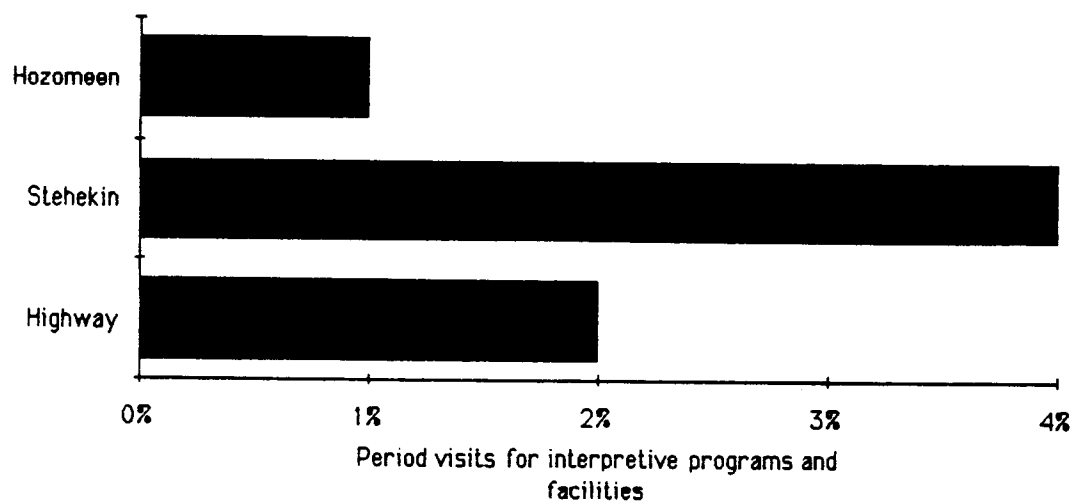


Figure 5.2: Proportion of period visits for interpretive programs and facilities at each area

How to Request Further Analyses

This report contains only some of the information that can be provided by the visitor mapping technique. By combining items such as location, time of day, etc., in different ways, a large amount of detailed information can be made available.

Managers may wish to see other tables, graphs, and maps in order to learn more about certain aspects of their park. This menu is provided so that managers can order these further analyses easily.

Two kinds of information are available:

- 1) Two-way comparisons--comparing two items at a time. For example, if a manager wished to know which time periods a particular entrance received the most use, he could request a comparison of time period by entrance; if he wished to know which zones received a greater portion of day use, he could request a comparison of zone by length of stay.
- 2) Three-way comparisons--comparing a two-way comparison to a third item. For example, if a manager wished to know the different amounts of activities occurring during each time period in each zone, he could request a comparison of (activity by time period) by zone; if he wished to know which age groups were participating in an activity during each time period, he could request a comparison of (activity by time period) by age group.

In Table 6.1, all of the possible two-way comparisons are shown. You can use this table to request further analyses the same way you would use a mileage table on a road map to determine the distance between two cities. First, locate one of the items you wish to compare in the left-hand column. Then, move to the right across the page until you intersect the column under the other item of interest. The number indicates the number of the two-way comparison of the two items--use this number when ordering further analyses.

To request a three-way comparison, please list all three items you wish to compare. For example, if you wish to request a comparison of activity by time period by age group, each of these items should be listed in the space provided on the order form. An example order form follows Table 6.1. Then, blank order forms are provided for you to tear out and complete, as shown in the example.

**Visitor Services Project
Analysis Order Form**

Date of request ____/____/____

Park _____

Person requesting analysis _____

Phone number (commercial) _____

1. Additional two-way comparisons (please circle appropriate number from Table 6.1)

1	11	21	31	41	51	61	71	81	91	101
2	12	22	32	42	52	62	72	82	92	102
3	13	23	33	43	53	63	73	83	93	102
4	14	24	34	44	54	64	74	84	94	103
5	15	25	35	45	55	65	75	85	95	104
6	16	26	36	46	56	66	76	86	96	105
7	17	27	37	47	57	67	77	87	97	
8	18	28	38	48	58	68	78	88	98	
9	19	29	39	49	59	69	79	89	99	
10	20	30	40	50	60	70	80	90	100	

2. Additional three-way comparisons (please describe, listing the three items of interest)

3. Special Instructions

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

Appendix A: Visitor Mapping Methods

Visitor Mapping Methods

The visitor mapping technique was first attempted at Yellowstone National Park in 1983. It was further tested in the Two Medicine area of Glacier National Park in 1984, and in Crater Lake National Park and the North Cascades National Park Service Complex in 1985. The general strategy is to distribute questionnaires to randomly selected visitors entering the park during a designated study period. Specific visitor sampling strategies differ from area to area, depending on unique site characteristics.

Questionnaire design

The questionnaire asks visitors to keep track of where they go and their activities for each day spent in the park (see Appendix B for a copy of the questionnaire). A park map, showing mapping zones, and a list of activities are provided in the questionnaire. Respondents indicate their primary location (by zone) and their primary activity during several designated time periods.

Additional information is requested about the group type and size, and the age, home zip code, and number of previous visits to the park of the respondent and each group member. Also, one to two questions are included that reflect the park's specific interests. Space is provided for respondents' additional comments about their visit and the survey.

Sampling

At North Cascades, different sampling methods were used at each study area. Along the North Cascades Highway, a random sample of non-commercial vehicles was made. Thus, visitor groups were sampled, rather than individuals (assuming one vehicle per group for most groups). At Stehekin, purposive samples were made of visitors departing on the excursion boat and visitors arriving in planes or private boats. An attempt was made to sample representative portions of the many visitors who arrived and departed on the excursion boat and the few visitors who arrived at other times. At Hozomeen, a census was made of all visitor groups camping in the area during the study period.

Questionnaire administration

Visitors entering the park or study area are stopped by a contact person, greeted, and briefly introduced to the objectives of the study. They are asked to participate voluntarily. If a visitor agrees to participate, further instructions are given as time allows. One adult member of the party contacted is asked to complete the questionnaire for his or her group. Completed questionnaires can be sealed and returned via U.S. mail, postage paid.

Missing data and reporting errors

Often, a respondent may not answer all of the questions in the questionnaire, or may answer some incorrectly. Unanswered

questions create missing data. Missing data causes the 'N', or number in the sample, to vary from figure to figure. For example, in Figure 2.1 'N' should equal 217 respondents but only equals 210 because 7 people did not answer the question on group size; in Figure 2.3, 'N' should equal 571 group members but only equals 567 because of missing data.

Questions that are answered incorrectly due to carelessness, misunderstanding directions or maps, and so forth, show up in the data as reporting errors. Reporting errors create small, but obvious, inconsistencies in the data. For example, 798 period visits to zones and 821 period visits for activities were reported by Highway visitors; thus, 3% of the period visits for activities were not recorded properly as occurring in a particular zone. In Table 3.1, 1 period visit for shopping is shown occurring in zone F; since there were no stores in zone F, this 'reporting error' may be due to improper map reading.

Data analysis

The questionnaires are pre-addressed to the staff at a computer facility. Upon arrival, responses are coded and entered into a computer system. Frequency distributions and crosstabulations are calculated, using a standard software package. Respondents' additional comments are xeroxed, and copies are forwarded to the park.

Limitations

The mapping technique has several limitations. First, the

questionnaire 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 and is reduced by having visitors fill out the survey as they visit the park.

Second, the data describe the use patterns of only those visitors who enter the park during the designated study period at the entrances sampled. Results do not apply to visitors using other entrances or entering during different times of the year.

Third, respondents can only indicate the zone they were in or the activity they were doing for the most amount of time each time period. Visitors may travel to additional zones or be involved in additional activities during one time period. Thus, the data present a simplified picture of visitor behavior.

Fourth, data are not collected on non-respondents. That is, we cannot know if the visitors who return their questionnaires differ from those who do not.

Fifth, the data are limited to only 3 days of a visit. Visitors who stay longer may use their time differently than those who stay 3 days or less. Again, the data present a simplified picture of visitor behavior.

Nevertheless, the mapping data provide managers with a useful profile of visitor use, which can be further analyzed in a number of ways, as illustrated in the menu for further analysis.

Appendix B:
Questionnaire used at North Cascades

